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. 10

No. 9

FREQUENCY OBSERVATION

IN this issue we publish from the pen of our Calibration Manager a short constructional article dealing with the class of Frequency Meter used by the Band Monitoring Group.

Although costs are not mentioned, we believe that these meters can be built for approximately £3; at this figure such an instrument becomes an investment rather than a luxury.

We cannot too strongly impress upon our members the desirability of knowing the exact frequency upon which they are transmitting, for the reason that future extensions of our operating facilities depend to a large extent upon how accurately we are now carrying out our work.

The Band Monitoring Group are not policemen of the ether, but are performing a sound voluntary task for the benefit of the Society as a whole, with the thought in mind that, when the time comes, they, with us, will be able to prove that out of many hundreds of transmissions checked only a fractional percentage have been found off frequency. Evidence of this nature will, we hope, suffice to convince the G.P.O. that British amateurs have earned the right to use the full international amateur band widths.

Fortunately, the vast majority of our transmitting members employ crystals which have been purchased from reliable manufacturers, but we must warn the newer devotees to our hobby that a hidden danger lies in using home-made crystals, or, for that matter, commercial crystals, if the fundamental or harmonic happens to fall near to the edge of one of the British bands. The reason the limits have been set a few kilocycles inside the international bands is simply and solely to safeguard members from wandering into adjacent bands and thereby causing criticism from other services.

Take the low frequency end of the 7 mc. band as an example. No British amateur should use a crystal which will place his transmissions on a frequency lower than 7,012 kc. By this we mean that the manufacturer's figure for the crystal should not be lower than 7,012 kc. (or 3,506 kc. if a doubler is used). Allowing for commercial variations up to 0.1 per cent., the transmitter will still be operating inside 7,005 kc. as a worst condition.

To assist our members arrangements have been made to calibrate their crystals at a nominal charge, furthermore, standard frequency transmissions are emitted by G6NF on the last Sunday in each month. Whilst these facilities are of inestimable value we consider that an accurate frequency meter is essential at every licensed station. This recommendation becomes doubly important in the case of members who use any form of master oscillator control or self-excited circuits.

RANDOM NOTES ON ALL-MAINS RECEIVERS.

By S. W. Cutler (G2OL).

NUMEROUS articles dealing with mains driven receivers have appeared in this journal and elsewhere, but the writer is of the opinion that if attention is given to the recommendations which follow, sensitivity and selectivity of existing sets can be improved and hum effectively eliminated.

These notes, whilst primarily intended for all-mains apparatus, will also be found to be applicable to battery sets in some instances, especially as regards the L.F. stages.

At the end of this article will be found a brief description of the author's receiver, which has functioned perfectly for two years, and which may be of interest to readers.

Detector Control.

In most battery receivers it is usual to connect a potentiometer across the filament of the detector, and to bring the grid return lead to the variable arm, thus obtaining negative or positive bias as desired. This may also be accomplished with mains valves without very much alteration.

The detector anode voltage is now variable by means of the larger potentiometer, and the grid, when the arm is at the earthed end of the small potentiometer, obtains negative bias from the cathode in the usual way. As the grid is brought towards the positive end of the potentiometer the cathode resistance is gradually neutralised, and eventually becomes positively biased.

The grid coil must not be directly earthed, but earthed through a large condenser, preferably of .1 MF capacity. Reference to Fig. 1*a* should make these points clear. With the values given bias may be varied approximately from ½-volt negative to ½-volt positive, which is all that is usually necessary for the detector, but these values may vary with different valves. The D.C. supply must be perfectly smooth, as any residual hum is applied to the grid and amplified by the valve.

It should be noted in passing that most of these remarks apply to Resistance capacity coupled, or parallel-fed stages.

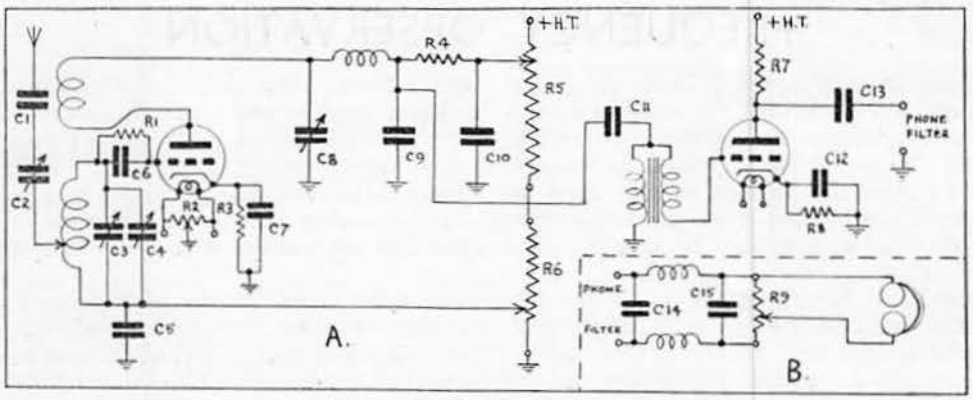


Fig. 1.
The Receiver used by Mr. Cutler.

C. 1. .00005 MF.
C. 2, .00005 Variable.
C. 3. Single plate band-spread.
C. 4, 8. .0001 Var.
C. 6. .0001 MF.
C. 5, 7. .006 MF.
C. 9, 10, 14, 15. .002 MF.
C. 11, 12. 13. .5 MF.
R. 1. 500,000 ohms.
R. 2. 200 ohms Var.
R. 3. 100 ohms.
R. 4. 50,000 ohms.
R. 5. 30,000 ohms.
R. 6. 400 ohms Var.
R. 7. 40,000 ohms.
R.. 8. 400 ohms.
R9. 10,000 ohms. Var.

Variable H.T. may be acquired in the same operation. Assuming the detector to be fed through a fixed resistance of 50,000 ohms, two potentiometers are placed across the H.T. supply in series with each other: one of 30,000 ohms having its free end connected to H.T. positive and the other of 400 ohms having its free end connected to earth (H.T.—). The feed to the detector through the 50,000-ohm resistance is then attached to the variable arm of the large potentiometer, and the grid return lead is brought through its grid leak, either in series with the grid coil, or direct, whichever is preferred, to the variable arm of the 400-ohm potentiometer. At the same time the cathode of the detector is supplied with a resistance of 100 ohms, and by-passed with a condenser of at least .006 MF capacity.

Deletion of Extraneous Noise.

A large amount of "pick-up" hum may be eliminated from the receiver not only by keeping all grid leads as short as possible but by using screened sleeving, especially in the L.F. stages. It is also advisable to screen all L.F. wiring in the same way, and to enclose the L.F. transformer, if not already shielded, in an *iron* screen, earthing this and the core of the transformer. The heater wiring should be enclosed in screened sleeving, and a potentiometer of 200 ohms connected across it, the centre arm being earthed. The potentiometer should be added even if the heater winding already has an earthed centre tap, as this may not always be the exact electrical centre.

H.T. positive should be taken from the rectifier filament or heater in the same way by placing a

potentiometer across it and the H.T. positive taken from the centre tap. This ensures correct balancing.

If a metal chassis is used each point earthed should be connected to the chassis separately, where possible, in order to avoid as much common coupling as possible.

Eliminator Hum.

To check whether any residual hum is present from the eliminator the grid of the last valve should be earthed. If residual hum is present it will be heard in the telephones. There should be complete silence. The remedy for this residual hum is to apply more smoothing.

Whilst on the subject of hum it should be mentioned that both the aerial and earthing systems are capable of introducing quite a large amount of trouble in this direction. The aerial should be clear of all mains wiring and thoroughly insulated. It will be found worth while to use a couple of ebonite rods, well covered with shellac and at least 2 ft. long, as aerial insulators. The author uses these, and his aerial insulation resistance measured 2½ megohms in pouring rain.

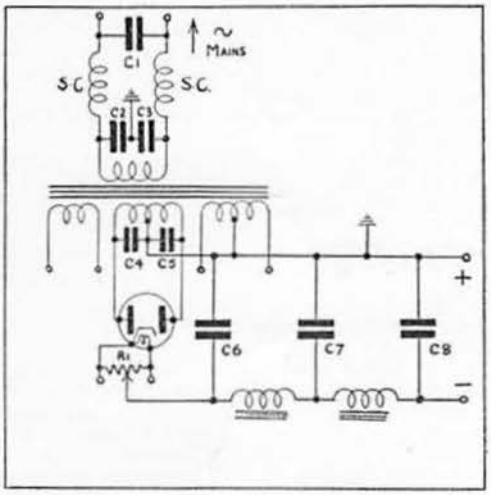


Fig. 2.
Power Pack Arrangements.
C. 1, 2, 3 .002 MF.
C. 4, 5. .01 MF.
C. 6, 7. 4 MF.
C. 8. 8 MF.
R. 200 ohm potentiometer.
S.C. 20 henries.

The length and position of the aerial also affects hum. The aerial used on the receiver at the author's station is 41 ft. long and arranged in the loft, but as conditions vary considerably with different locations, mains and earths this cannot be taken as a very reliable measurement. Resonant aerials, unless very loosely coupled, are the worst offenders in introducing hum.

The earth lead is as important as the aerial, and should be as well insulated to its point of contact with the earth. It should, of course, be as short as possible, and of a fairly heavy gauge wire. Water pipes, gas pipes, and electric-light conduit should be studiously avoided.

The Power Pack.

If possible a completely separate power pack should be used, and kept several feet away from the receiver, unless the latter is shielded by a *thick* iron cabinet. If the power pack is incorporated in the receiver it should be well screened in an iron box.

The position and axial relationship of the L.F. transformer to the mains transformer and smoothing choke is important. It should be kept away from all mains apparatus, well shielded, and its position checked by rotation in all planes to neutralise hum as much as possible.

Another form of hum, known as modulation hum, only audible either when the detector is in an oscillating condition or when a signal is being received, is due to feedback through the mains, and may be cured in most cases by one of two methods. Two .01 MF condensers in series, with their junction earthed, can be connected across the secondary winding of the mains transformer, or the primary winding may be screened with copper foil placed on each side of the bobbin and earthed. These screening cheeks should have a slot cut in them so that they do not form a closed secondary coil which would rapidly heat up.

If expense is not important the heaters may be run from a *Westinghouse* metal rectifier, and well smoothed. In this case the heaters may be joined in series and run (if only two valves are in use) off an 8-volt 1-amp. type rectifier. The grid bias potentiometer can then be connected as in a battery driven set if preferred.

An R.F. filter in the mains lead is of great help in preventing feedback in both directions. It will also lessen interference due to electric-light switches and motors running in the house. This filter should consist of two chokes wound on tubular formers of 1 to 1½ inches in diameter and as long as possible, with at least 300 turns of No. 30 S.W.G. enamel and cotton covered wire. Fig. 2 shows the connections.

The L.F. Amplifier.

If it is desired to increase the step-up ratio of an L.F. transformer it may be connected by the auto-transformer method, when the ratio is increased by roughly one-third of the ordinary step-up ratio. Thus a 1 to 3 may be increased to 1 to 4 step up, and a 1 to 6 increased to 1 to 8. It is necessary to parallel-feed the transformer for this purpose. Fig. 3 shows this method of connection. Transformers, when marked A, HT+, GB—, G, usually require to be connected in the following manner. A to earth, HT+ to GB—, and together to the L.F. output from the preceding valve *via* a 0.5 MF condenser, and G to the grid of the following valve. Other types require the junction to be earthed, and the L.F. taken to the point A, but this again is a matter for experiment. One arrangement may give rise to serious motor-boating or hum, and the other perfect silence.

Complete stability and freedom from hand-capacity effects in the phone cords and phones may be obtained by the insertion of an R.F. filter similar to the one previously described, but wound on a former ¼ of an inch in diameter and about 6 ins. long, using No. 40 S.W.G. enamelled wire. A capacity of .002 MF should be connected across each end of the chokes. Reference to Fig. 1b will make this clear. A single choke in one lead and decoupled is not usually effective alone.

It should be remembered that where R.F. chokes are used in series with resistances, as in grid leads, the resistance should be placed next to the grid, with the choke below. This allows the low potential end of the choke to be earthed, directly or through

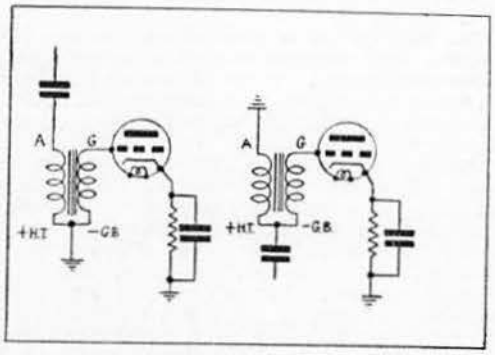


Fig. 3.
Two arrangements of the L.F. stage designed to produce a greater transformer step-up ratio.

a capacity as the case may be. This practice also saves a condenser, usually incorporated to by-pass the resistance when following the choke. Unearthed chokes are generally completely ineffective.

Valves.

L.F. valves, power valves, and super-power valves make better detectors than the usual type of general purpose valve, more especially when " power grid " detection is used. High gain valves following the detector, where no " power output " is required, such as for headphone work, make extremely good L.F. amplifiers, and a large stage gain may be obtained.

The Author's Receiver.

Referring to Fig. 1, which is a circuit of the receiver in use at the writer's station, it will be seen that it consists of a simple, straight detector and L.F. Reception is possible down to 5 metres without difficulty, but it must be admitted that there is some hum present on this wave, due to the aerial. It seems impossible to cut an aerial to suit all bands. The detector is a *Mazda* ACHL, followed by an AC2HL as L.F. amplifier. The receiver incorporates the usual band spreading condenser, six-pin plug-in coils, extension spindles for tuning, and a metal chassis made of zinc. This metal is very easy to work, cut, bend, or solder providing a *hot* iron is used. It has also the added advantage of being cheap, a sheet 24 by 18 inches, gauge 18, costing about 2s. 6d. Gauge 18 seems to be the most suitable thickness compatible with weight and rigidity.

The lay-out of the receiver is not unorthodox, the valves and coils being the only components mounted on the top of the chassis. All valves are metallised, this being an almost essential condition. The rest of the receiver follows general practice, and the circuit diagram should be self-explanatory. For the benefit of anyone interested, the values of components are appended.

In conclusion, the author hopes that at least some of the points mentioned may be of help to those troubled with hum and other difficulties.

THE HL2/K VALVE.

By J. N. Walker (G5JU).

MEAGRE details of the new " Acorn " valve, made in America and specially designed for ultra short wave work, have recently made their appearance, but the valve is unobtainable in this country and, in any case, will probably prove expensive, owing to high manufacturing costs.*

The *Marconi Co.* produce a midget valve with a 1 volt filament, but this has rather poor characteristics and is not suitable for short-wave work.

There is, however, a valve made by the *Osram Co.* which does not seem to be well known to the amateur, and which possesses some very attractive features. The valve referred to is the HL2/K battery Catkin type, which possesses the same normal characteristics as the usual HL2, which are amp. factor 27, mutual cond. 1.5, impedance 18,000, these being recognised as suitable for leaky grid or anode bend detection.

The main features of the valve are its small size and short leading out wires, which also, by reason of the steel mica clamping, are spaced wider apart than usual, these giving very low internal capacities and lower losses at high frequencies.

If an HL2/K is inserted in place of the normal detector, it will invariably be found that oscillation is produced more easily, necessitating a cutting down of reaction, and, at the same time, the tuning capacity will need increasing to reach the same frequency.

If, as in the writer's case, the valve holder is dispensed with and connections soldered directly to the valve legs (the valve being glued into a piece of sponge rubber), a still greater improvement is obtained and it becomes possible to increase the number of turns on the tuning coil and reduce them on the reaction coil, with better over-all performance.

Using a 60,000 ohm dropping resistance and a 100 volt H.T. battery, tests were made on 28 mc. with a standard SG-v-1 receiver. At 80 volts, oscillation was only just possible with the usual valve, but with the HL2/K oscillation was still good at 40 volts (battery tapping) and control was delightful.

The new type was also tested in a 56 mc. receiver and proved extremely suitable as a combined detector and quench, oscillation being much stronger and signals noticeably improved. It is intended to rebuild the 56 mc. receiver soon, incorporating this valve soldered directly in, when the coils will have to be considerably increased, and good results are anticipated.

Parasitic noise is less with the HL2/K and it acts as a very good low frequency amplifier, needing, of course, a small grid bias.

The valve costs no more than the usual HL type of valve and, being so small, lends itself to a compact layout for portable gear.

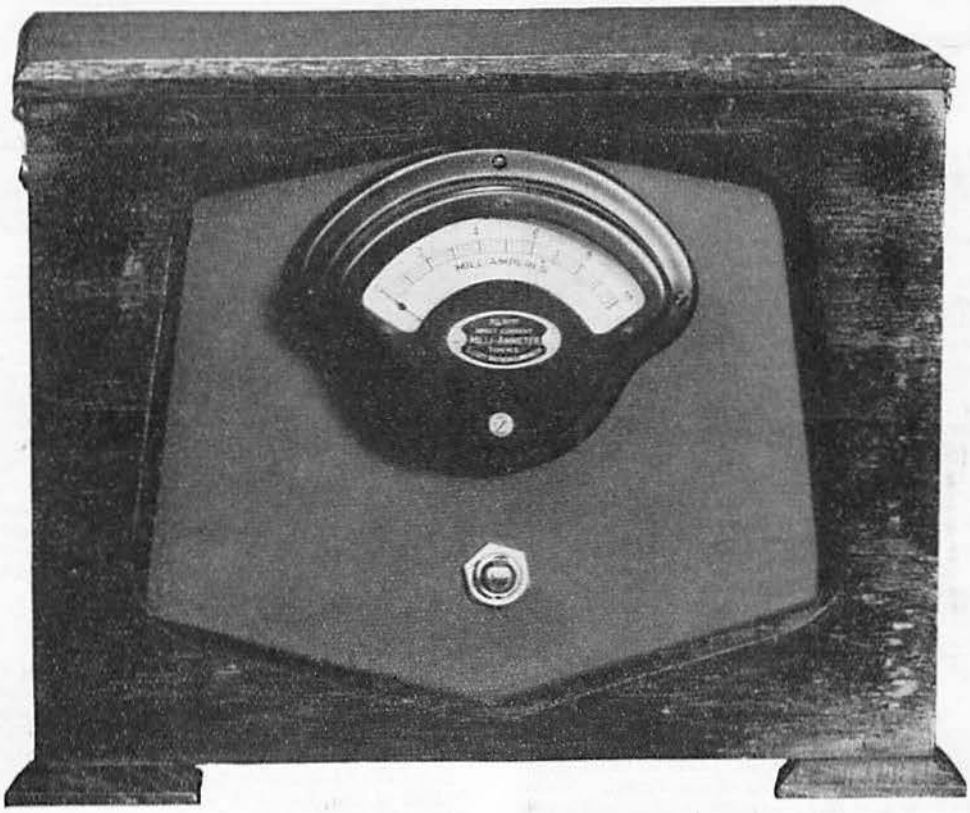
*Samples have been obtained by the Society and these are now being tested by R.E.S. members.—Ed.

A 100 KC. FREQUENCY SUB-STANDARD.

By A. D. Gay (G6NF).

This article describes one of the crystal oscillators constructed for the Band Monitoring Group.

THE use of a carefully calibrated 100 kc. crystal oscillator in close proximity to a short-wave receiver provides a number of useful harmonics of high accuracy, 100 kc.'s apart. These harmonics can be utilised to mark the edges of the international amateur bands in the following manner :—



Order of harmonic	*Frequencies on which harmonics fall.*
17th, 18th, 19th and 20th	1,700, 1,800, 1,900, 2,000 kc's.
35th, 36th, 37th, 38th, 39th, 40th ...	3,500, 3,600, 3,700, 3,800, 3,900, 4,000 kc's.
70th, 71st, 72nd, 73rd	7,000, 7,100, 7,200, 7,300 kc's.
140th, 141st, 142nd, 143rd, 144th ...	14,000, 14,100, 14,200, 14,300, 14,400 kc's.

In Great Britain the 3.5 mc. band is shared with Government services so that only the 35th, 36th and 37th harmonics are of use for marking the edges of this band. Also the safety tolerances each end of the bands make the use of a simple frequency meter necessary. Providing a good band-spread condenser is used, this frequency meter can be of simple design, as it can be under constant check for scale accuracy by means of the harmonics from the 100 kc. crystal.

The 100 kc. Crystal.

The bar type of crystal differs from the usual quartz plate used for controlling the frequency of a transmitter in two important ways. (1) They have a much lower temperature co-efficient. (2) The 100 kc. bar vibrates in a longitudinal mode. See Fig. 1. Quartz oscillators of the plate type vibrate in a transverse direction and the frequency is proportional to their thickness. The cross dimensions are not so important except that the usual width lies between $\frac{1}{2}$ in. to 1 in. across and a crystal that has been ground to a certain frequency can again be made lower in frequency by reducing the cross-dimensions, but not in the same proportion, as thickness reduction increases the frequency.

A transverse oscillator could be manufactured for 100 kc. but this would not be such an economical proposition as the bar type owing to the fact that it would be nearly cubical in section and use quite a

large piece of quartz. Another disadvantage would be the much higher temperature co-efficient which the transverse oscillator possesses. The x-cut plate or transverse oscillator has a temperature co-efficient of about 23 parts in a million negative per degree centigrade ; this means that a

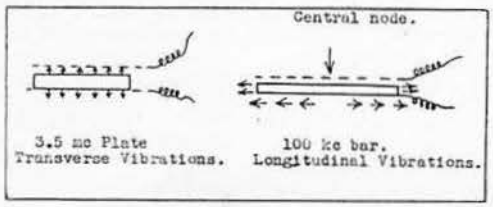


Fig. 1.
Mode of vibration of quartz crystals.

