



T. & R. Bulletin

Incorporating

The Journal of the Inc. Radio Society of Great Britain

(BRITISH EMPIRE RADIO UNION)



Vol. 4. No. 9. March, 1929 (Copyright)

Price 1/6

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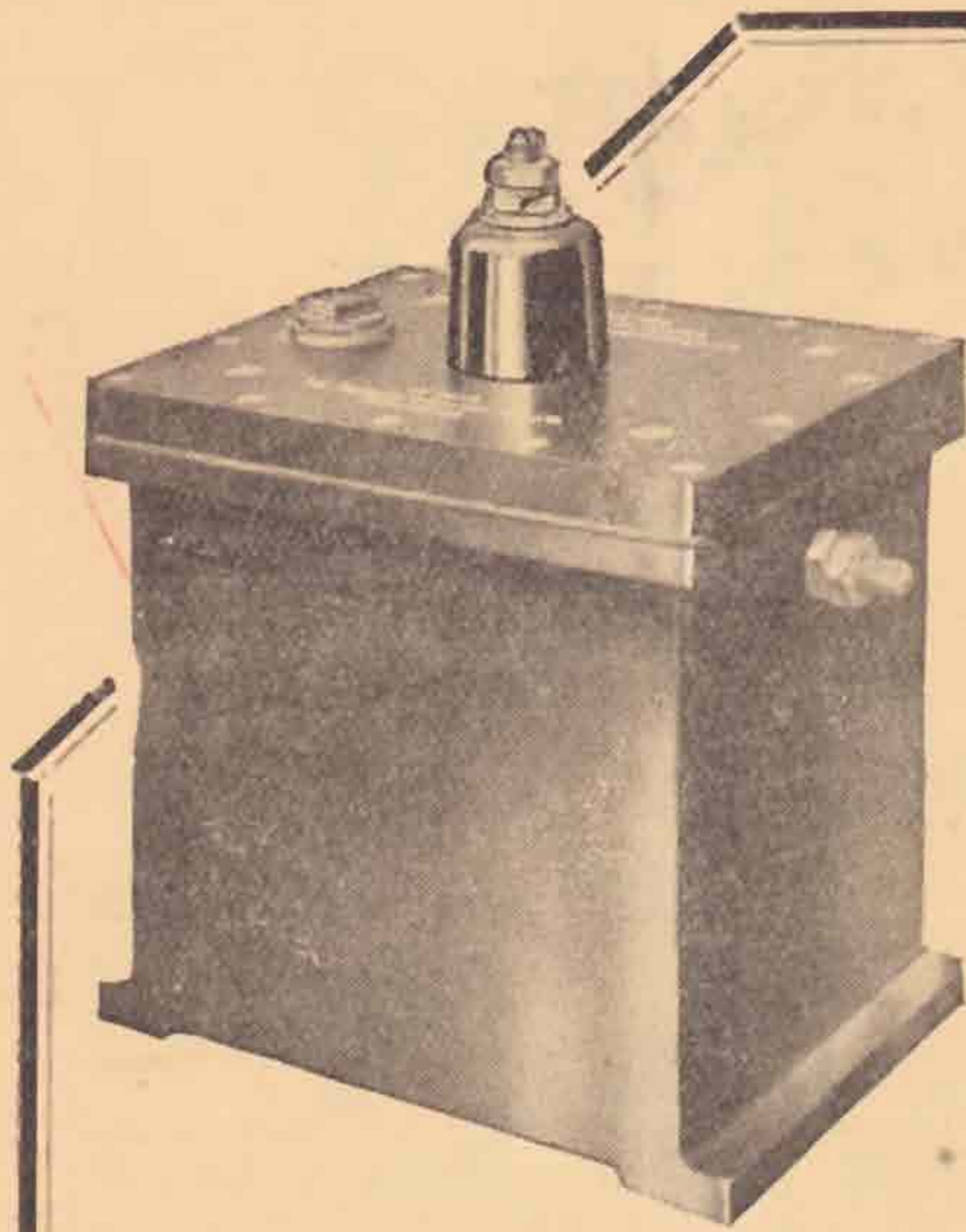
Many of the "Amateurs" already possess a copy; their kind remarks have almost brought a blush to our faces.

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BULLETIN.

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MARCH, 1929.

Vol. 4. No. 9.

Our President Speaks.

Although we are still in the throes of wintry weather conditions, which have always been regarded as the best DX weather, we are rapidly approaching the light evenings, and consequently many of our members may be considering pursuits other than radio during the spring and summer months. Of course, we all appreciate the fact that radio rather takes a back seat in the seasons mentioned, but the by word of the British amateur has always been "Progress."

It may appear to some that there is very little to be achieved, but there is still plenty of research work open on the higher frequencies; also I do think we ought not lose sight of the possibility of television. There are several interesting events in prospect, the first and foremost being the 28 M.C. tests in March, while our advertising agents announce some very interesting competitions, which, I feel sure, will have the support of the whole membership, as we are anxious to see good entries. One question which has recently cropped up, one on which I, as your President, have a very open mind, namely, the restriction of telephony on the 7,000 K.C. band on Sundays. The R.T.U.

have unanimously decided to refrain from using telephony on this band on Sundays, and it would be interesting to obtain the views of all our members on this subject.

* * *

I have spent a considerable amount of time keeping watch on the 1,770 band, which is one where all the telephony experiments can be carried out which could not be done on artificial aerials, and I am rather surprised at the lack of stations using this wave-band which is very suitably adapted to telephony experiments, also CW; although, perhaps, the distances reachable with a given input, as compared with the higher frequencies, may not be so great, I venture to suggest that for local working, such as telephony as the 7,000 K.C. band is used for, can be easily accomplished on the 1,770 K.C. band.

* * *

I, personally, would very much like to see more stations on this band, and I shall be very pleased to help any members with tests any evening or on Sundays, using this band for telephony experiments or code.

SOCIETY NOTES

We have with regret to record the resignation of Mr. E. J. Simmonds from the office of Honorary Treasurer, a post he has so ably filled for two years. Mr. Simmonds has had the difficult task of keeping the financial side of the Society sound, and we trust that the ill-health which has been mainly responsible for his relinquishing office will soon give way to renewed vigour and strength to enable him to carry out his increasingly difficult professional duties.

To Mr. E. D. Ostermeyer, the newly-appointed Hon. Treasurer, we offer our thanks for having taken over an onerous and difficult duty.

* * *

The Council are pleased to record that Mr. R. J. Hibberd has been elected a Vice-President of the Society in recognition of his work as Hon. Organiser of the Schools Section.

We regret that this section has not progressed in recent months as well as we would wish, and we suggest that individual members offer to personally interest their local schools in the work of the Society and amateur radio in general.

* * *

Several interesting letters have been received from members in connection with our Editorial remarks in our last issue with reference to the Area Notes.

One letter in particular from Col. Dennis has interested us considerably, and we are arranging to publish this in our Correspondence Columns. It will be noted that the report from the Irish Free State Area has been prepared on the lines suggested by their manager. We shall be pleased to receive further correspondence on this subject which will be published in a future issue.

* * *

We publish this month an article written by our QRA Manager, Mr. M. Pilpel, in which he gives some general opinions regarding operating conditions under the new regime. He raises the question of the QSA code difficulties, and points out that the new code does not give the same degree of accuracy as was possible with the old R scale.

Whilst we do not entirely agree with his views, we feel that a suggestion which may overcome this trouble is worthy of consideration. The present QSA5 signal seems to be the one which is causing confusion and, therefore, if we agree that QSA1-QSA4 means to *amateurs* precisely what R1-R4 meant, then providing we can amplify QSA5 all will be well.

The suggestion, therefore, is that when a signal is reported QSA5 the old R strength should also be quoted. For example: if a signal is on the old code R7 and on the new QSA5, then this should be reported as either QSA5 R7 or QSA57.

We have taken the opportunity of offering this suggestion to the amateur organisations operating in several foreign countries, and we should be glad to have the opinion of our own members.

Messrs. Parrs Advertising, Ltd., contemplate offering cash prizes to the value of £100 to members of the Society for designing and constructing the following receivers:—

- (1) Five-valve portable for British Broadcast wave-lengths.
- (2) Three-valve non-portable for British Broadcast wave-lengths.
- (3) Short-wave receiver.

The components should, as far as technically possible, be selected from those firms whose advertisements appear in the T. & R. BULLETIN during the months of April, May, June and July.

* * *

Now it must be understood that before deciding to carry this competition through and make formal announcement of it, Messrs. Parrs must have some idea as to how many entrants there will be. *For this reason, will every member who proposes to enter drop a line to H.Q., and at once, so that full details may appear in the April BULLETIN.* You are not bound to make up all three receivers, as the prizes will be distributed between them. This is a grand chance for members to show their capabilities as designers and constructors of really good receivers, and they will, incidentally, be doing the Society a good turn.

* * *

The attention of all members is drawn to the notes written by our QSL manager, Mr. Hinderlich. It will be seen that the Council have now definitely laid down that in future the Society will not forward cards to British amateurs who are not members of the Society. We regret that certain Britishers remain aloof from our Society, but we would assure everyone that we have tried in every way possible to obtain their support. The sum total of the *active* stations remaining outside our organisation is less than a dozen. We understand that they propose starting a society of their own, to be known as the B.R.R.L., which we imagine means British Radio Relay League. We deplore this step as much as will our American cousins—in the A.R.R.L.—for we realise that the future of amateur radio lies in the continuation of a united front at all times. The privileges which we as amateurs now enjoy have been fought for in past years by those who are now in control of the R.S.G.B. destinies, and we feel that any attempt to start another society will reflect on the good sense of British amateurs. As a society we are now stronger than ever and opposition can do us no harm, but for the good of amateur radio as a whole we would delight in the knowledge that all Britishers are united.

* * *

We should like to congratulate the 5th District members on the success of their recent Conventionette, and would suggest that the example set by Mr. Baker and his friends be followed by other districts. The Yorkshiremen are preparing for their next gathering; we wish them every success.

R.S.G.B. Short Wave Three.

In describing this receiver, nothing special in the way of performance is claimed, and it is designed with the object of giving maximum signal strength with minimum "background." It is offered, therefore, not as a new or better receiver, but as something that may be tried and experimented with to achieve that ratio of signal strength to "background" that is so desirable.

This receiver will function from 28,000 K.C. (10 metres) to the broadcast band by the insertion of suitable coils; those described in this article are intended for use in the amateurs' bands around 14,000 and 7,000 K.C. (20 and 40 metres). As this set was designed to function primarily on short waves, a small tuning capacity was desirable, and throttle-control reaction is used, being recognised as giving the smoothest possible control.

In order to provide sufficient volume on weak signals, two L.F. valves are used, R.C. coupled, as it is thought that this method of coupling gives a more silent background than with the average transformer. Moreover, the quality from a receiver of this type using suitable valves is practically as distortionless as it is possible to obtain, and threshold howl is conspicuous by its absence. It should be borne in mind all the while that the main thought in building this receiver is not colossal signal strength, but 100 per cent. readability, it being far more pleasant to listen to a weak signal on a weak background, especially if it be telephony, than having the appalling hiss and "mush" so easily obtained from a short-wave receiver of poor design.

surface of the aluminium quite a good finish is obtained. To retain the bright finish, the panel should be treated with a colourless lacquer.

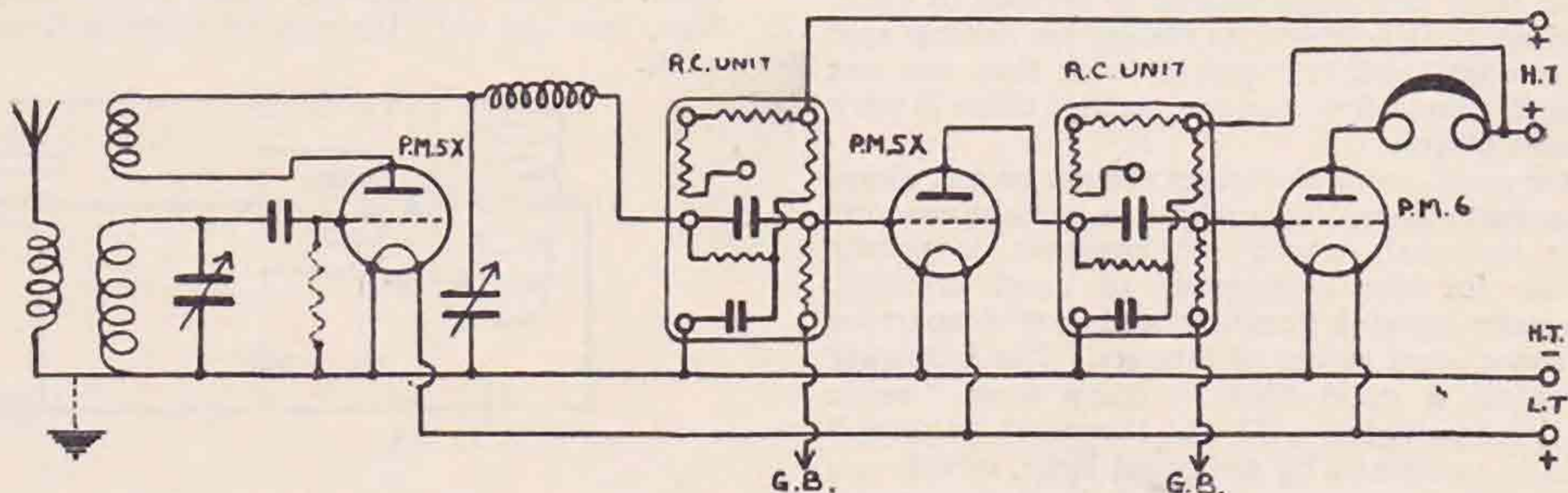
As regards the components, there is nothing unusual about them, except, perhaps, the coils. These consist of a former composed of six ebonite rods, $\frac{3}{8}$ " diameter, 3" long, equally spaced round an ebonite base $2\frac{1}{2}$ " diameter, and supported at the top by an ebonite ring. The rods are secured at both ends by ebonite screws, which is undoubtedly an advantage, considering the short waves used. Four pins are mounted in the base for plugging into a suitable socket. The rods are threaded 20 to the inch, with half an inch at the base, turned flat for a close-wound reaction winding. These formers are obtainable from the B. & J. Wireless Co. The coils may be wound in adjacent slots, or spaced by winding in every one or two slots.

The aerial coil is also wound on this former, at the top, and the aerial is attached by means of a clip. The other end of the aerial coil (*i.e.*, the end remote from the grid coil) is attached to negative L.T., which may or may not be earthed.

The valve-holders are all Bowyer-Lowe, White-line type, and it may be safely said that these valve-holders are about the best commercial ones for the purpose; they are absolutely silent and the valves do not wobble about like jellies.

The grid condenser is a T.C.C. .0001 mfd., capacity; and the grid leak a Mullard 5 megohm.

The variable condensers are Cydon. The grid tuning condenser is a .00015 short-wave type,



Owing to the fact that hand capacity effects are rather troublesome on some short-wave receivers, it is advisable to use an aluminium front panel and possibly enclose in an aluminium box. The aluminium, when delivered, has a very nice polished surface, but unfortunately this shows up the slightest scratch, so that it is necessary to put a fresh surface on it. A machine finish may be put on, if desired, by some firm specialising in that work. Another method that gives quite a pleasing finish, and is very simple to do, can be carried out as follows. Cover the end of a small cork with a piece of fairly worn emery cloth, mount on a rod, and fix in a hand-drill. By rotating the cork over the

without extension handle, and the reaction condenser is a .0003 mid-log line. The choice of vernier dials is left to the constructor.

The H. F. choke in the anode circuit of the detector valve is of Messrs. Bulgin's manufacture.

The most important thing with regard to the L.F. side is the use of good R.C. coupling units. Either R.I.-Varley or Mullard are recommended. They both have an absolutely silent background, which speaks very well for the resistances and leaks incorporated in them. In choosing these units, get one with an anode resistance of about 100,000 ohms for the first stage and about 25,000 to 50,000 ohms for the second. The units shown in the

diagram are the R.I.-Varley type, with anti-motor-boating device. There is, of course, no reason why transformer coupling should not be used if the constructor so desires, except that it will probably be found to be more noisy (*i.e.*, more "background") than with the system described.

It is suggested that Ripaults H.T. batteries be used and about 120 volts will be found sufficient. Two leads to H.T.+ are required, one to supply the detector valve and the other the two amplifying valves. Two T.C.C. 2 mfd. condensers should be connected between the two H.T.+ tappings and H.T.—.

A push-pull filament switch of Lotus or Igranic manufacture may be incorporated and attached to the front panel.

A terminal strip carrying 2 L.T. and 3 H.T. terminals is mounted at the back of the baseboard. In order to simplify wiring the telephone terminals are mounted on a strip at the side.

As a brief guide to the size of coils required, it is suggested that for the 14,000 K.C. (20 metre) band a grid coil of five turns, wound in every third slot, with an aerial coil of three turns wound in every second slot, the space between the two windings being about $\frac{1}{2}$ ". The reaction coil should consist of about five turns of 28 D.C.C. close wound at the base of the former. This may be given a coat of shellac to keep it in position. The 7,000 K.C. (40-metre) band may be covered by a coil consisting of 11 turns grid winding, wound every second slot; six turns aerial winding, wound in adjacent slots; 7 turns reaction winding, wound as before.

The wire used for these coils is No. 22 enamelled, unless otherwise specified.

It must be pointed out that when dealing with these short waves, the sizes of the coils given must necessarily be approximate, as the exact wave to which a coil will tune depends entirely on the length of wires used in connecting up the various components. All wires should be kept as short as possible.

It is recommended that 6-volt valves be used where possible, as they are undoubtedly more efficient than either the 2 or 4-volt types. Mullard PM5X type are used in the detector and first L.F. stage and a PM6 in the last. The nearest equivalent valves in the 2-volt range are PM1H.F. and PM2, respectively.

A grid bias battery should always be used, and is attached by means of clips to the baseboard.

In conclusion, it may be emphasised that this receiver is not intended to be the "last word," or anything like it, but it can safely be said that for general amateur purposes it can be relied upon to give satisfactory results, coupled with minimum "background."

A list of the component parts is appended:—
 Aluminium panel, 18"×6"×1-16" (British Aluminium Co.).
 Baseboard, 18"×9".
 2 Cylcon Condensers (S. S. Bird & Sons).
 3 Whiteline Valveholders (Bowyer-Lowe).
 Short-wave Choke (Bulgin).
 1 .0001 Fixed Condenser (T.C.C.).
 2 2mfd. Condensers (T.C.C.).
 Grid Leak, 5 megohms (Mullard).
 7 Terminals (Lectro-linx).
 2 R.C. Coupling Units (R.I.-Varley or Mullard).
 Filament Switch (Lotus or Igranic).
 Coils (B. & J.).

Concerning Pebbles.

By 2BFA and G5MU.

We have noticed that some amateurs have had difficulty in getting their pebbles to "perk," and hope that these few lines will be of service to such. It is obvious that pebbles are meant for optical and not radio work, and for optical work they are cut in the most economical manner, so that there is very little waste quartz.

Now for radio work the quartz must be cut along certain definite lines. This means a certain amount of waste material, which, we suppose, is partly responsible for the high price of good crystals. The amateur crystal grinder need not despair of getting some good pieces of quartz. The following is, we think, a good idea to show how "radio pebbles" are mingled with the "optical pebbles."

Quartz is examined by polarised light, which can be obtained by various means, and the figures given below are obtained from many dozens of lenses handled, and are given in relation to the optical axis:—

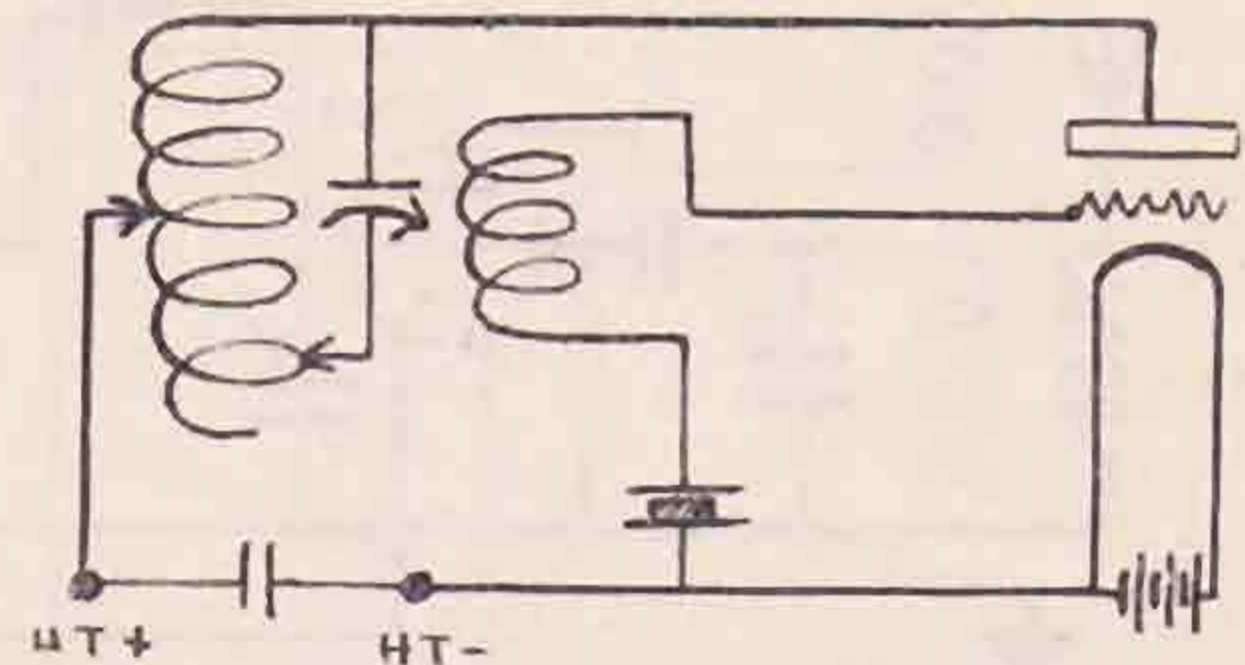
- (a) 40 per cent. cut wrongly and no use for radio.
- (b) 50 per cent. cut correctly for radio work, but will not oscillate without reaction.
- (c) 10 per cent. cut correctly for radio and will oscillate strongly without reaction.

The (c) pebbles are almost invariably 150 metres per millimetre, and will, with care, oscillate without reaction down to 80 metres.

It is suggested that amateurs, before grinding their pebbles, should ask an optician to examine them, by polarised light, and if colours or twins are

present do not waste time grinding. It won't "perk," as it is cut too far from the optical axis.

The reason for there being no indication of the optical axis being present in a good crystal is that the axis is parallel to the surfaces, and cannot be seen, because the ground edges prevent it. Therefore, one has only the risk of twins left to contend with.



2BFA permits me to write in the singular, so here goes:—

G5MU ventures to disagree with the amateurs who say that "using reaction on a crystal is fatal." I have obtained just as good results using a crystal that required a reaction coil to make it oscillate as when using a "self-oscillating" crystal.

It is, however, very important to use a *very* small reaction coil—one just big enough to maintain oscillations. The output can be fed to the F.D.'s to be amplified in the usual manner. I find the values of the coils in the C.O. to be something like the sketch.

We welcome discussions on pebbles, and conclude, trusting that this effort has been of service to those who have encountered difficulties with pebbles.

The Valve as an Oscillator and Amplifier.

By E. MEGAW, B.Sc. (G6MU).

PART II.

In the first part of this article we discussed some of the fundamental operations of the valve. We saw that if a varying voltage is applied to the input (*i.e.*, the grid) circuit a varying current results in the output (*i.e.*, the anode) circuit which is in phase, or in step, with the input voltage; and, further, that if there is an impedance (inductance, capacity or resistance) connected in the anode circuit the voltage across this impedance will be in phase opposition, or exactly out of step, with the grid voltage. We are now going to consider how the inter-dependent variations of these three variables—grid voltage, anode current and anode voltage—can be conveniently depicted and investigated with the aid of the "characteristic curves" of the valve.

