THE T. & R.

BULLETIN

THE INC. RADIO SOCIETY OF GT. BRITAIN

AND THE BRITISH EMPIRE RADIO UNION

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THE INCORPORATED
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THE T. & R. BULLETIN

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Vol. 11

No. 9

TELEPHONY ON THE 7 Mc. BAND

WE seem to have read somewhere that the frequencies which lie between 7,000 and 7,300 kc. are allocated exclusively by International agreement to amateurs. How comes it, then, that at least three so-called amateurs are broadcasting advertised programmes on specified frequencies in this band?

We should like to feel that their presence is the result of an unfortunate accident, but in reading the current issue of one of our contemporaries, we find that stations VP3MR, EA8AB and CR6AA are broadcasting set programmes at definite times on 7,080, 7,200 and 7,177 kc. respectively.

Already one of these stations has fallen foul of the American and British amateur fraternity, several of whom have communicated with the I.A.R.U. and ourselves about its intrusion into our exclusive band.

Whether or not our protests have had the desired effect remains to be seen, but we can assure our members that we shall never hesitate either now or in the future to use our best endeavours to put a stop to these illegal transmissions.

The ease with which pseudo-experimental broadcast stations obtain recognition makes it imperative that every amateur organisation of standing should take steps to see that imitators do not spring up in their own country. Fortunately no definite example of broadcasting within amateur bands has yet been laid at the door of a British amateur, but since we are writing of 7 Mc. telephony transmissions, it would do no harm if we repeated some comments concerning telephony congestion made by one of our members in answer to a particularly "brilliant" effusion from a correspondent published in a weekly radio journal.

Our member summed up the reasons for the congestion under six headings :—

1. Stations use unnecessarily high power to effect local contacts. The 100 watts phone station on a Sunday morning is a pest.

2. The reluctance of many amateurs to use the high frequency portion of the band, viz., 7,200 to 7,288 kc., because it is not in harmonic relationship with the 14 Mc. band.

3. The general disinclination to work during the week and boldly tackle the problem of broadcast interference.

4. The over-modulated, unstabilised and bad quality transmissions which emanate from many sources.

5. The neglect of artificial aerials for many types of modulation experiment.

6. The lack of interest in the 1.7 and 28 Mc. bands, plus the tendency of certain stations to

(*Continued on Page* 382.)

A 56 Mc. RECEIVER FOR C.W. AND TELEPHONY

By J. N. Walker (G5JU).

Foreword.

UP to the present, practically all communication made on 56 Mc. has been effected, using speech or tone modulated transmitters, usually very heavily modulated, and of more or less poor frequency stability, in conjunction with receivers which depend chiefly on the use of super-regeneration for their sensitivity.

Super-regeneration has, admittedly, been almost a necessity, since it makes the receiver tuning broad, without which it would be difficult to hold the transmissions. At the same time, the signal received, to be intelligible, has to be strong enough to cut through the quench noise, and the writer has known of many cases where weak signals have been heard and not identified. In the November issue of the Bulletin a crystal controlled 56 Mc. transmitter was described, and the tendency now is for the old self-excited type to be relegated to the junk-box. It is hoped that everybody using the 56 Mc. band will discontinue using self-excited transmitters and build transmitters using either crystal or E.C.O. control. If one of the buffer or doubler stages is keyed, modulation of any type can be dispensed with and straight C.W. signals transmitted. No one can say at the moment what the range of these may be. The ground wave, we know, attenuates rapidly over normal country, but there is a strong probability that an ionised layer exists in the upper atmosphere capable of reflecting these ultra short-waves. An interesting field of experiment lies open here, to find out the best angle of radiation to use, and the conditions under which reflection occurs.

The need of the moment, therefore, is a receiver, the sensitivity of which must be very high, and possessing stability of an order which will allow of the reception and holding of straight C.W. signals on 56 Mc.

The receiver to be described is a serious attempt to evolve one possessing the necessary qualities. It is realised that, since essentially the receiver is practically a one-band set, too complicated and costly a design is not called for at the moment, and a straight, as opposed to a super-het, circuit (Fig. 1) has been adopted, the points of which will be briefly enumerated.

With normal valves at these frequencies, even with a tuned H.F. stage, it would not be possible to obtain any appreciable stage gain, but a screened-grid valve performs the very valuable service of acting as a buffer between the aerial and the detector, so that the aerial characteristics have no effect on the tuning of the detector stage, "dead spots" are obviated, and reaction is extremely smooth, the latter quality necessarily being a great advantage. To keep two tuned circuits in line would entail extra complication, so the aerial input circuit has been made aperiodic. A small variable *J.B.* Neutralising Condenser couples the anode of the s.g. stage to the detector stage, which incorporates band-spreading, infinitely more necessary on these frequencies than on more normal ones. A dual ratio dial gives extremely fine tuning.

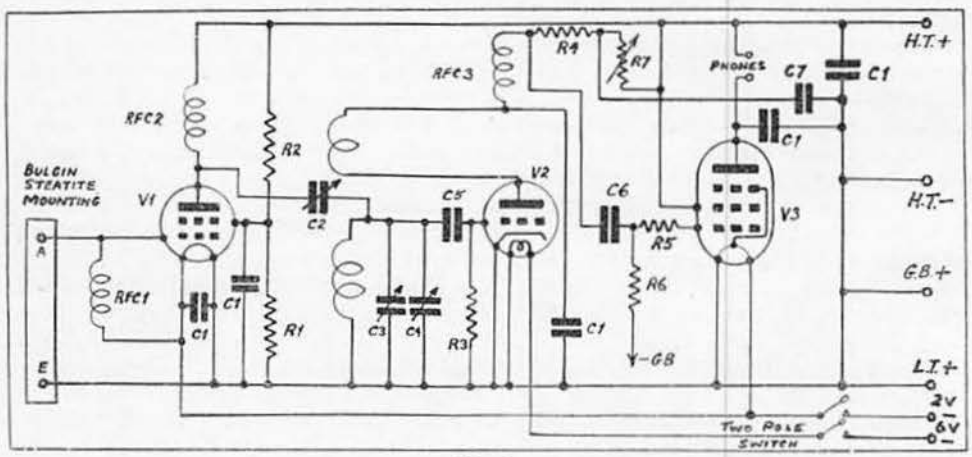


Fig. 1.
Circuit diagram of 56-Mc. Straight Receiver.

R1, R5	*50,000 ohms Dubilier 1 watt.*	*RFC 1 & 3*	*Chokes, B.T.S., Type 2.*
R2	*40,000 " " "*	*RFC 2*	*Chokes, B.T.S., Type 3.*
R3	*5 M " " "*	*V1*	*Hivac XSG.*
R4	*100,000 " " "*	*V2*	*R.C.A. Acorn Type 955.*
R6	*500,000 " " "*	*V3*	*Hivac XP.*
R7	*50,000 ohms Reliance Potentiometer.*	*Switch*	*Bulgin*
C1	*300 μμF Dubilier Type 665.*	*Terminals*	*Lectro Linx.*
C2	*20 μμF Neutralising, Jackson Bros.*	*Valve Holders*	*Lectro Linx.*
C3	*15 μμF Midget, Jackson Bros.*	*Dial*	*Dual ratio Arcuate, Jackson Bros.*
C4	*40 μμF Microdenser, Eddystone.*	*Tuning Coils*	*B.T.S. type UT 2.*
C5	*50 μμF Dubilier Type 665.*	*Condenser Bracket*	*B.T.S. type UB.*
C6	*.02 μF Dubilier Type 4501.*		
C7	*.5 μF Dubilier Type 4517.*		

and all the components used are of the modern real "low-loss" type, using insulation specially suited to ultra high frequencies. The reaction is controlled by series resistance, and is so smooth that it is difficult to tell when the receiver commences to oscillate, and the grunts and howls that are sometimes difficult to get rid of are conspicuous by their complete absence. It will be realised that the sensitivity of a set of this type depends largely on the detector valve used. For this reason, one of the *R.C.A.* type **955** Acorn triodes has been incorporated, and is fitted directly into the wiring. Modifications to the L.T. circuits are required as this valve is of the indirectly heated type, the heater taking 6 volts. Where it is intended to use the set for really serious work, the inclusion of this valve, although somewhat expensive, will be found well worth while, since it is made for use on very high frequencies, and possesses unique qualities. The heater supply may be obtained from a mains transformer with a secondary giving 6 volts, and this will be found to introduce no hum.

A single stage of resistance coupled L.F. amplification is used, and, while a pentode can be used if desired, it is preferable to use a small triode of the HL2 type in this stage, this giving lower background noise.

Construction.

In the original model a 20 s.w.g. copper chassis is used, this material presenting the lowest surface resistance to u.h.f. currents, and full details and dimensions are given. *Peto Scott Co., Ltd.*, market a material known as "Plymax," consisting of plywood 5/16-in. thick, covered with 20-gauge aluminium, and this is quite suitable.

The lay-out of those components which are mounted on the chassis is given in the accompanying sketch (Fig. 2) and this should be adhered to as far as possible, since all connections between parts of the tuned circuit must be kept very short, otherwise the tuning range will be affected. The other components, consisting of resistances, condensers and two H.F. chokes are held suspended in the wiring, which can be done with 18 s.w.g. tinned covered wire, systoflex sleeving being used as an additional safeguard where any wire passes through the chassis. The bracket on which the *J.B.* Midget condenser is mounted is supplied with the dial, while the tuning coils, neutralising condenser, and H.F. choke are kept clear of the chassis by means of ½-in. lengths of ebonite or steatite tubing. The earth end of the grid choke is connected to the negative filament pin of the midget valve-holder, and the 300 μμF by-pass condenser is connected directly across the filament pins by suitably bending the tag-ends, and similarly the screen-grid by-pass condenser is soldered direct from the valve-holder to the chassis, and the output by-pass condenser from the terminal to the chassis. One end of the reaction by-pass condenser is soldered to the tag on the inner end of the reaction coil, the other end being bolted to the chassis.

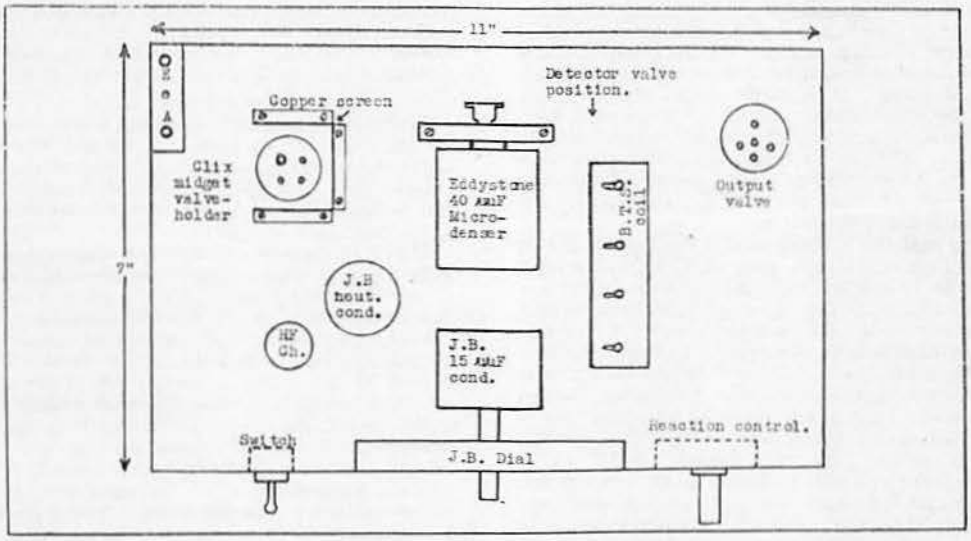


Fig. 2.
Layout of apparatus used in 56-Mc. Receiver.

This bolt on the underside holds the H.T. 300 μμF by-pass condenser.

The wiring of the actual tuned circuit is somewhat unconventional, and any trouble that may occur will be found here. This part was first of all wired up with ordinary wire and most extraordinary effects were obtained, due to the surface resistance of even short lengths being so much more than that of the silver-plated wire in the coils. Copper strip was therefore used, and this can conveniently be obtained by cutting strips ½-in. wide from a piece of foil, previously brightly polished. Use as short lengths as possible and lacquer when they are in position.

We now come to the fitting of the Acorn valve. One end of the grid condenser, after snipping off the tags, is fitted under one end nut of the band-set condenser, and the other is soldered to the grid wire of the Acorn and the grid leak. A very short length of wire connects the anode wire of the Acorn to the end tag of the reaction coil. The filament

wires are brought up through a single hole in the chassis and connect directly to the two (outside) heater wires on the valve, while the remaining one, the cathode, is connected to the "earthy" side of the tuning coil by a short length of copper strip. Great care must naturally be exercised when soldering on to the lead-out wires of the Acorn valve. Half-inch lengths of tinned copper wire should first of all be soldered to the valve pins, and all connections afterwards be made to the end of these wires. If the wire or strip is well tinned, and resin used as a flux, a light touch of the soldering iron will make a good joint. A big iron should not be used, to avoid damage to the valve through the iron touching it. If preferred, this valve can be mounted by utilising the clips supplied with it. These can be fixed with the aid of the template on a thin piece of ebonite or a strong piece of mica, which can in turn be mounted 2 ins. above the chassis. The wires coming from the clips should be flexible for an inch or so, to avoid putting a strain on and distorting the valve mounting piece.

A copper screen is fitted around the s.g. valve, but may possibly not be found essential—this was added after double oscillation was experienced, which it cured. It is easily made, using a piece 4½ in. by 3 in. bent to form a U shape with 1-in. sides, and is worth while fitting. After placing the *Hivac* XSG in its holder and fitting the wire from its anode through the screen to the top connection of the neutralising condenser, the receiver is ready for testing.

In all probability the action of the set will not be all one desires. It will quite likely be found that, although connected in parallel with very low resistance paths, the band-set and band-spread condensers will act independently. A certain amount of ingenuity is required to overcome this, and the method is as follows. Adjust the variable resistance so that the receiver is oscillating weakly, and with a long pencil find out which points of the tuned circuit, comprising coil and two variable condensers, are "hot" and which "dead." Very unexpected parts will be found "hot," and points on the moving vanes side of the condenser will definitely show up. Any parts of what should be the "dead" side of the circuit which show H.F. (indicated by "plops") should be connected by independent copper strips to the "earthy" end of the tuning coil, and the ingenuity comes in making connections to the condensers. Usually a nut can be loosened and the copper strip inserted underneath. When this has been done, the receiver should act normally and give very smooth and noiseless reaction. With the band-setter at minimum, the wavelength will be in the region of 4 metres and at maximum about 8 metres, and the band spread will give good control over any part of this, so that, in London at any rate, the experimental television transmissions should be received, as well as amateur 56 Mc. transmissions.

The receiver is designed to work with any usual aerial but in order that a voltage node may appear at the grid of the first valve, it is recommended that an aerial of a length making an even number of half waves be used, and one 32 ft. long, partly vertical and partly horizontal, would meet the case.

The receiver is finished off by fitting two lengths of 1" × ½" wood across the ends of the chassis, and projecting ¼ in. below the chassis. This will make it perfectly rigid and enable it to stand without wobble. The leads to the grid bias battery pass through a hole made in one of these runners.

Use and Results.

Care must naturally be exercised when connecting up the filament supplies, as, should the 6-volt supply be inadvertently connected up to the 2-volt valves, they will probably suffer damage! The end terminal is made the 6 volt negative, and so no confusion should arise.

The high tension voltage required will not be more than 60 volts. This value gives nice control of oscillation and the *J.B.* Coupling Condenser can be screwed down to the full capacity.

It is rather too early at the moment to say much of results, but a commercial harmonic from a station 15 miles away, working on 31 metres, can be tuned in and held easily and read without effort, at 20 w.p.m., and over. The strength of this signal averages R/6, and once tuned in, the receiver can be left untouched and the signal remains steady, proving frequency drift to be negligible. It must be remembered that the usual signal transmitted by amateurs on 56 Mc. is very broad, quite often split and very rough and may, therefore, be difficult to receive beyond a few miles.

With a clean, sharp signal, T/9 in character, this receiver will undoubtedly give a good account of itself.

Use of British Valves.

As previously mentioned, since the sensitivity of the receiver depends chiefly on the detector valve, one specially made for this class of service has been incorporated in the design. At the same time, it is realised that there is probably a considerable number of members who will not wish to go to the expense of an "Acorn" valve and who would prefer to use a British valve in its place. Further experiments were therefore made with the object of finding a suitable type, and it is gratifying to know that some of the latest *Hivac* X series work well in this receiver, though with a falling off in sensitivity.

Slight alterations will be necessary, since coupling in the *B.T.S.* coils specified is too loose to cause oscillation without resort to high anode voltages. Experiments were made with a number of coils,

(*Continued on page* 382).

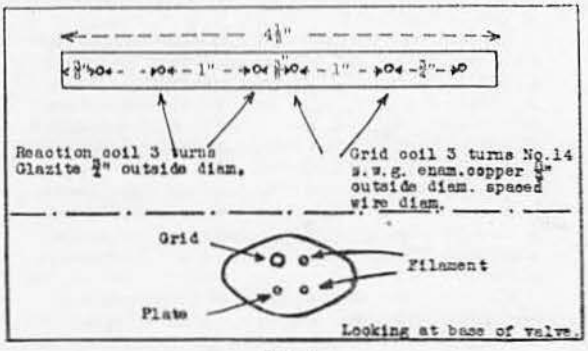


Fig. 3.
Arrangement of coils when a Hivac valve is used in place of an Acorn.

Fig. 4.
Connections to Clix Midget valve holder, view looking at under-side of holder.

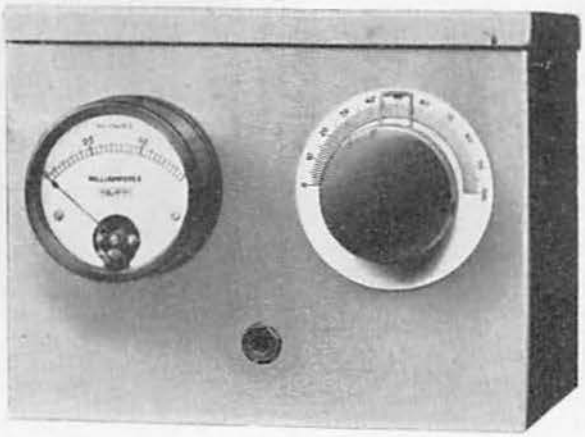
A FIELD STRENGTH INDICATOR

By G2IS.

ALTHOUGH in the last year or so it has received more attention, the radiating system still remains the weakest link in the amateur transmitting layout. In many cases lack of space and facilities forces the amateur to make shift with a comparatively imperfect antenna. In these cases it is essential that the existing antenna be operated at optimum efficiency and adjustment.

The purpose of this article is to describe a simple, inexpensive, yet useful field strength indicator. As its name implies, a field strength indicator is used to measure the strength of the radiated signal at a given point. In order to read this value quantitively we should require an extremely complex and expensive laboratory instrument. We are not, however, interested in a quantitive reading, for all we need is a *comparative* reading which will show whether one of a number of adjustments is giving the best results.

The field strength indicator is a simple diode detector which rectifies the signal received and measures it on a low-reading D.C. milliameter. Most of the components should be available in the amateur shack, and the first cost works out a great deal less than a thermo-coupler galvanometer. Fig. 1 shows the wiring diagram. The physical layout is unimportant and may be arranged to meet individual taste or the limitations imposed by the apparatus available. It is important that the device be adequately screened.



Front view of the completed field strength indicator.

The field strength indicator may be used for the following purposes:—

Field strength indication.
Linear monitor for modulation.
Neutralising indicator.
Wavemeter.

Field Strength Indication.

The procedure for field strength indication is as follows:—

Place the indicator at some point within the immediate field of the antenna. It is often possible and most convenient to locate it in the shack, but in this case care must be exercised to see that the indicator and its associated antenna are not in the direct field of the transmitter. To begin with, let us assume that the antenna is swung above a back garden and that it is not convenient to place the indicator in the shack.

A box or old table should be set in the garden directly under the antenna if possible. The field strength indicator is placed upon it and *earthed* —one of those commercial earthing rods driven into the ground will do. A pick-up wire should now be connected to the antenna terminal on the indicator box. A walking-stick driven into the ground makes a suitable " mast " and the pick-up wire should be run parallel to the antenna. The length of the wire depends on the power being radiated by the antenna, but only a few feet will be necessary even for low power.

The indicator should then be switched on and the filaments allowed to warm up. With the transmitter radiating, the field strength indicator should be tuned to resonance, as shown by a deflection on the meter. This should show about half scale. If the deflection is more than half scale the pick-up wire needs to be reduced until the right length to give half scale deflection is reached. If the operator is making his adjustments single handed, it is best to arrange for the meter to be read from the shack window through a pair of field glasses. If assistance is available, the one reading the field strength indicator should keep well away from it in order that the presence of the mass of his body will not cause errors. Much calling back and forth can be overcome by the simple expedient of arranging beforehand a tabulated list of the tests to be made in order. The readings can then be noted against this list and conclusions reached by comparing the field strength indicator readings with readings taken in the station of dial settings, anode current and radiation.

As most amateurs have discovered, the radiation meter can lie! The curve, Fig. 2, shows a series of readings taken at a medium-powered London station during the adjustment of a Collins coupler. It should be borne in mind that the indicator does not read radiation, but gives a true picture of the actual " flux density " appearing about the antenna. A suggestion has been made that the field strength indicator might be upset by radiated waves from surrounding objects. That fact is true, but, provided it is not moved, it will still give a true comparison of various adjustments. If the field of the antenna is more powerful for a given setting, then it follows that the reflected wave will be more pronounced in the same degree.

Although the author has not tested the suggestion, it seems reasonable to suppose that, by using a simple tuned RF stage ahead of the diode detector in the indicator, readings could be taken at a dis-

tance of several wavelengths from the antenna, and hence a radiation directional curve could be plotted.

When the indicator can be located in the shack,

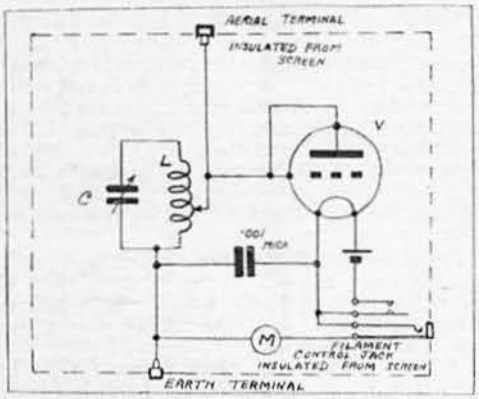


Fig. 1.
Circuit diagram of field strength indicator.
C—100 μμF.
L Wound with suitable number of turns to tune band required.
V—2-volt Triode.
M 0-1.5 milli-ammeter.

an indirectly heated triode can be used, and in this way the operator obtains a check on the operation and adjustment of his transmitter at all times.

Linear Monitor for Modulation.

The detection characteristic of a diode is linear. This field strength indicator can be used as a radio telephone monitor by fitting it with a pick-up wire a few inches long. Headphones are plugged into the jack, and the field strength indicator placed in the field of the antenna or of the modulated RF amplifier. A simple listening test may thus be carried out which will give an exact picture of the modulation. In the case of CW stations, superimposed ripple on the D.C. plate current and key clicks are readily apparent.

Neutralising Indicator.

In the same general way the field strength indicator makes a highly sensitive neutralisation indicator. A short pick-up wire is used, and the indicator serves the purpose in the same fashion as the time-honoured flash lamp and loop. The degree of sensitivity is so much higher that a more precise degree of neutralisation can be reached. The smaller the deflection on the meter, the more perfect the neutralisation. It will probably be impossible to get an absolute minimum reading, as such a degree of neutralisation cannot be reached in the average amateur P.A.

Wavemeter.

The device may also be used as a wavemeter for rough check only. A short rigid pick-up wire, only a few inches long, should be used, and this should be so arranged that when connected it is always in the same position relative to the screening can of the indicator. Calibration can be carried out against a known standard.

Where power in excess of 100 watts has been used, the indicator has achieved useful work in finding metal which was absorbing radiation from the antenna. By "exploring" the field of the antenna, it will often be found that sudden peak deflections appear on the milliameter. These can usually be traced to the presence of a standard lamp, curtain rod, or some other metal object close to the pick-up wire (which should be a short rigid piece of brass rod in this case), which is radiating,

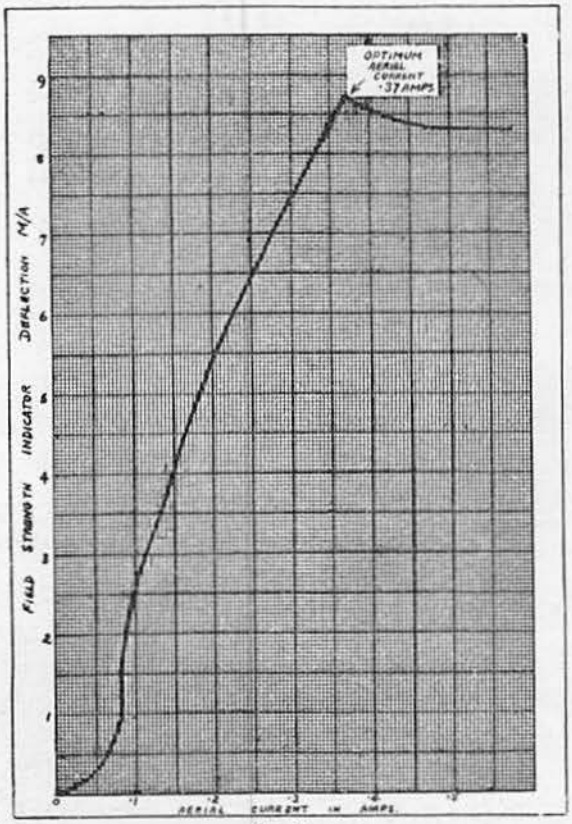


Fig. 2.
A graph showing a series of readings taken at a medium power station during the adjustment of a Collins aerial coupling network.

and hence using up power and distorting the field of the antenna. This can often be corrected by bonding to earth, or removing the offending article. The latter method is the easier!

