THE T. & R.

BULLETIN

THE INC. RADIO SOCIETY OF GT. BRITAIN

AND THE BRITISH EMPIRE RADIO UNION

Vol. 11 No. 11 MAY, 1936 (Copyright) Price 1/6

THE INCORPORATED
RADIO SOCIETY of GREAT BRITAIN

HEADQUARTERS:
BRITISH EMPIRE RADIO UNION

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THE T. & R. BULLETIN

CONTENTS.

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Vol. 11

No. 11

LICENCE CONCESSIONS

THE information which we published in our last issue to the effect that we may now use aerials up to 150 ft. in length, will have been noted with interest by all Home members, and in particular by those who have facilities for erecting an aerial system which is longer than "half-wave on 7 Mc."

Concessions, or improvements in our operating facilities, are not easy to come by, but the fact that we have obtained two more during the past few weeks, should provide ample evidence that when we have a strong case to put before the G.P.O. there is every chance of it being accepted.

Perusal of the official notice published on Page 456 of this issue will show that we have been successful in obtaining for our members a concession which affects the pockets of many—namely, 25 watt permits for an extra 10s. per annum instead of 20s. as hitherto. Lest any low power station operator should think otherwise, we should mention that an endeavour *was* made to have the minimum input allowed to new licensees increased to 25 watts. The fact that we were unsuccessful does not mean that the point has been forgotten, because we are firmly convinced that at the present time it is more economical to build up to 25 watts than down to 10 watts.

The concession to allow recommended members to operate portable 56 Mc. transmitters without extra payment, is one which will appeal to those who, in the past, have been compelled to either take out a separate licence at additional cost, or write to the G.P.O. each time they wished to operate their station under portable conditions.

Having drawn attention to these recent improvements in our operating facilities, we take this opportunity of mentioning a matter which is wrapped up in concessions obtained in September, 1934. We refer in particular to the question of tolerances, and as there appears to be some misunderstanding on the point, the G.P.O. have asked us to make the position clear. Further, they have approved the text of that which follows.

British amateurs by the terms of their licences are not permitted to use or select for their transmissions frequencies which lie outside the limits shown below.

1722—1993 kc.	14020—14380 kc.
3508—3730 kc.	28035—29965 kc.
7012—7288 kc.	56060—59935 kc.

(*Continued on Page* 476.)

TRANSMITTER DESIGN

By G. McLean Wilford (G2WD).

Part II.

Doubler and Buffer Stages.

IN the first part of this article different types of crystal oscillators are described, any one of which is suitable as a low-power transmitter, or as an exciter unit for a larger transmitter.

We now come in logical sequence to the doubler and/or buffer stage, but before proceeding further it is desirable to state that the function of a doubler is totally different from that of a buffer or sub-amplifier stage. A doubler stage is, as its name implies, a device for increasing the frequency of the output from the crystal stage, whilst a buffer, or, as it is sometimes called, a sub-amplifier stage, steps up the R.F. voltage for the purpose of obtaining a greater drive for the final or power amplifier stage of a transmitter. With modern valves which have very low inter-electrode capacities the buffer stage is not used as much as formerly, because in most cases sufficient output (except on the very high frequencies) is usually obtained from the doubler stage.

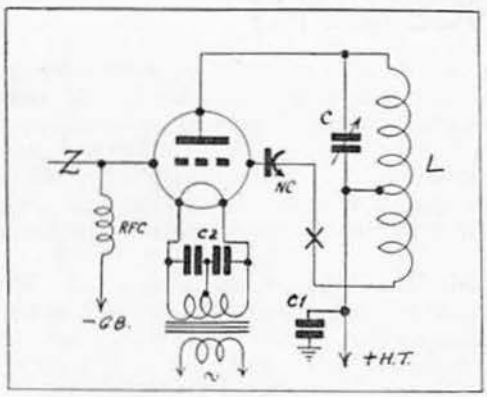


Fig. 11.
Circuit of a Triode Doubler.

In cases where the intermediate stage employing a triode is used as a doubler or, alternatively, as a buffer, it will be necessary to incorporate a neutralising condenser, the reason being that when this intermediate stage is used on the same frequency as the preceding stage, it must be neutralised to prevent oscillation occurring. The point naturally arises—how can an intermediate stage be used either as a doubler or a buffer without resort to neutralising? The solution lies in the use of either a screen grid or a pentode valve, because neither of these valves require neutralising. Their use also simplifies the circuit; further, the R.F. output obtainable from a screen grid or pentode valve is very greatly superior to that obtainable from a triode.

Unfortunately there are very few British screen grid or pentode valves available for use as buffer-doublers, and as a result quite unsuitable receiving valves are often pressed into service. However, American valves which have been specially developed are now generally available in this country, and are, in the majority of cases, infinitely cheaper and greatly superior to makeshifts. Recently a British firm have produced a 15-watt R.F. pentode which is a most useful valve for buffer, doubler and P.A. stages.

Having thus covered the initial stage, we now proceed to design considerations. An amateur transmitter is usually built to work on as many frequencies as are allowed in the G.P.O. licence. To achieve this object one or more doubler stages are usually incorporated, but by using a crystal oscillator which is capable of operating on one or more frequencies such as the Tritet, the number of doubler stages can be reduced. In many cases where two doubler stages were formerly used one is now sufficient.

Doubler stages, as previously stated, are used for raising the frequency and, provided that the doubler stage is really efficient, an appreciable power gain, as well as an R.F. gain for driving the final stage, is obtainable. This is, however, dependent upon two important factors: (1) the correct design and proportioning of the circuit itself; (2) the input coupling to, and the output coupling from, the doubler stage to either a second doubler or the P.A. stage.

Doubler Circuits.

Triode Doubler.

The first doubler circuit to be discussed is that shown in Fig. 11; a neutralising condenser is included so that the stage can be used as a buffer amplifier if required. The input and output coupling arrangements will be discussed later.

In this circuit as well as others to be described it is necessary to use a high value of negative bias to obtain maximum output on the harmonic and maximum efficiency in the doubler. The value will vary with the type of valve used, but the higher the bias the higher the R.F. voltage that will be

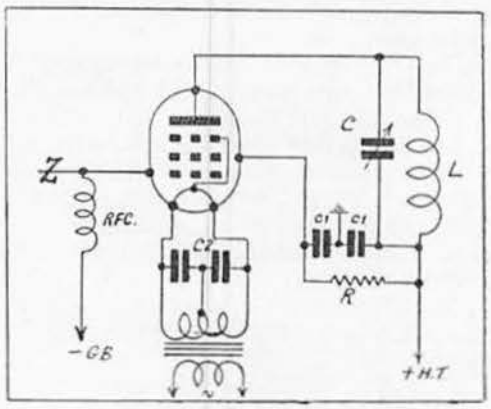


Fig. 12.
Circuit of a Pentode Doubler with the suppressor grid connected internally.

necessary to excite it. Generally speaking, a valve with a high amplification factor is better than one with a low amplification factor, *e.g.*, an LS5B is a better doubler than an LS5.

The neutralising winding in the plate tank circuit can be used to increase the output by the regenerative effect.

The triode doubler is given as a first example, but for effective output no harmonic greater than the 2nd is really satisfactory to give R.F. power gain.

Except for the values of C and L, which are given in a table at the end of the article, the constants in this circuit are as follows: C1 .002 μF mica to stand plate voltage; C2 .002 μF; R.F.C. standard sectional chokes; N.C., 35 to 50 μμF maximum. The plate spacing for N.C. must be wide enough to stand the R.F. voltage developed without flashing over; if this is likely to occur, a fixed *mica* condenser of about 500 μμF should be inserted at the point X. This condenser is also useful in P.A. stage neutralising circuits.

Pentode Doubler.

The circuit for this is shown in Fig. 12, and is

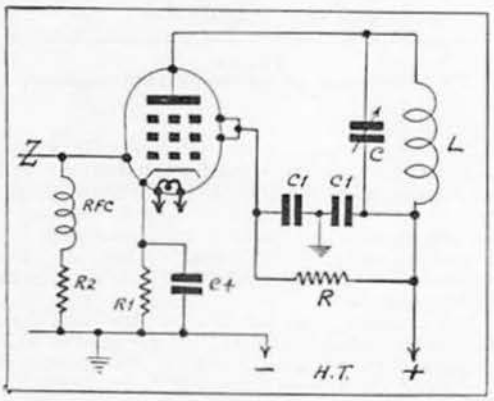


Fig. 13.
Circuit of a Pentode Doubler with the suppressor grid brought out to a separate pin. The valve is indirectly heated.

very similar to Fig. 11, but due to the extra element, i.e., the screen, the voltage dropping resistor R and its by-pass condenser C must be added. The resistance R is very important, for if too high a voltage is applied to the screen, it affects the operation of the valve. There is a critical optimum value of screen voltage which is usually in the region of 100 volts. Experimentation with this resistor is definitely worth while, as the R.F. output obtainable can be varied within quite wide limits. Power potentiometers with a rating of 10-15 watts would be very suitable for the purpose, and would also provide another method of controlling the excitation to the next stage. A 25,000 ohm. resistance would be a good value to use.

The values of the plate and filament by-pass condensers can be similar to those given for the triode doubler. Data for C and L are given at the end of the article.

Pentode Doubler with Regeneration.

The circuit for this class of doubler is shown in Fig. 13. It will be noticed that the suppressor grid is brought out to a separate pin. The regeneration is controlled by the condenser C4, and its value should be about .0001 μF with mica dielectric. The cathode bias resistance R1 should be about 1000 ohms 2 watts, and R2 50,000 ohms 1 watt. Experiments should be conducted with the values of R, R1 and R2 to obtain maximum efficiency. The suppressor and screen are strapped together outside the valve to produce a better internal screening effect. This circuit is useful when using indirectly heated pentodes.

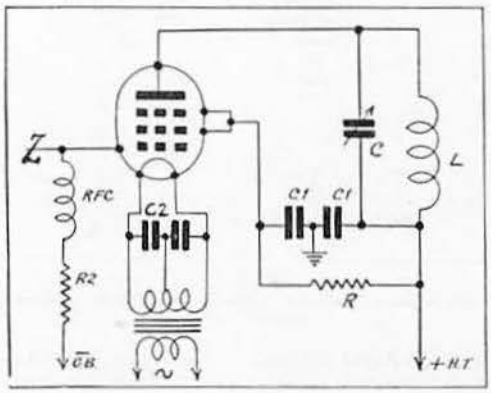


Fig. 14.
A Pentode Doubler with suppressor grid brought out to a separate pin. The valve in this case is directly heated.

Fig. 14 is similar to Fig. 13, but in this case a directly heated or filament type of pentode is used. The circuit values are as for Fig. 13.

Pentode Doubler using Suppressor Grid.

The circuit is shown in Fig. 15, and is one which could be used with the new RFP 15, 15 watt pentode. It will be seen that the circuit is very similar to Fig. 14, except that the suppressor grid is used as an element by itself. Those who have studied the articles in THE T. AND R. BULLETIN dealing with R.F. pentodes for P.A. work will remember that for greater output on C.W. it has always been recommended that the suppressor grid should have

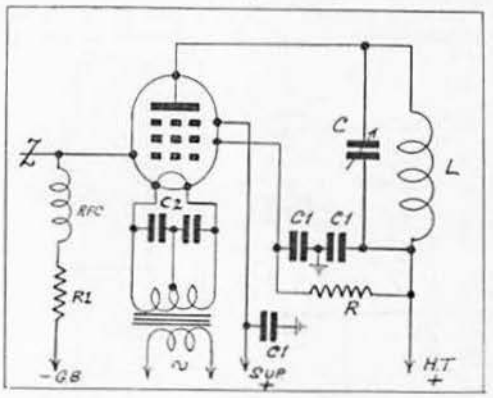


Fig. 15.
Another Pentode Doubler arrangement with the suppressor grid brought out to a separate pin. The filament is directly heated.

a positive bias. This case is similar, for if the suppressor grid is supplied with a positive bias its output as a doubler will be increased. The exact value of positive bias cannot be laid down very definitely, as it will depend upon the plate and

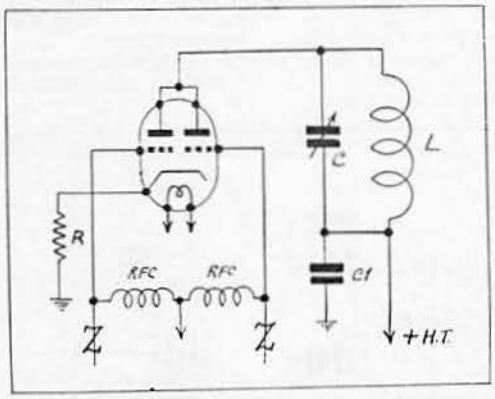


Fig. 16.
A push-push Doubler using twin triode indirectly heated valves.

screen voltages applied. The circuit values are similar to those given for the pentode doublers in Figs. 13 and 14.

Push-Push Doubler.

The last type of doubler to be described is the push-push arrangement shown in Fig. 16. It is a well-known fact that push-pull circuits will not function as doublers on second harmonic output owing to the fact that even harmonics are cancelled out, but if the grids are connected in push-pull, and the plates in parallel, extremely good second harmonic output can be obtained, as the grid circuit gives two impulses to the parallel plate circuit for each impulse to the grids.

This circuit naturally has to employ two valves, but if American valves of the 6A6, 53 or RK34 types (which are twin triode Class B indirectly heated), are used, one valve (in reality two valves in the same tube) only is required.

If an experimenter who wishes to adopt this type of doubler does not desire to employ American valves it is best to use two valves having a high

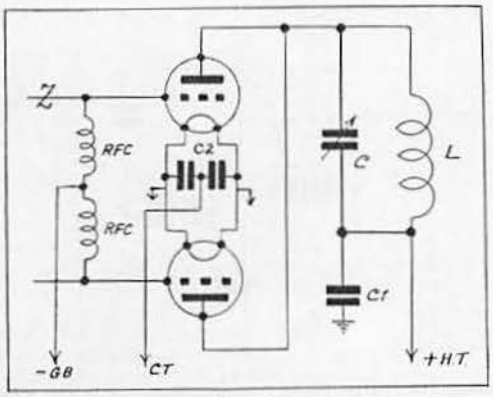


Fig. 17.
A push-push Doubler using two directly heated triodes.

impedance. It is immaterial whether they are directly or indirectly heated types. Fig. 17 shows a circuit using directly heated valves.

Coupling a Doubler from Preceding Crystal Oscillator Stage.

Having described several crystal oscillator and doubler circuits, the methods of coupling one stage to the other will now be discussed.

The two principal types in common use are so different that each will be considered separately.

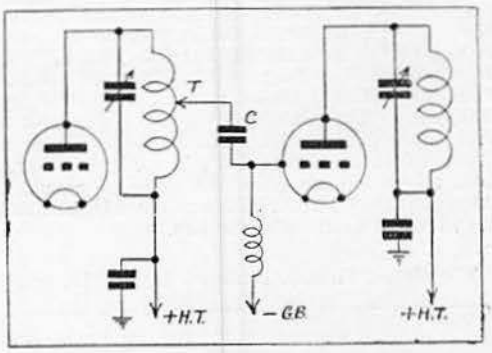


Fig. 18.
The variable grid tap method of capacity coupling.

Capacity Coupling.

This type of coupling was, until recently, widely used, and for certain stages of a transmitter is still the most popular. Figs. 18, 19 and 20 show circuits using capacity coupling, but before proceeding to describe them, a few comments are necessary.

Capacity coupling by reason of the few parts required and ease of adjustment probably account for its popularity.

The coupling condenser C in each of the three circuits has two functions: (1) it provides an R.F. coupling from the plate of one valve to the grid of the next; (2) it prevents the H.T. voltage in the plate circuit from being applied to the grid of the next valve, and for this reason it must be designed to withstand the full plate voltage applied to the preceding stage, plus about 50 per cent.

The capacity of this condenser is not very critical, and can be any value between 100 and 500 μμF. When it is possible to do so, it is preferable to make C a variable condenser of one of the sizes mentioned (or any intermediate size), because at some setting, which has to be determined by experiment, an optimum value will be found where the greatest excitation is obtained for the driven valve. A variable condenser is also useful because once the correct setting has been found, it can be reset at will to this point.

The grid bias is applied through the R.F. choke (R.F.C.) in each diagram.

Fig. 18 shows the most usual form of capacity coupling, in which the point T is made variable up and down the plate coil of the driver stage. This is another method of varying the excitation, for, as will be found by experience, a tapping from the top of the coil does not always give the greatest excitation to the driven stage, and is often apt to overload the driver, thus pulling it out of oscillation. Time will be well spent in finding the optimum point for attaching the coupling lead to the driven stage.

Fig. 19 is similar in many respects to Fig. 18, but in this case the coupling is fixed to the "cold" end of the driver plate coil, and the H.T. tapping point is varied until the maximum excitation is obtained in the driven stage.

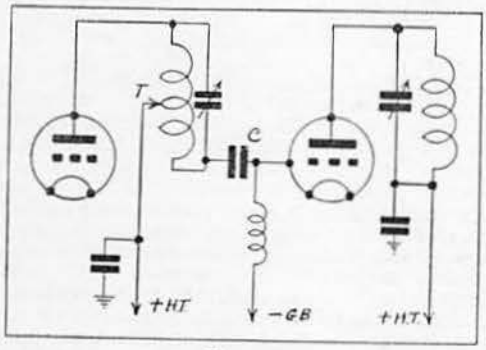


Fig. 19.
The variable anode tap method of capacity coupling.

Fig. 20 shows a method of coupling a single-ended driver to a push-pull or push-push doubler. Two coupling condensers and two R.F. chokes are employed, the coupling condensers being attached to variable taps on the driver plate coil. It is, of course, a matter for experiment to determine the optimum points of attachment for maximum excitation to the driven stage. It will be noted that the driver plate coil is centre tapped and the excitation leads are equidistant from both ends of this coil.

These three circuits are equally satisfactory for the lower power stages of a transmitter, provided always that the maximum excitation to the driven stage is obtained without overloading the driver stage.

Generally speaking, when using capacity coupling it is best to use a valve with high rather than low magnification. Pentodes for that reason make better doublers than most triodes.

Link Coupling.

This form of coupling has leapt into favour in recent years, although as a point of historical interest many British amateurs were using the method as far back as 1929. Figs. 21, 22 and 23 illustrate three different arrangements.

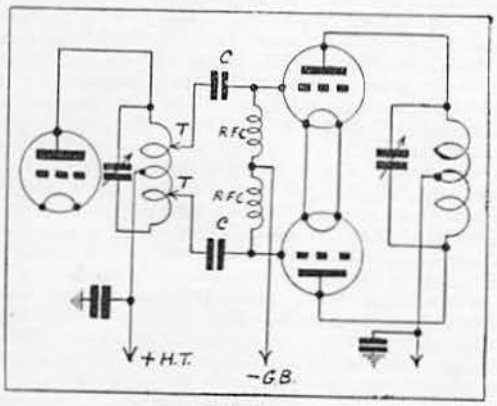


Fig. 20.
A method of capacity coupling a single-ended stage to a push-pull stage by means of variable grid tap.

It will immediately be seen that the stages to be coupled are entirely isolated electrically from one another, except, of course, for power supply connections. The coupling condenser C has disappeared, and in its stead we now have a tuned grid circuit in the driven stage. This adds an additional control to the stage whether it be a buffer, doubler or power amplifier. The considerations now to be given apply equally well to any of these three classes of circuit.

The link proper, consists of a pair of wires with one or more turns surrounding the driven grid and driver plate coils.

Link coupling quite definitely reduces undesirable capacity coupling effects between stages, and thus avoids any danger of feed back. By increasing or decreasing the number of link turns or by varying the physical position of the turns surrounding the driver or driven coils, we are able to vary the degree of coupling in a manner which is much superior to that obtained by capacity coupling. Being of very low impedance there is little or no danger of harmonics being radiated by the link into the aerial.

The link can best be visualised as a step up-step down transformer. By correct adjustment of the link and grid coils, the grid impedance is stepped down and the plate impedance of the driver stepped up to that value which is necessary in order to load the driver up to give optimum output.

Summing up, we can say that greater excitation is obtained with link coupling; furthermore, feed-back between stages is practically eliminated, as each stage is an entirely separate unit.

Common earth connections which are often responsible for circulating currents between stages can be dispensed with, but this point will be discussed in greater detail under the title "Power Amplifiers."

A link coupling line may be several feet long if desired, a useful point to bear in mind when planning a rack and panel transmitter layout.

Constructing and Adjusting Link-Coupled Circuits.

As stated earlier, the grid circuit of the driven stage must be a tuned circuit, but due to the small currents flowing, the coils may be wound on ordinary 1½-in. receiver coil formers and quite fine wire may be used. The suggested link coil sizes given at the end of this article are applicable to *all* stages of the transmitter. The tuning capacity of the grid circuit should be about 50$\mu\mu$F; ordinary midget condensers are quite satisfactory. It is advisable to keep the grid leads short, in other words, the grid coil and its condenser should be mounted as close as practicable to the valve which it is to control.

The by-pass condenser lead in the grid circuit from the "cold" end of the coil must be earthed by the shortest possible route; this is most important. In a single-ended stage the "cold" portion of a coil is the end furthest from the grid, but in push-pull circuits it is the centre of the coil. All by-pass condensers should be earthed at one point only, a suitable place being the centre point of the filament by-pass condensers. From thence a lead may be taken direct to earth. It is also

advisable to take all other earthed points separately to this point, thereby reducing the risk of circulating currents. This method of earthing is most strongly recommended, and will be referred to again in the next part.

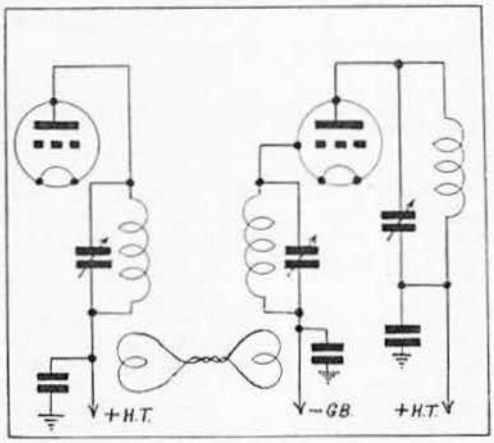


Fig. 21.
A method of link coupling single-ended stages.

The link may be either a twisted pair of *solid wire* or two parallel solid wires. When twisted pairs are used solid rubber covered wire with *no* braid is recommended. A parallel link should be made from slightly spaced bare or enamelled wire —never use stranded wire. The length of the link is not very important, in fact, experiments have shown no great difference in output when the link has been either 1 ft. or 20 ft. long. It is desirable, however, to prevent the link wires from touching the base board or metal chassis, they should, therefore, be supported on stand-off insulators if very long. The method of attachment to the driver plate and driven grid coils is left to the ingenuity of the experimenter. Once the correct position of the link has been found it can be terminated on two of the pins of the coil socket if this type is used. Thus, when changing bands, it is only necessary to substitute new plate and grid coils.

We now come to the actual adjustment of the link coupling for operation.

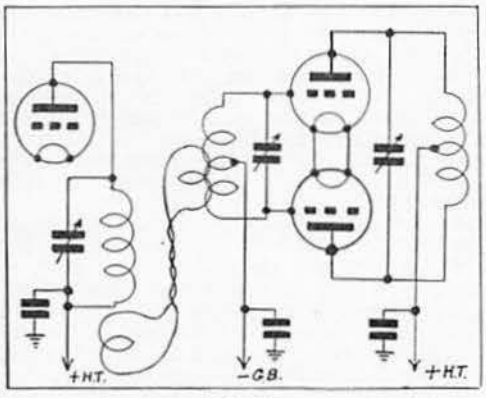


Fig. 22.
Link coupling a single end to a push-pull stage.

Adjustment of the Link.

First of all, tune the driver-plate tank condenser until the familiar resonance dip is obtained; the driven stage should have its filament or heater alight, but no plate voltage applied.

The link loop on the driver is then placed at the "cold" end of the coil, and is not touched again, as all further adjustments are made at the grid coil of the driven stage.

The other end of the link is then placed round the "cold" end of the grid coil (the centre if a push-pull stage is used). For accurate tuning, and as a gauge of excitation, a grid current milliammeter reading 0–30 ma. is strongly recommended. This is inserted between the bias battery (or source of bias if a power pack is used) and the grid bias lead. The grid condenser of the driven stage is now tuned to resonance which will be indicated by a peak on the grid circuit milliammeter. It is then desirable to try different positions of the link by moving its position up and down the grid coil. At each position the grid condenser must be tuned until resonance is obtained.