I_a and V_a , so that if we know any two of them we can find the third from the point of intersection of the two on the surface. Fig. 5 attempts to show this diagrammatically. V_g is measured horizontally and V_a horizontally and at right angles to V_g . I_a is measured vertically. The method of arriving at the ordinary two-dimensional characteristic curves is now fairly obvious. "Contours" are drawn on the surface at equal intervals of current or voltage for each of the three variables. If the curves connecting any two variables are required, we look in the direction of the *third* variable *at the contours of the third variable*. For example, if we want to find the familiar set of curves connecting grid volts with anode current (for various values of anode voltage) we look in the direction of the axis of anode voltage (see Fig. 5)

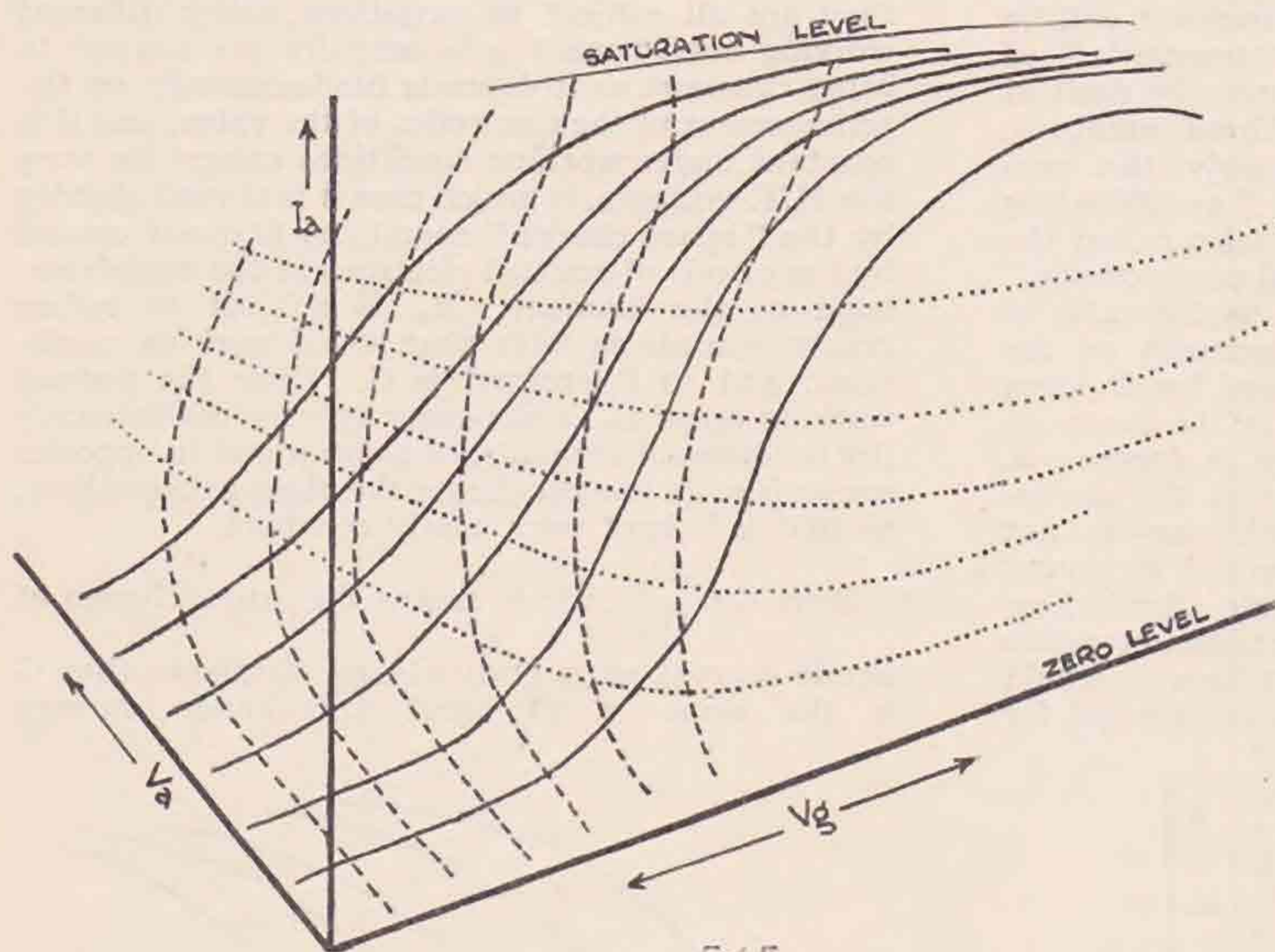


Fig 5.

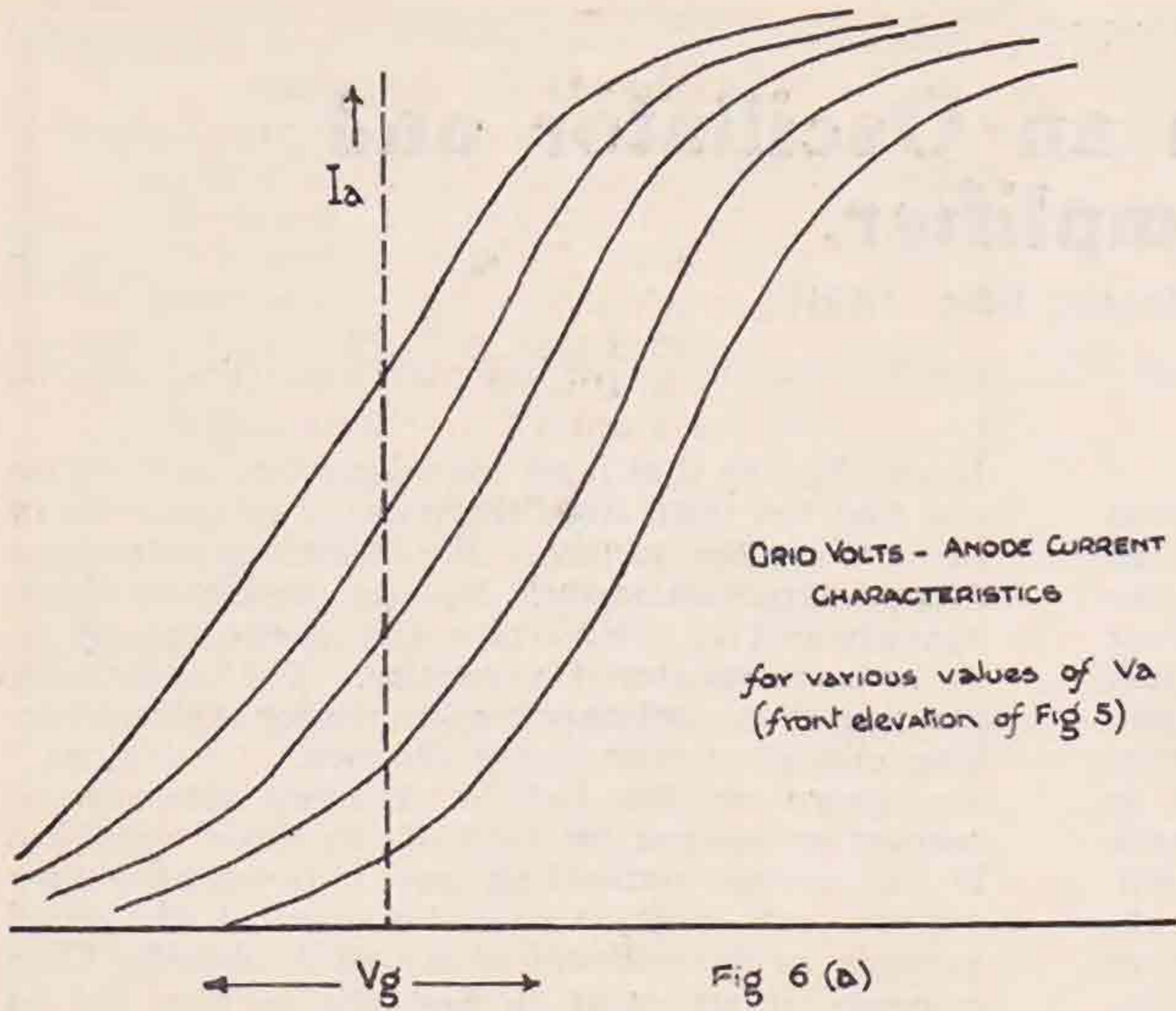
Since we are concerned with the changes in three variables, it is evident that a three-dimensional curve—a curved surface—will be needed to represent the variations completely. Unfortunately such a three-dimensional curve, which rather resembles a model of the corner of a plateau, is neither very easy to construct nor very convenient to work with, so we have to resort to some scheme to represent our three-dimensional curve on a two-dimensional piece of paper. It will be understood that in the three-dimensional "characteristic surface" grid voltage, anode current and anode voltage are measured in three directions which are mutually at right angles, and that any point on the surface represents a definite condition of V_g ,

at the contours which are drawn at equal intervals of anode voltage. The result is represented in Fig. 6 (A). The anode volts-anode current characteristics are similarly found by taking an end elevation of the model plateau and the grid volts-anode volts characteristics by taking a plan view. These are shown in Figs. 6 (B) and 6 (C) respectively. In practice, of course, it is not necessary to resort to such a lengthy process to find a set of characteristic curves, as they can be obtained by direct measurement, but the above discussion is intended to show where the characteristics originally "come from" and to emphasise the fact that the three sets of characteristics are simply three different ways of looking at the same thing. From this it follows that we will get the same results by using any one of the three sets

of curves (provided they are used correctly), and it is simply a matter of convenience which we decide to use. For general use and for many calculations in receiver work the grid volts-anode current curves are very convenient. For power amplifiers or output valves the anode volts-anode current curves are often used.¹

When considering the valve as a power converter (either oscillating or amplifying), it is particularly convenient to use the grid volts-anode volts curves,

(1) See "Experimental Wireless," Vol. 3, p. 403, (July, 1926) "The Use of Plate Current—Plate Voltage Characteristic, in Studying the Action of Valve Circuits," (Green) and Vol. 5 p. 660. (Dec. 1928) "The Graphical Estimation of Low-Frequency Choke Amplifier Performance." (Barclay).



and these (the curves of Fig. 6 (c)) are the ones we shall use.

Before showing how these curves may be used in practical amplifier and oscillator circuits it will be well to define the characteristic "constants" of the valve and to show how they may be derived from the characteristic curves. These numbers, by which we describe approximately the performance of a valve, are (1) the "amplification factor," (2) the "A.C. resistance" (also called the "impedance") and (3) the "mutual conductance." The amplification factor is defined as the ratio of the effectiveness (in attracting electrons) of the anode to that of the grid and is found by dividing any (small) change in anode voltage by the change in grid voltage which will be necessary to produce it. The A.C. resistance—the resistance of the anode-filament path under working conditions—is not always the same as that which would be found under static conditions by applying Ohm's Law because the anode volts-anode current characteristics are curves and *not* perfectly straight lines (as would be the case if a true resistance was substituted for the valve). Ohm's Law states that resistance is equal to voltage divided by current, but to get over the difficulties introduced by the curvature in this case we define A.C. resistance as any small change in (anode) voltage divided by the corresponding change in (anode) current. If we make the "small change" small enough, we can consider the curve as a straight line over the very short distance concerned and the ambiguity disappears. "Mutual conductance" is defined as the change in anode current produced by any small change in grid voltage divided by the change in grid voltage. Unfortunately there are several different symbols in current use for these three ratios (except perhaps mutual conductance), but those most generally used in this country are μ for amplification factor,

R_a for anode A.C. resistance and G for mutual conductance. The above definitions can be expressed much more neatly in mathematical form, thus:—

$$\mu = \frac{\delta E_a}{\delta E_g}$$

$$R_a = \frac{\delta E_a}{\delta I_a}$$

and $G = \frac{\delta I_a}{\delta E_g}$

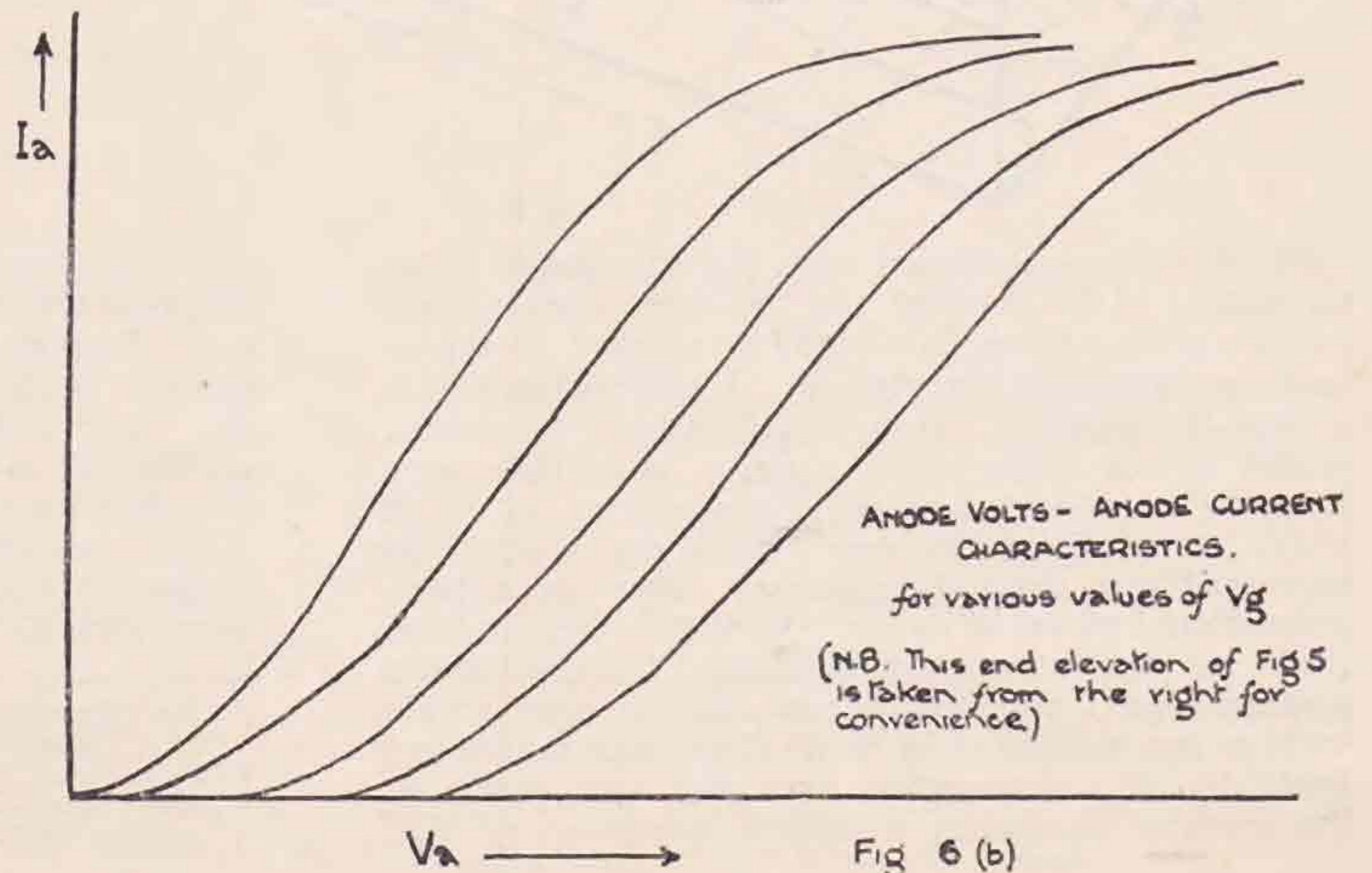
where δ is simply a mathematical shorthand for "a small change of." It will now be seen without any great mental effort that if we multiply G and R_a together (the δI_a 's cancel) we get

$$\frac{\delta E_a}{\delta E_g}$$

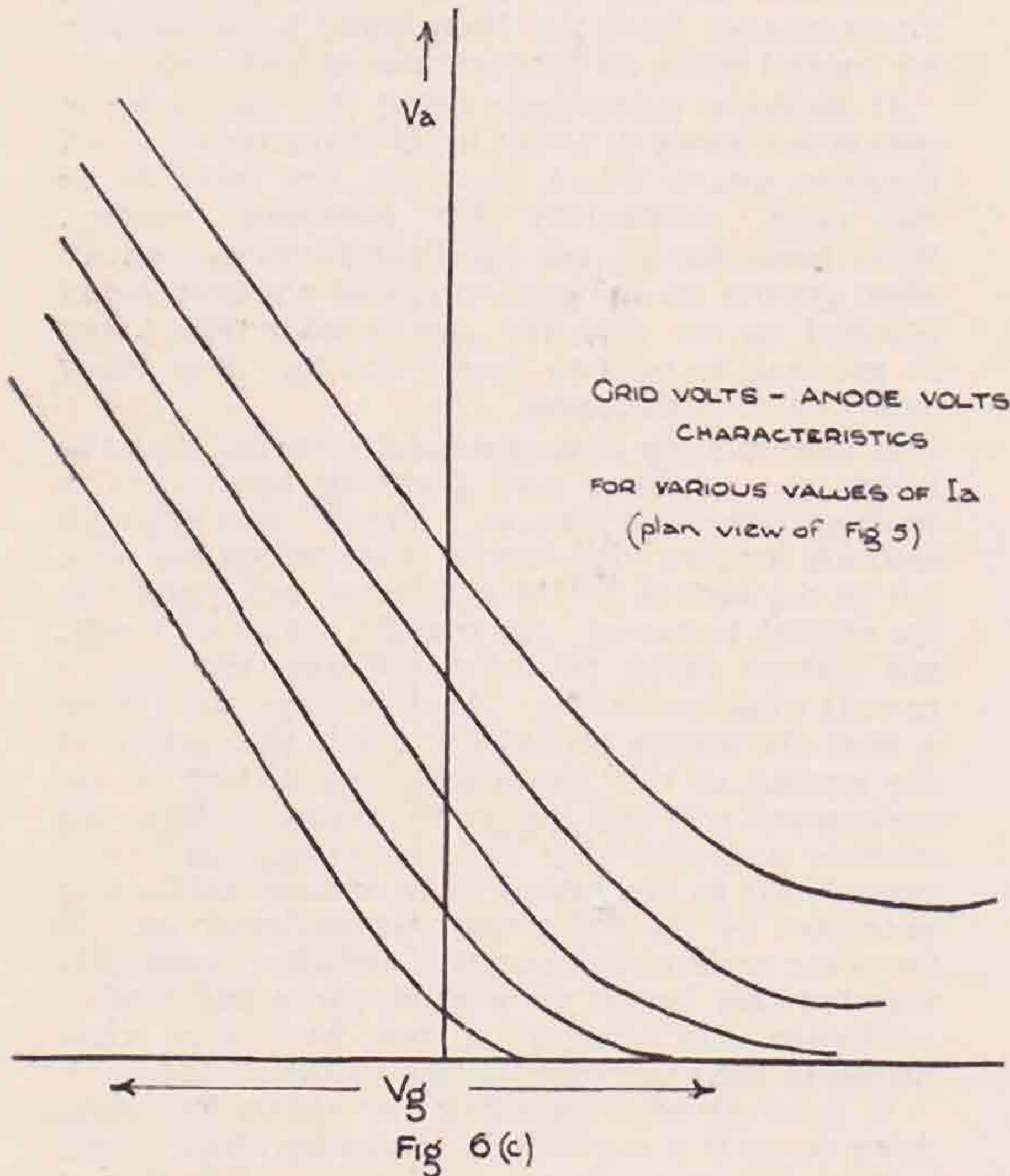
which, we notice, is equal to μ . So we have the simple relation between the three constants that $\mu = G \times R_a$. This means that if we know any two of them we can find the third. Now we have been referring to these ratios as "constants," and it is indeed common practice to do so, but actually they are all subject to variations under different working conditions. μ is actually the nearest to being constant, as it depends fundamentally on the arrangement of the electrodes of the valve, and it is constant under working conditions except for very low H.T. voltages, in which case it is altered slightly by the "space charge" round the filament caused by the clouds of emitted electrons in the neighbourhood of the filament. R_a is subject to rather greater variations with changes of working conditions, and so (therefore) is G . Over the normal working range R_a and G usually vary continuously (by fairly small amounts, of course), and in opposite senses (*i.e.*, as one gets larger the other gets smaller), so that μ is kept very nearly constant.

Since $G = \frac{\delta I_a}{\delta E_g}$, which means the rate of change of

anode current with grid voltage, it follows that G is the slope of the grid volts-anode current



characteristic (Fig. 6 (A)). Similarly R_a is the slope of the anode current-anode volts characteristic, that is to say, it is the slope of the curves of Fig. 6 (B) inverted. Also μ is the slope of the grid volts-anode volts characteristic (Fig. 6 (c)). It will be seen from the figures that this last slope is the



most constant of the three (*i.e.*, the curves approximate the most closely to straight lines), as is to be expected from the previous discussion. But it is quite evident that if the operating point on the "characteristic surface" goes beyond the part of the surface which is strictly flat, the so-called constants of the valve will be liable to vary (see Fig. 5). When this happens distortion will result.

(To be continued.)

Calibration Service.

Calibration signals will be transmitted from G5YK on March 24 and April 28 as follows:—
14.00 G.M.T. 7,050 K.C. (nominal).
14.05 G.M.T. 7,250 K.C. (nominal).

A similar schedule will be transmitted on April 10, commencing at 10.00 G.M.T. The call is R.S.G.B. DE G5YK, followed by the frequency used and a two-minute dash.

Rules.

A regular schedule of calibration signals shall be given at such times as will be most convenient for the majority of members of the Society by one member of the sub-committee, and such schedule to be announced in the BULLETIN.

Wavemeters or Frequency meters belonging to members shall be calibrated by any member of the sub-committee *free of charge*. Non-members to pay a small fee.

Should any British member be heard off wave by a member of the sub-committee, the latter shall at once endeavour to get into touch with the offender and request him to readjust his transmitter to coincide with the regulations.

Forthcoming Events.

MARCH 22.—Lecture at the Institution of Electrical Engineers. Subject: The Tuning of Radiating Systems, by Mr. F. Aughtie (G6AT). 6.15 p.m.

APRIL 6, at 6.30 p.m.—London Area Hamfest, at Pinoli's Restaurant. Price 5s.

APRIL 12.—At the Institution of Electrical Engineers. Talk and Demonstration by Mr. C. A. Grant on 28 M.C. Receiver and a new type of Frequency Meter. 6.15 p.m.

Danish Short Wave Station at Lyngby on 49.5, 31.6 and 19.6 m. approx. 300-500 watts aerial output. Relays Copenhagen programmes and reports are asked for.

"T. & R. Bulletin."

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DISTRICT No. 15.

Will members in this district get in touch with their Area Representative? He is arranging a Conventionette.

Quartz Crystals from Lenses for Harmonic Control.

By E. S. ELLIOTT (G5LT).

Articles on this subject have already appeared in the BULLETIN which have dealt very fully with the various points in connection with the use of quartz optical lenses for harmonic control, but it may not be out of place to pursue the subject further, and as many fellow members have written to me asking for assistance in preparing quartz lenses for harmonic control I would give the following personal experiences which might be of help to many members who are very chary as to how to commence. In the first place the following comments are made with a view to being of assistance, and although no doubt many will disagree and raise various points for discussion, I am sorry that it will not be possible for me to reply to any letters on the subject which may be sent direct to me owing to lack of time, although should any member desire to ask a question or ask for fuller information on any point which appears in this article I shall be glad to help providing the necessary postage is enclosed, as it becomes rather expensive to reply otherwise.

There are many different kinds and cuts of quartz, axis cut, parallel cut, optic cut and other cuts, but from information obtained it might be of interest to record that each piece of quartz is different in its characteristics, due no doubt to the country from which it is secured, and the age of the piece. It has been found that Brazilian quartz is an excellent quartz for use for radio purposes.

It would appear that quartz during its formation may be formed at a definite frequency, and its composition of atoms may alter during the formation, although this is a point of which there may be many divergencies of opinion, but sufficient that quartz is suitable for radio control both on the fundamental and harmonic principle, and this is the point which mainly concerns the amateur transmitter and the subject of the article.

A likely crystal can be found by placing on the receiver coil, or between two plates connected across the receiver coil, and a distinct click or series of clicks will be found on some wave bands, this being dependent on the class of quartz and thickness—it is more likely that these clicks will be found between 30 and 50 metres, as most optical lenses are somewhere between one and two millimetres in thickness. It may be well to point out here that it does not necessarily mean that the loudest click on the receiver will give the best control, and I have a crystal that gives a loud click when held in the hand between the fingers 3 in. away from the receiver coil, but this harmonic will not give any control whatever or any other smaller clicks in this band of the crystal, a further band of weaker clicks, however was found, one of which gives perfect and excellent control.

Many crystals need not be ground dead flat on both sides, particularly the clear cut, *i.e.*, when looked at by polarised light no colours of the spectrum appear; axis cut lenses give a very definite colour spectrum when looked at through polarised light and if looking through an electric light lamp the filaments of the lamp are multiplied and dis-

torted and all colours of the spectrum appear. These crystals have not been found to be suitable for control either on fundamental or harmonic.

It should be particularly noted that each piece of quartz is entirely different in its characteristics and Brazilian quartz lenses, clear cut, are found to be the most satisfactory for harmonic control. Many lenses have given excellent harmonic control when ground on one side only, and not even being polished on one side, the approximate time taken in grinding being two hours and the lens being over 1 m/m in thickness.

It is absolutely important and essential that the lenses are scrubbed and perfectly clean, and a washing powder known as "Rinso" is a splendid medium for removing dirt or rouge which has been left in the surface of the lens, when being polished for optical purposes. Very slight traces of rouge, not always visible to the naked eye, will stop a crystal from oscillating. Another important point is that the fingers should not touch the surface of the crystal, as this leaves a foreign matter on the surface and will stop the crystal giving clicks in the receiver and also stop the oscillation. In fact a crystal sent to me, stated to be without clicks, was examined by me and rouge was distinctly seen to be in the surface of the crystal, and after thoroughly washing this lens it gave good clicks and perfect oscillation and control on two harmonics when placed in the experimental transmitter.

It is worth while grinding any quartz lens right down to see if it is possible to find a harmonic which will give control. One crystal used at this station did not give any clicks on the receiver, neither did it give any clicks or any trace of harmonics in the transmitter, but this crystal has been ground down to less than 1/100" and it gives one definite oscillation which is remarkably clear and strong and controls the transmitter perfectly. The TP and TG controls can be turned 30° before the crystal stops oscillating. It is really a perfect quartz crystal ground to 42 metres, very thin and fragile, but controls 5 watts perfectly, and it was worth while the time and trouble.

It has been stated that crystals cannot be ground down very thin without difficulty, but with patience and care it is possible to grind lenses to less than 1/100" in thickness.

Knife-polishing powder has been found to be most suitable for grinding and water the best liquid medium. Plate glass should be used and this should be at least 18" square. If it is found necessary to polish crystals, a very hard wood, such as mahogany, with the surface finely sandpapered and then rouge rubbed in and, further, the whole surface rubbed with a piece of smooth glass to prepare the surface for polishing the crystal, gives an excellent polish in about one hour after the lens has been first partly polished on glass with flour-emery and water.

The plates used at this station are prepared and polished in the same way as the crystals, the bottom

(Continued at foot of next page.)

Frequency Modulation.

By W. H. HEBDIGE.

At the present time, when overcrowding in certain parts of the ether is sometimes only too evident, notes on a new system of modulation giving much more room in the ether may be of interest.

The old method, of course, is well known to everyone, and may be termed "amplitude modulations." The new method is "frequency modulation," *i.e.*, the modulating current is applied to the carrier-wave in such a way as to alter the *frequency* of the wave (making "spaces" and "crowded" parts in the wave according to the rise and fall of the modulating current), thus cutting out all "sidebands." This is done by causing the aforesaid modulating current to vibrate an electro-magnet connected to one side of the main transmitting aerial tuning condenser. The movement of the condenser vanes varies the total capacity of the aerial circuit, and so varies the frequency, but not the amplitude of the oscillations generated.