3.5 m.c. crystal will decrease in frequency nearly 81 cycles for each rise of one degree in room temperature. With the bar type of crystal the temperature co-efficient is never more than five parts in a million, providing, of course, the correct cut is made. Out of several the writer has tested, it has, in some cases, been found much less than this. It can therefore be said that a bar type of crystal, calibrated at 15° C. over abnormal changes in room temperature, which can be reckoned from 5° to 25° C., never varies more than plus or minus 5 cycles, which makes a difference on the 35th harmonic of plus or minus 175 cycles. This variation is negligible for all amateur requirements and being linear might be easily corrected for if necessary.

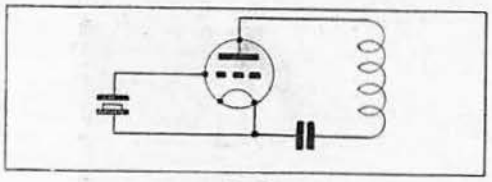


Fig 2.
Circuit of crystal oscillator.

But here we must pause and consider other possible influences on the stability of the crystal. Variations of L.T. and H.T. voltages, within reasonable limits, can be dismissed. Change of type of valve may have some influence on the frequency of the crystal and the choice of valve is important for the precision required for band monitoring.

It is desirable to use a power valve for the crystal oscillator in order that the strength of harmonics is such as to be easily audible up to 28 mc. Of the class of 2-volt power valves available we found the *Mazda* P220 the most suitable. Such is the uniformity of construction of these valves that two selected from stock, when interchanged, produced no detectable difference in the crystal frequency. The P 220A was also tried out for this purpose as this valve has a higher plate dissipation and should therefore produce stronger harmonics, but it was not such a good oscillator as the P220.

The most important influence on the frequency of the crystal is the holder for the crystal. This is just as important as the crystal itself in determining frequency stability and a badly made holder will completely spoil the performance of a perfect crystal.

The Crystal Holder.

The type of holder chosen for these bar crystals is the one described in the T. & R. BULLETIN for January, 1933. A photograph of this is reproduced herewith and the crystal is normally operated resting lightly against the two silk threads. This position renders any serious movement of the crystal practically impossible. It will be appreciated that to grind two brass plates absolutely parallel is an impossible task so that any movement of a crystal on slightly uneven surfaces will make small variations in frequency inevitable. The amplitude of a crystal's vibrations on a plane surface is such as to cause the crystal to move, in fact, a very light crystal may have a cushion of air molecules beneath it during oscillation which will allow considerable lateral motion to take place. By having the electrodes on a slant, with the crystal resting against the silk threads, its mass is sufficient to prevent any movement which might otherwise take place on a plane surface. A little calcium chloride held by a plug of cotton wool at the bottom of the test tube enclosing the holder, ensures the crystal and holder being in a dry unchanging atmosphere.

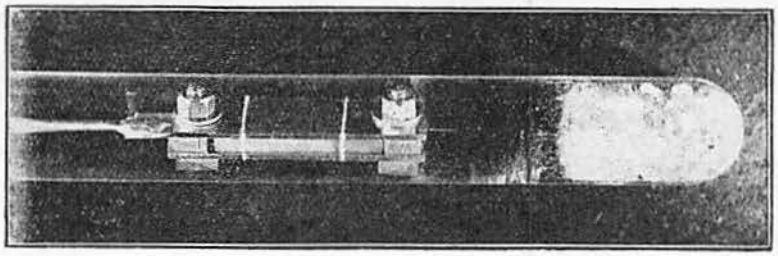
Circuit

The circuit is shown in Fig. 2 and is of simple design consisting of a 300-turn anode coil and holder, valve and holder, and by-pass condenser. No grid leak is used as this was found to reduce the strength of harmonics. To obtain the maximum strength of harmonics the anode coil must have low value of distributed capacity. Plug-in coils of the *Igranic, Edison Bell* or *Gambrell* type F are suitable. A milliammeter is included in the circuit to indicate that the crystal is oscillating. If, for any reason,

(*Continued on page* 362.)

Fig. 3.

This shows the electrode and crystal assembly. The position of the crystal between the brass electrodes and the carefully adjusted Keramot spacers to give the required air-gap are clearly seen. The silk threads prevent lateral movement of the crystal.



PROPAGATION AND A STANDARD RADIATING SYSTEM.

By H. CHORLEY (G5YH).

Foreword.

IT is proposed to produce a series of articles dealing with various types of radiating systems in common use among amateurs, and to examine the theoretical and practical work which may be accomplished with each type. Needless to say, such research, with the simple apparatus which the author has at his disposal, can only be done slowly, hence the subsequent articles in this series will appear at fairly long intervals.

In this article the propagation of radio waves at various frequencies, and the design of a simple standard radiator (without which no quantitative comparisons are possible) will be considered.

Light and Dark Zones.

The next few paragraphs, while obvious to those conversant with the theory of propagation, will be found by the tyro to merit a careful study.

The world may be divided at any time during the twenty-four hours into four main zones according to the amount of light received by those zones from the sun. These are as follows :—

Zone A.	Daylight.	Zone C.	Darkness.
Zone B.	Twilight.	Zone D.	Intense Darkness.

For each zone there is a frequency for propagation between any two points to give optimum signal strength under fixed conditions (i.e., power, etc.) and the effect of the zones may be summed up as follows :—

Zone A. The greatest possible extent of daylight is 6,000 miles, and the most suitable frequency 20,000 kc. Higher frequencies normally have a skip distance exceeding 6,000 miles. For distances less than the maximum the frequency is decreased till at 1,000 miles the optimum is 10,000 kc. ; but at this frequency the attenuation is high.

Zone B. The attenuation is very low, so that a signal may pass two or three times round the world. Optimum frequencies are from 21,000 to 10,000 kc., depending on the distance to be covered and the grade of twilight.

Zone C. Above 15,000 kc. attenuation will rapidly become infinite, owing to insufficient ray bending. This corresponds to summer night conditions, when 14,000 kc. is a good frequency.

Zone D. The effect produced above is found down to lower frequencies of approximately 10,000 kc. ; between this frequency and 6,000 kc. propagation is not satisfactory, but below 6,000 kc. it is good.

It is only the amateur frequencies of 3,500, 7,000 and 14,000 kc. that are to be considered in this instance, so from the foregoing it may clearly be seen that the 14,000 kc. band should be employed when zones B and C are to be traversed, the 7,000 kc. band for local (less than 2,000 miles) work and medium distances in Zone D, and the 3,500 kc. band for normal Zone D work.

When the effect of light and dark on the various frequencies has been thoroughly understood it will be easy for the experimenter to arrange his schedules on the appropriate frequencies and at the right times to secure optimum signal intensities. Eckersley charts are indispensable for this purpose as they show received intensities from any one point to any other at any time on any frequency by means of a very simple calculation. It may safely be assumed that all experimenters in propagation problems, in this country at any rate, are equipped with a set.

A Standard Radiator.

It is now required to design a radiator which will be as omni-directional as possible to act as a standard for comparison against the other systems to be tested. Acting on the belief that the best results are obtained with the simplest apparatus, it has been found that the end-fed Hertz is an excellent base system. Carefully designed and erected free from disturbing fields this type of aerial is singularly non-directional, but it should be emphasised that extreme care should be paid to insulation, stray fields, etc.

Experiments carried out at Round Hill, N.J., several years ago showed that to function efficiently the radiator must not be less than $\frac{1}{4}\lambda$ above ground, the word " ground " signifying the highest grounded object in the immediate neighbourhood of the antenna. If the standard to be erected cannot be made higher than a half-wave above earth it must be carefully compensated until it is an equivalent radiator for the designed frequency.

In the present case the system was calculated for its natural frequency to be 14380, no correction being applied as the antenna was more than a half-wave above ground. The system pointed north-south.

Practical Tests.

The next part of the work to be undertaken is the practical testing under actual radiation conditions. Therefore, schedules must be arranged with efficiently operated stations at various distances and bearings from the transmitting source. These schedules should be as frequent as possible over a considerable period, so that a fair average signal strength may be obtained. Everything else, power input, characteristic tone, receiver, etc., should be left constant throughout the tests. It is essential for reliable work that the received signal should be considerably stronger than the background noise.

Contrary to common opinion, it is entirely unnecessary to plot field strength measurements, using complicated receiving apparatus, for several reasons, the chief of which are (1) Eckersley charts are plotted in the R scale. (Note : This is the commercial FRAME code, so care should be taken in giving reports to ensure that the R strength given is not affected by the readability of the signal (E in the FRAME code), or by the common error of giving a distant station a " better report " than would be given to a local signal of the same received intensity.) In this instance it is preferable to use the nine-point R code to the modern five-point S code, in common use among amateurs, as for the present purpose this does not give enough

variation between complete inaudibility and maximum signal strength. (2) Over the long period an average is to be taken, and there is no more inaccuracy in an average of " R " strengths than there is in an average of field strengths.

Under test some interesting facts were brought to light, the first of which is at variance with the statement recently made in the BULLETIN by the General Post Office that antenna propagation tests may be carried out on reception only. It is possible that the results obtained only apply to transmitters in towns, with more or less screened antenna systems.

The author, situate in South-West London, receives western stations on 14,000 kc. vastly better than a colleague located in South-East London, and the latter receives Eastern stations at a strength superior to that of the author. However, the reports received from such distant stations are similar in both cases. This can only be due to screening and absorption effects of buildings with steel framework in London, which apparently affect reception but not transmission.

As to power, it has been found that while in normal circumstances one hundred watts is ample for experiments on 14,000 kc., it is necessary to have an input of at least 250 watts to obtain equivalent results on 7,000 kc. Tests carried out by a colleague showed that no audible difference in received level at the distant point resulted when the power was increased from 100 to 250 watts on 14,000 kc. On 7,000 kc. this same increase in the majority of cases produced an increase of two points in the R scale from reliable distant stations. It cannot be said whether a corresponding increase say, to 750 watts, would produce a further increase, as this power was not available to either of the stations participating in these tests, but it would seem probable that 250 watts is approximately the optimum 7,000 kc. *economical* input power.

For detailed information on directive arrays the reader is referred to *Radio* for June, 1934, the article " A Brief History of Directive Radio Transmission " on page 12 dealing admirably with the progress in this subject since 1889.

Appendix.

Some difficulty was encountered in deciding on the easiest way to present the results obtained. It was felt that they should be tabulated in such a form that any amateur could at once see how his antenna system compared with the standard system without the necessity for any mathematical calculations. The data, then, are presented in two distinct forms, the first dealing with the northern hemisphere and the second with the southern.

A glance at the globe will show that the greatest and most populated mass of land lies between the 20th and 50th parallels of latitude (north), and it was found that the comparatively slight variation north or south of the parallel passing through Greenwich made no difference to the received signal intensity; in other words, a broad band, of constant intensity across its width, is transmitted. The graph (Fig. 1) shows received signal intensity at various degrees east or west of the transmitter, so that to determine what the received signal intensity at any given place will be it is only necessary to know the distance of that place in degrees from the transmitter. This method, therefore, will save calculating great circle distances.

It will be noticed that there is a gradual and constant fall in received signal intensity, the lowest being, approximately, at the opposite side of the world to Greenwich.

Obviously, when we come to deal with land situate south of the band referred to above such a method of plotting received signal intensity cannot be used. There is also the added difficulty that there are far fewer stations outside this band with which to conduct tests. It is therefore thought most convenient to take each continent in turn, and to give for it the received signal intensities proceeding from north to south.

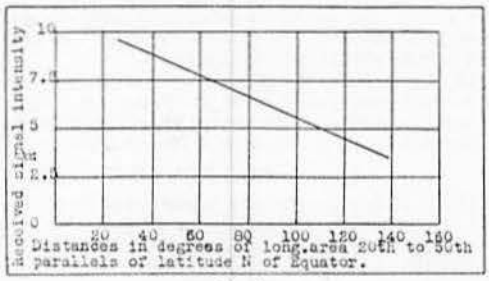


Fig. 1.

(1) *Africa.*—North Africa is dealt with under Fig. 1. Radiation is not, of course, so good as in a due east-west direction, and there is a fairly rapid fall from R9 at the North Coast to R5 over Central Africa, and to R4 over the area covered by the Union of South Africa. It must be admitted that this is not too satisfactory, since a " good " signal should be at least R6.

(2) *South America.*—Owing to the distribution of stations in this continent it has only been possible to deal with the east coast and its immediate hinterland. A number of reports have been obtained from other parts, but they are not considered accurate enough to give here. Proceeding, as before, from north to south it is found that received signal intensity gradually increases from R5 at the north-east end of the Brazilian coast to R6 at the middle of the coast, falling again to R5½ south of the 30th parallel of latitude.

(3) *Australasia.*—A very large number of reports have been collated. It must be borne in mind that Australasia is worked by both the westerly and easterly routes, according to the time of day. In actual fact the disparity between received signal intensity over these two routes is small, and the figures given are the average for both routes.

Australia (excluding Western Australia and the Northern Territory), R4.

New Zealand (both islands), R4.

Conclusion.

It is hoped that the above information may be of some interest to those amateurs interested in antenna design. By comparing their figures with those given above experimenters can quickly see how their antenna systems compare with the simple standard. It must be reiterated that the figures given apply only to the 14,000 kc. band. The writer apologises for the many and obvious imperfections in this article.

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THE DYNATRON AS AN AMPLIFIER

By A. M. Hardie, M.A., B.Sc. (Hons.) (G5FP).

In a triode the phenomenon of secondary emission is unobserved unless the grid be made highly positive and the anode voltage reduced below normal.

In a screened grid tetrode secondary emission occurs at normal grid voltages and reduced anode voltages. The reason for this is well known, but is briefly repeated here. In the tetrode, due to the highly effective screening, the number of "primary" electrons reaching the anode per second from the filament is nearly independent of the anode voltage. The number of secondary electrons emitted from the anode depends on the speed of the primary electrons. As the anode voltage is raised from zero the anode current rises to the point B in Fig. 1, where secondary emission becomes ob-

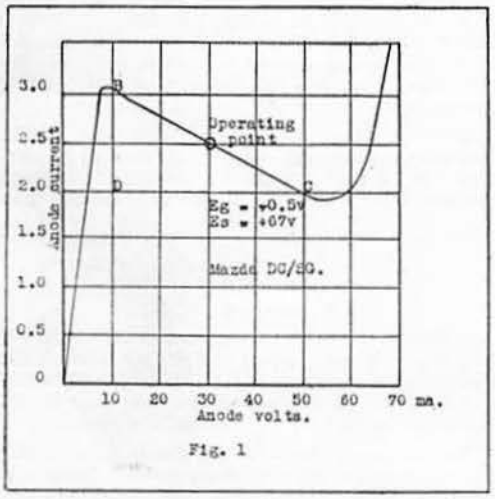


Fig. 1

servable, the secondary electrons constituting a current opposing the normal current and being re-absorbed by the high potential screen. As the anode voltage is further raised, secondary emission is increased owing to the increased speed of impact of the primary stream, and the anode current falls steadily until C is reached. After this point the anode is positive enough to re-absorb its own secondary emission and the anode current rises.

The slope BC, where increase of voltage produces a decrease of current, is actually a negative resistance or its reciprocal, a negative conductance. That is to say "R_A" becomes (—"R_A") in algebraic work.

Fig. 1 shows an accurate curve of a *Mazda* DC/SG. The part BC is sensibly straight, and if the ratio $\frac{DC}{DB}$ is measured it will be found to be —40,000 ω.

It is interesting to compare the expressions for the amplification of a single stage with resistive anode load (*a*) when BC is positive as in a triode. (*b*) when BC is negative as in a tetrode.

(*a*) Let R_A = anode resistance of valve.
r = grid-anode resistance.
R = load resistance.

δi_a, δe_a, δe_g are total positive changes in anode current, anode voltage and grid voltage.

M = total stage amplification
μ = valve amplification factor $= \dfrac{\frac{\delta e_a}{\delta i_a}}{\frac{\delta e_g}{\delta i_a}} = \dfrac{R_A}{r}$

Then if both grid and anode volts vary

$$\delta i_a = \frac{di_a}{de_g} \cdot \delta e_g + \frac{di_a}{de_a} \cdot \delta e_a$$

$$\text{i.e. } \delta i_a = \frac{1}{r} \cdot \delta e_g + \frac{1}{R_A} \cdot \delta e_a .$$

But $\delta e_a = -R.\delta i_a$.

$$\therefore \delta e_a \left(\frac{1}{R_A} + \frac{1}{R}\right) = -\frac{1}{r} \cdot \delta e_g .$$

$$\therefore M = \frac{\delta e_a}{\delta e_g} = -\frac{\frac{1}{r}}{\frac{1}{R_A} + \frac{1}{R}} = -\frac{\frac{R_A R}{r}}{Ra + R}$$

$$= -\frac{\mu R}{R + R_A} \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

Thus if M is to approach to μ, R must be made very large indeed.

(*b*) We have $\delta i_a = \frac{1}{r} \cdot \delta e_g + \left(-\frac{1}{R_A}\right)\delta e_a$.

and $\delta e_a = -R.\delta i_a$.

whence $-\frac{\delta e_a}{R} = \frac{1}{r} \cdot \delta e_g - \frac{1}{R_A} \delta e_a$

$$\therefore M = \frac{\delta e_a}{\delta e_g} = -\frac{\frac{1}{r}}{\frac{1}{R} - \frac{1}{R_A}} = -\frac{1}{r} \cdot \frac{R}{1 - \frac{R}{Ra}} \quad (2)$$

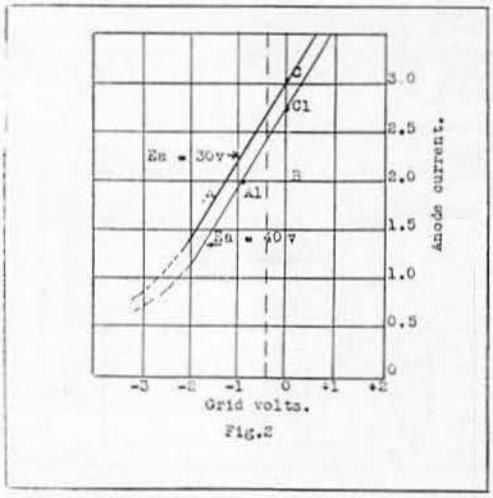


Fig.2

So that if R approaches in value to R_A, M becomes very large and theoretically infinite when $R = R_A$. In the *Mazda* DC/SG, R_A = —40,000 ω.

The writer made some fairly accurate measurements on a single stage operated in this manner at

audio-frequencies in order to verify the theory and to find a limiting value for M.

The curves of Figs. 1 and 2 were constructed in order to measure R_A and r under the given conditions.

The operating point was fixed at 0 in Fig. 1.

Anode volts = + 30. volts.
Screen volts = + 67. volts.
Control grid bias = — 0.5 volts.

$R_A = -40{,}000\ \omega.$

$$r = \frac{AB}{BC} = \frac{A'B}{BC} \text{ (approx.)} = 1{,}250\ \omega. \quad \text{(fig. 2)}$$

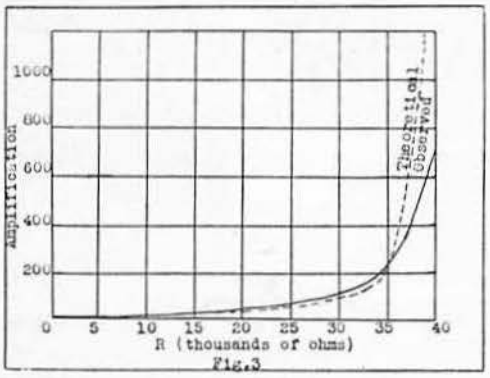


Fig.3

The circuit diagram is shown in Fig. 4. The output from a low frequency oscillator was fed through R1 (fixed at about 2,000 ω. as a load for the oscillator) and R2, which is variable from 0—200 ω. Both were non-inductive. A series microammeter enabled the RMS. voltage across R2 to be calculated in millivolts. The voltages developed across various values of R in the anode circuit were measured by a Moullin type valve voltmeter, the reading on the latter being limited in each case to about 2.5 volts. For each new value of R, the operating point 0 in Fig. 1 was maintained by calculating the drop across R and setting the H.T. potentiometer so that V_2 read $(30 + i_a R.)$.

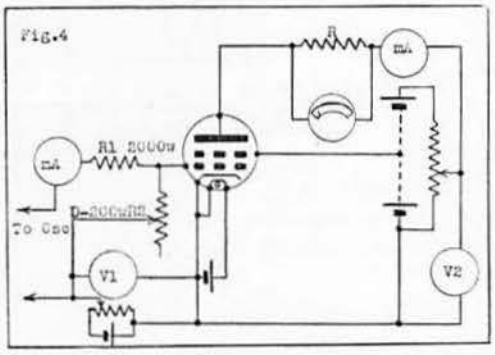


Fig.4

The dotted curve in Fig. 3 shows the theoretical amplification calculated from

$$M = -\frac{1}{r} \cdot \frac{R}{1 - \frac{R}{R_A}}$$

The reader can verify the curve for himself by inserting the appropriate values of r, R, and R_A.

The full line curve shows the observed values of M. When R exceeded about 38,000 ω., the system became somewhat unstable, and quite unmanageable at 40,000 ω. Controllable amplification was possible up to about 500 at various audio-frequencies.

It will be seen that the observed and theoretical values are in fair agreement up to R = 35,000 ω.

The permissible swing across R is ±20 volts on either side of 0 in Fig. 1. A set of readings was taken with larger grid input and with the Moullin reading about 10 to 12 volts. Instability was reached in this case when R = 34,000 ω. approximately, i.e., when M = 250.

It is fully realised that this is more in the nature of a scientific curiosity than a practical concern. The behaviour of a mains-operated stage followed by a power stage of ordinary triode type would seem to be valuable as a high gain amplifier for low output microphones. This has not been investigated yet, but should be an interesting experiment.

In conclusion, the writer acknowledges his indebtedness to the Electrical Engineering Department of Robert Gordon's Technical College, Aberdeen, for placing the apparatus at his disposal.

Portables.

By E. HOLDEN (VO1H).

As several enquiries have reached me regarding my portable station, which was in operation all last summer, I am giving the following brief information with a view to assisting any who may care to add a portable outfit to their station equipment.