For operation on five meters, a modified field strength indicator might be used with a large single turn inductance acting as a loop antenna. Such an arrangement would be especially useful for checking the directive properties of a beam radiating system.

Optical Range

An approximate rule for finding the range of vision for small heights is to increase the square root of the number of feet that the eye is above the level surface by a third of itself, the result being the distance of the horizon in miles. Refraction is taken into account in this approximate rule.

An example will illustrate the application of the rule.

The eyes of an observer are 36 feet above a level surface; therefore, the horizon is $\sqrt{36} + \frac{1}{3}\sqrt{36}$ miles distant. Square root of 36 is 6, one-third of 6 is 2, $6 + 2 = 8$ miles.

A MINIATURE SHORT-WAVE RECEIVER FOR LOUD-SPEAKER RECEPTION

By A. P. Soublette * and J. Billard.

MINIATURE short-wave receivers have always appealed to the average radio amateur, chiefly because of their usefulness in field-day work. In planning the construction of the receiver to be described, the authors did not intend to produce the " world's smallest," but it is highly probable that it is one of the tiniest working instruments in use to-day.

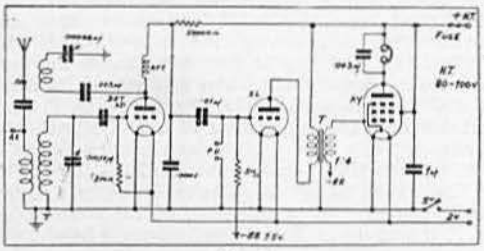


Fig. 1.
Circuit diagram of the three-valve midget short wave receiver for loud speaker reception.

The advantages gained by using a miniature receiver can be summed up as follows :—

(*a*) Extreme portability.
(*b*) Economical in construction.
(*c*) Simple to operate.
(*d*) Economical to operate on account of the small current drain by the valves.

The advent of the *Hivac* midget valves and the availability of other small British components made the design possible.

The original circuit developed was for headphone reception using resistance coupling and a *Hivac* XP triode in the output stage, and with this arrangement stations as far distant as India were received with ease.

It was then decided to substitute a *Hivac* XY output pentode in order to obtain loud-speaker reception. Tests proved successful, hence this article.

A careful examination of the photographs will show that standard components have been used throughout, whilst the circuit is of a conventional nature. Considerable thought was given to the placing of all components in order to reduce coupling effects to a minimum, and the shortest possible leads were used for connections. The midget low-frequency transformer has been placed underneath the chassis.

Reaction is smooth, and hand capacity has been entirely eliminated by inserting a choke in the anode circuit of the detector valve, a *Hivac* XD.

The first stage of low-frequency amplification is obtained by the use of a *Hivac* XL valve, resistance coupled, thus ensuring very little distortion. A *Celestion* speaker is used with the receiver.

The weight of the completed set without batteries is under 2 lbs., and it can be housed with batteries in a small box measuring approximately 8 ins. by 5 ins. by 4½ ins. A belt has been provided for easy transport.

The constructors will be pleased to hear from other readers who have had experience with miniature receivers.

* 122, Boulevarde Exelmans (16e), Paris.

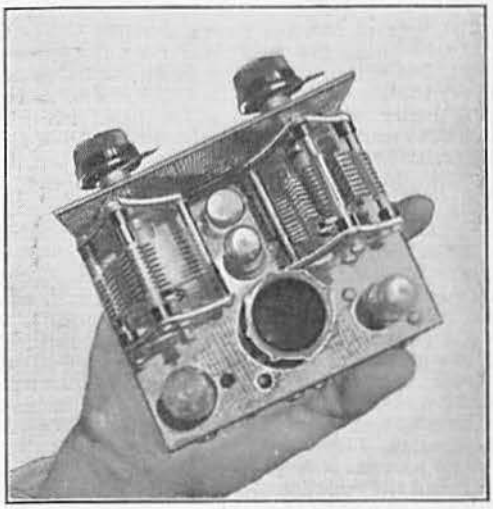


Fig. 2.
A plan view of the receiver showing arrangement of components. Note the size compared with the hand which is holding it.

Components Used or Recommended.

Valves	...	Hivac Midgets XD, XL and XY.
Valve holders	...	Lectro Linx (Midget types).
Tuning condensers		B.T.S.
Resistances	...	Dubilier.
Condensers	...	Dubilier.
Coils	...	Eddystone.
Transformer	...	B.T.S. (Midget).
Switch	...	Bulgin.
Choke	...	Eddystone Type 1010.
Batteries	...	Drydex 90 v.
Accumulator	...	Exide 2-v. non-spillable.
Chassis	...	Peto Scott or Paroussi, 5 ins. by 3¾ ins. by 1½ ins.

British Isles Work on 56 Mc.

Mr. W. B. Champion (2AXB), in a letter to the Editor, suggests that, instead of attempts being made to work DX on 56 Mc., each British District should endeavour to set up a permanent station for inter-British Isles working. N.F.D. week-end might prove a suitable occasion for preliminary tests.

THE STUDY OF PROPAGATION USING A ROTATING HALF-WAVE BEAM ANTENNA

By G. W. Slack (G5KG).

FOR the past few months the writer has been studying the propagation of the electro magnetic wave through different light densities. In these studies a standard half-wave Hertz antenna has been chiefly used in conjunction with a simple half-wave reflector.

Type of Aerial.

The type of antenna chosen was the Windom, chiefly because it is simple to construct and operate, also it has only a single wire feeder, which makes it easy to sling in any position, and it can be moved quite easily without having the usual two-wire feeders to contend with. The feeder can be of any length, this also being a useful property when the position of the antenna has to be changed.

Height of Aerial.

The height of the antenna was the next problem to be settled, and this was, of course, governed by the frequency to be used. The 14 Mc. band was decided upon. Propagation of signals over long distances was the objective, therefore, a height giving low-angle radiation was required.

Now an antenna suspended one half wave above ground gives an angle of radiation of 30 degrees, which means that the signal leaves the antenna at an angle of 30 degrrees out of the horizontal plane, this gives fairly low angle radiation.

If an antenna is suspended $\frac{3}{4}$ wave above ground nearly all the radiation is at an angle of 90 degrees, which gives a very high angle of radiation, and is very unsuitable for DX work. The small portion of radiation which remains leaves the wire at an angle of about 20 degrees, and this is the only redeeming feature when using this height. If the aerial is suspended a full wave above the ground, it has two lobes of radiation, the first comes off at an angle of 45 degrees, and is suitable for medium DX, the other comes off at an angle of 15 degrees, and is ideally suited for very long distance work.

It is well known that when a short wave signal leaves an antenna, it travels through space until it strikes one of the ionised layers above the earth from whence it is reflected back again to earth, and this process is repeated until the signal is completely absorbed by the ionised layers and the earth. So, theoretically, the aerial most suitable for DX work is one which will give the lowest angle of radiation.

Examining the cases previously mentioned, we find that the half and full wave arrangements are the best for this purpose. Considering the full wave first, we say that it has two lobes both suitable for DX,; these two radiations leave the aerial at the same moment of time, but as they leave at different angles, they strike the ionised layer or layers at different points, and as it takes a certain period of time for a wireless wave to travel a given distance the two angles of radiation do not reach the layer or layers at the same moment. It will thus be seen that to reach a very distant point one radiation has to make more "hops" than the other. A time lag has now been introduced, which consequently produces phase-distortion, echoes, and what is known as corridor effects at the receiving end. Phase-distortion may become so bad under these conditions that cancellation of the signal at a distant point of reception may take place, thereby introducing one cause of fading. Therefore, we can state that although the full-wave height is very good theoretically, it introduces many disadvantages. Examining the half-wave height, we find that although it does not possess the very low angle component of the full wave, its angle of radiation is sufficiently low to make it very suitable for the propagation of a DX signal, also it has only one lobe of radiation, it is less prone to phase distortion, echo, and fading, the latter an important factor to consider for signals of low field strength. After weighing up all points carefully, it was decided that the half-wave height was the most suitable for the purpose, of the studies in hand.

Length of Aerial.

The next point considered was the aerial itself, and as the author was chiefly interested in the propagation of signals through different light densities, it was most important that the correct length be used.

We will now consider what happens when we use aerial wires a half, full and two wavelengths long. In the case of a wire two wavelengths long (which for 14 Mc. is about 132 ft.), we find the transmitted wave leaves the wire in the horizontal plane in six directions. This means that if our aerial runs due north and south, we shall have lines of maximum radiation leaving the wire in the following directions: (1) 36 degrees to the north-east; (2) 36 degrees to the north-west; (3) due west; (4) 36 degrees to the south-west; (5) due east and (6) 36 degrees to the south-east.

In the case of the full wave antenna, we find that this has only four lines of maximum radiation, which leave the wire in slightly different directions, namely, two go off at 54 degrees to the north-east and north-west, and two at 54 degrees to the south-east and the south-west.

When we come to the aerials which are a half-wave long, we find that it produces only two lines of maximum radiation, which leave the wire at an angle of 90 degrees in the horizontal plane, or in the case under discussion one due east and the other due west. From these observations we are able to choose the type of antenna most suitable for our requirements.

In the particular case under review, it was important that signals should be propagated in one direction only, because the writer desired to know exactly what happened when his signals passed through one particular light zone. If the signal travelled in more than one direction to a distant point, it would, of course, pass through more than one type of light density, and, there-

fore, any observations made on that account would be upset.

To achieve the desired result, it was decided to use a half-wave antenna in conjunction with a simple half-wave reflector. The latter, of course, cut off one of the lines of radiation and thus helped to concentrate the signal in the desired direction. This method proved a great help, because when observations are made, it is essential that a signal of good strength be received at the point of reception. An R6 signal at about 10,000 miles was aimed at.

Erection of Aerial.

The aerial itself, as has been mentioned, is a Windom, which was constructed to the formula propounded by G2BI in the BULLETIN of December, 1934, viz. :—

$$\text{Length of the top} = \frac{474150}{\text{freq. in kc.}} = \text{length in ft.} \quad (1)$$

Distance of feeder tapping point from centre of antenna = X, where

$$X = \frac{\text{length in ft.} \times \text{factor F}}{180} = \text{ft.} \quad \ldots\ldots\ldots\ldots \quad (2)$$

F=23.2 for 14 S.W.G. wire, which was the size used for the feeder.

The aerial was suspended one half wave (33 ft. 3 ins.) above the ground between two poles 40 ft. high, separated 140 ft. apart, so that its ends would be more than one half-wave away from any earthed object, to eliminate as far as possible absorption and shadow effects and thereby allow the antenna to radiate as near to theory as possible.

If these precautions are not taken, the aerial is liable to develop peculiarities of its own and upset the observations that it is intended to make.

The Reflector.

The dimensions for the reflector were taken from an article written by G6CJ, and proved to be ideally suitable. A piece of wire the same gauge as used for the aerial itself was cut exactly 2 ft. longer than the aerial. This was spaced exactly one quarter-wave behind the antenna (accomplished by using light wood spreaders), and the aerial and reflector attached. The whole system was then slung up to the height mentioned, and it was so arranged that it could be turned over,

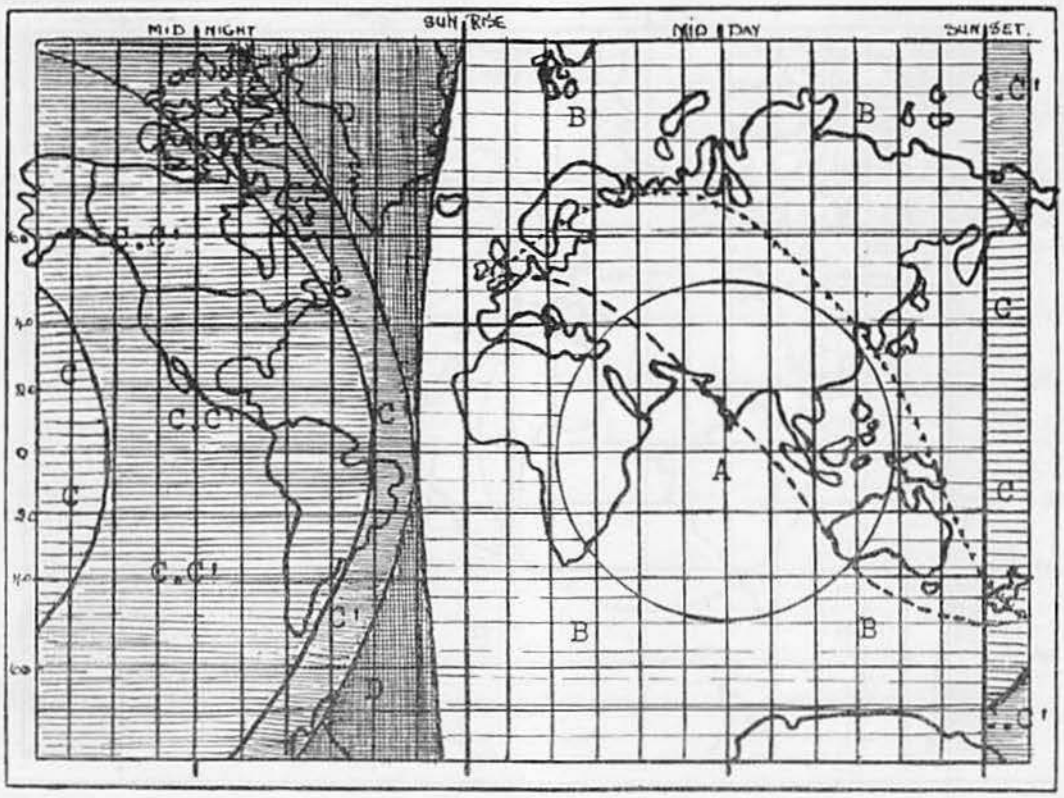


Fig. 1.
Shows the condition of daylight all over the earth's surface during the Autumn and Spring equinox at 0700 G.M.T.

A indicates the all-daylight zone.
B ,, twilight zone.
C ,, first darkness zone.
C, C¹ ,, darkness zone.
C¹ ,, late darkness zone.
D ,, intense darkness zone.
- - - - - indicates the Great Circle Route due East from Greenwich.
. . . . . indicates the Great Circle Route North-East from Greenwich.

and therefore beamed, either in one direction or the other. When completed, it was given a preliminary test and gave results beyond expectations.

Daylight Condition Charts.

The next problem was to find out the exact conditions of daylight all over the earth's surface at any time of the day and any period of the year. This was easily accomplished by making up a set of Eckersley and Tremellin charts, so that they would fit over Mercator's Projection of the World graduated in hours. The charts were made up on tracing paper and the photographs of the original charts were carefully traced from a copy of *Ladner and Stoner*, and then enlarged to the size of the map with a pantagraph used the wrong way round. The tracings were then coloured with six successive washes of very thin blue transparent stain to represent the six main light densities which exists at all times over the earth's surface. The equator line, mid-day, sunrise, and sunset lines were also indicated. Three of these charts had to be made, one for summer, one for the equinox periods and one for winter.

To use them correctly, we select the chart for the particular season in question and place it over the map, adjusting the two equator lines. We then set the mid-day line on the chart over the mid-day hour line on the map, wherever mid-day occurs on the earth at the time of the observation. Then by observing the map through the varying transparency of the chart, the exact condition of daylight all over the earth's surface can be seen at once for that particular time.

To illustrate this more fully, we will assume that we wish to know the condition of light density over the earth's surface at 17.00 G.M.T. in the middle of autumn. All we have to do is to take the chart for the Equinox, and place it on the map as before described. We then count five "hour lines" to the west of Greenwich, which brings us to the mid-day line in New York, at which point we put the two mid-day lines together and the job is done. The exact light conditions over the earth's surface are shown for that particular hour.

Light Densities for DX Work.

The next problem was to find out what density

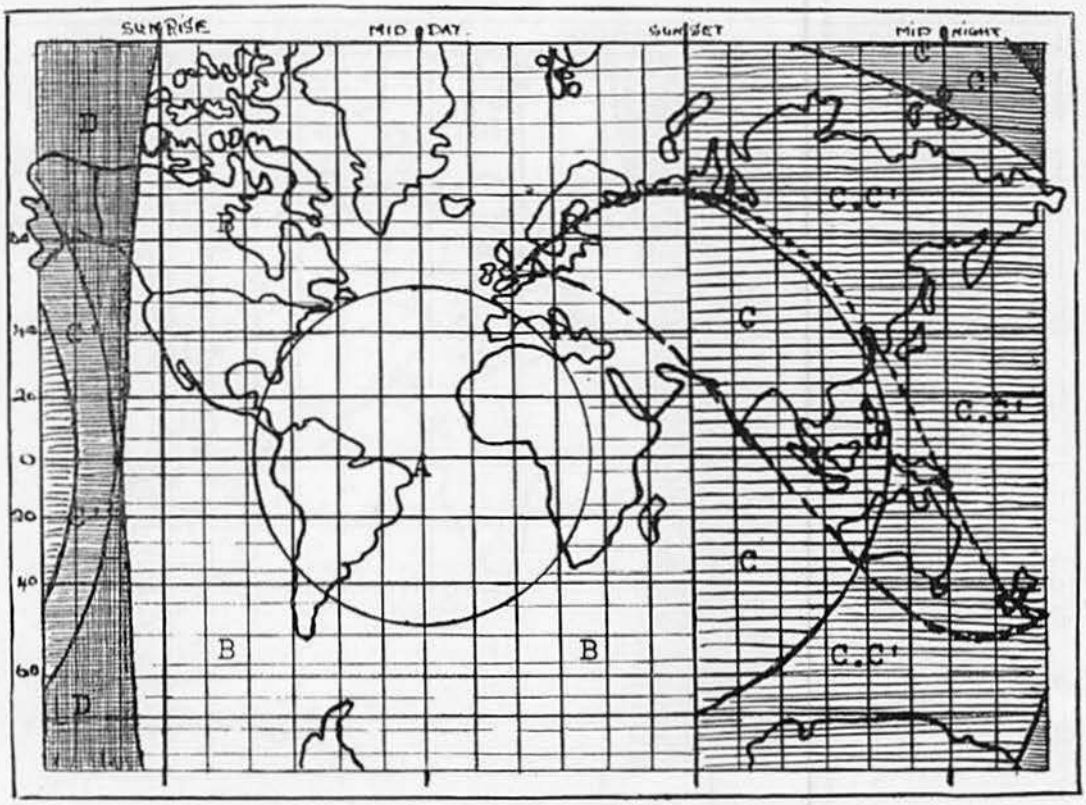


Fig. 2.

Shows the condition of the daylight all over the earth's surface during the Autumn and Spring equinox at 1400 G.M.T.

A indicates the all-daylight zone.
B ,, twilight zone.
C ,, first darkness zone.
C, C¹ ,, darkness zone.
C¹ ,, late darkness zone.
D ,, intense darkness zone.
- - - - - - indicates the Great Circle Route due East from Greenwich.
. . . . . indicates the Great Circle Route North-East from Greenwich.

of light was most suitable for the propagation of 14 Mc. signals over long distances. Investigation proved that what is known as the twilight zone was the most suitable.

Before proceeding further an attempt will be made to differentiate between the different light densities. There are four main zones, the first being the " all daylight zone," which is only suitable for frequencies of about 20,000 kc. This zone is always circular in shape and its diameter is never more than 6,000 miles. The second is the " twilight zone," which is most suitable for frequencies of about 14,000 kc., and at certain seasons extends the whole way round the earth. This condition exists when " halos " or " one seventh of a second " echoes can be heard on 14 Mc. signals, and is due to the fact that attenuation is so low that the signals have made more than one journey round the earth. The third zone is the " darkness zone," and this is most suitable for frequencies between 8,000 and 12,000 kcs. The reflection of a 14,000 kc. signal in this zone would be so small that it would not return to earth on account of insufficient ray bending. The fourth is the " late darkness " zone, which is most suitable for frequencies between 6,000 and 7,000 kc.

Summarising these facts, we can say that if we know the frequency to use, the condition of the light density at the time we wish to transmit and the distance to be covered, all that is required is to send the signal on the right GREAT CIRCLE ROUTE, and we can be sure of it getting there with sufficient strength to make itself heard. QRM permitting !

A Practical Case.

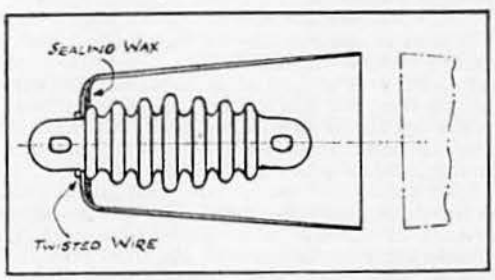
To illustrate these points, let us consider the condition of the light which exists between Australia and England at 07.00 G.M.T. in the autumn (see Fig. 1). Firstly, the " all daylight " zone exists over East Africa, Arabia, India, Siam and the Southern Indian Ocean. The " twilight zone " extends over Northern Europe, Siberia, Japan, Philippines and the greater part of Australia. Let us now plot a great circle route due east from Greenwich, and we shall find that it passes over Central Europe, Persia, India, Ceylon, and Western Australia. It will thus be seen that it is useless to expect a 14 Mc. signal to reach Australia with good strength if the maximum line of radiation is due east, because nearly all the distance is through the " all daylight " zone, where attenuation is very great. So let us plot another great circle route this time north-east, and we shall find that it passes over Northern Europe, Siberia, Mongolia, South of Japan, just east of the Philippines and Eastern Australia. This coincides with the " twilight zone," and, therefore, is just the right route for a 14 Mc. signal when it has to cover a considerable distance.

Now we will examine the light conditions on this same route at 14.00 G.M.T. the same day, and we shall find that a great change has taken place (see Fig. 2). The " twilight zone " only extends as far as Mongolia, and the route then passes into the " darkness zone " over Japan, Philippines and Eastern Australia. We find that under these conditions there is insufficient reflection for a 14 Mc. signal, and therefore, a signal sent on that route at that time will be very weak when it is received in Australia. If we wish to get a strong signal into that part of the world at that time we must find a different route for the signals to travel, assuming we desire to use the same operating frequency. Let us, therefore, move the direction of the maximum line of radiation of our antenna 45 degrees, so that it becomes due east once again, and at this point let us examine the light conditions on this Great Circle Route at this time fo day (14.00 G.M.T.) ; we shall find that the " twilight zone " extends over Central Europe, Persia, India, Ceylon, and Western Australia, which coincides with the Great Circle Route in question, an ideal route for propagating a 14 Mc. signal that distance.

From the foregoing it is clear that where it is possible to move the direction of the antenna, it is of great assistance in sending a good signal to where it is wanted, and over as long a period of time as possible ; but to those who are so situated that their antennas have to stay " put," a little thought and study in this direction will be of great help in finding the right time and season when one can get the best out of the gear available. If one cannot get the " right " direction with a half-wave, because the man who laid out the garden did not worry about which way your aerial went, you may be still able to get it by installing either a full wave or double wave aerial in its place.

Aerial Insulation

The device illustrated is an attempt to maintain the insulation of aerials during wet weather. The outer case is made from one of the bakelite tumblers which were being offered gratis some time ago with each tube of a well-known brand of dental cream. The bottom is drilled out and filed until the end of a pyrex insulator is a fairly good fit in it, a strand of



wire is then twisted round the outside. A quantity of sealing-wax is then poured into the tumbler which, when cool, forms a good seal round the insulator. A second insulator can be wired to the first as shown by the dotted lines, allowing, say, ½" between the two rims. The only disadvantage seems to be the rather large surface which catches the wind, but this is not a very serious drawback with a good taut aerial.

BRS1680.

SOLILOQUIES FROM THE SHACK.

By Uncle Tom.

(The Old Walrus, wiping his outside moustache, announces that someone has stirred up some trouble at last!)

WELL, boys and girls, it isn't often that some kind friend comes forward and writes this page for me. But this month the miracle has happened—and I'm not spoofing. My various remarks last month have got under the skin of at least one nephew, whose letter (with or without permission) I am reproducing in full below. And may I take this opportunity of thanking him for relieving me of the necessity of placing undue strain on the old think-box for one month?

Here we go: "Dear Uncle Tom,—Assuming that I don't know who you are; assuming that I think *you* think what you say you think; assuming that this doesn't amount to *lese majeste*; assuming in fact anything improbable you like, I propose to reverse tradition and tell Uncle a story.

"There were once (not Once Upon a Time, because this is a parable and not a fairy tale) two hams that lived in the same town, G2?? and G6??. G2?? was generally accepted as a model of what an upright clean-noted young Englishham should be, and his 250-watt (British or bakers' measure) transmitter was built on the best lines of commercial practice, rack-and-panel, all soldered, crackle-finished and all.

"Every day of the week for years it punched R9 T9 vy vy fb fb sigs all over the world, so that coloured gentlemen perched on the four corners of the Globe, hearing them, said 'Ah, there's dear old G2?? working DX again.'