This method of doing away with the "sidebands" will make room for twenty stations where one operates now.

No special form of reception is, of course, necessary, as every sharply-tuned receiver has a resonance or response curve; that is, the current flowing in the receiver rises or falls as the tuning of the circuit coincides with or differs from the incoming wave; therefore, as the frequency of the wave increases (the "crowded" portion), the current in the receiver increases, and when frequency decreases (the "spaced" portion of incoming wave), the current flowing in the receiver decreases correspondingly.

It follows, therefore, that the applied frequency variations of the carrier-wave have been converted into corresponding *amplitude* variations capable of being rectified in the usual way.

(Continued from previous page.)

plate being $2" \times 1" \times \frac{1}{8}"$ thick, and the top plate $\frac{1}{8}"$ thick, the size being determined by the size of the crystal, and I would remark that it is essential to experiment with the weight of the top plate, particularly for QRP stations who desire to use harmonic control.

The experience with three crystals might be of interest and help:—

CRYSTAL 1.—No clicks on receiver when 1 m/m thick. Distinct click $\frac{1}{2}$ m/m thick, ground on one side only, gave good control.

CRYSTAL 2.—No clicks 1 m/m thick, no clicks $\frac{1}{2}"$ thick, no clicks $\frac{1}{100}"$ thick, excellent control.

CRYSTAL 3.—Very loud clicks on QRH desired, no control, ground further to lesser clicks, harmonic found giving perfect control.

The above is written with a view to being of help to members and I am obliged to G5MU for his assistance and the articles which appeared in the BULLETIN, which should be carefully read by all Amateurs who have a good lens which can easily be spoilt by not carefully reading *important "little" points*. Experiments have been carried out at this station with fused quartz and all kinds of quartz and experiments have been carried out with dissolved quartz, but no further information or data has been collected which might be of use, other than mentioned in this article.

Some Questions on Tuning a Transmitter.

By G6QT.

After much experimenting on tuning a transmitter I have found that apparently obvious facts were misleading and that the usual means of measurement (hot wire ammeters, plate and grid milliammeters) do not give a correct report of what is actually taking place. To come down to "brass tacks," the average ham tunes his transmitter for minimum feed current giving greatest excitation, and then connects up his aerial and tries to make his milliammeter needle go twice round the dial. I have found that most hams feel quite content when they can double their plate current by switching in their aerial.

Now, to me this seems to be a most ridiculous operation, for I view it from this point, that we first endeavour to get an oscillator to oscillate as fiercely as we possibly can, and we then damp those oscillators down to an enormous degree. The question naturally arises—why generate a fierce oscillation and then damp it practically out of existence? Why not have our coupling so loose that we only raise our plate current say 10 per cent. and it will be found that this gives one better DX.

I contend that we generate a high amplitude oscillation, and by means of our feeder system excite our radiator with a similar high amplitude oscillation only by not damping—the original oscillation.

It has been found at this station that under the suggested conditions DX R strength has been increased, but ranges up to 300 or 500 miles the R strength has decreased. Increasing the coupling has increased local reports but DX has decreased. These results also apply to two other ham stations.

Furthermore, the average ham is constantly using means to increase the current in his feeders, and tends to adopt the habit of sticking his chest out when he can raise .9 amp. on 2 watts. This, too, I consider is wrong, as we do not require an enormous current in our radiator. We require a voltage difference which is quite another matter, and because we have a good current figure it does not necessarily follow that we are developing a good voltage.

I think it would be enlightenment to many if some of our technical brethren would elucidate these effects.

Furthermore, I feel sure that you, O.B., who are now reading this, do not agree with my views. Then why?

Can You Beat This One?

G5QF sent a test call on the 14 M.C. band one afternoon recently. On searching he heard an OK station replying to him. Nothing very wonderful about that, *but* what would you say if you were told, as QF was, that the station he was listening to was on 28 M.C., *and* transmitting on that wave as well? Exactly; you would pinch yourself; well QF (you all know his nickname) did that, and more, but the more he pinched the more certain he became that he was party to one of the most curious freaks short wave radio has yet given us. Mr. Buckingham's input was 7 watts—no, not kilowatts!!!!

Contact Bureau Notes.

By T. P. ALLEN (G16YW), MANAGER.

At the moment of writing the stage for the 28 MC. tests is being rapidly set; at the moment of reading the play will be in progress, and I send my best wishes to all who are engaged in this attack on the mysteries of 28 MC. Yes, the metaphors are a bit mixed, but the wish is genuine. And, by the way, you will not forget to send in your report immediately after the tests? It does not matter if you heard nothing but WIK—we will know from it that WIK was heard and readable through the tests period, and it may help. All the details were sent to a number of foreign organisations, and I sincerely hope that the tests are getting the support from our own men that they warrant.

I must mention here my great appreciation of the kindness of Mr. Handy, of the ARRL. In response to my request for assistance he wrote to the effect that not only would he mention the tests in QST, but would send out the details on an official broadcast just previous to the tests.

Such co-operation is encouraging, and I am sure that I speak for British amateurs when I say "Thank you."

From Czecho-Slovakia comes a request for permission to enter the tests. (EC)2YD joins us and sends most interesting details of his 28 MC. gear. He has heard G6DH, G2OD and EU15RA, but no W stations at the time of writing. He has been transmitting on this frequency without success. 2YD uses 8 watts P.D.C. to a T.P.T.G. circuit. Coils are copper tube $\frac{1}{4}$ in. diameter, and the number of turns is: 4 for aerial, $3\frac{1}{2}$ for anode, and $1\frac{1}{2}$ for grid. They are spaced $\frac{1}{8}$ in. and have a diameter of $2\frac{1}{4}$ in.

Home-made tuning condensers have 2 fixed and 1 moving plates.

At present a vertical $\frac{1}{2}$ wave Zepp is used, and is inspiring confidence. The valve is a Phillips TBO4/10 with 270 volts. For the tests 2YD hopes to use 50 watts D.C. The receiver uses valve base coils *à la* G5VL in C.B. Notes.

Belgian 4AG joins us; he is our first Belgian member and is very welcome. As engineer-in-chief to the largest electricity concern in his country, he is often faced with a problem and asks for our help. He points out that his query has only a remote connection with radio, but it is so interesting that I think it should arouse some thought. He has to deal with peasant folk, and asks for the answer to their query, "What is a Kilo-watt-hour?" Without introducing volts and amperes, or fancy comparisons, how can this be answered? They can think in gallons of water (or litres perhaps), and in cubic feet of gas, but how are they to visualise this amount of energy? Any suggestions?

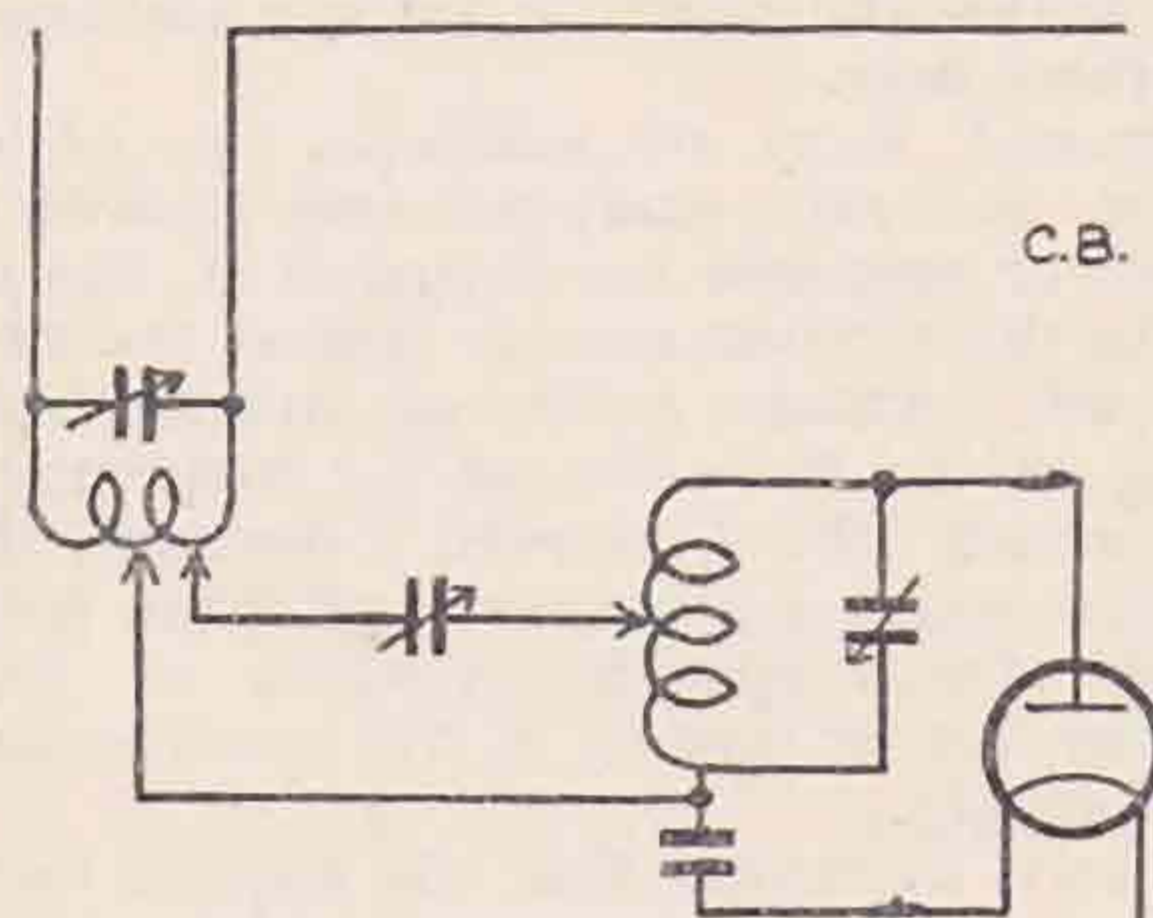
G6DH sends the idea shown in sketch. It gives improved results on 7, 14, and 28 MC. The antenna coil is not directly coupled to the anode coil.

CTIBK, whom I thank for stamps, mentions that, like 2AAK, he is troubled with tram QRM.

He has made quite a study of the trouble, *i.e.*, the interference caused by various trams and the variations in intensity from night to night.

As the frequency of the receiver gets higher the trouble gets less, but on 5XX it is unbearable. The use of peaked transformers may be good for CW, but is obviously out of order for BCL stuff. He offers to compare notes with anyone in the same bother, and thinks that there is room for a group on the subject.

He asks why it is that a run-down battery, not too low to stop things working, always gives better results than a freshly charged one with a resistance in series? This is quite a usual phenomenon.

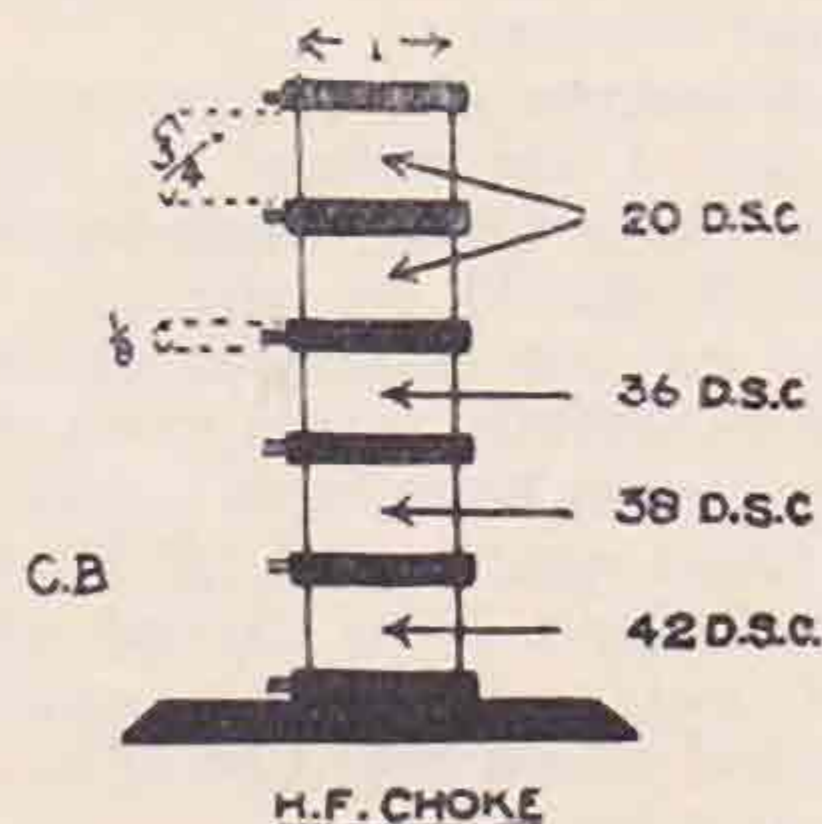


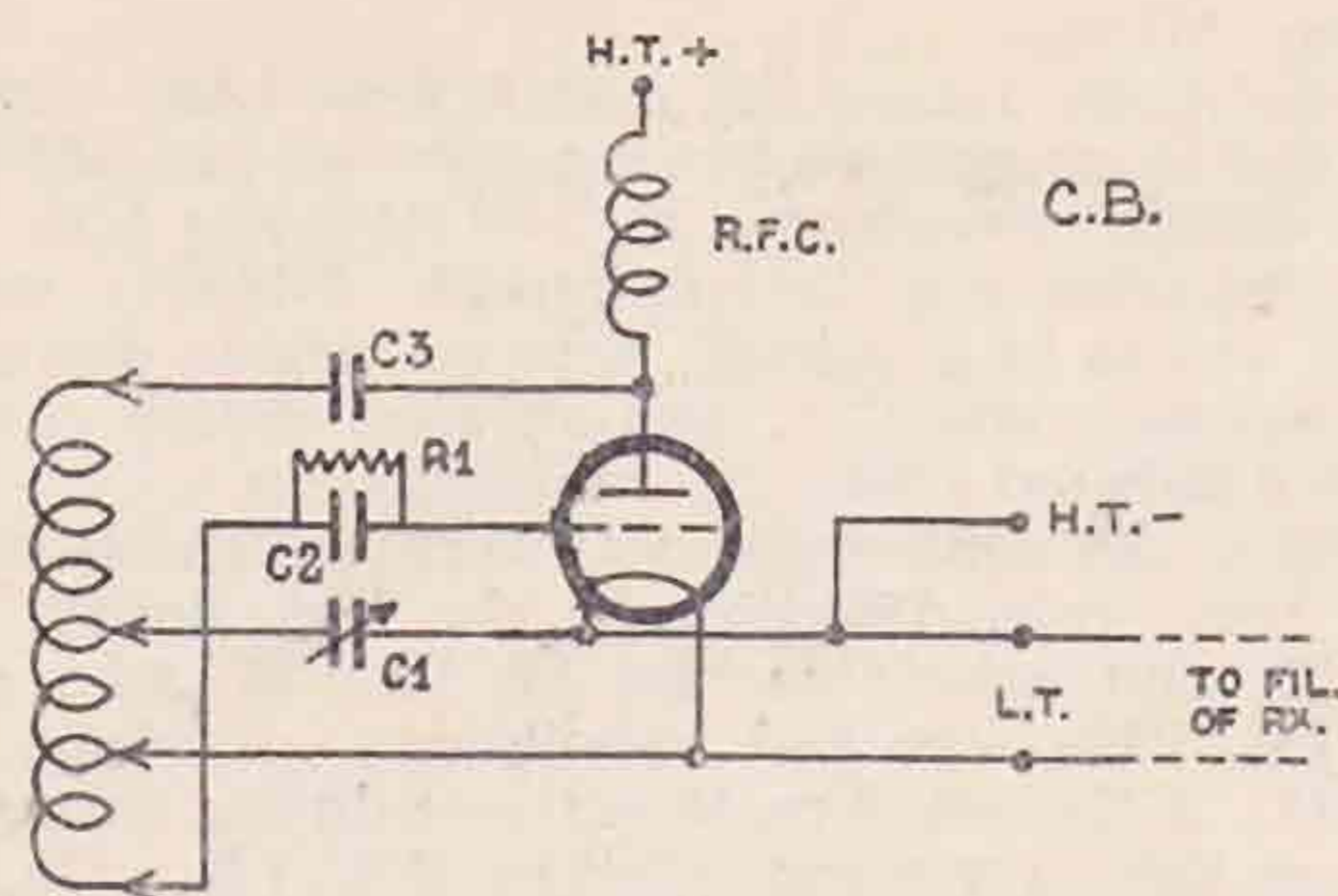
COUPLING FOR ZEPP FEED AT G6DH.

G2AI, who is doing fine work with a DE6 valve, asks if anyone can give him the impedance and filament current of a VT13A valve? These valves have a low capacity base and are rated at 30 watts at 1,000 volts.

G6VO is doing some work on sunrise fading, and is being helped by G6QA. They are anxious to have help from listeners about, say, Berwick and Gloucester, and also in Denmark or some spot due East of them. Report sheets are being printed, and a Group is under consideration. Please write to G6VO direct if you can help in this work.

2ABA writes with reference to the remark in a recent CB Notes about ENOCX's filament remaining bright when L.T. switched off. 2ABA has an oscillator which has been doing duty for a filament





ZABA'S OSCILLATOR FOR FIL. CURRENT.

supply generator during the last twelve months. A sketch of this oscillator is shown. To start up, a flashlamp battery is placed across L.T. terminals, H.T. is switched on, and condenser C1 is turned slowly in until valve gets brighter. When this occurs, remove battery and the valve will be found to be still alight.

At 2ABA the short wave superhet derives its filament current from this, the condenser being used for filament control instead of a rheostat. The advantages are that all valves have greater emission than normal for a given brilliancy, and if D.C. mains are used, H.T. can come direct for hours without attention. The disadvantage is that the life of the valves is reduced.

Dutch ODU, who joins this month, says that it is hoped that licences will appear in the next six months. He is experimenting on 28 MC. and will be joining a Group. The following calls heard will be of interest:—

Calls heard by PAODU on 28 MC.

- 13/1/29 : G5YK de W2JN QSA3-4 T9.
- W2AYR QSA3 T6.
- 3/2/29 : G6CI de W2JN QSA3-5 T9.
- G5HL de W2ALW QSA3 T6.
- G5VL de W1CMF QSA1-4 T7.
- " de W2NM QSA3 T6.
- " de W1ZZ QSA2-3 T5.
- " de W1BW QSA4 T5.
- " de W1AQD QSA1-3 T7
- chirpy.
- " de W8ZG QSA1-3 T?
- spark? unsteady bad
- note.
- " de W9BLT QSA1-3 un-
- steady A.C., bad note.

PAODU has noticed that when using a 10 metre vertical aerial the 28 MC. signals are 50-100 per cent. better than on a 10 metre horizontal aerial.

Group 4A:—

BRS90 sends in the useful monthly chart, and tells me that 2AUH is ill; I hope that he will soon be fit again, and he has our sympathy.

EI7C tells me that on February 6 and 7 F8CT was QSO with OH2NM on 28 MC. R7 and R8, old scale, each way between 11.00 and 13.00 G.M.T., best time being 12.00 G.M.T. EI7C has been trying a reflector wire with apparent success, but further tests are necessary to convince him of its effectiveness.

W9EXW, H. H. Reynolds, 1,148 Calumet Avenue, Whiting, Indiana, who has worked a few

G stations but never received a card, is anxious to make a series of schedules with G amateurs on 7, 14, or 28 MC. bands. Will anyone interested please write to W9EXW giving their frequency and saying on what frequency, within 50 kc., they will listen for his signals. This schedule scheme is for experimental work and his power input is from 30 to 120 watts. W9EXW's 28 MC. signals have been reported R8 from the West Coast, and he has heard F8CT.

G5HJ, whose application was too late to be mentioned in last notes, is having a little trouble with a crystal across the grid of a T.P.T.G. When the coil is tuned to the crystal frequency, the set goes out of oscillation.

BRS125 is interested in 60 MC. and is anxious to get into touch with someone who is experimenting on this frequency. He wants information about suitable valves and components.

GROUP 4A RECEPTION CHART. March 20—April 20. All times are G.M.T.

Continent.	14 MC.	7 MC.
Asia ...	14.00-18.00 VT 14.00-17.30	15.00-21.30 AI at 19.30 AS 20.30-21.30
Australasia	05.00-08.30 16.00-19.00 K6 heard at 06.25	06.30-09.00 17.30-22.00 on 9 MC.
Africa, N. ...	10.00-14.00 and at 19.45	07.00-08.00 18.00-23.00
Africa, S. ...	16.00-20.00	18.00-22.00 FQ at 19.45
N. America	11.30-06.00 U.S. 6th Dist. heard at 20.00 G.M.T. West best at 05.00	20.00-09.00 morning after U.S. Central 21.30-09.00 U.S. West Coast 01.30-08.30 Cuba 08.45 Mexico 08.00
S. America	21.00-02.00	21.00-08.00 on 9 MC.
Europe ...	Daytime, fade at sunset. G heard just before sunset	Locals fade after dark after which DX appeared

PRIZES FOR 60 MC. WORK.

BRS125 has sent me a cheque for £3 3s. to provide a prize for the first QSO on 60 MC. over a distance of more than 10 miles. The prize will consist of a cup, transmitting valve, or screened grid valves. IFS stations are included in this offer. BRS125 has also stated that he will award a prize to the foreign station, if any, which co-operates successfully in the QSO. The QSO must be notified and verified before December 31, 1929; after this date the offer lapses.

This is a very kind action on the part of BRS125, and one which deserves our best thanks. I hope that this will help to encourage research on this frequency, and that I will soon have to report to BRS125 that a claim has been made.

He also informs me that ZU6C hopes to be operating soon on 60 MC. band.

I welcome YIILM to our ranks ; he is building a 28 MC. transmitter. It will employ a Mesny M.O. on 14 MC.—two 30 watt valves in push-pull as F.D.'s and two 250 watters in push-pull P.A.

His receiver circuit is shown, and it appears to function on 28 MC. very efficiently. He has heard only commercials as yet, but these may be of interest ; LSD, LSE, RGX, RGV, WQA, and PPX-PRLA (dual control).

LSE, RGX, and RGV nearly as strong (R8-9) as PPX. PPX best at 12.00 G.M.T. and the others at 13.30 G.M.T. WQA is R4 at 14.00 G.M.T. PPX is at Rio.

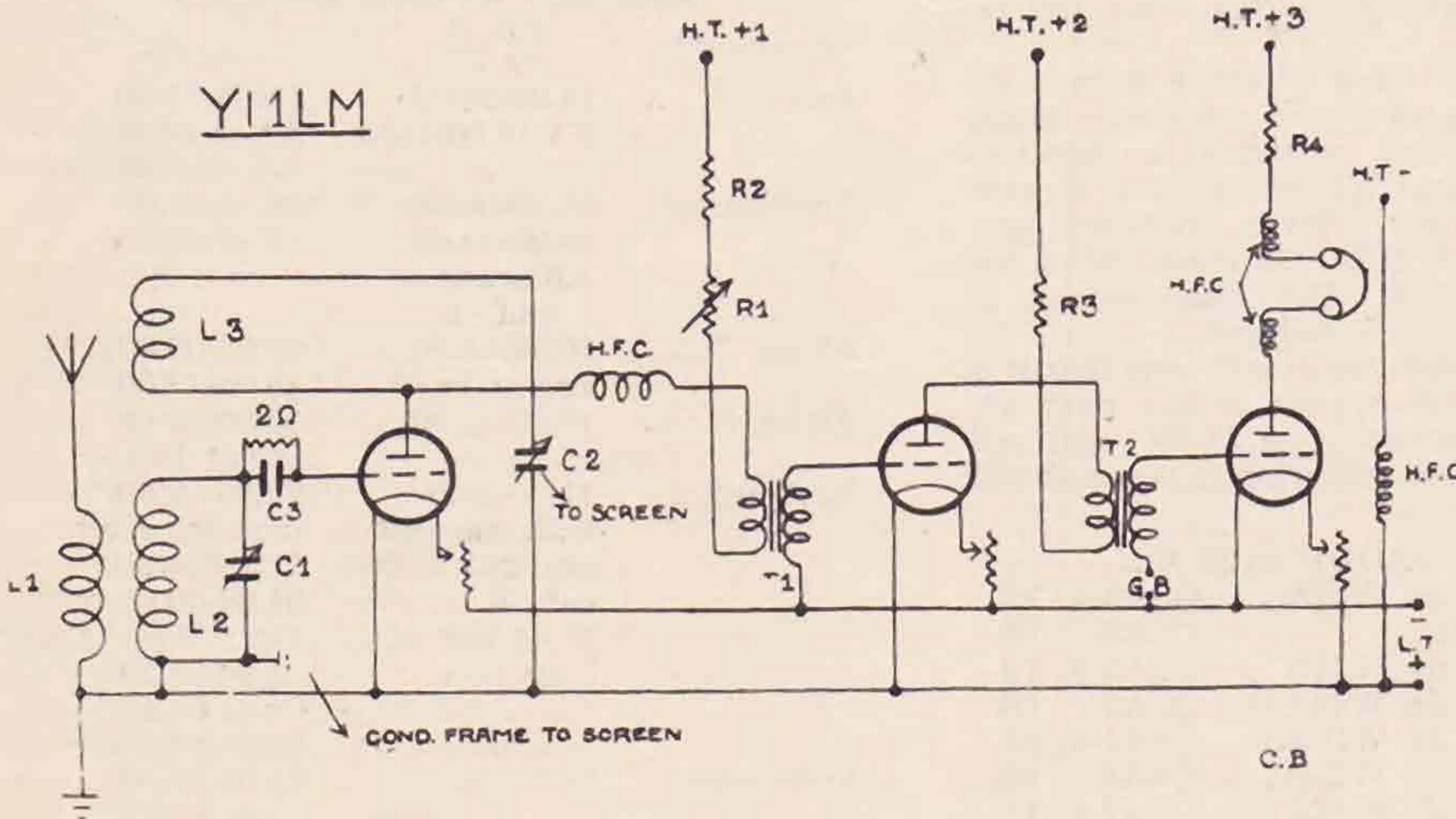
The de-coupling resistances cured TH on 7 and 14 MC., but the resistance R1 was necessary for 28 MC. work. TH appears if C2 is used for reaction control near the oscillation point.

