

LOW TENSION

# T. & R. Bulletin



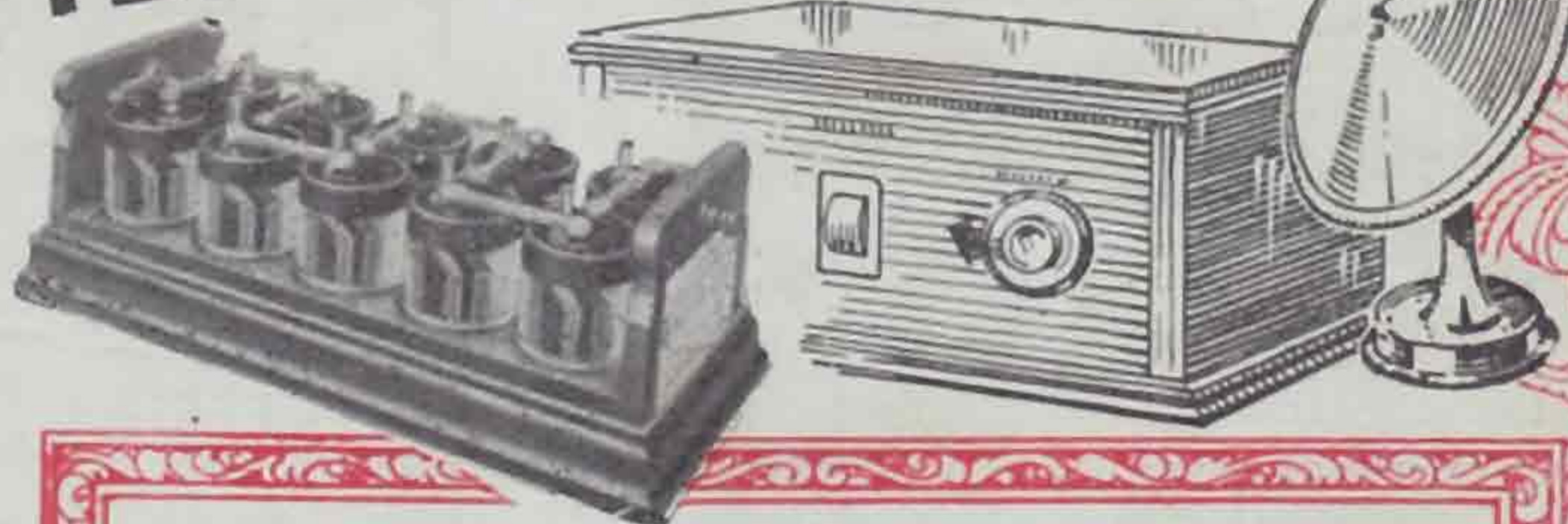
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## The Journal of the Inst. Radio Society of Great Britain

Vol. 3. No. 2. August, 1927

Price 1/6

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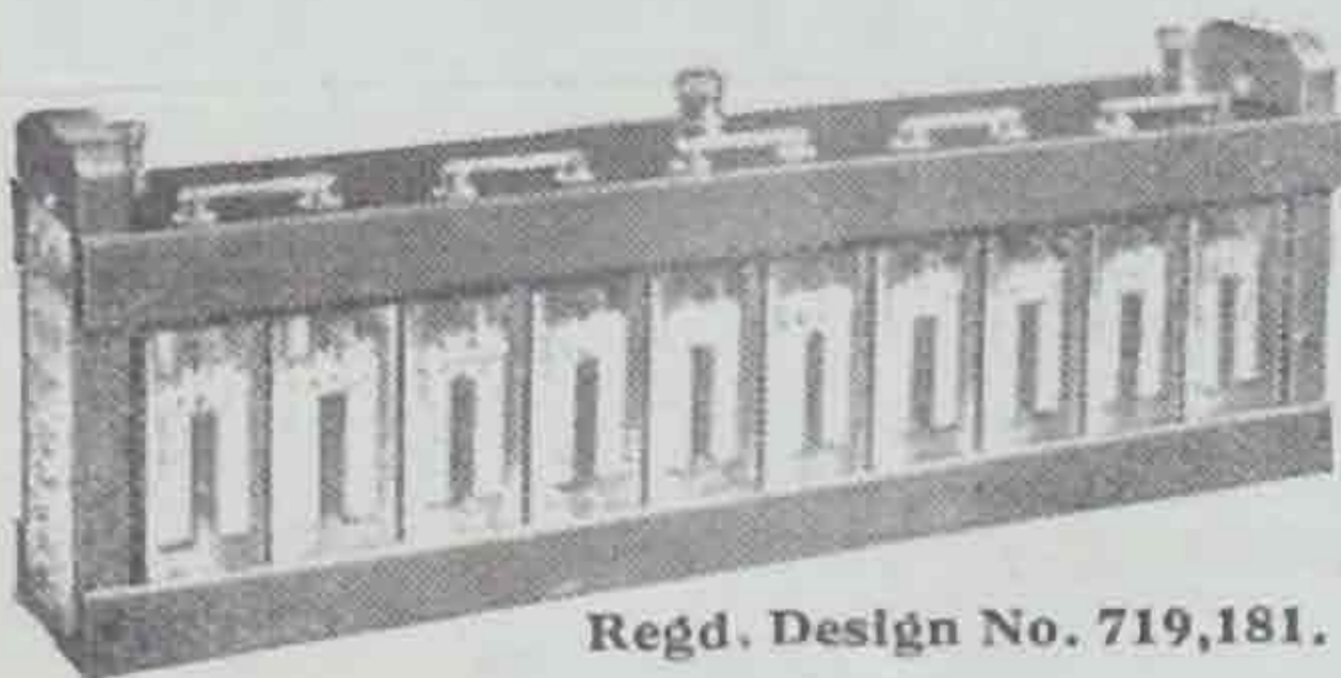
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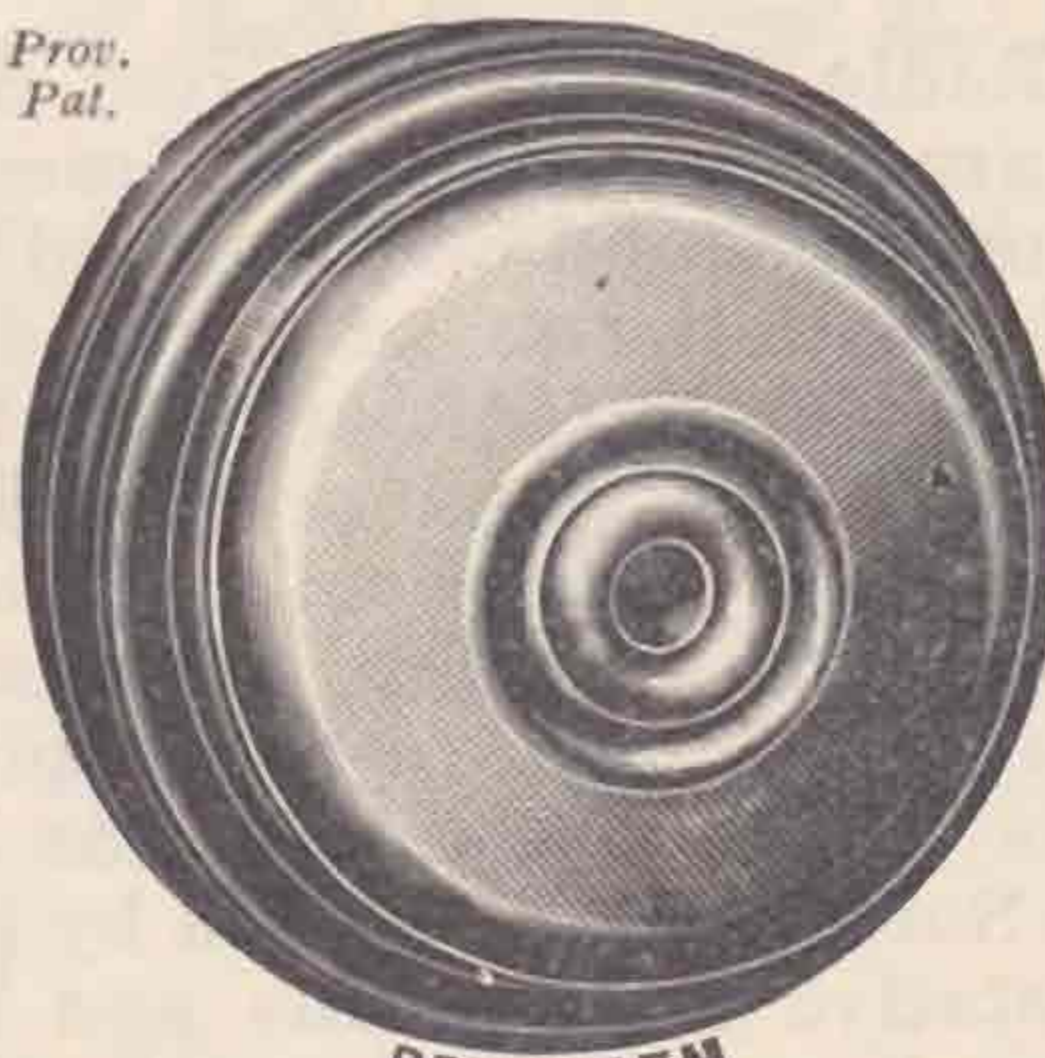
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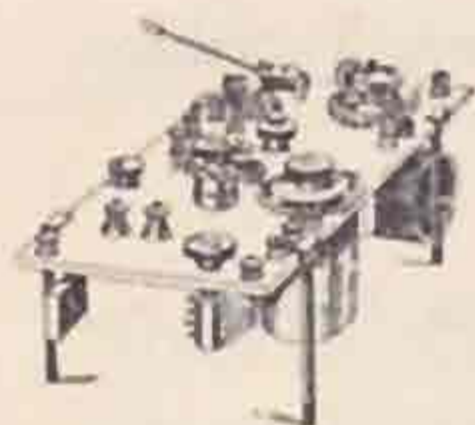
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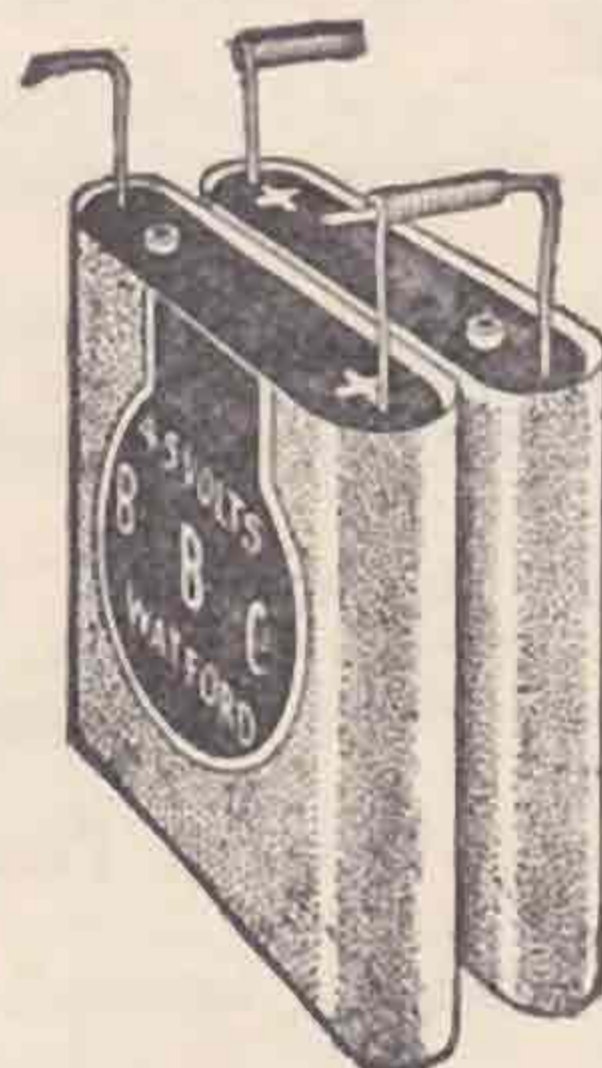
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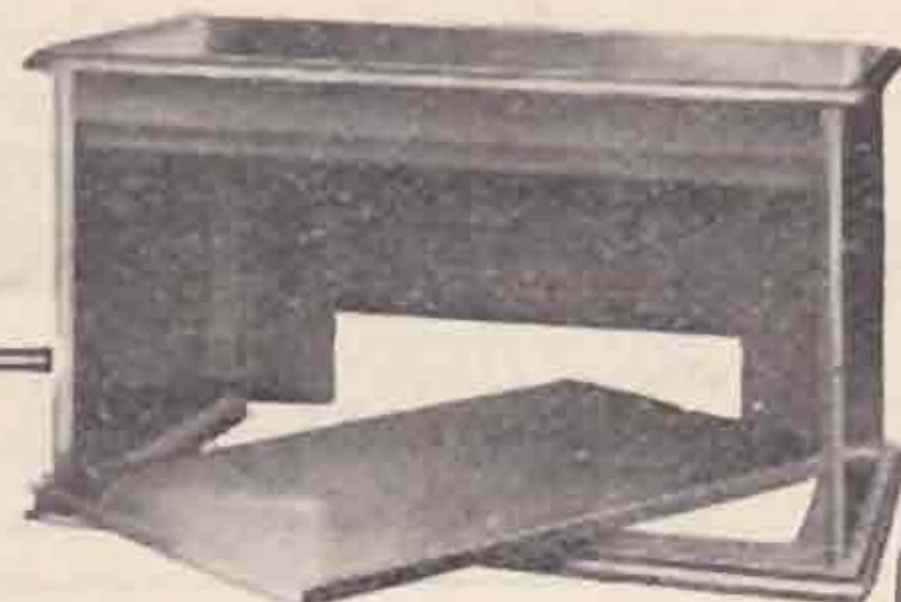
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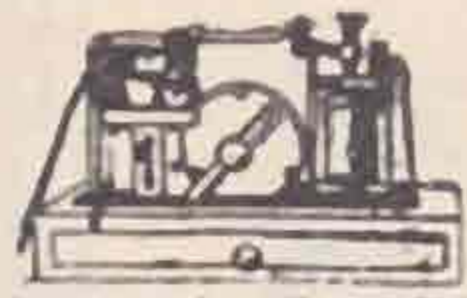
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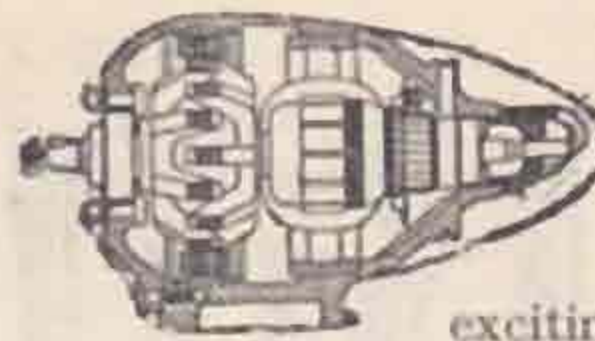
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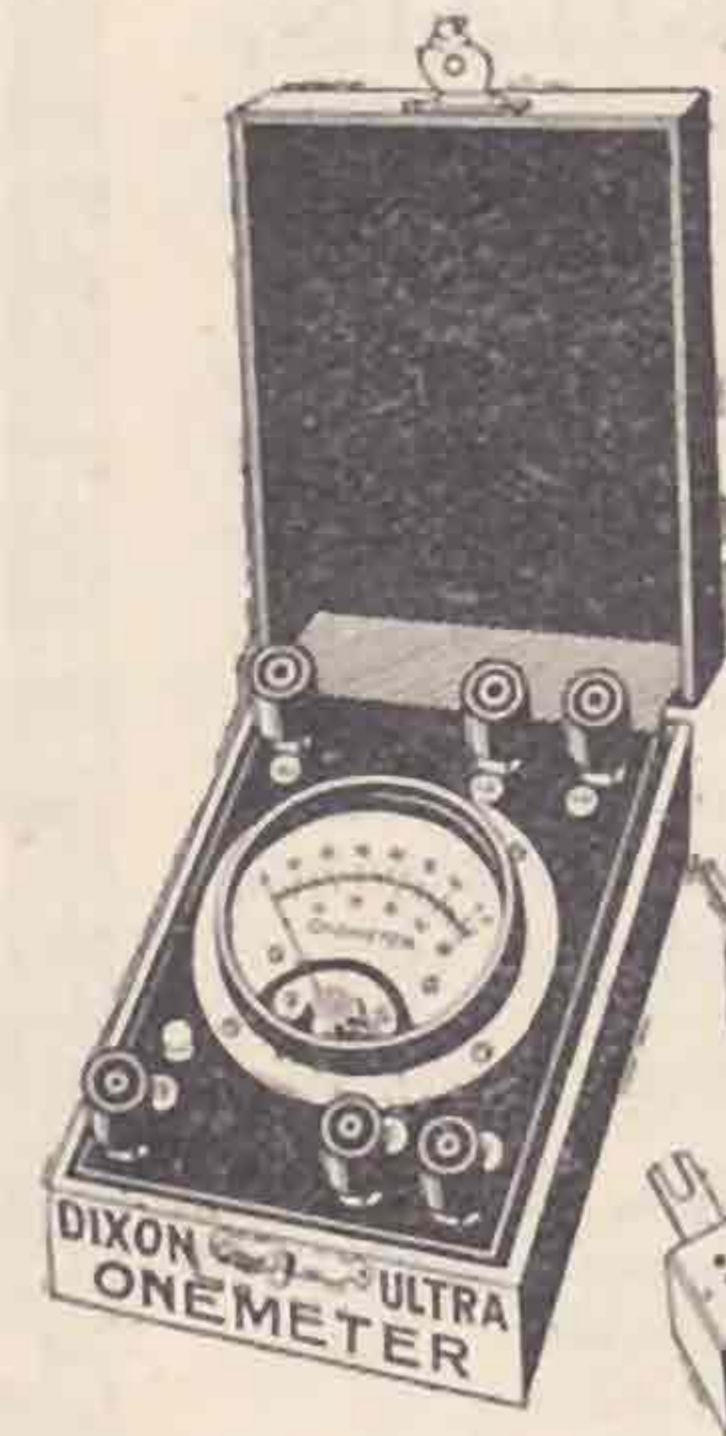
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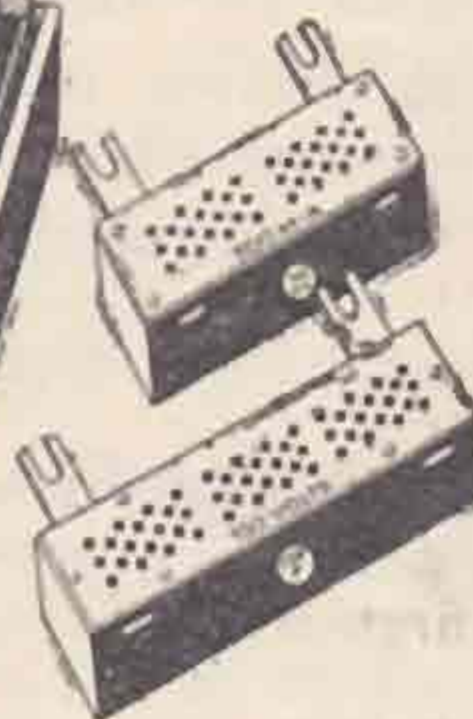
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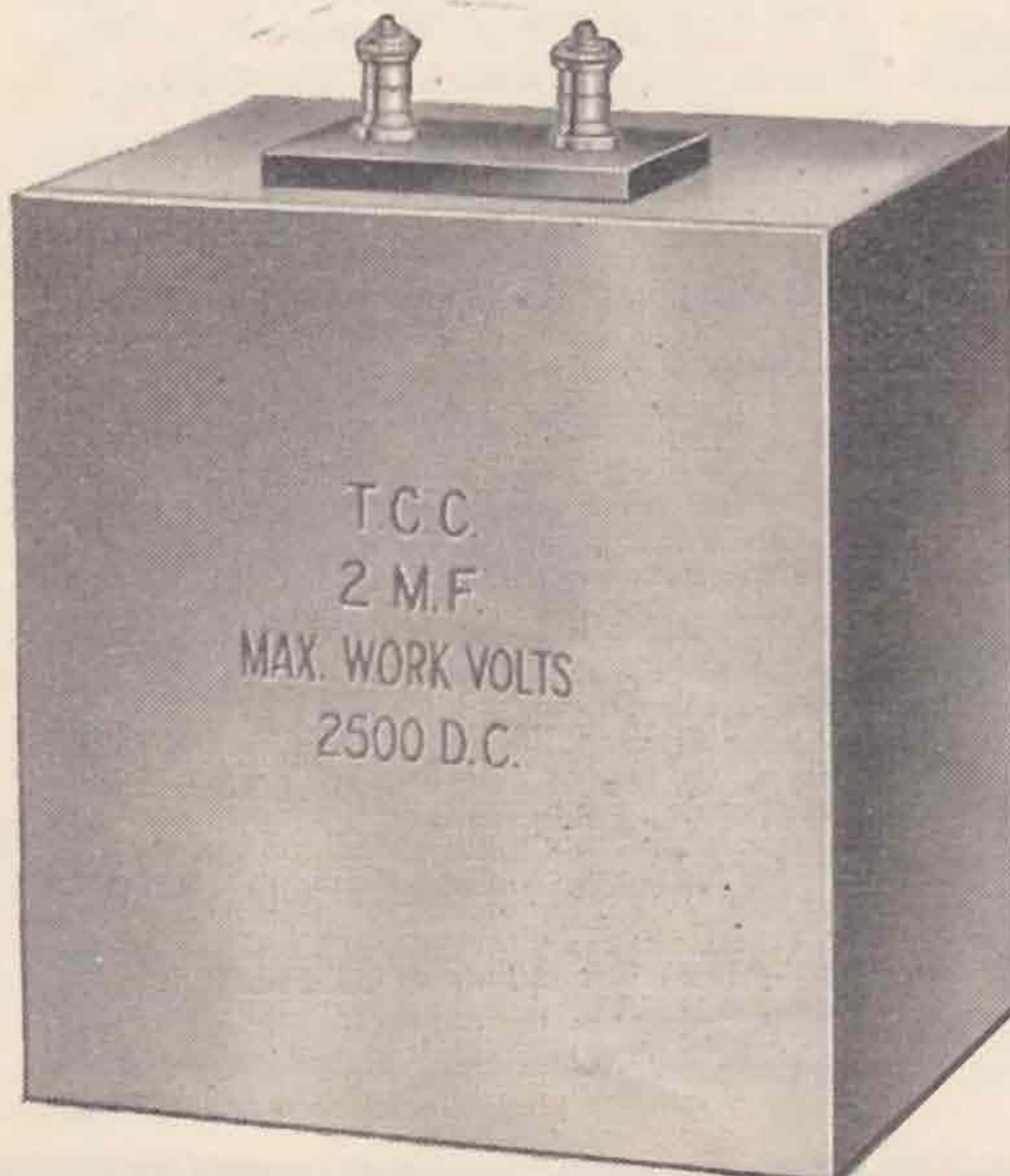
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# T & R