"G6?? hadn't much time for radio, and everybody thought that it was a Very Good Thing. The collection of hairpins, junk, tintacks and bootlaces known as his transmitter put out a sig. when it worked at all, like an aspen leaf with St. Vitus' dance in a gale.

"If anyone heard it, and that didn't happen often, they used to laugh a lot—all except G2??, and he used to swear a lot. G6?? was a joke to the world, but QRM to *him*, and often he would put out a call of the 'Pse qrt, u qrm whole band and I only want VK for WAC in an hour' kind, and sent sarcastic notes about G6?? being a credit to the country, and why not use a Xtal?

"To which G6?? would reply apologetically that he was trying to evolve a new frequency-stabilising device that somehow would never quite work, and that he'd try to keep out of the way when G2?? was on, which was nearly always.

"By an extraordinary coincidence both of them died on the same day, and when G2?? had pushed aside the wreaths and got to the Golden Gates, there was G6?? waiting! And judge of their alarm when they learnt that there was only room for one inside. Stranger still, the competition between them was so close that eventually Peter said that it would have to be finally decided by their merits as hams.

"G2??, confident of victory, started off on his, and for a long time he told Peter all about his station and Society activities; how he was D.R., C.R., T.R., W.A.C., W.B.E. (C.H.), B.E.R.U. winner, always used C.C., ragchewed, never sent double when he was QSA5, and always, always QSLd, foto for foto.

"While he was getting his breath back, G6?? mumbled something about his idea for a frequency stabilising device that would never quite work, and looked sheepish.

"'Come inside,' said Peter to G6??. And to G2?? he said 'You may have been a first-class operator, but you don't seem to have understood what you were given a licence for. You ought to have kept its terms.' 'Me?' said G2??, flabbergasted. 'You,' said Peter. 'English licences are for making experiments in wireless telegraphy, not for telling VK about your cat's new kittens,' and he shut the door.

"I always like stories where Vice triumphs, don't you, Uncle? Perhaps this one is a puzzle and not a parable after all, and the solution is in the licence, if you've still got one. The beginning of Clause 7 is helpful—so is a dictionary definition of 'experiment.'

"If you can get that far with your nephews and nieces, consider the legality of ragchewing, contests and so on. And then have a big laugh over the whole idea of R.E.S. After that someone can try to teach fishes to swim. And then you can go and have one.

"So what, sez you? So let's scrap all the imported ideas of virtue and vice that are always getting bleated, or perhaps blote, at us, and get some new ones more suited to our tickets. Let's call Test and mean it, or keep out of the way. Let's have short and snappy QSOs and stuff rags down their chewers' throats. In fact, let's start doing things—even I might, under pressure.

"So having proved everybody else is wrong and solved the QRM problem, I'll go to sleep again. But what an opportunity for a skilfully flung Tomshell! Your rebellious nephew, *Wellwisher.*"

So what, nephews and nieces? Grab hold of a basin-full of that, and see how you feel! Just now I'm not going to commit myself by saying what I feel about it. Doubtless it will bring in a regular shower-bath of letters, rude, frigidly polite (which is ruder still), inane and insane. But think what you like, that little boy has hit one very large nail accurately in the centre of the head.

I seem to remember saying the same things, once upon a time, myself, and didn't they just start things humming? I made at least five permanent enemies, who, thank goodness, have never since condescended to speak to me. All you faultless operators and blameless hams whose idea of experimental work is collecting VK cards—just you have a good think. And just you write to me within a few days of reading this, so that I have time to get things together for the next instalment.

Cheer up, boys and girls! Lectures from the Old Man don't leave a permanent effect, like endorsement of licences.

The 362 RFP 15 Valve.

By G. McLean Wilford (G2WD) *.

The 362 *Valve Company* are now manufacturing a smaller edition of their 60-watt R.F. Pentode, and this will no doubt appeal to many operators of low-power stations. The output rating for this new valve, known as the RFP 15, is given as 15 watts, a figure which appears to be as conservative as that quoted for the maximum anode voltage.

The operating data follows :—

Filament volts	...	...	4
Filament amps.	...	...	1
Max. anode volts	...	...	500
Max. screen volts	...	...	300
Max. anode input	...	...	25 watts
Max. anode dissipation		...	15 watts

The physical dimensions are the same as for the larger valve, but the anode structure is quite different, being of the lattice type peculiar to several other valves produced by this firm.

The pin connections are as for a standard 5-pin base :—

Filament pins	...	...	Normal
Grid pin ...	...	...	Normal
Anode pin	...	...	Screen grid
Centre pin	...	...	Suppressor grid
Cap ...	...	...	Anode

The sample valve submitted was tested at varying anode and screen voltages from 400 to 600 volts, the screen voltage varying from 150 to 275 volts from the lower to the higher anode voltages. The circuit used was a normal P.A. with capacity coupling form the exciter-multiplier unit. Link coupling was also tested and the valve behaved perfectly with either method.

Using a dummy aerial the valve was operated on 3.5, 7, 14 and 28 Mc., and on each frequency sufficient output was obtained to drive a pair of RFP 60's in push-pull to their full rated output. The valve was also tested by itself as a P.A. on an open aerial, and with a maximum input of 30 watts, an aerial current of .8 amp. was registered at the ends of 45 ft. Zepp feeders attached to a 66-ft. top. This current was obtained on 3.5, 7 and 14 Mc., whilst on 28 Mc. a figure of .55 amp. was registered.

The valve was next tested for telephony operation using suppressor grid modulation and worked very well indeed, an average input of 25 watts on 7 Mc., giving an aerial current of .5 amp. Several good reports were received as regards signal strength and speech quality. The modulator used was that described for the Tri-tet transmitter in the February, 1936, issue of this Journal.

The valve was operated from both auto and battery bias; it was found that 25 to 30 volts negative on the control grid was ample. The suppressor was biassed 30 volts positive for c.w. and the same amount negative for suppressor grid phone. The valve is very easy to drive, 3-5 milli-amps. being ample to fully excite it. A slight tendency to " blue-glow " was noticed, but this is due to electronic bombardment and does not appear to have any effect on the operation.

The valve should prove generally popular due to its ability to give a very good R.F. output.

* Head of Transmitter Design Section R.E.S.

TRADE NOTICES

American 7-Pin Valves.

Apropos our remarks in the January issue regarding holders for American valves, *Quartz Crystal Co.*, of New Malden, have sent us samples of American holders designed for the larger type of American 7-pin valves. Listed by them as the National Tube Socket, 7L Prong, they retail at 2s. 3d. each post paid. The socket has a ceremic base and is designed for chassis mounting, but stand-off pillars are supplied for baseboard mounting.

* * *

Filament Chokes.

In our last issue we described a single valve tritet transmitter employing a new 362 RFP 60 valve. In response to numerous requests *Quartz Crystal Co.*, New Malden, Surrey, have produced a special tapped filament choke for use in this circuit. The choke is wound on a ribbed ebonite former with a special two-start thread which gives the tapped winding interwound with the non-tapped winding. This method of construction is preferable to winding one coil over the other.

The retail price for the choke is 5s. post paid.

* * *

British Acorn Valves.

We learn from *The Wireless and Gramophone Trader* that the " Acorn " type of valve which is so popular in America is to be produced in this country.

This will be news of interest to many of our members who have been conducting tests with ultra high-frequency receiving apparatus, and have been unable to obtain entirely satisfactory results with the more usual classes of valves.

The unique construction of the " Acorn " reduces inter-electrode capacities to a very low value. By dispensing with the usual pinch and base the connections can be brought out direct to soldering tips around the periphery of the glass bulb, which, as its name implies, is rather similar to an acorn.

No details are next to hand concerning the types which are to be produced in England, but as soon as this information is available we hope to publish full details in this Journal.

* * *

A New 15*-watt R.F. Pentode.*

362 *Valve Company* receive our congratulations upon again producing a valve for amateur needs. This valve, listed by them as the 362 *RFP*15, will, we believe, become as popular as their now well-known *RFP*60.

We have been asked by the manufacturers to mention that their larger R.F. pentode has now been recoded *RFP*60 instead of *RFP*362, the price for which is £3, and not £3 10s. as mentioned in their advertisement which appeared on page 293 of our last issue.

Members of our Transmitter Design section and our Valve Research Manager are testing these valves, and we hope to publish additional circuits and technical data in the course of the next few months.

NATIONAL FIELD DAY, 1936

THE Tests and Awards Committee have pleasure in submitting the rules for the Fifth Annual National Field Day Contest.

It will be noticed that a slight modification has been made in regard to the scoring system. In previous years 6 points have been given for contacts with portable stations in Europe, and only 4 points for contacts with fixed stations outside Europe. To meet the wishes of members who have expressed opinions on the matter, it has been decided to reverse the points allowed for these contacts. To encourage work with non-B.E.R.U. portable stations outside Europe the points allowed have been increased from 8 to 12.

D.R.'s are requested to note that their application for permission to operate stations during N.F.D. must reach Headquarters not later than April 18. This will enable us to publish in the May issue of the T. & R. BULLETIN details of all portable calls. In forwarding this information, the call sign to be used, the location of each station, and the name of the operator in charge must be stated.

Overseas amateurs are invited to co-operate with the R.S.G.B. in this event, and, providing details are given us prior to April 30, a list of the portable calls to be used by such stations will be published in this Journal.

Attention is drawn to the following points:

(*a*) Every endeavour must be made to ascertain that stations worked (particularly Continentals) are licensed.

(*b*) Particular care must be taken to see that public or private power supplies are not used.

(*c*) Crystal control or some other method of frequency stabilising is essential in order to conform to licence conditions.

(*d*) After contact has been effected, both stations are required to acknowledge receipt of the report given. There has in the past been a tendency amongst certain operators to commence another call before the sending station has completely finished his transmission.

RULES.

1. The event will commence at 16.00 G.M.T. (17.00 B.S.T.), June 6, and conclude at 19.00 G.M.T. (20.00 B.S.T.), June 7, 1936.

2. The event is confined to the English, Welsh, and Scottish Districts, and to Northern Ireland and the Irish Free State. (N.I. and I.F.S. count one District each.)

3. Each District taking part will be permitted to place into operation two portable stations, A and B, which may be located at any point or points within the District. An exception to this rule will be permitted in the case of the four London Districts, who may erect their stations in counties adjacent to their District.

4. Station A will be permitted to operate on the 1.7 and 3.5 Mc. bands. Station B will be permitted to operate on the 7 and 14 Mc. bands.

5. In the event of a District being unable to erect two stations, the District station will be permitted to use any of the four bands mentioned in Rule 4.

6. No station may be operated on more than one band at any one time.

7. Stations A and B must be licensed to use different call signs, the D.R. is responsible for forwarding to Headquarters an application for such permission, together with exact location of each station, not later than April 18, 1936.

8. The input to the valve delivering power to the aerial must not exceed 10 watts on 1.7 Mc., and 25 watts on the other three bands.

9. The power supply must not be derived from either public or private supply mains.

10. The height of the aerial at any point must not exceed 45 ft. above ground level.

11. Stations must not be operated from a normally occupied dwelling-house.

12. No apparatus may be erected on site prior to 10.00 G.M.T. (11.00 B.S.T.), June 6, 1936. This rule includes aerials and aerial fittings.

13. Points will be scored for established contacts on the following basis:

With fixed stations outside the District, but within the British Isles	1
With portable stations outside the District, but within the British Isles	3
With fixed stations in Europe	2
With portable stations in Europe ...	4
With fixed stations outside Europe ...	6
With portable stations outside Europe ...	12
With B.E.R.U. stations	8
With B.E.R.U. portable stations ...	16

NOTE.—In the case of the four London Districts, points may not be scored for contacts with fixed or portable stations located within their District.

14. The points scored by stations A and B shall be added together to give the District's score.

15. An exchange of reports, viz., QSA, QRK, and Tone, shall be made before points can be claimed; proof of contact may be required.

16. Contacts with ships or unlicensed stations located in countries where licences are obtainable will not be permitted to count for points. The decision as to whether a station is to be classed as unlicensed will rest with the Awards Committee.

17. The British Isles, for the purpose of this event, shall include England, Scotland, Wales, Northern Ireland, the Irish Free State, and the Channel Islands.

18. All entries must be submitted and signed by the D.R., who will be solely responsible for the conduct of the event in his District.

19. The official entry form must be signed in full by the station operator at the time of each contact.

20. Entries must be made on the approved form issued by Headquarters, and must reach that address not later than June 20, 1936.

21. The District securing the highest total number of points will hold the "N.F.D. Award" for one year, which will be handed to the District Representative at Convention. The D.R. will be solely responsible for its custody during the year.

22. Persons operating a portable station which is competing shall be members of R.S.G.B.

23. Council reserve the right to amend or alter these rules at any time prior to the commencement of the event, and their decision will be final in all cases of dispute.

Have YOU sent in YOUR B.E.R.U. Contest Entry?

THE R.S.G.B. RESEARCH AND EXPERIMENTAL SECTIONS.

Organisation.

1. The Sections shall be controlled by a member of Council who shall be known as the R.E.S. Manager. The R.E.S. Manager may recommend Assistant Managers for appointment by Council.

Membership.

2. R.E.S. shall consist of Group and Individual members of the Radio Society of Great Britain and The British Empire Radio Union.

3. Group members shall be those who apply for enrolment in one of the regularly constituted R.E.S. Groups.

4. Individual members shall be those who are interested in problems of a general research or experimental nature, but who, while not desiring to contribute to the regular monthly R.E.S. Group reports, wish to work under the auspices of R.E.S.

Enrolment.

5. All applicants for membership of the Sections must apply in writing to the R.E.S. Manager, who will furnish an application form, which must be filled in and returned. Research members are those with special qualifications and experience. They are appointed by the R.E.S. Manager on the recommendation of the Section manager.

6. Members, on being accepted, will receive a certificate which will remain the property of the Society. A receipt for the certificate must be given, and this will be retained by the R.E.S. Manager.

7. On a member ceasing his association with the Sections he shall return the certificate.

Sections and Groups.

8. Sections are controlled by a Section Manager, who shall be appointed by Council on the recommendation of the R.E.S. Manager. Groups are controlled by a Group Manager, who shall be appointed by the R.E.S. Manager on the recommendation of the Section Manager.

9. Where more than one Group is operated, Group Centres shall be appointed by the Section Manager n consultation with the Group Manager.

10. A member may contribute to the activities of more than one Group or Section.

Letter Budgets.

11. There are three types of Letter Budgets in a Section.

(*a*) Members' Letter Budgets.
(*b*) Group Centres' Letter Budgets.
(*c*) Group Managers' Letter Budgets.

(*a*) Members' Letter Budgets are made up of reports, letters and comments received by the Group Centre from his members, together with material copied by him from the Group Centres' Letter Budgets. These are forwarded, first to the Group Manager for inspection, then to the members in rotation, returning eventually to the Group Centre for filing.

(*b*) Group Centres' Letter Budgets are made up by the Group Manager of reports, letters and comments from his Group Centres, together with material copied by him from the Group Manager's Letter Budgets. These are forwarded first to the Section Manager for inspection, then to the Group Centres in rotation, returning eventually to the Group Manager for filing.

(*c*) Group Managers' Letter Budgets are made up by the Section Managers of reports, letters and comments from his Group Managers and Individual Members, together with material sent him by "Contemporary Literature." These are circulated, first to the R.E.S. Manager for inspection, and then to all the Group Managers, returning to the Section Manager for filing.

The Section Manager may vary the above arrangements to suit special cases at his discretion.

12. Reports to the R.E.S. Manager must in all cases reach him by the 22nd of each month, but when circuits and drawings are required for publication, such information must be sent not later than the 18th of the month.

13. Reports to the R.E.S. Manager must be typed (double spacing) or written legibly, and in a form which will permit of publication with a minimum of Editorial attention. Slang, radioese and exaggerated contractions must be deleted. The reports must be regarded as scientific contributions.

Activity.

14. Failure to take an active interest in the work of the Group to which a member has been assigned for a period of three months may nullify a member's claim to be listed as a member of the Group in question.

15. Individual members must report active at least once in every six months. Failure to do so may nullify a member's claim to be listed in the Section in question.

Identification Numbers.

16. For record purposes, each Group member will receive a number in the Series R.E.S.1 onwards, and each Individual member a similar number in the series R.E.S.I.1 onwards.

Awards.

17. Annually, in December, the Council of the R.S.G.B. will award special premiums and/or certificates to such R.E.S. members as they consider have contributed some useful information of general interest.

18. The awards will be based on contributions published in the T. & R. BULLETIN. All such contributions must be forwarded to the Section Manager, who will pass them on to the R.E.S. Manager. The R.E.S. Manager will forward any suitable contributions received to Council for examination. Publication, which will be made anonymously if desired, will not automatically ensure a Council award. Members of R.E.S. are asked to submit all contributions to the Section Manager, whether they are intended as entries for an award or not.

19. The decision as to which members shall be granted awards will rest entirely with Council, who will be guided in their judgment by advice from the R.E.S. Manager, and the Technical Committee.

Contributions.

20. Contributions must in all cases be typed (double spaced), or legibly written in good English; drawings must be submitted on separate sheets. All drawings and circuit diagrams should be drawn on a large scale.

RESEARCH AND EXPERIMENTAL SECTIONS

MANAGER :

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

ASSISTANT MANAGER :

J. C. Elmer (G2GD), "Aethelmar," Seabrook Road, Hythe, Kent.

SECTIONS :

No. 1 : TRANSMITTER DESIGN

S.M. : G. McLean Wilford (G2WD), 33, Bibury Road, Hall Green, Birmingham.

G.M. : 7 and 14 Mc.

S. Buckingham (G5QF), 9, Brunswick Park Road, New Southgate, N.11.

G.M. : 28 Mc.

G. McLean Wilford (G2WD).

G.M. : 56 Mc.

J. N. Walker (G5JU), 4, Frenchay Road, Downend, Bristol, Glos.

G.M. : Artificial Aerials

G. McLean Wilford (G2WD)

No. 2 : RECEIVER DESIGN

S.M. : R. W. Newton (G5NQ), 94, Parkhill Road, Hampstead, N.W.3.

G.M. : General

D. Gordon Bagg, (G6BD), Fresh Woods, Tonbridge, Kent.

G.M. : 56 Mc.

J. N. Walker (G5JU)

G.M. : Literature

R. W. Newton (G5NQ)

No. 3 : AERIAL DESIGN

S.M. : F. Charman (G6CJ), Orchard Cottage, Stoke Poges, Bucks.

G.M. : General

F. Wilson (G2XX), 85, Risca Road, Newport, Mon.

G.M. : 28 Mc.

L. O. Rogers (G2HX), "Audwen," Estcourt Road, Gloucester.

G.M. : 56 Mc.

A. J. E. Forsyth (G6FO), "Westview," Appledore, near Bideford, Devon.

G.M. : Joint Group with Propagation

G. A. H. Eckles (G5GC), 57, Sutton Road, Beverley High Road, Hull.

No. 4 : PROPAGATION

S.M. : J. C. Elmer (G2GD), "Aethelmar," Seabrook Road, Hythe, Kent.

G.M. : 28 Mc.

E. H. Swain (G2HG), 31, Woodbastwick Road, Sydenham, S.E.26

G.M. : 56 Mc.

A. J. E. Forsyth (G6FO).

G.M. : Conditions

J. Haigh (G6HA), 2, Greenock Terrace, Leeds, 12.

G.M. : Literature

A. T. Mathews (G5AM), 24, Woodside Park Road, North Finchley, N.12.

G.M. : Joint Group with Aerial Design

G. A. H. Eckles (G5GC).

No. 5 : VALVE DESIGN

S.M. : D. N. Corfield (G5CD), 10, Holders Hill Gardens, Hendon, N.W.4.

No. 6 : AUXILIARY APPARATUS

S.M. : A. O. Milne (G2MI), "Southcot," Larkfield, Kent.

G.M. :

F. W. Benson (2BWF), 53, Corona Drive, Thorne, Doncaster.

No. 7 : MICRO-WAVES

S.M. : Dr. C. G. Lemon (G2GL), 19, Lena Gardens, Hammersmith, W.6.

IN our last issue we announced the production of a 56 Mc. Crystal Controlled Transmitter at an early date. We hope this will actually appear in the April number of the Bulletin. Perhaps it will not be out of place to make some reference to the methods being adopted. We would like to make it quite clear that this transmitter will be essentially a low-powered set. 56 Mc. is nearly virgin soil so far as frequency stability for the amateur is concerned, and it does not seem advisable that too ambitious a transmitter should be produced at the commencement. The transmitter to be described will be within the ability of all with average skill to build, and its cost will not be great.

We hope that such a set will encourage many of our members to become active on 56 Mc., for obviously the more people who use the band the better are the chances of contacts being made over long distances.

A careful study of the question of crystal control of a transmitter operating on such a high frequency has shown that, providing care is taken in the choice and layout of the component parts, crystal control is quite a simple matter to obtain up to the last doubler stage. The power amplifier is more difficult owing to the necessity for neutralisation when a triode valve is used. However this, we hope, will be overcome by the use of a different type of valve now in the course of production. No neutralisation will then be necessary.

The transmitter at present under construction will be produced in two parts. The first will be an exciter unit producing an output of at least one watt of R.F. to drive a more powerful unit acting as a power amplifier. This first unit will be a complete low-power transmitter in itself.

The construction and operation of the complete transmitter will be no more difficult than that for one working on the lower frequency bands. Actually the exciter unit may well be fitted with changeable coils so that operation on 28 Mc. will be possible. The R.F. output from the doubler working on 28 Mc. will be substantially the same as that on the higher frequency.

This transmitter works from a 7 Mc. crystal. Good use could be made of a higher frequency crystal. For instance, a 10 Mc. crystal could be employed, which would enable the frequency multiplier stage to be used as a *tripler* instead of as a doubler. Such stages have a very good output, often as good as a doubler. However, a better plan still would be to use a 14 Mc. crystal. In particular the use of a 14 Mc. crystal of the *thick plate* variety would be of especial use. These, however, are not yet being produced in this country, and would have to be obtained from the U.S.A.

Revised Rules.

Since the inception of R.E.S. we have been using a set of rules, which, while they were adequate at the time, are no longer so, and a fresh set have been drawn up for the guidance of all.

We would point out that all the rules now in force are the result of practical experience over a considerable period. In fact they will not cause anyone any inconvenience because they are already in use. While they are being published in the Bulletin, some members may wish to have a separate copy, and this may be obtained from the Assistant Manager on receipt of a stamped addressed envelope.

THE EFFECT OF THE MOON ON RADIO.*

Introduction.

THOSE who, reading the title of this article, hope that a definite statement on the moon is about to be made are doomed to disappointment, for it is doubtful whether any subject arouses more controversy than this one. But it is the author's intention to review existing knowledge and theory, suggest certain lines for research in the future, and indicate a method of attack.

Some Theories.

Most authorities are now agreed that the effect of the moon by light reflected from the sun must be negligible. This means that the phase of the moon as regards its reflecting power can be regarded as out of court.

Stetson, who has done considerable research on the subject in America, has suggested the possibility of the moon being charged with negative electricity, thereby exerting forces of attraction and repulsion on the ions in the ionized layers. Though there is no ground for supposing this is so, yet we cannot say it is not; and so this theory must be left open.

The theory which perhaps finds most support is known as the "Tidal Theory." A paper on this subject, written by Sir Frank Smith, was published in the *Journal I.E.E.* for December, 1933, and it will be well, perhaps, first to explain this theory.

Tidal Theory.

Just as the moon exerts the influence of its pull on the waters of the ocean, causing tides, so it may exert an appreciable pull on the atmosphere, causing high and low tides of the atmosphere. This would result in air currents, and Fig. 1 shows how these currents would flow. It is assumed that there would be two high and two low tides daily, for the same reasons that cause the double tides of the ocean. Fig. 1, which of course exaggerates the scale, shows that the directions of these winds would be mostly parallel to the surface of the earth. Their velocity in segments B and C would appear to be less than those in A and D relative to the earth. It might be supposed that at times of new and full moon "spring" tides would occur in the atmosphere also, as in the oceans.

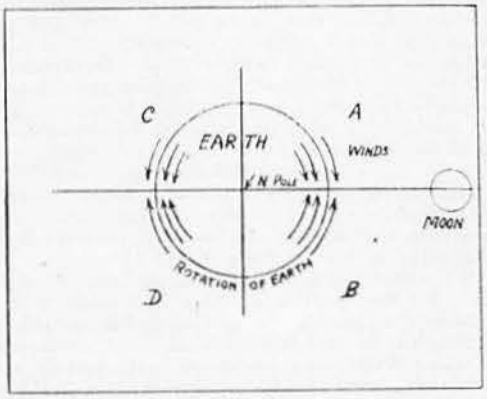


Fig. 1.
Showing the motions of the Tidal Winds.

* Contributed by Propagation Section.

Neglecting for the moment other factors, it is not easy to foretell the possible results of this effect. If matter is accumulating at the "hump," it might be expected that—

(*a*) the density of ionization is increased, or
(*b*) the atmospheric pressure is increased, thereby causing greater re-combination, or
(*c*) the height of the layers is increased.

Effect of Earth's Magnetic Field.

There is, however, another factor to be taken into account. These winds, moving parallel to the earth's surface, cut the vertical component of the earth's magnetic field; thereby a force is exerted on the charges of the ions which results in a motion of the ions themselves. The force is proportional to the product of the velocity of the charges and the strength of the magnetic field. At the earth's poles the velocity is obviously zero, whilst at the magnetic equator the vertical component of the magnetic field is also zero. So at these two places, the forces are zero. Intermediately they exist, and it has been estimated that they attain a maximum at latitudes of some 30° to 40°.