The transmitter uses '31's in p.p. (Hartley), with 180 volts on the plate from four 5308 Burgess B batteries. The filament is supplied from 2-1½-volt dry cells through a rheostat. The circuit will be found in the June issue of *QST*, under the heading, "Ultra Midget, using '45's in Push-Pull." The transmitter antenna is 66 ft. long, single wire feed, matched impedance, built according to *Handbook* specifications, and is used with an earth for 80-metre work. The transmitter, key, batteries and antenna all fit into a carrying case with handle, which is 14 ins. by 10½ ins. by 5 ins.

The receiver uses 230's as detector, and audio with filaments in series supplied from 4½-volt C battery, and with 22½ volts on the plate. The receiver antenna is 7 ft. long, and connected direct to grid.

AMATEUR RADIO TO THE RESCUE

We learn that Mr. F. A. Marr (ZE1JC), Police Commissioner, Native Department, Gokwe, Southern Rhodesia, was responsible for notifying the world that Lady Young, wife of Sir Hubert Young, Governor of Northern Rhodesia, had been found after being lost in the wilds of Southern Rhodesia for several days following an aeroplane crash. Once again amateur radio has demonstrated its worth at a time of emergency.

I.C.W. ON 56 Mc.

By F. R. CANNING (G6YJ).

A DEEP interest in 56 mc. work was the prologue to the writer's desire to discover some suitable form of tone modulation for such work. The following is merely a brief account of practical experiments, and no attempt is made to deal with effects theoretically, but the ideas are original.

Essential Requirements.

Considerable time and thought given to the subject decided that the principle of the audio-oscillator was likely to prove the most productive source for a line of experiments. This is especially obvious when one is aiming at a modulation system which will have the following characteristics :

(*a*) Cheap and simple to construct.
(*b*) Ease of portability and, therefore, light in weight.
(*c*) Current consumption to be at a minimum, and yet a high degree of modulation to be attained.

Feeding an ordinary audio-oscillator such as used for morse practice, or a buzzer, into an L.F. amplifier, and then into a modulator, clearly has no advantage over speech modulation, save, perhaps, in resultant QSA. Even if it is possible to dispense with an L.F. amplifier, this still holds good.

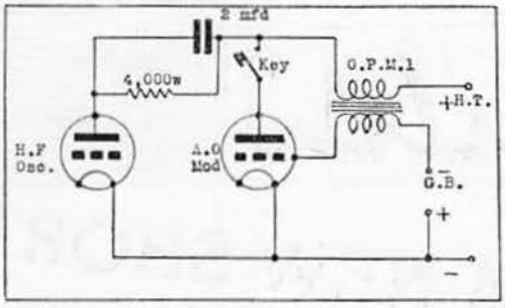


Fig. 1.
Diagram of audio-oscillator using iron core transformer. The winding in the plate circuit acts as a modulation choke, whilst the winding in the grid circuit has a reaction effect on the choke.

Using an L.F. Transformer.

Therefore, the aim was to try to get the modulator valve itself to act as an audio-oscillator, and yet couple it effectively to the H.F. oscillator. On studying the circuit diagram of the plain audio-oscillator incorporating an L.F. transformer as the means of coupling grid and plate circuits, it was apparent that the winding in the plate circuit could be used as a modulation choke as well, provided it was capable of carrying the total current from the common H.T. supply. The grid winding could then be employed to re-act on the choke. Fig. 1 shows the scheme diagrammatically. It will be noticed that a Ferranti OPM1 transformer was employed, as its windings can carry the necessary current. This does not imply that only this transformer will do, but the writer happened to have it on hand, and found it highly satisfactory.

The resultant modulator was not quite what had been aimed at. It was certainly of cheap construction, easily portable, and produced all the modulation (if not more) that one desired, but the current consumption was nearly as much as the H.F. oscillator, and the frequency of the tone was only about 400 cycles. Still, excellent results were obtained over good distances as has been seen in a recent issue of the BULLETIN, in which an account of some 56 mc. tests were given.

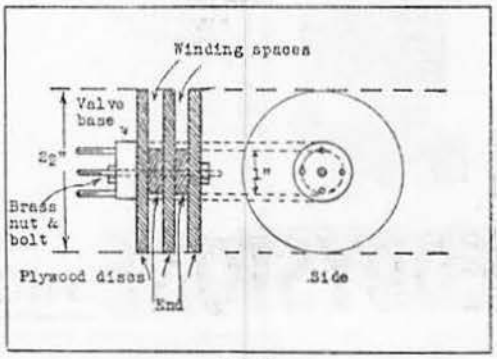


Fig. 2.
Method of constructing air core transformer.

As a result of these tests and the reports received, it was decided to try to improve the tone and lower the current consumption. The main disadvantage of the 400 cycle tone being that it was difficult to read above the characteristic "super" of the Armstrong receiver, which is now almost universally used for 56 mc. reception, when signals were very weak. Why the frequency of the tone should be so low and the current consumption so high was not clear, but it was decided that these factors were governed by the amount of iron present in the transformer, and a peculiar effect produced by using the primary winding as a combined choke and plate reactor.

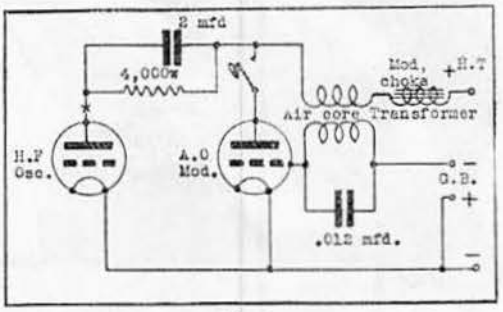


Fig. 3.
Audio-oscillator using air core transformer

Using an Air-Cored Transformer.

Therefore, an air-cored transformer was wound with 800 turns and 600 turns of 34 S.W.G. (enamel) on primary and secondary respectively. Fig. 2 shows the method of constructing the necessary former. The OPM1 transformer was replaced by this transformer, and the resultant audio-oscillator choke coupled to the H.F. oscillator (see Fig. 3). It will be noticed that there is a fixed condenser across the grid winding, the action of this is important in more ways than one. Primarily it obviates the "chirp effect" due to the inductance of the winding, but in addition, it has a decided effect upon the frequency of the note which in turn has an optimum value for maximum modulation. The initial tests resulted in reports which gave the frequency of tone the same as the familiar "ring" of quartz control, but the percentage of modulation was not so great as with the previous system. However, by substituting various values of condensers across the grid winding a value was found which gave an equivalent degree of modulation. The value in this particular case was .012 m.f.d., but the writer is inclined to think that other factors including power supply affect this value. Sufficient time has not been spent on it to establish definitely this latter suspicion.

When the current consumption was measured on this optimum position, it was found to be only 3 m.a., and on an actual test, with an input of 8 watts to the H.F. oscillator, it was possible to obtain extremely heavy modulation with 0.6 watt input to the audio-oscillator modulator! The ideal had at last been achieved, and here was a modulator possessing all the advantages mentioned earlier in this article. Truly it was ample reward for the time spent on it.

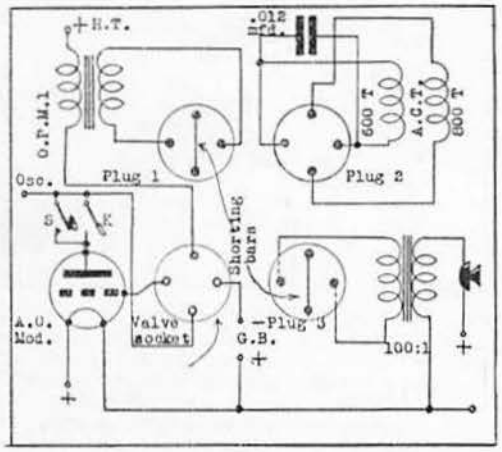


Fig. 4.
Circuit used for changing over from iron to air core transformer arrangement. Telephony for local work is catered for.

Suitable Valves.

Regarding the most suitable valves to use with the iron-cored transformer, this is not a critical point, as various valves will act satisfactorily so long as the grid bias is properly adjusted, although too big a valve, comparatively speaking, is liable to produce over-modulation, and stray sparks! In general, high impedance valves operate most satisfactorily, and a PM5X was used on all important tests. This latter valve was the only one on hand, which worked well with the air-cored transformer, but any valve with similar characteristics should be satisfactory.

The grid bias, especially in the latter case, needs careful adjustment. It was found that this has a far-reaching effect on results.

Naturally, when testing such apparatus, it may be necessary to reverse one set of windings to get the right "sense" in order to produce oscillation.

Change-Over Circuit.

Fig. 4 shows the circuit arrangement used to facilitate changing rapidly from one system to the other in order to obtain comparative reports. Old valve bases and a valve-holder were used for this purpose, but one must bear in mind that the grid circuit is being broken with each change, and the H.T. must first of all be disconnected. In addition to the two systems of tone modulation, it will be noticed that telephony is also provided for, but of necessity this will be purely for local work. Both modulator valve and the bias may have to be changed to obtain respectable telephony.

At this juncture the writer would like to express his appreciation to 2BPG, who has always been most ready to co-operate in, not only these tests, but all the writer's 56 mc. endeavours. He has devoted considerable time to this end, and his valuable help has had far-reaching effects on results.

CORRESPONDENCE.

USE FUSES.

To the Editor, T. & R. Bulletin.

Dear Sir,—May I beg a few lines to advocate the advantage of that small, but invaluable gadget known as the fuse, because its interesting properties seem to be too little known amongst the amateur fraternity. The value of this piece of apparatus lies in the fact that it will safeguard valuable apparatus by manfully committing "hari-kari" should an overflow of current appear along the circuit in which it is inserted. Its cost is but a few pence, plus the little trouble of replacement, yet I am amazed when I hear fellow amateurs bewailing the loss of a mains transformer, valve, or other expensive component, because it blew up before he could reach the switch.

Those who do not believe in fuses should visit a telephone exchange and see what chances the Post Office is willing to take with their valuable and costly apparatus. There are fuses everywhere.

Fuses rated from 60 m/a. upwards are available at trifling cost in comparison to the gear which they safeguard, even a few flashlamp bulbs are better than nothing. These usually blow at about 350 m/a.

Perhaps these few comments may serve to prolong the life of a few items of gear, and save one or two sore and sorry hearts. I hope so.

Yours sincerely,

Arthur O. Milne
(G2MI).

(Manager, Auxiliary Apparatus Group, R.E.S.)

EXPERIENCES AND OBSERVATIONS DURING THE 1.7 MC. CONTEST.

By T. Woodcock (G6OO).

AFTER weighing up the pros and cons of comfort combined with efficiency, and the inconvenience (or otherwise) of the remaining household, I decided to move my station from the discomfort of the roof shack, to the ground floor and fireside, in readiness for the 1.7 mc. Contest.

This was by no means an easy matter, and called for a complete re-wiring of all switching gear, without causing unsightliness, as well as the erection of as large an aerial as possible, with a short direct earth lead, as a counterpoise would not have been of much avail.

Eighty-two feet of aerial, consisting of 60 feet norizontal and 22 feet down lead, was erected, with the free-end due north at a height of 50 feet; the right angle, or down lead, which pointed due south, was 28 feet high.

Loose coupling to the power amplifier of the CO-PA Transmitter was employed, and the whole system tuned to 1766 kc., this being the crystal frequency.

Conditions at the commencement of the contest appeared (and in fact were) ideal, and a good start was made at 1500, Saturday, January 12, by contacting G5KG, who reported my signals QSA4, R4, T9, and received a similar report from myself.

From observations commencing at this time, with a practically cloudless sky, the weather being sunny and mild, the usual increase in signal strengths was noticed as dusk and then darkness fell.

At 21.50, a complete change was apparent in this location for although southern stations were all busily engaged in contacting one another the skip distance changed considerably, so much so that the only stations I could contact were the more distant F8WQ and F8XF, both in the same half-hour. A freakish contact with G2MI (Kent) followed at 22.51, but although the gear and enthusiasm held the same here it was an impossibility to contact any further stations (who would count for points) until 00.52 the following morning, January 13.

Apart from the violent intermittent atmospherical crashes, and the fact that several heavy snowpacks hung over the locality, a practically negligible background was noticed from 23.00 until almost 00.52, when G6NA was worked.

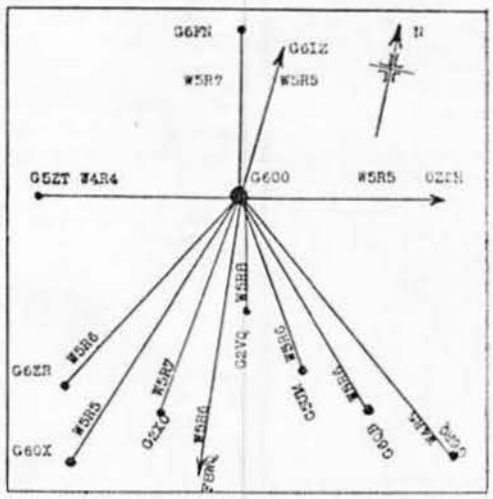
Returning to normal conditions, after this period, contacts were made with G2SX at 01.08 (followed by ten others, including OZ2H), up to 04.57.

With the quiet background returning at this time DX began to make its way through, and W2HXL, W2HY, W2GCE, W2HYS and W8UV were all logged at QSA 3, R3-4, T8/T9 respectively, either calling or working W8IYL, W1AZW, W8MUI, or VE1AR. Later, following a CQ call from W2GCE, I made an unsuccessful attempt to be one of the lucky ones, although I did not hear any G work other than the European stations which were worked by this station, namely OZ and F. A complete absence of any further contacts now followed for the very lengthy period of almost eleven hours. Altogether a most disconcerting time for one all out to try to capture the honour of winning the contest for District 18. This led me to the conclusion that one must have conditions more or less holding out at their best, a certain element of good luck, and be able to sit out the test for the full thirty hours.

However, I am still at a loss to understand why this long period of unaccountable conditions and phenomena should take place, and continue for eleven hours, when the greater portion of the time was during daylight. The strongest signals heard during this period were those from G6UJ, about ten miles away (and useless from a scoring point of view). This station was also calling test unsuccessfully. Weak signals were logged from G2XT and G5YV, and the former was called without success.

From 16.02 onwards snowpacks were observed in this locality again, and this time, although contacts were difficult, five were obtained, including an OZ at 18.53.

The contest was then at its height, with the superbusy period setting in, due to the fact that it was to conclude at 22.00, when a sudden and very heavy



fall of snow made conditions worse. It was certainly hard work in the violent QRM (and now apparent QRN accompanying the snowstorm), but five other G contacts were made in the remaining three hours and seven minutes, concluding with G5RX. Altogether forty points were scored. At the conclusion of this article a list of stations heard during the tests is given, those contacted being marked with an asterisk.

Whoever was responsible for choosing the particular dates on which these tests were held must be congratulated for giving us two of the best. They no doubt took into careful consideration past periods and experiences.

I, along with others, earnestly hope now that the tests are concluded most, if not all, who took part, will endeavour to spend quite a considerable

(*Continued on page* 362)

BOOK REVIEWS

TELEVISION AND SHORT-WAVE HANDBOOK. By F. J. Camm. Published by George Newnes, Ltd., London. 256 pages and 230 illustrations. Price 3s. 6d. net.

One's first impression of this practical book for the home-constructor is the profusion of illustrations, all of which are excellent and about evenly divided between symbolic circuit diagrams and "pictorial" circuit diagrams. In addition to the diagrams there are some 53 plates.

The book is divided into two sections, the first of which deals with the elementary principles of television, and the construction of simple apparatus for its reception.

The earlier chapters in this section cover scanning, the cathode-ray oscillograph, television optics and light modulation. Then follow short chapters on talking-film television, television recording and a few "side-lines" such as noctovision and colour television.

Further chapters in this section are concerned with the construction of a disc visor, a mirror visor, synchronism methods and apparatus, faults in television reception and the description of an amplifier especially suited to television reception.

The second section of the book deals with short waves. After describing a simple single valve construction, the author deals briefly with a few short-wave propagation phenomena, and oscillator circuits. Then super-heterodyne circuits and short-wave adaptors are discussed, and the construction of an ultra-short-wave converter described.

The final chapters in the short-wave section cover the construction of a 3-valve short-wave receiver, a portable receiver, calibrating, construction and use of a simple absorption wavemeter, tracing faults, aerial systems including transposed feeders and doublets, construction of screened coils, and a short consideration of condenser values.

The book concludes with a list of short-wave broadcasting stations and a substantial dictionary of television terms.

The scope of the book has been dealt with in this review in, perhaps, more detail than is usual, but the writer feels that Mr. Camm's book will prove valuable to many of our members who desire a very practical and constructional book as an introduction to television and short-wave reception.

The experienced amateur, with his particular problems in mind, may disagree with the author on a few minor details, but the writer's opinion is that, as an introductory book dealing with circuits and construction for the beginner, Mr. Camm has produced an excellent handbook.

T. P. A.

TELEVISION: THEORY AND PRACTICE. By J. H. Reyner, B.Sc., A.C.G.I., A.M.I.E.E., M.Inst.R.E. Published by Chapman & Hall, Ltd., London. 196 pages and 88 diagrams. 12 plates. Price 12s. 6d. net.

This book was first published in 1934 and deals not with actual constructional features of television apparatus but with the principles and practice. Nevertheless, the practice is described in sufficient detail for the experimenter of more than the "beginner" standard to apply it usefully. But it is not intended to convey that the book is an advanced one; it can be truthfully said that the book is non-mathematical, and almost entirely descriptive, but though not an advanced book in the general meaning of the term, it is exceptionally sound and has a decided engineering flavour.

At the present time many amateurs are taking rather more notice of television work than heretofore, and require a book which will allow them to acquire a knowledge of the various systems, the difficulties which arise, and—a very important point—the physiology of the eye. The eye is an immensely more exacting instrument than the ear which has governed the technique of amplifiers until recently.

The author has very wisely reduced the descriptive matter to a minimum where certain methods are likely to become obsolete, and concentrated his attention on vital fundamentals and systems which are likely to have a future.

In a book which is excellent in every way it is difficult to mention any sections in particular; but the writer was very much impressed by the author's treatment of the eye, photo-cells, cathode-ray tubes and time-bases, and the receiver circuits. Though the fundamental theory is the main consideration, values are given on many diagrams of the actual components, and this will be helpful to constructors.

The writer's opinion when this book was first published was that it was one of the soundest books on the subject for the amateur that he had seen. Since then he has had to recommend a suitable book to amateurs with a knowledge of "sound" wireless, but who wish to become *au fait* with vision work. He has had no hesitation in recommending Mr. Reyner's book, nor has he the least hesitation in doing so to the membership as a whole.

The book is beautifully produced, the illustrations very clear, and the price reasonable.

T. P. A.

STRAYS

BRS1544 (N. Hobbs, 29, Upper Beckwith Street, Birkenhead) is pursuing research on the reception in Great Britain of VK and ZL signals. He is anxious to obtain reports from British amateurs who consistently work the Antipodes. The call sign, date, time, should be included in the report ,together with comments of interest.

Mr. T. B. Wimbush (G2TW) is now with the R.A.F. in Egypt and hopes to be active shortly as SU2TW. He is in need of a 1,000 volts power pack using GU1s. His address is Signal Section, S.H.Q., R.A.F., Heliopolis, near Cairo.

Unlicensed Transmissions.

Mr. R. S. Martin (G2IZ) and Mr. E. J. Gleeson (EI5D) advise us that their calls have been pirated recently.

Mr. H. A. Bartlett, G5QA, also reports that his call is being pirated on 7 and 14 mc.

NATIONAL FIELD DAY, 1935.

THE rules for this event are similar to those adopted last year, except that an extra two hours have been allowed for the erection of stations (Rule 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 30. This will enable us to publish in the May issue of the T. & R. BULLETIN details of all portable calls, and thereby prevent confusion. 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. In checking the entries last year, the Awards Committee observed several instances where points had been claimed for working SM5ZZ and other stations who were subsequently found to be unlicensed.

(*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 1, and conclude at 19.00 G.M.T. (20.00 B.S.T.), June 2, 1935.

2. The event is confined to the English, Welsh, and Scottish Districts, and to Northern Ireland, the latter ranking as one District.

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. band. Station B will be permitted to operate on the 7 and 14 mc. band.

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 27, 1935.

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 1, 1935. 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 ...	6
With fixed stations outside Europe ...	4
With portable stations outside Europe ...	8
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 22, 1935.

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 operation 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.

56 MC. Transmissions.

G6NF will be transmitting on 56 mc. every Monday evening from 23.00 G.M.T. during March and April.

RESEARCH AND EXPERIMENTAL SECTION

MANAGER :

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

ASSISTANT MANAGER :

DR. G. F. BLOOMFIELD (G5MG), 34, Morton Way, Arnos Grove, London, N.14.

GROUP MANAGERS :

No. 1 : 1.7 and 3.5 MC. WORK
J. H. HUM (G5UM), "Byeways," The Drive, Welwyn, Herts.

No. 2 : 56 MC. WORK
T. VICKERY (G5VY), 274, Mount Pleasant Road, Tottenham, N.17

No. 3 : ARTIFICIAL AERIALS

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

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

No. 6 : CONTEMPORARY LITERATURE
R. A. FEREDAY (PAOFY), Abrikozenstraat, 87, The Hague, Holland.

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

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

No. 9 : AERIAL DESIGN
F. CHARMAN (G6CJ), Orchard Cottage, Stoke Poges, Bucks.

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

No. 11 : 20 MC. WORK
W. A. CLARK (G5FV), "Lynton," Hull Road, Keyingham, Hull.

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

The first requirements of any organisation undertaking research are facilities for reference to current or past literature. So many of us have in the past pursued some line of experiment only to find later that the work had been carried out long before. While not denying that repetition of previous experiment is a very desirable and essential way of acquiring knowledge, I should like to see more members tackling original problems of research. In order to facilitate reference to present knowledge, the Contemporary Literature Group was formed, and this group has carried out some very valuable work in abstracting article in foreign journals which would not ordinarily reach the amateur's hands. I now have pleasure in announcing that with the assistance of Mr. N. Keith Adams (G5NM), this service is to be extended to cover the more important English and American journals, and it is hoped eventually to accumulate a comprehensive R.E.S. literature reference file to which any member undertaking a new line of research may make reference.