# BULLETIN.

*The only British Wireless Journal Published by Amateur Radio Experimenters*

AUGUST, 1927.

Vol. 3. No. 2

## EDITORIAL

### Sloppiness and QRM.

Listening on the 45-metre band at certain times makes one wonder why it is that the British amateur does not avail himself of the wonderful concessions which he has obtained as regards the wave-length bands which he can use. On listening on the 90-metre band one is inclined to think that this wave-length has been tried and condemned as utterly unfit for use, yet to the contrary some of the finest DX work has been performed between 90 and 100 metres; at least, perhaps we should say the most reliable DX work. Why, then, is it that we all crowd to 45 metres like a flock of sheep harried by the shepherd's dog? Why is that almost every amateur with a microphone seems determined to make himself heard on this waveband, or at least to add to the hopeless QRM which now so often prevails? We don't know. To be honest, it would seem that no useful experimental work can possibly be carried out under the conditions which so often pertain on this waveband, for times out of number we hear that deadly C.U.L. tapped out on the key, hundreds of times do we hear a 'phone station link up with a colleague, pass the time of day and close down complaining bitterly of the QRM, to which, incidentally, he has just added, and to which he adds again a few minutes later when he calls another station only to repeat the performance! Moreover, one station (no name, no trouble!) has transmitted speech for many months on this wavelength, and all the time he has known that his modulation is broken and savours of a broken transformer winding or something similar. He seems happy to carry on under these conditions and apparently has never remedied the fault. Why? Again we don't know! We have three excellent wavebands to use, one of which at least is almost entirely neglected—the 23-metre wave-length. Ninety metres is as silent as the depths of a country meadow, and 100 metres is no more busy. Curiously enough, this condition of affairs seems to be unnoticed by those who complain of the QRM prevailing on 43-45 metres.

Why? Perhaps the answer is that Hertz aerials and crystal control are to blame. Nobody wants to relinquish his Hertz or his crystal, which now work perfectly on 43—45, but of which he has had no experience on longer or shorter wave-lengths. Surely we can cry "shame" on the amateur experimenter who is afraid to venture into unknown regions without a pioneer? Come on now, who is going to be the first to break this deadly QRM business?

### Shall We Revive the Experimental Section?

Some few months ago we made an attempt to establish an experimental section of the T. & R. membership, but owing to certain unforeseen circumstances this was, we frankly confess, a failure. We think that one reason for this is that the Society itself is devoted purely to experiment and research and has no Section such as a Relay Section or a Traffic Section, therefore the need did not arise. Lately, however, we have given the matter further consideration, and as a result have decided to make the following suggestions, i.e. :—

- (1) To form an experimental section whose object it is to collect, tabulate and circulate information on certain selected subjects.
  - (2) To assist individual members interested in particular subjects to trace published works and literature on that subject.
  - (3) To place in touch with one another members mutually interested in certain aspects of the science.
  - (4) Register members as members of the Section.
- As regards (1), the circulation of information will, of course, take place through the columns of the BULLETIN, and will take the form of articles on certain subjects from time to time. In this case the work of individual members of the Section will be published, and will be prefaced by suitable matter and followed by reasoned deductions from the results of the work. Discussions may take place in the Correspondence Columns under suitable headings. As regards (2), this will take the form of the publication of monthly "Radio Abstracts," which will state the names of technical papers in which certain articles will be found and give a very brief abstract of the information contained in the article. (3) and (4) must be undertaken by the member who becomes personally responsible for the Section.

Now there should be no mistake as to the functions and objects of the proposed Section, and the opening of such a Section will depend very largely upon whether a member with the necessary qualifications and time to spare is available to undertake the work. He may reside in any part of the British Isles, but, if he is going to tackle the job, will need to be a real live wire, patient as a man can be, and always willing to assist experimenters within reason. If there are any offers we should be glad to receive them. Remember, it is an important job not to be lightly undertaken. In the meantime those desiring to join the proposed Section should merely send a post card to R.S.G.B., 53, Victoria Street, S.W.1, with their name, address and qualifications (if any), and state the subject in which they are interested, and whether they are willing to pay a small extra fee per annum for this and what amount they suggest. Nothing more at present, please!

### One Opportunity in the Year.

From time to time we hear from members who fancy that they have a grievance or a complaint regarding things that we have done or have not done, and we know that they are not always satisfied with our reply. On September 30 to October 1 you will have an excellent opportunity to have your say before all the Conventionists who will be present for the express intention of putting Amateur Radio on its legs for another year, and it is for you to see that you do your bit in the discussion or debate on October 1. There should be no mistake as to the reason for the holding of a Convention. It is first and foremost for the good of Amateur Radio and all other things take a second place for a few brief hours in the year. Do not forget to turn up and do your bit, however humble—even though it merely be the registering of a vote.

### What is Wrong?

We hear rumbles of many voices from some of the country areas, and it appears that there are many members who are not quite satisfied with our constitution and methods of doing business at Headquarters. This being the case, it is surprising that suitable representations have not been made to the various Area Managers apart from occasional letters from these members at Headquarters. Each Area has a representative on the Committee at H.Q., and this is the correct channel through which such correspondence should pass.

What is wrong with British Radio we do not know, and any ideas which may appeal to members should be sent through your Area Manager, who is the right man to do the necessary work in putting the matter straight. It is for him to see that your representations are sent to H.Q. and placed upon the Committee Agenda for discussion and necessary action, and no amount of talking and complaining that members can do amongst themselves is likely to help matters forward. Remember, that the movement can only be built to a strong and solid body by the united efforts of every member, and that the success or failure of amateur radio in this country depends upon the efforts at organisation and co-ordination of every single member. Straight talking and open discussion is the only remedy for real or fancied grievances, and it is quite clear that the Convention is the only outlet for such discussions as it affords members from all over the country to have a say in the government of the Society.

So don't forget to be there.

## Second Annual Convention, 1927.

A very interesting and entertaining programme is being arranged by Headquarters, and the principal items on the list are as follows:—

Friday, September 30.—Opening remarks at 6 p.m. by General Sir H. C. L. Holden, President of the Society, and lecture, etc., by the Marconi Company on "Beam Stations and Reflectors." This lecture should be of special interest to those interested in short-wave work.

The meeting will be preceded by tea at 5.30 p.m.

Saturday, October 1, 1927, at 11 a.m., Captain H. J. B. Hampson (6JV) will open a discussion on "The General Policy of Amateur Radio," and the meeting will adjourn for lunch at 1 p.m.

At 3 p.m. the meeting will proceed to the Wireless Exhibition, Olympia, to view the exhibits, etc.

7.30 p.m.—Dinner at Savoy or Cecil Hotel if at least 50 members will forward 7s. 6d. with intimation that they would like to be a member of such a party.

In addition to the above arrangements are being made for several surprise items which we know will be appreciated. Now everybody, make this Convention the greatest ever by first of all attending; secondly, joining in the discussion; and, lastly, sending your 7s. 6d. for the dinner. Everything else is being paid for by Headquarters, but members must make their own arrangements as regards billets. A limited number of members have kindly intimated that they can place bed and breakfast at the disposal of country members, but early application should be made to Mr. Exeter, London Area Manager, for these! Also, any town members who are able to accommodate one or more country members in this fashion would greatly assist by sending their names and what they will provide to Mr. Exeter.

This Convention has been discussed for some time all over the country. We have heard rumours that many have got plans, grumbles and suggestions they would like to bring forward. Come along everybody and let us hear them, and see if we can put them into operation. This is your chance for a whole year. Do not miss it!

### Sales Section.

#### Enamelled Plaques.

We have received inquiries as to the weather-proofness of the enamelled car plaques referred to in our last Editorial, and can say that one of these has been exposed in the open facing South-West for three months and shows no signs of deterioration at the time of writing. They sell at 3s. 6d., post free, or with station's own call sign painted on price 4s. They also make handy ornaments for the wall of the wireless den or the door of the "shack," and, of course, will outlast any other form of decoration of this kind.

#### Bulletin Covers.

As an experiment we had made a number of stiff covers with wires for keeping together the monthly issues of the BULLETIN. These we advertised, but the response was so poor that we decided not to stock them as a regular feature. We have lately received single inquiries for more of these covers



which we are unable to fulfill, but should a sufficient number of members ask for them we will order as soon as we have received enough inquiries.