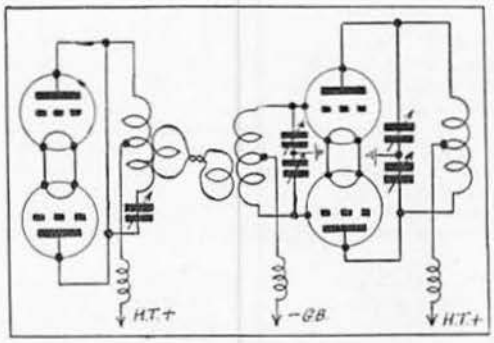


Fig. 23.
Link coupling a push-push stage to a push-pull stage.

Some position will be found where the grid current is greatest, and this is the point where the link should be permanently fixed. It may be found necessary to slightly re-tune the driver-plate circuit as a final operation. In describing this process of adjustment, it has been assumed that the link has only one turn. If, however, the grid current is not sufficient an extra turn or turns must be added, but ordinarily not more than four to five turns are ever necessary, and then only for the lower frequencies, such as 3.5 and 7 Mc. On frequencies higher than 7 Mc. one turn will be ample.

These instructions should enable anyone to tune a link-coupled circuit to its highest efficiency, *i.e.*, the greatest grid current for the driven stage. When this condition has been reached the driven stage may have its plate voltage applied and the plate circuit tuned to resonance, either for link coupling to the next stage or to the aerial.

From the above it should be apparent that link coupling offers decided advantages over capacity coupling. Further, it provides the only satisfactory method of coupling a single-ended driver to a push-pull stage.

The coil tables printed below can also be used for the crystal stages. Methods of biassing all stages will be dealt with in Part III.

TABLE 5.

Coil and Condenser Values for Buffer and/or Doubler Plate Tank Circuits. Link or Capacity Coupling.

Frequency.	Condenser. μμF	Coil Diameter in inches.	Wire Size and Winding.
1.7 Mc.	150	2½	55 turns 20 s.w.g. D.C.C. C.W.
3.5 ,,	100	2½	29 ,, 14 ,, enamel S.W.D.
7.0 ,,	100	2½	10 ,, 14 ,, ,, ,,
14.0 ,,	100	2½	4 ,, 14 ,, ,, ,,
28.0 ,,	100	2½	2 ,, 14 ,, ,, ,,
3.5 ,,	50	1½	40 ,, 22 ,, ,, C.W.
7.0 ,,	50	1½	18 ,, 22 ,, ,, S.W.D.
14.0 ,,	50	1½	10 ,, 18 ,, ,, ,,
28.0 ,,	50	1½	4 ,, 18 ,, ,, Length ¾ in.
3.5 ,,	20	1½	32 ,, 20 ,, ,, C.W.
7.0 ,,	20	1½	18 ,, 18 ,, ,, S.W.D.
14.0 ,,	20	1½	13 ,, 18 ,, ,, ,,
28.0 ,,	20	1½	7 ,, 18 ,, ,, ,,

Note.—C.W. = Close wound. S.W.D. = Spaced wire diameter. Length = Total space occupied by winding.

TABLE 6.

Grid Coils for Link Coupling only (not Centre-tapped). Used for Single-ended Stages as per Fig. 21.

Band.	Condenser. μμF	Coil Diameter in inches.	Wire Size and Winding.
1.7 Mc.	50	1½	80 turns 28 s.w.g. enamel, length 1½ ins.
3.5 ,,	50	1½	30 ,, 20 ,, ,, ,, 1¼ ,,
7.0 ,,	50	1½	18 ,, 20 ,, ,, ,, 1 in.
14.0 ,,	50	1½	10 ,, 20 ,, ,, ,, 1 ,,
28.0 ,,	50	1½	4 ,, 20 ,, ,, ,, ⅝ ,,

Centre-tapped Grid Coils for Figs. 22 and 23.

1.7 ,,	100–100 = 50 μμF	1½	70 turns C.T. 22 s.w.g. enamel, length 2¼ ins.
3.5 ,,	100–100 = 50 μμF	1½	42 ,, ,, 20 ,, ,, ,, 1¾ ,,
7.0 ,,	100–100 = 50 μμF	1½	33 ,, ,, 20 ,, ,, ,, 1½ ,,
14.0 ,,	100–100 = 50 μμF	1½	10 ,, ,, 18 ,, ,, ,, 1 in.
28.0 ,,	100–100 = 50 μμF	1½	6 ,, ,, 18 ,, ,, ,, 1 ,,

Notes.—C.T. = Centre-tapped. Length = Total space occupied by winding.

In all cases the windings given in the Tables may have to be varied slightly, due to circuit layout, etc., but are reasonably accurate as a starting point.

Author's Note.

It is much regretted that certain very obvious mistakes were made in several of the diagrams illustrating Part I of this article.

In Figs. 4 and 5 a lead should have been shown from the cathode to the side of the crystal remote from the grid of the valve.

In Figs. 7 and 8 the common connection to C1, RFC and crystal should have been shown earthed.

In Fig. 10 the earth connection should have been shown on the other side of the screen by-pass condenser, and between the bottom of L2, C2 and R4.

Reports Wanted.

G6CO (London, W.), on his 56 Mc. transmissions from 22.30 to 24.00 B.S.T. Telephony and modulated C.W. will be used.

G6ST (Witham), on his 1.7 Mc. transmissions.

G6PJ (Sheffield) on his 7 Mc. transmissions. All reports will be acknowledged.

G5JZ states that VE4NH is anxious to QSO G's. He is on 14,400 kc. every night at 11.00 M.S.T.

Stray.

We learn from Mr. Piggott (G2PT) that D4CSA, who is coming to England for a short holiday during June and July, wishes to meet British amateurs. If any provincial member would like to meet Herr Schulz he is asked to communicate with Mr. Piggott, 11, Jessica Road, Wandsworth, S.W.18.

TELEVISION AND THE CATHODE RAY TUBE

By G. Parr.

FOR the reproduction of high-definition pictures by the cathode ray tube two units are required :the short-wave receiver for applying the picture signal to the tube, and the scanning circuit for producing the line screen on the end of the tube. The subject of the short-wave receiver can be dealt with by many writers more qualified than the author, and in this article it is proposed to outline only the requirements of the scanning circuit for 240 and 405 line screens.

The successful reproduction of high-definition pictures can only be done by means of a high vacuum tube since the " origin distortion " in the gas-focused type mars the line screen and can only be obviated by more or less complicated methods. In addition, the " modulation characteristic " of the high vacuum is superior to that of the gas-focused type, and the beam can be altered in intensity over a wide range without loss of focus.

The high-vacuum tube nevertheless has one or two special points in its performance which necessitate special circuit design for distortionless scanning at high speeds. Owing to the reduced sensitivity of the tube as compared with the gas-focused type a higher deflecting potential is required for a full screen deflection. The basis of the design of a scanning circuit must take into account the value of this deflecting potential which is derived from the constants of the tube and the size of the screen. Fig. 1 shows the relative sizes of screens of the most commonly manufactured types of tubes. The rectangles shown are in the ratio of 4 : 3, the size of the high-definition picture, and it is assumed that the whole of the fluorescent surface is covered. In practice the area of the screen may be slightly lower than the theoretical value to avoid distortion due to the curvature of the bulb wall. The 5-in. and 7-in. tubes will not be adequate for high-definition scanning without overlapping of the lines, and the lowest satisfactory diameter is 9 ins., although results can be obtained on a 7-in. screen.

From the dimensions of the scan the deflecting voltage required can be obtained by dividing the dimensions of the picture by the sensitivity of the tube in mm. per volt. As an example, take the screen of 10-in. diameter. The dimensions of the picture are approximately 8 ins. by 6 ins., or 200 mm. by 150 mm.

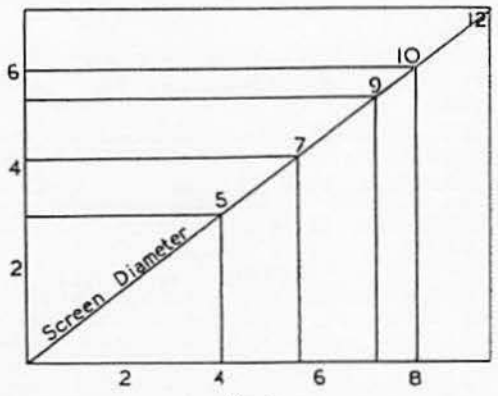


Fig. 1.
Shows the relative screen sizes of the most commonly manufactured cathode ray tubes.

The sensitivity of tubes varies, but an average figure may be taken to be 800/V, where V is the final accelerating voltage.

At 3,000 volts on the tube the sensitivity is 800/3,000, or .27 mm./volt. This figure divided into the length of scan required gives a maximum deflecting potential of about 750 volts, which is a higher figure than would be commonly expected.

The use of such high deflecting potentials accentuates a defect which is present in all cathode ray tubes, but which is normally inappreciable with low accelerating voltages—" trapezium distortion." This, as its name implies, is the distortion of a normal rectangular line screen into a shape resembling a trapezium.

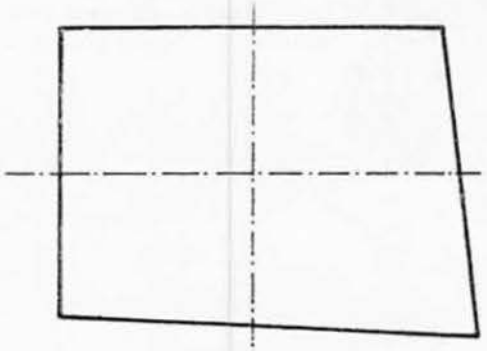


Fig. 2.
Shows the characteristic appearance of a "trapezium distorted" screen.

Fig. 2 shows the characteristic appearance of a " trapezium distorted " screen. The cause is a combination of two effects—cross modulation between the deflector plates due to the high deflecting potential and alteration in the sensitivity of the beam as it approaches and recedes from the margins of the plates. This latter effect can be appreciated when it is remembered that the maximum deflecting potential which has just been worked out amounts to ~~one-quarter~~ that of the final accelerator.

If we assume that one of the plates is momentarily made negative by this amount relative to the accelerator, the velocity of the beam will be reduced as it leaves the accelerator and enters the deflecting field, with a corresponding increase in sensitivity.

Apart from the effect on the sensitivity of the beam, the high deflecting potential will tend to defocus the beam as it passes through the plates, and the distortion described will be accompanied by loss of focus and blurring of the lines at the extremities of the screen. All of these defects can be avoided by making the deflecting potentials symmetrical with respect to the final accelerator

so that the mean potential at any instant is zero, and this can be done by using a push-pull circuit to apply the deflecting potential. The use of a push-pull circuit has the further advantage that the deflecting potential is halved between two valves, giving in the case quoted above 375 volts per valve. Also, owing to the stage gain introduced into the scanning circuit, the input swing to the grids from the timing device is very small, which is of advantage in some types of circuit.

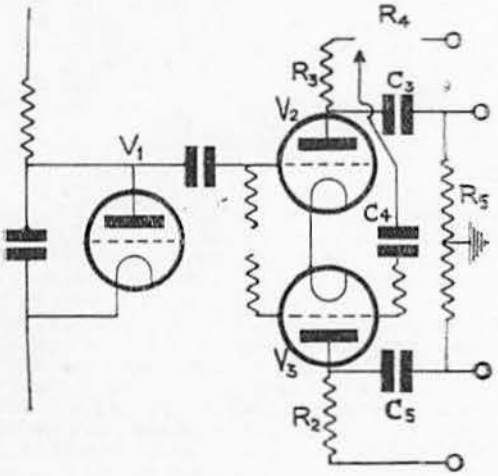


Fig. 3.
A typical push-pull stage added to the conventional condenser-relay circuit.

As to the fundamental circuit for producing the scan, there are several types, the choice depending on considerations of economy, simplicity and relative reliability.

The original "time-base circuit" using a gas-discharge relay has a great deal to be said in its favour owing to its simplicity and the unreliability of the gas-filled valve at high speeds of discharge is overcome by the use of the push-pull amplifying stage. Under normal working conditions the relay becomes erratic at speeds of discharge in excess of 6,000 cycles, although successful operation at 10 kc. and upwards has been noted. The gas pressure and the nature of the gas filling are the most important factors in determining the performance of the relay, but it is now established that improved results at high speeds are obtainable if the discharge potential is kept to as low a value as possible. If we assume a stage gain of 10 in the push-pull stage the input swing required from the relay is only of the order of 40 volts, and at this value it will perform satisfactorily at the speeds required for high-definition scanning. A typical push-pull stage added to the conventional condenser-relay circuit is shown in Fig. 3, the unimportant components being omitted for clarity. The gas-relay V_1 is coupled to the grid of the push-pull valve V_2 through the usual condenser and leak. It is important that the time constant of these components be comparable with that of the main condenser circuit or the scan will be distorted. The second valve of the pair is paraphased from a tapping on the anode resistance of the first (R_4). R_2, the anode resistance, is chosen to equal Rf+Rf to maintain balance. C_3 and C_5 feed the output to the deflector plates, which are earthed through the resistances R_5. These are usually of the order of 5 megs. This type of circuit has been developed and used successfully by von Ardenne in receiving the German transmissions. It should be possible to avoid the use of paraphase by the symmetrical arrangement shown in Fig. 4, in which it will be seen that the charging resistance R_1+R_2 is in two parts. A slight variation in speed can be obtained by varying R_1 as the unbalance is not sufficient to upset the symmetry of the whole circuit.

To economise in valves a simple circuit has been devised by the *Cossor Co.* in which a single valve is used to reverse the phase of a portion of the deflecting potential and to apply it to one plate, the other being fed direct from the relay. This is shown in Fig. 5. The main charging condenser C_1 has another condenser C_2 connected in series with it, the potential across the latter being applied to the grid of the amplifier V_2. The output of this valve is fed to the deflector plate D_2, the other plate D_1 being taken direct to the anode of the relay. It should be noted, however, that this circuit does not enable a low striking potential to be maintained on the relay, as it provides half the deflecting potential. For slow scanning speeds, however, it should be suitable. The ratio of the two condensers depends on the stage gain of the valve, and if this is M, the ratio $C_2/C_1=M$.

In all the above circuits it has been assumed that the main condenser is charged through a resistance and not through a constant current device such as a pentode. The use of resistance condenser circuits has been previously discussed, and it has been shown that, provided the applied H.T. voltage is high enough, no loss in linearity is noticeable in the scan. At the same time it must be remembered that the requirements of a high-definition screen are far more exacting than those of a 30-line, and a slight want of linearity in the scan would cause a serious distortion in the new system. It is generally accepted that the ratio of striking voltage to overall H.T. voltage must be 5 : 1 if

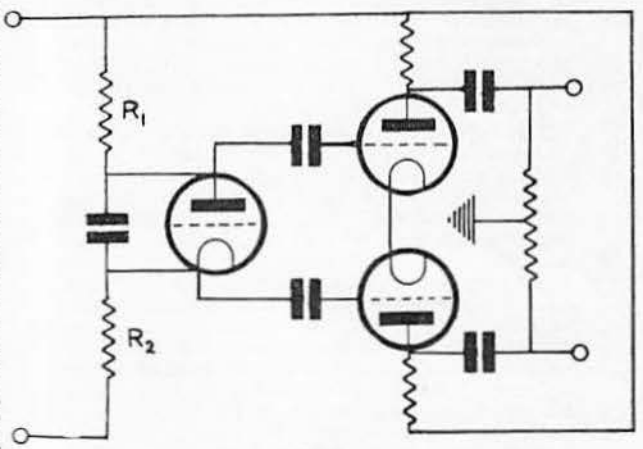


Fig. 4.
A symmetrical arrangement designed to avoid the use of paraphase.

distortion is to be avoided. If a value of 1,000-1,500 volts is chosen for the scanning circuit, ample voltage is available for the condenser charging and

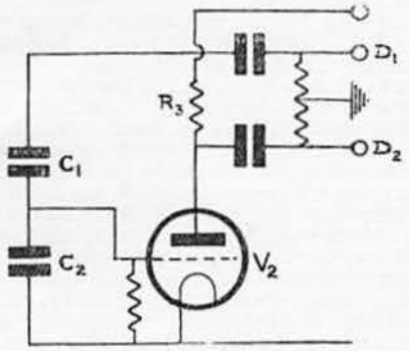


Fig. 5.
A simple circuit in which a single valve is used to reverse the phase of a portion of the deflecting potential and apply it to one plate.

for the push-pull anodes, and anode resistance of 100,000 ohms may be used with valves of the AC/P type. The use of a pentode for charging the condenser enables the overall voltage to be reduced to, say, 500, but there is the extra expense of the valve to offset the economy in the transformer. Since the H.T. supply can be half-wave, well smoothed, there seems little extra expense in the high voltage supply.

(To be continued.)

(Continued from next column.)

The large condenser undoubtedly acts as a reservoir and prevents the surges, which give rise, apparently, to the " bursts " mentioned. Powerful super-heterodynes are more prone to surges than are super-heterodynes of the smaller type. It was found that a condenser of 16 μF gave the best all-round results on the writer's receiver. A Helsby dry electrolytic condenser was used, care being taken to connect up the condenser in the correct polarity. The Research and Experimental Section may, perhaps, be able to carry this experiment a stage or more onward. Who knows !

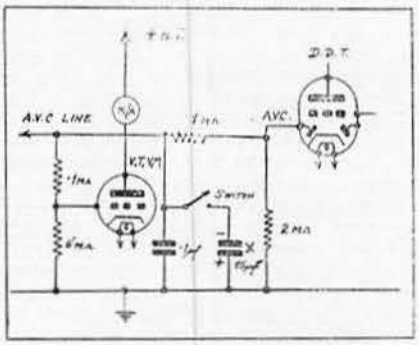
The explanation offered is as follows : It was observed that the " slipping out of control " of the receiver coincided, naturally, with a rapid upward movement of the needle of the milliameter in the plate circuit of the V.T.V.M., thus indicating less negative voltage on the A.V.C. line. Almost immediately, the A.V.C. again assumes control and a surge takes place. We cannot as yet design an A.V.C. scheme which will react instantaneously to ultra rapid fading, but we can use the large condenser in the position shown. This condenser retains its charge, and—during the period of a surge or " burst " or whatever one likes to call it—holds the A.V.C. line more or less at the same negative potential. A very slight fading may be observed, but no surge takes place and the net result is improved reception, which is exactly what is required.

Improving A.V.C. on Short-Wave Broadcasting

By J. MacIntosh, VS1AA (Ex VS2AF).

READERS are mainly interested in transmission but we could scarcely be called experimenters did we not interest ourselves, at least occasionally, in the reception of the short-wave British Broadcasting Stations. This is particularly applicable to our B.E.R.U. members.

The writer has just completed a powerful super-heterodyne ; the circuit being signal frequency R.F., triode hexode frequency changer, three I.F. valves, D.D.T., A.F. valve, and push-pull output. All R.F. valves are 7-pin British pentodes. The maximum output is 12 watts U.P.O. A.V.C. was first connected to all R.F. valves, but when bad fading was prevalent, it was observed that " bursts " took place, as if the frequency changer was being detuned ever so slightly. A.V.C. was then connected to the first and second I.F. valves only and a slight improvement was observed. Results still left a lot to be desired, however, so experiments were undertaken to get at the root of the trouble, if possible. Eventually it was discovered that the " bursts " could be completely cured by connecting a very large value condenser, 16 or 25 μF, across the input to the A.V.C. line, as shown in position X below. Results were now greatly improved and as good as could be expected under the circumstances. Normal fading, even under very bad conditions, was negligible, while ultra-rapid fading (or " wavering ") no longer manifested itself. A switch was arranged to disconnect the large condenser when necessary. Actually, the condenser could always be left in circuit, but if, *e.g.*, a valve voltmeter (American V.T.V.M.) is used for the purpose of tuning, then the large condenser so slows up the action of the A.V.C., that the milliameter in the plate circuit of the valve voltmeter responds too slowly for accurate tuning. The remedy is to disconnect the condenser X when tuning in.



The co-operation of VS2AG was secured to test out this experiment, and a favourable report has come to hand. The scheme is therefore passed on to all who are interested, as it would appear to solve some of the problems of short-wave fading in a simple and effective manner.

(Continued in previous column.)

THE R-S-M-Q SYSTEM

A Standard Method of Reporting for Telephony

By Arthur M. Braaten (W2BSR).

Introduction.

HERETOFORE there has been available no reporting or logging system devised especially for amateur radio telephone communication. As a makeshift, 'phone men have been forced to adopt the outmoded, misleading codes used in telegraphy. These codes, being designed for telegraph work only, are, of course, quite unsuited for use in telephony. Many 'phone men, appreciating the conciseness of the R-S-T System and the lack of confusion in its use, have expressed a desire for a similar system, including a code for describing modulation, which could be used in their work. With the requirements of these men in mind, such a system has been evolved. It is presented herewith for the consideration of the amateur radio fraternity.

Need for a 'Phone Reporting System.

Because of the nature of the codes of necessity now being used in 'phone work, it is impossible to adequately describe any 'phone signal. The result is that only a few more or less stereotyped forms of reports are generally used. Most transmissions are reported as " QSA 5 R9," or " 100 per cent." In extreme cases, when the operator's conscience is allowed to take control, a report of " QSA 4 R5 " is given. Modulation is generally glibly described either as " broadcast quality " or just plain " FB." Commercial radio communications companies have long used standard systems for logging and reporting broadcasts or other 'phone transmissions. A good system for amateur work was never more needed than at the present time.

Requirements.

Some readers are perhaps acquainted with the " Risafmone " or the " Rafisbemqo " systems used in commercial telephone work. Most amateurs, however, are probably not aware of their existence. Briefly, they are systems in which signals are described by means of code numbers, in the same manner that the " Frame " and the " R-S-T " systems are used in telegraphy. The letters of the code words stand for the various characteristics, of signal and reception conditions, to be described. The reports are always made in a definite order, determined by the sequence of the letters of the code word.

The commercial systems are, of course, much too complicated for use in amateur 'phone work. The " Rafisbemqo " system, for example, takes in carrier strength, fading depth, fading frequency, QRM, QRN, background noise, transmitted noise, modulation degree, modulation quality, and overall rating. Each of these characteristics is divided into from 1 to 5 or from 0 to 5 parts, depending on the characteristic. In the cases of " fading frequency " and " modulation degree," an additional or sixth classification is provided for abnormal conditions, these being for audio fading and for over-modulation, respectively. It is interesting to note that carrier strength is divided into five parts, not nine.

For amateur work, a code, to be really useful, must be as simple as possible. Due to the nature of amateur operating conditions, only the main characteristics necessary to accurately describe a transmission should be included. Inclusion of characteristics of relative unimportance to the amateur would only serve to create needless confusion. As in telegraphy, the most important characteristic of a 'phone signal is Readability. Next, in order, come Signal Strength and Modulation. Such extraneous influences as QRM and QRN, in so far as they affect the readability of the transmission, are taken care of in the Readability portion of the report.

The Proposed System.

In the new 'phone system the codes for Readability and Signal Strength are the same as in the R-S-T System. The reasons for this will be obvious. However, they will be given here for the sake of completeness.

Readability.

1. Unreadable.
2. Barely readable—occasional words distinguishable.
3. Readable with considerable difficulty.
4. Readable with practically no difficulty.
5. Perfectly readable.

Signal Strength.

1. Faint—signals barely perceptible.
2. Very weak signals.
3. Weak signals.
4. Fair signals.
5. Fairly good signals.
6. Good signals.
7. Moderately strong signals.
8. Strong signals.
9. Extremely strong signals.

A modulated transmission has two main characteristics. These are (1) degree or depth of modulation, and (2) quality. To adequately describe a modulated wave it is necessary that both of these characteristics be given. The degree of modulation may vary from zero to over a hundred per cent. The quality of the modulation may vary from very poor to the optimum obtainable with modern equipment. Thus, in place of the single tone code for telegraphy, we have in the case of telephony two for modulation, one for degree, and another for quality.

Modulation (Degree).