The aerial coil is wound on an ebonite collar, 1½ in. diameter. This collar is a push fit over the neck of the standard valve holder, and is capable of sliding over the valve-base and valve holder neck, so giving a fair variation of coupling.

Group 1D :—

Conditions during the month were bad. G6PA has had to resign from business reasons, but GI5WD and GI5OT have come in. GI5MO has had 'flu and therefore has little to report. GI5WD, using P.M. valves in a Schnell, gets oscillation down to 8.5 metres. His T.X. uses an ultra-audion circuit with a debased LS5. No results as yet.

G6GC has done some local work. G2AAK built the R.X. coils described in the last Budget by W2JN and heard his first 28 MC. W, who was W2JN. 'Flu checked rebuilding operations at EI4D. EI7C heard no W stations during January, but on February 3 was called by W2AYR. On the same day a harmonic of FVM2 was heard ; does anyone know his QRA ? CN8MB was also heard QSA2-3 on 28 MC. (not a harmonic), but all attempts at QSO have failed. EI7C has noticed that when W stations fade, the commercial signals coming from British stations east of him fade at the same time and return at the same time. It has also been noticed that when a W station has been weak at



- C1: Dubilier KC.—cut down to 2 moving and 2 fixed plates, quad spacing.
- C2: Usual 0.0003 mfd.
- C3: 0.0001 mfd.
- L1: 3 turns 1½ in. diameter all waves 28 MC./7 MC.
- L2 and L3: Valve base coils per GI6MU in CB Notes and also in QST.
- R1: Clarostat volume control for reaction control.
- R2: 5,000 ohms.
- R3 and R4: 10,000 ohms.

G6VP is getting together a group to replace Group 1C on 28 MC. work ; it will be of rather an international character.

G2HH sends me some excellent samples of pictures received from Daventry. Is there no demand for a group on picture transmission or even on television? G2HH is doing a little propaganda work for C.B. by having it printed on his cards. F.B.

Group 1C :—

G6WN has now got his 28 MC. permit and has C.C. going, but no contact as yet. G5YK has had two contacts with W2JN, using 60 watts C.C., vertical full wave Zepp with full wave reflector ¼ wave apart and directional with New York. Maximum signal strengths R7 and R5. Having no previous success, the reflector was tried, and first time it got a QSO. BRS142 and G5WF dropping out, and G5YK being very busy with editorial duties, I am very sorry to say that this group is now dissolved. I thank G5YK and the members for their help and reports.

T1 and T2: Ferranti AF4's.

H.F.C.: Wound in 5 sections on 1 in. former ¾ in. long. Sections 1 and 2 with 20 swg. dsc., section 3 with 36 swg. dsc., section 4 with 38 swg. dsc., and section 5 with 42 swg. dsc.

7C's, the same station has been strong with EI8B. This suggests strongly that local conditions have a deal to do with the reception.

Group 1G :—

G6BW has supplied this group with a fine 28 MC. R.X. circuit. G5GU has also invented a "Berries" receiver, and promises the details for the BULLETIN. He also is calibrating the wave-meters of Group 1G, which is a fine idea. G5PL is hearing G6HP, G5WK and W2JN on 28 MC. The group is helping him with his cloud investigations. G2SG and 2AUX failed to report. G2YU has been very busy with other duties, but is almost ready for 28 MC.

Group 2B :—

G2ZC suggested a reason why a town (in France) which was a blind spot for 1,500 kc., immediately

became possible for 7 MC. He thinks that the 1,500 kc. wave arrived at a lower angle and had to pass through the smoke screen at only a small angle, making a long path through the fog or smoke. The 7 MC. signal dropping down at a steep angle, had only a short path to travel. G6PP wants to know if anyone has suggested an explanation for "hollow" signals. He does not mean the echo effect due to "the second time round," but the hollow metallic ring which is often heard on quite local signals. G5AQ, ex-2AGC, says that fading is most pronounced when the moon is full, and that static is also bad. He thinks that signals are best and static least when the barometer is around 30°. CTIBK gives some theories which CTIBL holds about fading. IBL thinks that fading is the result of earth currents just as much as it is the result of any change in the "layer." IBL is an engineer in the Eastern Telegraph Co., and he mentions that when stationed in the Azores, which are subject to earthquakes, he noticed that when a quake took place not a signal could be heard for half an hour, after which they gradually returned to normal strength. He goes on to say that the variations of the earth current observed in a submarine cable are exactly similar in character to fading in radio. The cable people install compensating gear and it is up to someone to invent gear for radio work also!

D4DK reports that the minimum ionisation of the Heaviside layer was from January 2 to 4, and reports best strength of WIK as at 14.00 G.M.T.

(Thank you for such a full report G6XC.—GI6YW.)

Group 3A:—

G6XC tells how to obtain the plate-glass polish on a crystal. Use carborundum FF for rough grinding and then FFF 400 and 600 grit in the order stated. The last is used until no appreciable grinding is taking place, and the crystal throws a flat polish when light is reflected. Rouge may now be used to give a final polish, but it is useless to use it before this stage is reached. It is applied with a cork and wet rouge, working till dry, re-wetting the cork until the desired effect is obtained. G6XB wants information on the following points:—

- (1) A simple method of cutting blanks from the original crystal.
- (2) Why a crystal loses its oscillating properties after grinding down?
- (3) Why a crystal will excite a valve when there is neither grid or anode coil?
- (4) Any experiences of a crystal oscillating in a circuit with the plate coil giving three times the frequency of the crystal. (I think that G2NH mentions about this in the February Notes.—GI6YW).

G2BFA, in collaboration with G5MU, is examining crystals with polarised light and being very successful. They are sending the light polarizer and some samples of "Pretty" quartz (lent by 2QY) round the group.

G2QY has answered many of his own questions, but space at my disposal here would not do justice to the subject, and I hope that G2QY will expand the very interesting points into a short article for next month.

Group 5A:—

Has received licences to operate on the 3,500 kc. band each Sunday, Monday, Friday and Wednesday

in February and March from 23.00-24.00 G.M.T. They have already started work and are greatly assisted by D4DK, who is very interested in C.B. work.

Group 1E:—

G2XY has been using an LS5 in an ultra-audion circuit, but found that the heating of the anode gave a bad frequency drift. He is now building a C.C. set with DE5B-LS5B-LS5B-two LS5B's—and final amplifier of VO/250. Though he cannot expect to excite fully the PA with the two LS5B's, he should gain a reasonable output assisted by some feed back from the PA. G5US is concentrating on the stabilisation of his SW/50 by C.C., and has finished a 4-valve receiver with S.G. stage. G2OD has been working on aerials and finds his double wave horizontal aerial always gives a signal in U.S.A. after most G stations using vertical or horizontal aerials of similar dimensions (say $\frac{1}{2}$ or full-wave) have faded out. Contact with W2JN was established on January 20 at 17.30 G.M.T. after all other European stations on 28 MC. had long faded out at W2JN. On the other hand, it does not seem possible to QSO W districts until the twilight period passes over the station G2OD, using the same aerial. No contacts have been made at 14.00 G.M.T. when other G stations were QSO. Experiments are proceeding with simple reflector systems. Much attention is also being given to the reception side using a supersonic, but this receiver is particularly sensitive to modulated wave reception and interference from ignition system of cars is always intense. It is hoped to overcome this by a system of selective filtering and note tuning of the final detector stage; the success of this depends on the stability of the transmission to be received, and, up to the present with few exceptions, the frequency stabilisation of transmitters on the 28 MC. band is not good enough to make full use of the proposed method of filtering and note tuning. It has been noticed that NKF is running schedules and answering general calls on a frequency just below the 28 MC. band. The note is C.C. with a modulation of about 500 cycles.

Group 1F:—

G5WK intends to replace his present aerial with a Zepp. G6HP is using a new T.X. with LS5D as oscillator, and first call raised W2AYR. He is being received by G6DH at strength R4, old scale. BRS25 has now heard 27 different W stations on 28 MC. He has also heard VE2AC and OH3NE. This is the first report at C.B. of the reception of Canada or Finland.

Group 2A:—

All members of this group concentrated on gathering information from every source about skip, and having a big letter-budget. The Centre G6LN says that it is surprising what a huge amount of information can be gathered in this way, and gives the credit for the idea to G6NK. The tests by this group during the period January 6-13 proved negative. G6LN has noticed that during the Great Freeze the fade-out of G stations took place much earlier than usual, but that stations around 200 miles distance could be worked until the normal fade-out time.

NEW MEMBERS.

G5HJ, G2AI, ON4AG, G6XB, BRS162, (OK)2YD, PAODU, G6VO, G6QA, BRS15, G6OO, YIILM, G2MI, 2AYX. Total to date: 161.

Two Months Under the New Conditions.

By M. W. PILPEL (G6PP).

The first two months of the new regulations are now over, and before proceeding it might be as well to review things thoroughly and see just how much better or worse off we are now than we were up to the end of 1928.

In writing these few lines, I am only giving my own personal opinion of the general conditions upon the 7 M.C. band, and I am quite liable to contradiction, so don't all fall down on me like a load of bricks if I say anything that does not coincide with your own ideas.

The first and foremost thing to be mentioned is QRM. I have known some bad Sundays in the past which I considered to be the very limit, but after listening on a few nights after 10 p.m. G.M.T. since the beginning of the year, I have come to the conclusion that those Sundays were, by comparison, what 14 M.C. must have sounded like round about the year 1910. It is impossible to describe the perfectly hopeless babel of signals from American amateurs, and unless you have heard it yourself, you cannot imagine what it is like. Some time ago, I think, a friend of G6QB said "45" on Sunday morning sounded like a dog-fight. The same gentleman would probable describe "42" any night now as being the noise caused by about a dozen wars. I never used to be able to understand Americans' tales of hopeless QRM after 5 p.m. E.S.T. I can now see what it must have been like, and they have my sympathy. But what is it like now? To give you an idea, I need perhaps only say that a friend, writing from across the pond, says that he finds it difficult to work his own countrymen when using 100 watts input!!

Now, what am I leading to? I'll tell you. Do you remember that late last year the I.A.R.U. at Hartford proposed that the new wavebands should be split up into three sections, one part for the U.S.A., another for Europe and the third for the rest of the world? And what's more, do you remember how we all pooh-poohed the idea, and felt frightfully indignant because the Yanks proposed grabbing the lion's share of the bands? They were clever people, those heads of the I.A.R.U., they saw what was coming and tried to avoid it. But we weren't biting, so they just sat down and waited, guessing what the result would be. And now I think we feel a little bit sorry for ourselves, and wish we'd taken their advice. I don't believe it's too late to do that yet if we all make up our minds to stick to the rules. And don't let us grumble that U.S.A. gets a bigger slice of ether than we do, because I reckon they deserve it. There are nearly 20,000 amateurs in the States, compared with about 10,000 in the rest of the world, so it seems only fair that they should have more room. As it is, they are giving us more than we ought to have proportionately, so let us be satisfied. As far as I am concerned, I shall be only too pleased to fall into line, now that I know what real QRM sounds like. Will you?

The next point that I come to is that concerning the new "Q" signs. I suppose we have no right to kick against them, they were not made solely for our use, and besides, there is little cause for it. But there is one thing I certainly think should be altered, that is "QSA." When this abbreviation was first published, there was, I think, great jubilation amongst amateurs that we had at last got rid of that very indefinite "R." After having used QSA for a month, I find it is more indefinite still. Nobody seems to know what, say, QSA3 is, and even if they think they know, they are not sure whether it means R3. What is more, hardly any of the foreigners seem to be using QSA. Whether they will do so at a future date I cannot say, but I do know that the old "R" code seems better suited to the needs of amateur radio than QSA. In order not to come into conflict with the powers that be, however, until further notice I shall use both QSA and QRK when giving reports, in this style:—"Your signals QSA4 QRK R6." What do you think of the idea?

Lastly, I come to rather an important matter, namely, "off wave." The number of foreigners still working on 45 metres is astounding. Sooner or later a complaint will reach the authorities, and then we shall all be for it. Do not let us forget that another convention takes place in five years, when we hope to ask for more ground than was given us at Washington. If our conduct has been exemplary we stand a good chance of getting it, but if a lot of complaints have been lodged by commercial stations, we might easily lose some of our territory. Nothing is more likely to be the cause of a complaint than "off wave" working, and by QSO-ing those stations we are encouraging them in their irregularity. Therefore, although it may seem very hard to have to keep the transmitter switched off when we hear that "DX" station calling us on "forbidden ground," let us do so for our own sakes, and when the other fellow finds he gets no replies to his calls he will soon realise the reason and come down to where he is entitled to be.

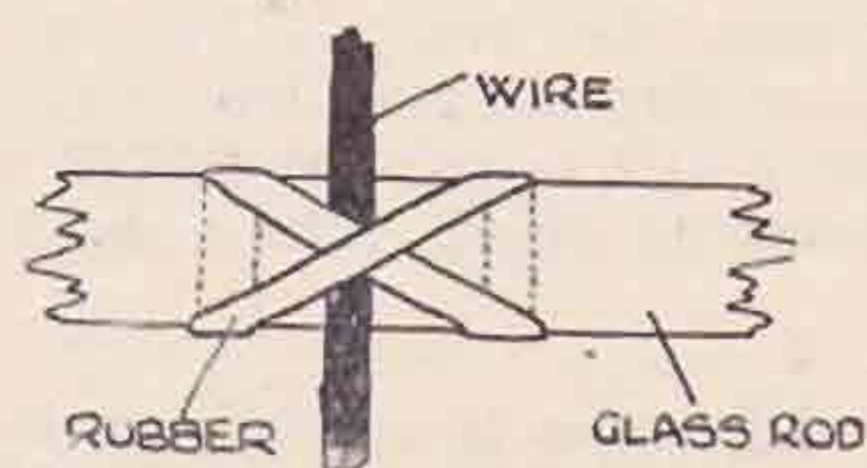
Spacers for R.F. Lines.

By A. PHILPOT (G5PL).

The following is a simple way of securing glass rods onto twin R.F. feeder lines. The rods are known as accumulator plate spacing rods, and can be obtained from accumulator makers in various sizes to suit the spacing between the feeders. Some stout rubber rings are also required; suitable ones about $\frac{1}{8}$ in. square and $\frac{1}{2}$ in. diameter can also be obtained from the battery makers. They are very strong and made to resist acid.

The method of securing the wire to the glass rod will be made quite clear on referring to the figure.

It has been found that using this idea in London amongst the smoke and soot the rubber lasts a considerable time, and is also easy to take down for alterations and adjustments.



SUPPORT THE SOCIETY AND TRADE ONLY WITH YOUR SUPPORTERS.

COMMITTEE REGULATIONS.

Revised September, 1928.

GENERAL.

1. Nothing in these regulations shall be so read as to be inconsistent with the Articles of Association of the Society.
2. "The Transmitters and Receivers Committee" shall be referred to hereinafter as "The Committee."

CONSTITUTION.

3. The Committee shall consist of seven representative members and all Area Managers.

REPRESENTATIVE MEMBERS.

4. Representative Members will be elected annually at the General Meeting of Members held during Convention. Each representative member will be so elected to fill a definite office. All such work to be conducted in an honorary capacity.

SECTIONAL DUTIES.

5. The following duties will be undertaken by the representative members:—
 - (a) The care of Society instruments and responsibility for a Calibration Service.
 - (b) Licence questions.
 - (c) Social activities.
 - (d) QRA Service.
 - (e) QSL Service.
 - (f) Contact Bureau Organisation.
 - (g) Publication of the Society's Journal.
6. One member will be responsible for each of the seven sectional duties and he alone will be held responsible to Committee for the efficient working of all matters relevant to his Section.

SUB-COMMITTEES.

7. Each representative member shall have power to co-opt to himself members not exceeding four in number, who shall assist him with the work of his Section. The names of all such members shall be communicated to the Honorary Secretary of the Society within seven days of their appointment, and shall be subject to the approval of the Committee.
8. Members of sub-committees (subject to Regulation 9) shall not attend meetings of Committee unless requested to do so by the Honorary Secretary of the Committee.

PROXY VOTES.

9. In the event of a representative member being unable to attend a Committee meeting, he may appoint one of his sub-committee to attend in his stead and may delegate to him such power to vote upon his behalf on any matter under discussion, providing that such person presents a duly authorised letter signed by the representative member to the Honorary Secretary to that effect on his entry to the meeting.
10. Representative members may vote by proxy (in writing and when not represented as in clause 9) for or against any proposal placed on the Agenda for discussion. Such vote to be sent to the Honorary Secretary of the Committee.

SECTIONAL DUTIES.

11. The functions of the sectional committees shall be as follows:
 - (a) To assume responsibility for the safety and maintenance of all Society instruments and to supervise their use at all times. To be responsible for the Society's Calibration Service to members and for the transmission of calibration waves as approved by the Committee from time to time.
 - (b) To consider all questions concerning the recommendations for special licences and to make representations regarding general questions of policy in connection therewith.
 - (c) To organise and arrange all Society social functions including dinners, visits, Conventions and Exhibitions.
 - (d) To be responsible for the organisation of the register of amateur stations and to furnish when requested by Committee such information as may be required for inclusion in any journal published by the Society.
 - (e) To be responsible for the organisation of the Society's QSL Bureau.
 - (f) To be responsible for the organisation of the Experimental Section known as Contact Bureau, to arrange the work of its members and submit a monthly report for insertion in the Society's journal.
 - (g) To be responsible for all matters appertaining to the Society's journal.
12. No further sections shall be formed without the sanction of the members gathered in Convention or with approval of Council.
13. Regulations governing the working of the various sections shall be drawn up annually and published in the December issue of the Society's journal. These regulations shall be drafted by each sub-committee and submitted to the Committee for approval before publication.

ELECTION OF DISTRICT REPRESENTATIVES.

14. The Honorary Secretary of the Society shall arrange to have published in the July issue of the Society's journal a nomination form worded as follows:—

FORM 1.

DISTRICT REPRESENTATIVE ELECTIONS, 19 .
I wish to nominate Mr.
for the position of District Representative for the
District.

Signed.....

Call Sign (if any).....

This form shall be returned to the Hon. Secretary of the Society not later than August 1.

In the event of more than one person being nominated as District Representative, the Honorary Secretary of the Society shall publish in the August issue of the Society's journal on ballot forms worded as follows, the names of all such persons nominated.

FORM 2.

DISTRICT REPRESENTATIVE ELECTIONS, 19 .
The following persons have been nominated for
the office of District Representative in the
District.

NAMES. CALL SIGNS (if any).

The name of the person you desire to vote for should be entered upon the enclosed voting form. These forms shall be returned to the Hon. Secretary of the Society by September 15.

FORM 3.

DISTRICT REPRESENTATIVE ELECTION, 19 .
VOTING FORM.

I desire to record my vote in favour of
for the District, as District Representative.

Signed.....

Call Sign (if any).....

The announcement of new District Representatives shall be made at the Business meeting held during Convention.

Ballot forms shall not be published in a position which will affect subject matter when cut out.

District Representatives shall be elected annually, and shall be representative of the members resident within their area. They shall be responsible to Committee for all matters affecting the Society's membership within their area, and shall be responsible for collecting each month reports of general interest from members within their area. Such reports to be forwarded to the Hon. Secretary of the Society by the 20th day of each month.

15. District representatives shall attend Committee meetings as often as possible and shall have a vote equal in effect to that of a representative member.
16. Provincial and Colonial Area Managers may appoint a London area member to attend Committee meetings on their behalf. Such member to be given power to register a proxy vote on any matter covered in the Agenda of the meeting he attends. Such a member must be nominated in writing by the Area Manager he represents. The appointment shall be approved by the Committee prior to business commencing.

RESIGNATIONS.

17. If any representative member of Committee fails to attend either in person or by his duly appointed representative two consecutive regularly announced meetings and fails to give reasons in writing to the Committee for such absence he shall be deemed to have resigned his position.

In the event of the resignation or removal of any Committee member, the Committee shall nominate a member of the Society to act as either representative member or District Representative as the case may be.

DISTRICTS.

18. The British Districts shall be as decided upon at the Third Annual Convention held in London September 29, 1928, and published in the Society's journal from time to time.
19. Each of the British Colonies and Dominions may appoint Area Managers as considered necessary by them, and these

may in turn appoint assistant or sub-managers. If the particular Colony or Dominion considers it proper they may establish a Headquarters in their own country, but for the purposes of administration in London each country shall be considered as a separate area and all correspondence of a political nature shall be addressed through the Dominion or Colonial Manager. Each Dominion or Colonial Area shall be self-governed as regards matter of policy.

FOREIGN REPRESENTATIVES.

20. From time to time the Committee may nominate representatives from foreign countries to act as British Correspondents to the Society. Such members may be granted full membership of the Society during the period they are acting in this capacity, subject to the approval of Council. Such members shall periodically forward to the Society reports on amateur activities in their country and act as a liaison on any question of general policy between their Society and the R.S.G.B. Foreign correspondents may be nominated from any country in which an organised amateur Society is established.

RESIGNATION OF COMMITTEE.

21. The Committee will resign *en bloc* at the Annual Convention.
22. Fourteen days prior to the date of the Convention business meeting the Honorary Secretary of the Society shall prepare a list of those representative members who are prepared to serve if re-elected.

ELECTIONS.

23. The ballot for District Representatives shall be conducted as laid down in Regulation 14. Their year of office commencing on October 1.
24. The ballot for representative members shall be made at the business meeting held during Convention. New members shall be proposed and seconded. Each sectional representative shall be elected to fulfil a specific office.

HONORARY SECRETARY AND CHAIRMAN.

25. During the first 14 days of October the Honorary Secretary of the Society shall write to all elected members to attend a meeting for the purpose of electing an Honorary Secretary and Chairman to act during their year of office. The election of such officers to be made only by representative members or Area Managers.

HONORARY SECRETARY'S DUTIES.

26. Immediately after the constitution of the new Committee shall have been established, the Honorary Secretary of the Committee shall prepare an agenda of business to be discussed. The Honorary Secretary will prepare minutes and reports of all proceedings of the Committee and arrange that all such as are required be presented to Council in a concise manner.

MEETINGS OF COMMITTEE.

27. The Committee shall meet at least once a month on a date to be arranged at the previous meeting. At least seven days prior to the date fixed the Honorary Secretary shall send to the President, Honorary Secretary of the Society, all representative members, all District Representatives, and all London Representatives, a copy of the notice convening the meeting and an agenda of business to be discussed. The agenda shall be drawn up in such a manner as to enable members to record a vote for or against a proposal.

ELECTION ARRANGEMENTS.

28. Election arrangements shall be under the direction of the Honorary Secretary of the Society or his nominee.
29. No member shall be deemed to have voted if his current subscription be unpaid, or be eligible for election on the Committee or any sub-committee of the Society.

DISPUTES.

30. In the event of a dispute which the Committee is unable to agree upon and which the Chairman considers to be of sufficient importance to merit such action, the matter shall be referred to Council for arbitration. Alternatively the Committee may pass a resolution proposing that a matter should be referred to Council for arbitration.

PROCEDURE AT MEETINGS.

31. A Quorum shall consist of five representative members or Area Managers including the Chairman and Honorary Secretary.
32. If by reason of limitation of time it is necessary to adjourn a meeting before the business down for discussion has been completed such business shall be concluded at the next meeting of Committee.
33. An attendance book shall be signed by all members attending the Committee meetings. The signature of a member in the attendance book shall be deemed to be evidence of his attendance.

REFUND OF FARES.

34. Council shall cause to be refunded third-class return railway fares of provincial District Representatives and representative members living outside the London Area, providing the member signs a declaration to the effect that the expenditure in which respect the claim is made was incurred solely for the purpose of travelling to London in order to attend the meeting, and that he travelled by the shortest route and the least expensive one.
35. No single member of Committee shall have his travelling fares refunded more than three times in any one year. All claims for refund of travelling expenses must be made within seven days of the meeting.
36. Council reserves the right to refuse the refund of fares on grounds of expediency or economy, and notice of such shall be given prior to the meeting.

PUBLICATION OF PROCEEDINGS.

37. The Committee shall instruct the member responsible for the publication of the Society's journal, through the agency of the Honorary Secretary of Committee, as to what Committee matters shall be reported upon in the Society's journal or elsewhere. No matters other than these shall be reported.

GENERAL MEETINGS OF SUB-COMMITTEES.

38. The Honorary Secretary of the Committee, if so advised, may call general meetings of sub-committees from time to time to consider programme matters or matters of policy. Such meetings shall then act as committee meetings and resolutions passed will have a like effect to resolutions passed by an ordinary committee meeting.
39. All members of sub-committees may vote at General Meetings of sub-committees.

Membership Certificate Competition.

The Committee have pleasure in announcing that the Membership Certificate Competition has been won by Mr. Arthur Watts (G6UN).

The winning design has been executed for Mr. Watts by Messrs. Bradbury, Wilkinson, the well-known engravers.

New certificates will be available on October 1, 1929, and in accordance with a recent Council decision they will be issued to all members. These certificates will remain the property of the Society after a person relinquishes his membership, and will not be issued annually as heretofore.

The Committee desire to express thanks to the several members who also submitted designs, and as a mark of appreciation have decided to give a year's free subscription to Mr. Allen (G6LN) for the next best design submitted.

Strays.

G2XV asks: Can anybody tell him how many volts it takes to light a neon lamp when the base of the lamp is held in the hand and the glass is touched against the aerial wire. And also how many extra volts are required to light the lamp at, say, half inch, one inch, etc., away from the aerial. Possibly this method might be used to get an idea of the approximate power in the aerial, when used in conjunction with an aerial ammeter. Can anybody give us an article containing some means of measuring the power in an aerial, without taking up all the BULLETIN with calculus.