I should be glad to hear from anyone who has carried out experiments with portable low-power transmitting and receiving gear capable of maintaining consistently reliable communication over a radius of 25 miles, and of a type suitable for use on appliances at fires. An enquiry is to hand from a new R.E.S. member, who is anxious to make practical use of such apparatus on fire-fighting appliances.

No report is available this month from Group 2, but I believe several research groups are now in operation. The G.M. (G5VY) would be grateful for any information relevant to the use of superheterodyne receivers for ultra-high-frequency work, particularly as regards suitable valves and the optimum value of intermediate frequency.

G5MG.

1.7 and 3.5 MC. Group (No. 1)

G5MP sends some interesting material regarding his reception tests in the Canary Islands. Up to January 16, 40 British stations had been heard on a two-valve receiver, together with 17 U.S. amateurs, many of them in inland districts.

Joining the harmonic-overtone discussion, G5MP reports reception of G6RB, HB9Y and W8CNC on 1.7 mc., although they were working on 3.5. mc., and suggests that they were actually radiating an overtone. (But G5MP is not using R.F. amplification. Reports from anyone hearing overtones on a *tuned S.G.* set would be welcome. I have yet to hear of this happening.—G.M.)

G5MP suggests that the possibility of receiving an overtone could be tested as follows :—

Select a powerful transmission, such as DHE or HAT2, of which an overtone can be heard in the receiver. While listening to the overtone, couple a simple absorption wavetrap to the aerial lead-in, and tune it to the fundamental frequency of the signal. A drop in the strength of the overtone would tend to show that its reception was due to the strong fundamental beating with the harmonic of the oscillating receiver. No drop in strength would show that an overtone was actually being radiated, and was, therefore, not being affected by the wavetrap tuned to the higher frequency.

* * *

As regards general group work, a reorganisation of all the groups has been effected. *Group* 1*A* is concentrating on DX propagation and aerial design, mainly on 1.7 mc. *Group* 1*C* is devoting itself to telephony, and wants two more members, including, if possible ,a BRS with a high-fidelity receiver; *Group* 1*E* is a Receiving Group with 2AZX as the new G.C., and *Group* 1*F*, under G5YD, is working on duplex, sometimes on 1.7 mc., at other times on 3.5 mc., and occasionally on both bands. Several members of the latter group have single signal receivers, which are proving very useful for duplex when a narrow frequency separation is used.

Group 1*B* is still under G6FO, but no definite specialised line of research has been decided upon. The same applies to *Group* 1*D*, under G6BS.

Group 1*C*.—G6AU adds his strength to the phone group. He reports excellent results with a Reisz microphone, of which the rubber diaphragm is 1/32 in. thick, and has corrugations on the side facing the granules, which are believed to cause a larger disturbance of the granules, to prevent

packing, and to give greater output. Choke control is used.

G5WW, on the other hand, has reverted to grid control, with a pentode CO, link-coupled to the P.A.

Group 1E.—2AZX (the G.C.), using an S.G. receiver, has heard three U.S. stations on 1.7 mc. He it was who provoked the harmonic-overtone discussion, and this latest feat raises the questions: "Can an overtone beat with the oscillating detector of an S.G. R.F. receiver?" We look to 2AZX and his men to provide the answer!

* * * *

D4BBF, Berlin, is to transmit on 3.5 mc., a series of low power tests, and requests reports. Please note his schedule: March 23 and 30, April 6 and 13, at 17.00 and 21.00 G.M.T. On March 24 and 31, and April 7 and 14 at 10.00 G.M.T.; transmissions commence on 4 watts, and power will be reduced every five minutes, and announced each time.

G5MP heard a British phone station at 00.10 G.M.T., January 28, near the low frequency end of the 1.7 mc., working G6AU. The station is believed to have been G5NW, but its actual identity is required. The identity is also requested of a phone station heard at 00.50, February 2, near the low frequency end of the band. The final letter of the call was given as —G.

Both of these stations, heard in the Canary Islands, probably hold the record for low power DX telephony.

G5UM.

Atmosphere and Fading Group (No. 4).

Group 4B.—ZB1F (ex BERS 209) sends his usual monthly log, in which the chief item of interest is that on January 8, between 1930 and 2100 G.M.T., he heard a Polish station at R5 on 7 mc. with a pronounced R3 echo 3 seconds behind the main signal.

Group 4C.—The monthly list of thunderstorms is forwarded.

Group 4D.—Routine observations have been continued.

Group 4E.—This group is to be congratulated on having enlisted the services of Mr. Sellers, F.R.A.S., who is most kindly supplying them with monthly records of sunspot activity.

Group 4G.—This group has continued routine observations. G6HA reports hearing American signals on 7 mc. at about noon on January 8, 9, 10 and 15, also a "round the world" echo of VP5PZ on 14 mc. at 1250 G.M.T. on January 2. BRS1614 reports "round the world" echoes on January 6 of GSF on 15140 kc. at 1312 G.M.T. and FYA on 15243 kc. at 1315 G.M.T.

Group 4C have received a list of earthquake activities, kindly prepared by G6YL, for the month of January.

With regard to the comment by G5MG on the summary of conditions due to thunderstorms published last month, it should be pointed out that the summaries are general, and, of course, there may be exceptions. Moreover, with frequencies as high as 20 mc., static is far more infrequently heard unless it is strong enough, as in the case cited, to make its presence felt. But perhaps the summaries should exclude the daytime DX waves. G5JH suggests that the storm mentioned may have been local, with a large storm centre some 200 to 300 miles away.

The following report on the eclipse of the moon on January 19 has been received from VS6AX via ZL4AI and G5YH. "Commencing 1237 G.M.T., reaching totality 1549 G.M.T. Weather cold, sky clouded. Temperature 10 degrees centigrade. Local signals noticeable changed at 1237, but by 1500 all Asian stations faded out, and Western America coming in very well. Communication two to three R strengths higher with W6 than usual. Signals reached a peak at 1550 G.M.T. and faded completely by 1610 G.M.T., at which time Asian stations were heard again. No apparent difference in signals noticed on 14 mcs. except that Africans were only stations coming over. A report from Shanghai supports observations on 7 mc., but regrets no information on 14 mc."

With reference to the work of Groups 4D and 4G, it is interesting to note that *The Wireless Engineer* for January published an abstract of the Sixth Annual Report of the Australian Radio Research Board for the year ending June 30, 1934; a close correlation was found between the ionisation density in the E layer each night and the barometric pressure at ground level. "This result suggests a closer connection between the troposphere and the ionosphere than has previously been thought probable." The report also contained confirmation that the existence of an absorbing D layer is unlikely.

Regarding the contribution by G5AM in the February BULLETIN, more recent work by E. and V. H. Regener (*Physik. Zeitschr.*, October 1, 1934), shows that the maximum concentration of ozone up to a height of 31 Kms. occurs at a height of 24 Kms.

The test signals radiated by G2GD three times a week are now being sent out regularly, and will be continued until further notice. Naturally, it is mostly the 1.7 mc. and 3.5 mc. signals that are being received in this country at the present time, but it is hoped that any abnormal ionisation will be revealed. Members of the group are reporting on these signals to their G.C.'s, but the G.M. would welcome reports every month from any members wherever they may be. Below is reprinted the schedule of tests:—

On Mondays, Wednesdays, Fridays, at 1845 G.M.T.

From 1845 to 1850 on 1789 kc.
Test RES4 de G2GD, G2GD, G2GD
1.7 mc. (repeated)

From 1855 to 1900 on 3578 kc.
Test RES4 de G2GD, G2GD, G2GD
3.5 mc. (repeated)

From 1905 to 1910 on 7156 kc.
Test RES4 de G2GD, G2GD, G2GD
7 mc. (repeated)

From 1915 to 1920 on 14312 kc.
Test RES4 de G2GD, G2GD, G2GD
14 mc. (repeated)

G2GD.

Aerial Group (No. 9)

As promised last month, we illustrate here some of the variations which have been made of the universal coupler. The original theory was published by Everitt in the *I.R.E. Journal*, May, 1931, and the arrangement as developed for aerial coupling

was illustrated by CT2BK in the BULLETIN of last January.

The first development is illustrated in Fig. 1a. One of the two shunt condensers is split into two separate halves, preferably at the outgoing end. This enables one to take up any asymmetry about the "earthy" point of either transmitter or line with greater ease and accuracy than by tap adjustments.

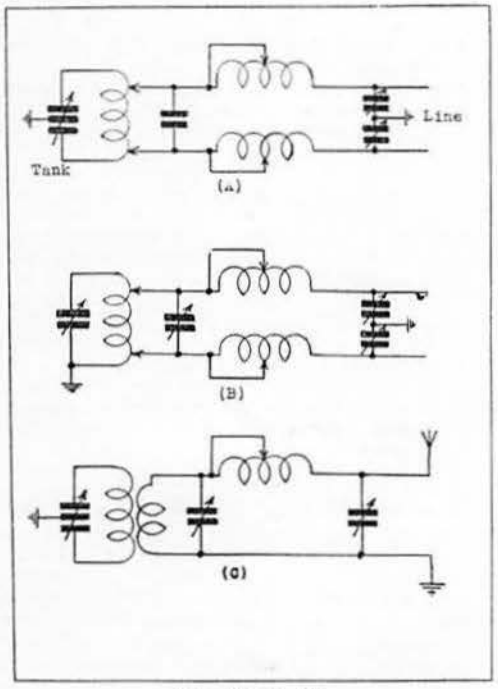


Fig. 1 (a. b. c.)

It generally occurs that the tank circuit is symmetrical about the "earthy" point, as the circuit is usually split for neutralisation or push-pull. It does occur sometimes, for example, with an un-neutralised screen-grid output valve, or when going from push-pull to an aerial and earth system, that it is necessary to match a one-ended circuit to a balanced line, or a balanced circuit to an unbalanced aerial system. Figs. 1b and 1c are examples of variations which cater for such cases, whilst Fig. 1d deals with the case when both ends of the network are unbalanced. Twisted flex has been used with success for separating the coupler from the transmitter, as in Fig. 1e. These circuits have been successfully used, particularly by G5GC and 5XB, and show how an arrangement may be found to suit any particular case; one could fill pages with networks, still using the original principle.

The following advantages claimed for the coupler have been verified:—

(1) Greater efficiency of transfer than hitherto.
(2) Perfect balance in the case of two wire feeders, particularly with the Zepp.
(3) Capability of dealing with almost any aerial system, irrespective of its "awkwardness" with other circuits.
(4) Suppression of harmonics and keythumps.

I am going to suggest a bold development. The network is capable of matching any pair of impedances. Why not, then, match the aerial straight into the anode and give the valve the load direct, dispensing with the tank circuit? The suggested scheme is shown in Fig. 1f. To adjust it, a tank coil is connected, the valve is balanced, and the coupler adjusted until it may be connected across the whole tank circuit. The tank coil and first filter condenser are then removed. This should give even greater efficiency though an early attempt has not met with great success. This arrangement is believed to be free from most of the evils usually attributed to direct coupling.

A 3.5 mc. aerial of interest has been used at G5ZT. It consists of a 66 ft. wire sloping upwards at about 30° from the transmitter in an easterly direction. The counterpoise is about 66 ft. long, and is bent underneath the top. This has been found to radiate very well eastwards, and a perusal of the results of the 3.5 mc. contest will show that it is quite an efficient aerial where height and space are not available.

G6CJ.

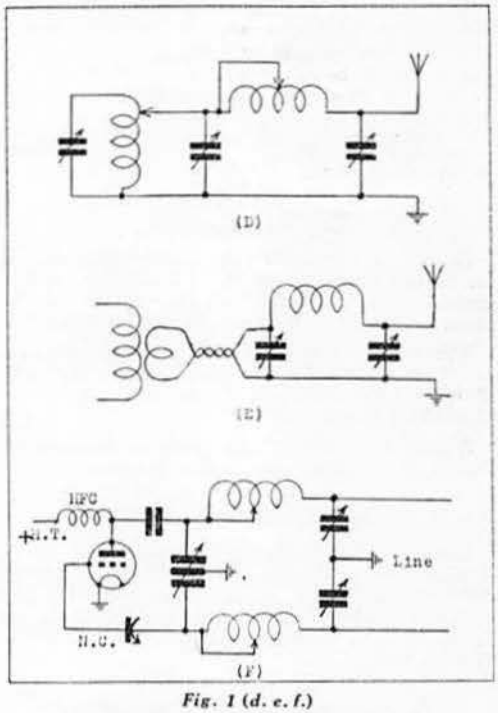


Fig. 1 (d. e. f.)

28 MC. Group (No. 11)

Group 11*A*.—G2YL made 8 QSO's between January 1 and February 13, with G2HG, G2MV, G5LB, G6LK, and G5OJ; two other local fundamental signals were heard but not worked. On January 18 she heard EAZ at 1700 and 1832 G.M.T., QSA5 R4, and also OK1AW calling CQ ten QSA5 R5; two days later PCT remained in for about 3 minutes. The reception of OK1AW's 28 mc. signals have been confirmed and a regular schedule fixed daily.

(*Continued on page* 362.)

HIC ET UBIQUE.

Headquarters' Notices—Calibration—Q.R.A. Section—Slow Morse.

I.E.E. MEETING

Mr. Arthur Milne, G2MI, will lecture on "Uni-Selector Automatic Senders and other Mechanical Devices," at the next London meeting, to be held on Friday, March 29.

Mr. Milne is Manager of the Auxiliary Equipment Group of the R.E.S., and we understand that his lecture will be illustrated by slides, and followed by a demonstratin.

Tea will be served at 5.30 p.m., and the meeting will commence at 6.15 p.m.

Mr. H. C. Page Joins Council.

Mr. H. C. Page (G6PA), Manager of the Research and Experimental Section, has been co-opted to serve on Council.

Awards Committee.

Mr. W. H. Matthews (G2CD) and Mr. C. J. Greenaway (2BWP) have been appointed to serve on the above Committee.

Contest Results.

Council have pleasure in announcing that Mr. H. B. Old (G2VQ) won the 1.7 mc. transmitting contest. Mr. Canning (G6YJ) was second, and Messrs. Watson (G6UJ) and Stanley (G6SY) third.

The reception contest was won by Mr. C. A. Bradbury (BRS1066). Mr. C. J. Greenaway (2BWP) was second and Mr. W. A. Laidlaw (BRS1213) third.

A report covering both of these contests will appear in an early issue of this Journal.

N.F.D. Films, 1934.

The above films having been shown in several districts are now back at headquarters. Applications for their loan should be addressed to the Secretary. There are two films available: one, the main film, on 9.5 mm.; the other, a shorter film, on 13 mm. size.

"Five-metre Radio Telephony."

We recently obtained a supply of the second edition of this popular handbook. Copies are available from headquarters, price 1s. 6d., post free.

Malaya and Borneo.

Mr. J. MacIntosh, VS2AF, our new representative for Malaya and Borneo, is now on leave in England. During his absence Mr. R. J. Bee, VS2AG, of Kuala Kangsar, will act as his deputy.

For the benefit of others the following are members of the B.E.R.U. resident in Malaya and Borneo:—

VS2AG, R. J. Bee, Engineer, P.W.D., Kuala Kangsar.
VS3AC, T. G. Laver, Government Power Station, Johore Bahru, Johore.
VS3AE, H.H. Prince Temenggong Ahmad, State Commissioner, Muar, Johore.
VS5AC, G. G. Gray, Kuching, Sarawak.
VS8AB, R. E. Earle, Singapore Harbour Board, Singapore.
VS8AC, M. J. Thorpe, Municipal Offices, Penang.
VS8AD, E. C. Yates, Post Box 564, Singapore.
VS8AJ, Flight-Lieut. L. H. Stewart, H.Q., R.A.F., Far East, Singapore.
BERS58, H. A. Dabell, G.P.O., Jesselton, North Borneo.
BERS132, C. Wilson, M.C.S., Labour Office, Kuala Lumpur.
BERS179, R. P. Whyte, Posts and Telegraphs, Kuala Lumpur.

W.B.E. Certificates

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

Name.	Call Sign.	1935.
E. R. Radford ...	G2IM ...	January 10
E. J. Williams ...	G2XC ...	,, 16
L. Parfitt ...	G6PF ...	,, 17
L. M. Mellars ...	ZL1AR ...	,, 24
F. H. Jackson ...	G2KZ ...	,, 28
S. G. Fisher ...	VQ4CRP...	,, 29
W. Johnson ...	G2IN ...	,, 30
F. C. Whitmore ...	ZE1JJ ...	February 13
G. A. Spencer ...	G2KI ...	,, 13
R. H. Jackson ...	G6ZU ...	,, 18
M. de M. Carbonini	— ...	,, 18
C. C. Newman ...	G6NC ...	,, 20
W. E. Nutton ...	G6NU ...	,, 28

Calibration Section.

Manager: A. D. Gay (G6NF).

The Stability of Quartz Crystals

Transmitting amateurs using crystals close to the edge of the amateur bands should take care to check their frequencies occasionally. Quite recently we have found two instances where the fundamental frequencies of crystals have altered alarmingly. Fortunately no off-frequency operation resulted, as one crystal changed from 3,575 to 3,526 kc. and the other, on 3,600 kc., which was only used on 7 mc., changed frequency to 3,606 kc. If these had been edge-of-band crystals the results would have been very serious.

The reasons for these changes were traced, and in the first instance a small nick had appeared in the edge of the crystal, which was due to overloading the crystal stage, and in the second the

crystal had been very thoroughly washed with "Monkey Brand" and water, the abrasive in this soap modifying the surface of the crystal to some extent.

Another cause of crystal instability is due to the faces being uneven. Only by means of constant checking with a micrometer gauge during grinding can the faces of a crystal be kept absolutely parallel. When ground pebble lenses are used for transmitter control the comparatively large area of them sometimes renders this process of grinding extremely difficult. Another disadvantage of pebbles is that the homogeneity of the quartz used for making spectacle lenses was not always so necessary as it is for crystal manufacture and what are known as twin crystals frequently found their way to the optician's saw. Crystals made from twinned quartz—that is, quartz having both right-hand and left-hand rotations—are liable to oscillate on two frequencies and sometimes three.

CALIBRATION SECTION FEES.

CRYSTALS, 1s. 6d. *each*; *FREQUENCY METERS*, 2s. 6d. *for five points, plus* 6d. *for each additional point. These prices do not cover cost of return postage, which must in all cases be remitted as a* separate amount.

Crystals and frequency meters should be sent for calibration, at owner's risk, to Mr. A. D. Gay, 49, Thornlaw Road, West Norwood, London, S.E.27.

This does not mean that satisfactory crystals cannot be made from pebbles, to the contrary: the writer has several excellent specimens of this type, but they all possess a high temperature co-efficient, in the region of 70 parts per million negative per degree Centigrade. We have on different occasions observed considerable frequency drift on certain crystal-controlled stations, and amounting to several kilocycles, but this is often due to excessive feed-back occurring in the crystal stage. With the increasing popularity of single-signal superheterodyne receivers frequency drift due to a crystal warming up in a transmitter makes constant receiver adjustment necessary, and a good deal of the usefulness of these crystal filters is lost if a station is drifting the whole time it is being copied. It is certainly more satisfactory to purchase a crystal from a manufacturer who will guarantee the right cut with low temperature co-efficient and a freedom from subsidiary oscillations. The edges of a crystal so purchased will be found rounded, which ensures a freedom from nicking, unless excessive overloading occurs, and the crystals, being manufactured by machinery, will have true surfaces.

R.S.G.B. SLOW MORSE PRACTICES

Dates and times for March-April are to 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. More reports will be appreciated and are desired in order to ascertain range of transmission and numbers utilising the services. Should a reply be needed, please enclose a stamped envelope or post-card. Two new stations, G5BK of Cheltenham and G2WO of Swansea, are thanked for offering their services and their call signs will be scheduled until further notice. Stations willing to assist on the 1.7 mc. band—particularly from those districts at present 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, 1935.	G.M.T.	Kcs.	Station.
Sundays,			
March 24	00.00	1761.5	G2WO
,, 24	09.30	1785	G5BK
,, 24	10.00	1815	G2DQ
,, 24	10.30	1911	G2JL
,, 24	11.00	1.7 mc.	G2UV
,, 24	11.30	1761.5	G2WO
,, 31	00.00	1761.5	G2WO
,, 31	09.30	1785	G5BK
,, 31	10.00	1815	G2DQ
,, 31	10.30	1911	G2JL
,, 31	11.00	1.7 mc.	G2UV
,, 31	11.30	1761.5	G2WO
April 7	00.00	1761.5	G2WO
,, 7	09.30	1785	G5BK
,, 7	10.00	1815	G2DQ
,, 7	10.30	1911	G2JL
,, 7	11.00	1.7 mc.	G2UV
,, 7	11.30	1761.5	G2WO
,, 14	00.00	1761.5	G2WO
,, 14	09.30	1785	G5BK
,, 14	10.00	1815	G2DQ
,, 14	10.30	1911	G2JL
,, 14	11.00	1.7 mc.	G2UV
,, 14	11.30	1761.5	G2WO

QRA Section.

Manager: M. W. PILPEL (G6PP).

NEW QRA's.