1. No modulation perceptible ... 0%
2. Very low ... ... 0— 25%
3. Low ... ... 25— 50%
4. Medium ... ... 50— 75%
5. High ... ... 75—100%
6. Over-modulated ... Greater than 100%

A good quality scale for 'phone work is even more difficult to devise than a tone scale for telegraphy. Since, in amateur practice, the judging of quality is done by means of any number of different types of receivers, it is necessary that the scale be so arranged that reasonably consistent reports will be given by all observers. In many cases the fidelity of a receiver used by an amateur is inferior

to the transmission being received. At any rate, the best receivers are quite a bit inferior to the best transmitters. The approximate transmission range of a high quality broadcast transmitter is from 30 to 8,000 cycles per second. That of an ordinary quality broadcast station is from about 90 to 5,000 cycles. A high-quality radio set will faithfully reproduce frequencies from around 50 to 5,500 cycles, while a poor receiver will pass from, say, 250 to 2,200 cycles. Tests have shown that experienced listeners can notice the difference in quality of sounds when frequencies below 8,000 cycles or above 80 cycles are cut off. For faithful reproduction of speech a range of from 150 to 8,000 cycles is required. (W. B. Snow, Audible Frequency Ranges of Music, Speech, and Noise, p. 616, *The Bell System Technical Journal*, October, 1931.) The ordinary, wire-telephone talking circuit is only good for from 250 to 2,750 cycles. This range has been adopted as standard for its speech transmission circuits by the Bell System as giving the optimum articulation with a minimum amount of extraneous noise. (W. H. Martin, Transmitted Frequency Range for Telephone Message Circuits, p. 483, *The Bell System Technical Journal*, July, 1930.) However, there is usually an ordinary instrument at the ends of such a line, so that the frequency range is somewhat further narrowed down. To use the words of Professor Morecroft, " Just enough of the frequency band is transmitted to enable the listener to make an intelligent guess as to what is being said." (J. H. Morecroft, *Principles of Radio Communication*, 2nd edition, p. 753.) The French type 'phone now used quite extensively in the United States is considerably better than the ordinary, older type instrument.

At first it was planned to arrange the quality scale on a basis of approximate ranges of frequency fidelity. Due, however, to the fidelity limitations of receivers this plan was abandoned as unsuitable. It was decided that the most satisfactory and workable arrangement would be a comparative scale which would not depend to such a great extent on the type of receiver being used. Since the judging is done entirely by ear, a scale of five gradations, ranging from very poor to excellent, seems to be the most suitable. The commercial people have evidently reached the same conclusion, since the quality scale in the " Rafisbemqo " system is identical with the one given here. An experienced operator, by listening to stations known to have high fidelity, can soon become proficient in grading the quality of transmissions according to this scale.

Quality.

1. Very poor.
2. Poor.
3. Fair.
4. Good.
5. Excellent.

Quality depends upon two factors, fidelity and harmonic distortion. The maximum allowable harmonic distortion for a high-quality system is 5 per cent. This is unnoticeable to most people. When the distortion goes beyond about 10 per cent. it becomes objectionable. It may be well to point out here approximately what may be called " excellent," " good," etc., qualities. " Excellent " is that quality which will be obtained from high-fidelity equipment, in proper adjustment, and the use of velocity, condenser, crystal, or the better grades of dynamic and double-button microphones. " Good " will be obtained from reasonably high-quality equipment, assuming proper adjustments for no distortion, in combination with a double-button or a dynamic microphone of the common variety. " Fair " quality will result from the use of average equipment and a good single-button microphone. Only a slight amount of distortion should be noticeable. " Poor " quality will come from a cheaply-constructed microphone, or poor audio equipment, or improper adjustments of the speech amplifiers, whether they be good or poor. Absence of highs or lows, or the presence of frequency peaks, will be noticeable. A quality comparable to that of the ordinary wire-telephone circuit, with which everyone is familiar, falls in this class. " Very poor " will, of course, be marked by serious distortion, which may be caused either by the speech equipment or by over-modulation. It should be pointed out that the quality code is only comparative, and no exact definitions can be given for the various gradations. The foregoing characteristics are given only as a guide to aid in the determination of the proper quality classification.

Application.

The R-S-M-Q System is used in exactly the same manner as the R-S-T System. The letters R, S, M, and Q, which in order stand for readability, signal strength, modulation degree, and quality of modulation, determine the sequence in which the report is given or logged. The optimum report will, of course, be " RSMQ 5955." After the system is well established the use of the letters before the figures can be dispensed with. It should be thoroughly understood that a four-figure report means that this system is being used. When atmospherics, interference, or fading affect the readability the report may be made somewhat like this, " RSMQ 3755 QRM," or just " 3755 QRM." Fading can also be shown, if so desired, as varying between certain limits, as " 49/444." When conditions are such that it is impossible to make a fair estimate of the quality, as, for instance, if a receiver is being used which has a very poor audio characteristic, or if it is equipped with a narrow band-pass system or a crystal filter, it would be advisable to replace the " Q " number with a question mark. A report of this type might take the form, " 364? QRN."

Discussion.

It is expected that a few 'phone men will say that a code for telephony is not necessary, that the characteristics of a transmission can be more accurately given directly in words. Right! I do not think anyone would argue that point. The system is not intended to take the place of extended discussions on the merits of a signal, nor to discourage such discussions. No one need feel obliged to use the system over the air if he prefers to talk at length. However, it is not always desired to take up valuable time in this manner. The fact that some 'phone men have asked for a code seems to indicate that there exists a need for one. I believe that the system will find its greatest use in the making of entries in the log, or for reports on QSL cards. There is no doubt that it is the most convenient method of recording such data and for transmitting it in writing. The receiving operator can easily translate a report, regardless of how it is

given him, into this code for entering in his log. This is practically the only way to gather signal data in a form that can readily be referred to. Sometimes the occasion arises where an operator desires a series of reports on his signals over a period of time, perhaps from observers who may not be able to communicate with him directly by voice. In any case, it will be evident that the only practicable way of transmitting a series of reports, whether by voice, key, or mail, is by means of some code.

In the modulation code it will be noted that the first gradation is for no perceptible modulation. The question may arise, " How can a 'phone signal have no modulation ? " The modulation may be there, but it may not be deep enough to be heard at the receiving point. C.W. men who have had foreign amateurs ask them to stand by for a 'phone test will appreciate this scale step. Very often in such cases the impression is that the operator at the other end is merely holding down his key.

While realising that this system is by no means the perfect solution, it is hoped that it will prove useful until such time when something more satisfactory is devised. The author wishes to acknowledge with thanks the many helpful suggestions made during the preparation of this article by Mr. M. G. Crosby, W2CSY, a specialist in modulation.

For the benefit of those who may not be acquainted with the R-S-T System referred to herein, it was first described in the October, 1934, issues of both " QST " and the T. & R. BULLETIN. Later it appeared in the German " CQ-MB." In deference to popular amateur opinion, the signal strength portion of the system was changed from a five-point to a nine-point scale. (See August, 1935, issues of " QST " and T. & R. BULLETIN). This change was enthusiastically received and was immediately adopted by the A.R.R.L. (October, 1935, " QST "). The complete system is given in the 1936 A.R.R.L. Handbook. That R-S-T is rapidly finding favour abroad is evidenced by an increasing number of QSL cards being received from countries in all continents on which the old method of reporting has been replaced by the new system.

STATION DESCRIPTION No. 46

MR. H. F. WARING, the operator of W9NY, is now working exclusively on 28 Mc., but as early as 1916 his station, then 9AEX, worked on 200 metres, and in subsequent years it was active on 3.5, 7 and 14 Mc., until in February, 1932, it had reached 56 Mc. Since November 19, 1933, the station has been operated only in the 28 Mc. band as the operator felt that when the band " opened up " signals from as many points as possible should be on show.

Located in the city of Milwaukee—on the extreme north side (N. Lat. 43° 6′ ; W. Long. 87° 56′ 20″)—W9NY has to work through serious QRM from cars, etc. Nevertheless he was active throughout the whole of the recent 28 Mc. contest, and succeeded in scoring 2,260 points.

The operating end at W9NY. The cards confirm 28 Mc. contacts made during 1935. The receiver to the left is a National HRO. The transposed feeder goes to the send-receive switch. The remaining gear is concerned with police radio work.

The transmitter uses a 7 Mc. crystal in a 59 oscillator-doubler electron coupled stage, which feeds a 59 regenerative doubler. This " Tritet exciter unit " was described in *QST* for October, 1933. It was found necessary, however, to use a plate voltage of 600 on both valves in order to obtain sufficient excitation for the final stage. For the first six months of the contest the final stage was a pair of 210's with 80 watts input, and for the last six months the final used a pair of 810's (210's with carbon plates) running at between 150 and 200 watts input. The layout of this stage follows low frequency practice, and the grid and plate inductances consist of six turns of No. 10 wire (No. 12 S.W.G.) 2 inches in diameter, and spaced about ½ inch. These are tuned by small 35 μμF split stator condensers. The coupling between the 59 doubler and the final is through a short link circuit. The aerial feeders are tapped on to the plate coil about 1½ inches from the centre-tap through .0005 μF fixed condensers to isolate the plate voltage from the aerial.

The same aerial has always been used for both transmitting and receiving, a double pole-double throw switch being operated by ropes from the operating desk. A vertical half-wave dipole aerial is used, consisting of 16½ ft. of No. 10 wire mounted on 3 in. standoff insulators from a 20 ft. pole attached to the chimney. The lower end of the aerial is about 22 ft. above the ground. A 440 ohm transposed feeder line is matched to the 80 ohm aerial by means of a quarter wave transformer inserted between the middle of the aerial and the line.

Three different receivers were used—a tuned H.F. autodyne L.F., a National FB7 superhet, and a National HRO.

(*Continued on page* 476.)

THE EUROPEAN BROTHERHOOD

By J. Piggott (G2PT).

THERE has been much heard of the distrust and enmity between nations in Europe to-day, and the writer has longed to counteract this disturbing state of affairs. The success of experimental radio work in which co-operation from Europe is essential, depends upon the reliability of the station contacted, which incorporates some personal knowledge of the man in charge of the key.

The first venture was to Belgium in 1934, and the few days spent with ON4ZA gave the writer enthusiasm to explore fresh fields. For some time G2PT had had "skeds" with definite European stations, and when the opportunity came, he decided to visit some of them. D4CSA was the best "sked," but his QRA was in Königsberg, East Prussia, rather a long way from South London on a cycle. However, early in July last, with some vague plan for days ahead, a map of Europe tucked away in a saddle-bag, a few QSL cards as introductions, and a ticket for the Harwich-Esbjerg boat to OZ, London's traffic was soon left behind.

The North Sea unsteadiness was quickly forgotten as a "CQ" was heard whistled by OZ1I, who had come to meet the boat. Together with OZ1I a visit was paid to Horsens, where 7HK was host. Here, the visit, due to a friendship of the ether, caused no small stir and the local paper printed columns about it! From Jutland the writer crossed into Fyn, where a visit was paid to OZ7YL, the only licensed YL in Scandinavia. Some trouble was experienced in finding the house, for the pronunciation of the road was impossible, but the Danes are a very friendly people, and help for a traveller in difficulties was always forthcoming. From Odense it was a short ride northwards to OZ4LM at Lango, he came by cycle to meet his "English brother," and it was an indescribable feeling to shake this OM's hand after conversations only in the air. He was the District School-master, and during the happy days spent with him one was roused by the sound of his fiddle playing in accompaniment to children's voices. At nine the school had a half-hour break, and 4LM would then be busy at the key, and if conditions were good, perhaps the kiddies had more than the half-hour!

Cyclist meets cyclist. G2PT (right) makes (left) a personal QSO with OZ4LM.

From 4LM skeds with D4CSA were kept telling of the progress of the travel to see him. It took about 3 days to reach Copenhagen, where a boat was to leave for Danzig. On the day of departure the writer found himself on the deck of a tiny Danish boat with 17 other passengers of almost as many nationalities, every language seemed to be spoken, and nearly everyone seemed to have someone to see them off. Feeling lonely for the first time and sad at the prospect of leaving Denmark and remembering the cheery voice of OZ1I, two weeks back, saying "welcome," it was a tremendous thrill to hear some unexpected morse whistled by an unknown messenger boy who cycled up to the quay about 15 minutes before departure. "G2PT CQ de OZ3D." It was but a short chat in which he explained that he had heard over the air of the voyage by this boat and had come down to say "Cheerio!" So, after all, there *was* someone to say "Goodbye" from Denmark.

During the trip "Spark's" cabin was sought, but, for he was the only one on board who knew any English. The boat stopped at Zoppot and decided not to go on to Danzig, and here some trouble began. Apparently a cycle was an unknown piece of luggage, and it was only after much payment of dues and tolls that permission to land was given. To Danzig D4CSA had come, and together we cycled to his home in Konigsberg. Long ragchews were enjoyed, for we had had many QSO's and radio experiences together, and were both very keen to understand each other's point of view. He was a medical student, and luckily his long vacation had just started. Time spent in East Prussia went very quickly, for the fellows in that district had never seen an English amateur before, and were very anxious to make the long journey worth while. The hospitality and plans for trips seemed to have no end and chief of the hosts was Uncle Hugo Fagien, Germany's oldest Ham, in whose little car many places were visited. Due to tension between Germany and Lithuania, D4CSA was not allowed by the Lithuanians to enter LY, and so a trip to the Memelgebiet had to be done alone.

After returning to D4CSA, we went southwards, and entered Poland, reaching Warsaw before any amateurs were met. Here SP1TZ, a retired Army Captain, was visited and another sought out in hospital. Imagine his excitement when this unexpected visit took place. The roads were so

(*Continued on page* 476.)

Uncle Hugo Fagien, Germany's oldest transmitting amateur, takes G2PT and D4CSA for a trip in East Prussia

AN EFFECTIVE TRANSMITTER FOR 28 AND 14 Mc.

By D. L. Martin.

IN the recent review of the new A.R.R.L. Handbook, a remark was passed to the effect that the cost and design of modern apparatus was far beyond the average amateur's pocket-book and workship facilities. The transmitter to be described is well within the reach of any amateur who can afford a licence and the construction is simple, in fact, because of the latter, there is not much that need be said in this respect.

The simplicity is accounted for by making use of the Unity-Couple principle with two valves connected in Push-Pull, and the general construction is shown clearly in the accompanying photograph. The Anode-Loop is made with $\frac{3}{8}$-in. diameter copper tube, and about 30 ins. long, shaped to form a circle of approx. 10 in. diameter with the ends cut back for $\frac{1}{2}$ in. on the inside. Suitable holes are drilled in the projecting pieces thus formed, to take the bolts that hold the valve-holders in position. These bolts are screwed into prepared holes in the bottom of the anode sockets and thus make a direct connection between the anodes and the ends of the loop. Difficulty may be experienced in getting similar valve-holders, as those shown are an old type bearing the name *Athol*. It would be desirable to use something more solid as the porcelain is very easily cracked during construction. The two adjacent filament terminals are embraced by a common nut with one on either side for locking, and supply connection respectively.

The tank condenser can be .0001 μF if 28 Mc. only is to be used, but by using .00025 μF this and the 14 Mc. band can be covered in one adjustment. The condenser must be suspended on solid, flat connections. The 16 S.W.G. grid coil is threaded through the loop and insulated with glass beads, but ordinary flex would make an easier job of the centre-tap. This is brought out through an insulated sleeve in a $\frac{1}{4}$-in. hole drilled at the centre, and on the inside, of the loop. The latter is held to the base by suitably-grooved blocks which were ebonite in the original, but there is no reason why hard wood should not be used as there should be a minimum of H.F. at this point. The anode centre tap is made by resting the loop on a brass angle bracket, complete with terminal, screwed to the base. Here also, are fixed three double-headed terminals to anchor the ends of the 20,000 ohm 1-watt grid resistance and L.T. leads respectively. External connections are made to the top portions of the terminals. No H.F. chokes or by-pass condensers are used in order to simplify matters. The set is not intended for powers of more than 10 watts.

Results.

The set gave a very good account of itself on 28 Mc. at VU2BL during the early part of this year. Contacts with VK, ZE, and G yielded an average tone report of T8, and during a long QSO with VU2LJ he reported that his receiver did not require any further adjustment after the initial one. Of course the transmitter was mounted on a solid base clear of keying vibrations, etc. The aerial used was a Windom, designed for 28,100 kc. and the dimensions were as follows:—top, 16 ft. 10.44 in., and the line tapped on the aerial at a point 2 ft. 4 in. from the centre; using 16 S.W.G. wire. The set-end of the line was connected as shown in the photograph.

On 14 Mc. the same aerial was used, acting as an A.O.G. (working length, 79 ft.), and ZL2BZ reported QSA 5 R6 T9. An improvement could have been made by using the same aerial adapted on G2BI lines. During all tests the local 220v D.C. supply mains were used for H.T., and unfiltered. It is hoped that this article will have the effect of getting more active stations on 28 Mc. so that our old friend "CONDX" will not always be blamed for those quiet periods!

Trade Notice.

We have been advised by *Westinghouse Brake and Signal Co.*, that due to an increasing demand for their half-wave Westectors, Types W4, W6 and WX6, they have been able to reduce their retail price from 7s. 6d. to 5s.

Ex G2II.

Mr. David Mitchell informs us that he has been issued with the call signs G6AA and G6MX, the latter being for portable work. Mr. Mitchell until recently was operator of G2II.

BRIGHT IDEAS.—No. 5.

A COMBINED telephony monitor, tuning lamp, and absorption frequency meter can be made very simply by arranging a D.P.D.T. switch to throw a coil and condenser either across a W6 Westector in series with a phone jack for monitoring, or across a flash-lamp for tuning purposes. See Fig. 1.

* * *

Permanent facilities for testing condensers and circuit continuity are an asset to any station. One method of providing them is as follows:—

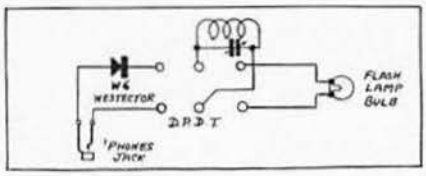


Fig. 1.

The output of an H.T. mains unit is taken to the two plungers of a D.P.D.T. switch so that, when not serving its normal purpose, the D.C. may be passed to two testing prods. Two lead-in tubes with ebonite casing serve well for insulated prods. A beehive neon lamp is wired in series with one of the prods.

If the condenser under test is sound its charging up will be indicated by the neon's "striking" only once when the prods are applied. A continuous glow means a complete breakdown, while flashing at intervals indicates slow breaking down the rapidity being governed by the amount of leakage.

For continuity tests, the neon will "strike," of course, when the prods are placed across the two ends of any complete circuit or continuous winding, failure to strike indicating an open circuit.

* * *

Rope, though otherwise excellent for holding up aerials, has an unpleasant habit of varying in length in wet weather. This defect may be overcome, however, by arranging an "endless" rope over the pulley and hanging a window sash-weight from the lower end of the rope. This will pull the aerial taut again after a rainy spell. Owing to the extra strain on the pulley it is advisable to replace it by a manger-ring, and the rope should be passed through a second ring a few feet from the bottom of the pole to steady it. Zepp feeders may also be stayed by attaching a rope to each end of an appropriate spreader and tying a sash-weight to the bottom of each rope. In this case also the ropes should be passed through rings fixed to a fence or to stakes.

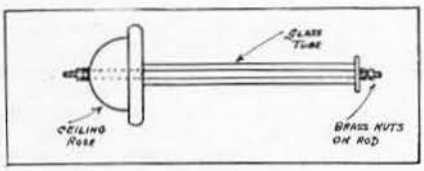


Fig. 2.

* * *

When it is desired to use an American valve in a transmitter wired for English valves without the trouble of replacing the valve-holder, the following suggestion may be useful. An angle bracket of the type used for supporting condensers should be mounted close to the valve-holder. A thin metal strip bent to form a clamp should then be bolted or soldered to the bracket, the valve placed in the clamp and gripped by bolting together the free ends of the clamp. Wires may then be soldered to the valve pins and taken to the appropriate contacts of the English valve-holder.

* * *

A ceiling-rose, a glass tube, and a brass rod from an old BCL lead-in tube may be easily converted into an efficient lead-in tube for short wave work, as shown in Fig. 2. Stand-off insulators may also be made from ceiling-roses by fixing a short bolt through the hole in the top of the rose and securing it by a nut on each side of the hole. If the plug-in type is preferred the bolt may be replaced by one of the old-type brass valve sockets. *Clix* coil pins attached to the ends of the copper tube coils may then be plugged into the stand-off insulators.

* * *

Trouble with sparking neutralising condensers may be avoided by using a rebuilt *Eddystone* .00016 μF variable receiving condenser. The fixed vanes should be unsoldered and removed, and the moving vanes taken off by tapping them gently. The condenser should then be reassembled with two moving vanes and one fixed, the space between the moving vanes being approximately three-sixteenths of an inch. This will give a maximum capacity of about .000025 μF.

* * *

Owners of indoor "shacks" have to solve the knotty problem of displaying QSL cards without damaging the walls. Ordinary garden trellis-work provides a simple solution, for opened to the required length, and hung from the picture rail, it forms a good base on which to pin the cards.

G2NS.

* * *

Cheap stand-off insulators may be made from bakelite salt containers sold at Woolworth's Stores. The single hole in the top will take an ordinary terminal, and it is advisable to fit a lock nut on the inside to keep the terminal from turning. Two holes should be drilled in the base (which conveniently screws off) to take wood screws for fastening it to the transmitter baseboard. The total cost is 4d.

G2JY.

* * *

Being in need of an American type, four pin valve-holder, and not being able to purchase one locally, the problem was solved in the following manner:—A square piece of ebonite was drilled with holes slightly larger than the valve pins. Copper contact strips were fashioned and pushed through the holes and then bolted to the ebonite leaving a lug on the outside for soldering purposes. See Fig. 3. The holder is mounted on spacing washers.

2AHM.

The system of continuous monitoring of all transmissions from SU2TW may be of interest to others.

Reference to Fig. 4 shows the receiver to employ choke capacity output with the headphones in both receiver and monitor circuits. The transmitter is not remotely controlled but break-in

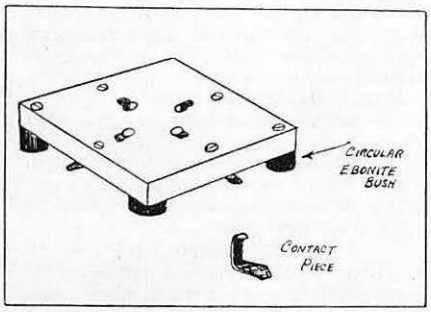


Fig. 3.

operation is effected merely by keying with the receiver switched on, care being taken to reduce induced currents in the receiver filament circuit. A clear note from the monitor is thus heard apart from the thump due to the receiver.

It is hoped to arrange a more efficient method of automatic transmitter switching and break-in working so soon as a pair of relays are obtained.

SU2TW.

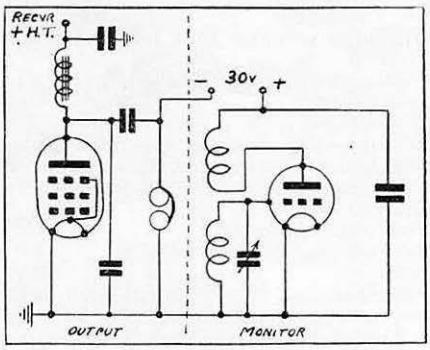


Fig. 4.

Finding that the shafting was not threaded far enough to allow for tightening up when double pacing some old .0005 μF receiving type condensers for use in the transmitter, the writer decided to replace all the plates and still reduce the capacity to approximately .000125 μF. This was accomplished by replacing the vanes two at a time. The result is a very robust job, particularly as the moving vanes are bolted at the outer ends.

2AHM.

* * *

Apropos the "Bright Idea" published in a recent issue, which referred to a method of bringing in an aerial through glass, G6US points out that unless the glass is of the plate variety, it will rapidly become smashed, due to strain either from the aerial or the feeders. G6US considers wood much more satisfactory for the purpose.

In regard to the ceiling rose suggestion, several readers have pointed out that the insulation properties of porcelain compare poorly with Pyrex unless a very high quality is used.

* * *

For successful "break-in" work, the writer recommends that the C.O. valve be very lightly loaded, say 80/100 volts to a 46 or 47. Keying can then be effected in a neutralised buffer operating on, say, 250 volts. If the remaining stages are biased to cut-off, and the plate volts left connected, the oscillator signal when working for example, on 7 Mc., will be so weak that it will be found possible to work right up to one's own frequency.