#### Call Sign Badges.

From time to time we receive inquiries regarding the supply of small strip call sign brooches, a few of which we have supplied. The intention of these is that they can be worn on the coat at meetings, conventions and the like. We are unable to obtain them singly for members, as, although each has to be separately engraved, it is only by obtaining them in small quantities that we are able to sell them at 2s. 6d. each. Therefore, anybody requiring such badges should send his order with 2s. 6d., and we will deliver the goods as early as possible, but we cannot guarantee delivery under a month.

### Short Answers to Sharp Sentences.

BY THE OFFICE BOY.

Q.—I don't think much of last BULLETIN.

A.—Neither do we, we are too busy!

\* \* \*

Q.—Why drop the T. & R. from the emblem?

A.—We didn't, it got lost in the (con)fusion.

\* \* \*

Q.—Whoever heard of a microphone being shorted?

A.—We did in the last BULLETIN, and we have heard of it ever since.

\* \* \*

Q.—Do you spell calibration as calabration?

A.—Not as a rule.

\* \* \*

Q.—I am writing to you as Editor.

A.—Don't, we are contributing at present.

\* \* \*

Q.—An Ode to a Manager is not dignified.

A.—We've told him.

\* \* \*

Q.—Why not get more advertisers?

A.—Why not?

\* \* \*

Q.—Can't you liven up the BULLETIN?

A.—Sometimes. But it's your paper!

\* \* \*

Q.—Why do you keep appealing for money?

A.—It's a little habit we have.

\* \* \*

Q.—I sent two valves and a ten shilling note for repair.

A.—Presumably a case of a poor note.

\* \* \*

Q.—Why does . . . bubble when he is transmitting?

A.—It sounds as though he is teething.

\* \* \*

Q.—Do you think my contribution suitable for the BULLETIN or the wastepaper basket?

A.—Neither.

\* \* \*

Q.—Why should I pay an extra six shillings?

A.—You should not; we only want one.

\* \* \*

Q.—Will the T. & R. Committee continue to exist?

A.—As much as usual.

\* \* \*

Editor: You're sacked.

## Session 1927-1928

Papers and articles are required on the following subjects. Papers which are considered suitable will be read before the Society at the I.E.E. before publication.

#### 1. Fundamental oscillators:—

(a) Hartley. (c) Mesny.

(b) Armstrong. (d) Collpitts.

A description of the circuit aneration with best values for 45 and 23 metres should be given and, advantages of each circuit over the others mentioned.

#### 2. Methods of modulation:—

(a) Grid. (c) Choke.

(b) Absorption. (d) Others.

Advantages of each system and method of connection.

#### 3. Hertz Aerials, Theory of:—

(a) Current fed. (b) Voltage fed.

Lengths for 45 and 23 metres. Advantages of each type.

#### 4. Crystal Control:—

(1) Theory of quartz oscillators.

(2) Obtaining crystals at reasonable prices.

(3) The use of reaction.

#### 5. The reduction of interference with BCL's.

Please write and let us know which paper you propose to contribute.

## Incorporated Radio Society of Great Britain.

#### Official Tests—Aurora Borealis.

During the month of September the Northern Lights are very strong in Iceland, and the Society has arranged with Dr. Hans J. Vogler to carry out a series of tests in order to investigate the interesting relations between the different States of the lights and their effects on short waves.

We welcome the co-operation of all BRS stations (British Registered Stations, registered by the Society) and reports of reception on the following lines should be sent to the Hon. Organiser, Northern Light Tests Radio Society of Great Britain, 53, Victoria Street, S.W.1.

#### SPECIMEN LOG SHEET.

Date Time (GMT) time marks (hours, minutes)  
QRK QSS, QSSS, QRN QRM WX other remarks.

Reports will be personally acknowledged by Dr. Hans J. Vogler in due course, and that gentleman will prepare a report on the results of the tests after all results have been received.

Details of Dr. H. J. Voglers station are as follows:—

QRA: Dr. Hans J. Vogler, Akureyri 7, Box 63, Iceland.

QRC: 66° N., 18 W., Gr.

QRH: 32 metres.

QSB: AC or perhaps DC.

Call Sign: N I-TFHV.

Time of transmitting September 1 to 30, 1927, every evening from 20.00 to 24.00 G.M.T.

The preamble will be "CQ de NI TFHV—test—pse QSLL with all details of QSS es QSSS es QRN es WX es time marks—hr QRA is Vogler Akureyri in Iceland—test."

## Fading in Radio Compared with Other Natural Phenomena.\*

By H. A. P. LITTLEDALE, F.R.Met.Soc., A.M.I.R.E.

THE subject on which I am to talk to you this afternoon is that of "Fading in Radio compared with Other Natural Phenomena." Some mistake has, I think, arisen in connection with this title in the announcements of the lecture, and I refer to the matter now as I think it is of importance.

What I propose to try and do to-day is to explain to you what I have found fading to consist of. I will try and tell you HOW not WHY. Then I will try and explain how certain other natural phenomena behave themselves, and after that I will show that there seems to be a connection between them all.

Anyone who expects that I shall explain why fading takes place will, I am afraid, be disappointed, but I think I can tell you something about what takes place. At the end of the lecture, if there is still time, I will give some account of a certain hypothesis on which, I think, future work might usefully be based. But what I shall say in that respect is hypothetical, although as a matter of fact there is a lot of evidence available to support it. The investigations on which I have been at work since 1923 have been carried out on the wave band between about 250 metres and 500 metres.

Now, I think that it is generally quite well known that a lot of work has already been done by others on fading, and I hope that it will not be thought, because conclusions to which I have arrived are somewhat different to those come to by others, that I am venturing to put my work forward in opposition to that of others. I think that the phenomena on which I have been working are perhaps not quite the same as those which have been studied more generally. I have been working on what I suppose is called short period fading. The method which has been used by others is that of making accurate quantitative measurements of the strength of the electro-magnetic field at various distances from transmitting stations. Put into the fewest possible words, I think that the general conclusion to which these workers have arrived is as follows: That owing probably to the energy reaching the receiving stations by more than one path, interference effects are experienced which result in the fluctuations which are called fading.

About four years ago, when I first took up the study of fading, at a time when very little had been published on the subject, I realised that the quantitative measurement of signal strengths not only presented very great difficulties, but would be expensive, and that my mathematical knowledge would in all probability not be sufficient to make full use of such results even if I succeeded in obtaining them.

But it seemed to me that something might result

if an accurate and continuous time record of the relative strengths of the fluctuating signals could be made. My proposal was to make a very careful study of the horizontal or time scale, and as for the vertical or intensity scale to ensure as far as possible that the relative strengths were accurately suggested throughout each record, but not to attempt to draw any conclusions from these relative strengths.

There is no great difficulty, of course, in obtaining accuracy in the time scale. Put into a few words, the principal difference between my method and the now generally accepted method is: That whereas the usual method is concerned with the strength of the variations and is not much concerned as to when they take place, my method is almost entirely concerned with the question of time intervals between the variations. My method is strictly quantitative in the time scale, and this is the only one on which any important deductions have been based.

A few words regarding the apparatus in use.

This consists of a stable wireless receiving set, a screened local oscillator, an acoustic resonator and a Moullin voltmeter with a suitable galvanometer shunt. The signal is first tuned in and the oscillator adjusted so that the resultant beat note is that to which the acoustic resonator is tuned.

As the signal varies in strength, so does the intensity of the beat note.

This beat note, as already stated, is switched over to an acoustic resonator. It consists of two telephone earpieces mounted one at each end of a tube and precisely half a (sound) wave-length apart. The pitch used is that note which the phones most favour. The beat note current passes through one of these and sets the acoustic resonator vibrating. The second telephone earpiece vibrates in sympathy and the potentials generated across its windings are applied to a L.F. valve. The output from this valve is passed through a step-up transformer and applied across grid and filament of a Moullin voltmeter, the galvanometer needle of which indicates the fluctuations in the strength of the signal.

The apparatus is extremely stable and reliable, easily handled and intensely selective. It is quite easy to get the precise optimum beat note and to hold it. If, for example, a frequency of 750 K.C.s. has been tuned in on the set, heterodyned and applied to the galvanometer through the Moullin voltmeter, as described, no interfering wave which does not come within 250 cycles has any effect on the needle, and in practice, once the apparatus is adjusted, interference of any sort is seldom experienced. At 750,000 cycles a difference of 250 cycles is equivalent to a change in wave-length of .14 metre only. Atmospherics cannot get through except in negligible strength.

Much work was done on the relations between

\*A paper read before the Society June 22, 1927. Copyright reserved by the lecturer.

input and output. As a result it was shown that the characteristic is almost a straight line, and so the galvanometer readings may, I think, be taken as being approximately proportional to the square of the voltages in the electro-magnetic field in the vicinity of the aerial.

No attempt at quantitative measurements in the intensity scale has been made.

The records are made as follows: An accurate watch which has been checked by a time signal within an hour or so of the time of making the record is placed on the table close to the galvanometer. The reading of the galvanometer is taken at least at every quarter minute and entered in a record book. When fading is not very quick, this is sufficiently frequent to cover all the movements of the needle. But if the needle is moving quickly so that changes in the outline of the curve take place during the 15sec. periods, then an extra reading is made at  $7\frac{1}{2}$ sec. This gives eight readings per minute, and experience shows that this is enough. Smaller fluctuations in between are ignored. I have frequently taken eight readings per minute for two hours on end. Many of the records are almost entirely composed of quick fluctuations and a great number of the 230 records already obtained exceed four hours, and some are nearly five hours in length. I had hoped eventually to obtain them longer than this, but more than four hours at a stretch becomes very wearisome, and it would be necessary to work in reliefs.

The records are then plotted on scaled paper divided into inches and tenths of inches. The time scale is always the same, *viz.*, 1-10th inch = 15 secs.

The vertical scale for weak records is 1 scale deflection = 1-10th inch. But normally it is 10 = 1-10th inch. Many of the charts plotted from the records are over 8 ft. in length. This is a nuisance, but unavoidable. I have brought some of them for you to see to-day.

The method adopted of studying these records is as follows:—

The chart is first examined for zeros. That is to say, for points where the signals were so weak that the galvanometer needle registered zero. The points which are zeros and all the best marked low dips are marked with letters of the alphabet all the way along the chart to enable them easily to be identified and referred to. Certain other points may have also to be so marked, but the chart is always allowed to "speak for itself," and it generally does so, as I shall describe.

As it is not practicable to take more than eight records per minute, there is no object in having a time unit of less length than  $7\frac{1}{2}$  secs. I have therefore adopted  $\frac{1}{4}$ th of a minute as a time unit, and the unit of time which is used in this is  $\frac{1}{8}$  of a minute unless otherwise stated.

I shall show you to-night on the screen some of the analyses of my records, and really a close study of these is necessary in order fully to appreciate the nature and persistency of the periodicity which I have discovered to exist in them. I will only give a general account of them to-day.

The time intervals between marked points are tabulated for ease of study. The time interval between any two adjacent "fades" is called a *term* in this paper. That periodicity was in existence was clear from the very earliest charts which I made. But its nature eluded me for a long time.

Having now discovered something of its nature, I can say with confidence that it exists in every record I have taken.

To illustrate in general terms what takes place I will draw an imaginary record on the board (Figure 1).\*

AB will probably equal  $BC/2$ , therefore AB equals  $AC/3$ , or — AB will equal  $\frac{BC \times 2}{3}$ ; therefore

AB equals  $AC \times 2/5$ , BC equals  $AC \times 3/5$ . That is the sort of thing which persists for a long time. In this case we should probably find that AC equals  $CD/2$ , or that AC equals  $CD \times 2/3$ , and so on.

These effects sometimes lead, particularly in the longer terms, to divisions of  $\frac{2}{3}$  and  $\frac{1}{3}$ . The accuracy to which the divisions of the terms is done at times is amazing. At other times there is a slight shift, of which I will speak from actual examples in a few minutes. In my records I have really only had time carefully to study the principal fades, but in all those cases where I have studied the very short ones, also, I find that this type of periodicity continues right down to the smallest divisions which a time unit of  $7\frac{1}{2}$  seconds can show up. In point of fact, I sometimes think that the thing is really an additive effect, not a matter of division.

As I have already said, I am able to trace this sort of periodicity in every record which I have taken. I am forced, therefore, to the conclusion that the effect is real, and that it is continuous. The same type of periodicity occurs on all wavelengths between 265 metres and 500 metres, whenever measurable fading takes place. It is independent of the average signal strength in existence at the moment, distance between receiving and transmitting stations, or their relative directions. It occurs in records taken in America. It occurs in records of Continental broadcasting stations. It is independent of weather temperature and season of the year. In order to demonstrate it half-an-hour's record is generally sufficient, but the following conditions would appear to be essential. First, the record must give, practically speaking, a continuous trace. Second, highly selective apparatus must be employed. It follows from (1) that all records based on averages will tend to obscure the effect and will only reveal the long periods.

There is one other point I should mention here, I think, and it is this. When measuring the fluctuations of a carrier wave by this method a normal amount of modulation seems to have only a negligible effect. But some stations, especially Continental ones, are so heavily modulated that all the energy in the carrier wave passes into the side bands and there is nothing left in the carrier to measure. These stations are useless for the purpose.

Now the above description of the periodicity in fading curves is a generalisation, and no record ever fits exactly into it. But I think that every exception will be found to reveal within itself the relationship of  $\frac{2}{3}$ . This is, I think, of importance.

I will now explain in detail a few of my fading records.

The charts are so very long that it is impossible to throw them entirely on to the screen, but I have brought with me a number of them and you can see them for yourselves afterwards. I have

had one slide made, however, of a portion of chart No. 168. (Lantern slide No. 1.) (Figure 2.)\*

This is a very interesting record throughout its whole length, and this little bit of it is fairly typical of the whole. The record is of interest because it began well before sunset and displays excellently a general rise of signal strength about half an hour before sunset. It is a good example of nothing very particular happening at the moment of sunset.

I will write on the board the analysis of this portion. It is very simple.

$$\left. \begin{array}{l} E-F \quad 60\frac{2}{5} \\ F-G \quad 90\frac{3}{5} \\ G-H \quad 224 \end{array} \right\} \begin{array}{l} 150\frac{2}{5} \\ 224\frac{3}{5} \end{array} \left. \right\} 374$$

The relationships are so simple and so nearly perfect that they are almost too good to be true. And yet I can assure you that record after record displays the same sort of thing.

I said nearly perfect for, of course, to be absolutely perfect G—H should be 225 instead of 224. If you take the percentage of error from what would give a perfect relationship, one part in 374 comes out to .27 per cent.  $7\frac{1}{2}$  secs. out in  $46\frac{1}{2}$  minutes.

This error is not, in my opinion, necessarily to be accounted for by an instrumental or observational source. Note that the smaller division (the two-fifths portion) is TOO LARGE for the perfect relationship. I will a little later show you some others which are very similar in this respect, and which I think are very striking in their way.

Now I will show you an analysis of the whole of this same record Number 168. (Lantern slide No. 1A.) (Figure 3.)\*

Here is EF—FG—GH—which I showed you on the last slide.

The record shows up quite a number of divisions of  $\frac{1}{5}$  and  $\frac{2}{5}$  as well as  $\frac{3}{5}$  and  $\frac{4}{5}$ .

Note the long term EW = 1198 units, that is to say, nearly  $2\frac{1}{2}$  hours. It is broken up into two parts— $\frac{3}{5}$  and  $\frac{2}{5}$ . Notice that the  $\frac{3}{5}$  portion is (as is usual) a little too big. To be perfect it should be 513 units. The discrepancy expressed as a percentage of the whole long term—1198 units—is .65 per cent.

This is rather larger than the others which I shall show you later on, but it is of the same order and is in the same sense.