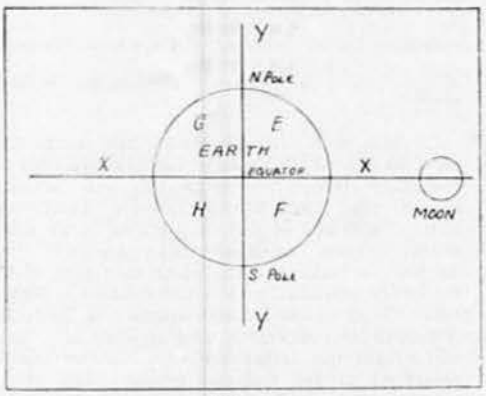


Fig. 2.
Showing the division of the Earth into quadrants.

Fig. 2 is a view of the earth and moon in certain relative positions, the lines XX, YY representing planes cutting the paper at right angles. By considering Figs. 1 and 2 together, it is obvious that the earth is divided up into eight spherical sectors, and it would be expected that adjacent sectors would have opposite electrical forces acting on the ions, according to the directions of the motions of winds and of the magnetic field.

The word ion is used throughout as referring to the positively charged ions as well as the negative electrons. Here, again, it is not easy to foresee the possible effect. But if the theory holds, it is clear that there is at any rate a redistribution of ionization from hour to hour due to the moon, and that this effect is superimposed on other controlling factors.

It is worthy of note that back in 1916 errors in direction finding were observed to occur at times of moon rise.

Future Research.

From the foregoing it seems that the line of attack

should be an endeavour to find a correlation between the behaviour of signals and the position of the moon in the sky. This study is now being undertaken by a group in the Propagation Section.

The first essential is to know the position of the moon relative to the observer. Where the moon is visible this is of course a comparatively simple matter, but at the majority of the observation times the moon is either obscured by cloud or is below the horizon, so recourse has to be had to astronomical tables.

The position of a body in the sky is determined by two measurements, known as " Right Ascension " and " Declination."

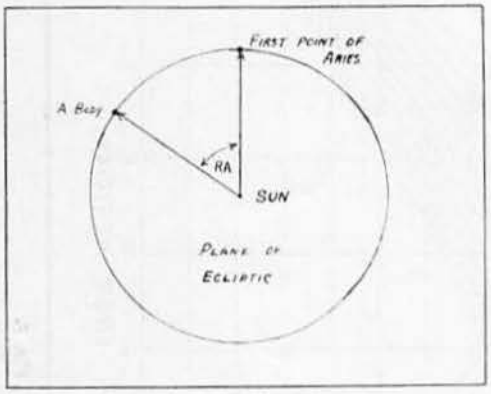


Fig. 3.
Showing the Right Ascension of a body in the sky.

Right Ascension.

The earth rotates round the sun in a plane known as the Ecliptic, which plane can be imagined as extending infinitely outwards into space, thereby cutting the heavens into two hemispheres, like an orange which has been cut in half and from which all pulp has been taken. The Solar System is a minute speck of dust in the centre of this empty orange. On the rim of this orange is the constellation Aries, and the direction of the First Point of Aries as viewed from the sun is the direction of zero Right Ascension. The angle which another body makes with this zero direction is the R.A. of that body, and is measured in units known as the Hour Angle (H.A.), in which a complete rotation of 360° corresponds to an H.A. of 24 hours, the time of the earth's revolution. So a body at an angle of 90° from the zero direction has a Right Ascension of 6 hours, 120° would be 8 hours, 210° 14 hours, etc.

Directions are measured *Eastwards* from the zero line, for that is the motion by which an observer's meridian on the earth sweeps the sky as the day advances. Fig. 3 illustrates the position. We must imagine we are right outside the Solar System, over the top of the North Pole, and looking down on the sun from afar. Now, as we rotate round the sun, and the moon rotates round us, both appear to us as in a different direction in the sky from day to day and hour to hour. This is illustrated in Fig. 4, where the angle M is the R.A. of the moon and the angle S is the R.A. of the sun as viewed from our earth.

Declination.

The Declination is the angle which the body in the sky makes at the centre of the earth with the plane of the earth's Equator, and is measured, of course, along that meridian which passes through the line joining the centre of the earth to that body. We are quite familiar with this in the case of the sun, whose declination at the Equinoxes is zero, for he is over the Equator, and at the Solstices in summer or winter is 23° North or South respectively. The maximum declination the moon ever attains is approximately 25° North or South.

Practical Application.

Now all this may sound rather complicated to the amateur who, perhaps, has not had the time he would have liked to study astronomical problems. He wants to know : " Where is the moon now ? " If he knows in which direction to look and at what angle from his zenith, that is good enough for him. It is to facilitate this purpose that the author has calculated and drawn the curves illustrated in Fig. 5, the use of which will be explained in this article. It must be noted that these curves relate to places on a latitude of 52° N. The error for other latitudes in Great Britain would not be excessive.

Zenith Distance.

We have seen that the observer requires to know what angle down from the zenith (that is the point vertically above the observer) is the moon. Obviously, if this angle is 30°, the moon is fairly high in the sky ; if 75°, it is low down ; if 90°, it is rising or setting ; if 120°, it is below the horizon ; if 180°, it is down under the earth. This angle is known as the *Zenith Distance*, and is measured in degrees.

So our problem now reduces itself to this : " What is the Zenith Distance (Z.D.), and in what compass direction is the moon at the moment under consideration ? "

If the moon is on the meridian at our required moment, all is simple ; for by knowing its Declination and the latitude of the observer, the Z.D. is obviously given by ZD=Lat.—Decl., where the latitude is taken as positive in the northern hemisphere, and a declination North is positive (South is negative).

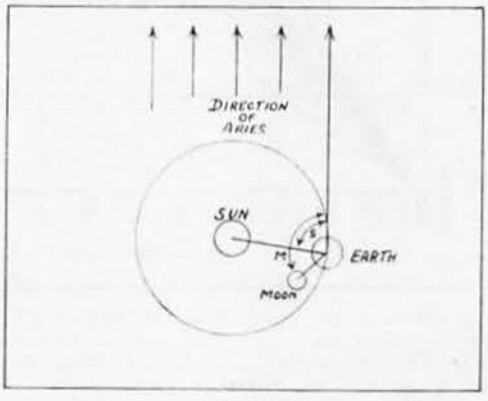


Fig. 4.
Showing the Right Ascension of the Sun and Moon from the Earth.

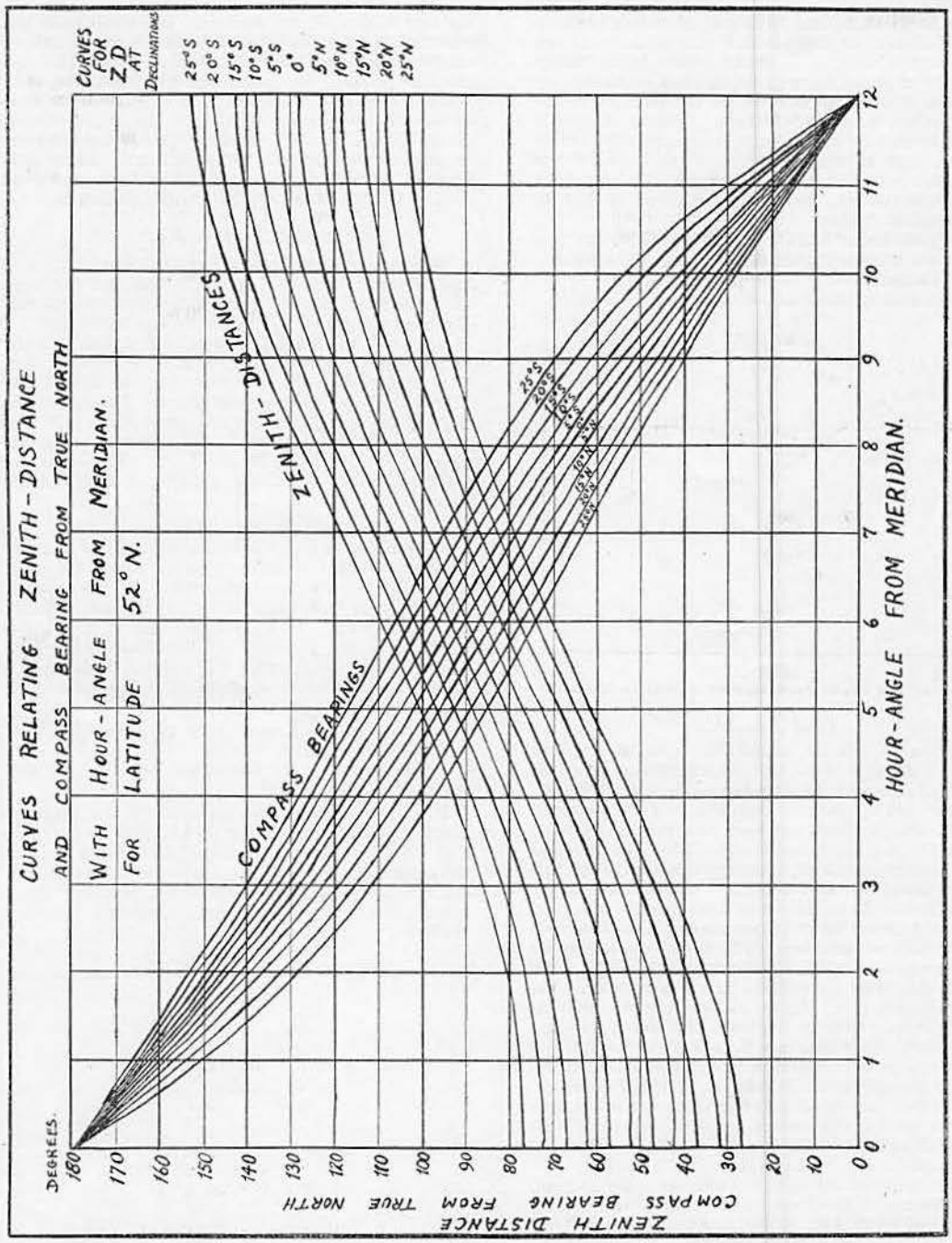


Fig. 5.
Curves relating Zenith Distance and Compass Bearing from True North with Hour Angle from meridian for Latitude 52° N.

If, however, the moon is not on the meridian, then it is necessary to know what is the Hour Angle which the moon makes with the meridian of the observer? To determine this, we look up in the astronomical tables the R.A. of the moon and sun at the time required, when it can be shown that

$$H.A. = M - S + Z$$

where H.A. is the Hour Angle of the moon measured *East*,
M is the R.A. of the moon,
S is the R.A. of the sun,
Z is the number of hours *before* noon,

so Z is positive in the morning and negative in the afternoon.

The following points regarding the possible values of H.A. should be noted :—

(*a*) The result of the formula gives H.A. measured *East* from the meridian.
(*b*) If H.A. is negative, it is West from the meridian.
(*c*) If H.A. exceeds 24 hours, subtract 24 hours from the arithmetical number.
(*d*) If H.A. numerically exceeds 12 hours, subtract the numerical value from 24 hours, keeping the sign the same, and reverse the compass.

Examples.

There follow now two examples, the first a simple one invented for illustration, and the second an actual case taken from the astronomical tables. (These are conveniently set out in *Brown's Nautical Almanac*, price 3s.)

Example 1.—What are the Z.D. and compass bearing of the moon at 19.00 G.M.T., when the R.A. of the moon is 5 hours, Declination 15° North, R.A. of the sun is 17 hours ?

Now H.A. = M − S + Z.

In this case the time is 19.00 G.M.T., so Z = 12 − 19 = −7 and M = 5, S = 17.

∴ H.A. = 5 − 17 − 7 hours *East*.
= −19 hours *East*.
= 19 hours *West*.
= 24 − 19 hours *East*.
= 5 hours *East*.

Now in Fig. 5 follow up the 5-hour vertical to where it cuts the curves for Z.D. and compass bearings drawn for Declination 15° N., and we read off the values on the left, namely,

Z.D. = 68½°
Compass bearing = 92½° East.

So we shall find the moon in a direction 92½° East from North, or just 2½° to the South of East, and at a Zenith Distance of 68½° of arc.

Example 2.—What were the Z.D. and compass bearing of the moon at 22.00 G.M.T. on January 30, 1936 ?

From the astronomical tables we find that on this day at the time required—
The R.A. of the moon was 2 hrs. 20 mins. 8 secs.
The Declination of the moon was 18° 56.2′ N.
The R.A. of the sun was 20 hrs. 35 mins. 52.1 secs.
So, as the time is 22.00 G.M.T., Z = 12 − 22 = −10, and M = 2 hrs. 20 mins. 8 secs.
S = 20 hrs. 35 mins. 52.1 secs.

H.A. = M − S + Z.
= 2 hrs. 20 mins. 8 secs. − 20 hrs. 35 mins. 52.1 secs. − 10 hrs. *East*.
= −28 hrs. 15 mins. 44.1 secs. *East*.
= −28¼ hrs. *East*, approx.
= −4¼ hrs. *East*.
= 4¼ hrs. *West*.

Now in Fig. 5 there is not a curve for a Declination of 18° 56.2′, so we must estimate the distance between the 15° and 20° lines, when following up the vertical for 4¼ hours we find

Z.D. = 58½°
Compass bearing = 99° West.

So we find the moon was in a direction 99° West from North, or 9° South of West, and at a Zenith Distance of 58½° of arc.

Conclusion.

In conclusion, it is hoped that this article will stimulate interest in the subject, while at the same time assisting those who are endeavouring to conduct research into the question of the effect of the moon on radio.

THE DELLINGER EFFECT

Notes Compiled by the Propagation Section R.E.S.

FOR the benefit of those who have not yet heard of this phenomenon, a few words of explanation may not be amiss.

Dr. J. H. Dellinger, of the Bureau of Standards, Washington, to whom the author acknowledges indebtedness for information, has recently observed periodical complete " wipe-outs " of all short-wave signals, lasting for times ranging from a few minutes to hours, and apparently occurring at intervals of 54 days. This phenomenon has been reported in *QST* and elsewhere. and it may be worth while recording the previous dates and times when it has been observed. These are :—

November 28, 1934	...	11.10—11.40 C.S.T.
March 20, 1935	...	01.50—02.05 G.M.T.
May 12, 1935	...	11.57—12.15 G.M.T.
July 6, 1935	...	14.09—14.25 G.M.T.
August 30, 1935	...	23.20—23.35 G.M.T.
October 24, 1935	...	For a long period.

Regarding these dates, the following facts are worthy of note :—

May 12 : The phenomenon was noted by G2QY at 12.15 G.M.T., who observed a complete " wipe out " of all signals on 7 Mc., accompanied by a hissing sound.

October 10 : Sunspot activity began to increase.

October 13 : VK was worked for the first time on 28 Mc.

October 20 : G2YL did her " star turn " on 28 Mc.

October 21-23 : The upper limit of frequency reflected from the Heaviside Layers was reached.

October 23 : G2YL's log showed DX on 28 Mc. was very good.

October 24 : Except for VK2, G2YL worked no DX on 28 Mc., but " skip distance " was very short, and Europeans were coming in well, showing that ionisation was very strong. Moreover, the F2 layer rose rapidly from a height of 250 km. to 460 km., descending again the next day. It appears that intense and sudden changes of hydrogen flocculi on the sun were observed within a few minutes of the occurrence of the radio phenomenon on this day, as well as on July 6 and August 30.

October 25 : Conditions returned to the same as on October 23, and G2YL worked VK4 and Europe in the morning, and W in the afternoons.

The Latest Occurrence.

It is of great interest, therefore, to find that the phenomenon has been observed again in this country. G6GA in Yorskhire writes as follows :— " On Friday, February 14, at 15.15 G.M.T., I was working duplex telephony with G2IL, of Southamp-

ton. At 15.30 G.M.T. he broke in with the remark that he was unable to work duplex ; at this time I could get no answer from him, and on looking round the band found that not a single station could be heard. The band remained absolutely dead till 15.40 G.M.T., when stations returned very faintly. By 15.45 G.M.T. conditions were normal again. I noticed at the time that the spread of my own transmitter on the receiver dial, which is normally about 30 degrees, was reduced to 5 degrees—or a reduction from 30 to 5 kc. It seems as though the whole of the radiation was being absorbed. I understand from G5GL that at that time his communication with a station *one mile* from him was also completely interrupted."

In a further letter G6GA writes :—" G5GL stated that the time was 15.15—15.30 G.M.T., though there may have been some discrepancy in the clocks. In a contact with G5LK the latter stated that he had observed a similar ' fade out ' on Saturday, February 15, at 23.00 G.M.T. for a duration of 10 minutes. On February 17 I (G6GA) had a contact with G5UI in the Isle of Wight at 22.30 G.M.T., and heard various other British stations, after which the fade-out was complete. All observations have been made on the 7 Mc. band."

Now it is worthy of note that hitherto the phenomenon has been associated wtih daylight conditions, and only on one day in the period. It is therefore a matter for careful scrutiny that we appear to have two separate occurrences, one in daylight and the other after dark.

On receipt of this report, the author wrote to the Astronomer Royal, who has courteously replied as follows :—" An unusually active group of sunspots crossed the sun's central meridian at February 14.0. A number of bright hydrogen eruptions have been observed at Greenwich in association with these spots, and in particular one of considerable extent on February 14, 12.39—13.27 G.M.T. No special magnetic phenomena were recorded. There was a moderate unsteadiness of the intensity from February 14, 14.00, to February 15, 04.00, and a short period of lively, though not extensive, disturbance lasting from February 16, 11.00, to February 17, 00.00."

So we have to note that any magnetic effect follows after the " wipe out."

The Explanation ?

The explanation that follows is put forward tentatively as seeming to fit some of the facts. But first it should be noted that, whereas the time intervals appear to have been approximately 54 days, that is the time of two revolutions of the sun, the interval from October 24, 1935, to February 14, 1936, is 113 days, which exceeds twice 54 by five days. Therefore it does suggest that the phenomenon has only appeared as a 54-day one by coincidence, and that any intense sunspot activity—which incidentally has been recorded in the past as lasting sometimes for as many as five revolutions of the sun—may cause the " wipe out."

That it is due to solar activity seems really beyond question, and theory suggests that the eruption causes radiation either of particles or waves or both, which cause very intense ionisation in the H. L.s. This results again in one of two things—or more probably both : (1) A very greatly increased density of ionisation and a lowering of the height of the E layer, which at relatively high atmospheric pressure causes complete absorption of all but the very shortest waves, and greatly reduces the " skip distance " of such high frequencies as 28 Mc. by giving vertical or nearly vertical reflection. (2) By absorbing some of the emanations from the sun, the upper or F2 layer attains an enormous temperature due to thermal agitation of the molecules, resulting in a great expansion and so a rise to an abnormal height, accompanied probably by an actual reduction in ionic density. (In parentheses it is worth noting that this does afford a possible explanation of the origin of " depressions." Owing to this rise by expansion of the H.L., is it not possible that this results in a very slight reduction in barometric pressure in the troposphere, which is the initial instability required by the Polar Front Theory of the history of a depression ?)

What is not explained is the apparent complete " wipe out " of radiation not only as close as one mile between stations, but even between transmitter and receiver under the same roof. Can it be possible that any ionising agent can penetrate down to the ground level and actually maintain the atmosphere in ionisation at the relatively enormous barometric pressure encountered ?

The magnetic disturbance following the phenomenon suggests that it is the result of the motions of these ionised layers, which really are the same thing as currents of electricity.

Future Research.

It is unfortunate that these notes will appear after the next 27-day period has passed, but any observers who note that anything unusual has happened on or about March 12 are asked to come forward with their observations. The next 54-day period is due about April 8, and 27 days after that brings us to May 5, so it is suggested that all who are interested will keep as good look-out over as long a period as possible round these dates for :—

1. " Wipe out " on ordinary S.W. bands.
2. Interruption or fading between stations virtually next door.
3. DX on 28 Mc.
4. Vertical reflection on 28 Mc., resulting in near-by contacts, accompanied or not by fading.
5. DX on 56 Mc.
6. Vertical reflection on 56 Mc.

All who have any experiences on this subject are cordially invited to communicate with the Section Manager, Propagation Section, R.E.S.

Individual Members.

The following are added to the list of Individual Members published last month :—

Transmitter Section.—Ex-VS9AA, BRS2069, 2216.

Receiver Section.—BRS2121, 2216.

Aerials Section.—VS2AG, ex-VS9AA, ON4AU, ZE1JB, BRS2121, 2216.

Propagation Section.—ZE1JB, ON4AU.

Unposted.—BRS2249.

A NEW CRYSTAL OSCILLATOR-MULTIPLIER CIRCUIT

EXPERIMENTS have been carried on over the past four months with a new type of crystal oscillator-multiplier circuit, which has given very good results indeed, and sufficient information is now available to enable the R.E.S. Transmitter Design Section to release this information for the benefit of members.

The circuit given in Fig. 1 is the complete unit, and was originally developed and patented by W2BFB, using an American Type 57 valve. Several British valves have been tried, but the best so far has been a "*362*" Type ACVP4, which has given very excellent results up to the present time, and shows no sign of breaking down at all. The ACVP4 is an indirectly heated vari-mu pentode, with all elements brought out to separate pins, and has a 7-pin base with the anode connection at the *top* of the bulb

On referring to Fig. 1, it will be seen that the circuit is that of a conventional Dynatron oscillator, with slight differences as regards the cathode portion of the circuit. The suppressor and screen grids are strapped together, and these two elements, together with the coil and condenser, tune to the crystal frequency, the coil and condenser in the plate circuit tune to the desired output frequency for driving the next stage.

It will be noted that the voltage on the plate circuit is lower than the screen-suppressor voltage so that the correct Dynatron action can be obtained, although it may so happen that equal voltages may be applied to some valves. The bias for the oscillator is obtained through a 6,000-ohm 10-watt *Reliance* potentiometer, as it is found advisable

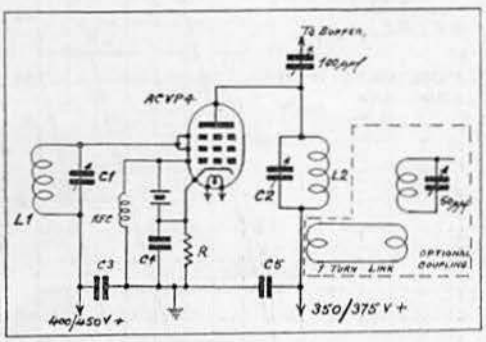


Fig. 1.
Circuit of a new Crystal Multiplier.
C1C2. 50 μμF Eddystone Scientific.
C3C5. .002 μF mica T.C.C.
C4. .004 μF. mica T.C.C.
R. 6,000 ohms ten watt Reliance potentiometer or 4,000 ohms ten watt wire wound resistance.
All coils L1 and L2 wound on Eddystone 1½ inch diam. formers for valve socket mounting.
L1. 3.5 Mc. crystal 30 turns 24 D.S.C. close wound.
L1. 7 Mc. crystal 17 turns 18 Enam. spaced to cover 1½ in.
L1. 14 Mc. crystal 6 turns 18 Enam. spaced to cover 1 in.
L2. 3.5 Mc. output as L1 for 3.5 Mc.
L2. 7 Mc. output L2 for 7 Mc.
L2 14 Mc. output 5 turns 24 DSC spaced to cover 1¼ in.
L2 28 Mc. output 3 turns 18 Enam. spaced to cover 1½ in.

sometimes to alter the bias for different outputs, but a 4,000-ohm 10-watt resistance would, no doubt, be quite satisfactory. The tuned circuit in series with the screen-suppressor is tuned to the fundamental frequency of the crystal being used, thus, so far as the crystal is concerned, this portion of the circuit (screen-suppressor) acts as a plate and will so oscillate as a conventional crystal oscillator. The two tuned circuits should preferably be "low C," particularly so for the plate circuit.

The average screen-suppressor current is about 15 mA, and the plate about 10 mA. The output frequency must, of course, bear some harmonic relationship to the crystal frequency—this fact will be referred to later.

This circuit has very good frequency stability because, by the electron-coupling between the crystal circuit, which is maintaining the frequency stability, and the plate circuit which is delivering power, a very high order of stability is obtained, and changes in the plate circuit do not upset this stability. This is because the plate is so isolated from the crystal portion of the circuit, greater power can be drawn than with any other oscillator with similar stability. A valve which has been treated to reduce secondary emission is not good in this circuit; in valves which have the suppressor grid brought to a separate pin, as has the ACVP4, this condition can be speeded up by using only the screen and then putting a small positive potential on the suppressor grid to speed up the electrons and increase the secondary emission, and also lower the impedance. So far this has not yet been found necessary with the valve used under test, but is merely given as a pointer should the output not be quite up to expectations, and will be the subject of a later report if it is found to be of value. Experiments have been carried out using 3.5, 7 and 14 Mc. crystals, and sufficient output has been obtained from the ACVP4 to drive ordinary pentodes such as the "*362*" ACME4C and *Mullard* Pen 4VA, but neither of these valves would oscillate satisfactorily much below 14 Mc. However, with an *RCA* 802 Pentode it has been found possible to get a good buffer output on 28 Mc.

The following bands may be worked with a 3.5 Mc. crystal.