It is better to run the neutralised buffer on the crystal frequency as this allows the c.o. voltage to be reduced to a minimum and still permit plenty of R.F. excitation to pass into the keyed stage.

The ability to work "break-in" overshadows the attendant cost of the additional neutralised amplifier.

VK3EG.

* * *

No doubt many amateurs, when making connections inside a receiver actually in use, have accidentally shorted out the H.T. battery or caused other trouble through a live lead touching the metalising on a valve, this being particularly likely to happen when fitting the anode cap on a screened grid valve.

To obviate this, it is recommended that the metalising be given two or three coats of clear cellulose varnish, which will be found to provide adequate insulation, at the same time improving the appearance of the valve, and keeping it much cleaner.

The above refers to battery valves only—mains valves should not be treated in this way as it would tend to prevent the escape of heat, and, in any case, is unnecessary, since one does not usually make connections with the power pack energised. Incidentally, it may be said that the metalising on valves presents quite a high impedance to the high frequencies used by amateurs, and in some cases can actually be the cause of stray couplings. A clear bulb valve, used with solid metal screens, will be much more effective.

G5JU.

Some Rapid W.A.C.'s.

Hot on the news that G6CJ had W.A.C.'d in 3¾ hours on 28 Mc., came news that G6WY had made a similar set of contacts in 1 hour 25 minutes on the 14 Mc. band. Yet another good performance was put up by G6NJ, who worked the six continents on 14 Mc. in 2 hours 20 minutes, between 19.10 and 21.30 G.M.T., on April 27. His contacts were with FB8AG, W3FXP, VK4HR, G5JF, J4CT and LU6JB.

What *is* the record time for a W.A.C. ? We believe it has been done in 55 minutes.

VALVE REVIEWS

Hivac PX230 S.W.

THE Hivac PX230 S.W. is a battery power valve modified for ultra short wave working manufactured by *The High Vacuum Valve Co., Ltd.* The valve is a triode fitted with a 4-pin ceramic base, and has the grid brought out to a push-on type top cap.

Characteristics.	*Makers.*	*Measured Sample.*	
Filament volts	2.0	2.0	
,, current (amps.)	0.3	0.30	
Anode volts	150	150	
Mutual conductance ...	3.5†	3.75†	1.77 *
Amplification factor ...	6.5†	7.08†	6.60 *
Impedance (ohms) ...	1850†	1900†	3800 *
Optimum load (ohms) ...	4000	Not measured	
Power output (watts) ...	0.45	,,	,,

†Taken at anode volts 100, grid volts 0.
* ,, ,, 150 ,, −15.

Characteristic Curve

The sample was found to agree quite closely with the makers' published curve, except that the grid base was somewhat shorter, cut off being at −20 volts compared with −25 volts; this difference is of no consequence. The valve was found to be quite hard, no trace of gas being measurable after running for 15 minutes at maximum conditions.

Inter-electrode Capacities

Grid—all other electrodes ...	8.5 $\mu\mu F$
Anode ,, ,, ...	10.0 ,,
Grid—anode	6.5 ,,

The valve is primarily designed as an output triode for battery receivers, for which purpose it would appear quite satisfactory, the S/W version reviewed is suitable for use in 56 Mc. receivers and for the low power stages of a 56 Mc. transmitter. In the latter connection a unit for a 56 Mc. transmitter employing three of these valves was described in the April BULLETIN.

Hivac D210 S.W.

The Hivac D210 S.W. is a battery detector valve modified for use on ultra short waves. The valve is a triode and is fitted with a 4-pin ceramic base. The grid is brought out to a push-on type top cap; the bulb is metallised.

Characteristics.	*Makers.*	*Measured Sample.*	
Filament volts	2.0	2.0	
Filament current (amps.)	0.1	0.11	
Anode volts (max.) ...	150	150	
Mutual conductance ...	1.35†	1.75†	1.64 *
Amplification factor ...	16†	19.2†	18.0 *
Impedance (ohms) ...	12,000†	11,300†	11,500 *

†Measured at anode volts 100, grid volts 0.
* ,, ,, 150, ,, −3.

Characteristice Curve

The sample was found to agree closely with the makers' published curve, except that the slope was slightly higher.

Inter-electrode Capacities

Anode—all other electrodes	5.0 $\mu\mu F$
Grid— ,, ,, ...	5.5 ,,

The valve is designed as a high-efficiency detector suitable for use on short waves and 56 Mc. receivers. The valve on test appeared to be quite free from any microphonicity.

Hivac SG220 S.W.

The Hivac SG220 S.W. is a battery screen grid valve modified for use on ultra short waves. The valve is fitted with a 4-pin ceramic base and has the control grid connected to a push-on type top cap; the bulb is metallised.

Characteristics.	*Makers.*	*Measured Sample.*	
Filament volts ...	2.0	2.0	
Filament current (amps.) ...	0.2	0.205	
Anode volts (max.)	150	150	
Screen volts (max.)	80	80	
Mutual conductance	1.5†	2.1†	1.45 *
Amplification factor	500†	665†	840 *
Impedance (ohms)	330,000†	310,000†	580,000 *
Anode current (ma)	—	4.9†	2.0 *
Screen current (ma)	—	0.9†	0.35 *

†Measured at anode volts 150, screen volts 70, grid volts 0.

*Measured at anode volts 150, screen volts 80, grid volts −1.5.

Characteristic Curve

The sample was found to agree with the makers' published curve, except that the mutual conductance was rather higher, which is, of course, an advantage.

Inter-electrode Capacities

Grid—all other electrodes	7.0 $\mu\mu F$
Anode— ,, ,, ...	12.0 ,,
Grid anode	not measured

The valve has characteristics entirely suitable for use as an R.F. amplifier in ultra short wave receivers or as a S.G. detector. The valve should perform in a most satisfactory manner for either purpose.

D. N. C.

British Standards Specification No. 448

Radio Valve Bases and Valve Holders.

A new edition of the above specification was issued recently, and we would like to draw the attention of members to the matter contained therein. The specification contains dimensions of all types of British valve bases and holders (excluding large receiving and transmitting types), together with the pin connections. This information is set out in the form of easily readable tables. The specification is published by the British Standards Institution, 28, Victoria Street, S.W.1, price 2s. net.

D. N. C.

QRP DX.

Mr. J. F. Isaac (G5JI), in a letter to the Editor, reports having qualified for W.B.E. in five days, using an input of only 5 watts. Although licensed as recently as August last, Mr. Isaac has worked 60 U.S.A. stations in all Districts except W5, 6 and 7, besides which he has received an R8 report from VS6AH and R5 from VS2AE. The latter contact was maintained for 1½ hours. In all, five continents and 41 countries have been worked using a series fed T.P.T.G. operated at fairly "high C." The valve used is a PV625, running at 200 volts 25 mas. from D.C. mains. The aerial is a half-wave Zepp., 23 ft. high, with parallel tuned feeders 12 ft. long and inductively coupled.

NATIONAL FIELD DAY, 1936

THE rules for this event were published in the March issue of this Journal.

In view of the recent G.P.O. concession, aerials may be of any length up to 150 feet.

All British official N.F.D. portable stations will call "Test N.F.D.," and will suffix their calls with the letter "P."

"A Stations" will operate in the 1.7 and 3.5 Mc. bands, and "B Stations" in the 7 and 14 Mc. bands.

Members of the Society who wish to operate private portable stations during this event are asked to suffix their calls with the letter "P," but to prevent confusion with the official stations they are asked to refrain from calling "Test N.F.D." We recommend that the operators at these private stations either answer "Test N.F.D." calls or send "Test Port."

It is hoped that cinematograph records will be taken at as many stations as possible, in order that we may again present an N.F.D. film at Convention. The film used *must* be the 9.5 mm. size, and all spools must be sent to Headquarters not later than July 15.

We publish below a full list of call signs and locations of British Isles stations taking part in National Field Day.

ENGLAND AND WALES.

District.	Station.	Call.	Site.
1	A	G2OI	Pike Farm, off Manchester Road, Shuttleworth, Lancs. (near Bury).
	B	G2RF	Ashurst Beacon, near Ormskirk, Lancs.
2N	A	G2FO	Whinney Hill, Darlington Back Lane, Stockton - on - Tees, Durham.
	B	G2PN	Kenton Lane, Newcastle-on-Tyne, 3.
2S	A	G5HK	The Lodge, Lodge Lane, Lodge Moor, Sheffield, Yorks.
	B	G6XL	Kenmore Estate, Moor Avenue, Great Horton, Bradford.
3	A	G6PW	Newbold Comyn Farm, Campion Hills, Leamington Spa, Warwickshire.
	B	G5GR	Dirty Gap Farm, Burton Green, near Coventry.
4	A	G6VD	Potters Marston (Granite Quarry), near Croft, Leicestershire.
	B	G2IO	Meadow Farm, Kirklington, near Southwell, Notts.
5	A	G2HX	"Paradise," Painswick Beacon, Glos.
	B	G6RB	Dundry Hill, near Bristol, Glos.
6	A	G6FO	Holsworthy, N. Devon.
	B	G5SY	Sandy Bay, near Exmouth.
7	A	G6NZ	The Field of Briggs and Sons, Builders, London Road, Widley, Portsmouth, Hants.
	B	G2NH	Mr. Jones' Farm, High Street, Walton-on-the-Hill, Tadworth, Surrey.
8	A	G5JO	Mustills Mill, Swavesey, Cambs.
	B	G6DX	Hill Farm, St. Ives, Hunts.
9	A	G2XS	Knight's Hill, King's Lynn, Norfolk.
	B	G6QZ	Mangreen Farm, Swardeston, Norwich.
10	A	G2JL	Penyrheol Farm, Wentwood, nr. Newport, Mon.
	B	G2UL	B. Legton's Farm, Kettle Hill, Bishopston, Gower, Glam.
11	A	G6OK	Great Orme's Head, near Llandudno, N. Wales.
	B	G5OD	Llysfaen Hill, near Old Colwyn, N. Wales.
12	A	G5QF	Finchley Scouts' Camping Ground, Frith Lane, Mill Hill, N.W.7.
	B	G5BO	Woodcock Lodge Farm, Tyler Causeway, nr. Hertford.
13	A	G2HG	Great Norman Street Farm, Ide Hill, Kent.
	B	G2WV	Westerham Heights Guest House, Westerham Hill, Kent.
14	A	G6UT	Rookwood Hall, Abbess Roothing, near Ongar, Essex.
	B	G6CT	Gusted Hall, near Hockley, Essex.
15	A	G6WN	Rush Green Farm, Rushy Green, Denham, Bucks.
	B	G6YK	Flowers Bottom Farm, Speen, near High Wycombe, Bucks.
16	A	G5IL	Portobello Hill, Wrotham, Kent.
	B	G2UJ	Pococksgate Farm, Frant, Sussex.
17	A	G2LR	Cranwell, near Sleaford, Lincs.
	B	G5CY	North End, Mablethorpe, Lincs.
18	A	G5GC	Southwold Farm, Elloughton, Yorks.

	B	G2TK	Oliver's Mount, Scarborough, Yorks.
		SCOTLAND.	
A District	A	G5ZX	Eaglesham Moor, Renfrewshire.
	B	G6MS	Lickprivick Farm, East Kilbride, Lanarkshire.
B District	A	G6VO	Bucklerburn, Peterculter, near Culter.
	B	G5TA	Kingseat, near Newmachar.
C District	A	G6RI	Downiebank Farm, Monikie, Angus.
	B	G6LD	Downiebank Farm, Monikie, Angus.
D District	A	G6IN	Macbiehill Railway Station, Peebleshire.
	B	G2TM	Lamancha Railway Station, Peebleshire.
		NORTHERN IRELAND.	
	A	G15GV	Killenican, Killinchy, Co. Down.
	B	G12CN	Rockport, Co. Down.
		IRISH FREE STATE.	
	A	EI6J	In County Dublin.
	B	EI6F	ditto.
		EGYPT.	
	B	SU1A	Alexandria.
		SWITZERLAND.	
Basle ...	...	... ...	HB9AC
Berne ...	...	... ...	HB9AA
,, ...	...	... ...	HB9AD
,, ...	...	... ...	HB9T
Geneva ...	...	... ...	HB9V
Lucerne	...	... ...	HB9BG
Lausanne	...	... ...	HB9K
Zurich ...	...	... ...	HB9AK
,, ...	...	... ...	HB9AU
,, ...	...	... ...	HB9J

Additions to this list will be given in the USKA broadcast on June 3, at 21.30 G.M.T., by HB9AA. This station will transmit in English on a frequency of 3,575 kc.

Listen for VO Portables.

We learn from Mr. Holden that stations VO1H and VO1J will be operated as portables during N.F.D. The frequency used by both stations will be near 14,050 kc.

Golders Green Society.

An interesting field day programme has been arranged by this Society. On May 24 an open 3.5 Mc. D. F. Competition will be held, and this will be followed by 56 Mc. field days on June 21, July 12 and September 13.

On July 26, a 3.5 Mc. field day will be arranged at Bradwell-on-Sea, Essex.

The Assistant Secretary, Mr. A. G. Griffiths, "Hornbeams," Priory Drive, Stanmore, Middlesex, will be pleased to hear from R.S.G.B. members who wish to take part in these events.

Stray.

ZS1AL, working on 14 Mc., is anxious to contact G telephony stations for his W.B.E. on 'phone.

The DX Possibilities of 56 Mc.

By L. G. BLUNDELL (G5LB)*

This highly interesting question is now claiming a great deal of attention, and is responsible for the recently organised contest in the United States and G5CV's plans for an international 56 Mc. week-end. The writer feels, however, that, apart from these attractive projects, future activity will be rather spasmodic owing to the fact that a very great number of amateurs interested in this band do not come on the air unless they are assured of contacts or at the least B.R.S. co-operation.

With a view to obtaining increased and lasting activity on 56 Mc., the writer puts forward the following suggestion :—

In the first place, it is reasonable to assume that CW signals will be productive of the first real DX contacts ; therefore increased CW activity is one of the first essentials, and as such, should be encouraged.

There are already a fair number of stabilised transmitters and receivers in operation in various parts of the country, and as there is every indication of this number steadily increasing it is surely time for organised and scheduled activity. This could be achieved by the formation of a separate section comprising members interested in CW work on 56 Mc., and publication in the BULLETIN each month of a register of CW stations, with details as to frequencies, whether directional radiating systems are in use, operating times, etc., together with notes of interest. Given a number of regularly active stations, transmitting periods could be arranged to cover, say 16 hours, out of every 24, so bringing both day and night conditions under notice. Together with good BRS co-operation, this scheme should be productive of very much more useful data than ever will be the case under the present haphazard conditions, and will be to the mutual benefit of both research worker and experimenter.

Members interested in, and willing to support these suggestions, are asked to get in touch with the writer, giving details as to the likely extent of their interest.

* 45, Monivea Road, Beckenham, Kent.

SOLILOQUIES FROM THE SHACK

By Uncle Tom.

(*"Breathes there a man with soul so dead, As to listen on forty and not see red?"*)

CALLING spitch, calling spitch! This is Uncle Tom, President-Elect of the Anti-Spitch Brigade, on a frequency (we hope) somewhere between 7012 and 7288 keelocycles (or, as one of our local wags would say, "kilossicles").

Many are the digs I have had at spitch in the past, and this month both my fan-mail and my scrounge-mail are full of letters on the subject, which goes to prove that the well-worn topic of the relative merits of G2?? and G6?? has burnt itself out at last.

Little Jack, 'way down in Berks., recently had occasion to listen on 7 Mc. for a whole Sunday morning. He classified the transmissions heard into various types. (*a*) The Mutual Admiration Society telling each other how sweet their modulation is; one sounds like a man with his mouth full of cactus, speaking from the bottom of a well, and the other applies a nice rasp of speech on a really nice 50-cycle tone.

(*b*) Is a gent with a refained accent regaling a pal with selections from his vast library of gramophone records, omitting the mere formality of a call-sign. (*c*) Is QSA 5, R 999, modulation perfect, using 100 watts to work a chappie 50 miles away. Half a mile per watt doesn't seem much for these enlightened days. (*d*) Was (or would have been) the bloke with some real experimental work on hand, but he wasn't heard, either owing to his unfortunate absence, or the fact that the others washed him clean out.

From all this my nephew suggests that the French influence is spreading, and wants me to dip my pen in a mixture of brimstone and carbolic, and gently hint that the air is for experimental work, and not for use as a training-ground for B.B.C. announcers and programme directors.

His detailed analysis of the 7 Mc. spectrum gives the following result: 25 per cent. 'Phone, grim; 45 per cent. 'Phone, grim to mediocre; 27½ per cent. 'Phone, mediocre to good; 2½ per cent. C.W.

But here's a whack in the eye for spitch enthusiasts. It is well known by now that they use this loathsome form of communication in an attempt to achieve secrecy. Nephew Geoffrey, the big brain of Suffolk, has crushed and thwarted their foul desires by evolving a "spitch-unscrewing machine."

He has a large L.F. oscillator giving a distorted output of 10 watts of A.C., at about 200 volts, frequency variable from 20 to 100 cycles. This is applied to the detector of the receiver, the frequency of the A.C. varied, the thing adjusted until it is out of phase with the raw A.C. carrier-wave of the spitch-hound, and there you are.

The carrier-wobble is dealt with by one of those self-tuning devices which draws the detector circuit into tune with the station you want, and the French *patois* is translated into English by another machine.

(In passing, I suppose it is only fair to suggest that most of the foul noises on the 7 Mc. band come from French *pirates* and not from licensed stations.)

The fact remains that good, reliable communication on 7 Mc. is practically squashed out of existence at times by the pestilent, nauseous, horrisonous (thanks, Mr. Hartley!), miasmic atrocities that wander up and down the spectrum, fulfilling their nefarious purposes, whatever they may be. If the owner of a British station ever perpetrates such a "transmission," may he be forced to sit on the dot contact of a giant Vibroplex for all eternity; preferably one on which the owner sends at 45 w.p. and invariably uses too many dots.

And now, a pestilence on spitch and spitch-generators. Listen to this. A man who has always been keen on 56 Mc. work, and has found it the divvle's own job to get any sort of co-operation down there, puts up the following scheme.

"We want something to *attract* the boys, and what attracts them more than the ancient word —YL's? Here's the idea. We go out and round up some YL's (I know some, and, no doubt, you know plenty more, eh?) and one is to be placed at an approved 56 Mc. station in each of the R.S.G.B. Districts.

"Certain stations are out of the running, of course; the stations must be chosen after careful investigation, and the op. must be above reproach.

"The first G outside a 25-mile radius to contact a District YL Station would be entitled to take the said YL out for an hour in daylight. Contact over 50 miles would entitle one to take her out for two hours in daylight, and so on over a sliding scale. Contacts over 1,000 miles would entitle the operator of the remote station to take the YL out for half an hour after dark.

"A special 'Worked All District YL's' certificate would be issued by headquarters, with photographs of each YL, and an autograph and fitting words for the winner.

"I hope to have your views upon this, Uncle. I think it's an alluring proposition, and I think you'll agree that it would make the boys do some work on 56 Mc. . . . and how!"

Certainly I think it would attract a certain species of ham—the type that has not yet got over such youthful attractions as the species YL. But it is well known that the only hams who do any serious work at all are those who, like myself, have grown out of such a stage for twenty years or more, and are, therefore, able to make due use of their cerebral matter, and to concentrate on the work in hand without continually looking at their watches and getting ready for that appointment at 7 p.m. under the clock.

I am all in favour, though. All the Young Squirts would undoubtedly gravitate to 56 Mc., leaving the other bands free for myself and the few other serious experimenters who still remain (possibly) in the country.

RESEARCH AND EXPERIMENTAL SECTIONS

MANAGER :

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

ASSISTANT MANAGER :

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

SECTIONS :

No. 1 : TRANSMITTER DESIGN

S.M. : G. McLEAN WILFORD (G2WD), 33, Bibury Road, Hall Green, Birmingham.

G.M. : 7 and 14 Mc.

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

G.M. : 28 Mc.

G. McLEAN WILFORD (G2WD).

G.M. : 56 Mc.

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

G.M. : Artificial Aerials

A. W. LISTER (G5LG), Royal Military Academy, Woolwich, S.E.

No. 2 : RECEIVER DESIGN

S.M. : R. W. NEWTON (G5NQ), 8, Selbourne Gardens, Perivale, Middlesex.

G.M. : General

D. GORDON BAGG, (G6BD), Fresh Woods, Tonbridge, Kent.

G.M. : 56 Mc.

J. N. WALKER (G5JU)

G.M. : Superhets

T. B. SMITH (G5TS), 115, Novar Drive, Hyndland, Glasgow, W.2.

G.M. : Literature

R. W. NEWTON (G5NQ)

No. 3 : AERIAL DESIGN

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

G.M. : General

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

G.M. : 28 Mc.

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

G.M. : 56 Mc.

G.M. : Joint Group with Propagation

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

No. 4 : PROPAGATION

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

G.M. : 28 Mc.

MISS N. CORRY (G2YL), "Redholm," Walton-on-the-Hill, Tadworth, Surrey.

G.M. : Conditions

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

G.M. : Literature

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

G.M. : Joint Group with Aerial Design

G. A. H. ECKLES (G5GC).

No. 5 : VALVES AND INSTRUMENTS

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

No. 6 : AUXILIARY APPARATUS

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

G.M. :

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

No. 7 : MICRO-WAVES (112 Mc. and above)

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

HOW many of our members read foreign publications dealing with the science of radio ? By that we mean journals published in French, German, Dutch, or any language other than English. We, as a nation, are poor linguists, and for that reason we are apt to overlook the fact that the subject of radio is being written about in languages other than our own.

Some while ago we asked for volunteers to translate foreign articles into English, and the response was quite good, but for some reason or other, very little use was made of the offers received. Now, once more, we feel that attention should be given these matters, and we shall, therefore, be glad to receive offers of help in the translation of foreign magazines.

Measuring Instruments.

It has been said that no subject becomes a science until it is possible to make accurate quantitative measurements concerning it. This most certainly applies to radio in all its branches, and we are pleased to be able to publish this month an article by Mr. Corfield, our Valve and Instruments Section Manager, dealing with the construction of a valve voltmeter. For the serious experimenter, the use of such an instrument becomes almost a necessity.

We hope to publish from time to time articles dealing with other instruments which it is possible for the amateur to build. In this connection we shall be glad to receive suggestions from members as to types of instruments which they would like to have described.

Individual Members.

The following are the calls of new Individual Members :

Transmitter Design.—BRS2274, DE1752g 2BGD, BRS2356.

Receiver Design.—BRS2274, 2BGD, 2ANR.

Aerials.—DE1752g.

G6PA.

The Sun's Eclipse

Mr. Douglas Walters (G5CV) informs us that during the sun's eclipse on the morning of Friday, June 19, he will transmit a 1,000-cycle note, interspersed with frequent telephony and telegraphic announcements of call sign, on a carrier frequency of 7,070 kc.

In order that observations on his signals can be noted before, during and after totality, transmissions will commence at 04.30 G.M.T. (05.30 B.S.T.) and conclude at 05.30 G.M.T. (06.30 B.S.T.).

As maximum totality lasts for only 2½ minutes in Siberia, it is essential that an accurate time record should be kept.

Reports from amateurs in any part of the world, but in particular from those in Russia, Hong Kong, Jamaica, Malaya and Australasia, will be welcomed.

At the conclusion of the test transmission, Mr. Walters will stand by for reports from DX stations who have co-operated.

Results of observations should be posted to G5CV, c/o R.S.G.B., London, S.W.1.

A MULTI-RANGE DIODE VALVE VOLTMETER

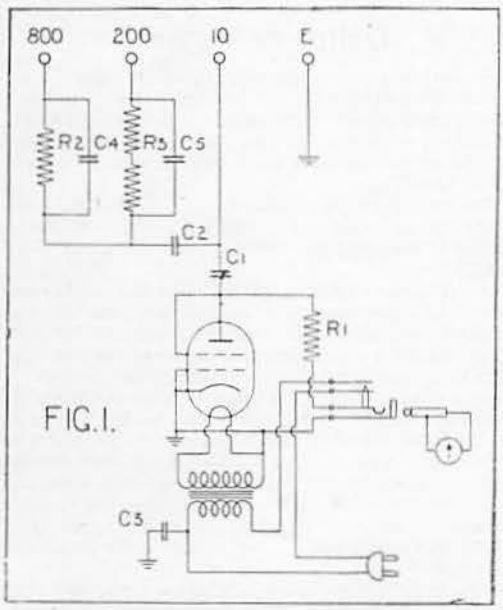
By D. N. Corfield, D.I.C. Hon., Grad. I.E.E. (G5CD).