I think that this slight shift may prove to be of great significance if ever the time comes when we try to formulate a definite rule to cover all these effects. Let me draw your attention to

$$BD = 228 \text{ and } DE = 232.$$

These do not belong to the big term EW and in fact the signal strength began to increase immediately after E: it is a different series. But carry your eye down to

$$JK = 114 \text{ and } KM = 116.$$

I do not know what it means, but it can hardly be coincidence that these two terms which follow each other are exactly half of the other pair of terms.

Note that BC = 137 and so does OP.

Note the arrangement TU—U U2 —U2 W. The  $\frac{2}{5}$  portion is here situated in the middle of the  $\frac{3}{5}$  portion which now becomes two portions of  $\frac{3}{10}$  each. Later I will show you an identical example occurring in a record of the Earth-Air potential gradient.

Now I will show you the analysis of my record Number 184. I have the chart here for those who would like to see it afterwards, and this lantern slide (Lantern slide No. 2) (Figure 4)\* gives us the analysis. There is not time to point out to you all the wonderful relationships which occur in this, as in all records. Some are very subtle. But you will see that all through the same sort of thing is going on as in No. 168. There was over a six-months' interval between the dates of the two records.

I would like once again to say that this type of periodicity is indicated on every record which I have studied. It is not always so perfect as the examples I have given you, but there is no mistaking it.

I will now pass on from fading records to other phenomena connected with the upper atmosphere.

A great deal of material valuable for my purpose has been found in *Terrestrial Magnetism and Electricity*, in which journal may be found the account "Of an Auroral Expedition to Bossekop in the Spring of 1913," by Professor C. Stormer.

In the time at my disposal I cannot explain the very beautiful method employed by Professor Carl Stormer, but his work is generally acknowledged to be of the highest value and accuracy, and we are certainly safe in accepting it. What he did was not only to fix the height of an enormous number of recognisable points on various auroras, but also their positions in space, with the result that he was able to plot projections of them on to a map of the Earth. It was, of course, a photographic method.

I have searched among the charts and diagrams published in this account for sets of parallel curtains obtained from a single observation.

In Vol. XX, Fig. 19, there is a very interesting example of which a sketch copy is shown in Lantern slide No. 3. (Figure 5.)\*

It will be seen that the points numbered

	LINES.
1—10	A
11—15	B
16—21	C
21—28	D
29—33	E

form 5 almost parallel lines, and for easy reference I have labelled them with letters as above.

Now, if a line ST be drawn through the five lines and the distances along ST as cut by A, B, C, D, E, be measured in tenths of millimetres, we get—(the unit of measurement is, of course, immaterial, and as the lines are parallel, the angle at which they are cut by ST will make no difference to the relative distances between the lines as measured along ST).

I will write out the analysis on the board:—

$$\left. \begin{array}{l} AB=32 \\ BC=13 \\ CD=30\frac{1}{5} \\ DE=60\frac{3}{5} \end{array} \right\} \begin{array}{l} 45 \\ 90 \end{array} \left. \begin{array}{l} \frac{1}{5} \\ \frac{2}{5} \end{array} \right\} 135$$

The fractions give the ratios as usual.

Of course, if AB=30 and BC=15, then the same ratios would be apparent there. The error is only  $\frac{1}{5}$  of a millimetre in any case.

On the left-hand side of the same Fig. 19 in *Terr. Mag.* we find another set of three curtains:—

$$\begin{array}{l} 23-20=F \\ 1-10=G \\ 11-19=H \end{array}$$

from the perfect ratio being that the smaller portion is again too LONG, and that the percentage

FG=70

GH=20

The very slight alteration to FC=72

GH=18

would give the relationship of  $\frac{2}{3}$  and  $\frac{1}{3}$ .

The only other set recorded containing a sufficient number of parallel curtains to enable us to measure up their relative distances is that mentioned on page 5 of Vol. XX. No. 1 *Terr. Mag.* Concerning these, Professor Stormer says: "We have clearly three curtains, one behind the other, with an interval of about 60 km." This indicates that there were two equal intervals.

The similarity between the relative distances between these auroral curtains and those noted for the principal divisions found in fading records is apparent.

It is unfortunate that I have no further material of this sort sufficiently definite to analyse. The remaining projections which are published in the results of the Carl Stormer expedition all point to the same conclusions, however.

I consider that the case AE is evidence that the ( $\frac{2}{3}$ ) relationship exists among the auroral curtains and that the two other cases available also support this view.

I will next consider some published records of variations in the magnetic elements.

Before examining the evidence by my method, there is a point which must be insisted upon. It is this: When a wireless signal is fading in and out rapidly, and with a heavy degree of fluctuation, it is almost always found that zero points and maximum points are of very short duration. This is not invariable, but, generally speaking, a fine fading display is marked by short minima and short maxima. From that it stands to reason that, unless a record is practically a continuous record, there is great danger of losing the effects.

Hence it follows that all data based on averages or means are almost useless for this purpose. So, also, are those of which the observations are separated by long intervals of time.

A study of the published material of variations of the magnetic elements reveals many records made at five-minute intervals. A glance at almost any of my fading charts will convince you how little chance of showing up the ( $\frac{2}{3}$ ) effect such records would have. The effect would be obscured.

The records which I examine below were taken at fairly frequent intervals, and are not averages.

Lantern slide No. 4 (Figure 6)\*, is an analysis of one out of three declination tables made on the same lines as the fading records. The published values were plotted as curves. The best marked dips were lettered and numbered, and the time interval between these were measured up and treated as terms. The degree of accuracy is not quite so high as usual, because these are one-minute intervals, but the same class of periodicity is in existence. Of the three records published at the same time, all were alike in showing up the periodicity.

Lantern slide No. 5 (Figure 7)\* is an analysis of a potential gradient curve, the record being treated exactly as before. The  $\frac{2}{3}$  relationship is again exemplified, and it will be noticed that the long term AM, which is 522 minutes long (nearly nine hours), breaks into two portions,  $\frac{2}{3}$  and  $\frac{1}{3}$ ; the discrepancy and of Helium gas gives results which are in all ways similar.

of error is .23 per cent. of the whole long term. This is almost identical with one of the fading curves, you will remember. Its error was .27 per cent.

Now please note how AB, BC and CD are arranged. It is very pretty how the  $\frac{2}{3}$  portion is situated in the middle of the  $\frac{2}{3}$  portion, breaking it up into two  $\times 3$ -10ths. This is identical with the arrangement I pointed out to you in record 168 (lantern slide No. 1a). (Figure 3).\* This is a potential gradient curve, and I think this similarity to the fading curve may be said to be striking.

I will now say something about sunspots.

The same effect is fully in evidence throughout the whole period over which sunspot records are available.

A table of the observed sunspot relative numbers from 1749 to 1924, compiled by A. Wolfer, appears in *Terrestrial Magnetism and Atmospheric Electricity*, Vol. XXX, No. 2, June, 1925.

My method of using this most valuable information has been as follows:—

The whole record has been plotted with the numbers as ordinates and single months as abscissæ. The resultant curve is a series of wave-like undulations. The maxima are, roughly speaking, equally spaced between minima and the periods from minimum to minimum are very roughly equal and are of the order of 11 years. The outline of the curve is throughout very much broken by indentations.

As I had previously found that it was more satisfactory to study the minima rather than the maxima, I again adopted this course.

The curve is a very long one and cannot here be reproduced.

I have prepared a lantern slide of a part of the table relating to the sunspot cycle (No. 6). (Figure 8).\* I wish to direct attention to the fact that simply by grouping the terms as they seem inclined to fall in with this type of periodicity, two long periods are obtained, namely, from

March, 1784—February, 1843—708 months.

March, 1843—February, 1902—707 months.

That is to say, two principal cycles of 59 years each. (I am sorry to have lost a month, but I simply cannot find it.)

I wish to lay particular stress on the fact that not only are these two long terms equal but that they are each broken up into  $\frac{2}{3}$  and  $\frac{1}{3}$  ratios, the error being .57 per cent. of the whole term, the  $\frac{2}{3}$  portion being too great and the  $\frac{1}{3}$  portion too small, as usual. This ratio, which is the outcome apparently of the  $\frac{2}{3}$  relationship, also appears between long terms in fading records. A very interesting little point is this: M—M14=122, and this does not apparently break up into the usual divisions. K9—J15=183 and also does not break up. But this later term equals the former  $\times \frac{3}{2}$  exactly.

Note also: that K9—H=308 and F11—B1=307 are each divided in the same way (to within the single unit discrepancy).

I have analysed the sunspot cycles at considerable pains because they are by far the most extensive material available after my own fading records.

It cannot escape your notice, I think, that the greater the amount of material available the more likely it seems to be that some law is at work.

There is not time to-day to do more than mention the fact that a study of the spectra of the Aurora Drawing the line QR to cut these curtains, we have in tenths of millimetres:—

The series in both cases ends up with two portions  $\frac{2}{3}$  and  $\frac{1}{3}$  of the whole long term. In both cases the  $\frac{2}{3}$  portion is too great, and in the case of the Aurora the discrepancy is .52 per cent. and in the case of Helium it is .43 per cent.

I cannot find any indication of this relationship existing among the spectral lines of Hydrogen, and I think that is very interesting and possibly very suggestive, when one takes into account what is the probable constitution of the gases in the upper atmosphere.

Something, to which I shall refer later on, suggested to me the rings of the planet Saturn as a suitable subject to study. I have analysed these in detail in Lantern Slide No. 7 (Figure 9).<sup>\*</sup> Here, once more, are all the old relationships. Perhaps the points which are most striking are, firstly, that when the diameter of the planet is put into the series, the final relationship between the main terms is that of  $\frac{2}{3}$  and  $\frac{1}{3}$ . But when the semi-diameter is placed in the series (which would appear to be the correct course) the final relationship is  $\frac{2}{3}-\frac{1}{3}$ . The error is .2 per cent. and, as usual, the  $\frac{2}{3}$  portion is the part which is too long. Of course I did not measure these—I got them from a reliable text book.

When the Satellites of Saturn are studied it is found that similar relationship exists between their interorbital distances, the relationships generally being  $\frac{2}{3}-\frac{1}{3}$ . In this case *alone* have I found that the "Series" ends up with the  $\frac{2}{3}$  portion too small. The discrepancy is .8 per cent. of its whole. I think their orbits may not be circular, and this would complicate matters.

The orbits of the Satellites of Jupiter give a very nice series, ending up with a  $\frac{2}{3}-\frac{1}{3}$  relationship, of which the  $\frac{2}{3}$  portion is .24 per cent. too large. Just as usual. Same percentage and same "sense."

The orbits of the satellites of Uranus end up with a  $\frac{2}{3}-\frac{1}{3}$  relationship. The  $\frac{1}{3}$  portion being too large, the percentage of error being .2 per cent.

I think I have given enough examples for to-day.

The finding of the  $\frac{2}{3}$  relationship in existence among the rings of Saturn and planetary satellites, as well as between the curtains of the Aurora, was of the first importance to me, because it fixes the relationship as one which can, and does, occur in space. As I have already reminded you, it is only necessary to combine these space relationships with continuous relative movement to get a periodicity of the same character.

There are many other stellar indications, but time will not allow me to go into them. I will pass on now to

#### WEATHER CONDITIONS.

There is in existence a very generally held opinion that the variations in wireless signal strengths are in some way connected with weather changes.

Opinions held in this way must, of course, always be viewed with suspicion, but frequently are well worth investigating. In my own records I have on many occasions noted what at the time seemed to me to be instances of a connection between these two things.

At one time I kept all the weather reports as published in the *Times*, with the barometrical charts of the British Isles daily. These were compared carefully with the records of fading, and attempts made to trace any connection there might be between various types of fading with types of weather, etc. After several months' tedious work, the attempt

had to be written down as a failure. At times it appeared that a positive result was shaping itself, but these cases invariably broke down when further tests were applied. The result must be classed as negative.

But there is more to be said.

Some of you may have heard of the Brückner weather cycle. If not, Dr. G. C. Simpson, F.R.S., has given a very valuable account of it in "The Nineteenth Century and After" for January, 1926, which you could read if interested.

There is no doubt that the Brückner Cycle exists. It is simply this. That meteorological and weather variations all over the earth tend to repeat themselves in thirty-five or thirty-six years. Note the period.

Now you remember I asked you to make a mental note of the sunspot cycles which I had discovered by my method of analysis. They were 59 years, and if you will follow this on the blackboard, please—

Brückner Cycle	Sunspot Cycle.
35-36 years.	59

3

5)177

35.4 years.

That, I think, indicates where the connection may be sought. Weather and "fading" may be found to be influenced by the same thing, and that thing may be connected with sunspot activity. At any rate, the figures are now before you. The  $\frac{2}{3}$  relationship is perfect.

Personally, I do not think weather has any influence on radio. But I do believe there may be a common cause.

I have now shown you, very briefly it is true, some of the evidence.

I will now attempt to review it.

We have in the case of all these observations of all kinds which can be plotted as curves a series of terms. These terms are the distances measured in arbitrary time units between the principal dips. In the case of the distances between the curtains of the Aurora and the rings of Saturn, etc., the terms are actual distances measured in spatial units. The periodicities of all the phenomena under review which manifest themselves to us in time reveal what I have called the  $\frac{2}{3}$  relationship. Those which are spatial in character reveal the same relationship in space. In the case of the Helium and Auroral spectra the relationship appears unmistakably, and may be reckoned as a spatial relationship if the length of the waves is considered, or as a time relationship if the frequency is considered.

The relationships are, I think, indisputable. The question is: "Is there any connection to be traced between all the phenomena showing the relationship, or is it chance?" I believe there is a connection. Chance would not persist.

The fading records which I have taken constitute a very large bulk of material. But they do not, of course, make anything like a complete record. It is just a series of samples taken here and there from what I believe to be an immense series. It is not, therefore, to be expected that anything which we could call final terms could be arrived at. But in the case of the rings of Saturn, there is something like finality. Here we get a relationship of  $\frac{2}{3}$  and  $\frac{1}{3}$ , which is common to fading, sunspot cycles, spectrum of Aurora and spectrum of Helium. Nor is this all.

The  $\frac{1}{7}$ — $\frac{1}{4}$  relationship is not precise. There is a small error in all cases. It is about .5 per cent. or .25 per cent. of the whole term. This small error from the exact relationship practically always reveals itself on the same side. The  $\frac{3}{7}$  portion is always too great, and the  $\frac{1}{4}$  portion is always too small. There is, in fact, a sort of shift. In all the fading curves I have taken, the recurrence of a slight shift from the perfect relationships has been noticed from the very earliest days, at a time when only wireless curves were being studied. The error has generally been, as I have shown you, about .25 per cent., exactly like the other instances.

The exception, therefore, would seem to provide an additional proof of the rule, for it is to me, at any rate, scarcely conceivable that such apparently widely separated phenomena as the Rings of Saturn, Sunspot Cycles, variations in the magnetic elements of the earth, and variations in the received strength of wireless signals should display the same relationships if there were not some law common to all or some cause controlling them all.

Up to now I have placed facts before you, or, at least, what I believe to be facts. I am comparatively safe as yet. But now, I suppose, I must venture to suggest something, not to account for all those facts (I am not so rash as all that), but to suggest something as a hypothesis on which to base future work.

Now supposing you were handed a piece of some mineral, such as a rock crystal, and you were told that one of the properties of this crystal was that when a beam of light or X rays was passed through it that there appeared on the screen shadows arranged in a certain way, and that chance was out of the question, and could not account for them. I think you would be justified in saying—even if you had no expert knowledge of crystals—that this property must reveal something of the internal structure of the crystal. And I think that if this really did occur, it would be possible to find out a good deal about that crystal's inside simply by studying the shadows.