(*a*) Fundamental at 3.5 Mc.
(*b*) 2nd harmonic 7 Mc.
(*c*) 4th harmonic 14 Mc.

Using a 7 Mc. crystal :—

(*a*) Fundamental 7 Mc.
(*b*) 2nd harmonic 14 Mc.
(*c*) 4th harmonic 28 Mc.

Using a 14 Mc. crystal :—

(*a*) Fundamental 14 Mc.
(*b*) 2nd harmonic 28 Mc.
(*c*) Signs of 4th harmonic (56 Mc.), but there being no thermo-galvanometer available at the moment this cannot yet be definitely decided upon. Probably the suppressor with positive bias would help the output, and any results obtained by members trying this circuit will be gladly received by the R.E.S. Transmitter Design Section, but from the foregoing remarks it will be seen that

56 Mc. crystal control is clearly indicated. At the present time the R.E.S. Transmitter Design Manager has a 28 Mc. transmitter working which only consists of three stages :—

(1) The crystal oscillator circuit described (ACVP4).
(2) Buffer stage (RCA 802).
(3) P-P PA stage (2-RFP 362's).

Using only 450 volts on the anodes of the PA valves into a dummy load, 25 watts is being obtained. High voltage on the PA has not yet been tried, due to a power supply breakdown, but it seems quite reasonable to expect at least 80 or 90 watts.

The method of tuning this oscillator is very simple. First, plug in the two coils, one for the crystal frequency and the other for the harmonic on which it is desired to work. Switch on both H.T. supplies and tune the crystal to resonance. Then tune the plate circuit to maximum current for the harmonic desired.

NOTE.—An absorption wave-meter must be used as it is very easy to hit the wrong harmonic.

The output from the plate tank can be either capacity or link-coupled to the grid circuit of the Buffer stage, but if capacity coupling is used a variable condenser of 100 μμF should be used, as it has been found during the course of the experiments that the variable condenser can be made to govern the degree of excitation which is very critical when working on the fourth harmonic output.

There is no doubt that there will be other interesting features brought to light regarding this circuit, and anyone who does find out anything new will be performing a useful action by informing the R.E.S. Transmitter Design Section.

In conclusion, R.E.S. would like to point out that the coil and condenser values given in Fig. 1 are those actually used in obtaining the above information ; other values may give equally good results, but as stated elsewhere in this article the circuits must be " low C " and condensers of 20 or 30 μμF capacity would probably give just as good results, but here again this gives further opportunity for individual experiment, and no hard and fast rules, other than those already given, need be postulated.

VALVE REVIEW

The 362 R.F.P. 60

THE *362* RFP60 is an R.F. transmitting pentode designed for use as an R.F. power amplifier or power frequency multiplier. The valve is manufactured by *Messrs. The 362 Radio Valve Co., Ltd.* It is fitted with a five-pin B.V.A. base and the anode is connected to a screw top cap. The suppressor grid is brought out separately and has characteristics suitable for suppressor grid modulation. At the time of review no curves or detailed operating figures were available from the makers, in consequence the data and curves below show our measured results.

Characteristics.	*Makers.*	*Measured Sample.*
Filament volts	6.0	6.0
,, current (amps.) ...	2.0	2.05
Anode volts (max.)	1000	1000
Screen ,, ,, ...	500	500
Anode dissipation watts (max)	60	—
,, input ,, ,,	100	—
Mutual Conductance (g) ...	8.0†	7.4 *
Amplification Factor (μ) ...	—	Not measured
Impedance (ohms)	—	Not measured
Inner mu	—	7.5*
Suppressor volts (telephony)	—	—170 approx.

* Taken at anode volts 1,000, screen volts 400, grid volts —10.

† Not stated.

Fig. 1 shows the anode current, grid voltage curves at various screen voltages, the dotted curve shows the screen current at a screen voltage of 400.

Fig. 2 shows the anode current, suppressor grid voltage curves.

Inter-Electrode Capacities.

Grid to all other electrodes (input capacity) 27μμf
Anode to all other electrodes (output capacity) 15μμf
Grid to anode ... ... Not measured

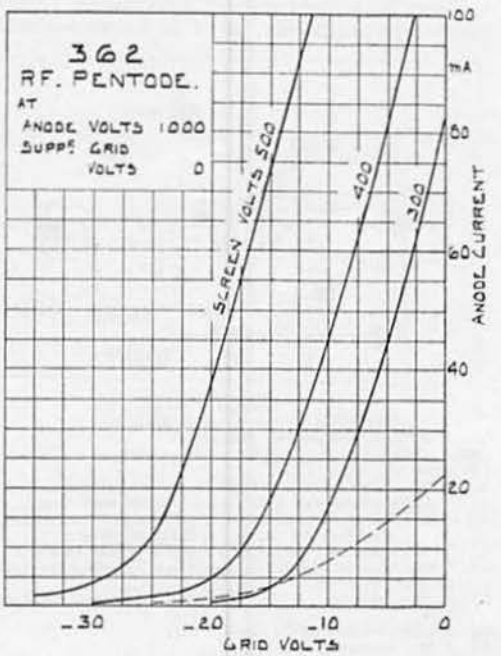


Fig. 1.

Dimensions.

Overall height ... ... 190 mm.
Maximum diameter ... ... 55 mm.

The emission was found to be excellent, no appreciable drop in anode current occurred when the filament voltage was dropped to less than 5 volts. The vacuum was also good, less than 1 microampere of gas was measurable after running

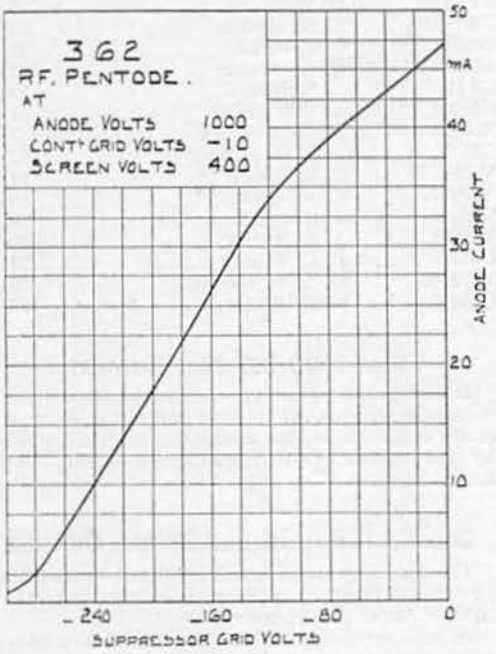


Fig. 2.

for ½ hour at maximum dissipation. The grid volts, anode current curves show a short grid base, indicating that the drive required is small. The screen current, anode current ratio is large, indicating good design. The suppressor grid curve for such a curve is noticeably straight and shows that high modulation with quite a small percentage of distortion is obtainable. The slope of this curve around zero volts would suggest that small positive voltages for C.W. working would be of little advantage. The cut-off is at rather a high voltage, but even with about — 170 volts bias the audio power for modulation would be within the capabilities of a normal output triode or pentode, such as used for a broadcast receiver.

It is understood that the valve is intended as a British equivalent of an RK.20, but is actually rather larger, and in consequence the power output in general should be greater, although this may not be so on the 28 and 56 Mc. bands, due to the considerably higher input capacity (about 2.5 times) tending to kill the drive.

Time has not permitted any quantitative R.F. measurements; these will be published in due course; in any case, considerable matter has been published in recent issues of the BULLETIN concerning this valve and its performance.

D. N. C.

The Ten Metre Band

Conditions during February have been variable, signals from all parts of the world being much less consistent than in December and January.

South Africans have been the most reliable signals, and South Americans have greatly improved, but North Americans have been less consistent. VK contacts reported are very few.

VU2BL sends a most comprehensive log for January 5 to February 6. He has heard D4, OK, VK, U, ZS, ZE1, FA8, ON, OE, HAF, PA, F8, J, OH, EI8B, G6WY, 6LK, 6DH, 5FV, 6NF, 5RS, 2PL, 6RH, 2HG, 6QB. His best days were February 1 and 2, when the band was open for four hours and seven hours respectively. On February 3 and 4 the band was dead.

VK4EI has forwarded a list of believed first contacts he has made, which are as follows: September 8, 1935, PK3ST; October 5, 1935, ON4AU; October 6, 1935, D4KPJ, F8VS; October 13, 1935, VS6AH; October 26, 1935, YM4AA; October 27, 1935, OK1AW; November 10, 1935, OH7NC; November 17, 1935, SU1SG; November 24, 1935, OE1ER; November 24, 1935, SM6WL; January 5, 1936, HAF8C. He says that VK4BB has the first W.B.E. in VK (Hearty contratulations 4BB) and first VE and VP5 contacts. VK2LZ has the first G contact, of course.

G6DH has worked three VK's only, VK4EI, 6SA, and 5ZC, as compared with many in January. He found South Africa most consistent, contacting ZS1H, ZS2A, ZU1C, and ZT6Y. His South American contacts were LU9BV, LU9AX, and OA4J. VU2BL has been worked several times, and he needs only Asia for 28 Mc. 'phone W.A.C. He made two first contacts with CT3AB and OA4J, and heard X1AY and HJ3AJ.

G5JW has now worked all W districts except W7 on CW, and W5BDB, W1WV, W1EWF, and W2MB on 'phone (10 watts input), and heard ZS1H, ZS2A, LU9AX, and OA4B. In spite of two receiving antennæ, which are at right angles to one another, he does not hear VK's and South Africa is weak, but North and South America are good.

2AXB has heard W1, 2, 3, 4, 5, 6, 8, and 9, VE2EE, VE3JZ, VE3MJ, ZS1H, OA4B, and CT3AB.

BRS1847 has heard W5, W6, W7, VO, OA, LU, VE4, ZS, CM, SU, and HJ.

G6HL (ex SU/ST6HL) is now on 28 Mc., and has worked SU, CN8, W1, 2, 3, and 5, and CP1AC, and heard all W districts except 6 and 7.

The 28 Mc. band provided G6NF with another opportunity of making W.B.E. during the last week-end in February. W6GRX was worked, thus giving him three contacts with this District. On February 29 the band remained open until 20.30 G.M.T., but went "dud" from midday, March 1. In the morning of that day, G6DH and 6NF worked VU, VK, etc., but a full report of this activity must be deferred until next month.

Incidentally G6DH had scored over 8,000 points in the Contest up to the end of February, but rumour has it that ZS1H topped the 11,000 in February alone!

Additions to first G 28 Mc. contacts this month are:

G6DH worked CT3AB on February 16, 1936.
G6DH worked OA4J on February 23, 1936.

NEWS AND VIEWS FROM 53.

London Meeting

As announced last month, Mr. P. G. A. Voigt is to be the lecturer at the next London meeting, fixed to take place on *Wednesday*, March 25. The lecture will deal with "Sound Reproduction," and this will be followed by a practical demonstration.

Tea will be served at 5.30 p.m., and the meeting will commence in the Main Lecture Theatre at 6.15 p.m.

Due to illness, Mr. Clark, of the Mullard Company, was prevented from giving his lecture at the February meeting. It is hoped to re-arrange this lecture in April.

North-Eastern Provincial District Meeting.

In order to avoid clashing with the last week-end of the A.R.R.L. International DX Contest, it has been decided to change the date of the North-Eastern Provincial District Meeting from March 22 to March 29. A displayed notice relative to this meeting appears elsewhere in this issue. It is hoped that members from Midland and Eastern districts will endeavour to support this gathering.

Awards Committee

Messrs. W. H. Matthews (G2CD) and J. M. S. Watson (G6CT) have been co-opted to serve on the Awards and Tests Committee.

Consideration is being given to a suggestion that a 10-watt contest be held next autumn. Suggestions should be sent to G6UT.

An R.S.G.B. Summer Cruise.

Following on the highly successful visit to Belgium last year, we are pleased to announce that Mr. Max Buckwell (G5UK) has agreed to organise a cruise during the August Bank Holiday period.

The preliminary programme is as follows:—

Friday,	July 31.	London, dep. 8.15 p.m.
,,	,, 31.	Harwich, dep. 11 p.m.
Saturday,	Aug. 1.	Amsterdam, arr. 1 p.m.
Sunday,	,, 2.	,, dep. 4 a.m.
,,	,, 2.	Antwerp, arr. 4 p.m.
Monday,	,, 3.	,, dep. 8 a.m.
,,	,, 3.	Zeebrugge, arr. 1.30 p.m.
,,	,, 3.	,, dep. 11.30 p.m.
Tuesday,	,, 4.	Harwich, arr. 6 a.m.
,,	,, 4.	London, arr. 7.53 a.m.

The inclusive cost for the cruise, which covers third class rail fare from London, first class fare on steamer, early morning tea (!), English breakfast, lunch, tea and dinner for three days will be £4 17s. 6d.

A Carnival dance will be held on board during which "Queen Cruisiana" will be crowned. (Ladies, please note!)

Over half of the cabins are reserved for one passenger (or two if desired) without extra charge.

It is hoped that a really enjoyable party can be arranged on this occasion. Ladies will be especially welcomed.

Further particulars can be obtained from Mr. Buckwell, 19, Meadway, Westcliff-on-Sea, Essex.

W.B.E. Certificates

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

Call sign.	*Name.*	*Date,* 1936.
VK4JB	O. E. Alder	January 13
VK3DM	D. McDonald	,, 15
VK2OJ	E. N. Arnold	,, 15
G2GB	C. S. Pollard	,, 20
W3EVW	R. D. Causse	,, 22
G6JZ	C. Fenton ...	,, 23
G2NQ	A. L. Thorley	,, 24
W9KA	R. W. McCarty	February 7
G5BP	H. N. D. Bailey	,, 12
VE1EA	C. E. Roach	,, 14
VS6AX	C. R. Emary	,, 19
G2LA	S. E. Smith	,, 20
VK3ZC	J. K. Tutton	,, 20
G5LI	E. G. Elliott	,, 21
VU2FY	O. A. F. Spindler	,, 26
G6HM	E. R. Henman	,, 26

The 1935 3.5 Mc. Contest

It is regretted that an error crept in the table of positions published on page 305 of the February issue, inasmuch as the number of stations worked by the winner, G5KG, was given as 30. This should have read 49.

Second International 28 Mc. Contest

The following clause has been added to the Rules for the Contest as published in the December, 1935, T. & R. Bulletin:

In view of the numerous Transatlantic contacts which will be made during the Contest, and in view of the difficulty of computing with accuracy the Great Circle Distance between European and North American stations which may be located in remote places, the following fixed scores shall be used throughout the Contest:

Between Europe and	W1, 2, 3, 4, 8	30 points.
	W9 ...	35 ,,
	W5 ...	40 ,,
	W6 & 7 ...	50 ,,
	VO, VE1 & 2	30 ,,
	VE3 ...	35 ,,
	VE4 ...	40 ,,
	VE5 ...	50 ,,

* * *

The following are the frequencies of regular 28 Mc. stations heard in London:

G5IS	28,062	G5JW	28,312
G6GS	28,067	G2JU	28,347
G6DH	28,070	G6WY	28,352
G5WP	28,086	G6CL	28,360
G6LK	28,094	G5SG	28,432
G2HG	28,128	G2JH	28,444
G6NF	28,160	G6WN	28,532
ZS1H	28,170	G6PS	28,536
G2FI	28,184	G2NM	28,578
G5FV	28,188	G6RH	28,592
G2PL	28,220	G5AN	28,656
ON4AU	28,224		

Town Representatives, 1936

The following have been appointed :—

District 1—

Hoylake ... ... G. Russell Lee (G6GL).

District 7—

Alton and Farnham E. W. Brownjohn (2BAU).
Horley and Reigate J. Butcher (G5XG).
Kingston-on-Thames R. Pottinger (2BNS).

The W.I.A.-N.Z.A.R.T. Contest.

Mr. R. Cunningham (VK3ML) has furnished us with the results of this popular contest. The sixteen G's who entered finished in the following order :—G6CJ (2220), 5YG (1770), 2PL (1400), 6RB (1200), 2YL (506), 2HG (506), 2OI (252), 2ZQ (225), 5WQ (216), 6XN (210), 6LK (196), 5BP (180), 5RV (84), 2WQ (48), 5JU (30), 5JM (12). Gi6YW (864) was the sole entrant from Northern Ireland. Scores are in brackets.

The following G's entered for the Receiving Contest :—BRS1535 (2070), 1173 (2040), 1581 (1890), 2AGW (1620), 2BVU (1566), 2BTQ (1200), 2BLK (1140), 2AXX (870), 2AFA (135).

From the report we learn that the special prize of £1 1s. offered by our Australian Representative, Mr. Millar (VK3EG), to the station making W.B.E. in the shortest space of time was won by VK2EO.

In the handicap section, our Queensland Representative, Mr. Mackenzie (VK4GK) was placed first with a score of 540 points per watt.

The winning Australian station was VK3EG, who amassed a total of 42,150 points, another B.E.R.U. member in VK3MR was second with 23,750, and VK4BB fifth with 20,240.

Some confusion was caused over Rule 14 (the 28 Mc. Rule), and in order to get over the difficulty, it was decided to award two separate certificates under every award rule of the contest. Under the conditions mentioned in the report, G6LK leads the British section with 2,096 points, followed by G2PL (1,400), 2YL (1,006) and 2HG (1,006). The leading VK in this section was VK4BB with a total of 48,740.

Space will not allow us to reproduce the report in detail, but home members who are interested may borrow a copy from Headquarters.

Montreal Amateur Radio Club.

Mr. H. Ashdown, VE2IO, sends details of the recent Executive Committee elections. We note with interest that Mr. Stan Comach, VE2EE, a well-known DX worker, is the new president of this go-ahead Canadian club. VE2JK is the treasurer and VE2CX, 2DR, 2HP and 2DU are members of the committee.

It is the intention of the new committee to send us periodically lists of Empire stations heard in VE2. They are also anxious to promote regular schedules between their members and other parts of the Empire.

An Eastern Canadian Convention, sponsored by M.A.R.C., is to be held at the Mount Royal Hotel, Montreal, on May 22 and 23. Any amateur who is in Montreal on the dates mentioned is assured of a cordial welcome.

Thames Valley Lecture.

We are asked to remind members that Mr. F. Addey, Assistant Inspector of Wireless Telegraphy, G.P.O., will lecture before the Thames Valley Radio Society on the evening of March 18. The Lecture Hall of the Twickenham Library has been selected as the venue, and it is hoped that many members and friends will attend. The lecture, which begins at 8.30 p.m., will be profusely illustraded with slides and the subject selected is "British Wireless Services."

Folkestone Radio Amateurs.

We have pleasure in announcing that this very active organisation is now affiliated with the R.S.G.B. Although a comparatively new Society, their membership is in excess of 20 and continues to increase.

It will be remembered that 56 Mc. is the particular flair of the F.R.A., and in this connection it is interesting to record that on February 27 last their station G2FA was in contact with G2AO at Eastbourne for an hour between 20.45 and 21.45 G.M.T. The distance is 46 miles, and signals were R6/9 at both ends. G2FA will be operated on 56 Mc. each Tuesday, Wednesday and Thursday during March and April from 20.00 to 22.00 G.M.T. The operators hope to contact the continent, but will appreciate reports and contacts from home members.

VQ3FAR.

Many of our Home members will be interested to learn that Mr. J. A. Farrer, until recently G5FA, is now an electrical engineer with Tanganyika Central Gold Mines, Ltd., Sekenke, *via* Kinyangiri, Tanganyika. Mr. Farrer has been allotted the call VQ3FAR, and as unlimited power supply (coupled with plenty of space for aerials) is available, he hopes to be putting out readable signals at an early date. He will be pleased to hear from old friends.

Ex VU2BL.

Mr. D. Martin, once of Iraq, and lately located at Ambala, Punjab, India, left for England on February 29. Mr. Martin's home address will be 180, King's Road, Gosport, Hants. In his last letter before sailing, VU2BL gave details of the DX stations he has heard on 28 Mc. The list has been sent to G2YL for circulation.

Mr. Martin has applied for a G licence, and hopes to be on the air within a few weeks.

G6NC

Mr. C. C. Newman, ex ZC6CN and lately G6NC, has now left to take up duties at the Meteorological Office, H.Q., R.A.F., Valletta, Malta. He hopes to be operating under a ZB call soon.

The Proof of the Pudding

In our last issue we published a description of a single-valve tri-tet transmitter using a 362 RFP60 valve. We understand from the head of the R.E.S. Transmitter Design Section, that this transmitter can be loaned (less valve and crystal) to any district who wishes to use it during N.F.D.

Application to be made direct to G2WD.

QSL Section

Manager: J. D. CHISHOLM (G2CX).

In case there are any listening members who are not already aware of it, we should like to repeat once more that as from the beginning of this year no report cards for British and European transmitters can be accepted by the Bureau. We are still receiving considerable numbers of these cards which are returned to the sender in his own envelopes.

Calibration Section.

Manager: A. D. GAY (G6NF).

Equipment Review No. 4.—The Muirhead Vernier Dial.

Constructors of frequency measuring apparatus, single-signal super-heterodynes, etc., will be interested in particulars of the *Muirhead* Vernier Dials, which are available for fitting to variable condensers of either ¼ in. or 3/16 in. diameter shafts.

These dials are 4½ in. diameter and have an exceedingly pleasant frosted silver appearance with accurately engraved scales of either 100 or 180 degrees. The scale thickness is 3/32 in. brass which is silvered and lacquered and the graduations are filled in black. Either direct or slow motion drive is available and the latter gives a reduction of approximately 50/1, which is a beautifully velvet-like action.

The slow motion dials are fixed to the condenser shafts by means of a screw clamp which is exceedingly simple to fit. Only two holes are needed in the panel for the vernier index block and two for the slow motion drive. The epicyclic drive inside the slow motion dial is of sturdy machined parts and unlikely to give any trouble through a long period of useful life.

These dials are being used by eminent manufacturers of frequency measuring apparatus, marine superheterodyne receivers and other types of precision apparatus, and, as might be expected from such well-known electrical engineers as *Messrs Muirhead & Co., Ltd.*, they are an excellent product and infinitely better than anything we have hitherto seen in this line, including products manufactured abroad, which are principally metal pressings riveted together. This will be a welcome accessory, at a reasonable price, for use with amateur equipment. These dials can be supplied with the engraved figures increasing in a clock-wise or anti-clockwise direction, and the type required should always be specified.

R.S.G.B. Slow Morse Practices

A list containing dates, times and frequencies of the stations sending slow morse for the benefit of those members wishing to learn or improve their code will be found below. 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. It is emphasised that reports will be appreciated and are desired in order to ascertain range of transmission and numbers utilising the service. If, however, replies are desired, stamps should be sent. Owing to rebuilding, G6QM will not continue and his call is omitted in the schedule below. G5BK is also now discontinuing owing to lack of reports, he will, however, commence a service again should the demand arise; it is regretted that the QRA of G5BK was wrongly given in the January issue and should have read Mr. G. H. Brown, 19, Clarence Square, Cheltenham. Stations willing to assist, particularly from those districts without a service, are invited to communicate with Mr. T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4. (Telephone: Silverthorn 2285.)

SCHEDULE OF SLOW MORSE TRANSMISSIONS.

Date, 1936.			G.M.T.	kc/s.	Station.
Mar.	22	Sunday	00.00	1769	... G5GC
,,	22	,,	11.00	7233	... G5JL
,,	22	,,	11.15	1810	... G6GC
,,	26	Thursday	23.00	1990	... G6AU
,,	29	Sunday	00.00	1769	... G5GC
,,	29	,,	11.00	7233	... G5JL
,,	29	,,	11.15	1810	... G6GC
Apr.	2	Thursday	23.00	1990	... G6AU
,,	5	Sunday	00.00	1769	... G5GC
,,	5	,,	11.00	7233	... G5JL
,,	5	,,	11.15	1810	... G6GC
,,	9	Thursday	23.00	1990	... G6AU
,,	12	Sunday	00.00	1769	... G5GC
,,	12	,,	11.00	7233	... G5JL
,,	12	,,	11.15	1810	... G6GC
,,	16	Thursday	23.00	1990	... G6AU

NEW MEMBERS.

HOME CORPORATES.

CAPT. F. C. MCMURRAY (G2FM), 176, Manor Drive North, Worcester Park, Surrey.
L. H. LOMAS, B.Sc. (G2HB), High Bank, Whirley, Macclesfield, Cheshire.
G. A. E. ROBERTS (G2IU), Twyford, near Winchester, Hants.
W. BARRACLOUGH (G2IV), 34, Vaux Crescent, Liverpool, 20.
J. F. MORTIMER (G2MF), Beech Drive, Hoylake Road, Moreton, near Birkenhead, Cheshire.