THE following article describes the details of a valve voltmeter that has been in use for several years by the author for measurements of audio and R.F. voltages between 1 volt and 800 volts.

The instrument described below has three ranges —0-10, 0-200, and 0-800, a sensitivity of approximately 1,300 ohms per volt, and reads to an accuracy better than 5 per cent. between 50 cycles and 14 Mc. on all ranges. The scale of meter is linear above 10 per cent. of full scale reading. The input capacity is small on the low range, and negligible on the high ranges.

The principle used is a diode rectifier, the rectified current being read on a suitable meter, the initial voltage being multiplied with resistances as in a D.C. voltmeter, but having compensated capacity in parallel to correct for frequency error.

The valve used is a screen grid (*Mazda* AC/SG) having the grid common to the cathode and the screen strapped to the anode. The meter used is a *Weston* 0-250 microamps moving coil. The instrument is screened in an aluminium box, and contains the heater transformer valve and associated resistances and condensers; the meter is jacked in as required.



Circuit of Diode Valve Voltmeter.

C1, 2 μf 200v. working.
C2, .01 μf 1,000 v. working.
C3, .001 μf 250 v. working.
C4, C5, see text.
R1, 25,000 ohm, 1 watt.
R2, 250,000 ohm, 1 watt.
R3, 480,000+480,000 ohm, 1 watt.

Circuit Used.

The circuit is shown in Fig. 1. When the input is applied on the 10 volt range and earth, the condenser C1 isolates the instrument from any D.C. voltage up to 200 volts, yet passes the A.C. input down to about 50 cycles without any drop. The valve rectifies the A.C. and the rectified D.C. passes through the resistance R1 and the meter. With no input applied, a small current flows round the meter circuit due to contact potential in the valve; it was for this reason that a screen grid type of valve connected as shown was chosen as this current was reduced. An AC/SG valve was used, but it has been found that other makes or types such as AC/S2 work equally well. The value of R1 was chosen in such a way that the initial range was reasonable. If R1 is lowered, the sensitivity is greater, but the linearity of the scale is not so good, also the input impedance (ohms per volt) is lower, whereas raising R1 lowers the sensitivity without improving the linearity appreciably. The initial range is 0-10 volts with a 0-250 microammeter; if the meter has a different full scale reading, the range is changed in proportion. For example, a 0-500 microammeter would be 0-20 volts and 0-1 ma, 0-40 volts, etc. The sensitivity in ohms per volt on the initial range approximately equals:

$$\frac{R1}{2 \times \text{full scale reading}}$$

The condenser C2 is effectively in series with C1, and is used on the higher ranges. It has a capacity of .01 μF and should be 1,000 volts working if the meter is to be used on P.A. tank circuits, etc. C3 is necessary to prevent R.F. pick-up on the mains input affecting the instrument, and should have a value of about .001 μF. The multipliers R2 and R3 are chosen to give the ranges required, and must be carbon type *non*-inductive, such as *Erie*, not the type having a metallic or carbonised thread wound in grooves. The values required are 250,000 ohms for the 200 volt range, and 960,000 ohms for the 800 volt range. The exact value should be found by experimenting when calibrating; as the resistances are only made to a tolerance of about 10 per cent., it is usually necessary to select one to give the right value. The condensers C4 and C5 consist of pieces of wire covered with sleeving near each other, having a capacity less than 1 μμF. Their value is also determined by experiment.

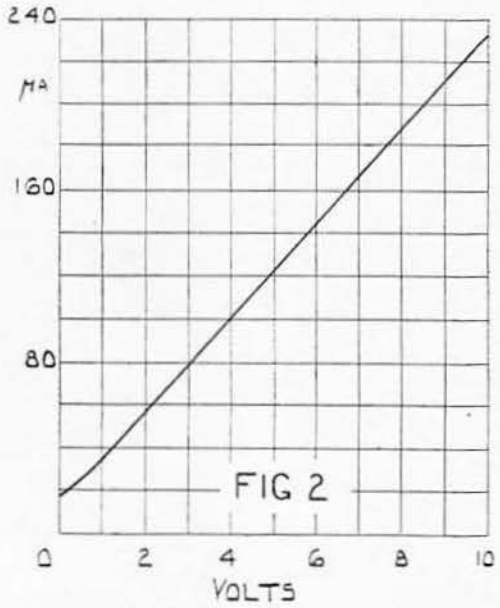
Calibration.

The calibration is done in two stages, firstly on low frequency A.C. or audio, secondly on R.F. Calibration on initial range is done against an accurate, say, 0-10 A.C. voltmeter. The meter may have a new scale made for it, or a calibration curve drawn and used with it. A typical calibration curve is shown on Fig. 2; as is seen, the curve is a straight line except just at the bottom. If a meter for calibration covering only half the scale is obtainable, the line can be extended with reasonable accuracy, but it must be remembered that the final accuracy depends on how well the initial range is calibrated.

The multipliers need only be calibrated at one point around full scale. The resistance R2 and R3 selected to give the correct multiplied reading. This should also be done against an A.C. voltmeter of suitable range. If no very great accuracy is required, resistances of the value given may be used, or they may be calculated, the value required being :

(Range in volts × ohms per volt)—½ R1

and measured by any means available.



Typical Calibration Curve of Diode Valve Voltmeter.

The R.F. correction calibration, *i.e.*, adjusting the values of C4 and C5, can only be obtained with R.F. and is quite easily done against an electrostatic voltmeter taking the output from a normal P.A. or C.O. It is best to do this on 7 or 14 Mc., but it can be done on 1.7 or 3.5 if the instrument is likely to be most used on these bands. The electrostatic voltmeter should have no protection resistance in series, as in a *Ferranti* for R.F. measurement ; the resistance is found on one terminal inside the case, and should be temporarily shorted. Of course, the electrostatic meter will upset the tuning of the R.F. circuits as it moves, and the reading should be allowed to become quite steady before calibration is attempted. Then adjust the length and position of the wires forming C4 and C5 until each range is correct. If the condensers are not fitted, the error at 14 Mc. may be as much as 50 per cent.

Precautions.

When using the instrument a few precautions should be taken :

1.—The heater of the valve should be maintained as close as possible to 4 volts, otherwise the contact potential or zero will change. This can be checked by making the meter read its own heater volts by taking a lead from the terminal of range 0-10 to the live end of the heater (the other is already earthed). Also, of course, the meter, if required, will read the mains voltage to its own input supply.

2.—When used on R.F., make sure the metal box is really earthed with a short lead and to the transmitter main earth.

3.—Do not expect great accuracy on 28 Mc. or 56 Mc., although readings *can* be obtained.

4.—Do not use it on the 10 volt range for taking readings on a high impedance circuit as in receivers ; rather hitch up an ordinary triode or S.G. as an anode bend valve voltmeter, and transfer the readings on to the diode meter for calibration.

5.—Use the correct range for the voltage to be measured ; too high a voltage will not burn anything out, but may bend the needle.

6.—The valve may, if required, be heated by a 4-volt battery, but see that the voltage is 4 volts.

No doubt many readers may say : " Well ! I have no means of calibrating accurately," but even then the writer believes that the instrument, even roughly or doubtfully calibrated, is better than no voltmeter, as it may be used for determining the comparative or accurate output of C.O.'s, Tri-tets, B.A.'s or P.A.'s, and is invaluable for accurate neutralising. Coupled or tapped on the aerial circuit, it is simplicity itself with the P.A., H.T. off to exactly neutralise for a minimum reading.

It is hoped that the article may stir some readers to make up an instrument capable of producing figures for future articles, giving quantitative measurements.

Dellinger Again*

So far no reports of the " wipe-out " have been received for March 12, but ionization seems to have been strong on March 8 and 13 ; on the 8th G6CJ obtained WAC on 28 Mc. in a few hours, and on the 13th the same band appeared active until 22.30 G.M.T.

We read in the April issue of *Q.S.T.* that W1GTN observed a " fade-out " on February 16 for a period of about 15 minutes between 16.00 and 16.30 G.M.T.

A " Dellinger 54-day period " was due on April 8, and it is interesting to find that the contract was fulfilled, together with a fore-runner on April 6. The following information has been supplied by G2XG : On April 6 there was a partial " fade-out," during which period stations became so weak as to be unreadable. Stations most affected appeared to be those between 15 and 25 metres from North and South America, Africa and the East. Exceptions seemed to be V1Z (Sydney), working the S.W. route on 25 metres, VWZ (Bombay) on 16 metres. The time of the " fade-out " was from 13.59 to 14.20 G.M.T., after which stations came in slowly."

On April 8 the " wipe-out " was complete from 16.50-17.10 G.M.T. on many services. African DX and the East were hardly affected at all, but North and South America from 16 to 23 metres completely vanished. Stations such as Cairo, Vienna, Madrid, went out suddenly, but soon

* Notes compiled by the Propagation Section.

(*Continued on page* 476.)

CORRESPONDENCE

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

CRYSTAL CONTROL ON 56 Mc.

To the Editor.

DEAR SIR,—The 56 Mc. C.C. transmitter described by the Research and Experimental Section in last month's BULLETIN has evoked a little comment among Bromley and District members which would possibly be of general interest.

It will be seen that the circuit is a fairly close reproduction of that described by G5LB in the BULLETIN for November, 1935, but unfortunately it is not quite close enough. For instance, for stability—the whole purpose of using a C.O.—the 7 Mc. tank coil should be kept small. The 14 Mc. coil should be as large as possible, while the 28 Mc. and 56 Mc. tank capacities could with advantage be cut in half and the inductance in each case increased.

The next point concerns the capacity coupling between the 28 and 56 Mc. stages. Surely so large a capacity as .001 μF. cuts right across the R.E.S. declaration that .0003 μF. is the most suitable value for these frequencies. In fact, G5LB's experiments have shown that an even smaller capacity is desirable. In any case this should not be taken straight from the 28 Mc. doubler's plate, but should be tapped on to the coil. My own experiments with the G5LB circuit confirm the importance of this provision for maximum drive.

Finally, the .001 μF. condenser from the 56 Mc. doubler plate to H.T. negative seems a little drastic. Its only purpose, as far as I can see, is to prevent the coil from melting owing to excessive R.F.!—Yours faithfully,

C. S. POLLARD (G2GB).

19, St. Mary's Avenue,
Shortlands, Kent.

To the Editor.

DEAR SIR,—I welcome the opportunity you have given me to reply to the criticisms contained in Mr. Pollard's letter with reference to the 56 Mc. C.C. Transmitter, which was described in the April issue of the BULLETIN.

In the first place I would point out that I stated in the article that no claims of originality were made for the circuit employed. Apart from the C.O./F.D. stage the circuit is ordinary F.D. practice.

While the circuit diagram is certainly much the same as that employed by G5LB, it is obvious that the values and arrangement of the components do not follow his method very closely. In fact, the values are mostly different for the simple reason that they were found to be better than those he specified. In this connection I may say that the wattmeter described in the article was in use during the greater part of the development of the unit. Mr. Pollard and his friends may rest assured that none of the values employed for condensers were chosen at random, but were the result of actual measurement of R.F. output of the unit.

It is evident from his letter that Mr. Pollard has not attempted to build the transmitter from the data given in my article. Had he done so he would have found that the points he raises with regard to the C.O./F.D. stage are all made use of. The 7 Mc. tuned circuit has very little capacity across its coil, and the 14 Mc. stage has much more. Here again the best ratio of L/C was found by actual measurement. The reason for the use of tuning condensers somewhat larger than is actually necessary is to allow of operation on lower frequencies without having to resort to coils of too unwieldy a nature. In each case the size of coil is adequate for the frequency employed.

Mr. Pollard states that there is an R.E.S. declaration that 300 μμF. is the correct value for coupling a 28 Mc. F.D. to a 56 Mc. stage. As the Manager of R.E.S. may I be allowed to inform him that we do not intend to make declarations about anything. He may have seen a *statement* that 300 μμF. is the best value for such and such a purpose, but I think he will find no definite assertion that such is the case. Our knowledge of such matters is still far too limited for us to be so dogmatic. My choice of .001 μF. was made after careful tests had been conducted, and for the same reason the condenser was tapped on to the plate end of the coil. The same applies to the other points he mentions. No doubt from a theoretical point of view he is correct, but the article in question is a practical article, and the unit works!

I must ask your indulgence, Mr. Editor, for taking up so much valuable space, but I feel it is very important that we should none of us be too sure that what works well in one case on such high frequencies will necessarily do so in another. After some four months' work on the unit in question I have proved that only too often!—Yours faithfully,

H. CECIL PAGE (G6PA)
(R.E.S. Manager).

RHODESIA (*Continued from page* 474).

here for Southern Rhodesian amateurs. These cards emanate principally from Germany, and almost invariably confirm that the stations concerned were in communication on 14 Mc. with some other station in Europe. It is regretted that in future these cards cannot be distributed unless they refer to reception either on 3.5, 28 or 56 Mc.

Information has just been received from the P.M.G. that the call sign ZE1JD has been allotted to Mr. P. L. Lowth, Waverley Hotel, 13th Avenue, Lobengula Street, Bulawayo. Any cards concerning this station subsequent to April 16 should be sent to Mr. Lowth, but cards dealing with the period prior to April 16 should be sent to W1DZE, whose call seems to have been mixed with that of ZE1JD.

The writer observes that there were no notes published in the March issue of the BULLETIN, although the notes were despatched from here by air mail on March 18 and should have arrived before the end of the month. (The March issue went to press on the 5th of that month and was published on March 15, the normal date.—ED.)

NEWS AND VIEWS FROM 53.

The Loyal Relay, 1936.

On the occasion of the forty-second birthday of H.M. King Edward VIII, which falls on Tuesday, June 23, we anticipate being in a position to hand to His Majesty greetings and congratulations from all British Empire Amateur radio organisations and groups.

Messages should be initiated by either the President of the National Society or where no such society exists, by the B.E.R.U. representative. Personal messages must not be transmitted.

Overseas stations with an official message on hand should call " B.E.R.U. Loyal Relay de . . . " All British Isles stations are invited to stand by to receive the messages, which, when received, should be forwarded without delay to Mr. A. E. Watts, G6UN, 58, Woodside Avenue, Highgate, N.6. Tudor 3970.

Council Meetings and Licence Applications

In future, Council meetings will be held on the second Tuesday, instead of the third Wednesday in each month.

Members desirous of being recommended for increased licence facilities are reminded that applications must reach their D.R. at least 10 days before the date fixed for the Council meeting, in order that their request may be included in the agenda for the meeting.

With reference to the information given in our March issue regarding applications for High Power Permits, we have to point out that as a general rule increases are only recommended in 50 watt stages. Applications for further increases can, of course, be considered, providing technical reasons are given.

New Council Member.

We have pleasure in announcing that Viscount Carlow (G6XX) has accepted Council's invitation to serve on that body as a co-opted member. Lord Carlow has been associated with the Society since 1929, and for some years has operated a very active station in North-West London. Among his many activities his work in connection with the Royal Air Force Auxiliary Reserve is, perhaps, the best known to members. Lord Carlow is the officer in charge of the Wireless Section of the Reserve.

An Official Notice *re* Licences.

We are very pleased to report that, as a result of further negotiations, we have obtained two more concessions from the G.P.O. They are :—

(1) The grant of permission to a limited number of members recommended by the Radio Society of Great Britain for the use without additional payment of portable apparatus for work on the 56 Mc. band during week-ends from Easter to the end of September.

The permission will be given each year for the year concerned.

(2) The grant of permission to such members as may be recommended by the Society who have held 10-watt licences for at least six months to use power up to 25 watts on payment of an additional 10s. per annum, without notification of specific reasons for the use of increased power.

The G.P.O. reserve the right to review the matter if difficulty is found to arise.

Members desiring to take advantage of either of these concessions should apply in writing to the Secretary, giving in the case of the 56 Mc. concession full details of the experiments they wish to carry out, together with an undertaking that suitable precautions will be taken to ensure that their transmissions are within the allotted band of frequencies.

Exhibition and Convention.

We are at last in a position to inform our members of the dates fixed for the R.M.A. Exhibition at Olympia. The exhibition will open on Wednesday, August 26, and will close on Saturday, September 5. In accordance with our usual practice, the Annual Convention will take place during the last few days of the Exhibition period, viz. : September 3 to 5.

To enable us to cater for the majority wishes of members who hope to attend Convention, a questionnaire is included in this issue. Interested members are requested to fill in the form and return it to Headquarters not later than June 15, 1936.

New D.R. for East Yorkshire.

Consequent upon the resignation chronicled recently of Mr. T. Woodcock (G6OO), Council now have pleasure in announcing that Mr. W. A. Clark (G5FV), of Hull, has accepted their invitation to undertake the duties of Representative for District 18.

We understand from Mr. Clark that he has appointed Mr. A. W. G. Anderson (2AAX), 25, Oban Avenue, Maybury Road, Hull, as his District Scribe, whilst Messrs. Dearlove (G2QO) and Wiggins (G2CP) have agreed to act as T.R.'s for Hull and Scarborough respectively.

The re-organisation of the East Yorkshire District will, we feel sure, lead to considerable progress being made in that particular area.

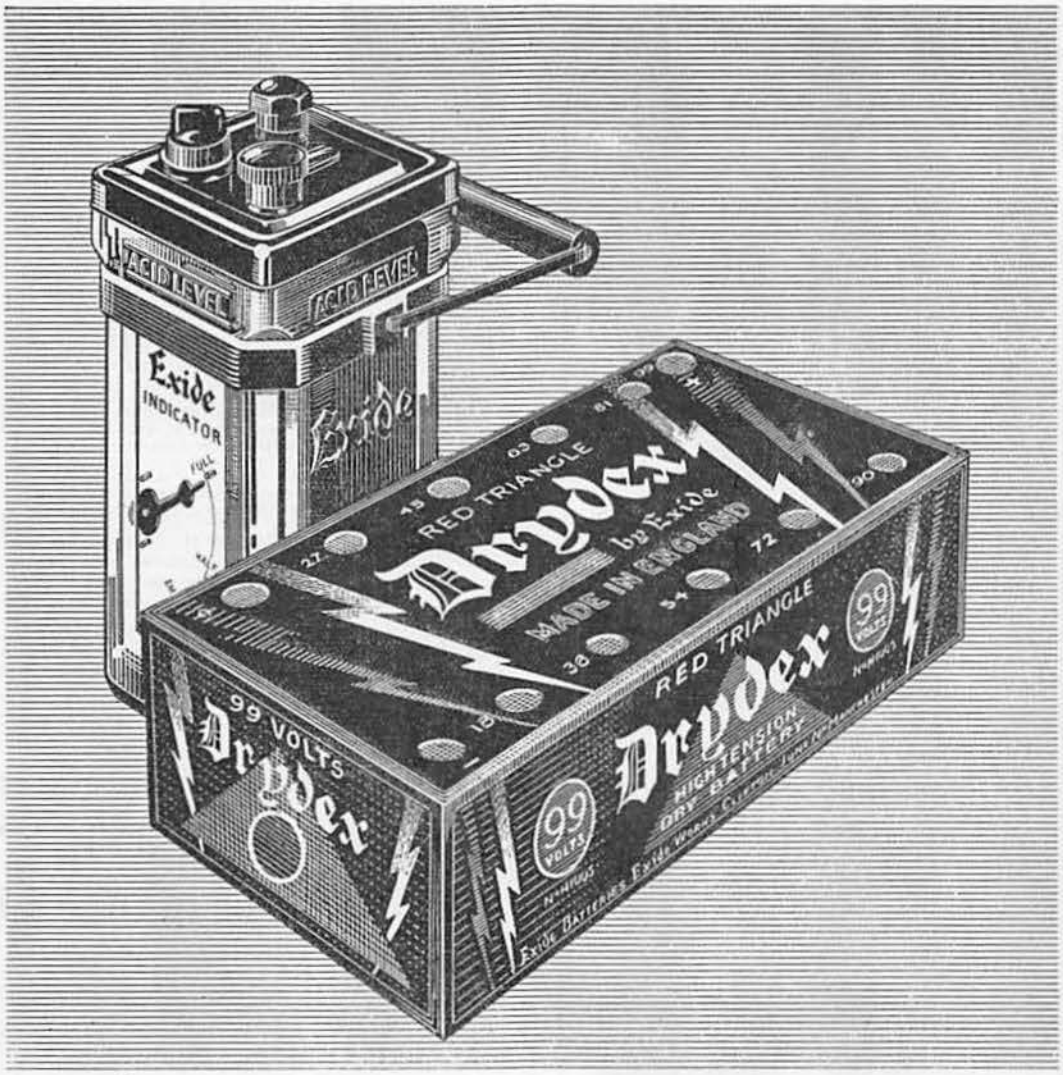
R.S.G.B. Cruise

We have been asked by Mr. M. Buckwell (G5UK) to mention that the latest date for reserving accommodation for the R.S.G.B. cruise to Holland and Belgium is May 20.

Details of the cruise were published on page 362 of the March issue. The cruise will take place during the August Bank Holiday period.

W.A.C. Certificates.

We have been advised by I.A.R.U. Headquarters that B.E.R.U. Section members resident in countries where no National I.A.R.U. Society exists may obtain W.A.C. certificates by sending their cards to the Secretary, R.S.G.B., for examination. B.E.R.U. Section members resident in countries where a National Society exists must submit their



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cards to the Secretary of their National Society. In cases where B.E.R.U. Section members are not members of their National I.A.R.U. Society, they can apply direct to the I.A.R.U. for the award, but a fee of 50 cents (American currency) is then charged for the certificate.

German DX Contest, 1936.

To mark the occasion of the 10th anniversary of the founding of the D.A.S.D., which occurs during the period fixed for the 12th series of Olympic games, a special Jubilee DX Contest has been arranged by our German colleagues.

The event, which will take place during the five week-ends in August, is to be open to all amateur transmitters, and any licensed frequency band may be used.

The Contest will be run in two sections. In the first or " Contest " section, points will be scored for contest QSO's on the basis of one point per 1,000 Km.'s between the capitals of contacting countries, except in the case of German stations, when 4 points per 1,000 Km.'s will be scored. In the second section to be known as " QTC," points will be scored for reports of all Contest QSO's sent by foreign competitors to German stations. For G stations 12 points are to be given for each report so transmitted and acknowledged.

The final score will be calculated by multiplying the sum of all the points obtained in " Contest " and " QTC " contacts, by the number of German districts (of which there are 19) worked.

Details of this interesting Contest, together with an official entry form may be obtained from Headquarters or by direct application to D.A.S.D., Berlin-Dahlem, Schweinfurth Str. 78.

Three awards will be given for each country, and every entrant will receive an artistic certificate in recognition of his support of the event, together with a copy of the Society's Journal, " CQ MB."

R.S.G.B. Slow Morse Practices

A list containing dates, times and frequencies of the stations sending slow Morse for the benefit of those members wishing to learn or improve their code will be found below. As usual, test matter will be taken from recent issues of The T. & R. Bulletin. The page, number and month of issue will be given at the end of each test—by telephony. A telephony announcement will also be given at the commencement of each test to assist those interested in tuning-in the sending station. It is emphasised that reports will be appreciated and are desired in order to ascertain range of transmission and numbers utilising the service. If, however, replies are desired, stamps should be sent. G5GC, of Hull, is discontinuing, and has expressed his willingness to recommence at a later date should the demand request it. The following are additional stations included in the schedule :— G6GL, Mr. G. Russell-Lee, of 25, Boundary Road, West Kirby, Cheshire, and G6ZQ, Mr. J. E. Squire, of " Winston," Alstone Avenue, Cheltenham. Additional stations willing to assist in this service are invited to communicate to Mr. T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4 (Telephone : Silverthorn 2285).

Schedule of Slow Morse Transmissions.