The military station FVM2 is carrying out experiments on 7, 10 and 14 M.C., and will be glad of QSO's with amateurs. If you hear FVM2, please QSL with full details, either to Mr. Yves Dutilloy, Senarpont, Seine, France, or direct to Corporal Vasseur, Chef de Poste Radio, Fort Flatters, Sahara, via Constantine.

"R.S.G.B. SHORT WAVE 3"

described in this issue.

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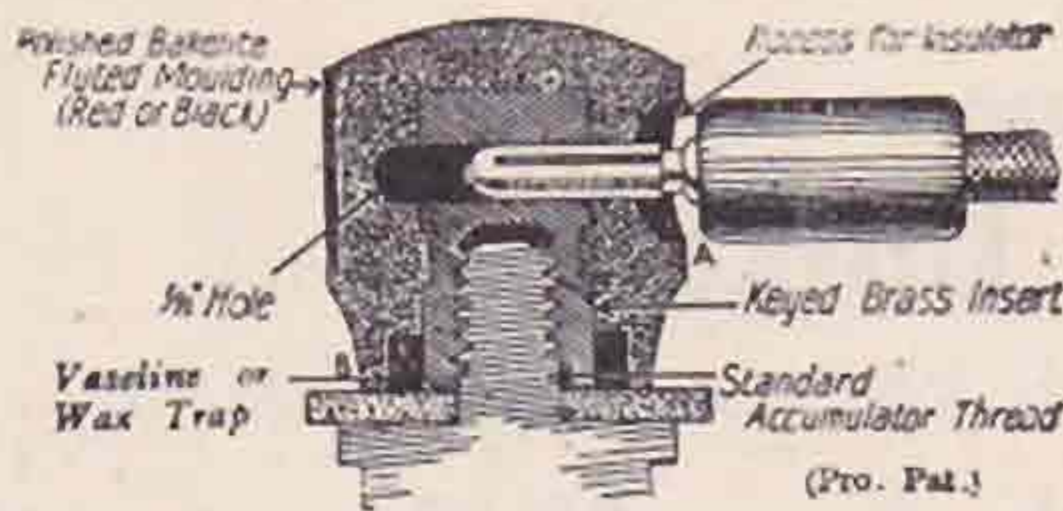
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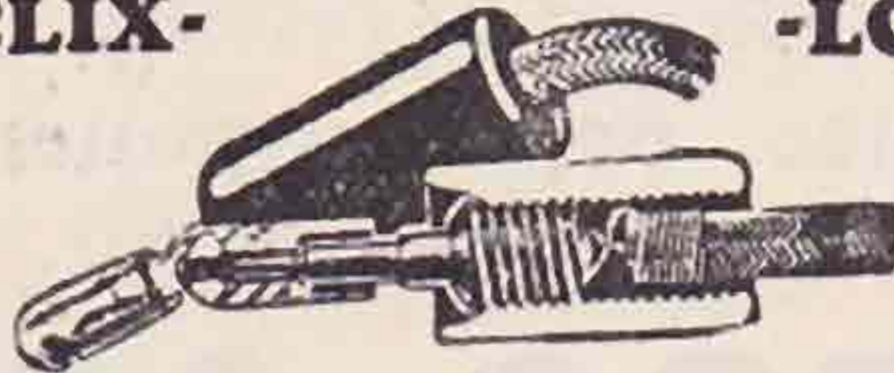
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Society Publications

Headquarters possess a large number of old issues of the BULLETIN—these are brand new. In order to make a clearance we shall be pleased to forward any member copies which he may require to make up his collection at a charge of 4d. per copy or 2s. 6d. per dozen.

Most issues are available for the years 1926, 1927 and 1928, but only very few 1925 numbers are left.

We do not want to destroy these journals, so ask all who want them to write in quickly to H.Q.

Copies of the Society's Articles of Association are available to members and may be obtained on receipt of 2d. for packing and postage.

There are a number of Log Books still unsold. We shall be glad to forward a copy of this handbook complete with supplements to any member on receipt of 1s. postal order.

We shall also be pleased to forward to any non-member a copy on the same terms providing an application for membership is sent with the request.

ORDER FORM.

THE SECRETARY,
R.S.G.B.

SIR,

Will you please forward the following as per the announcement in the March BULLETIN:—

Obsolete BULLETINS for the months of—

..... Copies of the Articles of Association.

..... Copies of the Log Book and Supplements.

I enclose P.O./Stamps to the value of.....

Name

Address

HAVE YOU READ THE ABOVE?

YOU CAN HELP YOURSELVES AND US

My Aerial.

By C. W. TITHERINGTON (G5MU).

The Editor has asked for ideas concerning the best methods of fastening glass tubes to the feeders of Hertz aerials.

The following method may be of interest. It may be mentioned here that no trouble has been experienced with any of the methods of attachment.

The aerial and feeders have just been down for examination and correction for the new wave bands, and after twelve months of all kinds of weather the tubes are still firmly attached to the wires. Every amateur has his own idea of radio matters, so perhaps I may be allowed to air mine. Now let's get down to the job and tackle it in a nice easy manner.

After working out on paper the dimensions of the proposed system, we'll saunter out into the garden and start work.

I am fortunate in having an oak paling fence encircling my garden, and this lends itself excellently to the various stages of Hertz aerial erection. The sketch is really self-explanatory, but with the Editor's permission we will enlarge upon it. Failing a fence, one should drive into the ground two stiff pegs (as in sketch the pegs B.B.), the distance apart being equal to the feeder spacing. It is obvious that the lengths of wire can now be easily adjusted.

The means of spacing the wires must now be considered.

In the writer's opinion nothing can beat the glass tubes used for separating the plates of large lighting accumulators. The tubes are about 14 ins. long by $\frac{3}{8}$ in. diameter. After many attempts to make a permanent means of attaching the tube to the wire, the following method was adopted, and, as before-mentioned, has proved very satisfactory. Insulating tape was first wound round the tube. (See sketch.)

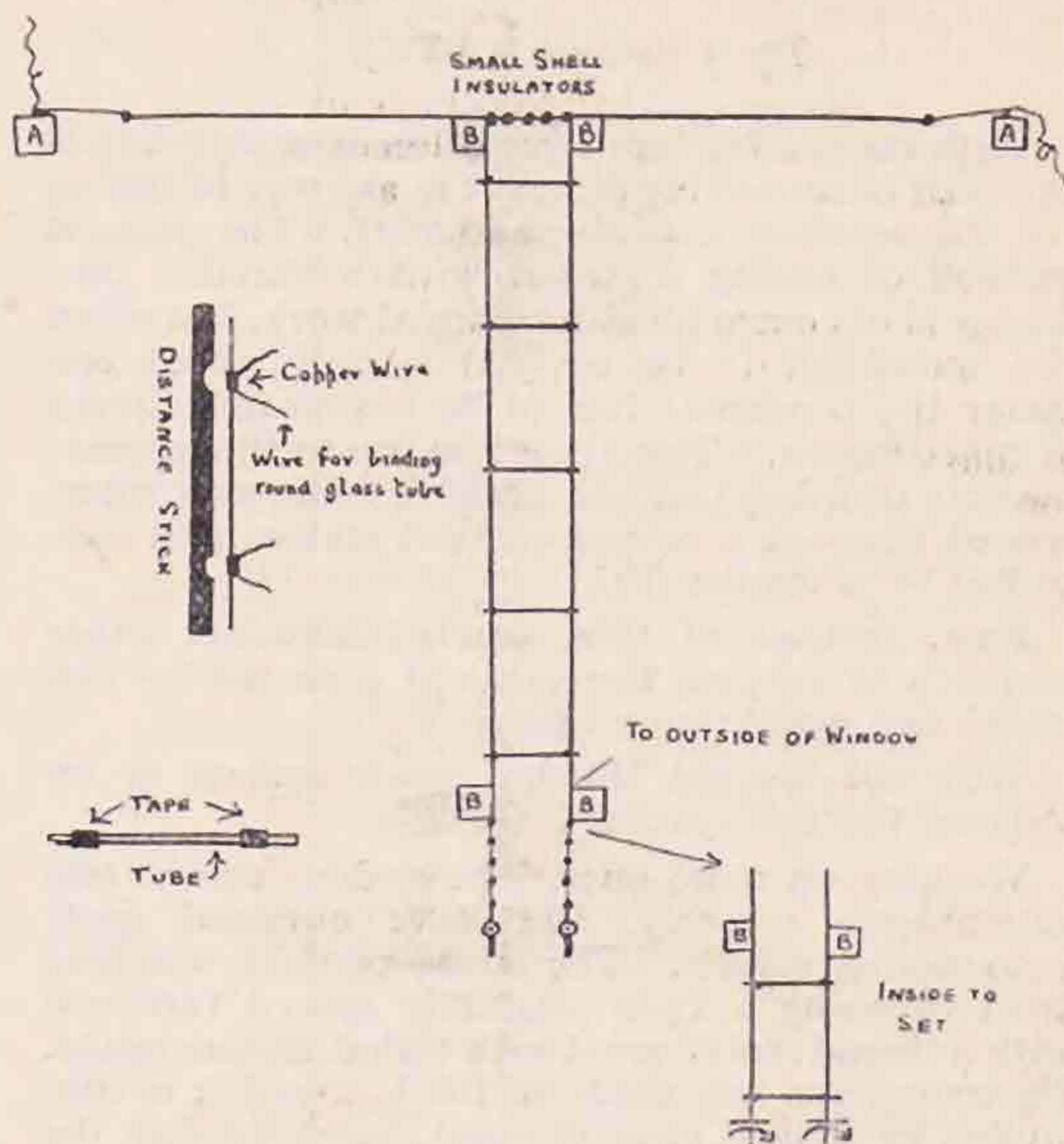
Next, the number of spacing tubes must be decided; the writer uses tubes at every 2 feet. Next, small pieces of copper tube were cut $\frac{3}{8}$ in. long and approximately $\frac{1}{4}$ in. inside diameter.

Allow two pieces of copper tube to each glass spacing tube.

A Quartz Crystal Holder.

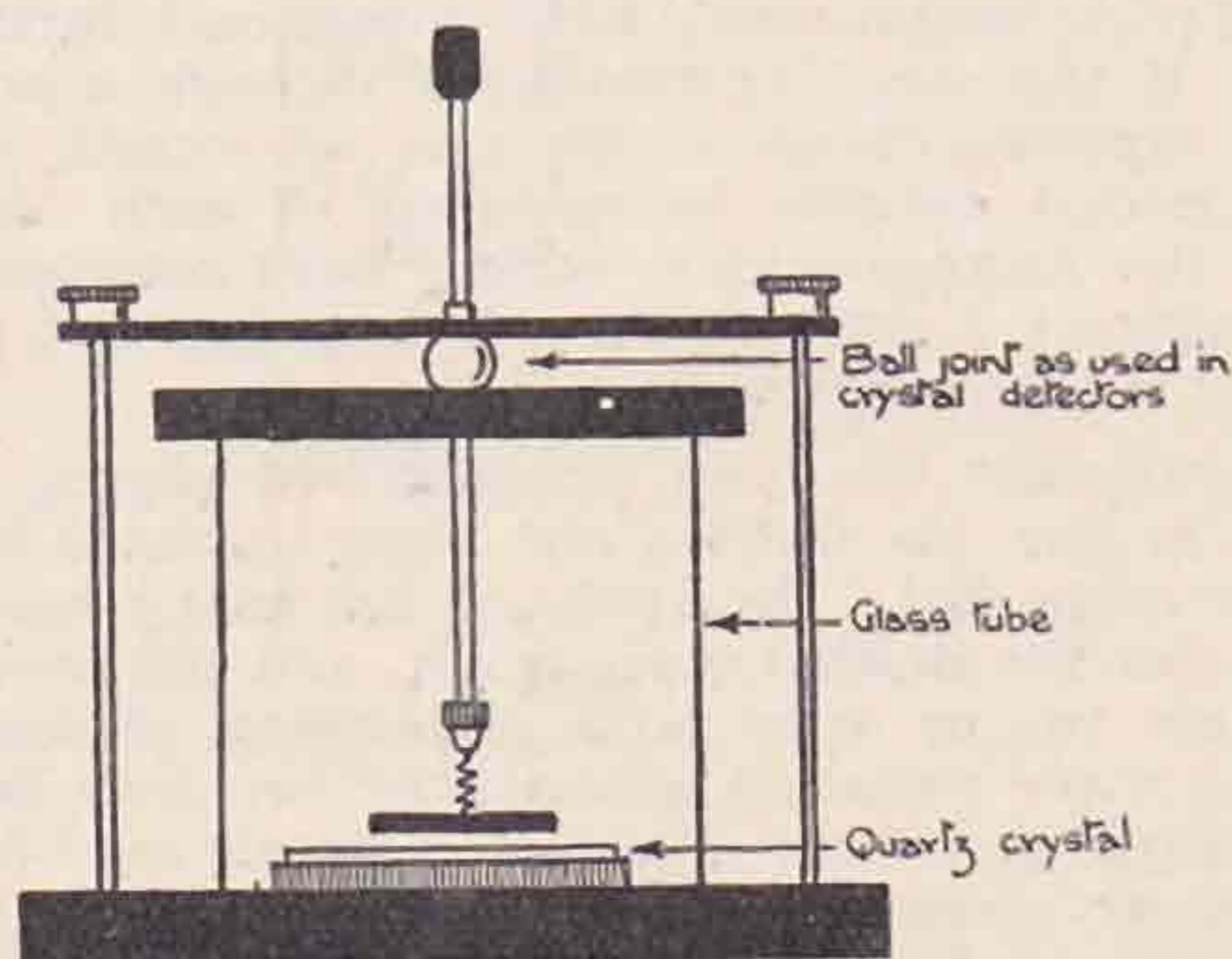
To Mr. B. F. Phillips, G5PH, we are indebted for the following particulars concerning his crystal holder. The diagram is largely self-explanatory. The works are enclosed in a glass tube $1\frac{1}{2}$ " long and $1\frac{1}{2}$ " diameter to keep the dust out. On the top of this is fitted an ebonite knob, through which is fitted the adjustable arm of an ordinary BCL crystal holder, but which terminates in a round plate for the upper plate of the crystal instead of a cat's whisker. The lower plate, on which rests the quartz crystal, is fixed to the base of the instrument. Suitable pressure is obtained on the ball joint by having another plate above the ebonite knob held in position by vertical rods. The base of the holder measures $3" \times 3" \times \frac{1}{2}"$ ebonite.

These small pieces of copper tube are used for clamping a short length of wire to the feeder wires, this short piece of wire then being bound tightly around the insulating tape on the glass tube.



Now, all we have to do is to cut two notches in a straight length of wood, as sketch. The notches will be cut according to the distance apart of the spacing best on the feeders.

The stick is then used for accurately placing the tubes on the feeders, one notch being placed on the last attached feeder, and it is then a simple matter to slide the piece of copper tube into the other notch, not forgetting to add the short length of wire, when the whole can be pinched together, thus making the whole arrangement very tidy. One last word: don't forget to slide the copper pieces on to each wire before starting on measurements of spacing tubes and give the insulating tape a coat of shellac varnish.



Have you written that article yet?

BY TRADING WITH ADVERTISERS.

A New Method of Short Wave Tuning.

By J. FYN (G6TX).

With the coming into force of the new wavebands the need of something different in the way of tuning for the receiver becomes apparent. The present method of tuning a circuit with a variable condenser is of course ideal for normal work, but when the waveband to be covered is only about one meter the condenser has to be drastically altered in construction. This alteration, up to the present, consists of using just one plate or vane as a rotor, spaced between a couple of fixed stators and controlled by a vernier dial.

Now, instead of this, surely there are other methods of varying the value of a circuit by one metre and maintaining efficiency?

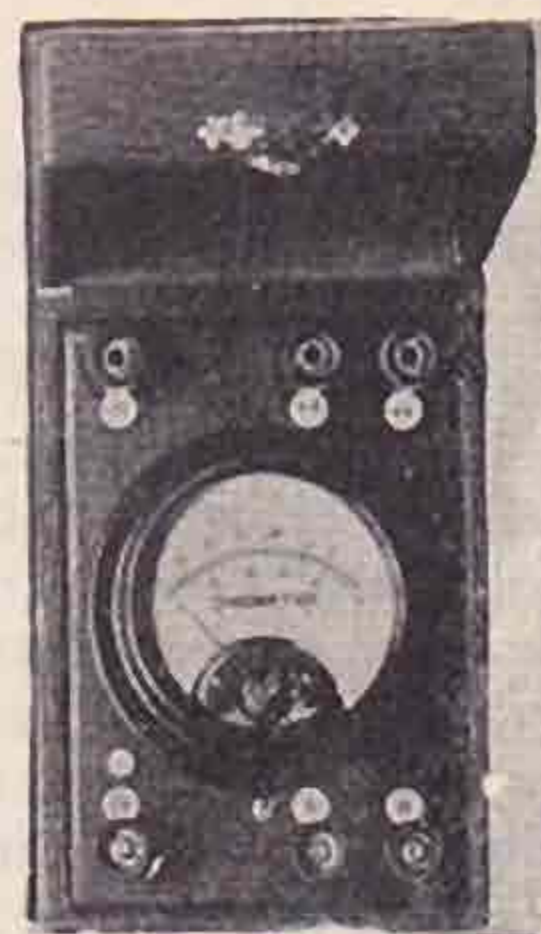
Why not the old Marconi spade system or by varying the coil spacing?

Working on these lines, I have done one or two experiments recently, and have obtained quite encouraging results. The spade method was first tried by using a 2½-in. diameter spaced turn coil with a thread reel covered with tinfoil, sliding inside. No connection was made to the foil, and it is controlled by a short piece of wood forced through the centre of the reel. The coil, of course, forms the grid circuit of the detector and is placed in a horizontal position to permit the free movement of the reel. The disadvantage of this arrangement was that reaction was rather upset, requiring constant readjustment as the position of the slider was varied.

For the next experiment, a single turn of wire was connected in series with grid coil and the coupling of this varied, working somewhat on the variometer principle. Whilst this did not give so large a wave range, and also the reaction control proved easier, I proceeded to concentrate on this method in preference to the other. At this stage the need for a reaction control that is not coupled to the grid coil becomes apparent, the Reinartz system having so far been used. No doubt a tuned plate circuit would help us here and, furthermore, if the aerial is connected through a small fixed capacity direct to the grid we would have each circuit entirely independent of each other. With this arrangement in mind I have commenced to construct a set but, as yet, time has not permitted me to complete it.

A coilholder has been reconstructed placing the plugs in line, the moving one being operated by a slow-motion dial; the fixed coil has nearly enough turns for the desired wavelength, and the moving coil just two or three turns, depending, of course, on the wave variation needed, the two coils being connected in series. Possibly a small semi-fixed condenser across this secondary coil would help oscillation and enable the coil to be more readily adjusted to the frequency desired.

Maybe by the time this appears in print this set will be completed, and so I shall be pleased to hear from anybody who experiments with this arrangement. No doubt some of you BRS lads can perfect this for the busy transmitters.



Mirror Double Scale.

IT IS IDEAL

A Multi Range DIX-ONEMETER
Model de Luxe

INSTRUMENT CASE

55/-

MULTIPLIERS

6/6 Each.

Complete RADIO OUTFIT

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Worth £10 easily.

Capacity Meters £8; Wheatstone Recorders £12; Multi-Micro Galvos. 60/-; Res. Boxes 17/6; Hydrometers 1/6; Relays 6/6; Remote Switches 15/-; 12 in. Spark Coils £10. Anode Converters from A.C. or D.C. Mains for outputs of 400 to 800 volts. H.T. Generators in stock, 50 watts to 2 KW.

BARGAINS

The Biggest Sale of Radio and Electrical Goods enables us to offer "Hams" their opportunity at scrap prices.

SPECIAL OFFER TO "HAMS"

SAVES YOU POUNDS A 5-page printed foolscap Sale Catalogue will be sent to you on receipt of a stamped envelope. If you cannot call order early as we are already sold out in some lines.

VALVES. Great Bargains.—4-pin A.T. 40-watters, brand new, M.O., B.T.H. or Mullard for 4/6. Make fine power amplifiers passing 50 m/a. plate. Specify hard or soft for 200 to 1,000 volts. 4/6 each, guaranteed. Two-Electrode Cossor Rectifier, same price. 250-watt Bottles, M.O. or Mullard's, 12v. 5a. filament, 1,500v. plate, 55/-; 450 watts, 60/-.

H.T. GENERATORS. Here is a snip. The well-known B.T.H. and Mackie Sets, giving 8v. 2a. L.T. on one commutator, 600v. 80 m/a. on the other, for 60/-, less 20% for one or 25% discount if two or more ordered at once. Special price for 1 doz. lots. These are all tested O.K.

STAR TURN!—Spanking brand new G.E.C. 960v. 60 m/a. and 8v. 3a. Generators, similar to above, but all in original makers' carton, not unpacked, complete with ½ mfd. 2,000v. Mica Condenser, £10 each, less 20%, or 25% for two or more. **EVERSHED HAND GENERATORS** of 1,000 v. 50 m/a. Mangles at £5 10s. A cheap G.T. Generator, off 6v. cells, is the T.V.T. Unit, giving 1,000v. 50 m/a. A.C., for 25/-. A full Wave Rectifier, with condensers and 2 valves, for this is only 28/-.

SMOOTHING CONDENSERS, 2,000v. mica in ½ mfd. blocks, at 5/- each. Pack in parallel for any value. 20% off six or more.

CHOKES, L.F., good hefty fellows, 10/- each; ½ kw. size, 30/-, Varley Double 50 H. 400 and 1,000w. Spark Coils, 1" Sterling, new and O.K., 6/-; 2" large Coils, 15/-.

MOTORS AND DYNAMOS.—100-volt D.C. Motors, 10/-; Elliott Gramo. type, with gear-box, 20/-; Lucas 12-volt 8-amps., 25/-; 50-volt 20-amp. L.W., £6, etc., etc.

SUNDRIES.—Lucas Auto. Cut-in and -out, 12/20v. 8a., 7/6; Morse Keys, 2/6, 6/-, 7/3 and 12/6; Phone Earpieces for home pick-ups, 1/6; 220v. Soldering Irons, 5/6; Rubber Lead-in Wire, 2/- per doz. yards; Wire Resistances, 3/6; Brown's "A" Phones, 12/6 pair.

ELECTRADIX RADIOS

218, UPPER THAMES ST., E.C.4.
Blackfriars Sta. Met. Rly. City 0191

London Meeting.

The February meeting of London members and friends was held on the 15th at the City Electric Restaurant, Ludgate Hill.

The chair was taken by Mr. Gerald Marcuse (president).

The meeting took the form of a debate, opened by Mr. T. Clarricoats (G6CL), on the subject, "Should Telephony be Barred on the 7 M.C. Band?"

Mr. G. W. Thomas (G5YK) opposed the motion.

In opening the debate, Mr. Clarricoats mentioned that owing to the very restricted frequency band allotted around 7 M.C. it had now become impossible to conduct any serious low-power telegraphy work on Sundays owing to severe interference from telephony stations. He further suggested that, as the vast majority of the telephony tests were conducted between local stations (up to 200 miles), if it was necessary to test modulation methods and other experiments these could be done on the 1.5 M.C. band, which is considerably broader. He expressed the opinion that in view of the fact that the broadcasting stations had now reached a high degree of efficiency in the art of reproducing both speech and music, he did not consider that the average telephony amateur could hope to effect any very marked improvements which could be used commercially. He mentioned that he had been advised by the honorary secretary of R.T.U. (Ireland) that the members of that body had pledged themselves to refrain from telephony tests on the 7 M.C. band during the whole of Sundays.

Mr. Thomas, in opposing the motion, said that if the privilege of conducting telephony tests on the 7 M.C. band was barred it would prevent the development of such international work as had been done by Mr. Marcuse in connection with Empire broadcasting.

He further suggested that as the development of television could only be advanced by telephony experiments, he felt that to restrict the most useful of all amateurs' frequencies to telegraphy tests would do much to hamper the advancement of the science of television.

The discussion which followed was contributed to by many of the leading London amateurs.

Mr. Griffiths (G2GF) suggested that much of the difficulty was at present caused through the Continental stations. He mentioned that certain of the unrectified A.C. and C.W. signals were responsible for further interference, and said that if official action could be taken to clear up this type of interference the band could then be used for both telephony and telegraphy.

Mr. Scott (G2SC) suggested that if the low-power

C.W. stations made serious endeavours they should be able to work through all broadcasting hours without causing local interference. This was not possible with the telephony stations.

Mr. Wardman (G5GQ) suggested that the 7 M.C. band was the only one suitable for conducting frequency stability tests. He considered that the low-power stations should give more attention to the use of directional aerials.

Mr. Matthews (G6LL) pointed out that the use of the 1.5 M.C. band was somewhat restricted during daylight. He also mentioned that certain of the 7 M.C. stations were at present capable of transmitting gramophone music comparable with the best commercial reproductions.

Mr. Fuller (G6LB), in supporting the motion, mentioned that the American amateurs had apparently realised the impossibility of doing serious C.W. experimental work if telephony were permitted on this band, and had accordingly banned the use of telephony on both the 7 and 14 M.C. bands. He agreed with the proposer that the 1.5 M.C. band offered all telephony experimenters considerable scope.

Mr. Nickless (G2KT) suggested that, in view of the numerous improvements still necessary in order to overcome needle scratch on gramophone reproduction, the use of the 7 M.C. band should be permitted for telephony tests.

Mr. Roberts (late of Hong Kong Signals) supported the motion, and briefly mentioned that one of his greatest difficulties whilst overseas was interference on the 7 M.C. band by telephony stations. He said that in his experience the majority of telephony was distorted, and for ordinary communication purposes it did not compare with the telegraphy signal.

At the conclusion of the discussion, the President mentioned that from his own experience he had found telephony to hold great interest, but he felt that the subject of the debate was of great interest as it enabled the British amateur to appreciate more clearly the viewpoints of his fellow experimenter. He expressed the hope that this would be the forerunner of many future debates.

The motion was then put, and resulted in 18 votes being recorded against and 10 in favour. A number of members remained neutral.