J. N. Shearme (G2SH), 3, Richmond Grove, Heavitree, Exeter.
W. H. Smith (G2SZ), 35, Norbury Close, Norbury, S.W.16.
C. Smith (G2UQ), Kenec House, New Road, Whittlesey, near Peterborough.
A. E. Wybrow (G2VJ), 54, Lordship Lane, E. Dulwich, S.E.22.
D. Bruce (G2XD), 3, Montrose Road, Aylestone, Leicester.
J. W. Swinnerton (G2YS), 35, Friars Road, Coventry, Warwicks.
H. Wright (G5PW), 6, Crawshaw Fields, Pudsey, near Leeds, Yorks.
J. W. Davies (G6NH), 13, South Street, S.W.7.
R. F. R. Clark (2ALB), 18, Parkthorne Road, Clapham Park, S.W.12.
G. E. Evans (2AVV), 5, Brynheulog Street, Port Talbot, Glamorgan.
M. M. Williamson (2AVG), 45, Rainhall Road, Barnoldswick, Via Colne, Lancs.
F. N. Bedwell (2BQP), 199, Bath Road, Cheltenham, Glos.
H. W. Palmer (2BWP), "Canberra," Oxenden Park Drive, Herne Bay, Kent.
H. B. Lambert (2BYL), "Aronda," Ringswell Avenue, Honiton Road, Exeter.
M. V. Lovegrove (BRS2259), The Old Blewbury Mill, E. Hagbourne, near Didcot, Berks.
J. E. Guy (BRS2260), c/o Keith, 24, West End Park Street, Glasgow, C.3, Scotland.
R. J. Mitchell (BRS2261), X6 Dormitory, "A" Squadron, Electrical and Wireless School, Cranwell, Lincs.
W. B. Bennett (BRS2262), 2, The Close, Hall-ith-Wood, Bolton, Lancs.
E. A. Laplain (BRS2263), "The Hollies," 7, Knightland Road, Upper Clapton, E.5.
G. Ashdown (BRS2264), 31, Ember Lane, East Molesey, Surrey.
R. F. Armstrong (BRS2265), "Blairgowrie," Caswell Road, Bishopston, Swansea.
H. J. Redgrave (BRS2266), "Newhaven," The Broadway, Derby.
E. Clarke (BRS2267), 156, Stanhope Road, South Shields, County Durham.
G. T. G. Claydon (BRS2268), "Friern," Barton Road, Torquay.
Dr. W. H. Buckley (BRS2269), "Oaklea," Breck Road, Poulton-Le-Fylde.
G. Hare (BRS2270), Station Road, Leadenham, Lincoln.
T. F. Higgins (BRS2271), 48, Woodlands Park Road, Kings Norton, Birmingham.
H. Haslam (BRS2272), 257, Cog Lane, Burnley, Lancs.
H. R. Fox (BRS2273), "Jubilee House," High Harrington, Cumberland.
W. H. Williams (BRS2274), 192, Revelstoke Road, S.W.18.
B. E. Tubb (BRS2275), Theatre Sound Service, High Street, Fordingbridge, Hants.
L. E. Pulford (BRS2276), Surrey House, Surrey Road, Felixstowe, Suffolk.
W. G. Horne, M.I.R.E. (BRS2277), 206c, High Street, Elgin, Morayshire.
J. Haddon (BRS2278), c/o H. N. Miles, 325, King's Park Avenue, Rutherglen, Glasgow.
R. Lyall, junr. (BRS2279), "Ewart," Wooler, Northumberland.
T. Purves (BRS2280), Mitchells Place, Selkirk, Scotland.
B. Y. Willoughby (BRS2281), 15, Bolton Street, Blackpool, S.
J. W. Tory (BRS2282), 3, Mylor Road, Ecclesall, Sheffield, 11.
R. J. Morris (BRS2283), 23, Salt Avenue, Stafford.
L. G. Furley (BRS2284), 7, Fulton Villas, North Circular Road, Palmers Green, N.13.
G. A. Chroston (BRS2285), "Florence Villa," Chester Road, Whitby Wirral, Cheshire.
F. J. Webb (BRS2286), Windy Ridge, Bishops Tachbrook, Leamington Spa.
T. N. Lloyd (BRS2287), 45, Romney Road, Willesborough, Ashford, Kent.
G. F. Mason (BRS2288), Girdlestoneites, Charterhouse, Godalming, Surrey.
G. D. Bruce (BRS2289), 11, Cluny Gardens, Edinburgh, 10, Scotland.
G. Austin (BRS2290), 26, Woodland Avenue, Goole, Yorks.
A. D. Taylor (BRS2291), "Culmore," Pensby Road, Heswall, Cheshire.
C. J. Harrington (BRS2292), 94, Earlham Grove, Forest Gate, E.7.
A. H. B. Cross (BRS2293), 237, School Road, Crookes, Sheffield, 10.
G. Henderson (BRS2294), Derwent Hotel, Whatstandwell, Derbyshire.
L. H. Gray (BRS2295), Windlesham, Surrey.
D. White (BRS2296), "Gowrie," Page Heath Lane, Bickley, Kent.
R. Oliver (BRS2297), Hylton Grange, Northallerton, Yorks.
E. R. Dolman (BRS2298), Holly Mount Cottage, Crosby Green, West Derby, Liverpool, 12.
W. L. Danes (BRS2299), 35, Withersfield Road, Haverhill, Suffolk.
R. G. Miller (BRS2300), 120, Richborough Road, Cricklewood, N.W.2.
G. A. Patrick (BRS2301), 4, Stokesley Crescent, Billingham-on-Tees.
H. A. Moston (BRS2302), "Bryn Estyn," Cadwgan Road, Old Colwyn, N. Wales.

J. E. Bazley (BRS2303), 31, Valentine Road, Kings Heath, Birmingham, 14.
K. Davies (BRS2304), 25, Beaufort Street, Brynmawr, Breconshire, S. Wales.
S. G. Smith (BRS2305), 13, Bryn Wern, Pontypool, Mon.
L. G. Willard (BRS2306), "Egerton," Tangmere, near Chichester, Sussex.
B. Snowdon (BRS2307), "Rossmoor," Newchurch Road, Cloughfold, Rossendale, Lancs.
H. T. Wood (BRS2308). "Pendleton," Port Hill, Shrewsbury.
R. A. Straton (BRS2309), Bradley Lodge, Newport, Isle of Wight.
J. Rhodes (BRS2310), 23, Chevin Side, Otley, Yorkshire.
Mrs. G. N. Salter (BRS2311), Frilford, Abingdon, Berks.
C. R. Taylor (BRS2312), Marlborough House, Greenhill, Oldham, Lancs.
A. G. Balmer (BRS2313), "Northmuir," Greenlaw, Berwickshire.
G. Houghton (BRS2314), "Meon," Down's Way, Tadworth, Surrey.
J.R. Treadwell (BRS2315), 108, Sandhall Green, Pellon, Halifax, Yorks.
E. Sammons (BRS2316), Eagle, Lincoln.
J C. Wannop (A.), 2, Scowcroft Drive, Bare, Morecambe, Lancs.

DOMINION AND FOREIGN.

Dr. Willy Diemke (SU1WD), Sharia El Kamel Mohammed 5, Cairo-Zamalek, Egypt.
C. J. Irvine (VK3DF), 9, Park Street, Ivanhoe, N.21, Victoria, Australia.
J. K. Tutton (VK3ZC), 31, Denham Street, Hawthorn, E.2, Victoria, Australia.
Pte. A. Williams (BERS339), Dett, 2nd Battn., The Sherwood, Foresters, Nicosia, Cyprus.
W. H. Christie (BERS340), P.O. Box 27, Nkana, Northern Rhodesia.
Capt. G. F. Ashpitel, M.C. (BERS341), Melville Hall, Dominica British West Indies.
H. A. Grant (BERS342), "B" Corps Signals, Karachi, India.
H. Winterbotham (BERS343), Vellamalai Estate, Valparai P.O., South India.

SILENT KEYS

Hiram Percy Maxim (W1AW).

The whole world of amateur radio mourns to-day the passing of one who has from the earliest days of the movement been a pillar of strength and wisdom. Hiram Percy Maxim, President of the American Radio Relay League, lived for the advancement of International Amateur Radio, and many of his utterances have provided the impetus to his colleagues to push forward the cause which was so near to his heart.

The last occasion that we British amateurs had of seeing Mr. Maxim in person was during the visit of the A.R.R.L. Delegation to London in 1925, after the inauguration in Paris

that year of the International Amateur Radio Union. It was the writer's great privilege to sit next to him at the dinner given in his honour on that occasion, and the impression gained was that of one whose heart was in the amateur movement and whose quiet but forcible personality well fitted him for the post of President of the Association he has so long and ably governed. Many others of our senior members whose names come instantly to mind whenever pioneer amateur radio is discussed were also present at that function. Although most of those who to-day form the newer generation of amateurs were not in attendance on that memorable occasion, they know from hearsay that the true *international* spirit of Amateur Radio was kindled in the hearts of all who were privileged that evening to hear the inspiring words spoken by one who has now passed from us.

In addition to his work on behalf of the A.R.R.L. and I.A.R.U., Mr. Maxim was well known as an inventor, and, of course, as the son of an equally famous father, Sir Hiram Maxim, from whom he inherited his inventive abilities. One of his best known fields of research was in the silencing of noise, and the Maxim Silencer, to exclude street noises from dwellings, was one of his most important contributions to mankind. He was also the inventor of many ordnance and electrical devices, as well as being the designer of the Columbia motor-car. He himself was one of the pioneer motorists and his first vehicle, a small light runabout of distinctly American design, already holds a place in history.

His death took place at La Junta, Colorado, last month when on his way to California with his wife.

Mr. Maxim was a most lovable personality, and his passing has left a gap in our ranks which will be greatly felt.

Within a few days of his death Mrs. Maxim also passed away—a double blow to their family and friends.

On behalf of all members of the Radio Society of Great Britain, at home and abroad, we offer our deepest sympathies to our colleagues in the A.R.R.L.

The Reverend Father Horan (AR8OBK).

Yet another of our old members has been called to his rest. Father Horan was for many years stationed at the Observatoire of Ksara, near Beyrouth, Syria, during which time he operated as AR8OBK.

Last year he returned to Europe and settled at St. Heliers, Jersey, where he became acquainted with Capt. Houston Fergus (G2ZC). Contracting a cold during the bad weather last month, Father Horan passed away on February 20. He will be mourned by many who had the pleasure of his friendship.

NOTES and NEWS from the BRITISH ISLES

DISTRICT REPRESENTATIVES.

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

DISTRICT 2 (North-Eastern).
Yorkshire (West Riding, and part of North Riding), Durham, and Northumberland (Middlesbrough is in this district.)
MR. L. W. PARRY (G6PY), 13, Huddersfield Road, Barnsley, Yorks.

DISTRICT 3 (West Midlands).
(Warwick, Worcester, Staffordshire, Shropshire.)
MR. V. M. DESMOND (G5VM), 199, Russell Road, Moseley, Birmingham.

DISTRICT 4 (East Midlands).
(Derby, Leicester, Northants, Notts.)
Mr. J. J. CURNOW (G6CW), "St. Anns," Bramcote Lane, Wollaton, Notts.

DISTRICT 5 (Western).
(Hereford, Oxford, Wiltshire, Gloucester.)
Mr. R. A. BARTLETT (G6RB), 31, King's Drive, Bishopston, Bristol, Glos.

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

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

DISTRICT 8 (Home Counties).
(Beds., Bucks., Cambs., Herts. and Hunts.)

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

DISTRICT 10 (South Wales and Monmouth).
Capt. G. C. PRICE (G2OP), The Mount, Pembroke Dock.

DISTRICT 11 (North Wales).
(Anglesey, Carnarvon, Denbighshire, Flintshire, Merioneth, Montgomery, Radnorshire.)
MR. D. S. MITCHELL (G2II), "The Flagstaff," Colwyn Bay, Denbighshire.

DISTRICT 12 (London North).
Mr. S. BUCKINGHAM (G5QF), 9, 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 and Middlesex).
MR. H. V. WILKINS (G6WN), 81, Studland Road, Hanwell, W.7.

DISTRICT 16 (South-Eastern).
(Kent and Sussex).
MR. A. O. MILNE (G2MI), "Southcot," Larkfield, Kent.

DISTRICT 17 (Mid-East).
(Lincolnshire and Rutland.)
REV. L. C. HODGE (G6LH), The Bungalow, Skirbeck Road, Boston, Lincs.

DISTRICT 18 (East Yorkshire).
(East Riding and part of North Riding.)

SCOTLAND.
MR. JAMES HUNTER (G6ZV), Records Office, 51, Camphill Avenue Langside, Glasgow.

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

NEW MEMBERS ARE CORDIALLY INVITED TO WRITE TO THEIR LOCAL DISTRICT REPRESENTATIVE.

DISTRICT 1 (North-Western)

MANCHESTER.—A very fine talk was given at the last Manchester meeting by G5YD on the construction of a complete valve testing unit, using an elaborate and well-thought-out method of switching. 5YD explained with the assistance of a blackboard how each electrode in turn could be tested for emission, also for break of circuit. A complete unit was at hand for inspection, and a vote of thanks was passed to 5YD on the completion of the talk. An attendance of 26 was recorded at this meeting, including three new members, to whom a cordial welcome was extended.

The following stations report active:—G2DH is busy building a superhet for SW's; 2OI working European fone on 3.5 Mc.; 5CH is rigging up for fone; 5PX, 2BJT and 2AXH are still working on 56 Mc.; 6KS is testing new 7 Mc. Zepp; 2DF, who will soon be on the 1.7 Mc. band, takes over as T.R. for Warrington. Will stations in that locality please note, and either call or write to him? G6QA takes over as T.R. for Rochdale; will members in this district please note? G2BK has made two very fine transceivers for 56 Mc., using a combined hand fone and mike and tests are shortly to be carried out between 2BK at Royton and 2OI at Winton, commencing each Saturday night after midnight. Reports and co-operation from BRS and other stations will be welcomed; it is intended to use directional aerial systems.

The Manchester Section meeting will be held at 1 Hilton Street on April 1. A junk sale will follow a discussion on N.F.D. plans.

Southport.—The 56 Mc. tests will probably take place towards the end of March or the beginning of April, and members willing to co-operate are asked to write to 2IN or 2OI. Both sections will have stations in the field and dates and times of the tests will be forwarded to those interested.

G5OP is working 1.7 Mc. fone on Sunday mornings; 6YR is rebuilding with 59's in push pull—helped DX stations to score in B.E.R.U. contest. 5ZI still transmits on 56 Mc. daily, and hopes to carry out tests in conjunction with 2IN from the summit of Ashurst Beacon late in March or early April. G2IN is taking part in the 1.7 Mc. transatlantic tests, and up to the 10th had worked W2UK on three consecutive week-ends, also W1BB on one week-end.

Support Your Local Meetings

Liverpool.—Activity is increasing rapidly in the Liverpool area. BRS900 is now G2FZ; 2AYS is now G2MB and BRS2180 is now 2ADX. G2DM has come from Bradford to join this group and BRS2207, 2173, 2180, 2160 are welcomed as new members. Thirty-four members attended the February meeting. The N.F.D. question was again discussed and members decided to leave the whole of arrangements to the committee. During question time G5RY asked more members to operate on the 1.7 Mc. band. The same request was made by some of the Southport members last month, but even these members who ask for more operation on this band seem to desert it about midday on Sundays. What about Sunday afternoon and Sunday evening? The meeting was then taken over by G2DC, Mr. Drudge-Coates, who gave a most enlightening talk on "Radio Activity in the Army."

Brief particulars were given of the duties of the Army operators, members being surprised at the vast amount of work they have to cover. Receivers and transmitters now in use were then shown, and although these were very much out of date compared with amateur gear, the speaker explained that new gear was gradually replacing the present equipment. He then briefly outlined the new apparatus which is to supersede that shown—one TX will be crystal controlled weighing 35 lbs. and having an input of 35 watts.

G2RF had a welcome but unexpected visit from VS7RF. Skeds have been arranged to commence on his return to Ceylon. G2FD is working duplex 'phone on 1.7 Mc. G5RY is active on 7 Mc. with an input of 8 watts and has worked W9 and V9. G2KZ is now active on 14 Mc. with 'phone. G6CX has built special TX for 1.7 Mc. 'phone, but finds the band deserted. BRS1322 is testing an amplifier for television purposes; BRS1589 has applied for A.A. licence; 2ASO and BRS1816 are patiently awaiting some 56 Mc. activity. The next meeting will be held on March 18 at 38, Mason Street. G2OA will be the lecturer.

Chester.—BRS2198 reports that he is listening on 56 Mc., but so far without any result, but no other reports have been received from Chester. What about it?

Blackpool.—The Blackpool and Fylde Short Wave Society has been started by the members here and good attendances are being recorded. Lectures, practical work, field days, etc., are contemplated. Will Blackpool members please note and get into touch with G5AD at the Police Station, Poulton. G5AD is working on 7 and 14 Mc. and also building 56 Mc. gear. G5TH is working on 3.5 and 7 Mc. and looking round for ideas for new super TX. G5LF is rebuilding after being off the air a few months, and G6MI, from the I.O.M., is now living in Blackpool and busy making shack at new QRA.

Rochdale.—No meeting seems to have been held this month, but G6QA sends a report of local activity. G6AX and 6QA are conducting cross-town tests on 56 Mc., using indoor aerials. BRS1680 is rebuilding his TX. with complete screening; BRS1152 reports variable conditions on 14 and 7 Mc. G5XF has been heard working on 1.7 Mc.

Burnley.—We welcome a new member in BRS2221, who is busy with code, as is 1933. BRS2154 is now 2ATY and he, with 2067 is building a new receiver. BRS1041 has been ill, but has now applied for his A.A. G2RB, 5XC, and 5ZN are on 7 Mc., phone or key.

DISTRICT 2 (North-Eastern)

Will all members please note that the District Provincial Meeting will be held at the Black Swan Hotel, York, on Sunday, March 29. Lunch, 1.30 p.m.; tea 5 p.m. Intending visitors are asked to let G6PY, 13, Huddersfield Road, Barnsley, know not later than the 25th, so that suitable accommodation may be reserved. Tickets, 5s. each. The meeting has been postponed one week from the previously advertised date, and it is hoped that a good attendance will be made from all parts of the District. T.R.'s, please try to bring a party along and make it a big success.

NORTH-EASTERN PROVINCIAL DISTRICT MEETING

SUNDAY, MARCH 29, 1936

at

"The Black Swan" Hotel, Coney Street, YORK.

Assembled ...	... 1 p.m.
Lunch ...	...1.30 p.m.
Business meeting	...2.30 p.m.
Tea	... 5 p.m.

Inclusive charge 5s.

Reservations to Mr. L. W. Parry (G6PY), 13, Huddersfield Road, Barnsley, not later than March 25.

Huddersfield.—G5VD has been elected T.R., and local members are asked to send him reports. He has already made several personal visits to the members known to him. Reports: G5QN is active on 7, 28 and 56 Mc.; 2BXO awaits his call; 2ACD and BRS2186 are active; BRS2195 has applied for an AA licence; G5VD has installed a Comet Pro. A meeting is soon to be held at the T.R.'s house to enable members to meet one another.

Leeds.—Fair activity is reported. BRS1098 has recently undergone an operation, and we wish him a speedy recovery. BRS1650 is willing to give reports on 56 Mc. transmissions. BRS1834 is now 2AHM, and is building transmitter and frequency meter. He asks the local stations to give their frequencies a little more often, when on the air, to enable calibrations to be made.

Tyneside.—At a meeting recently at 2BGG, only five members attended. Newcastle members are asked to support these meetings better in the future. Mr. Brown, of Sunderland, has been allotted the call G6NS, but believes this call is already issued. G5AY is testing grid modulation and wants schedules on Saturday afternoons or Sunday mornings. 2BGG is trying out high quality speech and music, and quiescent carrier transmis-

FORTHCOMING EVENTS

MAR. 18.—District 10 (Newport section), 7.30 p.m., at Queen's Hotel, Newport.

*MAR. 18.—District 15, 7.30 p.m., at BRS 647, 92, Woodlands, North Harrow.

MAR. 19.—District 13, 8 p.m., at Brotherhood Hall, West Norwood. Display of N.F.D. 1935 Films.

MAR. 19.—District 6 (Plymouth section), 7 p.m., at BRS2153, 6, Savery Terrace, Plymouth.

MAR. 20.—Scotland B District, 7.30 p.m., at the Empress Café, Union Street, Aberdeen.

MAR. 23.—District 14 (Southend section), 8 p.m., at 2BNR, 15, Nelson Street, Southend-on-Sea.

MAR. 24.—District 14 (East London section), 8 p.m., at G6UT, 28, Douglas Road, Chingford, E.4.

MAR. 25.—Scotland A District, 7.30 p.m., at the Institute of Engineers and Shipbuilders, 39, Elmbank Crescent. Glasgow. Talk on "S.S. Receivers" by G2WL.

MAR. 25.—London meeting at I.E.E., 6.15 p.m.

MAR. 26.—District 6 (Exeter section), 7.30 p.m., at G5WY, 95, Fore Street, Exeter.

MAR. 26.—District 10 (Cardiff section), 8 p.m., at Barry's Hotel, St. Mary Street, Cardiff.

MAR. 29.—North-Eastern Provincial District Meeting at York.

APR. 1.—S.L.D.R.T.S. Meeting, at Brotherhood Hall, W. Norwood.

APR. 2.—District 5, 7.30 p.m., at Carwardine's Café, Baldwin Street, Bristol.

APR. 2.—District 6 (Torquay section), 7.30 p.m., at G5SY, Sherrington, Cleveland Road, Torquay.

APR. 3.—Scotland B District at Empress Café, Union Street, Aberdeen.

APR. 7.—District 7, 2.30 p.m., at Tumbledown Dick Hotel, Farnborough, Hants.

APR. 12.—District 6 (Bridgwater section), 7 p.m., at Bristol Arms Hotel, Bridgwater.

APR. 12.—District 11, 6 p.m., at G2II, The Flagstaff, Colwyn Bay.

*APR. 14.—District 12, 7.30 p.m., at Wander Inn Café, North Finchley.

APR. 17.—Scotland B District. Venue as above.

APR. 24.—London meeting at I.E.E., 6.15 p.m.

APR. 26.—Western Provincial Meeting at Queen's Hotel, Newport.

* Sale of disused gear at these meetings.

sions, and has completed a 4-valve mains superhet. G2LD has started to build a 100-ft. lattice mast, but is doubtful about its completion. Next meeting at G2LD, 4, Priors Terrace, Tynemouth, at 6.30 p.m. on Sunday, March 15, and all members are asked to attend.

Stockton-on-Tees.—There is a good deal of activity amongst the transmitters, but the BRS members are asked to send in more frequent reports to the T.R. Several stations took part in the B.E.R.U. tests, but few contacts were made. Work has now been started on the NFD transmitter. G6CV is active on 7 Mc. fone; G5XT has rebuilt and is now busy with a single signal super; G6ZT is now WAC and WBE, and rebuilding; G5QU is on 7 and 14 Mc. after a long absence; G2FO is still testing mains receivers and conducting 56 Mc. experiments; G6MF has a new mast and transmitter completed, and is working on 7 and 14 Mc., and hopes to be on other bands soon; 2BHF is building a new receiver to incorporate two pentodes in parallel, and he intends to use the output portion for modulating the transmitter. A 56-Mc. Rx is soon to be made. Support for the provincial meeting is promised from the members in the district.

Bradford.—The majority of stations are active. Several of them, including G6XL, 6PY and 5HB entered B.E.R.U., but the going was none too easy. At a recent meeting of the Bradford Radio Society a talk was given by G6BX on "Relays." This was supported by a demonstration of several different types, and included one which was operated by sound impulses, and caused much excitement and interest. The relay was made to function when 6BX went to the back of the hall, a distance of about 10 yards, and whistled to it, or clapped his hands once. A promise has been made by him to publish the details in the BULL. (Thanks, O.M.) At a later date an excellent talk was given by G6AZ on aerials, when a good discussion followed. G2QM is busy with Reisz mikes, and G5SZ is rebuilding his QRO outfit. G5WK is on 7 Mc. fone; schedules on 3.5 Mc. are being carried out by G6BX, 5TQ and 6KU. Other stations known to be active include G5YW, 6PL, 6SP, 5YV, 2BH and BRS1298. Most stations have been heard on the air, and it is hoped that two letter, AA, and BRS men alike, will attend the York meeting to meet members from the other towns, together with the Secretary, and members of Council from London. Please don't forget to send G6PY your card, saying you will be there.

Sheffield.—The fortnightly meetings in Sheffield have started very well, the attendance for the first three meetings averaging 12. At the second meeting, G6LF gave a short account of the qualities of link coupling, and at the fourth meeting G2GN is to talk on aerials.

Plans are being prepared for building a portable TX to be used at week-ends during summer. An effort is being made to find a suitable site and get good results with this gear so that Sheffield can put forward a convincing claim to a NFD station next year.

G2AS is building a midget TX, and is putting up a new Zepp with 7.029 cable for feeders, and would welcome any information on the use of such wire. We are pleased to hear that his second op. is recovering from her illness.

Report Your Activity—Regularly

G5FZ is rebuilding for 1.7, 7 and 14 Mc. a three-stage link-coupled TX with push-pull output. G6LF is on the top band only, and is anxious to arrange skeds on this band; he is rebuilding for the other bands. G5TO has built a CO for 1.7 Mc., but seems unable to get a PA working on this frequency. G2GN has part of a new Zepp erected by G2AS, and has made first contact on fone. G5JY is active when time permits, and is very pleased with the support of the meetings. 2BGN is building TX, and hopes to get full ticket soon. BRS2039 and 2112 are applying for AA licences. BRS1625 is collaborating with G2GN and G5FZ. He reports remarkable conditions for DX on 7 Mc. on the evening of January 27; he received VK and J on loud speaker, using an O-v-2 with no aerial!

BRS2124 has visited 6LF, 5TO, 5HK, 2GN, and was very pleased with all he saw. BRS1944 is awaiting components for a 5 Band Two-valve receiver. BRS1800 has been very ill, and we wish him a speedy receovery.

The next meeting will be on Thursday, March 19, at The Angel Hotel, commencing at 7.30, and meetings will be held every second Thursday at the same place and time.