G2DC.—J. DRUDGE COATES, 38, Mason Street, Liverpool, 7.
G2HA.—A. L. MEGSON, "Highwayside," Bow Green, Bowden, Cheshire.
G2OR.—C. H. OLLETT, 59, Humberstone Road, Cambridge.
G2UJ.—C. H. ALLEN, 32, Earls Road, Tunbridge Wells, Kent.
G2UX.—G. EDWARDS, 6, Chipstead Close, Coulsdon, Surrey.
G2YP.—D. B. PIPER, Hillbury, Redbourn, St. Albans, Hertfordshire.
G2ZA-G2ZB.—C. W. WATSON, Earlham Hall Park, Norwich, Norfolk.
G2ZR.—J. W. RUSSELL, "The Elms," Newchurch, Isle of Wight.
G5DY.—W. H. DERRY, 19, Albion Road, Dalston, London, E.8.
G5GZ.—G. L. GRISDALE, 71, Beatyville Gardens, Barkingside, Essex.
G5MI.—N. VAN PERLSTEIN, 13, South Ridgway Place, Wimbledon, London, S.W.
G5SS.—A. SUMMERS, 35, Royal Mint Street, London, E.1.
GI5WD.—W. S. DAVISON, 9, Glenvale Crescent, Portrush, Co. Antrim, Northern Ireland.
G6DK.—F. BOYCE, Thames House, Bell Weir Park, Wraysbury, Staines, Middlesex.
G6OO.—T. WOODCOCK, "Conakry," Cardigan Road, Bridlington, E. Yorkshire.
G6PO.—H. HILLGROVE, 7, Dean Street, Blackpool, Lancashire.

2AGV.—I. H. Aulton, "Jesmond Dene," Shawhurst Lane, Hollywood, near Birmingham.
2AHZ.—C. W. G. White, 10, Raglan Terrace, Fairfield Park, Bath, Somerset.
2AZU.—T. L. Peterson, Jr., 7, Belle Vue Crescent, South Shields, Durham.
2BGM.—W. O. Wright, 53, Wellington Lane, Hull, Yorkshire.
2BHD.—C. Collins, Bagot House, Over Monnow, Monmouth.
2BHF.—N. A. L. Timbers, 10, Parramatta Street, Rawtenstall, Rossendale, Lancashire.
2BRJ.—H. Coakes, "Little Garth," Hollywood Lane, Hollywood, near Birmingham.
2BUS.—R. E. Dabbs, 4, Nutfield Road, Thornton Heath, Surrey.
2BZX.—J. M. Knott, 5, Pekin Street, Ashton-under-Lyne, Lancashire.

The following are cancelled :—G6HP, 2BAQ, 2BAR, 2BIQ.

Please send New QRA's, changes of address, etc., to QRA Section, R.S.G.B., 53, Victoria Street, London, S.W.1. Will members sending new QRA's kindly write their names and addresses in block letters, and thus obviate mistakes due to illegible handwriting.

NEW MEMBERS.

HOME CORPORATES.

V. L. Plascott (G5PT), "Duncroft," Shanklin Road, Southampton.
H. Riley (E12G), 58, Belmont Avenue, Donnybrook, Dublin, I.F.S.
E. C. Thwaites (2BDL), 41, Cross Lane West, Gravesend, Kent.
A. H. Cutt (2BHQ), 2, Kirkton Terrace, Heathhall, Dumfries, Scotland.
L. S. Farmer (2BHW), 5, East Smithfield, E.1.
A. Ogden (2BKH), "Rocklyn," Peulwys Road, Old Colwyn, Denbighshire.
P. N. G. Whitlam (2BLR), Warwick School, Warwick.
J. M. R. Sutton, B.Sc. (BRS1689), 15, Caradoc Street, Cwmcarn, Crosskeys, Mon.
W. Beattie (BRS1690), 35, Huntly Street, Aberdeen.
C. S. Douglas (BRS1691), 30, Pepys Road, New Cross Gate, S.E.14.
G. B. Ritchie (BRS1692), 4, Stanley Street, Aberdeen.
J. H. Battison (BRS1693), 66, Beach Avenue, Leigh-on-Sea, Essex.
J. G. Ross (BRS1694), 207, George Street, Aberdeen.
B. R. Greenhead (BRS1695), 7, Second Avenue, Hayes, Middlesex.
O. Read (BRS1696), 26, Pamela Road, Exeter.
R. L. E. Reynolds (BRS1697), 11, Glebe Villas, Hove, Sussex.
W. A. B. Geldard (BRS1698), 51, Reginald Terrace, Chapeltown, Leeds.
J. Steele (BRS1699), 71, Willowbank Gardens, Belfast.
B. W. Castle (BRS1700), 8, Tamworth Road, Boscombe, Bournemouth.
A. E. Clipstone (BRS1701), 15, Epperstone Road, West Bridgford, Notts.
A. C. F. Smith (BRS1702), 120, Bellemoor Road, Shirley, Southampton.
F. J. Forbes (BRS1703), 78, West Hill, East Grinstead, Sussex.
R. L. C. Jackson (BRS1704), Hove College, Kingsway, Hove, Sussex.
D. Niven (BRS1705), 263, Gidlow Lane, Wigan, Lancs.
J. H. P. Bell (BRS1706), 22, Front Street, Winlaton, Blaydon-on-Tyne.
J. West Harris (BRS1707), Highfield Lawn, Derby.
G. C. Manning (BRS1708), 42, Norton Road, Knowle, Bristol.
L. A. Bradshaw (BRS1709), "Alicia," Wootton Road, Gaywood, King's Lynn.
E. Mitchell (BRS1710), 40, North Marine Road, Scarborough.
T. W. Moss (BRS1711), 2, Bear Street, Exeter, Devon.
J. B. H. Lusk (BRS1712), Loughbrickland, Co. Down, N.I.
M. G. Church (BRS1713), Gognore House, Chertsey, Surrey.
G. B. Hunt (BRS1714), 231, Barclay Road, Bearwood, Birmingham.
D. G. Bagg (BRS1715), Fresh Woods, London Road, Tonbridge, Kent.
C. T. Malkin (BRS1716), 5, White Hill Terrace, Dodworth Road, Barnsley, Yorks.
W. F. Head (BRS1717), 3 Daison Cottages, Torquay, Devon.
F. H. Goldsmith (BRS1718), 237, Croftpark Avenue, Glasgow, S.4.
F. L. C. Firmin (BRS1719), The Cottage, Lothingland House, Oulton, Lowestoft.
G. Herald (BRS1720), 76 Albert Street, Dundee, Scotland.
J. Troy (BRS1721), 20, Battlefield Avenue, Langside, Glasgow, S.1.
A. W. Thynne (BRS1722), 6, Bayford Road, Littlehampton, Sussex.
D. Powell (BRS1723), "Caenwood," Presteigne, Radnorshire.
S. J. A. Nicholl (BRS1724), Brockhurst, Church Stretton, Salop.
W. H. Peek (BRS1725), 20, Bloomsbury Street, Poplar, E.14.
W. A. Bryce (BRS1726), 5, Lulworth Gardens, S. Harrow, Middlesex.
D. R. Aston (BRS1727), 15, Beechcroft Avenue, Golders Green, N.W.11.
H. R. H. Scales (BRS1728), 34, Leithcote Gardens, Streatham, S.W.16.
D. A. Squire (BRS1729), 12, Carew Road, Thornton Heath, Surrey.
C. A. M. Clackson (BRS1730), 15, Norval Place, Rosyth, Fife, Scotland.
J. Bolton (BRS1731), 32, Crank Road, Crank, near St. Helens, Lancs.
D. P. Binning (A.), Woodfield Works, Tile Street, Bury, Lancs.

DOMINION AND FOREIGN.

Senor M. de M. Carbonini, 10, Via Ansperto, Milan, Italy.
H. A. Sowley (VP5AC), 22, Church Street, Kingston, Jamaica, B.W.I.
K. Singh (VQ4CRS), Post Office, Thomson's Falls, Kenya.
L. H. Stewart (VS8AJ), H.Q., R.A.F., Far East, Singapore, S.S.
B. Goodman (W6CAL), 141, Alton Avenue, San Francisco, Calif., U.S.A.
R. A. Hill (ZE1JB), P.O. Box 484, Bulawayo, S. Rhodesia.
R. A. Jubb (ZE1JN), The Observatory, Bulawayo, S. Rhodesia.
S. W. Thorpe (ZS1AH), Chief Officer, Fire Brigade, Fire Brigade Headquarters, Roeland Street, Capetown, S. Africa.
Voon K. Han (ZH1), 13, Krian Road, Penang, S.S.
J. R. Cragg (BERS273), Post Box 391, Hong Kong.
H. J. Dent (BERS274), De Lisle Road Police Station, Bombay, India.
F. A. W. Byron (BERS275), Broadcast Dept., Accra, Gold Coast.

In our last issue Mr. R. Leporini's (SU1RL) QRA was given as Ramleh, Palestine. This should read: Ramleh, Alexandria, Egypt.

History in the making.

On December 15 last a 10-metre transmission from ON4AU was heard by Mr. L. E. Winton, Kenny Hill, Campbelltown, New South Wales, Australia. Reception was effected on a three-valve

ON4AU.

high-gain electron coupled receiver, and signals were reported, QSA 3-4, R3. This is the first authentic instance of 28 mc. European signals being heard in the Antipodes. Our photograph shows Mr. Mahieu's station at Peruwelz, Belgium.

TRADE NOTICES.

The Telegraph Condenser Company, Ltd., have sent us information regarding their new petroleum jelly impregnated paper condensers, which have been especially designed for use in higher output amplifiers and cathode ray television equipments.

The Type 111 is intended for use in circuits operating up to a working voltage of 1,000 volts D.C. and the Type 121B for use in circuits working up to 1,500 volts D.C.

DESIGN AND CONSTRUCTION.

The dielectric comprises multiple windings of pure linen rag condenser tissue impregnated in petroleum jelly, which gives an appreciable increase in protection against breakdown and a much longer life, as against the ordinary wax impregnation.

Jelly offers similar advantages electrically to oil filling, but the use of jelly removes the possibility of leakage and "creeping," since no free liquid is used.

TEMPERATURE CONDITIONS.

The condensers are filled with a specially prepared mixture, the basis of which is also jelly, to allow satisfactory working under tropical conditions, temperatures up to 140° F. being permissible. The metal case is hermetically sealed on all sides, and the terminals are a specially designed moulded bush pattern.

* * *

For all reception purposes a reliable and efficient earth connection is necessary. The days have long since departed when old metal receptacles were pressed into service for this purpose; in their place have appeared numerous devices designed to give improved results.

The "Regular" earth tube marketed by *Polchars, Ltd.*, 20, Bridge Street, Bristol, is the latest to meet our eye; this consists of a short perforated copper tube fitted with a wing nut connecting terminal at the top, and with a spiked end for easy insertion into the ground.

After insertion the tube is filled with a special chemical and water poured into the surrounding soil. The effect of the chemical is to lower the resistance of the tube at its point of contact with the ground, a desirable feature which cannot be achieved satisfactorily by other methods. The makers claim that the resistance to earth of the tube is only 0.280 ohm, but it should be mentioned that this advantage will be nullified if a high-resistance down-lead is employed.

On test the tube was connected by a short, thick wire to the earth line on a two-valve short-wave receiver working on 7 and 14 mc., and a marked improvement in signal strength was noted. Although the average amateur using a battery-operated receiver dispenses with an earth connection the use of a scientifically designed tube of the type under review would be an advantage. The tube retails at a price of 2s.

* * *

Amplion, for long a name associated with loud-speakers, can now also be identified with small wire-wound resistances and paper dielectric condensers. We have recently examined and tested several of the resisters and find them to be in every way satisfactory. The one-watt type ranges from 50 ohms to 100,000 ohms, each being clearly marked in accordance with the standard colour code. The resistance wire is wound on 5/16 in. glass tube and the ends terminated with thick leads-out. On test they were found to conform to specified values, within commercial limits, and under operating conditions no apparent heating occurred when the stated power was dissipated. On increasing the applied voltage to give 100 per cent. overload a slight warming was noticed after 15 minutes; it is probable, however, that they could be run with safety at 2 watts for a considerable time.

The retail price for any value is 1s., a figure which should appeal to constructors generally.

Mr. Alex Laidlaw.

We learn with regret that Mr. Alex Laidlaw (BRS1213), of "Brockmoor," West Sleekburn, Northumberland, met his death last month in an accident on his father's farm. Mr. Laidlaw was a very popular member of the North-EasternAmateur Transmitters' Society and was a particularly fine operator, having obtained his First Class P.M.G. certificate. He was especially interested in 28 mc. work, and had on many occasions rendered valuable help to members operating on that band.

We offer our deepest sympathies to his relatives and many friends.

G2TI Pirated.

Several QSL cards have been received at Headquarters for station G2TI. As the Editor's transmitter has not been in use for over 12 months it is obvious that his call is being pirated. Members are asked to note that if they work a station using the call G2TI, they are in contact with a pirate. Any information regarding the whereabouts of this station will be appreciated by Headquarters.

BERS 241.

The address of B.E.R.S.241 is Oorgaum Kolar Gold Fields, Mysore State, South India, and not South Africa, as printed in the list of new members appearing in the September, 1934, BULLETIN.

Empire Calls Heard.

By J. Alexander (BRS822), 63, Tennyson Road, Small Heath, Birmingham :—

FROM JANUARY 1 TO FEBRUARY 10.

7 mc.: su1ro (4.5.9), 8ma (5.5.6), ve1fn (4.4.9), vk3jq (4.4.9), 5so (3.3.9), 7kv (3.3.9), vo2j (4.4.8), vu2bz (4.4.9), yi4pr (5.5.5), zb1e (5.5.9), zl2gn (4.4.9), 2qt (4.5.9), 3bf (3.3.9), 3dj (3.4.9), zs2a (4.5.9), 2x (4.4.9), zt1r (3.4.9), zo5b (3.3.9), 6k (3.3.9), 6p (5.5.9).

14 mc.: ve1ci (5.5.9), 1do (4.5.7), 1ea (4.4.9), 2hg (3.3.9), 3nh (4.5.8), vk2cy (5.5.9), 5so (4.5.9), 7jb (5.5.9), vp2bx (4.5.8), vu2re (4.5.8), zb1f (5.5.8), zd1d (4.4.9), ze1jj (4.4.9), 1jo (5.5.9), zl4ck (5.6.9), zt1r (3.3.9).

O.V.1 receiver used. Figures in brackets denote signal strength.

DX CHART—No. 4.

DX CONDITIONS: JANUARY 15 TO FEBRUARY 15, 1935.

G.M.T.	14 mc.	7 mc.	3.5 mc.
0100		**W1 ; LU**	**VE1 ; W1.2**
0200		**W1 ; LU ; K5**	**VE1 ; W1.2**
0300		**W1**	Skip gradually increasing throughout the night, but conditions not as good as during last month.
0400		**W1**	
0500		**W1 ; PY**	
0600		**W1** ; K5 ; LU ; ZL	
0700		W1 ; **PY ; ZL**	
0800	ZL	W1.5 ; **ZL ; VK**	
0900	**ZL ; PY** ; VK2	W5 ; **ZL**	
1000	**ZL ; CX1 ; ZC** ; VK2.3		
1100	**ZL ; ZC ; VK2.3 VP5 ; VP2** ; VE1 ; KA ; VU		
1200	**ZL ; ZC ; VK2.3 ; VP5 ;** VE1 ; W1		
1300	ZL ; **ZC ; VK5.6.7 ; K4 ; VE1 ; W1 ; VP5**		
1400	**ZC ; VP5 ; VK5.6.7 ; PK2; X1 ; VE1 ; W1**	KA ; VK	
1500	**W1 ; VE1 ; PK2 ; VQ4 ;** VK6 ; ZT6	ZL; VK	
1600	**W1.6 ; VE1.3.5 ; ZT6 ; PK2** ; VK6 ; VQ3.4 ; ZE ; FB7	ZL ; VK	
1700	**W1.6 ; VE1.3.5 ; ZC6 ; VS8 ; FB8 ; ZS.T ; VO ;** ZE	ZL ; VQ4	SU
1800	**W1** ; **VE1 ; ZS6 ; FB8 ;** ZE	**VK2** ; VQ4 ; ZU	SU ; VK3
1900	W1 ; VE1 ; **VQ4 ; ZE ; PY**	**VK2.3** ; VQ4 ; VU	SU
2000		**VK2.3 ; W1 ; VE1 ; VO ;** VU ; PK1	
2100		**VE1 ; W1** ; ZU ; ZB	U6 ; VO
2200		**W1 ; VE1 ; K4** ; ZB	**VO**
2300		**W1.6 ; LU ; K4 ; T1**	**VE1 ; W1.2**
2400		**W1.6 ; LU**	**VE1 ; W1.2**

(A) W1 in the 14 mc. column signifies W1, 2, 3, 4, 8 and 9 when conditions are good.

(B) Bold type signifies strong signals.

We are glad to welcome the following new members to the scheme : G2TM, 2AWI, BRS1383, BRS1503.

We have now, contributors in the following counties : Middlesex, Essex, Hampshire, Somerset, Gloucester, Rutland, Lancashire, Midlothian, Lincolnshire and Norfolk, and contrary to expectations, very little difference in times of peak signal strength is noticed.

G2XS would welcome a contributor in North Ireland and North Scotland.

Practically all contributors remark on the poor conditions experienced during the B.E.R.U. Contests.

Empire Calls Heard.

JANUARY AND FEBRUARY, 1935.

By E. S. Wilson (G5CW), 20, Singleton Scarp, London, N.12 :—

7 mc. : vk2da, 2do, 2eo, 2er, 2fx, 2hf, 2hy, 2kz, 2ly, 2my, 2ns, 2pe, 2px, 2vg, 2xj, 2yl, 3dm, 3dp, 3eg, 3gq, 3kd, 3mr, 3or, 3uh, 3uk, 3vw, 3wp, 3xp, 4ap, 4bb, 4ck, 4en, 5gk, 4ry, 5fm, 5gv, 5mz, 5rx, 5eu, 6fo, 7jb, vu2bl, 2cq, 2dk, 2jp, 2jt, 2re, zd1d, zs1a, 1aa, 1p, 2a, zu6b, 6e, zl1hy, 1gx, 2ci, 2lb, 3aj, 3an, 3fg, 3gm, 3jd, 4ai, 4bq, 4ck, 4fo.

By Frank A. Robb (Gi6TK), 46i Victoria Avenue, Sydenham, Belfast, N.I. :—

FROM JANUARY 13 TO FEBRUARY 25.

7 and 14 mc. : su1ro (4.5.9.), su1ec (5.8.9.), su1sg (5.6.9.), su1kg (5.4.8.), su1ss (4.4.9.), su5nk (3.4.8.), su6hl (5.5.9.), v8ac (3.3.8.), ve1et (5.7.9.), ve1dq (5.8.9.), ve1aq (5.5.6.), ve1bv (5.8.9.), ve2ca (5.5.9.), ve2ax (5.6.9.), ve2dr (3.3.9.), ve2ch (5.6.9.), ve3wa (5.6.8.), ve3ok (4.4.9.), ve4wa (3.3.7.), ve5no (5.6.8.), ve5hc (5.6.9.), vk2yl (5.4.9.), vk2ba (3.3.9.), vk3wx (3.3.8.), vk3eg (3.3.9.), vk3kx (5.5.9.), vk3mr (5.8.9.), vk3yp (3.4.8.), vk3xq (5.5.9.), vk4bb (5.5.9.), vk4gd (5.5.9.), vk4gk (5.8.9.), vk4cc (3.3.8.), vk4ap (5.6.8.), vk4ei (3.3.9.), vk7jb (5.8.9.), vo2s (4.4.8.), vp2bx (5.5.8.), vp5pz (5.8.9.), vp6mo (5.5.8.), vq8a (4.5.7.), vq3bal (5.5.9.), vq4crh (5.6.7.), vu2fp (4.5.8.), vu2jp (3.4.9.), vu2bl (5.5.8.), vu2cz (5.5.9.), zb1b (5.6.9.), zb1c (5.6.9.), zb1f (5.7.9.), zc6cn (3.4.7.), zc6ff (5.8.9.), zd1d (5.6.9.), zd2c (3.3.8.), ze1jn (4.5.8.), zl1hy (3.3.8.), zl2bh (4.4.8.), zl3aj (3.3.8.), zl3gm (5.5.9.), zl4ai (5.6.9.), zs1p (5.4.9.), zs2a (3.3.9.), zs5a (5.6.9.), zs6al (5.5.9.).

In Memoriam — Donald Price (G6HP), 1908-1935

NONE of us who read Mr. Jardine's article in the January BULLETIN imagined that high-voltage dangers would presently be brought home to us in such a tragic manner. We all realised, in a kind of subconscious way, that most amateur transmitters came very near to risking their lives at times, but the thought that one of our best-known and best-liked members would shortly be taken from us could never have been present.

Every member knows, by now, the details of the tragic accident in the Baird Studios that in one brief second robbed amateur radio of one of its staunchest upholders. In that second R.S.G.B. lost a loyal member, and countless amateurs lost a close personal friend.

As one of the closest of them all I have been asked to write this brief appreciation of Don Prices' work, and it is an extraordinarily difficult task, writing, as I am, almost before full realisation of the facts has come.

I first met "HP" in June, 1926, and, curiously enough, the occasion was closely connected with R.S.G.B. He had called on me, with a friend, to ask me to propose him for membership. He already held his full licence, and wished to become a member "because it was the decent thing to do"—not, you will note, because of any benefits that might come of joining.

One of his chief characteristics, right to the end, was a certain intolerance for people who failed to back up the R.S.G.B. as the national society. This was all the more conspicuous since on every other subject he was so "easy-going" and open-minded that any sort of intolerance seemed a little strange.

In those days we both had far more time for amateur radio than has been the case of recent years, and we were together for an hour or more every day comparing notes and entering into friendly competition.

Our transmitters grew side by side, so to speak, any improvement incorporated in one being automatically installed in the other, and the value of friendly and co-operative work of this kind was immense.

In 1919 Don Price was offered a position in the research department of *Popular Wireless*, where he worked for rather more than two years. His "chief" had been Mr. G. P. Kendall, who left in 1931 to take an important position with Ready Radio, Ltd. "HP" joined him there after a few months, and was working with him until the firm went into liquidation at the end of 1933.

During May, 1933, he had co-operated with G6NF and myself in the 5-metre tests from the Crystal Palace tower, and, more or less as a result of this, was offered a situation with the Baird Television Co. early in 1934. He was responsible for the maintenance of the high-power vision transmitter working on 7 metres, and had constructed and wired most of the main transmitter himself.