		B.S.T.	kc.		Stations.
May 20	Wednesday	23.30	7100	...	G2LC
,, 20	,,	23.30	1775	...	G6ZQ
,, 24	Sunday	09.15	1775	...	G6ZQ
,, 24	,,	11.00	7233	...	G5JL
,, 24	,,	11.15	1810	...	G6GC
,, 24	,,	14.30	1775-6	...	G6GL
,, 27	Wednesday	23.30	7100	...	G2LC
,, 27	,,	23.30	1775	...	G6ZQ
,, 31	Sunday	09.15	1775	...	G6ZQ
,, 31	,,	11.00	7233	...	G5JL
,, 31	,,	11.15	1810	...	G6GC
,, 31	,,	14.30	1775-6	...	G6GL
June 3	Wednesday	23.30	7100	...	G2LC
,, 3	,,	23.30	1775	...	G6ZQ
,, 7	Sunday	National Field Day.			
,, 10	Wednesday	23.00	7100	...	G2LC
,, 10	,,	23.00	1775	...	G6ZQ
,, 14	Sunday	09.15	1775	...	G6ZQ
,, 14	,,	11.00	7233	...	G5JL
,, 14	,,	11.15	1810	...	G6GC
,, 14	,,	14.30	1775-6	...	G6GL
,, 17	Wednesday	23.00	7100	...	G2LC
,, 17	,,	23.00	1775	...	G6ZQ

W.B.E. Certificates

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

Name.	Call Sign.	Date.
B. Larsen	LA2B	... Mar. 6, 1936.
T. O. Cadell	VU2EB	... ,, 11 ,,
B. Turner	G6ZT	... ,, 11 ,,
Y. Beers	W3AWH	... ,, 19 ,,
L. Nagase	J2LB	... ,, 26 ,,
S. E. Martingell ...	G2MV	... ,, 30 ,,
C. W. K. Sands ...	G5JZ	... ,, 31 ,,
F. C. Clark	ZE1JS	... ,, 31 ,,
S. B. D. Young ...	G2YY	... Apr. 1 ,,
V. de Robillard ...	VQ8AF	... ,, 2 ,,
W. Milne	ZE1JY	... ,, 7 ,,
P. E. Littlefield ...	W1DUK	... ,, 8 ,,
G. H. Janes	W1GLQ	... ,, 8 ,,
H. J. Siegel	W3EDP	... ,, 15 ,,
S. Entwisle	G5VN	... ,, 15 ,,
L. E. H. Scholefield ...	G5SO	... ,, 16 ,,
H. W. Green	ZT6Y	... ,, 17 ,,
J. J. van Ravensteyn	ZU1T	... ,, 17 ,,
G. Hutson	G6GH	... ,, 17 ,,
P. Crisp	G6DX	... ,, 20 ,,
J. H. Payton ...	G2JB	... ,, 21 ,,
W. H. Robertson ...	G6WR	... ,, 21 ,,
B. Rowell	G5RL	... ,, 27 ,,
R. J. Bee	VS2AG	... ,, 28 ,,
C. Grundy	G6ZS	... ,, 29 ,,
R. T. Inman ...	W9PTC	... ,, 29 ,,

EMPIRE CALLS HEARD.

2AFU (Brigg, Lincs) during March :—

14 Mc. : zlldv (4.5.9), hy (5.6.9), 2ci (5.6.9), fa (4.5.8), fy (4.4.9), oq (4.5.9), 3dj (5.6.9), gr (3.3.9), ja (5.5.9), 4bq (5.6.9), ck (3.3.9), vk2as (5.6.9), dp (3.3.9), eo (4.5.9), ez (4.5.9), ks (4.4.9), lm (4.5.9), lz (4.6.9), mw (3.3.9), ny (2.3.9), px (5.6.9), ti (4.5.9), xu (5.5.9), yc (3.3.9), 3cp (5.6.9), dm (4.5.9), gp (3.3.9), gu (4.5.9), jn (3.5.9), kf (4.4.9), kr (3.3.9), kx (4.5.9), mr (5.7.9), nw (5.6.9), oc (5.6.9), oz (4.5.9), rj (4.4.9), wp (3.4.9), xp (5.6.9), 4ju (5.5.4), lw (3.4.9), rw (2.3.9), 5ai (5.5.6), wr (4.5.9), 7jb (5.6.9).

NEW MEMBERS.

HOME CORPORATES.

J. C. Foster (G2JF), Burghfield, Dornock, Sutherland, Scotland.
S. Murphy (G2MY), "Delorna," Bradley Avenue, Thundersley, Essex.
D. J. George (G2UA), 3, Gosfield Road, Epsom, Surrey.
F. E. Marshall (G2XQ), 52, Easton Street, Easton, Portland, Dorset.
R. J. Carter (G5UU), 138, Charter Street, Chatham, Kent.
D. R. Etchells (G5WH), "Felstead," Broad Lane, Bradmore, Wolverhampton.
T. H. Colebourne (G6IA), Selborne Drive, Douglas, I.O.M.
B. Pashley (G6PJ), 124, Nicholson Road, Heeley, Sheffield, 8, Yorks.
L. A. Lafone (G6ZA), c/o Airwork, Ltd., Heston Airport, Middlesex.
J. F. Stalley (2AIO), 680, Foxhall Road, Ipswich, Suffolk.
J. E. Thomson (2AJA), 22, Haigh Street, South Reddish, Stockport, Lancs.
A. H. Arnold (2AUY), 40, Springwell Avenue, Harlesden, N.W.10.
E. Walker (2AWQ), 2, Harbord Road, Sheffield, 8, Yorks.
Mne. C. P. Edmunds (2BGD), 74 Mess, H.M.S. "Nelson," c/o G.P.O., London.
E. J. Bayliss (2BLZ), 117, Albion Street, Kenilworth, Warwicks.
R. Marshall (2BMU), 153, High Street, Earlsheaton, Dewsbury, Yorks.
E. A. Harvey (2BRH), 28, Cowley Street, Derby.
J. A. G. Bowhay (BRS2338), Smith Street, Dartmouth, South Devon.
B. Farleigh (BRS2339), 3, Broad Park Terrace, Dartmouth, South Devon.
W. E. Parker (BRS2340), 9, Deanhill Road, East Sheen, S.W.14.
J. C. Aldred (BRS2341), "Aysgarth," Valley Drive, Ben Rhydding, Ilkley, Yorkshire.
L. Oxley (BRS2342), 1, The Broadway, East Cosham, Portsmouth.
H. Clegg (BRS2343), 23, Hutton Road, Bradford, Yorks.
I. G. Campbell (BRS2344), 106, Seacliffe Road, Bangor, Co. Down, Northern Ireland.
D. Wilson (BRS2345), 1, Ormanton Road, West Hill, Sydenham, S.E.26.
G. V. Francis (BRS2346), "Highclere," 17, Springfield Terrace, Aberavon, Glamorgan.
R. D. Muir (BRS2347), 134, Wedderlea Drive, Cardonald, Glasgow, S.W.2, Scotland.
J. Coatsworth (BRS2348), "Newton House," 10, Tweed Street, Jarrow-on-Tyne, Co. Durham.
C. Lister (BRS2349), 209, Portswood Road, Southampton.
523144, P. Halligey (BRS2350), 76, West Camp, R.A.F., Cranwell, Lincs.
E. H. H. Beuden (BRS2351), 4, Kiln Bungalows, Hope, Wrexham, Denbighshire.
W. J. Woodall (BRS2352), 145, Antrobus Road, Birmingham, 21.
C. Sherer (BRS2353), 3, Temple Street, Keynsham, Somerset.
W. R. Hawkins (BRS2354), 12, Palace Cottages, Exmouth, Devon.
A. G. Fowler (BRS2355), Roadside Cottage, Birse by Aboyne, Aberdeenshire, Scotland.
T. C. Morris (BRS2356), c/o 1, Lion Street, Brecon, Wales.
R. L. Glaisher (BRS2357), 279, Addiscombe Road, East Croydon, Surrey.
J. W. Batchelor (BRS2358), Ponsmere Hotel, Perranporth, Cornwall.
R. C. Philpot (BRS2359), 50, James Street, Scarborough, Yorkshire.
G. L. Moses (BRS2360), 109, Grafton Road, Keighley, Yorks.
L. Berry (BRS2361), 29, Rundle Road, Liverpool, 17.
H. F. Burtoft (BRS2362), 175, Lake Road, Landport, Portsmouth.
A. Parker (BRS2363), Ben-Eden, Ballymena, Co. Antrim.
L. W. Mundey (BRS2364), The Laurels, Featherstone Road, Stanford-le-Hope.
J. F. Salisbury (BRS2365), 26, Charlton Road, Weston-super-Mare, Somerset.
G. R. Barmby (BRS2366), 29, Crystal Street, Hull, Yorks.
R. J. Murray (BRS2367), 74, Admiral Street, Liverpool.
T. R. Blakemore (BRS2368), 8, Mount Street, Walsall, Staffs.
A. S. Garside (BRS2369), 450, Huddersfield Road, Wyke, Bradford, Yorks.
F. H. Spencer (BRS2370), "Redlands," Bonington Road, Mapperley, Notts.
T. O. I. Pick (BRS2371), Elmwood House, Leeming Bar, Northallerton, Yorks.
R. A. P. Patterson (BRS2372), 2, Dundee Road, Forfar, Angus, Scotland.
F. Macfarlane (BRS2373), Cestria, Brynmarl Road, Mochdre, Colwyn Bay, North Wales.
H. D. Porter (BRS2374), "Stilrovin'" Cornwall Road, Littlehampton.
H. E. Short (BRS2375), 23, Rosebery Road, Exmouth, Devon.
E. Hobbs (BRS2376), 85, John Street, Porthcawl, Glam, South Wales.
G. T. Tyler (BRS2377), 20, Pembroke Road, North Wembley, Middlesex.
V. J. Sewell (BRS2378), 28, Haydock Street, Burnley, Lancs.
N. E. Dalby (BRS2379), 57, School Road, Moseley, Birmingham, 13
S. Waters (BRS2380), "Sans Fil," South Road, Porthcawl, South Wales.
R. A. Wilson (BRS2381) "Kineton," 28, Monks Avenue, New Barnet, Herts.
A. Hodson (BRS2382), 99, Park Drive, Ilkeston, Derbyshire.
H. I. Popay (BRS2383), V8 Flight, "C" Squadron, E. & W. School, R.A.F., Cranwell, Lincs.
H. G. Coddington (BRS2384), 89, Roe Lane, Southport, Lancs.
R. A. Kettlewell (BRS2385), 42, Roy Road, Northwood, Middlesex.

DOMINION AND FOREIGN.

H. Schulz (D4CSA), Koenigsberg i PR, Albrechstr. 6, Germany.
P. E. Littlefield (W1DUK), 3, Furbush Street, Rochester, New Hampshire, U.S.A.
G. H. Janes 3rd (W1GJQ), 70, Summit Road, Medford, Mass, U.S.A.
W. S. W. Nourse (BERS346), Dandukellawa, Hatton, Ceylon.
A. J. Gardener (BERS347), c/o Barclays Bank, Wadebridge, Cornwall.
R. L. Akers (BERS348), c/o Public Works Department, Kuala Lumpur, F.M.S.
D. Sutherland (BERS349), Box 445, Salisbury, Southern Rhodesia.
LAC. W. A. Bridge (BERS350), W/T Section, No. 1, Indian Wing, R.A.F., Kohat, India.

QRA Section.

Manager: M. Williams (G6PP).

NEW QRA'S.

G2AJ.—G. H. Bowden, 57, Lake Road, Henleaze, Bristol.
G2BD.—W. D. Ingle, 3, Montpelier Terrace, Edinburgh 10.
G2FI.—G. W North, 474, Merton Road, Southfields, London, S.W.18.
G2HU.—F. Sargent, 391, Wellington Street, Grimsby, Lincs.
G2JR.—H. B. Burton, 215, Ansty Road, Wyken, Coventry, Warks.
G2KR.—W. R. Kerr, 32, Kings Road, Belfast, Northern Ireland.
G2VA.—E. J. A. Vaughan, 84, Barton Hill, Minster, Sheerness, Kent.
G2XU.—C. W. Shillam, 10, Broadway Avenue, Westbury-on-Trym, Bristol.
G5IT.—H. J. Redgrave, "Newhaven," Broadway, Derby.
G5LF.—R. M. McRobb, 10, Orchard Street, Aberdeen.
G5MI.—A. N. van Perlstein, 14A, Thornton Hill, London, S.W.20.
G5NO.—A. G. Chambers, 94, Tennyson Road, Stoke, Coventry, Warks.
G5PY.—R. F. R. Clark, 18, Parkthorne Road, Clapham Park, London, S.W.12.
G5QB.—H. D. Bickley, 95, Moor Street, Coventry, Warks.
G5QQ.—P. H. Trafford, Elmira, Ratcliffe Road, Sileby, Loughborough.
G5SC.—R. H. B. Candow, 1, Gowrie Street, Dundee, Scotland.
G5SX.—D. S. and J. B. Walker, 63, Park Drive, Grimsby, Lincs.
G6AA.—D. S. Mitchell, The Flagstaff, Colwyn Bay, North Wales.
G6FL.—P. C. Kidd, Ryecroft, Longstanton, Cambs.
G6GC.—J. G. Carlson, 8, Trajan Street, South Shields.
G6ID.—W. A. Chittleburgh, 222, Fitzstephen Road, Dagenham, Essex.
G6JF.—C. R. Wigg, Horsehills Farmhouse, Norwood Hill, Surrey.
G6KB.—J. J. Platt, "Purlea," Terncliffe Drive, Keighley, Yorks.
G6MX.—Portable of G6AA.
G6NG.—A. N. Harris, 695, Green Lane, Dagenham, Essex.
G6OB.—R. G. S. Bartle, 50, Woodbury Park Road, Tunbridge Wells, Kent.
G6OD.—C. F. Suffolk, 12, Norfolk Road, Thornton Heath, Surrey.
G6OI-OJ.—Major J. Timbrell, Treneath Lodge, Sandy Lane, Stourbridge, Worcs.
G6PG.—P. G. Targett, 97A, Whitehill Road, Gravesend, Kent.
G6QJ.—S. G. Lewis, 49, Clifton Road, Tuebrook, Liverpool 6.
G6RO.—R. C. Kaye, 153, Longley Croft, Lowerhouses, Huddersfield, Yorks.
G6ST.—E. W. G. Sainty, 23, Albert Road, Witham, Essex.
G6UV.—C. S. Lewis, 52, Barrow Lane, Hessle, Hull, Yorks.
G6VH.—F. H. Goldsmith, 237, Croftpark Avenue, Glasgow, S.4.
G6WR.—W. H. Robertson, 28, Snaefell Terrace, Seacliffe, Whitehaven, Cumbs.
G6YN.—H. D. H. Smith, 64, Columba Road, Grimsby, Lincs.
G6YT.—W. S. Turpin, 8, Carlton Close, Edgware, Middlesex.
2AAX.—A. W. G. Anderson, 25, Oban Avenue, Maybury Road, Hull, Yorks.
2ABS.—C. Stinchcombe, Hereward, Yatton, near Bristol.
2AFO.—N. Owen, 9, Northampton Road, Broughton, Kettering, Northants.
2AGC.—R. Chadbone, "Hildeslea," Orgers Hill, High Wycombe, Bucks.
2AGF.—F. G. Spragg, 86, Blenheim Crescent, Luton, Beds.
2ANX.—C. C. Newton, 6, Savery Terrace, Lipson, Plymouth, Devon.
2ATZ.—C. Turner, 4, Grosvenor Avenue, Whitefield, Manchester.
2AYZ.—Rev. E. D. Geddes, St. Barnabas Vicarage, Douglas, I.O.M.

2BBD.—C. L. Davies, 75, Rhondda Street, Mount Pleasant, Swansea, Glam.
2BBF.—J. J. Henney, 48, St. Mary's Street, Kirkcudbright, Scotland.
2BDT.—A D Taylor, "Culmore," Pensby Road, Heswall, Ches.
2BFG.—C. R. H. Carter, 29, South Esk Road, Forest Gate, London, E.7.
2BFH.—B. F. Hutton, 91, Topsham Road, Upper Tooting, London, S.W.17.
2BHV.—R. J. G. Harvey, 33, Howard Road, Westbury Park, Bristol 6.
2BKN.—K. C. North, "Midhill," Eastbank Road, Sheffield.
2BLA.—C. N. Blatherwick, 29, The Drive, Roundhay, Leeds 8, Yorks.
2BLQ.—R. Lyall, Ewart, Wooler, Northumberland.
2BMM.—E. W. Mortimer, 81, Whiteman Street, Gorse Hill, Swindon.
2BPT.—G. A. Patrick, 4, Stokesley Crescent, Billingham, Durham.
2BRB.—R. J. Brandon, "Ronda," Ferndale Road, Burgess Hill, Sussex.
2BVD.—J. F. Stone, 91, Erskine Hill, London, N.W.11.
2BWX.—W. S. Knox, "Brownfield," Moorcroft Avenue, Oakworth, Near Keighley, Yorks.
2BYN.—E. O. Byrne, c/o Ulster Bank, Ltd., Clogher, Co. Tyrone, Northern Ireland.
2BZK.—M. Golkovitch, 3, Burwell Road, Leyton, London, E.10.
EI7J.—F. W. Warren, Wine Street, Sligo, I.F.S.

The following are cancelled: 2AGK, 2ANK, 2AQC, 2ASW, 2AVG, 2AVR, 2AWK, 2BGO, 2BKW, 2BNC, 2BRM, 2BVU.

Southend and District Radio Society.

At the annual dinner of the above Society held at the London Hotel, Southend-on-Sea, on April 18, there was an attendance of about 60. The guest of honour was the Mayor (Councillor A. H. White), who, in proposing the toast of the Society, summarised its history since its formation in 1921 until the present day. Outstanding work has been done in connection with charity, local hospitals have been fitted up with receiving sets, and receivers for 56 blind listeners have been maintained. Changes in the policy of the Society have earned the attention of short-wave enthusiasts, and the amateur transmitters in the district. The chairman, Mr. Tunnicliffe, responded.

Mr. F. S. Adams, the Hon. Secretary, proposing "Our Guests," said that the policy of the Society was now to bend their energies in the direction of national and international obligations rather than to make a local force alone. Mr. T. A. St. Johnston (G6UT) responded on behalf of the Council of the R.S.G.B., and pointed out that the local transmitting members of the R.S.G.B. with whom the Southend Society were affiliated, would always be willing to assist and encourage non-transmitting members in any way they could. The Mayor then handed the "Pocock" Cup awarded for the best amateur-built piece of apparatus, to Messrs. Pugh (2BNR) and Legget (BRS1647), who jointly built the transmitter which will be used for District 14 "B" Station on National Field Day.

ZB1J.

Members resident in the Southern districts of England will be interested to hear that Mr. C. C. Newman has recently been issued with the call ZB1J. Mr. Newman was for some years ZC6CN, but lately operated from Broadstairs under the call G6NC. His present address is Meteorological Office, H.Q., R.A.F., Valletta, Malta.

He hopes to contact many old friends from Malta to which island he has been transferred on Meteorological duties.

The Ten Metre Band

By Nelly Corry (G2YL).

APRIL showed the first definite break in the run of good conditions which we have experienced since October, 1935, and after the middle of the month several days passed when ZS1H and a few commercial harmonics were the only signals to come through—conditions very similar to those of last September. From April 1 to 15 Africans and North, Central and South Americans were heard fairly consistently, and an occasional J, VU or VK was audible, but after that the North Americans in particular were conspicuous by their absence.

On the 26th four European countries were heard in the South of England, and it looks as if normal "summer" conditions will return this month, Europeans taking the place of more distant signals. On the other hand, G6DH reports that VK's were good from 06.15 G.M.T. onwards on the 26th, and theoretically, at any rate, we should be able to receive Africans at all seasons until after the time of sunspot maximum three years hence, so perhaps this summer the skip-distance will occasionally extend for thousands, as well as the usual hundreds, of miles.

Two Madagascar stations have been received well recently; FB8AB, first worked by G6HL on April 8, and FB8AG, first worked by G6WN on the 11th. Another new country was worked when G6WN raised VP1AA on April 12; his neighbour VP1JR has also been heard on several occasions. G6HL heard TI3WD on March 29; 2BFD heard HP1A's 'phone signals on April 5; several stations have reported NY2AE's 'phone when the band was otherwise quiet, and KA1AN's harmonic was R6 for about an hour on the afternoon of April 12.

G6DH heard J2IS at R6 at 08.20 G.M.T. on the 7th, but could not raise him, but he managed to work VS6AH on 'phone at 14.00 G.M.T. on the 25th. He also worked VK4, 5, 6, VU, FB8, VP1, K4, and CO6OM ('phone) during the month. BRS25 heard a J3 (probably harmonic of J3FK), at the unusually late hour of 18.24 G.M.T. on the 20th, and VU2AU has been heard at various times between 09.00 and 18.15 G.M.T.

SM6WL reports that conditions in Sweden are very similar to ours. He has worked five continents in the last two months, but an Asian contact is still needed for W.A.C.

ZL3AJ reports hearing G6LK, OH7ND and ON4NC on March 3. He has not had a European QSO for some months, but heard G6LK several times in March at about 09.00 G.M.T. He completed the first ZL W.A.C. on 28 Mc. on March 14, by working ZS1H, and was the first ZL, of the half dozen stations active on the band, to contact G, D, F and J.

G2PL claims first contact with HJ3AJH, as he worked him on January 30. First contacts will not be listed in future, but details of them will be welcomed by G2YL. Thanks are due to the several stations whose regular reports are invaluable in the compilation of these Notes.

Stray.

G2JH, who has been working exclusively on 56 Mc. for the past nine months, informs us that his call is being pirated by a U.S.A. station.

R.S.G.B. SALES DEPT.

53, VICTORIA STREET, LONDON, S.W.1

PUBLICATIONS

RADIO AMATEURS' CALL BOOK

(Published quarterly in U.S.A. on the 15th of March, June, September and December.)
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NOTES and NEWS from the BRITISH ISLES

DISTRICT REPRESENTATIVES.

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(Cumberland, Westmorland, Cheshire, Lancashire.)
MR. J. NODEN (G6TW), Fern Villa, Coppice Road, Willaston, near Nantwich, Cheshire.

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

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

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

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

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

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

DISTRICT 8 (Home Counties).
(Beds., Bucks., Cambs., Herts. and Hunts.)
Mr. G. JEAPES (G2XV), 89, Perne Road, Cambridge.

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

DISTRICT 10 (South Wales and Monmouth).
Capt. G. C. PRICE (G2OF), The Mount, Pembroke Dock.

DISTRICT 11 (North Wales).
(Anglesey, Carnarvon, Denbighshire, Flintshire, Merioneth. Montgomery, Radnorshire.)
MR. D. S. MITCHELL (G6AA), "The Flagstaff," Colwyn Bay, Denbighshire.

DISTRICT 12 (London North).
Mr. S. BUCKINGHAM (G5QF), 9, Brunswick Park Road, New Southgate, N.11.

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

DISTRICT 14 (Eastern)
(East London and Essex.)
MR. T. A. ST. JOHNSTON (G6UT), 28, Douglas Road, Chingford, E.4.

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

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

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

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

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

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

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

DISTRICT 1 (North-Western)

THE D.R. wishes each member in No. 1 District to note that reports for these notes must be sent to the Town Representative appointed for his particular town or area and not to T.R.'s for other towns or to the District Scribe. The T.R. is responsible for collecting the reports and forwarding same to the District Scribe. In areas where no T.R. has been appointed reports can be sent direct to the D.R. or to the District Scribe.

Manchester.—Twenty-five members attended the April meeting and N.F.D. matters occupied the whole evening. QRA this year is at Grants Hill, just outside Bury; postal address, Grants Tower Farm, Walmsley, near Bury. Visitors proceed via Bury, get a Walmsley 'bus from Kay Gardens, Bury, and ask to be put off at Gollinrod, from which place Grants Tower is visible. Make straight for this Tower and the presence of cars and signs will indicate the location.

Will all who intend staying the night, or require any catering, please write G2OI before the end of May, so that arrangements can be made?

We are still in need of meters, 150 volt H.T. accumulators, aerial wire, L.T. accumulators, or car batteries, and a really good receiver (note the bands used). Another suggestion is that portable 56 Mc. gear be taken along so that those not engaged in operating in N.F.D. can find something to do. Members will be on location from 10.00 G.M.T., so come early to help in the erection of the gear.

G2DH has now completed 8-valve super. 2WQ reports working K6; 5YD busy on suppressor grid modulation; 6GV completed 14 Mc. Collins type transmitter. 5CH, 6TL, 2HW, 6KS, 2LK, 5OZ, 5PX, 2JC, 2OI, 2BPJ, 2BZX, BRS2151, 2145, 2051, 2327, 2037, 2BYB are also active.