DISTRICT 3 (West Midlands).

After many months of silence your scribe, last month, received no fewer than three reports, but, unfortunately, pressure of business prevented him from preparing them for these columns. Since then the rush has been quite unprecedented, and it is doubtful if the Editor will be able to provide sufficient space for even a short précis of the contents of this month's bag.

Wolverhampton is riding on a wave of enthusiasm at the moment. No fewer than 40 odd applications have been received by 6UI, 6PC, 5WQ and 2NO, in connection with the revival of the old Wolverhampton Radio Society. They have undertaken the work necessary to this end, and they have our best wishes for the success of their efforts. They are fortunate in being able to have the assistance of the local press which is very enthusiastic. The local Town Development Dept. have provided an excellent two-colour block for the Wolverhampton Q.S.L.'s, so the members in that town are in luck's way. It is reported that pronounced success is being obtained there with American valves. 2NV and 2OG are active on 28 Mc., whilst, normally, at the other end of the spectrum 6WF appears to be most successful bee-keeping! Full tickets have been obtained by 5IQ and ex-2BNB. The latter's new call has not been reported. Monthly rag chews are being held at the Molineaux Hotel on the last Wednesdays.

From Coventry comes a boast that that town has more fully-licensed transmitters than any town or city outside London. The third dinner of the Coventry A.R.S. was held recently, at which the D.R. was a very welcome visitor. 6YU, 5PP and 6TD are active on 56 Mc. The first-mentioned is using a unity coupled rig, whilst 5PP is experimenting with a rotating beam.

From Shrewsbury comes a report from an old-timer, 6WB, who has recently joined the Society. We welcome his first report, and hope he will do so regularly. G6KR is now the call of our old friend Westlake, a one-time C.R. Congratulations, O.M.

2ANH, at Warwick School, has been alloted the call of G5OI. Those letters have a great tradition from other areas, so it is up to you, O.M. Our congratulations to you also on your advancement in the art. 6PW is a master at the same school. The School Society is affiliated to the R.S.G.B., and is arranging a visit to the Daventry S.W. Station.

G5TU, who is at Charterhouse, recently graduated to that call. He tells us that he has four amateurs with him at School, to wit, 2BYA, 2BTW and 2BUK, as well as another who expects his full licence shortly.

2BIC reports that he is getting some rather weird results.

DISTRICT 4 (East Midlands).

A most interesting gathering was held on Sunday, March 1, at Loughborough. By the kind invitation of G5HT, of Derby, and with the aid of a car radio, a party of about 40 members and the general public listened to the King's speech in the hotel yard. The members then adjourned for tea, after which the general business was transacted.

We had great pleasure in welcoming the well-known Belgian amateur ON4ZQ, who gave a short talk on the amateur outlook in Belgium and an interesting description of the two transmitters at the International Fair.

Discussion on the arrangements for National Field Day ensued, and it is certain that two efficient stations will be operated.

The question of 56 Mc. for the coming season was discussed and G2WS was elected district manager for same. Two anonymous donors have presented prizes to the value of 10s. for the first crystal control transmitter and superhet or straight receiver built under certain conditions (for which apply to G2WS) in the district.

In the B.E.R.U. contest 13 entries were received, and the two district "Tankards" for the Senior and Junior were awarded to G6CW and G5KG respectively.

From Northants G5YF reports that 5NX has his new transmitter installed at Peakirk, 2NV is experimenting with aerials, 6PD is looking forward to be on air at Easter after a spell at Nottingham University; 6LX, who is at Cambridge, has had his call pirated. 2UQ has rejoined the society and is putting out a good signal. BRS2075 and 2171 are practising Morse.

A Wellingborough society is being started by G5LP.

In Kettering the local club had an attendance of 120 at their February social.

The next meeting of the Notts and Derby Section will be held at the Swan Hotel, Mansfield, on Sunday, March 29, at 3.30 p.m.

The Leicester Section meeting will be held at BRS1583, 25, Rowsley Avenue, Leicester, on April 2, at 7 p.m.

DISTRICT 5 (Western).

The usual monthly meeting was held in Bristol, the chief topic of discussion being the proposed clubroom. After lengthy and heated argument the matter was put to the vote, and it was decided to ask Mr. Andrews (G5FS) to make further enquiries with a view to getting the desired accommodation.

The Bristol Hamfest has been abandoned for this year owing to the difficulty of securing accommodation, but it is hoped everyone will make a special effort to support the Provincial meeting at Newport. Owing to pressure of work it has been necessary for Mr. Brookes (G6VK) to resign his position as T.R., and Mr. Hellin (2BYU) has been appointed in his place. Several local stations took part in the B.E.R.U. contests, but conditions were not by any means as good as they might have been, the QRM from continental and G ground waves being a very noticeable feature.

A meeting was held in Gloucester on February 12 but owing to various reasons was poorly attended; it is hoped everyone will make an endeavour to give better support in future. G5JH is now home, and has managed to get on the air again. G2HX was the only Gloucester station to take part in the B.E.R.U. contests, and in view of the bad luck he experienced with a transformer breakdown, did very well in both Junior and Senior contests.

Activity seems up to the average in Oxford, but reports, G5LO complains, are few; it is known a number of stations took part in the B.E.R.U. contests.

DISTRICT 6 (South-Western)

Chief interest this month lies in the way in which the monthly meetings are going in different places. These appear to be thoroughly well supported, and it looks as though there will be no difficulty in keeping them well attended. It is good to find that they are appreciated, and thanks are due to T.R.'s and all those who have worked to bring these meetings into being.

Dorset seems to be the only area not in a position to do itself justice, but it is known that there are a number of members in the Weymouth district. Will those in that region who by some remote chance read these notes kindly write in to the D.R., and say if they would be interested in the starting of monthly meetings. Surely someone will offer to do the small amount of organising. In North Devon, 6FO continues his informal meetings with a number of local enthusiasts, most of whom are expected to join the Society.

Torquay.—The meeting here was well attended, but not as well as usual. However, it proved very interesting, and questions affecting N.F.D. and the local Conventionette were discussed. 2AMO brought along a new 56 Mc. transceiver for test. Members present were 2CI, 5SY, 5WY, 2AMO, and BRS1696, 1918, 2245 and 2251.

Plymouth.—This meeting was very well attended, and it says much for the enthusiasm of 2AMO and his helpers that an area, which until recently was almost dead, has now become very much alive. An interesting and instructive discussion was held on the relative merits of commercial and home-constructed receivers. Best of luck on the future, O.M.'s.

Penryn.—A meeting was held here, and was fairly well attended. There are other members in the area, however, and it is hoped that future meetings will stimulate interest.

Bridgwater.—The first meeting of the West Somerset group was promising, and judging by the way Dr. Iles, T.R. for Taunton, has got down to the job, West Somerset is in for a good time. It was decided to hold meetings on a Sunday at 6.30 p.m., in even months, and on Thursdays at 7 p.m. in odd months. Thus the next meeting (odd month) is on Thursday, March 12. F.B., O.M.'s. Thanks very much, BRS190, for getting things going so well.

Exeter.—Eight members were present at the last meeting, and all expressed willingness to support a Conventionette. G5QA is now on 28 Mc. BRS1676 awaits his full call.

The D.R. has in mind arranging a Conventionette in April. An announcement will be made next month as soon as a venue has been fixed.

DISTRICT 7 (Southern.)

There was a good attendance at the February meeting at G2NH, and the usual station inspection and general discussion occupied the whole afternoon.

The N.F.D. stations have been fixed provisionally at Walton-on-the-Hill for "B" station, and in the neighbourhood of Portsmouth for the "A" station. The stations will be in charge of the D.R. and G6NZ respectively.

Individual reports this month are "all time high," as our friends across the Atlantic would say.

Portsmouth.—The South Hants R.T.S. monthly discussion for February was on the 1.7 Mc. band, and interest in this band increases. Outdoor work was discussed and summer activities forecast. Next meeting April 1.

2BHR, recently licensed, is busy with crystal oscillators. 2BCM puts in much time at morse. BRS1319 is still on overtime. BRS1907 has been on sick list. G2XC was heard in U.S.A. on 1.7 Mc., and now wants QSO for complete bliss! G2WS on 7 Mc. phone, while G6SS keeps chiefly to 1.7 Mc. G2VH is trying out feeders for his high 56 Mc. dipole. G6NZ spends time on 7 and 56 Mc. when not building a new 1.7 Mc. TX. 2BHD, now in Egypt; we are all sorry to lose you, O.M. G5UI is perfecting his new 7 Mc. phone. BRS2105 sends in his first report, and is busy collecting gear together. Write to G6NZ for particulars of the local meetings. The D.R. wishes to apologise to the Portsmouth and I.O.W. members for leaving out their report from last month's notes. The sheet was missed from the manuscript sent to H.Q., and was not discovered until too late.

Reigate and Horley.—Congratulations to G5PR for W, VE, SU contacts on 14 Mc. with 5 watts input from dry batteries. G5LK, 2JO, 6KD, 2AIG all report active. G5XG contacted VQ8AC on 14 Mc., with cyclonic conditions in Mauritius.

Farnham.—The last meeting of the Farnham S.W. Club included discussion on short-wave receiver design and general "rag chew." 2BAU is getting his 56 Mc. gear overhauled for early tests in conjunction with G2ZU and BRS157. G5NF has moved to a good site with long garden, and hopes to be on again as soon as things are straight.

Guildford.—BRS1535 reports hearing W's on 1.7, some on phone, also heard VK4EI on 3.5 Mc. G2GK has worked some J's on 14 Mc., and has also been active in B.E.R.U. A reflector is being tried with a view to QSO South Africa. G5WP probably has the largest No.7 district score in Senior B.E.R.U.,

with over 600 points to his credit, although he complains of the very great strain trying to copy DX. BRS1847 has a card confirming reception of K5 on 28 Mc. 2BKK paid a station visit to G6GS and was duly impressed with the Autodyne RX. G5OJ has been on 28 Mc. chiefly, as has G6GS, who now only requires W7 for all U.S.A. Districts on that band. Perhaps the most outstanding event of the month can be credited to G6LK, who WAC on 28 Mc. in 4½ hours on 28 Mc. on February 12. VU2BL, CP1AC, VK4EI, ZS1H, and a W8 were the other participants in this meritorious achievement.

Kingston.—G6BI has rebuilt TX to rack and panel and installed Collins coupler. His mains transformer blew up on eve of Junior B.E.R.U. He would welcome reports on his 56 Mc. transmissions, as he is using c.c. 2BNS has also been rebuilding RX and preparing power pack for TX. G5ZK is awaiting confirmation of ZL and J8 QSO's for WAC. He reports very disappointing conditions for Junior B.E.R.U., has recently joined Aerial Section of R.E.S.

Reading.—We welcome two new members, 2AIW of Sonning, and 2AGO of Bracknell. Congratulations to G5IU, ex-2AIF, on obtaining his radiating licence. He is running a joint station with 2BJK at the Imperial Service College, and in spite of aerial limitations, is doing well on 7 Mc. He is 16 years old, and wants to know if he holds the "junior operator" record in G. Fourteen members were present at the last Reading meeting, when G5RT gave a lantern lecture on "P.O. Radio Telephone Overseas." Most members report active. G6GT has worked more VK's. G5HH is working all Europe with 2 watts input. G5TP only wants South America for WAC. The next local meeting for Reading will be held on March 18 at G5AO.

DISTRICT 9 (East Anglia).

G2MN, 5IX and 6QZ all report activity; 2AFZ in Lowestoft is hoping to be on the air shortly, and we are glad to note that there are four members now in that town.

We welcome a new member in Felixstowe, Mr. N. E. Pulford, and hope he will be able to raise further enthusiasm in that town.

No further news this month, but we are hoping that our meeting, which was held on March 8, will provide us with a few topics of discussion for next month's notes.

DISTRICT 10 (South Wales and Monmouth).

The appeal for more news of interest has been answered, a fact appreciated by the D.R. and his scribe.

Newport.—The meeting here was attended by some dozen members.

Cardiff.—Two meetings were held, the first being supported by 36 members of the organising body, the Cardiff and District Radio Club. The second was not quite so well attended, but 27 is a gratifying number, bearing in mind the weather, and the fact that some members made long and hazardous journeys. G5VX, for example, came over from Port Talbot.

Swansea.—Activity is increasing here, over 20 being present at the February meeting. On this occasion an excellent lecture was delivered by G6XC on the subject of A.C. and D.C. measurements. On the A.C. side he discussed all frequencies from 50 cycles to 56 Mc., a formidable task effectively achieved.

At an earlier meeting with G2UL in the chair, it was decided to hold meetings fortnightly in future. N.F.D. was also discussed. It has been decided that the A station shall be operated from Newport, and the B station from Swansea.

G5KJ reports having been on vacation in Switzerland, he is now W.A.C. and W.B.E. G6XC, late of Hull, is building a new transmitter using an RFP 60. G2SN is on 1.7, 14 and 56 Mc., and maintains a local schedule with G2WO, who is active with 'phone on 1.7 and 7 Mc.

G5PH is on 7 Mc., 6JW has worked VK for his W.A.C. and W.B.E. He is also congratulated upon the arrival of a junior op. G5LV and 5TW are QRP workers on 7 and 14 Mc. G2UL, after a rebuild, has installed a 9-valve superhet.

G5VX is using 'phone and C.W. on 7 and 14 Mc. The D.R. (G2OP) has installed a portable transmitter in his garage, with a car battery as source of supply. Several VK's were worked on 7 Mc. using this rig.

2BSI is hearing plenty of DX on 14 and 28 Mc., 2BRO has built a TX. 2BSN, 2BHZ are also preparing for a full licence. The former is now O.M. to a J.O. Congrats.

G2JL using a Pentode C.O. and P.A., has worked ZS6 and many other DX stations. G2QL, 5OC, 5KK, 2XM, 2NG, 6BK, 5FI, 5BI, 2AVV, 2ABI, 2BAQ, BRS1855 and 2212 are all active in various directions, G5BI having worked FA8BG on 1.7 Mc. G6PF has been busy on the T.O. Tests, and has contacted W1BB and 2UK. G5FK is interested in television, and is often heard on 7 Mc.

Don't forget to keep April 26 an open date.

DISTRICT 11 (North Wales).

There was an attendance of eight at the meeting held at G2II on February 23. Although this constitutes a slight improvement on previous attendances, it is far from satisfactory. BRS1947, who came about 65 miles to the meeting, commented on the very friendly atmosphere prevailing, which, he said, made no one feel "out in the cold." He felt that it was well worth while coming all that distance to attend. After reading a testimonial such as this, it is hoped that even our shyest members will attend the meetings in future. They can be assured of a cordial and individual welcome always. The D.R. is going abroad and will not be home until April 10; as the final N.F.D. locations, operators, etc., will have to be decided upon at the next meeting, it is important that he should be there. The meeting will therefore be held on April 12, and *not* on March 29, as previously arranged. The official "breaking-up" time of this meeting will be 9.30, as it is felt that proceedings are usually allowed to drift on to too late an hour!

G2II has been taking part in the 1.7 Mc. transatlantic tests, and has worked six W's, one VE, and FA8 on this band.

A special appeal is made to all stations in the North Wales and Liverpool area to use the minimum

power necessary for reliable communication when making local contacts. Many stations on 1.7 Mc. have been heard using their full power to work stations within five miles. In the majority of cases no special tests were being carried out. Under such circumstances power should be reduced to one or two watts, or aerials removed, in order to avoid interference with those working more distant stations. A few members are building small QRP transmitters for local work, and it is suggested that others should do likewise. If certain people would stop this selfish craze for being " R9 " everywhere at once, there would be a great reduction in the congestion in our bands.

It has been decided to hold the first District 11 summer outing and field day on July 5. We hope that some of our BRS will busy themselves with the construction of lightweight portable receivers for use on this occasion, as they will help to make the outing a success. We are hoping for the co-operation of OM WX !

Mark this event, and the next meeting, in your engagement books NOW !

DISTRICT 12 (London North).

A letter budget is now in circulation again and is supported by seven members ; if anyone else wishes to be included will they please drop the D.R. a card. 2BII is now an authorised second operator to G5VY, the rebuilding programme consisting of a series of transmitters and receivers from 50 cms to 56 Mc. is now finished. G5VY has found that a " Windom " aerial greatly improves reception on 56 Mc. ; he can now hear stations that were inaudible before.

G2QY is now a confirmed " Collins " supporter, since its erection he has worked VS6, VS8, VK, ZL, J and VO on 14 Mc. using 20 watts. G5CD is now licensed for 50 watts on 300 to 600 Mc., and hopes to be working on 80 cms. very shortly.

G5BO is building a directional array for working on 28 Mc. ; G2GO is very active, and has now worked the whole of Europe on QRP ; he is to be congratulated on his simple but very efficient receiver.

2BTZ has completed a receiver with switching for all bands, including a separate detector valve for 56 Mc. 2BOC is now G2OK. G6TV has left the district.

DISTRICT 13 (London South)

The annual dinner of the S.L.D.R.T.S. took place on February 27 at the Half Moon Hotel, Herne Hill. Over 20 members were present, including Mr. Bevan Swift (G2TI) who was the guest of the evening. The toast of the Society was very ably given by Mr. Dedman, and in replying, Mr. Johnson (retiring chairman) referred to the very satisfactory way in which the Society was maintaining its progress. The toast of the R.S.G.B. was given by Mr. Cullen (Secretary), who expressed his admiration for the excellent work that Mr. Swift had done in the past as President, and added that the thanks of all were also due to the present President, Mr. Watts, for the very valuable service he was rendering the Society. Mr. Swift responded. He referred to the many difficulties which Council have to contend with, but remarked that fortunately these were enlightened to a large degree by many humorous incidents. He appealed for an even greater spirit of sportsmanship among the amateur fraternity. After the dinner followed a competition organised by Mr. Johnson, in which the first prize was won by Mr. Lawrence (G2LW), and to conclude the evening the Secretary (Mr. Cullen) assisted by Mr. Maitland Edwards, gave a short cinematograph show. The party dispersed at 11 p.m.

We are very pleased to record that the Junk Sale held on February 20 was an unqualified success. It had been suggested that a South London District Station should be erected with the gear offered for disposal, and judging by the amount of apparatus put up to auction, this would certainly have been possible. The D.R. is most grateful to those who assisted with the event and is very gratified to see that the N.F.D. Fund has now grown to very reasonable proportions.

Now that the B.E.R.U. Contest is a thing of the past, the District's attention is once more focussed on N.F.D. 1936, and this, together with a display of N.F.D. 1935 films will form the agenda at the March meeting.

From a perusal of the reports this month it would appear that a large number of members took part in the B.E.R.U. Contest ; this is very encouraging, but we should like to stress the importance of sending in a report to H.Q. If you took part at all, please send in your report, no matter how small was your score ; this at least shows that you have taken an active interest in the event, and after all, there is no disgrace in having scored a small number of points. G2JB has been working DX on 14 Mc. G6HM is active on this band using Goyder Lock. BRS1729 and BRS2015 have both built new receivers. G2LW is now crystal controlled on 7 Mc. and anxious for reports. G6CB has been rebuilding and has also spent considerable time on field strength measurements. G2VJ is rebuilding and intends experimenting with various aerials in the near future. G5WG reports working a first district American on his first evening on the air. G2RD is building portable 56 Mc. gear for use during N.F.D. G5OX is still endeavouring to construct a really satisfactory receiver for use on the 56 Mc. band.

G5JW reports a considerable amount of work on 28 Mc. All American districts except the seventh have been worked on this frequency with a power input of 20 watts. Using 10 watts input, 'phone contact was established with W5BDB. This QSO lasted for half an hour and reception was QSA5 each way. G6AN is using 'phone on 14 Mc., but so far with little success. He finds a Collins Coupler very interesting and hopes to obtain results very shortly.

The following BR stations report active : 2218, 2149, 1675 and 2213. The latter is awaiting an A.A. licence. BRS1357 is endeavouring to build a station on the lines of G6MS as detailed in the BULLETIN. 2AZP has completed a new receiver and other apparatus with satisfactory results. 2AJA has received the call sign G2ZL. Congrats. OM, and good luck. G2ND is pleased to observe an increase in activity on the 1.7 Mc. band. He is experimenting with key thump filters and the like. G6UP is another applicant for the title of the youngest operator in the District. He was 17 in October. He is turning his attention to the Tritet circuit, and would welcome assistance on various points with regard to a Collins Coupler.

G2GZ is active on the usual bands, and has a really efficient station on the air (D.R.). 2AGW is now G2RC. Congrats. OM, and good luck. G2HG reports WAC and WBE on 28 Mc. Is this the first in South London ?

In conclusion, do not forget March 19 at the Brotherhood Hall. The meeting will commence at 8 p.m. sharp owing to the lengthy programme.

DISTRICT 14 (Eastern).

At the February Southend area meeting held at G2SO of Leigh-on-Sea, there was an attendance of 20, including G5RW, 6LB and 2AAX from the Chelmsford area. This was a record for this area, and it is hoped that an even greater number will be present at the next meeting at 2BNR, of Southend. (See District Calendar.) National Field Day was again discussed, and apparatus and offers of help were promised from most present. A local contest was arranged, and at the end of the meeting our T.R., G5UK, was handed an album of photographs of the R.S.G.B. Belgium trip presented by those whom he so ably conducted on that memorable cruise.

Congratulations to G2UK, ex BRS1994 of Eastwood. 2BCF having passed his Morse test, only awaits the issue of his full call-sign.

Congratulations are extended to G5XI, who was previously 2BCF, of Leigh-on-Sea.

The attendance at the February meeting held at 2AYB, Walthamstow, was 10, and several BRS members showed their disapproval of the recent change in connection with the forwarding of QSL cards to European countries. Offers of a large bell tent for N.F.D. are requested, also donations both in cash and apparatus. Although the Morse classes held at 2AYB have been poorly attended it has been decided to continue them for a further period ; future dates are March 30, April 6, 13 and 30, and the QRA is 16, Station Road, Walthamstow, E.17, at 8 p.m. Offers of QRA for future meetings are wanted, especially from the Ilford area.

DISTRICT 15 (London West and Middlesex)

Our thanks to G6VP for having put up with the 27 members who overwhelmed his QRA at the last meeting. We should like to know what members think of his new bottles and the studio. It is hoped the photographs will be a success.

Our funds were again increased by the junk sale and monthly collection. The D.R. would like to see this continued as it will save a lot of worry when N.F.D. comes along.

The T.R.'s have been doing their job in helping to obtain reports with the result that we have a few more this month. It is hoped that some of these members will be persuaded to contribute to the letter budget.

Will all members who have the slightest intention of taking part in the operation of N.F.D. please communicate with the D.R. by the end of March at the very latest, to enable him to notify headquarters of the persons on the stations ? Also please state which station you wish to be on. The sites will most probably be the same as last year. Both are available, and unless we can find others infinitely better there seems to be no reason for a change. We require help with cars both before and after activities to transport gear, so offers will be appreciated.

The T.R. for Twickenham reports that G6GB, with his new transmitter, using a TZ 05 20 valve, works good DX. G2KI worked three continents on 28 Mc. G5VB testing half-wave 14 Mc. Zepp, and intends trying vertical. G5XY testing Suppressor Grid modulation on 7 Mc. G2KX has W.A.C., and only awaits cards.

T.R. for Hayes reports BRS2073, is now 2ANR, and building transmitter (Congrats., O.M.). 2BCN trying push-pull detectors for 56 Mc., built CO.PA with plate modulation, he thanks G5JL for helping the district with slow Morse practice. Individual reports : G2BY busy with modulation tests. G5JL finds little time to get on the key. G6CO is on 28 Mc. again, and has a new aerial. G6WN could not work quite so many stations on 28 Mc. as last month. Congrats. to BRS1514, who is now 2BAZ, and has transmitter and power supply going. 2AJX on transmitter work and Morse practice. 2BAI heard two new countries. 2ADA can comb his hair rapidly and strike neon on it. (What next, O.M.'s.) Congratulations to BRS2178, who only joined last month, but entered B.E.R.U. He sends a fine letter for the Budget. 2AUB, who reports for the first time, has nearly finished his transmitter. 2AHW reports.

At the T.V.A.R.T.S. February meeting, G6CJ gave an interesting talk on " Transmitting Aerials," resulting in much feverish outdoor activity within the area.

DISTRICT 16 (South-Eastern).

The Scribe, for business purposes, has deserted Folkestone for Tenterden, Kent. His address during the week, at present, is " Westbourne House," Tenterden, 'phone Tenterden 98 ; the office 'phone number is Tenterden 11. Having acquired a car he will be making evening trips to most of the neighbouring groups, and is home at Folkestone most week-ends.

The D.R. states that Gravesend has been asked to provide the " A " station and Tunbridge Wells the " B " station for N.F.D. this year. It is proposed that a levy on the District membership of 6d. per head should be made to cover N.F.D. expenses, the fund to be administered and accounted for by the D.R., to whom subscriptions should be sent.

Brighton and Hove.—G2HV reports that Sleepy Sussex is waking up. (Ministerial cheers.) The group are active on 56 Mc. G6CY and 2BGQ are members of R.E.S., and are working with 2RM and BERS218 (Mr. C. J. Madden on leave from South India). 2ASC and 2BGQ are both waiting for Morse tests. BRS2152 is working for his full licence. BRS2074 is applying for a three-letter call. BRS1852 and 1571 are students, but both have been doing DX listening under difficult conditions.

Eastbourne.—G2AO has established a 56 Mc. link with 5YA.