Throughout all this period his interest in amateur radio had never flagged, and it says much for his enthusiasm that he could work with high power on 7 metres for twelve hours a day and still remain tremendously keen about the "ham" side of radio.

He married Miss Rita Smith, daughter of G6VP, early in 1934, and celebrated the event with a tremendous gathering of amateurs shortly after. One of his chief pleasures was to entertain other "hams" royally, and, being fortunate in possessing a radio room of considerable size, he could always be hospitable to numbers that would be outside the scope of most stations.

When, in 1934, he took the post of D.R. for the South London District his one aim was to "wake up" the district which had been much maligned and ridiculed for its inactivity. He sent personal letters and post-cards to every member that could be traced within the district, and soon had regular District meetings going—apart from the S.L.D. R.T.S., of which he was a member.

Many amateurs who were fortunate enough to stay with G6HP during Convention weeks will always remember his friendliness and hospitality—even to people he had never met before.

When I asked him, occasionally, what such-and-such a man was like he would reply: "He's a 'ham,' that's good enough"—a really characteristic answer, if ever there was one.

"HP" was a man who could have no enemies. True he had his little private leg-pullings and minor troubles with others in the district, but never bore the slightest animosity towards anyone. It is not every amateur that can be QRM'd all day during a contest and then greet the malefactor with a cheerful grin when he turns up the same evening. His support of R.S.G.B. contests was whole-hearted.

Many messages sent by amateur radio have been forwarded to H.P.'s family, and a genuine grief has been felt all over the world at the passing of such a familiar call-sign on the air.

I have not seen it suggested before, that the death of a well-known amateur is doubly tragic—he is lost to us in person, and, again, "on the air." The two are not the same by any means.

Perhaps I may quote one representative message that I received from a well-known U.S. amateur after I had told him the sad news: "O.K., o.m. and mighty sorry to hear it. He was a fine chap and you G's have lost a good man. Heard him on the air only last Sunday."

A special reference to his work for District No. 13 will be found under the heading of District Notes in this issue.

During the eight odd years for which I knew him I count it as a privilege to have been a close friend of his, and his passing on has left a gap which it will be impossible to fill. In the matters of friendliness, enthusiasm, conscientiousness his example will always be one to be remembered.

To his widow, his mother, and his many relatives we all offer our deepest sympathy, and our memories of him will always be full of sincere pleasure and admiration.

L. H. T.

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. H. B. OLD (G2VQ), 3, St. Judes Avenue, Mapperley, Nottingham.

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

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

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

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

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

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

DISTRICT 11 (North Wales).
(Anglesey, Carnarvon, Denbighshire, Flintshire, Merioneth, Montgomery, Radnorshire.)
MR. T. Vaughan Williams (G6IW), "Malincourt," Grosvenor Ave., Rhyl, Flintshire.

DISTRICT 12 (London North).
MR. S. BUCKINGHAM (G5QF), 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 (East'ern)
(East London and Essex.)
MR. T. A. ST. JOHNSTON (G6UT), 28, Douglas Road, Chingford, E.4.

DISTRICT 15 (London West and Middlesex).
MR. H. V. WILKINS (G6WN), 81, Studland Road, Hanwell W.7.

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

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

DISTRICT 18 (East Yorkshire).
(East Riding and part of North Riding.)
MR. T. WOODCOCK (G6OO), "Conakry," Cardigan Road, Bridlington.

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

THE D.R. regrets that some controversy has arisen in regard to the North-Western Provincial Meeting. It is hoped that the views put forward by the C.R.'s in charge of the Liverpool and Manchester sections will clear the air for a really successful meeting in Manchester later in the year.

An attendance of 23 was recorded at the last Manchester meeting which was in the nature of an open rag chew and junk sale; the sum of 22s. 4d. was thereby added to the funds. Thanks are due to those who contributed.

It was decided by vote at this meeting that to avoid any ill-feeling between the two sections, Liverpool and Manchester, Liverpool be asked to arrange the conventionette at Liverpool and that all arrangements for same be left in the hands of G6CX and G2OA.

Mr. Lupton (BRS1463), 21, Canal Bank, Lymm, asks for skeds or particulars of transmissions from anyone transmitting on 56 mc. 2DF reports active on fone on 7 mc. Feminine voices have also been heard from this station! G5CH, G2HL and G5YD report active on 1.75 mc., and G5YD is also busy on a SSS receiver, G5XF is working fone on 3.5 and 1.75 mc. G5PX, G5WR and G5ZT busy on 1.75, 3.5, 7, and 14 mc., the last-named building a special QRP set; G2KY active on 7 and 14 mc. G2WQ reports bad conditions on 14 mc., several ZL QSO's but ND in contest, building QST "R" circuit high-power CO. G6GV is very busy designing a new QSL card! also working television. BRS1504, 1502, 1389 and 1549 still working hard at code and 1549 interested in 56 mc. work. G2DH still preparing gear at new QRA (when the wife goes out). G5OZ rebuilding TX and antenna. 2AXA and 2ACP working on 1.75 mc., with 2BZX on 7 mc. G2OI working duplex on 1.75. The members welcome a new member, BRS1622, who hopes to have AA ticket before long (best of luck, om), also a visitor in Mr. Etherington at the last meeting. It is hoped that he will soon get BRS number.

Will those who have not reported let G2OI have a card once a month and show the other districts that Manchester section is alive?

Sixteen members and two visitors attended the February Meeting in Liverpool. Two new members

and the two visitors were introduced by G2RF, who is making great efforts to increase the membership. The members also welcomed G2DC who recently moved to Liverpool from the South. The question of National Field Day came up for discussion and G6OM, G2OA and G6CX were elected to form a committee to organise this function. A site has not yet been settled but it was suggested that this should be on the Cheshire side of the river and members are asked to make suggestions for a suitable location.

MIDLAND PROVINCIAL MEETING

SUNDAY, MARCH 24, 1935

at

"Hope and Anchor" Hotel, Edmund St., BIRMINGHAM

Assemble	12 noon
Lunch	1.15 p.m.
Business Meeting	2.15 p.m.
Tea	4 p.m.

followed by a visit to a place of interest.

Luncheon 3/6. Tea 1/6.

Reservations to Mr. V. M. Desmond, G5VM, or Mr. H. B. Old, G2VQ, not later than March 20.

The C.R. informed the meeting that the Manchester section had made the suggestion that the Conventionette for 1935 should be held in Liverpool instead of in Manchester, and after some discussion it was agreed that as H.Q. had decided to adopt Scheme No. 1 with regard to the Conventionettes the arrangements already made should stand, and H.Q. should not be asked to make any alteration. The principal reason why they objected to the Manchester proposal to join up with the Yorkshire District for a joint Conventionette is because they were of the opinion that Conventionettes should be centralised as far as possible within the district concerned. If meetings are held in out-of-the-way towns many of the younger members will be unable to attend on account of the expense involved, and the necessary support will not be forthcoming.

Official business having been concluded G2RF produced a very compact transmitter using Suppressor Grid modulation in the P.A. stage, and explained the construction and working of the transmitter. He stated that the maximum input to the P.A. for modulation was 3.5 watts but it was possible to modulate this 100 per cent. by a type 56 valve fed directly from the mike.

G2OA produced the exciter unit which he had just completed for his new transmitter and this was greatly admired, comprising oscillator, frequency doubler and buffer stage built for rack and panel mounting with quite a commercial finish. A lengthy discussion took place concerning the operation of the Tritet Oscillator employed in this unit.

Individual activities are as follows:—BRS1613 is congratulated on obtaining his AA ticket under the call 2BRM. BRS1322 and 2BWG studying compact transmitter design owing to small dimensions of shack! G2RF had interesting "break in" QSO with SU1SB. He wants to know if this is first BK QSO between England and SU. BRS1395 is building new RX. G2FD is building new transmitter, using 47 and 10. G5RY is on 1.75 fone. 2BHA experimenting with crystal oscillators. G2OA starting up again on 7 and 14 mc., using tritet control. G2DC is active on 7 mc. and 14 mc. BRS1662 calibrating new receiver. G2KZ and 2AVK trying to stop key clicks. 2BNA experimenting with mikes and low consumption pentodes. BRS1671 is willing to report on transmissions on 1.7, 7 and 14 mc. G6CX is operating on 7 and 14 mc. G5ZR reports active on 1.75, 7 and 14 mc., although he only received his ticket at the beginning of the year; he is carrying out field strength tests with different antenna systems. (Article, please.—ED.)

DISTRICT 2 (North-Eastern).

B.E.R.U. activities may account for the fact that not quite so many stations have been heard on the air locally during the past few weeks. Amongst those who were particiapting in the contest were G6XL, 6PY, 5HB and 6KU, who look back with pleasure to the event, though in most cases many of the points scored were obtained after a struggle, which in the end helps to add to the satisfaction of achieving them.

The Collins matched impedance filter has been installed by G6XL, who reports that an increase in output has resulted. A demonstration of a commercial single signal superhet was given to members of the Bradford Radio Society by G5TQ, whilst discussions on 56 mc. work are again being heard. BRS1151 is ready to give reports on transmissions on this band. G2XK is busy with his class B fone rig, and hopes to have it going soon.

The last meeting in Sheffield was supported by 15 members, including the D.R. (G6PY) and G2BH from Barnsley, and G2RU, who has now returned

WESTERN PROVINCIAL MEETING

SUNDAY, APRIL 7, 1935

at

Grand Hotel - - - Broad Street, BRISTOL

Assemble	12 noon
Lunch	1.15 p.m.
Tea	4.30 p.m.

Full programme to be arranged later.

Tickets 5/- inclusive.

Reservations to Mr. W. B. Weber, G6QW, not later than April 5.

from his seafaring activities. A talk was given by G6PY on short-wave supers.

The following stations are active :—G6LF, 5HK, 2HQ, 2AUB, 2ARZ, and BRS1512, 1468, 1625. G2AS reports working ZL on 14 mc., using only 3 watts. No B.E.R.U. entries are mentioned from Sheffield.

As a result of the meeting in Tynemouth, Mr. H. Baker (G2LD) has been appointed C.R. for Northumberland and North Durham. Members in that area are asked to send him reports by the 20th of each month.

DISTRICT 3 (West Midlands)

G5BJ active trying vertical antenna for RX and TX, also using Collins coupler with good results. Owing to losing six hours broadcasting from Midland Regional, he did not seriously compete in the senior B.E.R.U. G2DV has been trying a flock of directional antennæ for B.E.R.U. with good results, positive proof of an R5 increase in signal to VK in comparing two particular antennæ; now experimenting with special impedance matching

STANDARD FREQUENCY TRANSMISSIONS.

SUNDAY,
March 31st, 1935

0930 *GMT.*	3525 *KC.*
0940 *GMT.*	3625 *KC.*
0950 *GMT.*	3725 *KC.*

Accuracy within 0.01 per cent.

device for 7 and 14 mc. operation at any position of the band with the same aerial. G2AK lent out his receivers for B.E.R.U. G5TL is finishing new TX. G6DL, with the assistance of 5BJ and BRS1688 has put up a new mast which enables him to use three aerials, 33 ft., 67 ft., and 99 ft. His TX is link coupled, using Collins coupler he finds BCL interference reduced 50 per cent. G5NI is building Class B modulated rig for 14 mc. with 203 A's in push-pull. G6NJ has been swelling the number for Colonials to work in B.E.R.U. He states : " Am lost in cogitation why some of them spend hours calling test when about 100 G's are waiting for their turn." 2ANT reports junior Op. G5VM active on 3.5 mc. G6XQ has a new 7 mc. rig working and reports nearly wrecking neighbour's house while fixing that antenna to take his signals in the other direction. G5ML using Class B modulated TX on 7 and 14 mc. G5PP is active on 7 and 14 mc., and has had 200 fone contacts in past three months; he is testing various antenna arrangements and will report results later. G5GR reports active again after bad burn-out. G2LU is building new TX push-pull—R.F. everywhere except in the antenna! G2AV working VE and W consistently on 14 mc., heard in Hong Kong and VK using under 10 watts G2YS working fone and CW on 7 mc.; he will be glad to receive reports. G2ZT is secretary of the Coventry Short Wave Radio Society, who hold meetings every Tuesday; a welcome is extended to any members who happen to be in that town on a meeting night. He reports active on 7 mc. and has worked W1, 2, and 8 with 10 watts. Other active stations heard in Coventry are G6YU, 2DK, 2DD, 2DB, and 6JC. A hearty welcome is extended to two new Coventry stations, G6TD and 2BBA.

DISTRICT 5 (Western).

The Bristol Section held their usual monthly meeting during February, when 38 members and four prospective members were present. The title of the lecture arranged for this meeting was " The Milne's Nickel-Cadmium H.T. Supply Unit." The subject was most interestingly treated by Mr. F. W. Weaver, who has kindly offered the use of a quantity of these batteries for test purposes for field days, etc.

Station reports are as follows :—

G2HN has built a new 1-v-2 receiver, and is rebuilding all apparatus in tiers in a dustproof case. G5JU having put up a new 69-ft. Windom, found conditions rather poor for B.E.R.U., but had a good time during the contest, working many Empire countries. He is now experimenting with E.C. oscillators.

G5KT has been using a D.F. frame system on 1.75 mc., and hopes to be operating on 28 and 56 mc. shortly.

G5WI has worked his first real DX on 14 mc. He is experimenting with matched impedance feeders, and very busy with the B.O. checks. G6FO is busy with general work on all bands, using new MO PA.

G6VF also found conditions poor during B.E.R.U., but is satisfied with reports now being received on his 7 mc. signals from VK listeners. 2AKH is concentrating on television transmissions on the 30 mc. band.

2BYH, although busy learning the code, is logging plenty of DX fone stations; 40 W stations have been heard on the 3.5 mc. band. HP1A on 7 mc. and W5AYF on 14 mc. during the period February 11-13.

BRS744 is concentrating on television work.

The Gloucester Section held their usual meeting, when all local members were present. Preliminary N.F.D. arrangements were discussed and agreed upon.

G2HX and G5JH are testing out various aerial systems. G2CJ, owing to business, has little to report this month, but G5HC is working W6's on 14 mc. 2AOK, having recovered from his recent illness, is starting up again immediately. 2BLZ, BRS 1265 and 1341 are learning the code.

The Oxfordshire C.R. reports activity well maintained, most stations reporting active.

A meeting was held in the Oxford Y.M.C.A., and members of the Reading S.W. Club were present. The N.F.D. film was shown, after which a lecture on " The Measurement of Modulation " was given by Mr. Bell, of the University Laboratories, which proved most instructive to all members.

2ALA has passed his morse test, and is awaiting his call sign.

Arrangements have been made for the Western Provincial meeting to take place on Sunday, April 7, at the Grand Hotel, Broad Street, Bristol. In order that the necessary catering arrangements made be made, all members who propose attending are asked to advise the D.R. (G6QW) before April 5.

This District is well known for its fine conventionettes, and this year will be no exception. We hope to see many members from other Districts, all of whom will be assured of a hearty welcome.

DISTRICT CALENDAR
March/April, 1935

Mar. 20.—District 14 (Essex section), 8.30 p.m., at G5VQ, 149, Westbourne Grove, Westcliff-on-Sea.

* Mar. 20.—District 15, 7.30 p.m., at G6WN, 81, Studland Road, W.7.

* Mar. 26.—District 12, 7.30 p.m., "Wander Inn Café," Church End, Finchley. Talk, "Modern Valves and Their Application," by D. N. Corfield.

* Mar. 26.—District 14 (East London section). 7.30 p.m., at G6LL, 178, Evering Road, Clapton.

* Apl. 3.—District 1 (Manchester section), 7.30 p.m., at Brookes Café, 1, Hilton Street, Manchester.

* Apl. 3.—South London and District Transmitters' Society: meeting at West Norwood Brotherhood Hall, 8 p.m.

Apl. 4.—District 5, 7.45 p.m., at Full Moon Hotel, Bristol.

Apl. 7.—District 7, 2.30 p.m., at G2NM, The Ranch, West Drive, Sonning-on-Thames.

Apl. 14.—District 11, 6 p.m. at G2II. The Flagstaff, Colwyn Bay.

* Sale of disused apparatus at these meetings.

DISTRICT 6 (South-Western)

The month has proved a very active one for most members in the district and it has been notable for several important happenings. Chief among these are the very gratifying increase in membership, the very excellent response to the request for contributors to the Somerset and Dorset Budget, and the enthusiastic start that has been made with the Exeter monthly meetings.

With regard to the Somerset and Dorset Budget, the D.R. has read the first complete copy of this and considers it very good indeed. He thanks all the members concerned and particularly G6II who got it under way.

According to this Budget G6II is experimenting with ultra QRP, using an electron coupled TX and 120 volts! He is once more residing at Wellington. 2ABQ is working with a SS super, but finds background from local oscillator rather bad. 2HF, 2JM, 5AK and BRS1503 are all concentrating on 1.7 mc. work. An old hand resurrected is BRS1629, who used to dabble in pre-war days with things like Branly coherers! We heartily welcome you, OM! BRS190 may one day be persuaded to take up an AA licence!!

We wish to thank Mr. Wood (G5WY) for taking on the difficult job of organising the first Exeter meeting, which was called to find out whether the members required regular meetings. Those who attended were enthusiastic in their support of the idea, consequently it was arranged to hold meetings the third Tuesday in each month. The next meeting will thus be on March 19 at 5WY's QRA. Visitors will be made welcome.

As most of the Exeter membership contribute to the same Budget it was agreed to vary its working. Each member of the Exeter district who attends these meetings will be expected to come with his Budget contribution already written up on exercise-book paper. He is also asked to bring some question of general interest, written anonymously on a slip of paper, which he will place in a box. The Budget contributions will be handed round for inspection during the meeting and the various questions will be put to the meeting by the chairman. The D.R. hopes to get meetings going in Torquay, and probably by the time these notes appear the first will have been held.

G6XD is making another attempt to get a Budget going in Cornwall. If you are not interested in this scheme and do not wish to contribute please send it to the next man on the list, with a note to the effect that you wish to be left off the mailing list. Thank you.

DISTRICT 7 (Southern).

Congratulations to G2GK on the arrival of a junior op. on February 11. In common with other districts we were all very upset to hear of the terrible tragedy of our neighbouring D.R., and the members of No. 7 District take this opportunity of expressing their sincere sympathies with HP's mother and widow.

The next meeting will be held at G2NM, "The Ranch," West Drive, Sonning-on-Thames, on Sunday, April 7, at 2.30 p.m. This is the first meeting we have been able to arrange in Berkshire for some considerable time, and we trust that everyone will make an effort to attend in order to make it a success. G2NM's station is well known to all, and is certainly well worth a visit, apart from the meeting and tea!

The D.R. has been asked if he will revert to the old system of giving detailed accounts of members' activities; he is quite willing to do this providing notes of *sufficient interest* are received from the members. At the present time these notes are made up from his own observations and news gleaned at various meetings he attends. Not 1 per cent. of the information is received by report from the individual members, so if the notes are not sufficiently informative this is due to the scarcity of the material received.

At the last meeting, held at Weybridge, the D.R. gave a short demonstration of the wave form of various amateur and commercial signals as shown on a cathode ray oscilloscope, kindly loaned for the occasion by G5KH. This was followed by a lengthy discussion on the best venue for the Conventionette, but it seemed impossible to choose

a meeting place that was acceptable to all the members present.

DISTRICT 9 (East Anglia)

We regret to learn that our Suffolk C.R. is considering resigning his position as owing to a change of QRA he will not be able to carry on radio work for some time. We hope, however, that we shall find him active again ere long.

This fact will, probably, necessitate a postponement of our proposed meeting in Bury and possibly cause some alterations in the south station site for N.F.D. We shall give further particulars next month.

The other Suffolk stations report active and we believe a new member will be in Lowestoft by the time this is in print. Several Norfolk stations have not reported although known to be active—please, OMs.

G5UF is busy with aerial problems and hopes conditions will be better for the A.R.R.L. tests in March. G2MN is also studying aerials. G6QZ has commenced making contacts and has had some good reports. G2UT appears to have taken PY in his stride. G5JL, of Diss, is at home once again, and we hope he will find time to visit some of the district members. 2AWI, at school at Oakham, has completed a T.P.T.G.; he already has a C.O.P.A. G2JS is putting out some good fone on 3.5 and 7 mc. and welcomes reports from the district.

We are glad to report a new member at Lynn, who also hopes to hold an AA shortly.

G2XS has nearly lost his voice calling VE1E1 on 3.5 fone.

DISTRICT 10 (South Wales and Monmouthshire)

The Newport section were well supported at their meeting on the 13th, those present being:—2JL, 2XX, 5BI, 5KK, 6PF, 6GW, 727, 1128, 1131, 1689, Messrs. Hayward and Abraham; the latter now await their BRS membership. BRS1689 has been allocated to Mr. J. M. R. Sutton.

The initial stage of N.F.D. was discussed, station "A" being allocated to Swansea area under the leadership of G2SN and "B" station to Newport area under G5WU. In view of the extensive area covered by No. 10 and the fact that the Provincial Convention at Bristol is beyond the practical range of the majority, members have indicated keen support for a local Conventionette, and arrangements are now being made to meet this request. Your D.R., however, would like to make a special appeal to all members, wherever possible, to support the new provincial arrangements and attend the Bristol Convention. Two members from Swansea have already advised that they will be present.

Congratulations are extended to G6YJ on his appointment to an important position in the Treharris District. (We regret, however, that the change necessitates "giving up your Ham work." but appreciate that business comes first, and in this direction we wish you every success.) We have pleasure in placing on record that for many years his station has averaged 700 contacts per annum and that a single contact with either YI, ZC, or PY, LU would have earned for him both W.B.E. and W.A.C. certificates. We shall miss you, OM. as we know you will miss the interest and happy times spent in your shack. The best of luck; your co-operation on 5 metres in the summer months will be appreciated.