Now I place three facts before you to-day:

- (1) That wireless signals fade according to a definite type of periodicity.
- (2) That magnetic and other allied phenomena, particularly those which we are accustomed to associate with the upper atmosphere, do the same thing.
- (3) That this relationship can and does exist as a spatial relationship in many things in the universe. It is not always a pulsation (if, indeed, it ever is). It can be spatial.

Am I not entitled to say—

Well, I suppose that these facts reveal something of the structure of the upper atmosphere.

That is the hypothesis on which I am basing my future work.

I think that these facts, of which I have given you some account, point towards the probability of the upper atmosphere having a definite structural arrangement. It is an accepted fact that matter is discontinuous. The electrons and protons are spaced apart and the model of an atom is almost all space. In interstellar space there is not much doubt as to the discontinuity of matter. We are not connected to the moon nor to the sun—as far as we know.

## British Receiving Stations.

A number of members of the T. & R. are actively engaged in studying the vagaries of short waves from the point of view of reception, and they are always willing to listen for, and report upon short wave signals from all over the world.

They often send report cards giving details of their observations, and upon request by such members, headquarters issues numbers, to put on their cards, in order that replies to their reports may quickly be identified on arrival at the QSL Section, and to facilitate the filing of their stamped addressed envelopes, etc.

- B.R.S. 1. H. A. G. Quaintance, 55, Green Lanes, London, N.16.
- „ 2. K. B. Davis, 140, College Road, Moseley, Birmingham.
- „ 3. F. Smith, 101, Highfield Road, Saltley, Birmingham.
- „ 4. G. White, 55, Clarence Road, Derby.
- „ 5. G. E. Clothier, 5, Fenswood, Long Ashton, Birmingham.
- „ 6. A. Cross, The Manse, Nuthill, Perthshire.
- „ 7. F. A. Robinson, "Rotherwood," Jockey Road, Sutton Coldfield.
- „ 8. Unassigned.
- „ 9. A. J. Perkins, 117, St. Asaph Road, Brockley, London, S.E.4.
- „ 10. W. H. Talbot Smith, 16, Farman Road, Coventry.
- „ 11. F. T. Cowing, 70, Park Street, near St. Albans, Herts.
- „ 12. A. E. Watts, 58, Woodside Avenue, Highgate, London, N.6.
- „ 13. R. N. F. Allen, 28, St. Peter's Grove, Southsea, Portsmouth.
- „ 14. J. S. Drewett, 8, Blatchington Road, Tunbridge Wells, Kent.
- „ 15. C. W. Coomber, 53, The Avenue, Sunbury-on-Thames, Middlesex.
- „ 16. R. W. Lodge, 309, Albert Road, Langside, Glasgow.
- „ 17. H. E. Cook, Bessemer Cottage, Tyttenhanger Green, St. Albans, Herts.
- „ 18. L. J. Hows, 93, Albert Road, London, E.8.
- „ 19. C. A. Brown, 93, Mossgiel Road, Newlands, Glasgow.
- „ 20. J. Hollingworth, Rearsby, St. Peter's Road, Broadstairs.
- „ 21. N. Westbrook, The Poplars, Sandhurst Park, Tunbridge Wells, Kent.
- „ 22. E. J. Erith, Meadowside, Loughton, Essex.
- „ 23. D. K. Forbes, Gable End, Rusthall, Tunbridge Wells, Kent.
- „ 24. H. L. Sulman, 31, The Avenue, Brondesbury Park, N.W.6.
- „ 25. T. A. Iserbyt, "Lynmouth," 18, Broughton Road, Thornton Heath, Surrey.
- „ 26. A. S. Williamson, 106, Rushdale Road, Meersbrook, Sheffield.

\*All tables, etc., will appear in the September issue.

## Distant Control Switching.

The best position for so many receiving sets is at the back of the house near the aerial, short lead-in and earth wires being imperative, but listening is probably desired in front and upper rooms. The need for a wireless self-starter to switch on from any listening point is soon apparent where a set is constantly in use on one station. The value of distant control devices is the use of a very small current to control a very much larger one, and these controls or relays may be classed as (1) high tension, (2) low tension. The first, see Fig. 1, is operated by a sensitive relay energised by current from the H.T. battery passing through the loudspeaker, and such a relay will function on a control current of under two milliamps. A Weston relay, with a series resistance of 50,000 ohms in the moving coil circuit, will work well, but its contacts for the L.T. battery control should not be loaded above 250 milliamps or the filament current of three D.E. valves. Another type of relay is the Siemens or electromagnetic type, as used by the G.P.O. and adopted in various forms for radio relays. This has an iron core wound with thousands of turns of fine wire attracting a pivotted armature, which pushes two silver contacts on light spring arms together. This type will control current for about four or five valves. The coil of the relay, if for use on two wires through H.T. and loudspeaker, is wound to a high resistance to limit the current to two milliamps taken from the H.T. battery. A relay of 5,000 ohms needs a resistance of about 45,000 ohms added in series with it for an H.T. of 100 volts on last plate. The H.T. system has the advantage of not needing extra control wires, but requires a more sensitive relay than other systems. Connections are as in Fig. 1, where it will be seen that the completion of the output circuit at the loud speaker by a switch, or insertion of plug, connects H.T. + and - through speaker and relay windings. Current then flows energising the relay armature, which presses the L.T. battery contacts together and the filaments are lit.

The second or L.T. system, Figs 2. and 3, has additional control wires run with or near the loudspeaker leads, and either uses a double plug-switch or push button at these points. When it is desired to listen in, this four-pin plug is inserted, or switch closed, which completes a circuit through windings of a relay of about 1,000 ohms, connected to a 4 to 6-volt battery, either a small auxiliary battery or the filament battery, when a current of 4 to 6 milliamps will pull over the armature and spring contacts, thus lighting the valves and the loudspeaker at once bursts into song. So long as a control is left on at any one point in methods 1, 2 and 3, it is not possible to switch off anywhere else, and this has caused the introduction of another type of relay, which is, perhaps, the most efficient as it consumes no energy. The previous two methods may be called "constant current relaying," as current must be constantly passing to retain the relay in action. By using a spring-driven distant control switch, which needs winding about once a year, connected to the control wires through a 4½-volt pocket cell, the self-starter can be operated

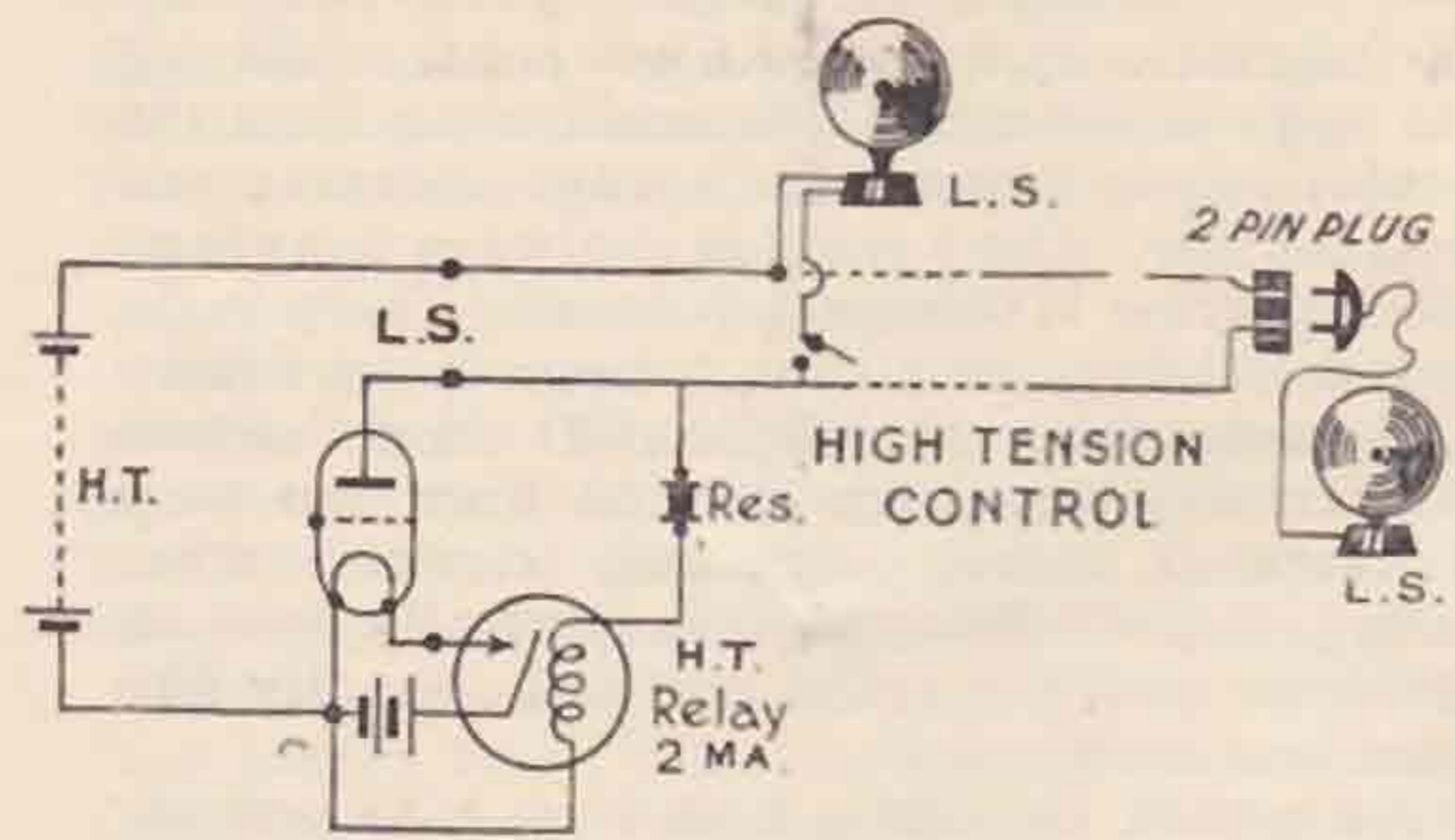


FIG. 1.

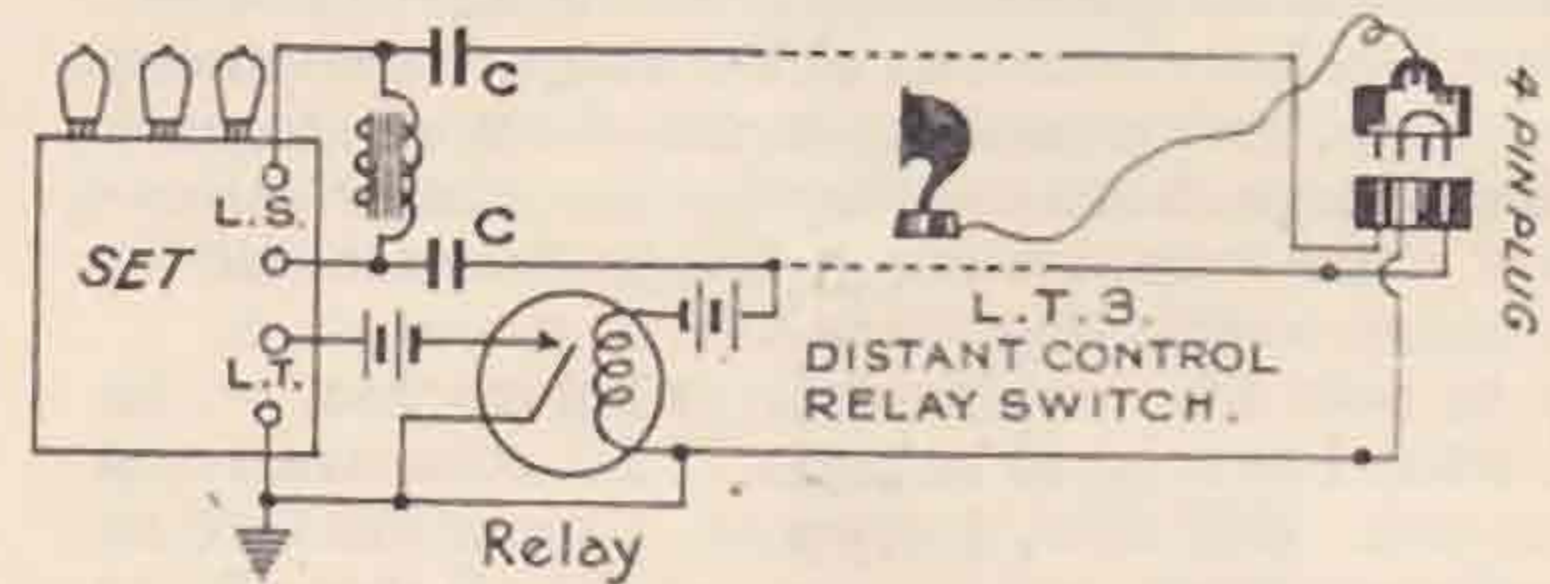


FIG. 2.

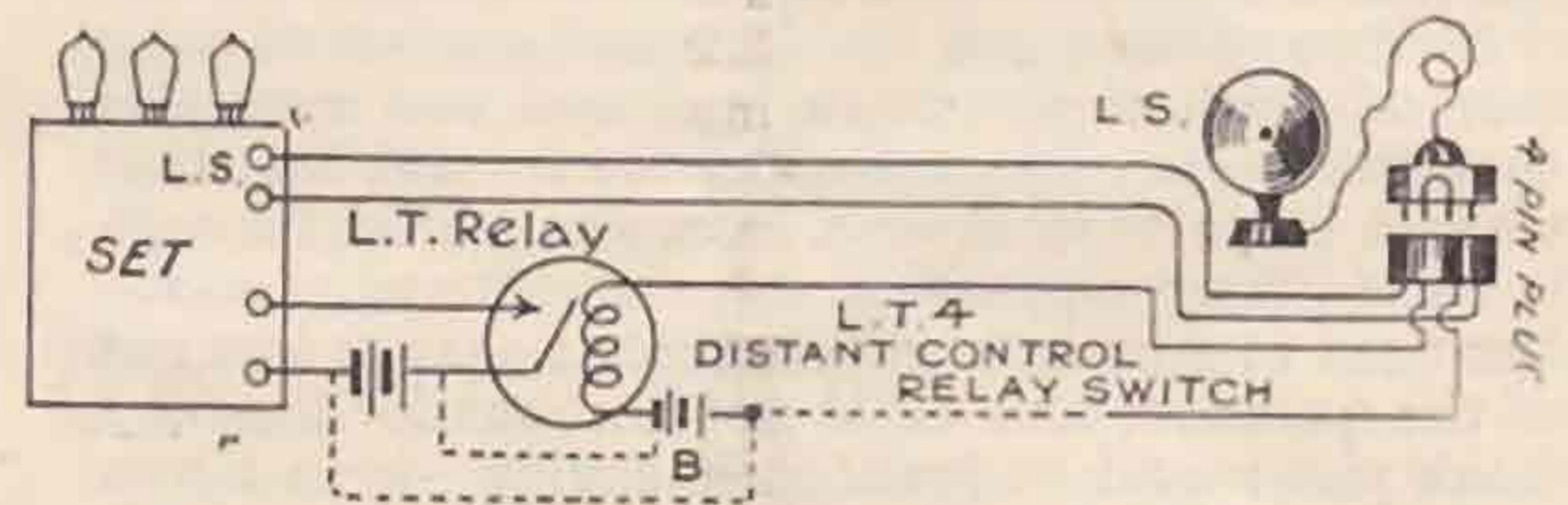


FIG. 3.