Mr. Clarricoats, in proposing a vote of thanks to Mr. Marcuse, mentioned that in view of the various debatable arguments published in the February issue of the BULLETIN concerning 28 M.C. operations, he felt that there was sufficient material available for many future debates.

LONDON AREA HAMFEST.

✻ ✻ PINOLI'S RESTAURANT ✻ ✻

Saturday, April 6th, 1929 at 6.30 p.m.

Price 5/-

Contact Bureau Rules.

1. Membership of C.B. is open to the various grades of members of the R.S.G.B., but foreign non-members may be admitted where such admission is thought advisable.
2. All communications requiring an answer by post shall be accompanied by a stamped and addressed envelope.
3. The appointment of "Official Group Centres" shall be made by the Hon. Manager, who will endorse the R.S.G.B. membership certificate to that effect. The appointment may be cancelled by a notice in the BULLETIN when the work of the Centre is unsatisfactory or if other sufficient reasons arise. Failure to report for three consecutive months will be deemed sufficient reason for cancellation.
4. O.G.C. stations shall have authority to report to the Hon. Manager any member of their group for unsatisfactory co-operation and, where the reasons are sufficient, the member shall be removed from that group and another appointed.
5. Group selections shall be made by the Hon. Manager or approved by him.
6. O.G.C. stations shall send the Hon. Manager a supply of stamped and addressed envelopes for the purpose of keeping them informed of tests, etc., which might be of interest to their groups.
7. Technical queries will not be dealt with by C.B. except where they suggest new lines of research.
8. Letter-budgets must not be sent to C.B. It is sufficient if a monthly extract be forwarded so as to reach C.B. before the 12th of each month.
9. Notices of tests intended for publication in C.B. Notes must be sent before the 12th of the month prior to the issue for which they are intended.
10. Information for publication in C.B. Notes must deal either with news of experimental results or improvements in existing types of apparatus.
11. All communications must be addressed to the Hon. Manager, R.S.G.B., Contact Bureau, 59, Marlborough Park North, Belfast, Northern Ireland.

Strays.

G5MU and 2BFA have evolved a method of facsimile picture transmission and would like to arrange schedules with any person interested; they aim at getting sufficient modulation to work machines off R3 signals.

CTICK is anxious to work "G" stations on the 7-MC band. He particularly wants to use telephony.

Activities on 28 M.C.

Before commencing these notes we must apologise for a printer's error in last month's notes. G5VL was rendered as G5UL. We apologise to both the members in question.

This month marks a further advance, in spite of very bad conditions. On Sunday, February 10, G5YK made contact with VT2KT, our old friend G2FN, now back in India again. G5YK was reported QSA4, fading to QSA2. VT2KT was reported as QSA1. On Sunday, February 24, G5ML was successful in making contact with VT2KT, being reported R6. G5ML also holds the record for DX stations worked, his total now being 10!

In Iraq, Y11LM is on regularly every day from 12.00 to 12.30 G.M.T., but so far has not been heard in this country.

VT2KT has been making things "hum" since his return to India, and although he is still using his G2FN TX with only 9 watts input, has already worked Australia, Finland and England. He is on every Sunday morning from about 11.00 G.M.T., or any other time by arrangement.

General conditions in England have been poor again this month, although the first two weekends were distinctly better than the last two. It is to be hoped that March and the forthcoming 28 M.C. tests will show a great improvement both in DX and calls heard, than the past two months.

Only a few stations have reported again this month. Do let us have a few lines, all of you, just to let us know what you have done, or whether you have found conditions hopeless. It is only in this way, by co-operation, that we can hope to make any advance on this problem.

Calls heard on 28 M.C. during February:—

By VT2KT.—G5YK, G5ML, G6HP, F8CT, OH2NM, OH2NAP, VK5HG.

By G5ML.—W1FS, 1ZZ, 1AQD, 1BJG, 1B'W, 2AQ, 2AL'W, 2MD, 2ACN, 8AXA, 8ZG, 8ZN, 4WE, VE1AR, AU7KAD. Worked: W1IA, 1BVL, 1CMF, 1CPB, 2JN, 2AYR, 2AOL, 2NM, 2BG, VT2KT.

By BRS25.—W2JN, 2AL'W, 2AYR, 2AOL, 2NM, 2ACN, 2BG, 1BVL, 1IA, 1B'W, 1CPB, 1ZZ, 1XV, 1CMF, 1COS, 8ZG, VE2AC, OH3NE, F8KF.

By G5VL.—W2AL'W, 1FK, 8ZG, 2JN, 1BVL, 1AQD, 2AYR, 1CMF, 2BG, 1ZZ, 1AI, 2ALP, 1COS, 4NH, FVM2, F8KF.

By BRS77.—W2JN, 1CMF, 2BG, F8KF.

By BRS190.—W1AQD, 1BVL, 1CMF, 1COS, 1IA, 1ZZ, 2ACN, 2AL'W, 2AOL, 2AYR, 2BG, 2JN, 2NM, 4NH, 8AXA.

It is interesting to note that three stations in different parts of the country report hearing F8KF on the same day, that being practically the only station logged that day. They all say "query harmonic" as he was working HAF2.

The greater part of the calls heard by the stations reporting were logged during the first two weeks of the month.

(Continued at foot of next page.)

Trade Notices.

Messrs. Ripaults, Ltd., always to the front, have recently sent us a specimen of a guarantee label that they are proposing to attach to their H.T. batteries from now onwards. This label has been designed not only to assure the purchaser that the battery carries a full guarantee, but also to save him the trouble of taking the matter up with his usual dealer, in the event of the battery having failed, in his opinion, to give satisfaction. In future, it will only be necessary for the purchaser to detach the label from the battery, fill in the details required and return the label to the makers. The details asked for are such as "dealer from whom purchased, and when," and certain information regarding the type of set used and the approximate number of hours' service the battery has given. From such information Messrs. Ripaults will be able to give the matter their immediate attention, and also complete satisfaction to the customer. We feel this is a great step forward, from which we hope Messrs. Ripaults and their customers may obtain the desired benefits.

We have recently received from The B. & J. Wireless Co., 2-3, Athelstane Mews, London, N.4, a very neat coil former. It is constructed throughout in good quality ebonite, and consists of six rods fixed by means of ebonite screws round a circular base and top ring, 2½ in. diameter. The rods have slots cut at a pitch of 20 to the inch, with half an inch at the bottom turned flat to take the reaction winding. The base has 4 pins mounted on to it to plug into a suitable socket.

The whole makes a very neat, low-loss former and is finished in a workmanlike manner. We are informed by the manufacturers that they can supply these formers either 2½ in. or 3 in. diameter, with slots as required.

We have recently received from Claude Lyons, Ltd., 76, Old Hall Street, Liverpool, a copy of their illustrated catalogue, and would recommend all our readers to obtain their copies at once. It is full of all the things the experimenter has been looking for.

The catalogue proper is prefaced by a dozen pages of useful information on receiving and transmitting gear. There are sections showing laboratory apparatus, meters, components, high-power battery eliminators, rectifying valves, etc.

The range of power transformers and chokes are exceptional, and we would draw special attention to these and to the "Clarostats" of all ranges.

We hope to be able to give a report of extended and severe tests on the "power" type clarostat in our next issue.

We have also had the opportunity of testing one of the new Mullard Pentode valves, the P.M. 26. When tested in both a broadcast receiver and a microphone amplifier, the valve came well up to our expectations and we were satisfied with it as a substitute for two ordinary type valves. For use on the average short wave receiver, however, we do not consider such a powerful valve to be advantageous, though we must say that the volume it produced from an otherwise strong telephony signal was considerable. We feel we must add that the filament rating of 6 volts, .17 amperes, is, in our opinion, only fitting to a valve of this type, bearing in mind the duty imposed on the filament. The valve sells for 25s., and all further details may be obtained on application to the makers, leaflet V.R.79.

We have recently had the opportunity of examining a new combined grid leak and condenser made by the Mullard Wireless Service Co., Ltd. On the base, which measures 2½ in. by 1½ in., are mounted two pairs of clips, for interchangeable leaks and condensers. The leak clips are short and thereby make a firm grip on the ends of the leak; while the condenser so fits into its clips that a good large surface contact is made. Leaks are made in values from 0.1 to 5 megohms, and condensers from .0001 to .01 mfd. This instrument provides a ready means of using the leak either across the condenser or down to filament. It is priced at 7s. 6d., and is of the usual high-class standard of Mullards products.

BRS25 tells us that W1BGK, whom he heard on December 16, was only using 3 watts input. Quite a record for a W station!

All reports by 25th of the month, to G6LL or G5YK, please!

BRS36 has logged VT2KT, W2JN and W2BJV.

G6CI uses an LS5D valve in a T.P.T.G. circuit, and his first test call on 28,000 K.C. was answered by W2JN. Wish we all lived in Coventry!

VK5HG will be on 28,000 K.C. every Sunday morning during March from 09.00 to 10.30 G.M.T.

F8CT announces his intention of taking part in the CB tests.

Strays.

OK2YD requests that the following British stations send him a QSL in acknowledgement of their QSO with him: G2LB, 5LF, 5SK, 5NJ, 6BY, 6DH, 6GZ, 6HJ, 6JK, 6QN, 6RB, 6RW, 6WO, 6RD, 6FA.

Heard outside a wireless shop:—

First Small Boy (pointing in window): "Them there things are called grid batteries."

Second S.B.: "Wot's a grid battery for?"

First S.B.: "To put on your 'Bike,' of course!"

Books Reviewed.

THE RADIO AMATEUR'S HANDBOOK. 4th Edition.

We have recently had the opportunity of examining the fourth edition of *The Radio Amateur's Handbook*, published by the A.R.R.L. Like the three earlier editions, this volume is full to the brim with all the useful information the average amateur can possibly wish to know. It is certainly the most useful publication that we know of for the person, newly acquainted with the excitement of amateur radio, who wants to "get on the air" with just as little delay as possible.

Besides containing all the useful information contained in the previous editions, this copy has certain space devoted to some of the outstanding problems connected with 1929 Conditions in Amateur Radio. The Britisher who is unacquainted with the American ratings for valves, and possibly names that are more American than English, may find himself a little confused in places, but we think that on reading on all these little difficulties will disappear. A very complete chart of American valves appears on page 76, from which the Britisher will be able mentally to substitute the British valve of similar rating for the American type described in the text.

There is a chapter on elementary electricity in theory and practice, about which so many amateurs know so little, when even the merest smattering would be a help to them. Commencing with the study of D.C. electricity, this chapter takes the reader through various simple calculations and ends up with A.C. theory, which in radio work is by far the most important of the two. There are some pages dealing with the radio waves as they leave the aerial, how they journey through the ether and are reflected and refracted by the heaviside layer. We then come to two chapters concerned with building the transmitter and receiver; here three different receivers are described, and the whole multitude of possible transmitting circuits discussed and photographs of actual sets are shown incorporating these circuits. Crystal control is also discussed here. The power supply problem is next dealt with, and after a dissertation on both the chemical and valve rectifier, readers are given much valuable information on building small power transformers and filters. The all-important problem of keying (together with key-thump filters and break-in work) is also mentioned, and we feel that this is a subject about which many of us could with advantage study for many hours. Having finished with the inside of the shack, the authors turn to the antenna, which, in all its varieties, is discussed at length: this chapter should certainly be carefully studied by any newcomer to the field of amateur radio. Lastly, we come to frequency-measuring apparatus, and that very useful instrument the Monitor is described in detail; hotwire ammeters, valve voltmeters, etc., are also mentioned.

The end of the book tells one how to operate a station, but we must warn some of our readers that traffic is not allowed in this country and that they must make allowances accordingly. All new 1929

procedure is dealt with, some methods are suggested for keeping a log, and much useful miscellaneous information is contained in the Appendix.

A copy of this book may be purchased direct from the Society's offices, price 4s.

WIRELESS WORLD. Probably at least 99 per cent. of our readers are familiar with this old-established weekly—any who are not are strongly advised to procure a copy and judge for themselves.

During last month the outstanding feature was a special valve number dated February 13. Besides general articles, a supplement gave in tabular form all the usual figures relating to British valves from the smallest up to the 10-watters. A useful addition would be a table of the permissible grid-excitation to each valve, but in view of the different views as to the amount of distortion that is tolerable, this will have to be done by individual readers from inspection of characteristic curves.

EXPERIMENTAL WIRELESS. This monthly is, unfortunately, better known among amateurs by reputation than by actual acquaintance.

The articles are always of the very highest class, though at first sight often appear very mathematical. The information is often presented months before it is even mentioned elsewhere. The review of current literature given every month is alone worth the price asked for the whole paper. A journal of this class cannot always contain an article upon one's pet subject, but when it does not, one is sure to find it represented amongst the references. The February issue contained authoritative articles upon the design of transmitting aerials, giving examples on 200 metres and the effect of anode-grid capacity in anode bend rectifiers.

The current issue contains a short note on the problem of selectivity without reducing the intensity of telephony sidebands, also an article describing a new method of determining all the operating conditions of a valve for maximum undistorted output.

We have received from Messrs. The Quartz Crystal Co. an interesting little booklet with a title very reminiscent of a recent article in the *BULLETIN*.

This booklet deals with several methods of crystal control in a way that will be found very interesting to anyone commencing experiments with this system of transmission. Several very useful circuits are shown, with hints on the best methods of operation.

A simple crystal oscillator, for use in checking wavemeters, is described and a suitable lay-out given.

This booklet is free to all members who send 4d. in stamps to cover cost of postage, etc.

J. W. M.

Do You Know?

A query received the other day:—

"What wave-length can I tune to with .0002 condenser and a two-turn coil 2 ins. diameter and five turns reaction?"

GET THAT "BULLETIN" FEELING AND TELL US ABOUT IT.

New QRA's.

- G2AI.—W. H. KEMPTON, 18, Piedmont Road, Plumstead.
- G2IA.—Miss A. J. BURNS, Alhambra, Carlisle, Lanarkshire.
- G2IJ.—W. J. HOLROYD, Leighton, Ovenden Wood, Halifax.
- G2MG.—C. C. MILLER, 59, York Drive, Glasgow.
- G2NZ.—G. S. WHALE, "Wanstead," Dinerth Park, Rhos-on-Sea, Denbigh.
- G2RT.—C. C. PARTRIDGE, Government House Gardens, R.M. College, Camberley.
- G2SG.—F. A. ROBINSON, "Rotherwood," Jockey Road, Sutton Coldfield.
- G2ZN.—J. E. JOHNSON, 7, Chestnut Avenue, London, E.17.
- G2W.—J. N. ROE, "Minydon," Ridgway Road, Farnham, Surrey.
- G2ZP.—R. H. N. JOHNSTON, Waverley, Hendford, Yeovil, Somerset.
- G5AQ.—L. A. CARTER, "Putland Cottage," Heathfield, Sussex.
- G5DR.—J. M. DEHEER, "Donna Nook," Kingsgate, Bridlington.
- G5FJ.—F. J. JACKSON, 45, Palmerston Road, Earlsdon, Coventry.
- G5QG.—G. W. H. TRIPP, 39, Dean Road, London, N.W.2.
- G5RP.—HUGHES & WATTS, LTD., Woodchurch Road, Oxton, Birkenhead.
- G5WO.—J. WOODAGE, 49, Dryfield Road, Burnt Oak, Middlesex.
- G5WT.—A. S. WOOD, 21, Albert Street, Forfar.
- G6GT.—G. TURTON, 12, Burns Avenue, Southall, Middlesex.
- G6HK.—J. H. HARKER, "Dunelm," Church Lane, Lincoln.
- G6NP.—W. GILL, Highfield Villas, Heckmondwike, Yorks.
- G6SQ.—G. A. HEANEY, 7, Parkmount Road, Belfast.
- G6WZ.—J. WILKIE, 39, Minard Road, Shawlands, Glasgow.
- G6YI.—E. WHALEY, 18, Stephen Hill Road, Crosspool, Sheffield.
- G6YY.—E. S. ROWLAND, 3, Colebrook Avenue, Southampton.
- G2AJT.—C. C. MORTIMER, 216, Brighton Road, Coulsdon, Surrey.
- G2AOZ.—P. R. SOLDER, 6, Churston Gardens, Blake Road, London, N.11.
- G2AUX.—J. N. P. DOUGLAS, 16, Newton Terrace, Hebburn, Co. Durham.
- G2AXN.—H. A. WALLS, "Redcliffe," Forefield Lane, Great Crosby, Liverpool.
- G2AYX.—P. TAYLOR, 658, Osmaston Road, Derby.
- G2AZD.—W. H. SLOUGH, 46, Station Road, London, N.3.
- G2AZN.—V. PERCY, 44, Ashfield Road, Altrincham, Cheshire.
- G2BFQ.—W. D. OLIPHANT, 19, St. Mildred's Road, London, S.E.12.
- The following are cancelled: G2NF, G6BB, G2AGC, G2AOU, G2AQQ, G2AQJ.

Membership.

NEW MEMBERS.

- A. HARGREAVES (G2BOD), 5-7, Ridge Street, Barnoldswick via Colne, Lancs.
- S. KAPLAN, 213-14, Kaiserallee, Berlin W.15.
- B. B. JACOBSEN, 140, Holland Road, W.14.
- R. BECKTON (Associate), Crofton, Castletown, Isle of Man.
- F. A. STOCKEN, 104, Colney Hatch Lane, Muswell Hill.
- P. TAYLOR (G2AYX), 658, Osmaston Road, Derby.
- H. W. SADLER, 80, Anston Avenue, Worksop, Notts.
- W. BRAND, "Flodden View," Wooler, Northumberland.
- J. WATKINS, 3, Redwood Row, Ebbw Vale, Mon.
- C. E. RENSHAW, Low Haggarth, Cantley, near Sedburgh, Yorks.
- G. R. S. FARNIE, Lloyds Bank House, Ebbw Vale, Mon.
- J. SHAWCROSS (W9CZF), 2,533, Verona Avenue, Overland, Mo., U.S.A.
- V. A. B. SMITH (Associate), Stanton Cottage, Portsmouth Road, Thames Ditton.
- J. E. JOHNSON (G2ZN), 7, Chestnut Avenue, Walthamstow, E.17.
- J. SCORGIE OWNER (G6XQ), 135, Springfield Road, Moseley, Birmingham.
- E. M. UGLOW, 4, Winsham Grove, Clapham, London.
- J. McNALLY (CT-IBI), 43, Rua Das Larangeiras, Foz du Douro, Oporto, Portugal.
- A. DISLEY, 239, Ashworth Lane, Bolton, Lancs.

B.R.S. NUMBERS ISSUED.

- 220.—F. A. STOCKEN, 104, Colney Hatch Lane, Muswell Hill, N.10.
- 236.—W. BRAND, "Flodden View," Wooler, Northumberland.
- 237.—J. WATKINS, 3, Redwood Row, Ebbw Vale, Mon.
- 238.—C. E. RENSHAW, Low Haggarth, Cantley, near Sedburgh, Yorks.
- 239.—G. R. S. FARNIE, Lloyds Bank House, Ebbw Vale, Mon.
- 240.—E. M. UGLOW, 4, Winsham Grove, Clapham, London.

Fading on Short Waves.

It is proposed to carry out at G6LN during the present year a series of tests to investigate the various phases of fading on short waves. After some considerable work on the subject, the writer has come to the conclusion that the problem needs approaching from several different angles at once, if the desired results are to be obtained.

Hence it is hoped that schedules may be arranged with other stations interested to obtain data on such subjects as: Nightfall fading; cloud effects; variations caused by the moon; possible effects of telluric currents on S.W. signals, etc.

The writer would be more than grateful if any member interested in the above subjects would communicate with him at the earliest date, stating which subject particularly attracts him.

BRS stations are particularly in request, and no higher qualifications than plenty of enthusiasm and the ability to read slow C.W. signals are required.

Notes and News from the British Isles.

District Representative Reports.

The Editor and his colleagues urge that in future the following points receive especial attention when reports are drawn up:—

1. Head the report:

District Number
Area Representative(G.).....
Address.....

2. Refer to each station as G—.

3. Refer to wavebands as 56000 KC, 28000 KC, 14000 KC, 7000 KC, 3500 KC and 1750 KC.

4. Sub-divide your reports if you have appointed "county representatives," heading each one as follows:—

(County).
Representative(G.....).
Address

5. Use only abbreviations recognised by the International Convention at Washington.

6. Omit "asides" as much as possible.

7. Forward to H.Q. all reports by the 25th of each month.

Attention to these details by each District Representative will assist the Editor in his work. It is his intention to make these notes uniform in set-up and will appreciate the co-operation of all representatives.

DISTRICT No. 2.

Representative to be elected at Conventionette to be held in March.

March reports to Headquarters.

BRS164 has rebuilt his station.

BRS162 is listening on 1.5 mc. and will be glad to report on transmissions.

G6DR reported bad conditions in his January report, but these have now improved. FM has been his best recently. He is now using a 400-volt Mackie generator. He is testing the possibilities of 1.5 mc.

G600 also reported poor conditions; Russia was his best DX up to January 9.

2BOD has joined the Society. Hope he will soon get busy with two letters.

G5DR (ex 2AQC) has commenced activities on 7 mc. and is doing fone work on the 1.5 mc. band with local stations.

NOTE.—All of the above reports were sent to Mr. S. R. Wright, who forwarded them to headquarters. Owing to late arrival they could not be included in the February issue.

Durham and Northumberland.

Representative: A. S. O. MILLARD, 1, Holmlands, Monkseaton, Northumberland.

G6GC has worked the U.S.A. (W4TZ Florida) on the 7,000 K.C. band with 9 watts in broad daylight. This makes four continents worked on 7,000 K.C. band. He finds the 28 M.C. band poor. A vertical aerial is to be tested on all bands shortly.

DISTRICT No. 3.

Cheshire.

Representative: JOSEPH NODEN (G-6TW), Coppice Road, Willaston, Nantwich.

May I again appeal to the Cheshire members to give me a little assistance by sending in reports, please. Also we have not got one quarter of the transmitters in this county as members of the R.S.G.B.

I would welcome suggestions from any member, grumbles or otherwise.

G-2SO still keeping off the air, but does a little station work at times.

BRS152 reports the 14 m.c. band is bucking up; in one day he heard Australia, Dutch East Indies, India, South Africa, Kenya, Philippine Islands, Hawaii, Canada, and U.S.A. 28 m.c. receiver not perfect yet. A visit was paid by BRS125, who had a surprise when five Continents were heard within the hour. Has also paid visits to stations G-5BR and G-6TW.

G-2AZN late BRS127. Rebuilt receiver, and starting to build transmitter.

BRS234. Welcome a new member, I am looking forward to your report.

BRS186 says the 7 m.c. has been quite F.B.; a number of W's have been logged, but the 14 m.c. has been somewhat patchy. A new receiver has been built, and he still wants a schedule for the 7 m.c. band.

G-6TW now got the 28 m.c. transmitter going, TG-TP, and is using for this wave 10 watts Rect. A.C. Will shortly be trying 50 watts D.C. input, and will welcome reports. Visits have been paid by BRS125 and BRS152.

Shropshire, Hereford, Monmouth and Worcester.

Representatives, I am still waiting offers, and no reports have been received.

DISTRICT No. 4.

Representative: E. R. MARTIN (G6MN), Castlemount, Worksop.

BRS103 has nothing to report, but is still receiving 3LO Melbourne on Sundays.

BRS156 sends his first report, which is F.B. At 3.40 p.m. on January 27 heard WFAT working G5BY. WFAT is s.s. "Eleanor Bolling," second ship of Captain Byrd's Antarctic expedition stationed in the Bay of Wales.

BRS225. Another new member, and is willing to send reports to fone stations operating on 7 M.C. and 14 M.C.

G5BD still finds 14,000 K.C. useless for QSO's. Southern Europe worked after dark on 7,000 K.C.

G5CY experimenting with earth versus counterpoise. QSO most of Europe, Tunis and Morocco on 7,000 K.C.

G5OD has now a crystal resonator working OK, but the TX refuses to function, also rebuilding the receiver.

G6LN been "on the air" all the month and finds conditions poor. Still keeping skeds on skip for "CB."

G6MN, after trying five different ckts for crystal control, has at last managed to find one which works OK, but not like the old T.P.T.G. Hopes to be on 28 M.C. shortly.

DISTRICT No. 5.

Area Representative: D. P. BAKER (G2OQ).

Well, the Conventionette is now a thing of the past, and I was more than pleased with the number that turned up, and I should like to thank one and all for the wholehearted way in which they supported me and only trust everyone enjoyed themselves (as I feel sure all did).

The reports from Staffordshire are all too few, but I am still living in hopes. Warwickshire still leads the way and G5ML seems to carry all before him.

Staffordshire.

Representative: G5UW.

G6UZ has spent a good deal of time working on a new receiver, with good results, and hopes to get a 28 MC transmitter going in the near future.

G6SO has been carrying out tests with CC on 7 MC. Fair results have been obtained, but no great DX has been done yet.

G5UW has now promised to get going again during the next few days.

G2OQ since the change-over from DC to AC has done a certain amount of work but is having some difficulty in getting really good keying.

Warwickshire.

Representative: G6CC.

G2AK has been working Europe on 41-metre band.

G2SG is an old friend who had his permit in December. He has been experimenting with phone work. We regret to report that he is now on the sick list.

G2ZW is also reported on the sick list.

G5ML in the first part of the month was easily the best for DX on both 14 and 28 MC bands. 28 MC—14 QSO's with U.S.A. 14MC—all continents, including W 1, 2, 3, 4, 5, 6, 8 and 9 districts, VE 2 and 4. Several QSO's with VK and ZS. PK1JR-r7; K1CM-r8/9; A15VX-r6; ZS5W-r7; W5WZ-r6; PY1CM-r5; PK4AZ-r6. This station is using a voltage-fed Hertz full-wave antenna. This seems the best so far.

G6CC has only done constructional work and has no working to report.

G6CI has been doing useful work on 28 MC band and has worked W2JN and was reported r5.

G6XJ is to be congratulated on his first start up on 20-metre band; his first QSO was with VK2EK (Sydney) reported R2DC. He has also worked Indian RWX on this band (R6DC). He is using MOPA 15 watts. Previously this station worked Italy on phone on 40-metre band and reported R8.