It is unfortunate that the Newport area should sustain two severe blows this month, for further news to hand indicates that our oldest active and much respected member in G2PA has found it necessary to close down his station. We shall all miss that delightful C.C. note and although we take this opportunity, one and all, of saying "Cheerio and the best of luck in the future," in respect to "Over the Air," we hope that you will still find it convenient to give us the pleasure of your company and able assistance at our monthly meetings.

BRS 1490 has applied for his AA licence and will carry on experimental work with PA's and fone. G2XX has resumed activities and is to be congratulated on the excellent fone and C.C. note heard quite recently. G6PF in addition to his usual activities will shortly take over Morse tests. With G2JL we now have two members concentrating on this useful work, but AA and BRS members must realise that reports and acknowledgments are necessary to prove the usefulness of the service; suggestions also would be appreciated by the members concerned. All the other members are active.

The Blackwood Radio Society continue their activities under the able guidance of Mr. Pond, chairman, and Mr. Mudford, Secretary, the latter having reported favourably on the advantage and

excellence of the Morse tests from G2JL. The photo hereunder is ample evidence of the enthusiastic support given to their recent Hamfest, R.S.G.B. members being well represented.

Remarkable activity is reported from the Swansea area supported by the following details :—

G5WO very active on 1.75 maintains daily skeds with G5OC, both on fone and C.W. Building separate TX for 7 and 14 mc. G2UL, the DX station of this area, hopes to extend his interest to 1.75 mc. band, also took active part in B.E.R.U. contest. G6PH, still active on 7 and 14 mc., but has now decided to extend his interest to 1.75 mc. G5TW has been experimenting with his RX, with excellent results ; is active on 7 and 14 mc. G2TY active on 7 mc., but finds the band very quiet. G2SN, in addition to 1.75 mc., testing DX possibilities on 7 and 14 mc. with a specially constructed 7 mc. aerial, so far with fair success. 2ATD, concentrating on his Morse with a full call sign in view. 2BYB, we regret to hear, is laid up. Here's to a speedy recovery, OM. 2BLL has passed his Morse test and now awaits his two-letter call-sign. Our hearty congratulations, OM.

We extend a hearty welcome to Mr. A. E. Jones (BRS1659).

It is interesting to record that Swansea and District members are holding enthusiastic meetings fortnightly in Swansea and all members within reach are invited to get in touch with G2SN.

G2OP, Pembroke, although on the edge of beyond as far as Ham radio facilities are concerned, has not wasted any time in getting over his difficulties. Scrapping previous aerial systems, a 2BI type was resorted to and functioned perfectly. Working on low power his first six contacts were VE2, W2, LA4, CT2, VK2, VK3,; this was followed by numerous contacts including VK4's, VK3, SU1 on 14 mc. and VU2's, ZC6, VK5, and SU1 on 7 mc. Swansea members no doubt will be interested in this news.

DISTRICT 11 (North Wales).

The last meeting at G2II was well supported. It was a great pleasure to see an old friend in G2BJ, of Colwyn Bay, together with our Liverpool friends, G2RF and BRS1395, who again travelled 60 miles to the meeting

G6IW, who is looking after the research side of the 56 mc. RES. group for this district, read Mr. Vickery's plan for this work. G2II has taken over the experimental side of the organisation. The plan was discussed, and all members who are interested in 56 mc. are asked to get in touch with the D.R.

G6OK, of Colwyn Bay, has constructed and calibrated a wave-meter for the 1.75 mc. band which has a very high standard of accuracy, and while this is not as good as the one used by the R.S.G.B. calibration section, G6OK will be pleased to help any member of the district with his 1.75 mc. crystal. It must be clearly understood that this is not a service for all members of R.S.G.B., as this is carried out by the calibration section.

G2II proposed that a crystal register be kept for the District, and G6OK will be pleased if all members will let him know the frequency of their crystals, on all bands.

N.F.D. was discussed in detail, and it has been decided to put A and B stations out as last year. Will all members who are willing to help advise the D.R.

We congratulate BRS1211 on becoming 2AJT, and also BRS1156 on taking up new duties in Coventry, although we are sorry to lose him we hope that he will remain active.

G2BJ, G2II, and G6OK are active on the 1.75 mc. band, G2II being successful in contacting W1DBM. He also reports hearing U stations on this band and managed to contact a U3 ; he also heard U9 (Siberia) at R5/6. G2BJ reports active on the 7 mc. band.

Please note that the April meeting will take place at G2II on the 14th, not the 21st as this is Easter Day. The meetings for the rest of the year will be on the third Sunday of the month as usual.

DISTRICT 12 (London North).

Members are requested to note that the next District meeting will take place at The Wander Inn Café, Church End, Finchley, on Tuesday, March 26, at 8 p.m. Mr. D. N. Corfield will give a talk on " Modern Valves and their Applications."

At the February meeting N.F.D. plans were discussed and decisions reached regarding the

personnel of the stations. Contrary to expectations, the Potters Bar site used last year is not available, but it is anticipated that both stations will be located in that neighbourhood on the great day.

The Contests were supported by about six local members. G5CW had some outstanding successes to his credit. Using 25 watts, he made W.B.E. twice during the last week-end of the Junior.

G5VY is beginning some experimental work with the new R.C.A. Acorn valves.

DISTRICT 13 (London South).

It is with deep regret that we have to announce the death of one of our District Representatives, Mr. H. D. Price (G6HP), who was electrocuted whilst at work in the Crystal Palace on Tuesday, February 19.

Mr. Price was a prominent and enthusiastic member of the Society, and his passing will be mourned by all. He was untiring in his efforts to assist his colleagues, and the highest praise is due to him for his achievements in the sphere of Amateur Radio. Those who have had the honour of working with him appreciate the excellent work he did in South London, as one of the few amateurs who upheld the traditions of the Society in the district during its past time of lethargy. We owe a debt of gratitude to him, also, for his invaluable assistance in reviving interest in this area, and it is hoped that the amateurs of District 13 will continue to further the work so admirably begun.

On behalf of all members of this District, we offer the deepest sympathy to his widow, mother, and other relatives.

As a mark of respect, all District Notes are suspended until next month.

J. B. K.

DISTRICT 14 (Eastern).

At the East London meeting held at BRS207, Forest Gate, a poor attendance was recorded. It was announced that the Field Day scheduled for March 16 and 17th was cancelled, but that it is hoped to arrange a fresh date, probably April 29, and that further details will be published in the April issue of the BULLETIN.

Members of the district taking part in the recent 1.7 mc. contest were G2DQ, 6CT, 6QK, and 2BWP. In order to assist on the Awards Committee, G2CD and 2BWP have been co-opted. G2ZJ has now moved to Ongar. G5UK and 2BWP have joined 56 mc. Group (No. 2) of the R.E.S., and will act as correspondents for the District. Will all members active on this band report accordingly?

Congratulations to 2AMC on obtaining his three-letter call.

At the Essex Section meeting held at G6IF, Leigh-on-Sea, the attendance of 14 was composed of Southend locals only. N.F.D. and television were discussed.

Station calls and QRA's for N.F.D. will be:—Station A, G6UT at Abbess Roothing; Station B, G6CT at Rettenden.

DISTRICT 15 (London West and Middlesex).

The February meeting was attended by about fourteen members and some very heated discussions took place during the course of the evening. The "junk sale" proved a failure, nothing being sold.

It was proposed that we run the area meetings in some suitable café or room in a local inn in various localities within the District. With this in view, will members please notify the D.R. of any likely venues.

Date and venue for the March meeting will be found under District Calendar.

Apologies are due to G2KI for his December letter having been mislaid. He is now WBE and WAC and, in fact, on the morning he worked his first ZL he was both WAC and WBE the same morning. This with only 10 watts input. Who says DX is not possible with small inputs? A very interesting letter comes from BRS1388, who is, perhaps, our youngest member. He is busy with receivers and television and in connection with the latter he has been getting good results from the B.B.C. using an Osglim neon and cardboard scanning disc, the neon being modulated with only 150 milliwatts from a battery-heated valve. The viewer cost only two shillings and sixpence. This would seem to confound the critics, who say that television is likely to be costly. G6VP and G6WN both entered for the senior B.E.R.U. contest.

It was with profound regret that the members of this District learnt of the tragic death of G6HP. In his passing we have lost someone who was near to us, someone who provided a very great link between South and West London. We extend to his relatives our very sincere sympathies in their sad bereavement.

FORTHCOMING CONTESTS

MAR. 30 & 31 ... Low Power Transmitting.

JUNE 1 & 2 ... National Field Day.

DISTRICT 16 (South-Eastern).

Members in this district were distressed to read of the tragic death of G6HP. Your D.R. has written to Mrs. Price on behalf of the district expressing sincere sympathy with her in her sad bereavement.

It is gratifying to have a budget of reports from Gravesend. G2IZ complains that someone is pirating his call; has rebuilt his receiver, but is bothered with induced mains hum. It is rumoured that G2IZ has planted some cabbages under the aerial, and is hoping for some DX on the resulting cabbage stump aerial, thus getting over the royalty difficulty with the "6CL beanstick."

G5SU, of Gravesend, has worked K5AM with 10 watts, and has received a QSL confirming the contact. Frequency 7 mc!

G6VC has had a "burn out," but is hoping to be on again soon. 2AVL is now G5IL, and is active on 7 and 1.7 mc.

In the Medway District G6NU continues his television experiments. He is active on 56 mc., and is on that band every Sunday from 10.00 to 10.45 G.M.T. 5FN has completed his 3.5 mc. telephony transmitter and has worked W on 3.5 mc. using C.W. G6VV is rebuilding, 6QC is moving to new QRA, 2CM is rebuilding, 2OV is experimenting with a battery operated S.S. super, 6RQ has developed something new in microphones. (BULLETIN article, please.)

BRS745 is building a super and a receiver for 7.5 metre television.

G2OO is QRL, 5XB is building a rack-unit TX, 2VA is QRL wedding! We wish you and the YL all the best OM.

G2IG has nearly finished the final touches to his mains S.S. super, 2MI was able to thoroughly test it during the first week-end of the senior B.E.R.U. G6KP, 6RH, 5XB, and 2MI appeared to be the only supporters of the B.E.R.U. contest in the district.

A " Field Night " was held at the last Beckenham meeting at 5LB, where a 56 mc. transmitter was alternatively coupled to a dipole and a 66-ft. aerial. The latter gave the best results to the four who went out in 5OJ's car. A 56 mc. network is being arranged. G6NF was a welcome visitor at the meeting.

From Thanet 6NC and 2OF report active. 2TW has been moved to Cairo and will soon be on the air as SU2TW.

G6SY, the secretary of the Ashford and District Radio Society, reports full activity in his area. G5MR at Dover is busy with television.

In Tunbridge Wells 2BFJ is now G2UJ. (Congrats OM!) He has already worked most of Europe and North Africa with a battery C.O.P.A. 5OQ reports that the rest of the group are active.

Folkestone Radio Amateurs (which includes G2QT) continue active, but G2IC wants to know why his TX always gives as good results switched off as it does switched on during a contest!

We welcome G6JB to the district, better known as VK2NR, who has settled in Bexley Heath.

DISTRICT 17 (Mid-East).

The usual stations have again sent in reports of their activities, for which they are thanked. The majority of members continue active; many of them participating in the B.E.R.U. Contests.

The C.R. is grateful to G6RN, who has acted as the " recording angel " for Grimsby and reports on the activities of the transmitting membership there. G6RN has been doing well with QRP, but has now moved to a new QRA with A.C. mains and a new TX has made its appearance. He now uses a CO-PA with pentode CO. G6AK is another who has rebuilt his TX and is being rewarded with plentiful R8 reports. G2QH has changed to a pentode CO. G2VY continues active. BRS1590 submits an excellent log of DX heard during the Receiving Contest. He is now using a H.F. stage in his receiver. 2BQR makes some trite remarks on the speech and speech quality of the local trawlers!

G5BD reports a poor score in the B.E.R.U. Contest; the only redeeming features being QSO's with VK and ZL. During the Contests he added a new country to his log in the shape of V8AC. He is active on 3.5 mc. and has worked SU and U6 on that band. G5CY has a new American all-wave receiver, which is excellent on telephony, but poor on C.W. He is mainly active on 7 mc., using telephony.

G5XL is active again at his new QRA. He is using indirectly-heated valves in the CO and buffer stages and a DET5 as PA. He is now licensed for 14 mc. and will be working on that band soon. 2BSR sits for his examination in six weeks time, after which he will be free to get his full call. He is experimenting with H.F. stages in his receiver and is making a new receiver to his own design (details, please, OM).

G2LR has concluded his tests with a matched impedance aerial and is now back on his Zepp.

G6GH entered the B.E.R.U. Contest, and on the last Sunday had his only contact in SU1EC. He does not contemplate having any difficulty in working out his score! G6LH was unable to enter owing to his usual Sunday work and has been testing receivers. He finds a tuned H.F. stage very much worth while and finds local QRM reduced by it. We are delighted to learn that BRS1044 is applying for his AA call. He has co-operated splendidly with G6GH and G6LH and it is hoped that he will progress further to a full call eventually.

It seems a pity that this district has no L.B. There used to be one, but it passed peacefully away. This is to be regretted and in the absence of an L.B. members tend to sink into their own little dens and no one knows of their activities. The BRS and AA members should find an L.B. most useful and interesting, as they cannot meet on the air. The C.R. will be very willing to start an L.B. if there is a general response. This District OUGHT to have an L.B. Who is willing to join in?

DISTRICT 18 (East Yorkshire).

The following members participated in the B.E.R.U. Contest:—G2QO, 5BP, 5GC, 5FV, 5VO 6OS; all report conditions poor.

2AVR forwards a long report in which he gives details of work carried out with M.O. systems. He is also interested in various keying systems recently described in the BULLETIN.

G5FV, who entered for the Senior B.E.R.U. Contest, found that apart from the poor conditions of the first week-end, the gales which were prevalent hindered work with various aerials which he attempted to erect during the second week-end. Some 25 contacts were obtained in 11 zones, making a total of 275 points. He is also very active on the 28 mc. band each week-end. An application for increased power is being made.

Other stations which are active are G2KM and 2NP.

A new member, BRS1663, at Withernsea, is welcomed to the District. The Scarborough S.W. Club activities continue; most of the members report active. BRS1321 and 1316 both continue to listen on 28 mc. BRS1420 is trying out converters with success. BRS1480 reports he is active. G5AX is in hospital, and we wish him a very speedy and good recovery. 2AMM reports active. 2AUN has rebuilt television gear, but is having lamp trouble.

A good deal of interest is being shown by the Scarborough members in 56 mc. work.

G5VO raised ZL and a few other DX stations in the Junior B.E.R.U. Contest, using his newly-built Tri-Tet transmitter. It was an error to say that he was using a single signal-super (built with the aid of 2APU) during the B.E.R.U. Junior Contest, as the receiver in use was his old one rebuilt and rescreened.

G6UJ is making some preliminary N.F.D. arrangements.

G6OO, having safely moved all his apparatus to his new QRA, is in the usual quandary, wondering about a new layout, aerial, etc. Where does all this junk come from? A sale will be arranged at the next meeting.

It is with profound regret that we learn of the tragic death of Don Price, and we join with all who knew, or had a QSO with G6HP, in offering our deepest sympathy to his nearest friends and relatives.

Scotland.

February has proved peculiarly barren in items of news value, no doubt due to the abnormally bad conditions generally pertaining.

The re-organisation of "C" District forecast in last month's notes has been accomplished as follows. A line of demarcation has been drawn across the county of Fife, passing just north of the towns of Leslie, Markinch and Leven. The two sections of the county thus produced will be known in future as North and South Fife respectively. North Fife remains a component part of "C" District, the focus town of which is Dundee, while South Fife, together with the counties of Kinross, Clackmannan and Linlithgow, is transferred to "D" District, the focus town of which is Edinburgh. This change became necessary to facilitate the handling and to suit the convenience of the members in the outlying districts.

This month we have two further new licences. G5TY is now the call of Mr. Tyre (2AMY), of Glasgow while an "AA" permit under the call of 2AAL has been granted to Mr. J. Wilson (BRS1609), of Edinburgh.

The B.E.R.U. contest has been with us a complete and absolute failure. To a limited extent this may have been due to poor conditions, but for the most part other reasons must be sought. "Least said, soonest mended," will be our motto for the present, but it seems clear that the ambition of our Contests Committee to let the present rules stand for a period of years is not likely to be attained—at least, if a reasonable entry of "G" stations is to be desired. The Contests Committee, we consider, is blameless in the matter, and has our entire sympathy, as they could not possibly have foreseen what actually occurred.

"C" District reports its first meeting for 1935 on February 6, when there was a representative turnout, which included G5GK (now of "D" District—G5YG). "GK" brought along a small 56 mc. trans-receiver which he recently brought back from the U.S.A. It occasioned much interest, and some work is planned for it in the future in conjunction with some of the Dundee members. Talks on their gear were given by G5WM and G6RI, and the N.F.D. film was shown. The next meeting is scheduled for March 6. Mr. Allen, the District Officer, is endeavouring to foster in his district an interest in 1.7 mc. work. G5IM had a stubborn R.E.S. S.S. super, but thanks to the assistance of BRS1405 it "stubs" no longer. G5NW and G5IM desire to express their appreciation of the hospitality of Mrs. 1405 on the occasion of the post mortem on the "IM" RX.

"A" District had several entrants for the B.E.R.U. contests, but one and all threw the thing up in disgust before the end. Last meeting a talk on the R.E.S. S.S. super was given by BRS1300, and was much appreciated by the large turnout. Practically all the stations in the district are active.

"D" District Officer (G5IG) writes to say that he hopes the members recently transferred from "C" to "D" are bearing up under the good news as so far none of them have shown up at the "D" meetings. Most of the "D" members are active, but the District Officer is inclined to "gloom," as G6FN has apparently gone BCL *pro tem.*

No report has been received from "B" District this month.

Northern Ireland.

We have to extend a welcome to Mr. T. Arnold (BRS1681).

GI6YW found DX patchy, but was W.B.E. during B.E.R.U. He noticed that Empire stations invariably tuned up the band from LF to HF end. 6TK is generally on 3.5 mc., and has been QSO U6, U5, ZC6, VE1, 2, 3, NX and FB8. GI5WD and 6WG are active in Portrush; they are separated by about 200 yards of ozone, but manage to contact other stations without great difficulty.

The N.F.D. film was enjoyed, but we are still wondering if the two gentlemen with the chests so proudly displayed used blowlamps or merely caustic soda to remove the paint?

We do not like to drag horses to the water, or adopt the gun-at-the-head manner, so we will merely ask—what are YOU doing to make these notes a success?

EUROPEAN NOTES

At the Annual Convention of U.S.K.A. held in Berne on January 20, the following officials were elected: President, HB9B; Vice-President, HB9RBG; Hon. Treasurer, HB9RBA; Hon. Secretary, HB9RCU; Hon. Editor, HB9P; Traffic Manager, HB9T; QSL Manager, HB9AC.

The Headquarters address of the Society is now U.S.K.A. Neu-Allschwil, near Basle, Switzerland. Attention is drawn to the fact that a large number of cards and letters are sent to obsolete addresses.

We learn from their annual report that 45 members of the U.S.K.A. are now active transmitters. During the past year four national relay tests took place, all of which contributed to the study of the propagation of high frequencies in the mountainous Swiss country. Mention is made of the interest shown by their members on the occasion of the R.S.G.B. National Field Day held in June. A second event of the same character took place on September 9, whilst a Christmas DX Contest was also well supported. In this event HB9AQ finished first with 27,100 points, HB9J was second, and HB9Y third. The latter established a unique performance, as all work was carried out on the 3.5. band, his QSO's including W1, 2, 3, 8, 9, VE1, 3, VO8 and YI.

Five Swiss amateurs qualified for W.A.C. during the year, and numerous first contacts with remote places were established. A weekly broadcast dealing with Society matters was given on 85 metres every Thursday at 22.30 G.M.T. by two high power telephony stations. All Swiss amateurs are now using frequency controlled transmitters, 90 per cent. of which employ crystal oscillators.

* * *

ON4AU, Traffic Manager for Reseau Belge, reports that ON4BZ has worked all continents in

(*Continued on page* 360).

Empire B.E.R.U. News.

B.E.R.U. REPRESENTATIVES.

Australia.—H. R. Carter (VK2HC), Yarraman North Station, via Quirindi, N.S.W. *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, Vict.; A. H. Mackenzie (VK4GK), Fire Station, Wynnum, Brisbane; G. Ragless (VK5GR) South Road, P.O., St. Mary's, S.A.; N. F. Ollivier (VK6FO), 26, Merriwa Street, Hollywood, W.A.

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

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

Canada.—C. S. Taylor (VE1BV), Stewiacke, Nova Scotia; 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 St. West, Calgary, Alberta; and A. L. Cusden, (VE5HJ), 1465, 17th Avenue, New Westminster, British Columbia.

Ceylon.—A. T. Kingston (BERS. 196), P.O. Box 100, Colombo, Ceylon.

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

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

Hong Kong.—C. Emary (VS6AX), R. C. Signals, Hong Kong.

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

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

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

Malaya and Borneo.—R. J. Bee (VS2AG), P.W.D., Kuala Kangsar, Perak.

Malta.—L. Grech (ZB1C), 44, Sda San Benedetto, Chircop, 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.—J. W. Mavis (ZE1JE), P.O. Box 160, Umtali, South Rhodesia.

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

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

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

Australia

By VK2HC, via VK3EG, ZL3AN and G6WY.

Conditions over the past month have been very satisfactory and prevalence of Empire stations augured well for the success of the ever-popular B.E.R.U. contest.

This year the contest has been exceptionally well patronised in both senior and junior sections, and large totals are expected.

During the first week-end of the senior contest conditions were generally poor for Europeans and Africans on 7 mc., no G stations coming through till 19.00 G.M.T., which usually is the peak period, but on the next two week-ends conditions were at their best again, both on 7 and 14 mc. The latter band was extremely efficient, ZS being contacted around 05.00 G.M.T., then VS6, VS8, VU, and so on, till the G signals came through at 11.00 G.M.T.

It is expected that the largest scores will be centred around SU or VU.