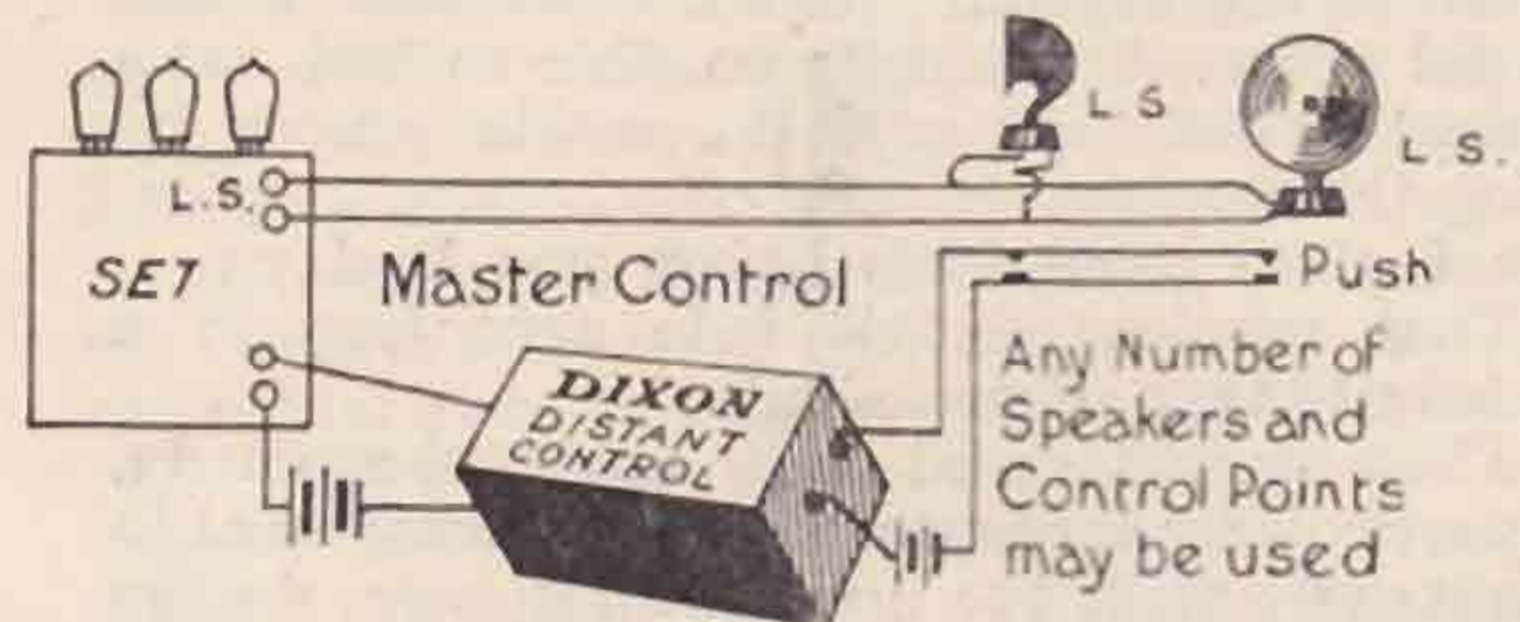


FIG. 4.

by one touch of a push button if it is required to switch on, or off, at any point, or the control buttons can be fitted at master control points only, so that, when bedtime comes, the switch "off" can be made positively by the master of the house. The connections are as Fig. 4.

To sum up, the H.T. control has the advantage of requiring the two loudspeaker extension leads only, but the relay must be sensitive, of very high resistance, and costs 25s. to 30s.

The L.T. relay is more robust, but needs an extra wire or pair of control wires. Cost 12s. 6d. to 17s. 6d.

The distant control switch also needs an extra wire or pair for control and spring needs winding like a clock once a year. It has the advantage of not taking current except for a fraction of a second, and is a master stopper, as well as a starter of reception. Cost 15s.



# Indian Radio DCR.

It will no doubt interest quite a few "G" stations to see the diagrams of the apparatus at AIDCR. Both transmitter and receiver are of the simplest type and are quite straightforward. The values of components are as follows:—Transmitter; H.T. is derived from a rotary transformer, input 12 volts D.C. at 15 amps., output 1,000 volts at 60 milliamps D.C. condensers, C.1 is an Ormond S.L. of the ordinary receiving type .0005, C.2 is another ordinary receiving type by Jackson Brothers, .00034 C.3 is a Dubilier, tested to 6,000 volts, .00015 C.4 is the same as C.3, C.5 is an ordinary receiving type of fixed condenser, .0002 C.6 and C.7 are Dubilier, tested to 6,000 volts, .002.

L.1 is wound with 12½ turns of ½-inch copper tube, diameter of coil 4¼ inches and spaced 3-8 inches. L.2 is wound on an ebonite former, 2½ inches in diameter, 250 turns of 22 SWG, D.S.C., L.3 is wound on same size former and consists of 60 turns of 20 S.W.G. D.S.C.

C3 is a fixed condenser of .0003 incorporated with the "Variohm" grid leak. C4 is a Lissen fixed condenser of .002 and C5 is a Mansbridge 2 Mf. fixed condenser. The grid leak is a "Variohm," 50,000 ohms. to 40 megohms. L1 is wound on an ebonite low loss former 4½ inches in diameter and 6¾ inches long; 16 turns of 18 S.W.G. bare

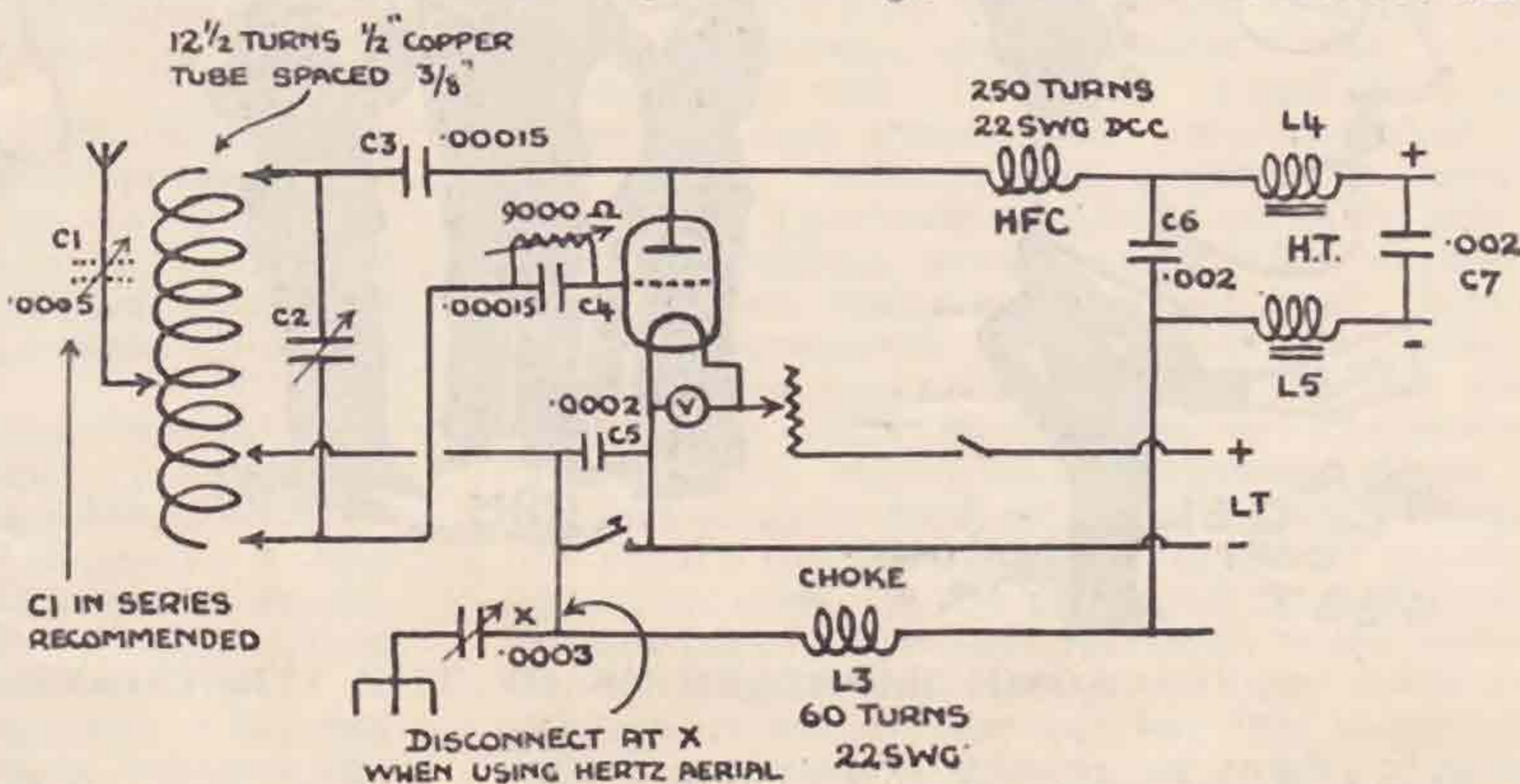


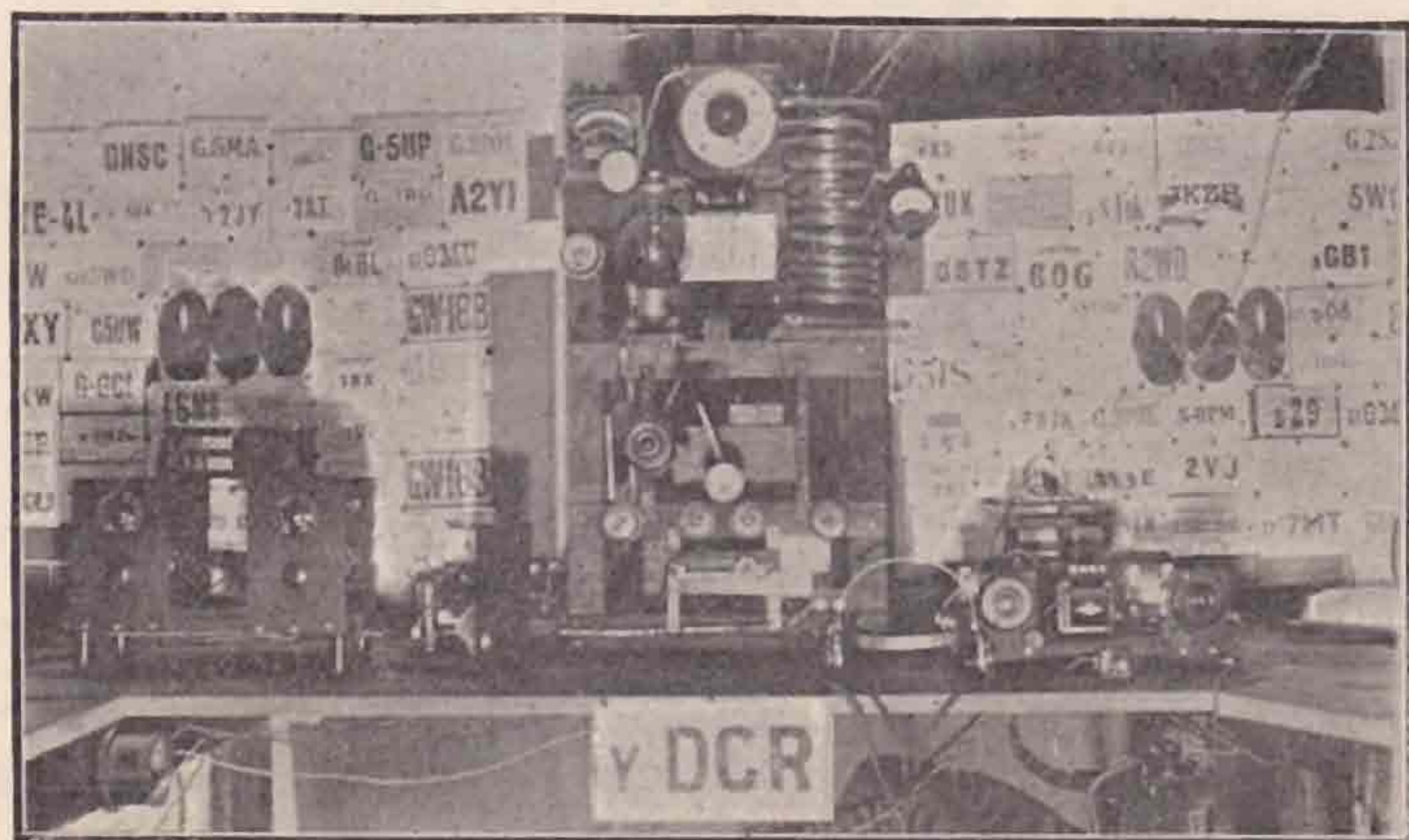
Fig. 1.

copper wire, spaced 3-8 inches and tapped at every turn. With this coil a wavelength between 19 and 80 metres can be tuned to with the aid of the variable tappings. L2 is wound on an ebonite tube former 2½ inches in diameter and 4 inches in length. 250 turns on 22 S.W.G. D.S.C. is wound in a single layer. The L.F. transformer is an Igranic 5-3, telephones, Browns' "A." A V24 valve with 60-80 volts to the plate is used as the detector valve, and a Mullard "R" with 40-60 volts to plate is used in the L.F. side.

The best DX obtained with this receiver is: (1) Reception of GI6MU when his input only 2.5 watts; (2) reception of KW3 when his input only 1 watt; (3) reception of GI6MU, G5KZ, G2NH, G5HS, during the QRP test last November. The reception of GI6MU on fone is often attained. The single feed Hertz type of aerial is used; this is 45 feet high and the

length is made variable by the insertion of links or insulators to suit the particular wavelength it is desired to work on.

Continued on page 16.



The grid leak is wire wound and variable from 5,000 ohms. to 9,000 ohms. The smoothing chokes, L.4 and L.5, are of 15 henries each.

With this simple transmitting circuit and with a power never exceeding 60 watts, DCR has been QSO with 35 countries all over 3,000 miles away, 103 different stations, and 692 QSO's also all over 3,000 miles. The best DX is a QSO with ARCX, a Norwegian whaler in the Antarctic, approximately 10,000 miles.

Fig. 2. The receiver is also a very common circuit, a modified Reinartz. The variable condensers are Ormond S.L.F. of .00031 and are fitted with 18-inch ebonite extension handles.