Mr. G. Brown (late 6YD) will be on the air with his own call-sign by the time this is in print.

Northamptonshire.

(I am still waiting for someone to come forward as Sub Area Representative.—G2OQ.)

G2CH—Considerable activity is being shown at this station, a crystal controlled 7 MC transmitter is well on the way and the receiver is being altered for 28 MC.

DISTRICT No. 6.

Representative: G. W. THOMAS (G5YK), 169, Hills Road, Cambridge.

G2XV has now definitely settled on crystal control, using a T250 as power amplifier. He has worked stations in U.S.A., N. Africa, and Australia with it on 14,000 K.C. On 7,000 K.C. he has worked phone all over the country, and obtains the loudest reports from the most distant parts of Great Britain. He hopes to get on the 1,750 K.C. band again soon and revive interest there.

G5YK has done little of interest except a contact with VT2KT

on 28,000 K.C. Signals were very weak each way and contact poor, but it is believed to be the first on that frequency. A little has been done on 14,000 K.C., and the usual rag-chews on 7,000 K.C.

BRS77, who hails from Thorpe Bay, Essex, and who is at the moment at Cambridge University, sends me a report of 28,000 K.C. activities which are to be found under that heading. He is living almost on top of Cambridge Power Station, and those who know what the supply is like must wonder how he hears anything!

There is no report from G2HJ on account of illness.

I suppose this applies to most of the other stations in the district.

Essex.

CR Representative: R. C. HORSWELL (G2ABK) "Hepani," Wickford, Essex.

G5OK reports C.C. work on 1,750 K.C. with many locals; also a report from Australia on his 14,000 K.C. C.W.

G5SN has been putting out some good music on 1,750 K.C. Has had a television licence granted.

BRS144 reports fair conditions on 7,000 K.C. band, but poor on 14,000 K.C. All Yank districts coming over well. Various aeriels and earths have been tried.

BRS233, of Billericay, is a new member, and we welcome him. I have pleasure in recording a visit to his shack, which is just the shack all hams dream of. A new short-wave set is being built. Building the shack himself he deserves praise, its F.B.

G2LZ is still busy on 1,750 K.C., and also many other Essex hams. Let's have your reports, OM's.

BRS191 and G2ABK have been busy all the month on various experiments, but none are worthy of note.

Q6QX has now a little more time for radio, and should shortly be heard.

I want reports from all Essex stations by the 17th, especially G5QV, G5XW, G6QO and G6WI, as I hear so much of you and know you are busy.

DISTRICT No. 7.

Representative: H. C. PAGE (G6PA), Newgardens Farm, Teynham, Kent.

If the number of reports received this month are anything to go by, you fellows in No. 7 District don't want to see anything about your activities in print. Well, no doubt the Editor will be able to find something to fill the space with, so there is no need to worry. However, it will probably mean the end of these notes, so the remedy is in your hands, that is if you want notes, which apparently you don't.

Now for a report of the "Faithful."

Sussex.

G5UY has been continuing his experiments on coupling, with and without crystal control. U.S.A. has been worked once at 08.20 G.M.T., but conditions on the whole have been poor. Will be changing QRA next month, but hopes to be on again shortly.

BRS125 has been experimenting with Screen Grid receivers on the short wavelengths.

G5AQ (ex 2AGC) is now on the air with a TPTG outfit on 7,134 K.C., and would welcome reports on his transmissions from anyone. Will also be trying 14,268 K.C. later in the month. Initial tests have produced encouraging reports.

Surrey.

G6XP reports nothing much doing, but has worked phone to VE1BR on 7M.C. Has also worked a number of "local W stations." The transmitter has been rebuilt and a milliammeter given to each valve.

G2VV, who is our old friend 2BUW, is a newcomer to the air, and we wish him the best of luck. He is using TPTG set with an input of 8 watts from dry batteries. Has been getting out on 7 M.C. quite nicely, and hopes to try 14 M.C. shortly.

Kent.

G2MI uses a rotary converter, and has been trying to get a pure note out of it. He finds very loose coupling and low power do the trick. He works chiefly on 1.7 M.C.

G6MO and G6VV have been building a Reiss microphone.

G2AFG reports the acquisition of a motor generator, which is giving good results. Hopes to have a transmitter working shortly. Receiving conditions seem poor.

G6PA has been very busy building a new transmitter for use on 14 and 28 M.C. Has worked a number of "W" stations and also "VK." Hopes to start up on 28 M.C. shortly with a vertical Hertz aerial. Conditions here have been very "patchy," but have improved lately. He keeps a "Sked" with G2BI on 3.5 M.C., and finds the relief from QRM a great treat.

DISTRICT No. 9.

Representative: G. COURTENAY PRICE (2OP), 2, St. Annes Villas, Hewlett Road, Cheltenham.

Owing to the usual lack of reports, I wish to draw attention to the fourth paragraph of the Editorial Notes in the February issue. Will you please be good enough to send the post cards as requested.

A second District Conventionette has been suggested in several quarters, and I should be glad to know the general feeling on the matter, together with any suggestions.

During January conditions on all bands were found to be good, the end of the month being particularly good.

The following group have now fixed up, and are testing out speech Xmitters on the 1750 band for local work and to help the QRM on the 7,000 k.c. band—2YX, 6UG, 2LV, 5BK and 2OP.

6XB reports nightly skeds with FM on 7 m.c. band with F.B. results on 4 watts.

6RB reports having worked ZL4AM, VK4BB, VK5HG, and numerous stations in W districts 1, 2, 3, 4, 5 and 8 with new TPTG. transmitter. Is also using Ultra-Audion on 28 m.c. band.

BRS212 reports VK good on 14 m.c. band at noon. Has heard PK and VS. Is running regularly weekly sked with BRS231.

2AOK has been working in conjunction with the 1750 k.c. group.

DISTRICT No. 10.

Representative: J. CLARRICOTS (G6CL), "Ciel," Hartland Road, N.11.

In accordance with my remarks last month I am only publishing notes from stations who have given me a direct report.

G6PP has re-built, but at the time of reporting had been in difficulties. He is getting good reports on his note, but cannot raise any distant stations; his aerial is, and has been, only 15 feet long with a 24 feet lead-in; his past results have been remarkable with so small an aerial.

G5UM is sticking to 1,800 kc. and gets good reports up to 70 miles. Input is 5 watts. He has entertained a number of amateurs at his station.

G5QF has had a good month with his 8 watts. He has worked Asia and a number of Europeans. His curious QSO on 14 mc. with an OK on 28 mc. is reported elsewhere.

G5HJ has converted to C.C. and results are up to expectations. With 6 watts he has worked Russia and Czecho Slovakia. His fone is also satisfactory. He reports the Asiatic stations as being very strong on most evenings when other nearer stations were weak.

BRS232 sends his first report, which announces the BRS number.

G6UN has had several good contacts, but is still trying for the States.

G6CL had his best month since last March; 26 countries were worked in ten days. Switzerland, which had been dodging his station since 1926, was worked *twice* in one evening on consecutive calls! FR was a new spot to be worked. RWX (in the Suez Canal) and XOZ7XU (off the Azores) were worked on 14 mc., as were nine new European countries. Fone was successfully sent to Austria on this wave and was apparently perfectly received. Input has been 7 watts maximum from either a Cleartron 25 or a Cossor Stentor 2. The Pertrix batteries, after five months' hard use, still show 85 volts per unit (100 volts nominal) and can be recommended for low power work.

We hear that G5AD is to come to life. I wish a few others would do the same.

G5GU reports activity on 28 M.C., but has still to make his first contact.

G6KW laments the lack of co-operative effort between stations, and suggests that pairs of stations form small C.R. groups themselves to study the problems they are mutually interested in. He mentions that the stations he works seem only anxious to get through with them quickly in order to work someone else. His actual work is mainly on the 1.5 M.C. band.

DISTRICT No. 11.

Representative: L. H. THOMAS (G6QB), "Conway," 66, Ingram Road, Thornton Heath, Surrey.

There are a few more signs of an awakened area this month; at all events, sufficient reports for me to reconsider the idea of dropping them, for which many thanks to the energetic ones.

G2AI reports nothing much doing owing to changed QRA, but hopes to start up very soon.

G2CX reports not much time on the air owing to 'flu and bronchitis. Hard luck O.M., and hope for the summer! He has worked XW7EFF on 7 m.c. when at Aden, also sundry Europeans, but is out of touch with 28 m.c. work. CC going now on 7 m.c.

G2NH has been moved to awaken by the sudden improvement in conditions, and has been getting out in his usual style once more.

G5RM has been on QRP all the month, best QSO being W8 on about 10 watts, and FM8RIT on 1.5 watts. He has also been on 1715 k.c. and worked 140 miles on 4 watts. Keep up there, O.M., and things will soon wake up.

G6HP, whose slogan is, "We work while others sleep," has done all his DX in the afternoons. On 7 m.c. has worked Phillipines, Java, India, and the Antipodes. On 14 m.c. 11 VK's, one ZL, Sumatra, W6, and innumerable others. On 28 m.c. he has worked W2AYR and been heard R7 by OH2NM.

G6NT has never been above 9 watts or so, and has worked W, FR, FM, AG, and been covering all Europe well, chiefly on 7 m.c.

G6WY has worked YIILM, and is waiting for his card to get his W.A.C.

BRS188 reported just too late for last month, but has been active on all frequencies, and seems to have heard every active country. He has logged W6, W7 and VE4 and 5 at 5 p.m. on 14 m.c. He is using a Triotron TD2 as detector and strongly recommends it.

BRS190 has also put up a very good log, and is going on 56 m.c., but so far has heard nothing but a harmonic of G5BZ! He says 28 m.c. has been extraordinarily good and has logged 20 "W" stations on that band. He also has a wonderful display of countries logged, and I cannot find many missing!

G6QB, apart from keeping skeds on 1715 k.c. has been on 14 m.c. all the month and found conditions extremely good. Best reports R6-7 from VK7CH, R6 from K1CM, R8 from PK4AZ (Sumatra). Also worked seven new countries and been reported R6 by ZT5E.

Please drop me a line, O.M.'s, if anyone would like a sked on 1715 k.c. simply for local rag-chewing purposes. We have no business cluttering up the 7 m.c. band for local work—DHE does that for us. Any time, preferably Sundays. Thanks very much.

DISTRICT No. 12.

Representative: L. J. FULLER (G6LB), 13, Seagry Road, E.11.

G6UT has worked another ship, call sign XEN OCP, in the Mediterranean, on 14 mc. He has also worked another country, HAF3A (Hungary) and has received a visit from FE2GD.

G2ZN is a newcomer to R.S.G.B., and we extend to him a hearty welcome to East London. Using .6 of a watt on 7 mc. he got R4 from D4QW. His phone on 1,750 kc. is getting out nicely in London using the same minute input.

G6FY is on 3,500 kc. doing CB QSB tests, and is also busy making a monitor and coupled frequency meter.

G6LL has had a good month, having worked plenty of W's on 14 mc., also South Africa, Java, and our old friend Rodman of VT2KT. He has also heard VT2KT on 28 mc.

G6LB is busy still with his new RX and finds little time for any other radio owing to business.

DISTRICT No. 13.

Representative: H. V. WILKINS (G6WN), 81, Studland Road, W.7.

Again only the same few stations have sent me reports. I have come to the conclusion that the rest have given up radio or do not think they have done anything interesting.

In connection with G6CL's question on these notes, only three stations have written me on the subject. All three seem to think it would be a great pity to lose them. The other members of this district cannot have read the area notes!

Now for the reports.

G6VP is again the star station in spite of having the 'flu twice in five weeks. In ten days he worked the usual east coast U.S.A., Florida, VO, PY, FK (four days in succession), a good few ZS stations. He has never before found South Africa so easy to work, as many as four stations answering one "test" call. All this on 14,000 K.C.

G6JY is at present QRT. Hopes to be on A.C. mains shortly, so is winding transformer. He finds conditions still bad.

G6WN has not had much time for radio during the past month, but in the short period available 28 stations have been worked. With the exception of FM and XW7EFF, 250 miles north of Port Sudan all the stations have been in Europe. Austria has been worked on 14,000 K.C. for the first time. A new T.P.T.G. set has been constructed for use on both 14,000 K.C. and 28,000 K.C., but has not yet been tested.

G2XO, with the assistance of G6JY and G6CO, has got his new transmitter going, but is having trouble with some new French valves. Has changed to Telefunken valves and they seem to work better. He is troubled with A.C. getting through to the transmitter which is a M.O.P.A. Has not yet installed C.C. as the above set seems to be as good. Reports having burnt out his charging 'ant.

G2ARV hopes to have a full permit by April. Thinks new "O" code good, but not the intermediates!

BRS222 is at present very busy reconstructing his station, so has little to report.

No. 14 DISTRICT.

District Representative: J. WYLLIE (G5YG), 31, Lubnaig Road, Newlands, Glasgow.

January has produced little in the Area worthy of comment. Radio conditions in Scotland, while not by any means good, showed some improvement towards the end of the month.

I am pleased to learn that "B" District has had a social evening, and trust that instead of making it an annual business, as they suggest, it will become a monthly, or at least quarterly affair.

I regret that in the January BULLETIN I inadvertently made a Benedict of 5GK. Very sorry, OM, and my apologies, but I am somewhat relieved to learn that my para. can be construed as "intelligent anticipation." Hi!

"A." DISTRICT.

District Representative: A. T. WILSON (G2WL), 206, Newlands Road, Cathcart, Glasgow.

G2MA is once again the most active station in the district, and is working plenty of W's with an input of about 6 watts. For plate supply he uses chemically rectified 25 cycle A.C., and finds that when a crystal is incorporated in the TX he can produce a very pleasing note in spite of the low frequency ripple of the supply.

G2WL has just completed a new TX, and is now busy on a short wave superhet incorporating screened grid valves.

G5XQ has nothing to report, except a little work in connection with broadcast reception.

G5YG has now got delivery of his heavy (ye gods, it is!) battery, from which he proposes to run his transmitter filaments (5 amps.). The A.C. filament supply is to be discarded, as it has been found impossible to reduce the modulation of the carrier so long as the filaments are fed with 25 cycle A.C.

G6WL reports some satisfactory work with C.C. on the 7 M.C. band. He recently carried out a long contact with VE1DR, who reported 6WL's signal readable throughout through heavy QRM. He also reports contact with NX1XL, Palestine, and the Azores, with an input which never exceeds 5 watts. America has been worked on the 14 M.C. band, making use of harmonic control. Some receiving work has been done on 28 M.C., and W2JN is reported QSA 5R6.

G6NX has not done very much, as he has been laid up a great deal with a damaged knee. He is understood to have been working W quite frequently on the 7 MC band.

"B." DISTRICT.

District Representative: E. G. INGRAM (G6IZ), 20, Cairnfield Place, Aberdeen.

G5JK is still busy getting his gear together in readiness to start up, and expects to be on the air before long.

G6IZ has been doing a little with CC making use of a harmonically controlled TX, with fairly satisfactory results. He proposes to have a try at the MOPA circuit, however.

G6VO has been working hard in the early mornings conducting a series of sunrise tests, and it is hoped that he will communicate his results to the "BULL." at a later date.

"C." DISTRICT.

District Representative: J. B. STURROCK (G6KO), Kirkbuddo, Forfarshire.

G2SR has arranged a 28 M.C. sked with 6KO, 2SR handling the TX end. The stations are separated by some twenty or thirty miles, and so far the TX has not been heard. 2SR is now away on holiday, and the tests will be resumed on his return.

G5GK has got on the air once again, but is having a little trouble with his generator.

G6KO has done quite a lot of listening on 28 M.C., and has heard numerous W stations. He has done some good C.C. work, and has worked Palestine on the 7 M.C. band with a very low input. Hitherto the CO and FD have been fed from a separate plate supply, but greater efficiency has been obtained by using the same source of supply for all valves. He is very QRP at the moment, as his generator has burnt out a coil.

BRS158 reports work on a 28 MC. RX.

DISTRICT No. 15.

Representative: H. ANDREWS (G5AS), Wireless Depot, Ystradgynlafs.

G5PH is now using full wave rectification with no LF chokes, and is getting better reports, using L.S.5 with crystal control TPTG.

G2AV.—We are about to lose this ever-active station from our district, as he is going to sea during the coming week; he proposes to keep in touch with his past friends, and is arranging to take an SW receiver with him. I am pleased to learn that he is not relinquishing his licence, and we can look forward to his company again.

G2AOI is carrying out tests on reception on the frequencies above 7,000 KC with attempts to eliminate hand capacity and threshold howls. These tests have been successful up to a frequency of 40,000 K.C. He is now busy on modulation of transmitted wave to eliminate the side band, and would be pleased to hear from any other Hams who are carrying out similar tests.

G5TJ has at last cleared the QRM from his hand generator.

G5AS.—Very QRL ere and nothing of note this time. I am very pleased to receive report from G2OAI, and wish the other members of this area would do the same. We shall be sorry to miss G2AV from the air, but take this opportunity of wishing him the best of luck. I have been approached with reference to an area convention for the spring. Will the members of this area please let me have their opinions as soon as possible.

DISTRICT No. 16.

Representative: C. MORTON (G15MO), "Simla," Glastonbury Avenue, Belfast.

Conditions here have improved during the month, although the 1,400 kc. band is very "patchy," with good signals to be heard one night, right up to 2300 G.M.T., and nothing the following night. The "star" station this month is:

G16WG, who is going well in the 14,000 kc. band. He has worked W 1, 2, 3, 4 and 8 districts, with average QSA4.

G15HN has re-built his receiver, using valve base coils. He has also made a "bug," and is so well pleased with it he would not go back to ordinary brass-pounding again.

G12CN is only on at week-ends, but has managed to work most of Europe using a 2-volt receiving valve and hand gen.

G16YW is almost inactive at present. He worked VO, W, and HB during the month, with 4 watts to a CT25 bottle. VO and HB are new countries, making a total of 38 countries worked with 6 watts and under.

G15OT reports good European conditions, and has had a fair number of contacts. He is working at CC at present.

G15WD moved to his new QRA, "The Poplars," Lodge Road, Coleraine, and spent most of his time getting the gear rigged up; hence he has nothing to report.

G15MO has been listening on 28,000 kc., but conditions were not good in this band. A few local contacts were made on both 7,000 kc. and 14,000 kc.

Channel Islands.

Representative: A. M. HOUSTON FERGUS (G2ZC),
La Cotte, St. Brelades, Jersey, C.I.

The past month has been very full of blanket effects on the 7 MC band during the morning, as has been noticed during the past three years at this season of the year, it being particularly noticed about the midday period, especially during bright sunshine. In view of the findings of a well-known German station, this is interesting in that in his district this blanket is also noticed, but only during foggy weather. It is quite obvious that it is somewhat local, and only affects "received signals," from the observations taken of schedules with regular stations, and I bring the matter up in the hope that it may interest some, and even bring about some explanation. Group 2B of C.B. are going into the matter.

Owing to business, all the stations, with the exception of G2ZC, are inactive at the moment, and the keeping of schedules is the only work being done by him, but he has successfully got several crystals to control properly.

The question of dropping the "Area Notes," while being a matter for the members themselves to vote upon, might, however, give place, if dropped, to more space being given to the work of C.B., which, after all, were it supported well enough, more than fills the needs of Area Note readers, and the reports of C.B. might well include the features of the present individual notes. From small beginnings, C.B. has already made itself one of the leading features of the "BULL.," and, given time, will doubtless be the feature.

Notes and News from British Dominions.

Irish Free State.

Representative: COL. DENNIS (EI2B).

Conditions over here are generally reported poor on all bands. One rather curious point noted by the writer is that D and E stations come in and are easily worked long after all the rest of Europe has completely faded out. Transatlantic stations appear to be infinitely more difficult to work than they were last year. A possible explanation of this would be the difficulty of stations on this side getting through the concentrated local QRM over there now that all stations are on the same band.

The following stations have reported via EI7C, but, with the few exceptions mentioned below, there is nothing of general interest in the reports, and, if details are omitted, it is only with a view to saving valuable space in the "BULL." EI's 3B, 5B, 8B, 5C, 6C, 7C, 8C and 4D. EI8B has worked several W stations on 14 MC EI7C has worked W 1, 2 and 3 districts. VO and YIILM, Baghdad, on 14 MC and AU, Turkestan, several times on 7 MC, getting good reports. EI2D and EI4D have been heard in Australia.

It is very disappointing in view of the March tests by C.B. on 28 MC that we have heard nothing from the Post Office about our applications for permission to use this band.

EI2B would welcome any DX reports on his sigs with new Zeppelin aerial.

Notes and News from Europe.

Czecho-Slovakia.

By L-WDRA.

Conditions during January were not very good in our country on any of the usual DX bands. The 7 MC band was the best, as was to be expected at this time of the year, fading occurred on this wave at about 1900 G.M.T. Only distant Europe was then audible. For work with your country, the best times are from 1500-1900 G.M.T. During these hours, G stations are received here at very good strength invariably. The 28 MC band has not so far yielded us anything much, except that our station AA2 has now received W2JN R5-RO. 2YD has heard G2OD and G6DH. EU15RA has also been heard, but, in spite of much calling, none of our men have had a QSO on this wave, but we hope to record success very soon.

The new prefix for our amateurs is OK. We have not had any good fortune yet in having our licences granted officially, so that we must continue to operate as unlicensed stations.

The low-power tests which were conducted by our 2nd District stations were very successful. Several W stations were worked with inputs ranging between 5 and 12 watts, whilst 2ET was QSO with AP, using only 1 watt.

A new series of tests with Mr. Robert Kriesinger (ex W2TC) at the key of a station on board S.S. *Chickasaw City*, which runs from

England to New York, are being organised. The call of the ship is KUNZ.

All cards for our stations should in future be sent to: R.K.C.S., QSL Bureau, Praha 2, Post Box 531.

Holland.

By J. H. KOEN, M.Sc.

This report will be a very cheerful one, as at last we Dutch now know the regulations of our transmission licences. Hats off for our Government! We never dreamed that the rules would be of so liberal a nature, although everyone of us have to pass an examination, which will not be very difficult, but there will be a lot of things over that must not be taken too lightly. The committee will be a severe one, only fully-fledged people can get their ticket. The wave-meters will be calibrated by an amateur. Standard meter for the top and bottom of each band are ready at the Government laboratories.

Early February saw a big amateur convention at Rotterdam, the last "pirate gathering" in Holland. In the morning a visit was made to the radio station of Waalhaven Aerodrome. During the afternoon many serious matters were talked over. Philips Radio had a fine stand of transmitting valves up to 20 kilowatt water-cooled type. The meeting closed with a big dinner, some seventy amateurs filled the large dining-room. Later in the evening a moving picture exhibition was given by our President; the films were made by him personally, and it was a very fine sight to see our Hon. Secretary riding on camel-back under the bright Algerian sky. Views of America were shown. The exhibition was in every way a success, and we look forward to many future such occasions.

Germany.

By E. REIFFEN.

During January conditions on 7 MC continued to be favourable, and many QRP stations had good QSO's with the U.S.A. In the last two weeks there have been several days on which the ether has been "dead," but we hope that this is only a temporary occurrence. Comparatively little has been done on 14 MC. A few stations have been reported as being heard on 28 MC., but in reality there were only 14 MC harmonics. This goes to prove that care must be taken when reporting on 28 MC signals. It is very confusing that the old intermediates and R code are still being widely used, so that it is often very difficult to find out what the "other man" means.

QSL Section.

By A. HINDERLICH, G2QY.

Once again I am pleased to say that the main purpose of this section is being achieved with ease and regularity, but there are one or two matters where some of you fellows try to do things different from everybody else, resulting in confusion and misunderstanding. Don't think that I am laying down the law—I am just telling you what the majority are doing, and what I normally look at.

PREFIXES.—Either put the name of the country before the call-sign, or use the new prefix for that country. For example, Italian IGC or IIGC, the latter being much preferable. Don't put EIIGC, even if the other fellow used it, as EI is the correct prefix for Irish Free State. I haven't time to read any more than the prefix. Whether you put "Italian" or alter his call-sign to what it ought to be is a matter of indifference to me, but please remember that the old "intermediates" are completely out of date. Those of you who are still sending in cards relating to last year please note.

ENVELOPES.—Put your call-sign (less the initial G) in the extreme top left-hand corner. If you don't want your cards too often, write immediately below "Wait for 6" or "Wait for 12." Most stations want their cards in threes—if that does not suit you it is up to you to say so on each envelope.

OLD CARDS.—It has proved an impossible task to keep unclaimed cards sorted out ready for immediate despatch. You can either mark your envelope "Wait for 50" and take your chance on excess postage, or wait till we have time to clear

the duds out. We shall deliver or return every single card sent to us, but when British stations are reluctant to receive them, obviously we can only do so at fairly long intervals.

ADDRESS.—Please note correct QRA. My neighbours strongly object to mis-addressed correspondence: G2QY, 15, Lyncroft Gardens, London, N.W.6.

QSL BUREAUX ABROAD PLEASE NOTE.—We either deliver or return every card sent to us. Cards for commercial and non-existent call-signs are returned at once, as also are cards for the three active transmitters who refuse to join the R.S.G.B. Cards for all other amateur stations are delivered, in most cases, within seven days of receipt.

QRA Section.

By M. W. PILPEL G6PP.

Don't forget to place an early order for your copy of the March issue of the Radio Amateur Call Book. I have done my best and the publishers have done theirs to make it the very last word in "up to dateness," and that we have succeeded I think you will agree when you have seen the book. In addition to a first-class British list, this issue contains all the new Russian, Danish and South African call-signs. It is an absolute necessity for everyone interested in DX work. Order now so as to avail yourself of the reduced rate for members.

In this number of the "BULL." appears the first of a list of new call-signs and changes of addresses which have taken place during the last few weeks. It concerns British stations only. If you would like to see these lists become a regular feature of the "BULL.," write and let me know. I am quite willing to do the extra work entailed in preparing the lists every month if I know that you want them. If I get no letters I will take it that you consider the lists a waste of space, in which case none will appear next month. It's up to you now!