Locally there is a marked increase in the number of VK stations on the air, and the contest proved a regular W.B.E. feast; all agree that we had a great time.

The W.I.A. Convention was held at Hobart last month.

The Australian Centenary DX contest resulted in VK3MR, with 100,320 points, winning the open prize, an '852, with VK3GQ, 97,218, and VK3JQ, 56,666, second and third. VK3HL wins the range of Philips tubes with 40,181 points, using an input of 23 watts. The contest will be held again in future years, its popularity being undoubted. Logs were received from some 30 countries.

VK2HC is at the moment spending a delayed festive season holiday in Sydney.

* * *

The following items were discussed at the recent W.I.A. Convention held at Hobart:—The P.M.G.'s department is to be requested to reduce experimental licence fees following the reduction of B.C.L. fees. A request is to be made for the duty free entrance of experimental equipment for members of the Institute. A request is to be made for legislation to suppress electrical interference to receivers. A decision was reached to organise a DX contest annually. Federal headquarters for the year are located in New South Wales, with

VK3RJ as permanent Federal QSL officer. (The above information was received via VK5SU, VK3EG, ZL3AN, and G6WY from Mr. Bowman, Federal President, W.I.A.).

Burma and Northern India.

Via VU2LJ, VS6AQ, VK3EG, ZL3AN, and G6WY.

VU2FP (G6HB) was very active up to the middle of January on 14 mc., and ran schedules with VP5PZ, but has recently been in camp, and as a result he was unable to enter the B.E.R.U. Contest. VU2JB and VU2CD were active on 7 and 14 mc. during B.E.R.U., and both have run schedules with VP5PZ. VU2LJ is running a regular schedule with VS6AQ for ELS purposes, and it is hoped that regular notes will now come through on this route. VU2FP hope to be on the air again at the beginning of March.

Canada (First District).

By VE1BV via G6LK.

Conditions during B.E.R.U. tests were poor compared with last year, and many odd skip effects were noticed. During the first week-end no "G" stations were heard until 12.00 G.M.T. QRM from W fone and code stations was very heavy during the four week-ends. A few VK and ZL stations came through on 14 mc., which is unusual in VE1. A large number of VE1 amateurs were invited to enter the tests, but it is regretted that only three took part. The Halstead Radio Club held their monthly meeting at Armdale; after the business was concluded a supper took place, and a very enjoyable evening was spent by all present.

Canada (Second District).

By VE2CA, via G5YH.

The B.E.R.U. tests were a washout here; no 14 mc. European signals were heard during the first week-end and very few on the second of the senior contest. VE2BG is looking for African contacts. XIAI is listening for British fone stations every night on 7 mc. after 01.00, and on 14 mc. all day Sundays. All members join in extending sympathy to the family of G6HP; his cheery fist will be missed.

Canada (Third District).

By VE3WA, via G6NJ.

Conditions were very poor here last month; during the senior B.E.R.U. tests only one G was heard. 14 mc. was bad except for a few South African stations around 19.00 G.M.T., 7 mc. mostly poor. Few ZL and VK stations heard around 13.00 G.M.T., but contacts few. There were only a few VE3 stations in the tests, but those that did enter had a good time and are hoping for better conditions next year. VE3WA worked ZS6AL, the latter using fone which was heard R5.

Canada (Fourth District)

By VE4CJ.

This is another little story of how amateur radio came to the rescue in a state of emergency. On January 20 last the most severe snowstorm for years struck the British Columbia coast, reaching as far as the Rocky Mountains. Vancouver, B.C., was entirely cut off by road, rail and line telegraph communication for five days, and the snow followed by a thaw caused considerable damage to property. Furthermore, it removed the tracks of the Canadian Pacific and Canadian National Railways in places, and as the result of rock slides, telegraph lines in many places were demolished.

Immediately the storm broke the amateurs in this part of Canada went into action and QRR calls were the order of the day. Calgary and Edmonton were the farthest points north unaffected by the storm and, consequently, were the chief junctions for communication over the air to the West. Calgary amateurs handled the traffic which is normally routed *via* C.P.R., whilst the Edmonton group dealt with the normal C.N.R. traffic. Important links were also established at Lethbridge and Warner, two towns in Alberta.

The non-permanent militia R.C.C.S. stations in Calgary and Edmonton handled the bulk of the traffic; most of these operators are experienced amateurs. It is difficult to ascertain the call-signs of all who lent a hand during this state of emergency, but the following are known to have assisted: VE4AF, BZ, CJ, FI, GD, HM, HQ, HJ, QH, NH, LX, NJ, OF, OG, SC.

Fine co-operative spirit was shown throughout this trying period, proving once again that radio amateurs have at least justification for encouragement and assistance.

Ceylon.

By VS7GJ.

VS7RP, the only member to report, complains that Russian commercial stations are again interfering with amateurs working near the top frequency end of the 7 mc. band. During the past few weeks he has contacted AC3, PK1, ZL, VK, etc. It is understood that the call VR2NB has been allotted to Mr. G. C. Cawood, Sandakan, British North Borneo. This, it will be recognised, is an incorrect prefix, and it is believed that the operator is attempting to have it changed to VS4NB.

VS7EB and 7RP, although only five miles apart, are still unable to establish contact on 56 mc. This is probably due to the intervening broken country.

It has been pointed out several times in the BULLETIN that certain British Empire stations send *all* cards to G for distribution. In particular, I would quote the case of VKs who send cards to amateurs in countries comparatively close to Australia. It would appear that this method has been adopted owing to heavy postal charges, but I am of the opinion that much time and trouble would be saved if such persons were to send their batches of cards, in an *open packet*, direct to the country concerned. From my own experience I find it more convenient and cheaper to send an open packet of, say, 14 cards to one country than one card in a sealed envelope. I would suggest that each country, either through its local society or representative, should register a QSL address with the BULLETIN. Twice monthly this representative would send all cards collected from local members direct to the country concerned, and vice versa. To meet postal expenses, which would not amount to much per member per annum, a small subscription could be sent to the person undertaking the distribution. I feel confident that this would relieve the heavy work of the R.S.G.B. QSL Section. [We believe that most parts of the Empire are now represented with a QSL Bureau, and therefore the latter part of Mr. Jolliffe's suggestion is being taken

care of. With regard to overseas members' cards intended for countries other than G we heartily recommend that these be sent direct, in order to save duplication of effort.—ED.]

Via VS7GJ, VS6AQ, VK3EG, ZL3AN, and G6WY.

There are three active stations in Ceylon at present, namely, VS7RA, VS7GJ, and VS7GT. VS7RA leaves for England at the end of February and hopes to start up with a G call at his home in Ludlow, Shropshire.

Egypt.

By SU1EC via G6WY.

The B.E.R.U. Contest provided the main interest of the month and conditions seemed to be very good, especially during the first week-end of the junior. QRP G stations were coming in at amazing strength on both 7 and 14 mc., and their strengths held up well. On 14 mc. the peak period was from 11.00 G.M.T. to 14.30 G.M.T., also marked by an almost complete absence of static. During the first morning of the senior a heavy sandstorm took place and aerial masts seemed in great danger.

An express letter arrived from Alexandria announcing the confiscation of SU1TM's transmitting gear by the Post Office authorities, due to his being unlicensed. A hurried consultation with the Director of Broadcasting in Cairo, and a "stand still" order on the proposed confiscation of a further six amateur transmitters was made. The trouble was due to a misunderstanding, as all the amateurs had been told by SU1EC not to apply until further news was heard. All amateurs in Egypt will apply during February for an experimental licence, and all applications will be considered sympathetically.

The Egyptian broadcast authorities are now running 100 watt stations in Cairo and Alexandria to supply alternative music and talks for European and Egyptian listeners. SU6HL is still working with temporary gear, mostly on 3.5 mc. SU1EC is very busy with schedules and B.E.R.U. test. SU1TM is finding it difficult to work his transmitting gear while it is in the police station! SU2GA, SU1SG, are active. SU1RK, of Port Said, is applying for 50 watts C.C. licence. SU1AA in attempting ultra short-wave work with new R.C.A. acorn valves blew both. SU5NK is also active. SU1CH works at midnight on 7 mc. with W schedules. SU1RO is now WAC with a PY contact and is awaiting QSL confirmation.

Hong Kong.

By VS6AX, via VS6AQ, VK3EG, ZL3AN, and G6WY.

During the Senior B.E.R.U. Contest, conditions on 14 mc. were good, and on 7 mc. fair. During the second half of the Senior, G Stations were very good on 7 mc., but during the first week of the Junior conditions were poor, only VK, ZL, and VU being heard and worked. The second week, and the remainder of the contest, only 14 mc. was good for ZL, and 7 mc. only fair. Static has been bad at times.

During the contest, VS6AQ worked ZB1F in Malta, this being the first VS6-ZB1 contact. VS6AH has rebuilt again. VS6AX is now using 20 watts prior to rebuilding. VS6AS, Mr. Thompson, is using an input of 10 watts.

Irish Free State

By EI2B.

There is little to report this month. EI5F sends a list of stations worked on 14 mc., including seven VK's, CX, OR, LO, ZD, ZF, ZL, ZS, ZT and VU; also VE on 3.5 mc. We welcome BRS1645, Mr. Warren, of Sligo, who is working hard at Morse, and hopes to be in a position to apply for his licence soon.

[The above notes were unavoidably held over last month.—ED.]

Conditions on 14 mc. during the past month have been reported by EI5F as being generally good and his record of countries worked has been consistently maintained. He has been experimenting with a modification of the old third harmonic method of control, the circuit comprising a 4,772 kc. crystal across the grid of a TPTG oscillator tuned to 14,316 kc. and taking 16 watts, which is capacity coupled to a neutralised PA taking 60 watts. He has been getting good results and consistent T9 reports. The QRA of EI2G is G. Riley, 58, Belmont Avenue, Donnybrook, Dublin. Two other stations have also been licensed: EI3G, D. A. Kelly, 35, Pembroke Park, Dublin, and EI4G, G. H. O'Donnell, 21, Kenilworth Park, Rathgar, Dublin. Quite a number of unlicensed stations using EI calls are on the air, and one of them has been using EI5D's call. The following stations are reported active:—EI2B, EI5B, EI8B, EI9D, EI5F, EI6F, EI9F and EI2G. I hear that the activity of EI3C has been interfered with by the arrival of a little EI3c. Congrats, OM.

Malta.

By ZB1A, via ZB1E AND G6WY.

A very enjoyable meeting was held on Sunday, February 24, and attendance was very satisfactory; some members were unavoidably absent, but it is hoped they will be present next time. Many points were discussed and settled, the most important being the election of Mr. L. Grech (ZB1C) to take over local representation in place of ZB1A, who is returning to England. All correspondence should now be sent to ZB1C. It was also decided that ZB1B should continue his work in connection with QSL section, and that ZB1E should assume command of the E.L.S. organisation.

Date, place and time of next meeting will be communicated to all by ZB1C. The attendance gave a hearty welcome to G5WS, who has recently joined us from England.

Conditions for the past month have been very erratic on all bands, and very good periods on the lower frequencies have been, more often than not, spoilt by QRN. The 14 mc. band improved later in the evenings, and for very brief periods during the day, showing exceptional DX.

Station Reports.—ZB1B worked Madagascar and ZL1. ZB1F took part in contest in spite of difficulties. ZB1C is trying to beat the "miles per watt" record. ZB1E has antenna tests suspended; experimenting with BCL receivers. BERS201 taking out licence in near future. Ex G5WS also hopes to be active with ZB1 call before very long. BERS134 is joining H.M.S. *Ouse*, where he hopes to be very active. BERS183 returning to England.

In conclusion I should like to take this opportunity of thanking all for their support and co-

operation during the past two years, and it is not without regret that I find myself having to say "Good-bye, all."

Malaya and Borneo.

By VS2AG.

Generally, during the latter part of January and the first week of February, conditions on the 7 mc. band have been poor to bad, with some improvement in the second week in February. A new and lusty crop of FI, KA and PK stations appeared each night with lengthy periods of noisy CQ's and apparently surprisingly few contacts. On February 10 conditions were much better, ZL's, a VQ, several W's and a G being heard.

Flight-Lieut. Stewart, of the H.Q., R.A.F., Far East, Singapore, has joined the Society. He operates VS8AJ and reports having worked 93 stations. Jolly good work; he looks a dangerous customer for the B.E.R.U. contests. (G6NF worked this station in February.—ED.)

The writer of these notes (VS2AG, Reginald J. Bee, Kuala Kangsar) accepted the proposal to act for VS2AF as B.E.R.U. representative in Malaya very diffidently on account of his last twelve years' jungle and reconnaissance service away from a key resulting in comparative inexperience in short-wave technique.

It is hoped that a close liaison with the members of the Malayan group will be established with the resulting increased interest in the reported activities.

Late Notes via VS8AJ, VS6AQ, VK3EG, ZL3AN, and G6WY.

VS8AJ is running nightly schedules with VS6AQ, and forms an important link in the E.I.S. network. VS8AB, well known as VS1AB, is active, and was heard on in the B.E.R.U. Contest. VS2AN is going on leave shortly from Federated Malay States. VS8AB is also running a schedule with VS6AQ, and it is hoped that regular notes will be forthcoming from Malaya now that these schedules are in operation.

Mauritius.

By V8AF, via ZS1H, SU1EC and G6WY.

At the request of G6WY regular schedules have been arranged with ZS1H, an Empire Link Station, and V8AF for handling B.E.R.U. traffic and messages. Any E.I.S. messages for England can now be dispatched to V8AF for QSP via ZS1H.

The only active V8 stations are V8AC and V8AF, V8AB being QRT on account of business. Reports to hand show that conditions are good on 7 and 14 mcs. and it is possible to maintain regular contacts on 7 mc. with the East, VK, KA, PK., etc., and with a few Europeans after 17.00 G.M.T. On 14 mc. VE has been worked during the first part of the month, and G, F8, HB, D4, VU are being worked regularly. With a VE contact V8AC has now qualified for W.B.E. It is to be regretted that after 18.00 G.M.T. no DX has been worked on 14 mc. despite efforts being made.

Northern and Southern Rhodesia

By ZE1JE, via ZE1JF, VQ3BAL and G5SR.

The 14 mc. band still continues to be the most reliable for northern and western DX between 15.00 and 19.00 G.M.T., during which period the 7 mc. band is unworkable except for locals and South Africans owing to terrific static; occasional eastern DX is heard, but few contacts are made.

It is now proposed to form a B.E.R.U. group in Rhodesia instead of the suggested radio society as mentioned in last month's notes.

A welcome is extended to R. A. Hill, ZE1JB, an ex-member, and R. A. Jubb, ZE1JN, who have joined the B.E.R.U.; both operate very active stations in Bulawayo. ZE1JF, who has a good contest log to his credit, reports good all round DX on 14 mc. Congratulations to ZE1JO, who has now qualified for W.B.E. certificate.

South Africa

By ZT6X via ZS1H and G5LA.

In the Cape area conditions during the first week-end of the Senior contest were bad, VK signals being entirely absent, but by the first week-end of the Junior Contest things had improved, and VK2, 3, 4, 5, 6, and 7, G, VE, SU, VU, VS7, ZL4, etc., were audible on 14 mc. The most consistent VK was VK5GW, who, on occasions, was a good R8. No report of any activity on 28 mc. has been received, and it appears that no interest is being taken in the International 28 mc. Contest. 56 mc., which at one time appeared to threaten activity on the popular 7 and 14 mc. bands, has fallen into insignificance.

EUROPEAN NOTES.—

(*Continued from page* 354.)

43 minutes using the 14 mc. band. ON4JB continues to maintain regular schedules with ON4CJJ at Leopardville, Congo, using a directional aerial with loop reflector. ON4AC, working from the top of a tower in Antwerp, is transmitting television daily on a frequency of 42 mc., using an input of 30 watts. ON4AU has received confirmation from VE3PT and VE1DR regarding his 10 metre QSO's reported last month. W9TJ at Missouri received his signals on January 1; regular schedules with W2ARY have been maintained on this band. ON4JOR heard VP3AO at 23.00 G.M.T. on January 13.

In a later report ON4AU mentions that 43 Belgium stations hold W.A.C. certificates, five being for telephony contacts. On 56 mc. ON4JB and 4EL are working "break in" successfully. ON4JB has worked two-way 'phone with ON4CJJ in the Belgian Congo, using 40 watts input; ON4JOR has heard VP3AO on 7 mc. at 23.00 G.M.T.; ON4PA requires regular schedules on 3.5 mc. with G stations.

There is little activity on 1.7 mc. because of Government restrictions, which permit only limited operation for a week or two at a time. Permission is then only granted for inland tests.

The new R.B. Committee is: President, ON4UU; Technical Manager, ON4RX; Traffic Manager, ON4AU; Publishers, ON4EL and ON4JB; QSL Manager, ON4MY. A Y.L. has joined R.B. Headquarter's staff!

The Brussels World's Fair Amateur Convention will take place from August 3 to 5. It is hoped to arrange an outing to Ostend on August 6.

Note.—Members wishing to be included in the R.S.G.B. party to this event are requested to advise the Secretary at an early date. Further details will be published later.

100 KC FREQUENCY SUB-STANDARD.—

(*Continued from page* 326).

the harmonics are not found loud enough, a piece of insulated wire wound twice round the 300 turn coil and the other end twisted round the receiver antenna lead will increase their strength in the receiver considerably.

EXPERIENCES & OBSERVATIONS DURING THE 1.7 MC. CONTEST.—*Contd. from page* 334.

amount of time regularly on this band, and not put away all the gear for a year. There is plenty of room for all interested in this frequency to do useful work as well as to show band occupancy throughout the year. I agree also with G6RB that more use should be made of the 3.5 mc. band in the early mornings.

A sketch accompanies this article showing the signal strengths obtained on my signals at some of the more distant points, with one or two reports from nearer stations lying in more or less opposite directions. These were taken from my log during the more normal conditions which at times prevailed.

The most consistent stations heard were :— G2vq, 2xc, 2pl, 5kt, 5kg, 5yv, 5jh, 6qb, 6uj, 6iz, 6fn, 6yj, 6rq, 6pf, 6zr.

Stations logged.—G2vq *, 2pl *, 2jl, 2xt, 2xc *, 2dq *, 2ll *, 2mi *, 2sx *, 2ol *, 2uy *, 2ox, 2bk, 5kg *, 5zt *, 5ju *, 5kt *, 5rl *, 5yv *, 5zx *, 5bi *, 5um *, 5cm *, 5jh *, 5rx *, 5qm, 5zb, 6fn *, 6yj *, 6qk *, 6rq *, 6sy *, 6lz *, 6qb *, 6na *, 6ox *, 6ct *, 6pf *, 6qc *, 6zr *, 6hd *, 6zx *, 6ha, 6mf, 6om, f8wq *, f8xf *, oz2h *, oz7fk *, w2hy, w2hxl, w8uv, w2hys (G6uj *, not counted for points).

R.G.S. NOTES.—(*Continued from page* 339).

Miss Corry has been testing a National FBXA receiver, but finds the tuning rather sharp on 28 mc., as the band only covers 12 degrees on the dial. She is hoping to obtain some band spread coils, so that this difficulty may be overcome.

G2HG has been busy rearranging his gear so that rapid QSY's can be made when testing with long-distant stations on 28 mc. He has built a T.P.T.G. output stage, which is locked to a 28 mc. FD, this arrangement proving superior to a neutralised T.P.T.G. He is, however, trying to improve the output of the doubler in order to enable the latter arrangment to be put into service. G2HG has had his reception of VE1GZ confirmed, the signals being a harmonic from 14 mc.

G5SY has been making transmitter tests and is considering using the tri-tet method of working the oscillator, and also proposes to use two LS5B's in the last FD stage. These valves are to be connected with their grids in push-pull and anodes in parallel. He has also been making receiver tests with a S.S. super and hopes to compare results (when signals arrive) with a second receiver using a modified Hartley circuit.

2BIW finds difficulty in receiving local fundamental transmissions, but is successful in receiving harmonics. He attributes this state of affairs to the masses of steelwork around his station. He has tried various aerial systems in the hope of effecting a cure, but so far with no success.

Group 11*B*.—G6ZV sends his usual long report and gives full details together with drawings of his high power 28 mc. transmitter. He has had one local QSO with G6VU, who is situated about three miles distant.

BRS1515 has been testing different receiver designs and is using at the present time a super-regenerative receiver, using a Class B valve for quenching and detector stages, and a pentode in the output stage.

G5FV has been fairly active, but not so much as usual, owing to the B.E.R.U. contest. Conditions have been generally poor throughout the month, no signals of any description being heard.

News has just come to hand to the effect that ON4AU has had a report from N.S.W., Australia, and has also been in communication with several station in the North American Continent. This is really splendid news, and he is to be congratulated on a remarkable achievement. According to my log book conditions on 14 mc. were most remarkable on December 15, a very short skip prevailing until a late hour. Several 28 mc. transmissions were made with high power that day, but up to the time of writing no reports have been received.

Further 28 mc. schedules are now in force and are as follows :—

OK1AW transmits on 28190 kcs. daily between the hours 1315-1400 and 1700-1720 G.M.T. (via G2YL).

VK2BP makes 28 mc. transmissions (input 250 watts) every Sunday, commencing February 3, at the following times :— 0400-0600, 1200-1400, 1800-2000 G.M.T. (via G6YL).

CX1CG listens on 28 mc. for a period of 10 minutes after each second hour commencing at 0900 G.M.T. and concluding at 1700 G.M.T., These times being G5FV's Sunday schedules.

G5FV.

Aerial Tests from W1QP.

We understand from G2WD that Mr. John L. Reinartz, W1QP, intends testing out the special aerial system described in the February issue of *QST* on April 6, 13, 20 and 27. His frequency will be 3510 Kc. G2WD will work on 3522 Kc and the tests will commence at 10 p.m. EST (0300 GMT Sunday mornings).

The co-operation of British stations is solicited. All reports should be sent direct to G2WD or via Headquarters.

Reports Wanted.

G5QZ (Nottingham) on his 7,135 and 14,270 kc. transmissions.

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