Liverpool.—In spite of the fact that the April meeting took place on the Wednesday following Easter week-end and several members were taking a holiday, an attendance of 28 was recorded. Unfortunately G2RF was called away on business on the day of the meeting and apologises for his absence, but 2DC kindly presided as deputy T.R. Members spent the evening in a general discussion of radio matters and N.F.D.

The T.R. reports that the arrangements for N.F.D. are now practically completed and he will be

visiting the proposed site before the date of the next meeting so that he can give full directions to the members. He also reports a very satisfactory balance in the N.F.D. fund. A 7 Mc. crystal is to be purchased for N.F.D. purposes and will be subsequently disposed of as a prize in connection with some kind of contest.

Numerous stations report active, but no reports of unusual interest have been received.

FORTHCOMING EVENTS

MAY 20.—District 1 (Liverpool Section), 7.30 p.m., at 38, Mason Street, Liverpool.

MAY 20.—District 15, 7.30 p.m., at G2IY, 2, Tring Avenue, Ealing Common.

MAY 23.—Radio Transmitters' Union. Visit to Northern Regional Transmitter, N. Ireland. Meet 3 p.m.

MAY 24.—District 11, 3 p.m., at 2AJT, "Deepdale," Marine Road, Prestatyn, Flintshire.

MAY 24.—East Midlands Provincial District Meeting, at Welbeck Hotel, Nottingham. Assemble 12 noon.

MAY 25*.—District 14 (Southend Section), 8 p.m., at G2KT, "Newsonia," Bull Lane, Rayleigh.

MAY 26*.—District 14 (East London Section), 8 p.m., at G6AU, 63, Margery Park Road, Forest Gate, E.7.

MAY 27.—Scotland "A" District, 8 p.m., at Sloan's Restaurant, Glasgow. Annual dinner. Tickets can be obtained from Mr. D. M. J. Tyre, 71, Waverley Street, Glasgow, price 4s. 6d. each.

MAY 28.—District 4 (Leicester Section), 8 p.m., at G6VD, 9, Cecilia Road, Leicester.

MAY 28.—District 13, 8 p.m., at Brotherhood Hall, West Norwood.

JUNE 3.—District 1 (Manchester Section), 7.30 p.m., at Brookes Café, 1, Hilton Street, Manchester.

JULY 12.—District 13, Conventionette, Wellington Hotel, Tunbridge Wells.

*Sale of disused apparatus at these meetings.

Rochdale.—No meetings were held during April, but in an effort to stimulate interest in amateur radio, G6QA has had a photograph and half a column in the local paper. It is too early to know whether this has had the desired effect.

G6AX and 6QA have both erected aerials of the same type (48 ft.—16 ft.) and observations are to be carried out on 14 Mc. propagation, as the aerials are at right angles, that of G6AX running east and west and G6QA north and south. Other stations reporting active are BRS1152 and BRS1680.

Southport.—The third Southport meeting was held at G5ZR on April 3, at which an attendance of nine was recorded, including a prospective R.S.G.B. member. Those present included G6SX, 6YR, 5ZR, 6KY, 5UT, 2AAI, BRS2140 and 5NU, and a short talk was given by 6KY on "Blind Landing Systems for Aircraft."

It is hoped to get a party from Southport to attend N.F.D. on cycles, as the site is only a few miles away. Those interested please advise G5ZR or 5NU.

Individual activities are as follows:—G6KY and 6YR are trying out 7 Mc. fone, with some success. 6SX on 7 Mc. with single C.O.—a 211E! BRS2140 is willing to stand by for anyone on 1.7, 3.5 or 7 Mc. 5ZR and 5NU are busy with UHF.

Hoylake.—A meeting of the newly-formed Wirral Amateur Transmitters' Society was held on March 25, QRA 2BON. After election of officers an informal discussion took place. About 12 members have so far joined the society, but more are required.

BRS2291 is now 2BDT; G2FZ has been working several J stations during a good DX period. 56 Mc. enthusiast, 6GL, took receiver to I.F.S., but failed to hear anything of Liverpool transmitters. He wishes to thank Dublin members for their hospitality. Active stations include G6CX, 6GL, 2AHG, 2BON and 2BDT.

Nelson.—Members in this town are interested in 56 Mc. and would like to arrange schedules with others living within range of their gear. G5XC is the organiser of these tests. Regular meetings are being held by the local club; the next will take place on May 20. The following are active: G2RB, 5XC, 5ZN, 2ATY, 2AVG, 2BWW, BRS1933, 1934, 1975, 2067, 2221, 2272 and 2307.

DISTRICT 2 (North Eastern).

National Field Day arrangements are being concluded and full particulars may be obtained from the respective D.R. or member in charge of the station in each locality. Area activities are as follows:—

Sheffield.—Ten members attended the York meeting and report spending a most enjoyable time. In view of the welcome, but unexpected news that Sheffield is to have an N.F.D. station, preparations are proceeding, and we hope to make good the poor showing of two years ago. The site will be Lodge Moor as before, and everyone is urged to attend the rehearsal on Saturday, May 23, and also the meeting on Thursday, May 28. A party of 25 recently paid a visit to the G.P.O., and were shown the progress of letters from being posted to being delivered. The following report active:—G2AS, GN, JY, 5LZ, TO, UA, UJ, 6LF, PJ, 2AVC, BGN, BKN, BOU, and BRS1625, 1800, 1851, 1944, 2124, 2282 and 2293.

Tynemouth.—At the last meeting held at G2LD, N.F.D. was discussed. The site will be Kenton Lane, Gosforth, and all R.S.G.B. members are invited to lend a hand. Sales of disused apparatus will be held at future meetings, and these will take place on the first Sunday in each month at 4, Priors Terrace, Tynemouth. Meetings are also to be held in North and South Shields, particulars from 2LD. G6XO is welcomed as a new station. The South Shields group are very active and hope to operate a

portable station on 7, 14 and 56 Mc. on the same date as N.F.D.

Doncaster to Goole Meetings have been held in the past, but not with a great deal of success, because the membership is so scattered. Further attempts are to be made. Reports of activity are to hand from 2AUO at Goole, 2BWF (TR.), at Thorne, and 2ANA at Stainforth.

Leeds.—The last meeting was held at 2AHM, when G5CX gave a talk on receivers,; we were glad to welcome BRS, 2191 and 2317. BRS1098 becomes 2BLA, and 1650 2AHL. The following are active : G5CX, 6AZ, 6XL.

Huddersfield.—G5VD and 2ALU attended at York. BRS2186 becomes 2ARN and the following are active : G5QN, 2ALU, and ARN. Meetings are to be held at each of the members' station in turn.

Dewsbury.—Reports of activity from G5YU, 5ZB, 6AO, and 6SP.

Bradford.—The arrangements for N.F.D. are now almost completed. and the site will be Kenmore Estate, Moore Avenue, Gt. Horton. Offers of help are requested for the loan of gear and assistance in assembling, etc. Notice will be given of a meeting to make final arrangements. Visitors will be welcomed and special efforts are to be made this year.

We are pleased to welcome G6KB, from Keighley, who reports success with his transmitting gear. The following are active : G6PY, 5TQ, 6KU, 6BX, 6SN, 5SZ, 5HB, 2QM, 5WK, and 2UY.

Stockton-on-Tees.—Members are preparing for N.F.D. The following are active :—G5XT, 6CV, 5QU, 6ZT, and 2FO. 2ARB has applied for full licence ; 2BQO is working from new QRA ; BRS2297 is making a comparison between vertical and horizontal aerials for receiving purposes ; BRS2317 is a new member ; 2301 is now 2BPT.

DISTRICT 3 (West Midlands).

Reports this month are few, but there is apparently considerable activity in the District. Our D.R. had hoped to make the journey to Newport on the 27th by air in his new 'plane, but unfortunately conditions were unsuitable.

BRS2286 reports direct from Leamington Spa and encloses for examination a graceful acknowledgment received from LA2N with reference to a report made to the latter.

Warwick and Leamington.—Meetings here are held each Thursday and Saturday at the QRA of 2BLR, Coton Lodge, Coton End, Warwick. An invitation is extended to members and friends.

Progress is being made in the construction of the gear for the District A Station for NFD. The sign will be G6PWP, and the QRA, Newbold Comyn Farm, Campion Hills, Leamington Spa.

2BXG is applying for his full ticket. He has completed a 7 Mc. transmitter. The Leamington and Warwick A.R.S. has applied for affiliation to R.S.G.B. Eight stations are reported active.

Coventry.—Weekly meetings of the Coventry A.R.S. are held on Tuesdays at the Ragged Schools (hope we have deciphered this correctly), New Buildings, Coventry. A lecture on " The Class ' C ' Amplifier " was given at a recent meeting by G5QB. Arrangements in connection with the " B " Station for NFD are well advanced, but the location is not given.

G5NO, whom we congratulate on the attainment of his full licence, is working on 56 Mc. Twenty-one stations are reported as being active.

Wolverhampton.—An exceptionally good meeting of the local society was held on March 25 at the Molineaux Hotel, no fewer than 42 being present. Some excellent equipment was shown, including a 5-metre transmitter-receiver—not " Transceiver." It is fitted to use a 6D6 suppressor grid modulated by 56, whilst the valves in the receiving portion consisted of a S.G. detector and a separate quench. This was injected on to the screen of the detector, and the output was a pentode. Midget valves are used in the receiver.

A field day has been planned for 5-metre work, and the co-operation of two planes has been promised.

G2WD kindly supplied data suggested by J. L. Reinartz for several directional 5-metre aerials which are being erected in the district, where considerable activity on 56 Mc. is being shown.

The lecture for the April 26 meeting was " The Cathode Ray Tube in Radio Research." A Town Crystal Frequency Register is being compiled, and all members who have not already done so are asked to send their operating frequencies to G6UI or 2NO.

EAST MIDLAND PROVINCIAL DISTRICT MEETING

SUNDAY, May 24th. 1936

at

WELBECK HOTEL, Nottingham

Assemble ...	... 12 noon
Luncheon ...	...1.15 p.m.
Business Meeting	...2.15 p.m.
Tea	...4.0 p.m.

Special Visits of Interest at 4.30 p.m.
Inclusive charge, 6s.

Reservations to Mr. Jack Lees (G2IO), 17, Trevose Gardens, Sherwood, Nottingham, before May 20th.

DISTRICT 4 (East Midlands)

A record meeting was held at Ilkeston when 36 members and visitors attended. Special mention must be made of three members from Retford, who cycled over 80 miles to be present.

Arrangements for N.F.D. and the Provincial District Conventionette, to be held in Nottingham on May 24 have been completed. Will all members please make every effort to attend and let your D.R. or T.R. know ten days before.

Leicester.—The T.R. was pleased to see a better attendance of members at the last Leicester meeting, held at 2BLR. The next meeting will be held on May 28, 1936 at 8 p.m. at 6VD, 9, Cecilia Road, Leicester. 2BIT is very active on 56 Mc. and hopes shortly to be C.C. on that band. Other stations active are G6IM, 2XD, 5ZP, 6GF, 6GO and 5UQ. BRS1583 is now 2BLR.

DISTRICT 5 (Western).

The joint Provincial Meeting of Districts 5 and 10 was held at Newport on April 26. During the

afternoon our Secretary (G6CL) gave a clear idea of the work being done by the Society, outlining several very important licence concessions which have recently been obtained for members. He also dealt with points concerning the T.R. scheme, and appealed to all members to give the new T.R.'s their full support. The importance of work done by the Band Occupancy and Commercial Activity groups was stressed especially in view of the necessity of providing data for Cairo.

Arrangements for N.F.D. are well in hand, and both A. & B. stations should do well if all operators will realise that it is a contest and not just a social event.

Bristol.—The local clubroom is now an accomplished fact, and hearty thanks are due to G5FS and 2BYU for the splendid work they have done in getting it going. The opening will take place shortly upon completion of the necessary work, in which it is hoped all will do their part. Active stations are G2GQ, 5JU, 5KT, 5UH, 5WI, 6DJ, 6VF, 6GU, 6VK, 6RB.

Oxford.—Portable 56 Mc. tests have recently been carried out, and some very interesting results obtained between a car and a fixed station. Active, G2CL, 2DU, 5HS, 5TB, 6QQ, 2AKB, 2ABM, 2BHP.

DISTRICT 6 (South-Western)

By the time these notes are published the local Conventionette will have been held. It is hoped next month to give a somewhat detailed report of what took place for the benefit of those members in the district who were unable to attend. During N.F.D. the A station will be situated at Holsworthy, in North Devon, while the B station will be at Sandy Bay, near Exmouth. In connection with this latter station, 5QA and 5SY are each constructing power tri-tet oscillators as the transmitters, each to be used on one band only. The valves will be RFP60's. The A station is under G6FO, and the B station is in charge of G5SY.

Torquay.—The meeting here was again very well attended, fifteen turning up, including two prospective members from Dartmouth. It was decided to hold no further meetings till the autumn, when the D.R. hopes to be in a position to recount his further adventures at Convention!

Penryn.—An excellent report has been received. It has been decided to hold meetings on the third Sunday of each month at The Tanner Inn, Tanner. At the last meeting there were present BRS2252, 2048, 2BXT, 2BPB, 2AZW, and 2AQB. 2BPB, 2AZW, and 2AQB are all hoping to have their two letter calls soon. An interesting and noteworthy point in this report is the fact that practically the whole of the membership is assisting in the band occupancy check. Good work, OM's.

Taunton.—At the last meeting there was an attendance of seven, including two visitors. Members present were BRS190, 2027, 2249, 6BW and 5AK. The high spot here was a demonstration by 6BW on gramophone recording, using home-made gear. The next meeting has been arranged to take place on the Blackdown Hills, when some 56 Mc. tests will be conducted.

Exeter.—Six members turned up at the last meeting, an improvement on former attendances.

DISTRICT 7 (Southern.)

Final arrangements for field day were concluded at the April meeting held at Farnborough. The site for the A station has been changed, and the corrected address is at the field of Briggs & Sons, builders, London Road, Widley, near Portsmouth. Conventionette still remains to be definitely fixed. Not a single reply was received in response to the note *re* suitable venues published in the last issue of the BULLETIN, so we take it that members are not interested in the suggestion to hold it on the South Coast.

There will be no monthly meeting in June, as NFD will occupy most of our time.

Portsmouth and District.—At the April meeting of the South Hants R.T.S. held in Southsea, 2BCM demonstrated his s.s. super het. receiver, which performed very well in a noisy location. G6SS is using a master oscillator to avoid 7 Mc. QRM. 2XC rebuilt speech amplifier, and now has greater modulation. Welcome to BRS2342 of Cosham. BRS2105 now gets good results on an A.C. receiver. BRS1945 is now 2BBG. 6NZ has home-made super with I.F. regeneration. Others active: G6WS, 2VH, 5OT, 2AIV, 2BHR, BRS 1964, 1907.

Reading and District.—Fourteen members were present at the meeting held in Reading on April 22. Field day was the main topic, and it was decided to run a portable station in Berkshire during NFD. This station will be non-competitive. A demonstration of an all-wave receiver was given by G5HH. Most stations report active on one or more bands. G6GT rebuilding. 5JI reports working WBE on 5 watts in five days, and in all has had 500 contacts in 40 countries with this input (F.B. O.M.). 5JI works break-in and raised VS6AH on this system. Next local Reading meeting is on Wednesday, May 20.

Reigate and Horley.—A cordial welcome to G6JF, who has contacted all Europe and CT2 on 7 Mc. within a month of having been licensed. 5LK is experimenting with vertical indoor aerials. Many thanks to 2UJ and other Tunbridge Wells members for entertaining 5PR and 5XG on a recent visit, and a return visit is hoped for shortly. 5PR has doubled his output by use of link coupling. G5XG contacts LU6B on 14 Mc. fone, 2AIG, 2JO and 6KD also report active.

Guildford and District.—G5CM is getting good reports from East Coast U.S.A. stations on 28 Mc., with 7 watts input to a 59 valve used as an E.C.O.

G5OJ kept watch for recurrence of "Dellinger effect," and says that on the critical day signals from G6GS on 28 Mc. were half usual strength. He also has a C.C. 56 Mc. transmitter and straight 56 Mc. receiver with optional quench, but no tangible results to date. 6LK has been working the world on 14 Mc. fone, and been trying new aerials out in the process. He has now reverted to the old Windom. 6GS is active on 14 and 28 Mc., and has been amazed at DX on the former frequency. 28 Mc. has been very moderate, but in one good half hour worked VU2AU to complete his 28 Mc. WBE and WAC. BRS1847 reports hearing K6 at R9 on 14 Mc. fone, and his new super is going very well. BRS2250 has been trying commercial all-wave B.C. set, but although amateur signals are loud, the lack of band spread is a great drawback.

Kingston and District.—G2NH is working most of the usual 'phone DX on 14 Mc. Also has most enjoyable sked with No. 7 members and others on 7 Mc. Sunday mornings. A spot frequency of 7,270 kc. is used.

G6BI is building 7 Mc. portable for field day use of the Kingston and District S.W. Club. 2BHU is concentrating on 56 Mc. with good results. 6RS is also on this band exclusively, and would welcome reports on his tone transmissions.

EASTERN PROVINCIAL DISTRICT MEETING

SUNDAY, JUNE 28, 1936

at

CAMBRIDGE

Assemble at Drinking Fountain, Market Place ...	10.30 a.m.
Visit to Pye Radio, Ltd. ...	11.0 a.m.
Lunch at Red Lion Hotel, Petty Cury	1.0 p.m.
Business Meeting	2.30 p.m.
Tea	4.30 p.m.
Conducted tour to well-known Local Beauty Spots ...	5.30 p.m.

Inclusive charge, 5s.

Reservations to MR. G. A. JEAPES, G2XV, 89, Perne Road, Cambridge, not later than June 23.

DISTRICT 8 (Home Counties).

At a meeting held in Cambridge on April 3, the 15 members present discussed arrangements for N.F.D. G5JO at A and G6DX at B will be in charge of their respective stations.

A new Letter Budget has been started. Members' reports will be pinned together and posted around the circuit.

The Provincial District Meeting will take place on Sunday, June 28, at Red Lion Hotel, Petty Cury, Cambridge. All members who intend to be present must notify the D.R. *in writing* at least three days before the event takes place. The cost will be 5s. and this will cover a course luncheon and tea, but not liquid refreshments! A detailed announcement concerning this—the big event of the year—will appear later.

As a result of the appeal for reports, a fair response has been received, but more are required.

G2PL is testing a W3EDP aerial after a long run with a Windom. Directional results are contrary to expectations and the efficiency is encouraging. Tests against a 132 ft. end fed Hertz are to be conducted. G5OV has worked VK on phone. 6XN is testing aerials on 28 Mc., and finds a full wave vertical best; he is rebuilding for higher power.

G6HD is interested in 56 Mc., 6DX having worked YN1AA has qualified for his W.A.C.

The following also report:—G2HJ, 2NJ, 5NX, 6PD, 6LX, 2075, 2121, 2171.

G6FL of Willingham, is welcomed as a new call. 2AGC graduates from 1873.

The D.R. has almost completed a new 14 Mc. phone rig, giving an input of 100 watts.

From G6DX we learn that weekly meetings are now being held at G5RL, St. Ives. All members in that area will be welcomed.

DISTRICT 9 (East Anglia).

Progress towards N.F.D. moves swiftly. Incidentally, the "B" station is having difficulty in procuring a generator for the power supply. Will any member who knows of one please inform G2MN?

The generator for the "A" station kindly loaned by G5QO, has arrived at G2XS and is being fitted with smoothing, etc.

Norwich.—G6QZ has completely rebuilt his station and has managed to QSO W on 28 Mc. 2MN has been busy with field day gear. 2UT is becoming the local DX man and is doing some good work.

Ipswich.—Many signs of increasing activity, and we welcome a new member, 2AIO. Mr. Wood informs us that several other likely new members are on the way in his town.

King's Lynn.—G6FB, home from his ship, has been rebuilding; 2JS has acquired a super-het; G2XS has been making a tour of the "Nottinghams," and his station was considerably active during Easter due to the presence of G6MN.

DISTRICT 10 (South Wales and Monmouth).

The outstanding activity in the District last month was the Provincial Meeting at the Queen's Hotel, Newport. Members assembled at noon, and there was soon a buzz of personal QSO's until lunch was served at 1.15 p.m. About 40 sat down. No. 5 District was well represented and visitors came from Bristol, Gloucester, Birmingham, Cardiff and Swansea. A telegram of apology was received from G5VM. After lunch a photo was taken and this was followed by a business meeting at which the Secretary gave a report of Society activities. "Clarry" was at the top of his form, and every moment of the hour and twenty-five minutes he spoke was of the greatest interest and value.

After tea a visit was made to the Newport Power Station, and the gathering did not finally disperse until late in the evening. The D.R. takes this opportunity of again thanking all those who attended.

DISTRICT 11 (North Wales).

The D.R. apologises for the lack of notes in the last issue; this was due to his absence abroad.

The April meeting was well supported, N.F.D. being the main topic of discussion. It was revealed that the District could muster only four operators for this event, due to the very small number of fully-licensed members available. It was decided, however, that support should be given to the event by the operation of two portable stations. These will work the contest stations, but the District will not compete.

In addition to working on 1.7 and 3.5 Mc., the "A" station will work on 7 Mc. under the call-sign G6MXP, and will thus be able to help some of the "B" contest stations.

All members will be welcomed at the N.F.D. stations, but the operators cannot be expected to supply them with food!!

Are you making your portable gear ready for the July outing?

DISTRICT 12 (London North).

A practical demonstration and talk on 56 Mc. receiving equipment was given by Mr. D. Corfield, G5CD, at the district meeting held at the "Wander Inn," on Tuesday, April 14. Comparisons were made between a Superhet and a Super-regenerative receiver, which demonstrated most effectively the need of frequency stabilised transmission on this band.

Arrangements for N.F.D. are completed and the sites are :—

"A." Scouts' Camping Ground, Frith Lane, Mill Hill, N.W.7.

"B." Woodcock Lodge Farm, Tylers Causeway, near Hertford.

The following members report active :—G6QM, 6ZO, 5CD, BRS2228.

DISTRICT 13 (London South)

The main item on the agenda for the April District meeting was N.F.D., and the discussions which took place were, it is felt, enlightening to all those present. In view of the decisions reached, the D.R. would like to express his gratification at the apparent enthusiasm of the membership for the success of South London in the contest. It is, however, with regret that we have to mention that not one member has as yet written to the D.R. in answer to his appeal in last month's BULLETIN for offers of transport on June 6.

The following have reported active this month :—2AMW, 2AOP, G6NH, 5PY, 2ND, 2GZ. We hesitate to mention a fact which has so often been stressed in these columns, but if no reports are received these notes will cease to appear. It is hoped that the usual good attendance will be recorded at the next meeting on May 28. Further N.F.D. discussions will take place.

DISTRICT 14 (Eastern).

Southend-on-Sea.—At the April meeting held at G5VQ, Westcliff-on-Sea, a record attendance of 26 was obtained and included, in addition to the usual visitors, G6ST, BRS1572, and 2AMF, of Witham, and BRS2364, of Stanford-le-Hope. Details of the Southend Radio Society's dinner appear elsewhere. Rules for the local contest were drawn up by Messrs. Adams and Varney and most stations are improving the efficiency of their transmitters and aerial systems in ready. For this contest staged for May, G5RW, using 2 watts, has worked W. G2KT has worked VK on fone. Our T.R., G5UK, has returned from a business tour in Greece, Cyprus, Egypt, Palestine, and Turkey, and while in Alexandria visited SU1SG and other local transmitters.

The Western Provincial District Meeting, Newport, April 26, 1936.
Centre of front row, G2OP (D.R., South Wales and Monmouth), on his right G6RB (D.R., Western England) on his left G6CL (Secretary).

East London.—At the April meeting held at G6UT, Chingford, there was only a small attendance. The main topic discussed was N.F.D. 2AYB has a list of 14 Mc. N. American fone stations who are willing to make schedules with any member interested. Write to 2AYB direct and a list, including suitable times, will be forwarded. Congratulations to BRS1977, of Leyton, who is 2BZK, also to 2AMF, of Witham, who is now G6ST. 2BGL, of Loughton, awaits a call sign, having passed his Morse test.

DISTRICT 15 (London West and Middlesex).