QRA's wanted: G2ID, G2MN, G5MJ, G5YA, G6CW, G2AOP.

Correspondence

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

DEAR SIR,—I am sending you the following suggestion in the hope that it may be of some use. This is that a short list should be published each month in the BULLETIN of transmitting members who want reports from G stations. At present it is very difficult for BRS and AA stations to know to what G stations to report. Most high-power stations don't want reports, and others are working on definite lines, which do not require reports from G's. Many stations, however, I know from experience, are very pleased to have these reports, and it would save much trouble and expense, besides being an advantage to the transmitters concerned, if such a list could be published, instead of half the reports sent being useless, or often not even acknowledged. Such a list could take the following form:—

Name of Station.	Reports wanted.
X ...	Working on "skip."
Y ...	Reports from Scotland.
Z ...	Reports on quality of note.
	etc.

Hoping you will find it possible to institute something of this kind.—I remain, yours sincerely, D. J. BEATTIE (2AJC).

[Will transmitters who wish their calls to be included in a monthly list in the BULLETIN, as suggested above, kindly notify us by the 25th of the month prior to publication.—Ed.]

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

DEAR SIR,—In this month's Society Notes you ask for members' views on the continuance of "Notes and News" from Areas, so I give mine for what they are worth. In a way, they are scientifically useless, especially in some of the individual reports. For instance, it is of little general interest to know that NY2 is grinding crystals, or that someone else is building a transformer, but the mention in the "BULL." of stations who report to their Area Managers does, I think, have a beneficial effect on membership, in that it gives them some small publicity, and lets others know of their existence—also some like to see their stations' names in print! You will probably understand what I mean to convey, although it is a little difficult to express. The only point that occurs to me in this connection is that many of the stations who get "publicity" in the "BULL." are those of non-members, which is not as it should be, but there would be difficulties in making distinctions.

I would suggest that matters could be improved possibly by a circular letter to Area Representatives suggesting that the Notes should be somewhat on the following lines:—

- (1) "The following stations are active, and have reported: A2X, A3X, A4X, etc."
- (2) Then any items of general interest from these reports, but omitting personal details, such as sprained ankles, grinding crystals, etc. If a station has made any material alteration in his equipment, let him say so, and that he wants reports, his request should then be published.
- (3) Then any remarks on DX conditions, and social items in the area.
- (4) Any special points.

I would not limit the length of a report on any given station to a certain number of words—leave this to the discretion and common sense of the Area Representative.

My whole suggestion might be summed up in this way: Reports only to include mention of stations reporting; any outstanding achievements of these stations, and requests for reports on their signals. DX conditions noted, and social or special items.

Yours faithfully,

WILFRED DENNIS, Col.,
Area Representative, I.F.S.

P.S.—Some of the Continental notes are at present on the lines I suggest.—W.D.

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

DEAR SIR,—Having read the article on aerials by Mr. Kenyon Secretan (GSLF), I suggest a feeder construction which I have used since the autumn of 1926. The double feeder line of my current-fed Hertz consists of a double-wire cable such as is used for dust-cleaners. It is absolutely waterproof, and has two advantages: (1) the two flexible wires are pressed together in a rubber casing; the capacity between them is, therefore, constant, and the signals remarkably steady. (2) There are no worries about spacers and no difficulties in preventing dirt collecting along them.

As to the objection of dielectric losses in a rubber-pressed cable, they are practically unimportant until the aerial has to be used on a wave-length below four meters.

S. KAPLAN.

213-14, Kaiserallee,
Berlin, W.15.

VARNISHING GLASS RODS.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—I have no wish to start an argument, but I would ask your indulgence to make the following remarks on your footnote to my letter on p. 190 of the February "BULL."

You state that "the surface formed by good shellac is definitely less hygroscopic than glass." Now I think that it will be news to most of us that glass is hygroscopic! It is definitely and absolutely not so. On the other hand, a coating of shellac varnish appears to be always slightly hygroscopic, most probably due to the impossibility of obtaining absolute homogeneity of the varnish coating. To prove this I have carried out the following experiment. A piece of glass 1.5" square was coated on one side with shellac varnish made from the best orange shellac dissolved in rectified alcohol of over 90 per cent. alcohol. The coated glass was allowed to dry at room temperature for 24 hours and the drying then finished at a temperature of about 50° C., being left for an hour to cool. It was then weighed, the weight being 13.1788 grammes. It was next immersed in cold water for four hours, taken out, carefully dried without heat and, after about a quarter of an hour, re-weighed. The weight was found to have increased by almost exactly 2 milligrammes to 13.1808 grammes, due to absorbed water. Of course, such an experiment can only be carried out if one has access to an accurate chemical balance, which I am fortunate in possessing. After immersion the varnish coating was somewhat opalescent, but after warming for a short time it became clear again, whilst the coated glass returned to its original weight.

Of course, it is well known that in a normally dry situation the surface leakage across glass at high voltages is greatly reduced by varnishing it with shellac varnish, e.g., in the case of Leyden jars and parts of influence machines; but the conditions here are not comparable with those obtaining when the varnished glass is

NEW MEMBERS ARE WANTED.

exposed to rain and weather. Therefore, Mr. Editor, with all respect, I submit that nothing is gained and something is lost by varnishing under the conditions in question, because, (1) the varnish will absorb *some* moisture which the glass will not do, and (2) it will collect and retain dirt which, in turn, will hold moisture and be more or less conductive even when dry. After some weathering these conditions will become infinitely worse. Glass, on the other hand, will be washed more or less effectively by the rain. When both are really wet there is nothing to choose between them.

M. J. C. DENNIS (E12B).

[Colonel Dennis has raised some interesting points and we have investigated them in some detail. The first point at issue is whether or not glass is hygroscopic. After searching in vain through a number of standard scientific works for an exact definition of the word "hygroscopic," we found the following given in "Webster's New International Dictionary" (1920) as one of three possible meanings of the word in question: "readily absorbing and retaining moisture, as caustic potash, or becoming coated with moisture, as glass, etc." The last part of the preceding sentence indicates that it is correct to describe materials as hygroscopic if they tend to collect a surface layer of moisture (as ordinary glass does) as well as those materials which actually absorb moisture. The only definite information which could be found regarding shellac in this connection was that it was classed in tables of insulating materials as "non-hygroscopic," and it is generally assumed to be so in electrical engineering practice. Colonel Dennis's interesting experiment appears to indicate that shellac is, however, slightly hygroscopic in the sense that it "absorbs and retains" moisture. The experiment is open to criticism on one point, namely, that as the piece of glass was only varnished on *one* side, there is, strictly speaking, nothing to prove that it was not the *unvarnished* side that was responsible for the observed increase in weight. While it may be objected that this is only a scientific quibble, the possibility of glass changing weight after immersion in water is not so absurd as it sounds since it is a definite fact that ordinary soda glass is very slightly soluble in rain water, this slight solubility probably being responsible for the hygroscopic properties of glass. In this case, however, it would be reasonable to expect a decrease rather than an increase in weight, and it seems probable that the experiment in question does constitute a proof that shellac is capable of absorbing minute quantities of water under conditions of actual immersion. From a practical point of view the fact remains that under normal atmospheric conditions (*i.e.*, not equivalent to "immersion") a film of moisture forms on the surface of ordinary glass (some moisture always being present in the atmosphere), while this is not the case with a shellac-varnished surface. The reality of the difference can be demonstrated by insulation resistance measurements. It is quite possible that, after weathering and under conditions of rain, snow, etc., there may be no practical advantage in using the varnish, but it would seem that an actual measurement of insulation resistance is still the only valid comparison. We regret that we have not been able to find any published results which hold good for such conditions and would welcome any information on the subject. It is suggested that an unvarnished glass surface will not collect a surface layer of dirt on continued exposure to the atmosphere. While this may be so in the country, our experience in and near industrial centres has been definitely to the contrary. It has been found that hard glass, such as "pyrex," keeps reasonably clean even in a smoke-laden atmosphere, and it does not form a surface film of moisture as soda glass does. It is highly improbable that even under the worst conditions the insulation resistance of a glass rod such as that referred to in the original letter would be less than, say, a megohm, and even if a dozen of these were used on a feeder with a characteristic impedance of, say, 500 ohms, the leakage loss would be quite immaterial. It is even on record that a certain feeder once collapsed on a wet slate roof during a gale without any difference being noticed either in the meter readings on the transmitter concerned or in the signal at the distant receiving station.—ED.]

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

DEAR SIR,—G2ZC says that he can hardly fall in with the suggestion that raw A.C. stations should be boycotted. He then suggests a most effective boycott, and that I endeavoured to encourage some time ago with no success. Despite the continual grouse about this trouble, I could get only about 7 stations to say that they would not work raw A.C. signals. One can only form the impression that the majority of G stations will not forego a DX QSO for the good of the whole amateur situation.

The majority of the offenders are foreigners, and I fail to see what effective steps we can take with them other than an effective boycott; they are in many cases unlicensed and reports to their official people would be useless, even if noticed.

But my good friend G2ZC does not go far enough; we will have to boycott stations which work with these offenders. This makes things rather complicated. It is really a matter for the I.A.R.U., and if they laid down certain regulations which would be world-wide, the air would be clearer.

Just as the Spaniard listens with a smile to the fox-hunting Britisher condemning bull-fighting, so the raw A.C. merchants must smile at the rage of the high-power fone merchant trying to work a distance of a few miles with 100 watts through A.C. QRM.

CB is not, in my opinion, a suitable instrument for the policing of the ether; a new section is what is needed to add another terror to our existence.

I am glad that Mr. Fergus raised this point and I should like to hear the opinions of members. If there is the will to solve this problem, it will be solved.

Yours sincerely,
T. P. ALLEN (G16YW).

To the Editor of T. & R. BULLETIN.

SIR,—With reference to the article by 5HP in your January issue, could any of your readers help in an explanation of the phenomenon he describes.

The only hope seems to me in the fact that he says he is dealing with transformer coupling. All the adjustments he mentions, L.T. and H.T. and high grid bias, are normally hardly acceptable and do not "smooth out" very well, but it is possible in this case a transformer unsuitable for a DE2 was used. A high frequency resonance might then be decreased by increasing valve impedance, but to make the information given of real value, the transformer used should have been stated.

Personally, it always seems that the removal of needle scratch can hardly be achieved without removing the top frequencies so necessary to the real "stuff." It seems probable that the pick-up described would not greatly assist from the point of view of record wear.

To diverge slightly. The writer, unfortunately, was not able to be present at the general meeting, but is greatly pleased to note that the resolution proposed by Mr. Inman was carried.

N. R. BLIGH.

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D.C. H.T. Generators, 600 volts, 80/100 m/a, 48/-; 960 volt ditto, £8; Armatures, 30/-; Fields and poles, 10/-; 2,000 volt, 500 m/a Newton Generator, £25; Newton 1,500 volt, 100 m/a, £15; Osram Valves, 1,200 volts, 40 m/a, 4/6; Cossor Rectifier, 1,000 volts, 4/6; Marconi D.C. 1,000 volt Generator, coupled to 100 volt D.C. motor, output 1,000 volts, at 40 milliamps, pure D.C., £15.—ELECTRADIX, 218, Upper Thames Street.

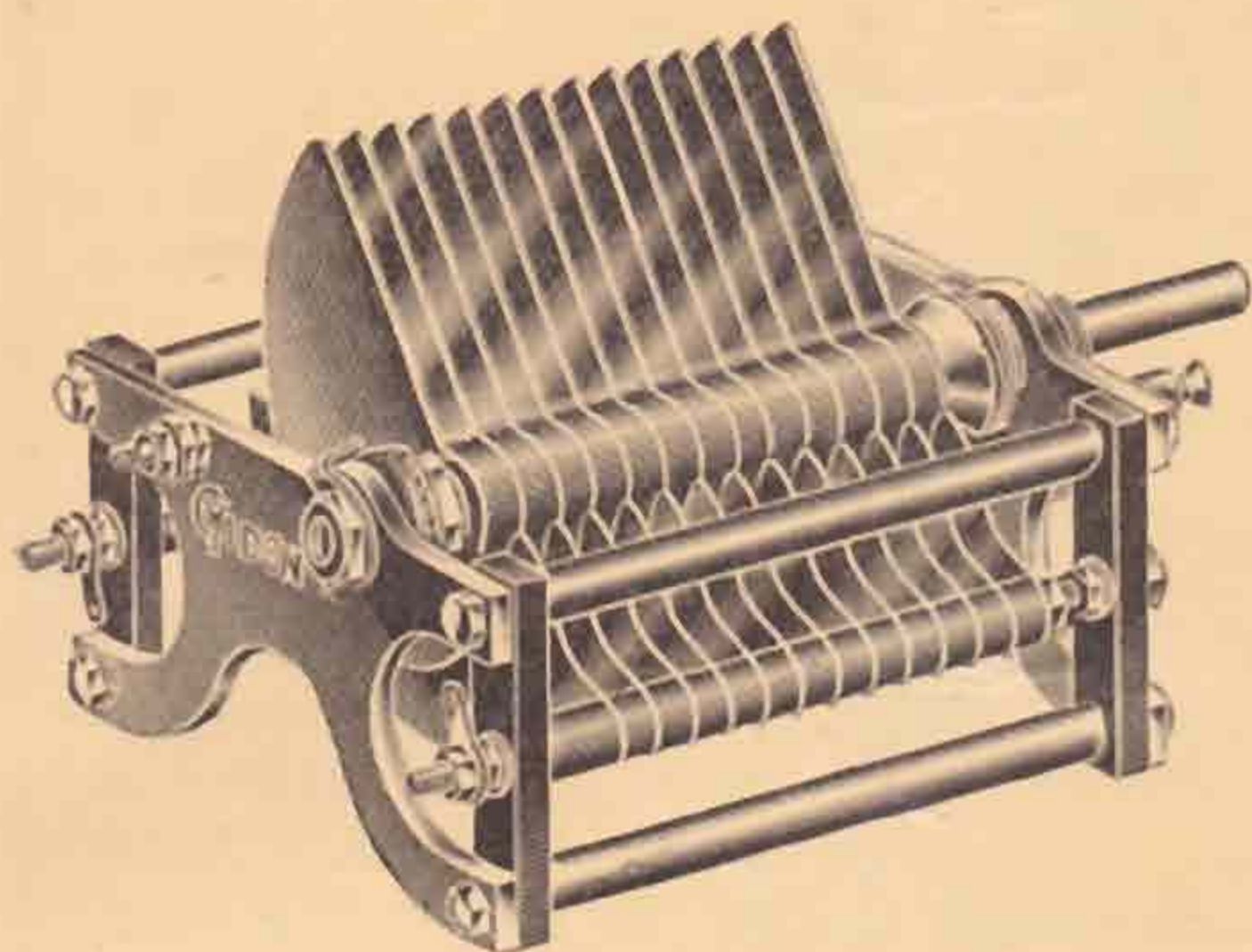
FOR SALE.—Foster H.T. Transformer (not fused). Input 200v. A.C. Frequencies 50/87.5. Output 2,000v.-0-2,000v.—Offers to 6TH, Newport.

OSRAM DETI, good condition, £2 5s. Several pairs of phones 8s. each. DE6 DER 2 volt dull emitters, 4s. 6d. each. Write for list.—G6TZ, Glynwood, Brighouse, Yorks.

"DON'T FORGET YOUR LONG PADS—6CC."

CYLDON

The CONDENSERS with the Five Years' Guarantee



DOUBLE SPACED

TRANSMITTING CONDENSERS

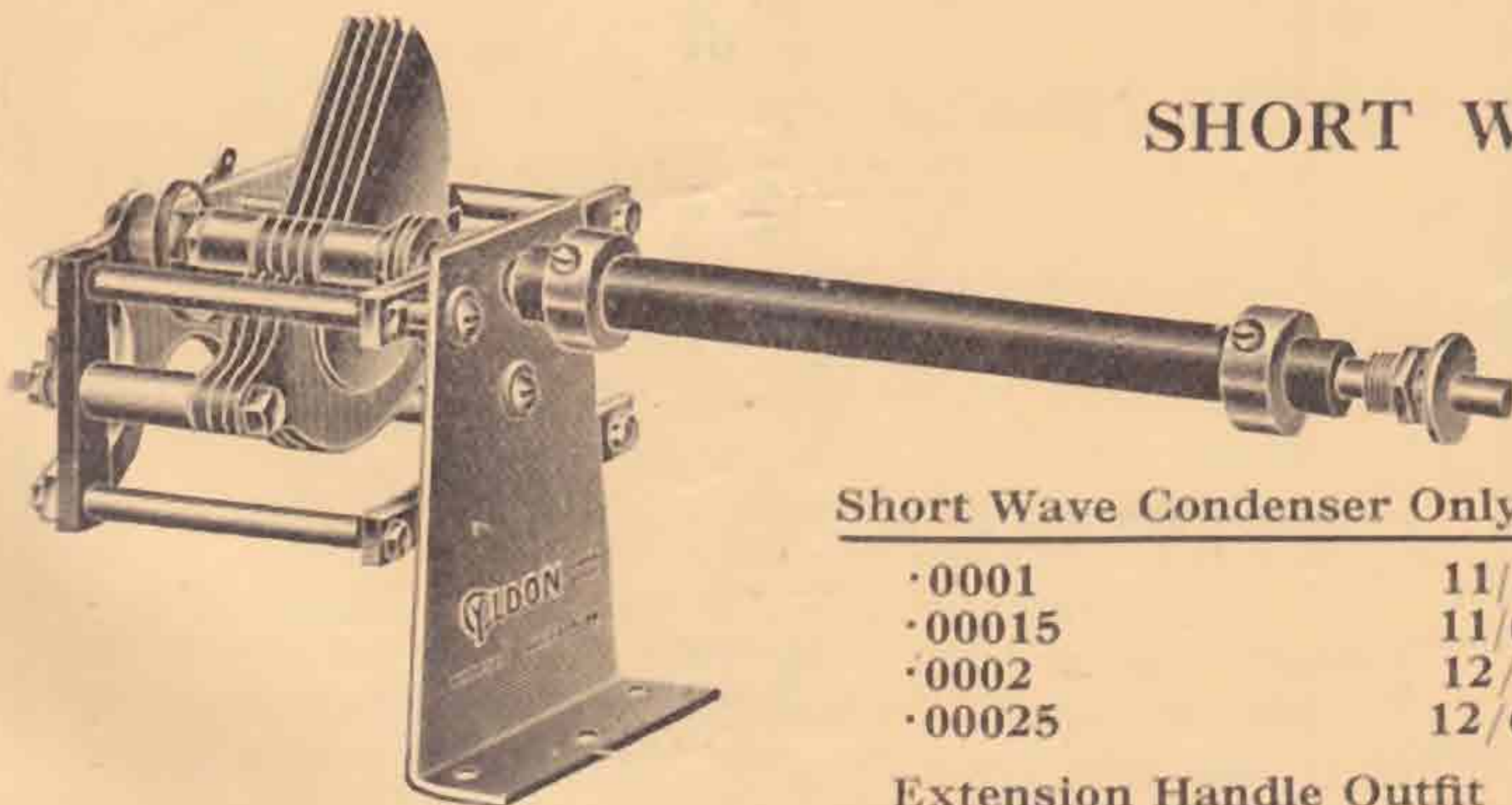
Robust, sturdy, rigid condensers, so well constructed that they are guaranteed for five years. These Cyldon Double Spaced Transmitting Condensers have been designed in response to the numerous requests for a high quality standard pattern at a very moderate price.

The vanes are shaped square law and are of extremely accurate construction, whilst the condensers embody all the unique features which have gained for Cyldon such a high reputation for all-round efficiency.

Prices :

List No.	TR.4	·0004	25/-
	TR.35	·00035	19/6
	TR.25	·00025	17/6
	TR.2	·0002	16/6
	TR.15	·00015	15/6

SHORT WAVE CONDENSERS



Short Wave Condenser Only.

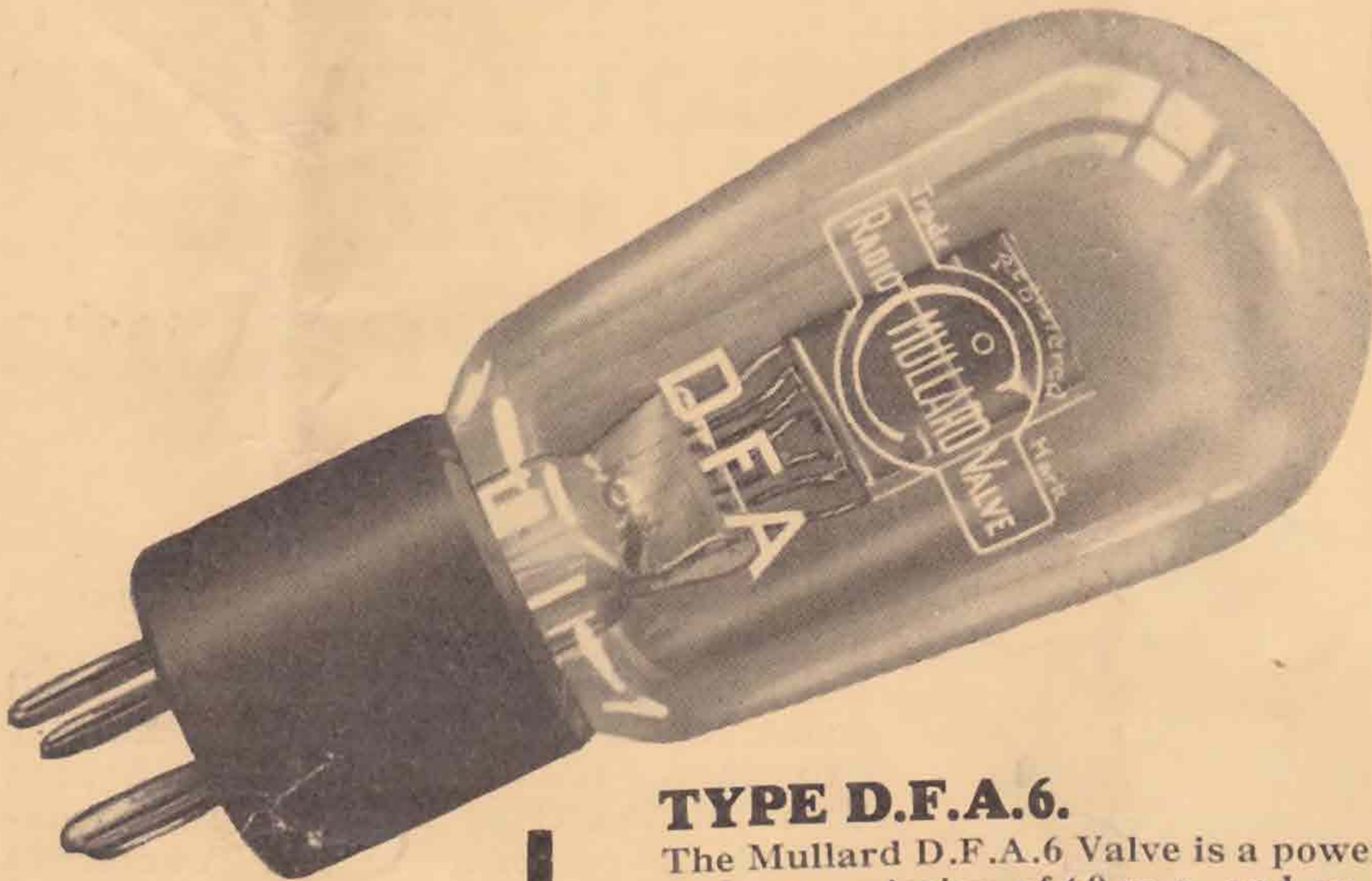
·0001	11/-
·00015	11/6
·0002	12/-
·00025	12/6

Extension Handle Outfit Complete (Extension Tube, Bracket, Spindle, etc.), Price 3/6 extra.

Cyldon Short Wave Condensers can be obtained with a stout aluminium supporting bracket, ebonite extension tube, clamping collars, panel-bush, nut and $\frac{1}{4}$ " spindle. This Extension Handle Outfit provides an extremely rigid assembly, and permits of smooth adjustment and accurate tuning.

SYDNEY S. BIRD & SONS, LTD.

Cyldon Works, Enfield Town, Middlesex.



**POWER
AMPLIFYING
AND LOW
POWER
TRANSMITTING
VALVES.**

**TYPES D.F.A.6.—
D.F.A.7—D.F.A.8.**

TYPE D.F.A.6.

The Mullard D.F.A.6 Valve is a power amplifier with an emission of 60 m.a. and an impedance of 4,500 to 6,000 ohms. and so is suitable for use with the largest loud-speakers. The anode voltage may be raised to 400 volts and with this high voltage a large grid base is obtained. Under these conditions, large outputs free from distortion can be obtained. The filament is stout and a long life is assured. With 100, 200, 300, 400 volts anode potential, grid bias of approximately 5, 10, 20 and 30 volts should be used. This valve can also be used as a low-power transmitter dissipating 10 watts continuously with perfect safety.

TYPE D.F.A.7.

The Mullard D.F.A.7 Valve is similar to the D.F.A.6 and due to its much larger grid base is suitable for the largest loud-speaker installations. It can also be used as a transmitter or modulating valve with voltages up to 400 on the anode.

TYPE D.F.A.8.

The Mullard D.F.A.8 Valve has a high amplification factor, and is suitable for resistance capacity amplifiers using high anode voltages. It can also be used very successfully as a low-power transmitter.

	D.F.A.6	D.F.A.7	D.F.A.8
Filament Voltage	4.5 volts	4.5 volts	4.5 volts
Filament Current (max.)	0.85 amps.	0.85 amps.	0.85 amps.
Anode Voltage	100-400 volts	100-400 volts	100-400 volts
Total Electron Emission	60 m.a.	60 m.a.	60 m.a.
Anode Impedance	4,500 ohms.	2,850 ohms.	15,000 ohms.
Amplification Factor	6.4	2.4	19.5
Mutual Conductance	1.45 m.a./volt.	0.85 m.a./volt.	1.28 m.a./volt.

Mullard
THE · MASTER · VALVE

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