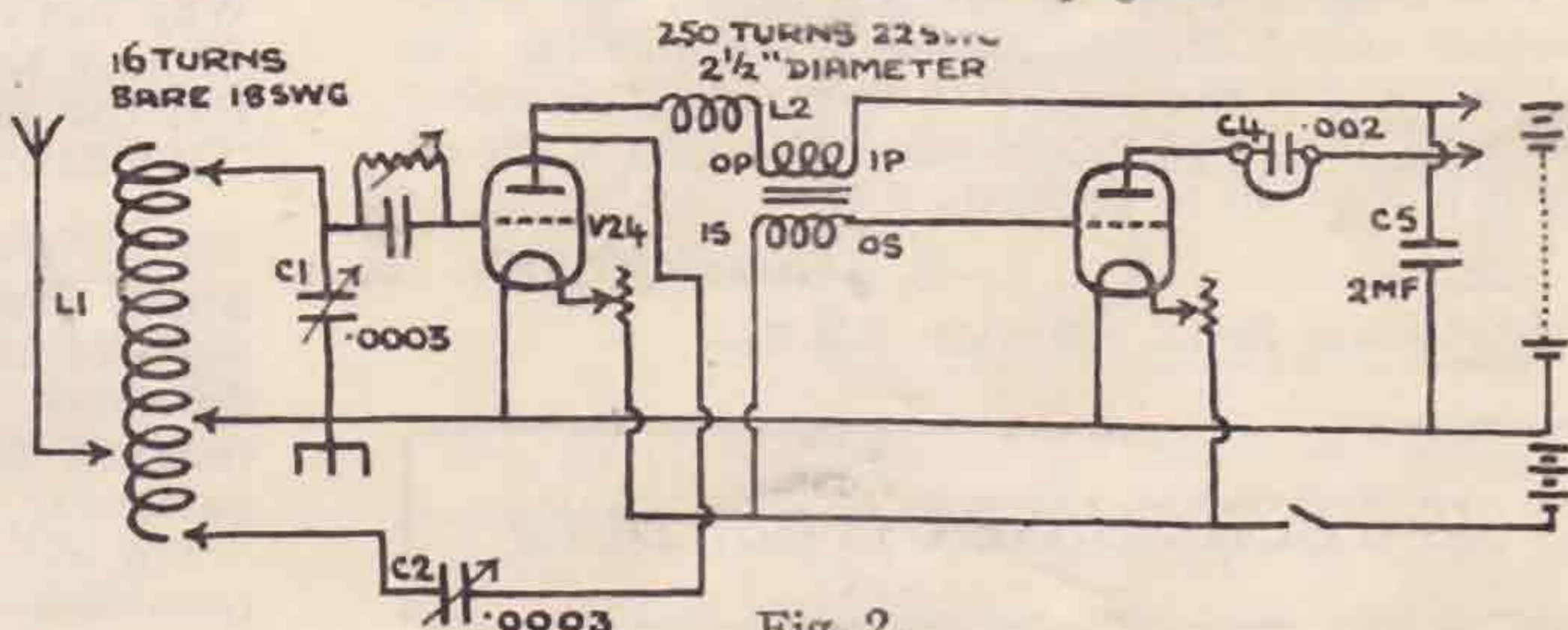
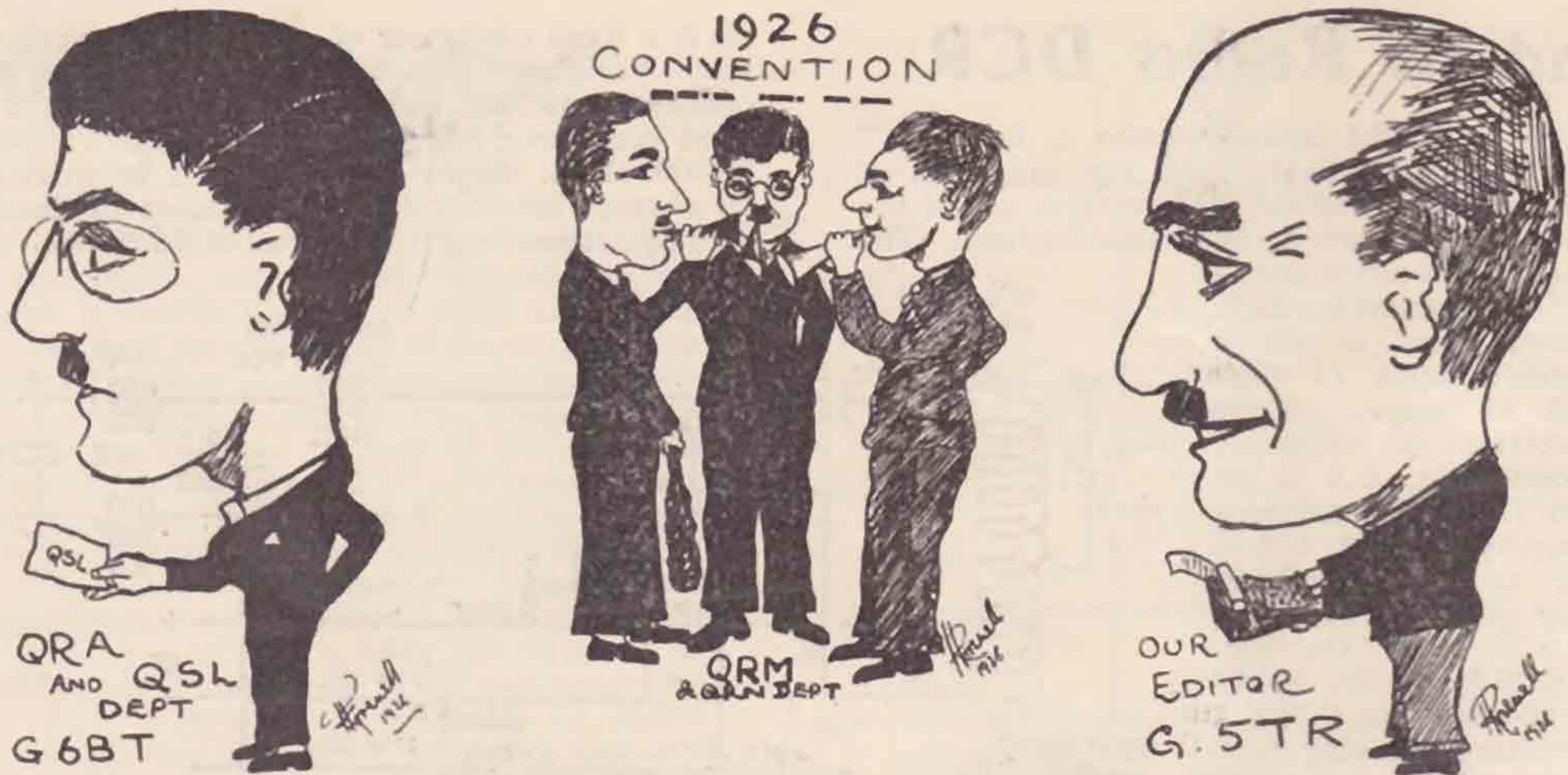


Fig. 2.



SOME IMPRESSIONS OF THE 1926 CONVENTION!

## A Grid Leak for the Low-Power Transmitter.

Transmitter grid leaks are generally of two kinds—the tapped wirewound resistance and the waterbottle resistance with variable electrode. The water-leak is useful, but is not constant, and QSB sometimes suffers through bubbling at the electrodes. It is not greatly used by the man who wants his power to be fairly constant. The tapped wirewound leaks are very good and do not cause trouble, but they are comparatively expensive.

The writer has used some leaks which were made in the following manner:—

A 100,000-ohm Mullard wirewound anode resistance was purchased, and the resistance element removed from inside the cartridge by heating the metal end caps and pulling them off with pliers. The resistance consists of 51-gauge michrome wound on a non-conducting fabric core, and in appearance is like a banjo wire. It is further wrapped in paraffined cotton. The whole element looks like white string wrapped round a match stick, the ends being bound with bare copper wire to form contacts.

The resistance element should be unrolled and can then be cut up into approximate resistances. From a 100,000 water-leak one can get 10, 15, 20, 25 and 30,000 resistances (values only approximate, of course).

The lengths may be wound up in the same manner as the original bobbin. The winding will safely stand a current of 10 m.a., and the writer has used this type of resistance for grid leaks on input powers up to 40 watts F.B.

P. JOHNSON (G51S).

49, Carson Road, Dulwich, S.E.21.

IS YOUR SUBSCRIPTION DUE?

## "Forty-Five."

(Lines written, without real malice, after trying to keep a "shed" on Sunday, June 19, at 18.30, and finding eight "G" stations using fone, all at the same time, all on top of "shed" wave, and none under about R6.)

The air is filled with voices strange  
Of those who deem themselves in clover,  
Whose topic mostly is of "um"  
Or "er," or "over, old man, over."

Care they a jot that ninety-nine  
Per cent. of Hams the week are toiling  
And only have the Sunday left  
To test to see their sets are boiling.

Such things as "sheds" or QRP  
They care not if they tie in knots.  
They shout their "One, two, three, four, five,"  
Backed up, I'll bet, by many watts.

The mighty QRM they make,  
The QRO with anodes glowing  
Tends far from friendly thoughts to make,  
From those whose few watts—"tests"—are flowing.

For goodness sake, let's face the facts,  
And just restrict unwelcome matter.  
Let QRP have half the way,  
The other half be fone friends' chatter.

Why can't we, like the Yankee Hams,  
Arrange to keep all waves alive,  
But bar just one from telephone.  
"Which one is that?" Why, forty-five.

Q.R.P.

**Super-Het. Intermediates**—Concluded from p. 15. mediate amplifier and the greater the percentage difference of tuning of the oscillator and the received signal, the lower in wavelength will a particular set work.

For 40λ work the writer would recommend an intermediate wavelength between 1,500—1,800λ.

## Super-Het Intermediates.

By CAPT. K. HARTRIDGE (5CB).

The apparent lack of popularity of the super-het. on short and medium short wavelengths appears, perhaps, to be due to the purchase of parts of incorrect design or assembly.

The required characteristics of an intermediate frequency amplifier for use on broadcast music transmissions and short waves are very similar.

To reproduce good quality music a 10 K.C. side band must be evenly amplified, for good high quality speech 6 K.C., and for commercial speech 3 K.C.

A great many commercial transformers work on about  $8-10,000\lambda$ , i.e., 33-30 K.C., probably on account of the much more easily obtained stability.

10 K.C. on these wavelengths is equal to a band about  $2,000\lambda$  wide, so that the amplifier should amplify evenly from, say,  $8,000\lambda-10,000\lambda$  and then cut off sharply in order to obtain selectivity.

There are two or three American iron-cored transformers on the market which will give this even amplification, but there is no so-called "fitter" transformer which will pass the required band and cut off sharply. These transformers will give good quality reproduction, but rather bad selectivity on broadcast, but they should be quite useful on wavelengths down to about  $90-100\lambda$  because they allow a  $\pm 2$ -tolerance of 5 K.C. on the transmitted wavelength, and even this is hardly enough for some stations.

The remaining transformers are mostly "air core," either matched or provided with condensers for matching.

The resonance curve of these transformers is far sharper than the true "iron-cored" type, and if a resonance curve is taken of an amplifier, using, say, 3 stages of these transformers, it will be found to amplify evenly a band of only 2-3 K.C., so that musical reproduction will not be faithful, and when used on short waves a transmitter must keep wavelength with a tolerance of  $\pm 1-1\frac{1}{2}\lambda$ .

This latter type will be most unsuitable for even medium short wavelengths.

From the above it will be seen that the shorter the wavelength of the intermediate amplifier the easier it will be to pass the necessary 10 K.C. side band.

On a wavelength of, say,  $3,000\lambda$  the side band will occupy a band of approximately  $550-600\lambda$ , which is much more easily dealt with by a transformer without sacrificing all its amplification.

Further, a single fitter transformer can be designed to give quite fair selectivity.

There is another side also to look at. The longer the wavelength of the intermediate amplifier the nearer is the oscillator tuned to the received signal.

As the received wavelength is decreased the percentage difference of the oscillator tuning is also decreased, until a point is reached where the tuning circuits of the first detector are unable to keep out the oscillator which drags them into step with itself and oscillates the set.

Hence the lower the wavelength of the inter-

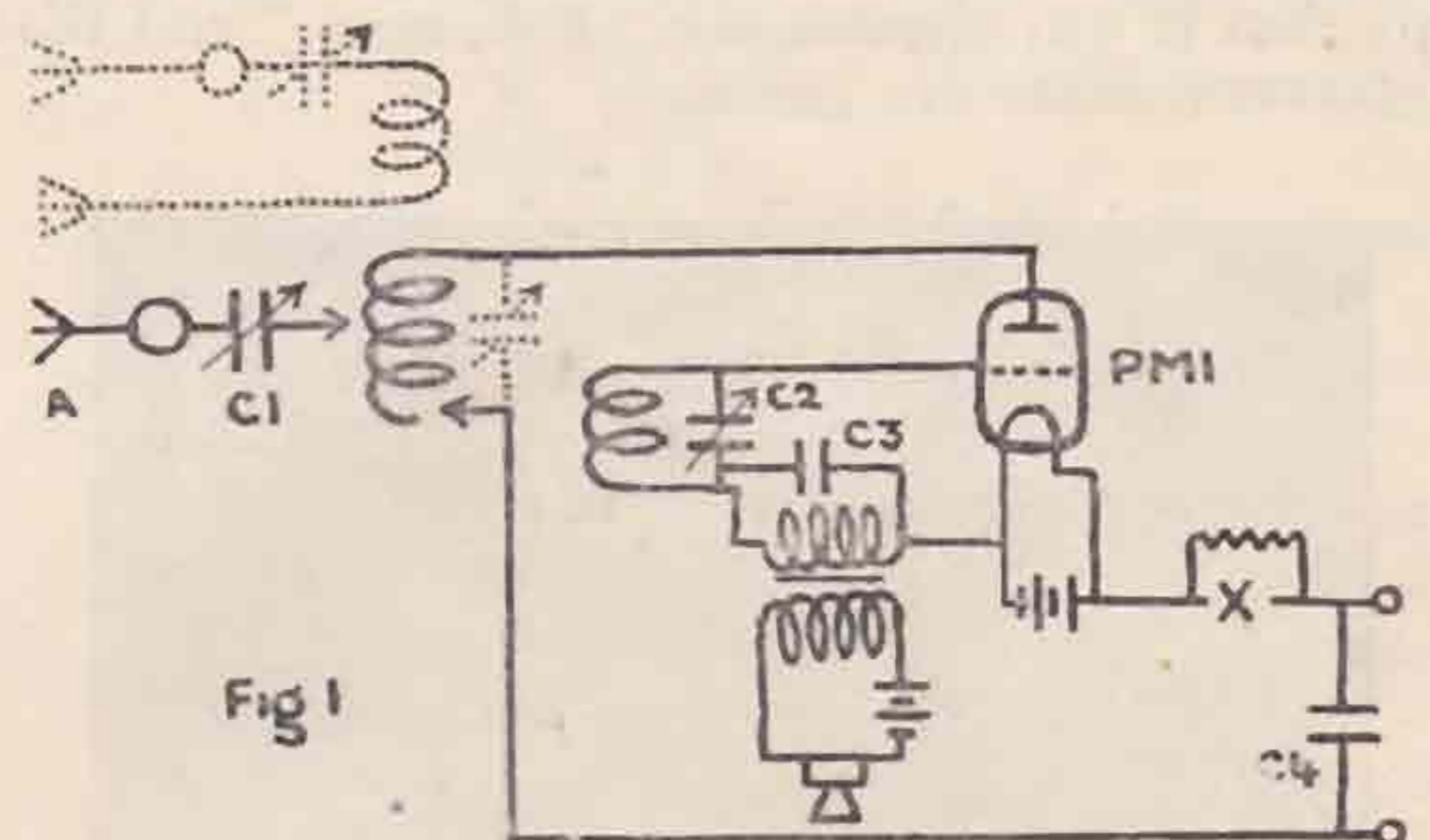
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## A Low Power Transmitter.

By C. W. TITHERINGTON (5MU).