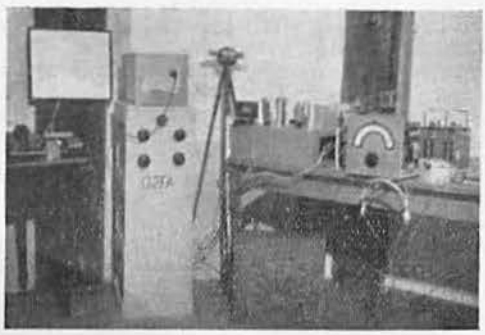
The attendance at meetings is growing (thirty-two last month) ; the Letter Budget is growing ; the subscription list for the magazine is growing, interest in N.F.D. is growing. These are healthy signs at this time of the year, and we hope that when the winter comes round again the progress will have continued.

Sixteen reports have come to hand, which is better than we have had for many months.

Twickenham.—The following are reported active : G2KI, 2LA, 2NN, 2VV, 5VB, 5XY, 6GB. G5VB and 6GB have installed " Wheatstone " tape transmitters.

Hayes.—G5JL and 2BCN report. Individual reports come from G6XP, who graduated from 2AJX during the month. Congratulations. G5LI, 6CO, 6WN, 2BAI, 2AUB, BRS2178 and 2239 are all active. G6CO sends some interesting news of night tests on 56 Mc. during the Easter week-end. With 2BAZ he spent nearly seven hours (until 2.15 a.m.) out in the cold testing transmitter coverage under such conditions.

Both N.F.D. stations will be on the same sites as last year. Will those attending keep in touch with the person in charge of the station concerned ? He will need your help on the day. The Treasurer is still open to receive contributions.



This is the Station that made history by effecting the first 56 Mc. contacts with France—G2FA, the Club Station operated by Folkestone Radio Amateurs.

DISTRICT 16 (South-Eastern).

It is suggested that TR's should collect the 6d. levy for N.F.D. expenses at the next meeting of their groups, and remit to the DR in bulk as the time for the event is now approaching.

Ashford reports activity on 56 Mc.

Bromley and District.—Frequency stability on 56 Mc. is proceeding rapidly. 5LB is putting out a T9 signal that compares favourably with most C.C. signals on the lower frequencies. 2GB who is on regular schedule with 6PU, of Portsmouth, is also using the 5LB 56 Mc. C.C. circuit. Both 5LB and 2GB would welcome reports from other districts on their CW signals.

Folkestone.—Radio amateurs heard interesting talks at their last two meetings by Mr. A. Mills. Future meetings 11 a.m., second Sunday in the month at the " Valiant Sailor," and all will be welcomed.

Gravesend.—All report activity. N.F.D. gear, which will be built by 6BQ and 5SI, was discussed at the last meeting.

Medway Towns.—Another report of full activity. Several members have made good contacts on 28 Mc.

Tunbridge Wells.—An informal meeting was held on Good Friday at G6BD. All are active.

Whitstable.—G6PA, 2IC, 2BWR, 1996 and 1300 were present at a meeting held at BRS1996, when 1300 was elected TR. Members in that area are asked to get in touch with him.

Brighton and Hove.—At the April meeting at 2HV, 2BRB exhibited a receiver for use on all bands from 1.7 Mc. to 56 Mc. There was a general discussion.

Eastbourne.—G2KV, 2AO, and 2BIU are active.

Heathfield.—G5JZ is now WBE and WAC. 1173 is having some good DX on 28 Mc.

DISTRICT 17 (Mid-East).

The Crystal Register should now be in the hands of all members. Corrections and additions to it will be announced in these notes. Those whose frequencies are not included are asked to send them in with their next report.

Grimsby.—Activities are centred on 56 Mc. and Field Days are planned to take place during the summer. G5GS continues to work DX. 6AK is specialising on 7 Mc. with fone and CW. 2VY is safely installed in his new shack. 2QH is heard on 7 Mc. fone. Congratulations to 2BVU, who is now G5SX. 2BWV is testing on fone. 2AZH is on 56 Mc. 2BFC prepares for his full ticket. 2AFU regrets curtailment of District notes. He is adding a PA stage to his '59 Tritet oscillator.

Lincoln.—G5XL reports activity when work permits. Membership here is very low for a city of this size. We must try and remedy it.

Cranwell.—A warm welcome is extended to VU2CD, an old member of the R.S.G.B. All members are active on 56 Mc., testing a long lines push-pull transmitter and beam array directed on Boston. Several tests have been conducted with portable receivers in cars with satisfactory results. Our best thanks to the T.R. for producing the Crystal Register. BRS2155 is now out of hospital, and is making good progress. He is spending his enforced leisure listening to DX.

Boston.—G6GH continues to add to his list of DX ; this time it is XE, ZE, J2 and J8. 6GH, 6LH and 2BJY co-operated with the Cranwell 56 Mc. experiments on April 25, using 6GH's car and, although they heard nothing were well rewarded with a free tea provided at BRS2155 ! Congrats. to BRS2030, who becomes 2AAS. BRS103 and 406 are hoping to get on the air later in the year. 6LI is doing installation work for Western Electric.

DISTRICT 18 (East Yorkshire)

G5FV accepts the office of D.R. with pleasure, and earnestly hopes members in both Ridings will give him all possible assistance to uphold the prestige of District 18.

T.R.'s have been appointed as follows :—

Hull (G2QO). *Bridlington* (5VO). *Scarborough* (2CP). Mr. A. W. G. Anderson (2AAX), has consented to act as District Scribe.

Reports from T.R.'s follow :—

Hull.—N.F.D. arrangements are in hand, G5GC taking over the construction of the transmitter for the A Station, which, operating on 1.7 and 3.5 Mc., will be located at Southwold Farm, Elloughton, near Brough. Loan of gear will be appreciated.

Most stations are active, G5BP and 6OY are delighted with the former's break-in system. 6FQ and 5MN are rebuilding. G6UV has a 59 locked by another 59 in a tri-tet hook-up with 7 watts, and is getting good results. G2QO has 100 watts' grid-modulated 'phone on 14 Mc. and has worked four continents. Adjustments for good quality are rather critical. G6OS has been on 56 Mc. and deplored lack of co-operation, though 5BP has been on this band. 2ACN and 2AAK are working in co-operation building transmitters. BRS 1948 and 2366 are busy with receivers.

Scarborough.—Members operating the N.F.D. Station B have chosen " Oliver's Mount " which, with its elevation of 500 feet, should make an ideal site for long-distance working. G2CP has absorption trouble due to neighbouring aerials. G5MV has good results with his Collins Coupler on 14 Mc. A W6 contact now gives 5GI all-American districts, and 6CP had his first DX in working VK, VS6, KA1 and J. 2BGS making tests with high efficiency oscillator circuits.

Bridlington.—Bridlington members will be closing down more or less in favour of outdoor activities. G6WP, 6UJ, 6OO and 5VO are active, but most of G6OO's time is occupied with R.N.W.A.R. activities. 5VO has his new transmitter working and is active when time allows. 2APU is building a Single Signal Super receiver.

Scotland.

As there are quite a number of changes this month, we will commence by recording them. In A District, Mr. Leishman, 2BMP, is now G2TW; Mr. W. Begg, 2BJG, G5JP, and Mr. D. McDonald, 2AXA, G6KH. " B " District, Mr. D. Milne, 2BYF, G6BM, and in " D " District, Mr. W. Ingle, 2BXD is now G2BD. " B " District suffers the loss of Mr. Robertson, G6GQ, by his transfer to London.

The sympathies of all members will be extended to G6RV, in the deep loss he sustained through the death of his father.

National Field Day will not be far off by the time this appears in print. The arrangements for participation in this popular event are now well under way in the various districts. The 7 and 14 Mc. station in " A " District will be located at a new site near East Kilbride, and the 1.7 and 3.5 Mc. will occupy the old site on Eaglesham Moor. " B " District stations will be at Buklerburn near Culter, (" A "), and Kingseat near Mewmachar (" B "). Monikie, Angus, will be the site of both " C " District stations. As regards " D " District nothing is known.

The " A " District annual Dinner will be held on May 27, and details will be found under " Forthcoming Events " elsewhere in this issue. It is hoped there will be a good attendance.

At the April meeting of " A " District, Mr. Atkins, BRS2204, gave a very informative talk on the design and construction of power transformers, which was much enjoyed by the large attendance of members.

For the benefit of any new members in " A " District, we wish to inform them that the dinner will be the last meeting of the district until the autumn.

Activity continues at a high level, and several of the recently licensed stations have been working very good DX, amongst these stations being G2TW, 6IS, and 6KH.

All the regular transmitters in " C " District are active, and G6RI is accomplishing some fine DX on QRP from dry batteries.

We are glad to note that the recruitment of new members continues on a good scale.

Mr. W. Stirling, G6RV, has been forced to relinquish his appointment as T.R. for Stirling, and Mr. Harrower, G6NX, has consented to carry on. We hope the Stirling members will support Mr. Harrower.

Northern Ireland.

Arrangements for National Field Day are well in hand, the following being an outline of the arrangements : Station " A " will operate under the call sign GI5GV. It will be situate at Killenican Hill, Killinchy, Co. Down, and the personnel will be GI5GV, 6YW, 5DU, 5HV, 5UR, and 2BFJ. Station " B " will have the call sign GI2CN, and will be situate at Rockport, Co. Down. The personnel will be GI2CN, 6XS, 5SQ, 6TB, 6WG, 2SP and 2BNL. We are glad to record that the fund in connection with the event has reached the satisfactory total of £6 10s. 6d.

At the monthly meeting of the Radio Transmitters Union, Northern Ireland, arrangements in connection with the proposed 56 Mc. tests were discussed, and GI5SJ and 2CN reported that the transmitters and receivers were nearing completion. The next meeting of the Union will take the form of a visit to the Northern Ireland Regional Transmitter at Blaris, after which the members will adjourn to a café for tea.

We have several new members to welcome this month : Mr. F. C. Ballam (BRS2324), Mr. M. L. McCracken (BRS2325), and Dr. M. A. Woods (BRS2335). Mr. E. O. Byrne has been granted an A.A. licence, his call being 2BYN.

GI5TK informs us that his call has been pirated by some person who was operating outside the limits of the 7 Mc. band. This is a nasty business, and we hope the offender will soon be brought to justice.

Mr. Sheane (2BRV) has now been granted a radiating licence and his call is GI2CC.

GI5UR reports having worked HJ3AJH, which is a new country for him, he would like to know if this is the first GI contact with HJ3. He recently worked ZL3AZ, who stated he was anxious to secure contacts with Northern Ireland.

Empire B.E.R.U. News.

B.E.R.U. REPRESENTATIVES.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Ceylon

By VS7GJ.

Conditions having been very variable, it has been impossible to fix schedules with British Empire stations.

VS7RP reports QRN bad on 7 Mc. Some 56 Mc. tests have been carried out between 7RA and 7RP. VS7GJ, owing to mains failure, has been almost inactive.

VS7RA submits a list of DX worked which shows that he has contacted numerous G's as well as other Europeans. He has worked G5VD on 'phone.

Egypt, Sudan and Trans-Jordania

By SU1SG *via* G5OV.

A new scheme to improve social relationship between members is being started. Monthly meetings will be held at different member's stations in Cairo and Alexandria. The host of the evening will act as Chairman for a short business meeting which will precede the general discussion.

Minutes of the business meetings will be kept, and copies exchanged with other Town Centres, thus all members will be kept informed on all matters of interest.

The first meeting was held at SU1SG on April 22, when the whole of the local group attended. Various suggestions and complaints were discussed with great vigour, but at 2 a.m., when the meeting finished, everyone present felt that considerable ground had been covered and a better understanding reached.

During the meeting it was unanimously decided to co-operate in the N.F.D. event. SU1KG offered a complete station, which offer was accepted. Two 56 Mc. transceivers built by SU1SG and Mr. Wilkinson, a prospective member, have since been tested out, together with SU1KG's station.

As far as Alexandria is concerned, the success of these monthly meetings is assured ; the next is due to take place on May 15, the host on that occasion being SU1KG.

In Cairo, SU1RO is making the necessary arrangements for the initial meeting, which will be held at his QRA, and we hope that it will meet with success equal to that of the Alexandria gathering. In the near future it is hoped to get the same scheme operating in Palestine.

In Port Said SU1RK organised another of his popular amateur entertainments which was relayed over the Egyptian Broadcasting Company network. We welcome Mr. C. Collins, ex 2BHD, who has recently arrived in Cairo. SU1FS has just returned from " the blue," and hopes to be active for the

next few months, after which he will be returning to G.

From Palestine ZC6CG reports good conditions on 14 Mc. He has worked W and J on this frequency, and mentions he has heard Europeans calling him during periods when he has been QRT! Our mystery station SU1SS is still going strong at present; judging by the number of cards received he appears to be concentrating on the Americans, his QRA is still unknown, but it is believed to be somewhere in Europe. Last month we were visited by Mr. Norris (G5NS), who has spent the last three years travelling round the world.

Irish Free State

By EI9D.

Whilst having some experience of "Crystals, Quartz, Amateurs, for the use of," EI9D knows little of the other kinds, and is not proficient at crystal gazing. He is, accordingly, unable to visualise the past, present, or future with a degree of accuracy sufficient to justify recording results in this Journal. In order that these notes may be of interest, therefore, will members please send a report by the 25th of each month?

EI2D, 4D, 8F, 8G, 5J, 6J, and 7J are known to be active, but for all we know to the contrary, the remaining stations were QRT for the month.

It is a pleasure to record the undernoted new licences:

EI5J, Mr. J. D. Taheny, "Suncrest," Albert Road, Sligo, ex BRS1932.

EI7J, Mr. F. W. Warren, Wine Street, Sligo ex BRS1645.

EI9J, Mr. Patrick Smyth, 60, Main Street, Cavan.

N.F.D. arrangements are nearly completed, and two stations will operate as last year. Locations are not yet definitely decided.

Malaya and Borneo.

By VS1AA.

We extend a hearty welcome to Lt. L. Stirling-Wilkinson, of Singapore, who has been licensed as VS1AF. A. R. Gilding, BERS 311 has been transferred to VU. Our very best wishes go with you, om.

1AF forwards details of his apparatus now under construction. C.O. a tritet or E.C.O. 59; F.D. 59 link coupled to B.A. using T.Z.0520 T.P.T.G. neutralised. When more power is available, the final will be a P.P. T.P.T.G., neutralised, link-coupled to the B.A. A sub-standard frequency meter and a 100 kc. oscillator is also on the programme.

2AE is getting out very well. Input to final about 20 watts. His serial system is somewhat outstanding. A 132 feet length of No. 6 swg. is swung between two lattice, cigar-shaped masts, erected 170 feet apart. These are 70 feet high. The feeders to the zepp top are no less than 192 feet in length! He gets good reports from U.S.A. and Africa, and as the aerial is along a line 35° East of North, it would appear he is getting "end on" radiation.

2AG complains of QRM from CLP on approximately 14235 kc. There is another offender, VU2CQ, who is transmitting gramophone records on the 14 Mc. band. 2AG reports full moon on April 6 brought in good DX on 14 Mc. from 2130 to 2400 local time (i.e, 7 hours 20 minutes ahead of G.M.T.). On the 8th even better conditions prevailed.

2AG's aerial system is probably one of the best out here. The aerial is 75 feet high and 132 long, set along a line N.64° E., voltage fed to SW end.

1AA, who is almost ready to take the air, notes that more signals are now available on 14 Mc. than was the case a year or so ago, QRM now actually exists at times when previously one was lucky to hear five or six stations. More representative reports would be welcomed. Members should note that the Letter Budget does *not* replace the monthly reports, which should reach 1AA not later than the 15th of each month.

Malta

By ZB1C *via* ZB1E and G2SN

The April meeting, held at ZB1H, was attended by a good turn-out of the members. Arrangements for N.F.D. were discussed, and it was decided to take part with a portable station, as last year.

The question of obtaining new licences was once more brought forward, and it was proposed to approach the authorities again.

On the 14 Mc. band very abnormal conditions existed on Saturday, April 25, for an hour about 20.00 G.M.T., and W6, PY, LU, and VK were good R7 signals here, while local and Central European signals were at R2; afterwards conditions returned to normal. QRN on this band is appearing in the afternoons.

ZB1J is the new call of ex-G6NC, who is now on the air.

Rhodesia.

By ZE1JB.

The outstanding event in the preceding month has been the two-way communication between Mr. F. C. Whitmore (ZE1JJ) and ZL1AR, of New Zealand, on 28 Mc. This event took place on April 5, and is the first two-way communication ever effected on any wavelength between Southern Rhodesia and New Zealand. New Zealand stations have on one or two occasions been heard in Rhodesia on 14 Mc., and a few reports of reception of Rhodesian stations in New Zealand have been received.

Mr. Whitmore used about 45 watts input to the final stage of a crystal oscillator feeding a pair of TC 04/10 valves in push-pull. The aerial runs North and South, and has a full wave top with non-resonant transmission line. Mr. Whitmore has been on 28 Mc. for about six weeks and has had no difficulty in contacting the United States and Australia, but appears to find it difficult to work Europe with either aerial, the second one being the same as the first, excepting that it runs East and West. An Asian contact is all that is required for W.A.C. on 28 Mc.

No reports have been received from the other stations, but a number of them are active.

ZE1JH hopes to be operating in the near future. He will be conducting experiments on 56 Mc. for office purposes, and also will be on 7 and 14 Mc. for amateur purposes.

ZE1JN will be going on leave about the middle of May, and is taking transmitting and receiving apparatus with him.

It has been found impossible to deal with the number of listeners' cards which are being sent

(*Continued on page* 455)

EUROPEAN NOTES

Belgium.

By ON4AU.

ON4UU has resigned from the Presidency of R.B. ON4PA has been elected Secretary in place of ON4AC, who has been in Teheran, Iran, for some time. ON4AC is working on 7 and 14 Mc. with the call EQ4AC; QSL *via* ON4CC. 4AU, 4JB, 4NC are W.A.C. on Ten. 4AU, being the first W.A.C. Ten, won the cup, value £20, offered by 4BZ. 4AU has worked ZS1H and J3FK at R6 and R3 respectively, using a 3 metres long indoor aerial. 4HM had an R8 fone QSO with J8CD. 4PA is W.A.C. fone without using C.W. even for calling. 4CR and 4JB are ready on 56 Mc. 4AU has a pair of W.E.304A.'s working on 56,220 kc. (Write for skeds during June week-ends.) 4UU has worked PZ1PA.

Denmark.

By OZ7Z.

There are now 240 licensed amateurs in Denmark representing an increase of forty since January 1. The membership of E.D.R. is also increasing, being now 400.

The first Danish W.A.C. on 28 Mc. went to OZ2M. OZ7Z has worked four continents, and OZ3FL and OZ7KG three each on this band. OZ7KG worked U.S.A. on 3·5, 7, 14 and 28 Mc., and heard a W on 1.7 Mc.

E.D.R. has arranged a Danish 28 Mc. test for both transmitting and receiving amateurs, which will last from May 1 to August 15. It is hoped that some interesting data will be obtained.

In the A.R.R.L. DX contest OZ2M scored 23,556 points, whilst OZ3FL was second with 11,988 points.

Our annual Convention will take place on May 31 and June 1, in Kalundborg.

Estonia.

Amateurs in Estonia have formed themselves into a society under the title of "Estonian Radio Amateurs' Union." The President is Capt. A. Isotaam; Acting Vice-President is A. Pärjel (ES7C); the Secretary and QSL Manager is V. Suigusaar (ES6C).

According to Estonian Radio Law every amateur must pass an examination before he can be granted a transmitting licence, and so far 14 licences have been issued. Estonian call-signs comprise the prefix ES, followed by one figure and one letter.

The E.R.A.U. is anxious to get into touch with other amateur organisations throughout the world, so as to foster closer co-operation between Estonian amateurs and those of other countries. The E.R.A.U.'s address is Tallinn, Post Box 220, Estonia.

EDITORIAL.—(*Continued from page* 431.)

This table, known to the G.P.O. as Table B, appears in the conditions governing amateur licences, and also in the Society's *Guide to Amateur Radio*.

In several cases which have come to our notice members have purchased crystals or selected a frequency outside the limits of Table B, but within the limits of Table A, in the mistaken belief that they are in order in doing so.

It is clearly stated in our licences that the frequency selected must be within the limits of Table B, " in order to ensure that the frequency shall not vary outside the limits of the bands due to crystal variation and transmitter instability." The fact that the manufacturer has guaranteed the frequency of a crystal as being correct to within ½ kc. is beside the point, if that frequency falls outside the limits of Table B.

There are perfectly sound and logical reasons for setting the tolerances, consequently it is for us to show that we can work to them. It should be apparent to everyone that by operating against the terms of a Government licence, members are jeopardising the Society's chances of having the tolerances removed altogether at some later date.

W9NY (*Continued from page* 443).

All transmissions for the past two years have been made on 28.3 Mc., and all reception has been done on the 28 Mc. band. W9NY is greatly opposed to the practice of calling " CQ ten " on 14 Mc., apparently keying transmitters on two bands simultaneously, and then listening on 14 Mc. for replies, for quite apart from the unnecessary QRM caused by such operation he sees no promotion of 28 Mc. work by this means, but sees many possibilities for false results. He suggests that when it is thickly populated with stations—as the lower frequency bands are—the 28 Mc. band will be found to be useful for a much greater part of the time than it is now believed to be.

The operator was born in Nottingham, England, and obtained his amateur operator's licence in 1916. He is now radio engineer to the City of Milwaukee Police Department.

DELLINGER AGAIN (*Continued from page* 454)

came back to normal. The noise level was ce inly higher than usual while the " fade-out " was n.

By the courtesy of the Astronomer Royal, we are able to supply the following information: " A moderately large group of sunspots (area 850 millionths of the sun's hemisphere) crossed the sun's central meridian on April 7-9 in solar latitude 20° north. At 14*h* on April 6, the centre of the group was 17° east and at 17*h* on April 8, 10° west of the sun's central meridian. Owing to weather conditions, spectroscopic observations of the spots were not possible at Greenwich.

During the period April 5-11, the magnetic traces were normal."

Now once more we must notice that it is the higher frequencies which are affected most, thus strengthening the suggestion that the cause is ionic limitation, due to thermal expansion of F2 layer. It is unfortunate that Greenwich were unable to take any observations of hydrogen eruptions, but we shall await with interest news relating to the height of F2. G2GD.

EUROPEAN BROTHERHOOD.—

(*Continued from page* 444.)

dusty and travelling by day so difficult, due to the excessive dry heat, the journey from Warsaw to Lodz was done by night. Finding our way was no easy task, and we wandered many miles off the route. Such a time was a great test for the sincerity of the " Ham Spirit." After sleeping in haystacks and only having peasant's food on the way (for no other supplies were possible), we arrived in Lodz. This town is the " Manchester " of Poland, and as only one in six had work, conditions were very poor. In this town we visited SP1DC and 1DU, the former was an engineer in the local BCL station, and the latter a radio set manufacturer. Both gave us a " royal " welcome.

From Lodz we cycled to Berlin via Szamotuly, where we visited SP1DJ, 1AX and 1CY. A few days spent with them made a life-long impression of goodwill. In Berlin the writer said " Good-bye! " to D4CSA without whose staunch friendship the long ride would have been impossible, and spent some time with D4BUF, Foreign Manager of DASD. We had a tea party at D4ADF, with the Union Jack flying at the " Cake head." The Radio Exhibition was on at the time and amateurs from all over Germany and several from other European countries were in Berlin and the opportunity of personal QSO's was appreciated. No matter who the fellow was or his social positon, one was at home immediately. Even the language difficulty seemed very small, and it was amazing how one could get on when the other fellow was equally anxious to become acquainted.

Finally, the end of the trip came with a flying visit to 4KUJ and 4CPJ in Hamburg and 4BQK in Bremen (an old member of RSGB). It was a sad business to say QSK to such excellent fellows, but anyway—" CUL! "

When visiting the shack of any of these amateurs, it was fine to see familiar calls on his QSL's and England was often brought very near by such means. The writer will never forget the impression of real goodwill between amateurs of countries with histories steeped in long misunderstanding and he feels that all international quarrels could be easily settled by a company of fellows such as he met. This experience has taught the writer that indeed " Radio makes the world a little village."

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Printed for the Inc. Radio Society of Great Britain, 53, Victoria Street, London, S.W.1, by Loxley Brothers Ltd., 50, Southwark Bridge Road, London, S.E.1.