Heathfield.—The local society still holds successful meetings. G5JZ is working DX and BRS1173 is listening to it.

Bromley and District.—At G2AW, members were able to inspect some interesting and original 56 Mc. apparatus, including a silent super-regen receiver with an H.F. stage, which receives C.W.,

modulated C.W. and 'phone. They saw also the MO-FD-FD TX which puts good quality and steady signals into a super-het receiver 50 miles away with an input of 4½ watts. 2AW is now licensed for wavelengths below 1 metre. 5LB is awaiting suitable valves before a satisfactory 56 Mc. PA can be built.

Gravesend.—Congratulations to 2BPQ, who is now G2TN. G6BQ is rebuilding and 6VC has already rebuilt. 6PG and 2BDL are doing good work on 56 Mc. and 5VZ and 21Z propose co-operating. BRS1521 is active.

Whitstable and Tankerton.—Will all members in this area please communicate with BRS1300, J. Mawbey, 109, Clare Road, Tankerton, with a view to forming a local group? BRS1996 has left the district, but 2BJN and BRS1300 are active.

Ashford.—Two meetings a month are now held at the QRA's of G2JV and BRS2240, who with BRS2181 is a new member, and is heartily welcomed. G2KJ is on 7 Mc., whilst 5QL, 2JV, 2BLN and 2BLU are on 56 Mc. and have carried out some interesting tests on the Downs at Wye. G6SY is on 1.7 Mc.

Tunbridge Wells.—The Tunbridge Wells and District Amateur Transmitters' Society held its first meeting at the end of December and is now a flourishing organisation. Congratulations to G6BD who has been appointed G.M. of the General Receiver Design Group of R.E.S. G5OQ is on the 1.75 Mc. band after an absence on 7 and 14 Mc. for 18 months, and is getting out very well, using COPA and a 2BI aerial and counterpoise. G5KV is also on this band. G2UJ has been getting up in the wee sma' hours calling W's in the American Tests. So far no contact has been made, but several W stations, both CW and 'phone, have been logged at strengths up to R7. G6BD is on 14 Mc. with a COFD. G2UJ is using an English Pentode as combined COFD in a special electron-coupled circuit. G2PQ, who has been licensed since the 1,000 metre days, is again active and is co-operating with 2BTI in the design and construction of portable 1.76 Mc. 'phone gear. G6OB is QRT for the present owing to change of QRA, but hopes to be on again soon with an improved aerial system. He, together with 5KV and 6BD, have been using a method of "valve-grid-leak" modulation with great success. This system uses no H.T. current, and even with a Reiss microphone no additional amplifier is required.

Just as we go to press we learn that G6BD has become a father, and that YF and YL are doing well Congratulations OM!

Folkstone.—G2FA is operating on 56 Mc. every Sunday morning at about 11 a.m., with a self-excited outfit and a beam aerial which local tests show to be very efficient. All stations please stand by, and write to G. Emrys-Jones, 71, Sandgate Road, Folkestone, for schedules. The P.A. stage of the crystal control outfit is not yet working properly, and therefore will not yet be put on the air. A 1.7 Mc. outfit is being used for 56 Mc. co-operation work.

M.A.T.S.—A combined meeting with Gravesend was held and an interesting evening spent. G5FN has been testing aerials, 6NU and 6QC are working DX; 2VA is working from new QRA, 2CM experimenting with electron-coupled oscillators,; BRS745 and 2054 are building gear.

DISTRICT 17 (Mid-East).

Owing to the temporary indisposition of the D.R., G6GH and the D.S. have this month had to use their own literary ability to compile the month's news for the District.

Grimsby.—The activity in this area is still sustained. G6AK reports power supply trouble, and is rebuilding this section. 5GS has been busy at the B.I.F. 6UG has rebuilt his transmitter. 2BYS has his first transmitter under construction. 2AFU is having trouble with Neon signs and can hardly read an R9 signal. 2BVU is building his transmitter. 2AZH's new transmitter is now complete, and he would like information on 56 Mc. transmitter and receiver.

Mablethorpe.—G5BD had little luck in the B.E.R.U. Contest. 5CY is temporarily QRP, but is getting out well on 7 Mc. fone. 5LL is building a new receiver. 2FT is doing well on 7 Mc. with SU as his best DX.

Cranwell.—The T.R. (2LR) reports that the new shack is now open and has an excellent antenna on 60-ft. masts. All members may operate there on 3.5, 7 and 14 Mc. Individual reports follow:—2XK hopes to be active again soon. 6TV is now here, but has no gear available as he returns at week-ends to London. BRS1814 has moved in from District 8 (welcome OM) and hopes for a full ticket soon. Members will be sorry to hear that BRS2155 has had a serious motor accident, and is now in Lincoln Hospital with a broken thigh and leg; the membership will all wish him a speedy recovery. 6AC is active and hopes to produce a description of this Class B transmitter for the BULLETIN at a later date.

Boston.—We welcome a new member, Mr. Felts (BRS2243) who is polishing up his code to his former speed of 30 wpm. BRS2030 reports building a new receiver for 28 Mc., and finds DX good. 6GH entered for the Junior B.E.R.U. Contest and, as far as is known, he was the only district entrant, his latest DX is VK, VU, VS7 and VE5. The D.R. hopes to meet the membership on 668 kc. on the 22nd of this month, when he will be radiating with an input of 50,000 watts! The D.R. would also like to mention the enjoyable three days he spent in London recently. He met G6CL and other members and was much impressed by the business-like methods employed at "53." Unfortunately he has not been in the best of health recently, and this has culminated on medical advice in his being ordered to remain in bed. All members will doubtless wish him a speedy return to the key.

DISTRICT 18 (East Yorkshire)

G5BP is looking forward along with many others, to the York gathering on the 29th, and he promises to bring a car-load. In the meantime he sends in the following notes and news, after being active on 7 and 14, and receiving W5 R7 on his signals from all continents. His WBE certificate has been received, and a W.A.C. certificate is in the mail-bag. G5FV was very active during the Senior B.E.R.U. contest, raising both ZS and ZE on 28 Mc, but still looks for VU to make him W.A.C. on that band. G6OS and ZE5BP were also active during the contest, but no outstanding scores were made by these or any other Hull station. G6OY has entirely rebuilt his receiver, and is again on the air, after a few months' bench work with various pieces of

apparatus. G5GC is still keen on 7 Mc. telephony, but has been on 1.7 Mc., and obtained excellent results.

G6KN, 5MN and 2KM are heard active on various bands. G2QO has been doing research work on D.F. apparatus, and has a promising system well under way. He is only heard on the air when he wants local bearings on the D.F. as a check on each method being tried. A welcome is extended to BRS2232. G5BP has a 59 as C.O., and is putting the finishing touches to a 28 Mc. transmitter before going on the air. G6AW is rebuilding speech amplifiers. G6CP listening only on 28 Mc., and has so far heard only three continents. Transmissions are being made with success on 7 and 14 Mc. G2CP active on 7 Mc., and listening often on 28 Mc. G5MV is testing out telephony on 7 Mc., and all reports are welcome. G5HZ (ex VU) has been heard testing on 7 Mc., using only 10-watt input to a CO.BA.PA.

G5GI feeling a little exhausted after a thoroughly successful bout in the B.E.R.U. contest. G2TK reports working OS1BR twice. During the second contact he asked OS1BR if he held the distinction of being the first G to contact OS, but found that G5TP held the honour. A Yardley-Beer's antennæ system as described in THE BULLETIN is being erected here.

Mr. P. Briscombe (secretary of the Scarborough S./W. Club) has become 2BGS, and is busy constructing a 56 Mc. driven transmitter.

BRS2216 is welcomed as a new member. A Mid-West receiver is in use here, and telephony from both W and VE on 3.5 Mc. is received very well. A comparative test of a Dipole antennæ as against an inverted L-type showed the former to be far superior.

Four Scarborough members made a special trip over to Whitby to keep in touch with an isolated member, G5JD, only to find that he had gone to live in Hull!

It is hoped that as many members as possible will do their utmost to attend the gathering at York this month, in co-operation with No. 2 District, and make the Sunday a most enjoyable one.

Scotland.

The B.E.R.U. contests are over again, few stations are known to have competed in the Senior contest, the only scores to hand being G5YG, 354, G6RV 275, and G6LD 120. The Junior contest was, unfortunately, held during a spell of poor conditions and very few contacts were made by the entrants, the second week-end being, so far as known, a complete blank for Empire contacts.

The following changes are to be noted this month :—" A " district : Mr. Male (2BYK) is now G6IS, and in " B " district Mr. McRobb (BRS1508) is now G5LF. Mr. McRobb, incidentally, will welcome reports on his 7 and 14 Mc. transmissions.

2BYF and 2AUT expect to be issued full calls very soon, having only to pass their morse tests.

G5TA had the misfortune to have a " blow-up " during B.E.R.U., losing a meter, 2 valves and 2 chokes. 56 Mc. transreceivers are under construction by G5JK and 5IP.

Congratulations are extended to G6KO on his election to Provost of Kirkbuddo. G6RI and G6LD are testing the W3EDP 84-ft. antenna and find results very encouraging. G6LD raised W7AMX as his first 14 Mc. QSO on this antenna, getting a report of R7, since this he has had contacts with ZB1E and ZL4CK on 7 Mc.

At the " A " district meeting to be held on March 25 Mr. T. A. Wilson (G2WL) will deliver a lecture on S.S. receivers, and it is hoped that a good attendance of members will be present.

Northern Ireland

G16XS has changed his QRA and will now be found at " Gilhall," Groomsport Road, Bangor, Co. Down. G15UR reports having worked a considerable amount of DX last month, including the following new Countries : FM8D, VO4Y, VP2. He WBE during the B.E.R.U. contest, his score being 76 points in the Senior and 93 in the Junior. G16YW is off the air at present and is rebuilding his transmitter completely. We regret to announce that G16TK has been ordered to hospital. He is, however, lightening the monotony with a portable transceiver. We wish him a speedy recovery.

It is now time to commence preparations for N.F.D., and the D.R. would take this opportunity to remind those who intend to take part that payment of arrears of subscriptions would be appreciated.

EUROPEAN NOTES

Denmark.

By OZ7Z.

Interest in 28 Mc. is increasing in Denmark. OZ2M worked four continents in four days with an input of 20 watts. OZ7G, 7T and 7Z are also active, and will appreciate reports on their signals.

The E.D.R. Convention will take place in Kulunborg on May 31-June 1. Overseas amateurs will be welcome, a card to Box 79, Copenhagen, will bring full particulars.

OZ7Z wishes to inform British listeners that his call sign has been pirated by a phone station working on 3.5 Mc.

France.

By F8DS.

G. Barba (F8LA) has been the President of the Council of the R.E.F. for some time, succeeding Andre Auger (F8EF). The new President is an old-timer, having been active since the first trans-Atlantic contests. F8EF has been made Hon. President in recognition of his activities during the past four years.

The year 1935 will mark a particularly notable time in the history of 28 Mc. Although conditions had been poor for a long time they improved considerably and many French amateurs were able to effect DX contacts. We recall with pleasure that it was a French amateur, M. Auschitzky (F8CT) who established the first contact between Europe and North America (NU2JN) on January 1, 1928. Since then many amateurs have tried to emulate his feat, but have been prevented from doing so by bad conditions. In September last LU1EP worked for several hours with F8OZ, F8EF and F8VS. Shortly afterwards FA8IH reported having received ZS1H. Then came an avalanche of DX, and the 28 Mc. enthusiasts, F8CT, EF, OZ, RJ, WK, VO, VS and FA8CR and IH, etc., had a record number of contacts with stations in all continents.

Empire B.E.R.U. News.

B.E.R.U. REPRESENTATIVES.

Australia : I. V. Miller (VK3EG), P.O. Box 41, Tallangatta, Victoria ; Sub Representatives : J. B. Corbin (VK2YC), 15, Yanderra Flats, East Crescent Street, McMahon's Point, Sydney, N.S.W. ; R. Ohrbom (VK3OC), 22, Gordon Street, Coburg, N.13, Victoria ; A. H. Mackenzie (VK4GK), Fire Station, Wynnum, Brisbane ; G. Ragless (VK5GR), South Road P.O., St. Mary's, S.A. ; J. C. Batchler (VK7JB), 21, Quarry Street, North Hobart, Tasmania.

Bahamas, Bermuda and the Eastern Part of the West Indies : P. H. B. Trasler (VP4TA), Point à Pierre, Trinidad, B.W.I.

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

Canada : C. S. Taylor (VE1BV), Stewiacke, Nova Scotia ; Earle H. Turner (VE2CA), 267, Notre Dame Street, St. Lambert, P.Q. ; W. P. Andrew (VE3WA), 1337, Dougall Avenue, Windsor, Ont. ; A. E. Howard (VE4CJ), 2401, 25th Street West, Calgary, Alberta.

Ceylon : G. H. Jolliffe (VS7GJ), Frocester, Govinna.

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

Egypt, Sudan and Transjordania : F. H. Pettitt (SU1SG), Catholic Club, Mustapha Barracks, Alexandria.

Hong Kong : G. Merriman, (VS6AH), Box 414, Hong Kong.

Irish Free State : Captain G. Noblett, M.C. (EI9D), Barley Hill House, Westport, Co. Mayo.

Kenya, Uganda and Tanganyika : W. E. Lane (VQ4CRH), P.O. Box 570, Nairobi.

Malaya and Borneo : J. MacIntosh (VS1AA), Posts and Telegraphs, Penang, S.S.

Malta : L. Grech (ZB1C), 18, Constitution Street, Zeitun, Malta.

Newfoundland : E. S. Holden (VO1H), Box 650, St. John's, Newfoundland.

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

North and South Rhodesia : R. A. Hill (ZE1JB), P.O. Box 484, Bulawayo, S. Rhodesia.

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

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

South India : J. Shepherd Nicholson (VU2JP), c/o Kanan Devan Hills Produce Co., Ltd., Munnar P.O., Travancore.

Burma

By VU2JB.

Two interesting events are due to be recorded. First, a Radio Exhibition, under the auspices of University of Rangoon Radio Society, has been held, and second a Radio Experimental Society has been formed at the Government High School Maymyo. At the moment the writer's call signs, VU2BJ and 2JB, are being used. A transmitter, using an ACS2 Pen in the tri-tet stage driving a 20 watt P.A., has been built. Mauritius and the Philippines have been worked with a Windom on 7,060 kc.

All B.E.R.U. members in Burma are cordially invited to get in touch with VU2JB so that a programme can be arranged.

Local members are reminded that transmissions of gramophone records for one or two hours at a time are not looked upon with favour by other members who have experiments to carry out. The practice of announcing the titles and numbers of records is nothing else but commercial advertising and should cease.

Canada (Third District)

By VE3WA, *via* G15QX.

Another B.E.R.U. Contest has passed and conditions in Ontario were better than during any previous year.

The 7 Mc. band was the greatest surprise, the first week the G stations were roaring through at R7, while VK and ZL were numerous both week-ends.

On 14 Mc. although QRM from W was bad, and most signals were weak, conditions were good each week of the Senior event. The only thing that was noticed was the number of Empire stations in QSO with stations outside the Empire, especially with W stations. It would make the contest much pleasanter for those who enter if those stations who are not interested would curtail their activities during the tests.

The death of Hiram P. Maxim, President of A.R.R.L., was a sad blow to amateurs throughout the world, as he did much to help the cause and his death will be felt by all amateurs.

VE3UG turned in a nice log of stations worked in the Contest ; he is now a member of R.S.G.B. VE3MJ is getting out well on 28 Mc. with 40 watts.

VE3UD has been working Europeans on 7 Mc. VE3WJ would like QSO's with G on 7 Mc., his frequency is 7,155 kc. VE3WA reports that Asia only is needed for 28 Mc. WAC.

Ceylon

By VS7GJ.

Conditions were variable on both 7 and 14 Mc. during the B.E.R.U. contest, the latter band was fair up to 10 p.m. local time, when fading became troublesome. Static has been bad on 7 Mc. and QRM at a high level every week-end.

VS7RP has been doing good work on 7 Mc., working VK, KA, VS4, PK, etc. It has been noticed that the South African stations have not been coming in at all well this year. 7RW has been heard working good quality phone on 7 Mc., 7EB is on the same band and is putting out an excellent D.C. signal. 7GJ has been on both 7 and 14 Mc., and has worked a considerable amount of DX. VU2BG and 2BI. have been heard on 28 Mc., the former calling VK and the latter working England. VU2BL was called unsuccessfully by VS7GJ, who is now working on that band. VS7RA having just returned from England, is preparing his station for the air with much new gear.

VS7GJ has cards for distribution to 7AI, 7B, 7AW, 7AA, 7AB and 7ZZ. It would appear that a number of VS7 calls are being pirated in the States, because the majority of these cards emanate from the East Coast of America.

Egypt, Sudan and Trans-jordania

By SU1SG, *via* G5JX.

With the exception of the B.E.R.U. Contest, nothing of much importance has taken place in SU during the past month. The experiments on television and 56 Mc., are still pending as the necessary gear has not yet arrived from G. Of the two B.E.R.U. entrants, SU5NK has made the best showing, with a score of around 500 points; SU1WM, the other competitor, did not do quite so well, partly owing to the fact that he was unable to do any operating on Sundays before about 12.00 G.M.T. He had the satisfaction, however, of working VE for his W.B.E., so on the whole was quite satisfied with results. ZC6CN is again active and pushing out a nice T8 signal on 7 and 14 Mc.

During the coming W season on 14 Mc., this station will be in great demand, as ZC is their easiest Asian to contact. Quite a lot of local fone tests have been carried out between local members using various systems ranging from absorption to class "B," and some interesting results have been obtained. SU1SG, after considerable trouble has at last obtained results, using Class "B" modulation, which are reasonably pleasant to listen to, and favourable reports have been received from W., G and VU. In the near future a more accurate test on modulation and frequency response will be carried out with the aid of an oscilloscope.

Hong Kong

By VS6AH, *via* VS6BD, G6CJ and G6LK.

Conditions were moderately good during February for 7 and 14 Mc., but poor on 28 Mc. The B.E.R.U. Contests were thoroughly enjoyed by all. VS6AF made WAC on phone and 6AH needs Africa for the same award. 6AL is back on the air after some years. Towards the end of February conditions on 28 Mc improved slowly. Hong Kong 28 Mc. stations are aware that they are in demand and have the situation in hand, awaiting favourable conditions. Nearly all activity at present is on 14 Mc. Active stations are: 6AF, 6AG, 6AH, 6AL, 6AI, 6AO, 6AS, 6AX, 6AZ, and 6BD.

Irish Free State

By EI9D.

Congratulations to the undernoted recipients of new licences:—

EI2J Mr. N. Maddock, "Sherbro" Dartry Road, Dublin.
EI3J Rev. M. Kelly, St. Finbarrs College, Farranferris, Co. Cork.
EI4J Mr. F. Halpin, "Drayton," Cambridge Road, Rathmines, Dublin.
EI6J Mr. Coombs, Dublin.
EI8J Rev. N. H. F. Waring, 35, Wellington Road, Dublin.

BRS1348, Mr. D. S. Patton, is now residing in Coventry where he finds activity greater than in Co. Donegal. He expects to have a G call soon. BRS1932, Mr. Taheny, of Sligo, has passed his P.O. test and is awaiting licence.

We are very sorry to lose EI7G, Mr. R. H. McDonnell, who has moved to London. His QRA is 20, Ederline Avenue, Norbury, S.W.16, and he is anxious to get in touch with local stations. (Yes, OM, we believe there are a few over there somewhere—why not look in at Headquarters?)

EI9F is rebuilding with RK23's, EI8G is QRT for exams. Most other stations have been hard at it in the B.E.R.U.'s Tests, but, as to scores, only rumours are yet available.

Malaya and Borneo

By VS1AA.

Only one report to hand. VS2AG has been busy owing to floods, but managed to put in a little time during B.E.R.U. contest. VS1AJ can no longer continue to act as E.I.S. owing to pressure of other work. VS2AG is to carry on as E.I.S. for 1936. VS1AA has started on the Commercial Activity Check, and hopes to be able to forward a weekly report. We have to welcome FRS38, Mr. Lim Gim Soo, to Penang. 1AA is in communication with the Posts and Telegraphs Department in connection with the use of the 3.5 Mc. band—at present banned to us.

Malta

By ZB1C, *via* ZB1E AND G5MR.

The B.E.R.U. contests were the main interest of the month and nearly all members took part. Conditions on 14 Mc. were only fair during the first week-end of the Senior and poor during the remaining three week-ends. Poor conditions and QRM rendered the 7 Mc. band quite useless. It is remarked that after 20.00 G.M.T. "TEST B.E.R.U." calls were answered by scores of W stations, but only one VE was contacted during the whole of the contests. Although G signals came in well no EI station was heard and staying up all night was

(*Continued overleaf*).

EDITORIAL.—(*Continued from page* 337).

use their apparatus for a species of family party.

He concluded with the statement: "I agree there is something wrong, but like war, poverty, disease and other problems of life, the remedy is in the hands of the victims."

We most heartily support the viewpoints and conclusions reached by the correspondent in question, who, although he did not advertise the fact, is a prominent member of Council and a District Representative.

Who ever uses the 7 Mc. band, let us see that he is an *amateur*, even if the seriousness of some of his experiments may be open to question.

J. C.

56 Mc. RECEIVER (*Continued from page* 340).

and the most successful ones were home made, and the exact details are given in the sketch (Fig. 3). Double-ended soldering tags are mounted with 6 B.A. nuts and bolts, the excess length being nipped off, and the coils are attached to one side of these. The reaction coil is made to lie up very close to the grid coil, and the turns are only very slightly spaced. It will be found that the other tags take up their proper relative positions in place of the other coils.

A *Clix* midget valveholder (Fig. 4) should be mounted near the end of the coil and supported 2 ins. above the chassis. The copper strip coming from the "earthy" end of the grid coil, which normally connects to the "Acorn" cathode, will be connected to the positive filament pin, and short wires from the other pins will finish this part of the alterations. Underneath, the wire connected to the outside (6-volt) terminal will be transferred to the side of the switch remote from L.T. negative terminal. The 100,000 ohm anode load resistance is too high to give smooth control with moderate voltage and should be replaced by one of 40,000 ohms. It is probable, however, that better results will be obtainable by the use of fairly high (120-150) anode voltages, in which case the 100,000-ohm resistance is retained, but a 20,000 ohm resistance should be inserted in the lead to the screen grid valve anode choke, to prevent this valve being overrun.

Both the *Hivac* XL and XP were found to give smooth oscillation, the XP oscillating at lower voltages, due to its higher mutual conductance.

With the "Acorn" valve in circuit, the band-set condenser will be about one-third enmeshed to give suitable coverage to the amateur band, but with the *Hivac*, this will need reducing to one-sixth.

MALTA (*Continued from previous page*).

unrewarded as no contacts were made between 22.00 and 06.00 G.M.T. BERS297, 300 and 331 took part in the receiving contests. ZB1E has received his WAC certificate and ZB1H awaits QSL confirmation for WBE. ZB1C has settled in his new QRA at 18, Constitution Street, Zeitun, where all communications should now be addressed.

DX Forecasts (No. 4.)

MARCH 15—APRIL 15.

G.M.T.	14 Mc.	7 Mc.
0700	K6; VE5; W6, 7	W4, 5; ZL2, 3; VK
0800	J	W5; VK
1100	ZL; VK; VP5	
1200	VK; ZC	
1300	VK; J	
1400	VE1; W1; J; KA; ZD; VS6; K6; X	
1500	VE1; W16, 7, 9; J; VK	
1600	VE1; W16, 7; VK; PK; VS1, 6; ZC6	
1700	VE1; W1, 7	
1800	VE1; W16; VK; VP2	J
1900	VE1; W16, 7; VQ8; VP5; PY; ZB1	J
2000	VE1; W16, 7; VQ8; VP	PK1; ZS
2100	VE1; W16, 7; ZT6	KA1
2200	VE1; W1; ZT6; VP2	W1
2300	VE1; W1	W1

EXCHANGE AND MART.

RATES.

Private members' advertisements 1d. per word, minimum 1s. 6d. Trade advertisements 2d. per word, minimum 3s., cash with order. First line, if desired, will be printed in capitals. Copy to reach 53, Victoria Street, or the Advertising Manager, Parrs, 121, Kingsway, W.C.2. not later than the 1st of the month preceding date of publication.

A CHANCE OF A LIFETIME!—High-voltage Condensers of well-known make. Brand new. Example of price: 8F. 1,500 volts working (list price £2), 12s. 6d. Send for list of sizes and prices.—2AYB, W.T.C. RADIO, 2 and 16, Station Road, London, E.17. 'Phone: Walthamstow 2541.

AMATEUR-BUILT TWO-STAGE PREAMPLIFIER A.C., suitable for Comet Pro or other with 57 and 58 tubes. 30s. Parts cost double.—G5VD, 20, Bromley Road, Birkby, Huddersfield.

BARGAINS.—Steel T.X. Cabinets, 36"×18"×12" adjustable Shelf. Rebuilt Typewriters, wholesale prices to Hamms. 5 sugar Peter asks for enquiries. Cash or Terms.—32, Shirley Road, Southampton.

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Tail Piece

G5-- (to G2--, who is using a bug rather badly): "Sa om top."

G2-- (comes back)—"Sa ob what top mean?"

G5-- "Top means, Try other paw ob."

G2-- (dotting dizzily)—teht teht teht de G2-- . . .

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