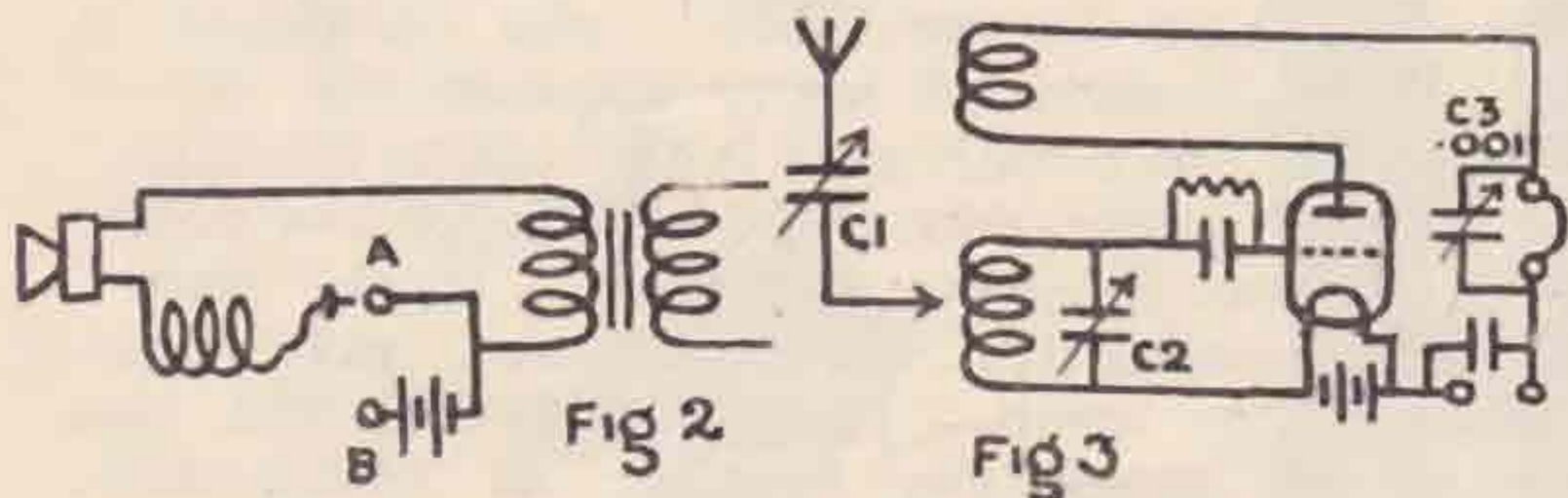
Much has been written about high power and crystal control gear, so the writer will, with the Editor's permission, try to interest "hams" who are concerned with "L.P." gear. I have, since my letter *re* "Low Power Tests" was published in the "W.W.," received many requests for circuit details, etc. The circuit used is as "old as the hills," and, in my opinion, cannot be beaten for low power work. It was during a test with a local "ham" that its possibilities were realised; my transmitting valve went "phut" and the test was finished by using the receiver as transmitter. The similarity will at once be obvious. There is nothing much to comment upon, except, perhaps, the aerial; this has a .0002 mf. condenser in series and is connected to the anode coil  $2\frac{1}{2}$  turns from the anode end. The aerial functions, to me, rather mysteriously, as one can swing the condenser through its whole range and not alter the wavelength one metre; there is, of course, a point where the aerial current is greatest, but if one has not a sensitive meter to measure the minute current it does not seem to matter where the aerial condenser is set; signals get out just the same. One other point may be of interest. The station is situated on a hill and is surrounded by high fir trees; the trees are very convenient for supporting aerial in calm weather, but when we get S.W. gales and strong west winds the aerial is like a "lashing whip." Counterbalancing the aerial with weights running over a pulley has been tried, but usually ends in a broken rope or aerial, so the aerial is kept very loose. Now, during all the swaying of the aerial, I have never received a report, unsteady signals or QSSS. When trees have been swaying 60 degs. from vertical position, and the aerial has been like a "writhing snake," requests have been made to co-operating station for "QSSS," as it seemed impossible that wave could be steady; report was always, "Wave stdy, F.B.O.M." This effect leads me to think that the aerial, from series condenser functions by shock excitation, it is just the same with various lengths of aerial from 120 ft. down to 40 ft.

Comments or theories, but no argument, please!



This circuit is simply our old friend the "straight magnetic." The constructional details are as follows, in case anyone condescends to make up such a simple arrangement. The anode aerial coil

is 4 ins. in diameter, skeleton type, with six supporting strips  $\frac{1}{4}$  in. square. End pieces cut from three-ply fretwood, strips are mahogany. The grid coil is 3 ins. in diameter, and slides, inside anode coil, on a glass rod. The coupling between anode and grid coils is fairly tight, but it is quite possible that coupling would be very loose with power over 5 watts. The winding of anode coil consists of 10 turns of 20 bare S.W.G. spaced 3-16 in.

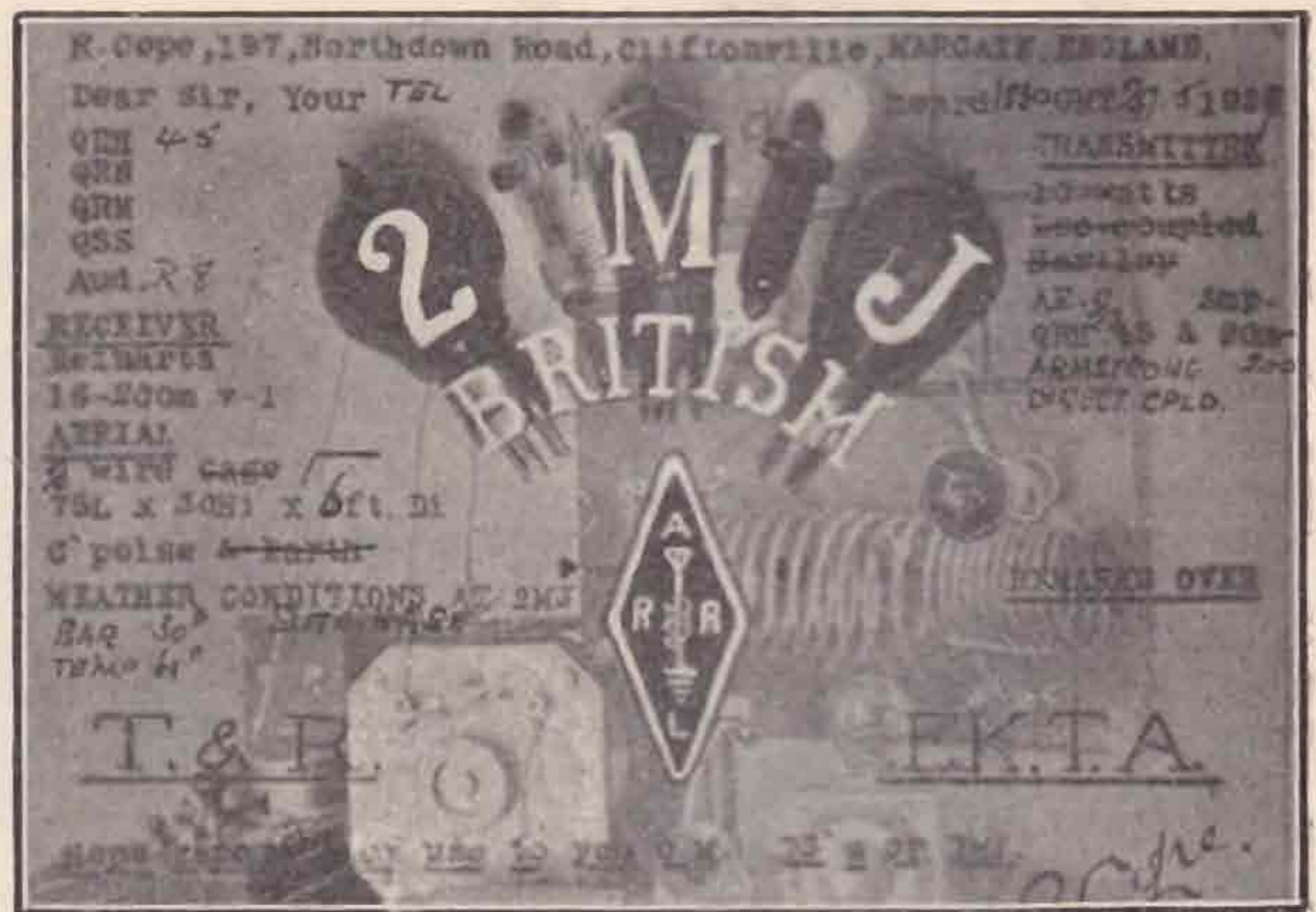


The grid coil winding is 6 turns of 18 S.W.G. spaced  $\frac{1}{4}$  in. and tuned with .0003 condenser.

It will be noticed that neither H.F. chokes or grid condenser and leak are used. Good telephony has been obtained from this circuit using grid control. A curious effect has been noticed. If microphone circuit is kept open when using Morse, and it is desired to use "fone," closing the microphone circuit causes the wavelength to go down, so the microphone circuit (Fig. 2) was used to keep wave constant when changing from Morse to "fone," the plug in 1A closes the circuit without using the battery; in 2A the arrangement is conventional. Owing to lack of charging arrangements a 500 volt Telefunken generator and a Marconi A.T. 40 are "standing by," so the only means of obtaining H.T. is from my receiving accumulators, two 50 volters. With this immense power at my disposal I have succeeded in raising 2 watts for my transmitter, and with this power have been QSO U.S.A., Arctic circle ships, and practically all Europe. Since March, however, my power has dropped to the ridiculous quantity of point 6 of a watt; still, I have been able to test with three stations every night, the average distance being 200 miles. Reports are usually R3 up to 90-100 miles, but R6 over 150 to 250 miles. The circuit, with a small 30 ft. aerial, has been tried out on 23λ and 2 E.N.s worked, report on 2 valves "R4 CW, FB," power 1.6 watts input. (G5MU is not licensed for 23 metres, but transmitter was tried out by a friend who is licensed.) In conclusion, may I say that I have given this in the hope that it will interest the "L.P. man" and that only actual facts are given.



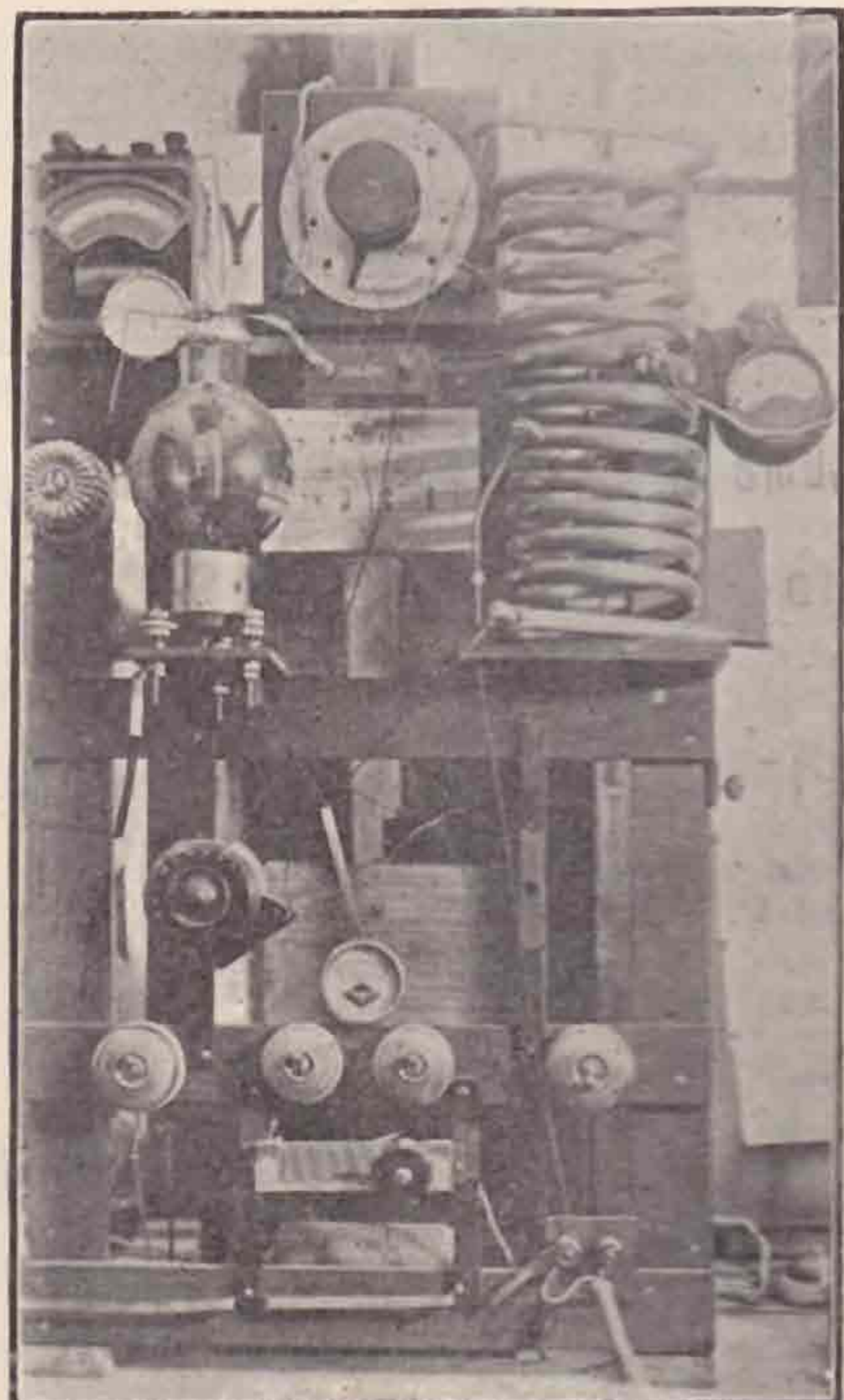
G5 MU.



A Novel QSL Card.

Indian Radio DCR—Continued from page 13.

General. In all DCR has worked 41 different G stations and wishes to thank all for their kind co-operation. In particular he thanks his good friend GI6MU. A schedule has been worked with this last station since last November. Three days per week on waves of 22, 33 and 40-45 has proved a great success. In most QSO's of the schedule the signals are such that a speed on 20 W.P.M. is the normal speed of Morse. DCR will not be heard on the air again. Hi! Hi!! However, it is only a change of the call sign; it is regrettable DCR is now 2KX. During June to Oct. 2KX will be operating in the foothills of the Himalayas.



The Transmitter at Y-DCR.

**British Receiving Stations**—Continued from p. 11.

- B.R.S. 27. G. E. W. Parish, 20, Avenue Road, Witham, Essex.
- „ 28. C. R. Ponting, 11, Woolcot Street, Redland, Bristol.
- „ 29. L. L. Parry, 106, Church Road, Moseley, Birmingham.
- „ 30. P. H. Brigstock Trasler, 37, York Road, Northampton.
- „ 31. V. G. Mellor, 1, Guildford Lawn, Dover.
- „ 32. G. Brown, 2, Cyril Grove, Cyril Road, Small Heath, Birmingham.
- „ 33. J. M. Rutherford, 146, Ethel Street, Benwell, Newcastle-on-Tyne.
- „ 34. A. Hine, 81, Chaworth Road, W. Bridgeford, Notts.
- „ 35. H. Brabrook, 31, Court Lane, Dulwich, S.E.21.
- „ 36. J. B. Kershaw, 25, Stanley Gardens, Hampstead, N.W.3.
- „ 37. C. L. Fry, c/o Mrs. Duce, The Stables, Chorleywood Cedars, Watford, Herts.
- „ 38. B. C. Bedwell, 204, Swanshurst Lane, Moseley, Birmingham.
- „ 39. F. G. Pratt, 54, Lombard Street, London, E.C.3.
- „ 40. C. E. Sutton, 3, Park Road, Woodside, Wimbledon, S.W.19.
- „ 41. Unassigned.
- „ 42. T. H. Steeter, School House, Alfold, near Billingshurst, Sussex.
- „ 43. W. J. N. Sowels, Preston Capes, Rugby.
- „ 44. J. G. Carlson, 28, Johnson Street, South Shields.
- „ 45. H. Bishop, 25, Victoria Street, South Normanton.
- „ 46. E. R. Westlake, 57, Queen Street, Shrewsbury.
- „ 47. J. J. Taylor, Hurst Hut, Somersbury Wood, Ewhurst, Guildford.
- „ 48. A. Harper, Cropwell Bishop, Nottingham.
- „ 49. H. L. Palmer, "Meadowlea," Gobowen, Salop.
- „ 50. E. Tibbitts, 6, Bournemouth Road, Peckham, S.E.15.
- „ 51. H. N. Witham, 124, Fellows Road, London, N.W.3.
- „ 52. W. C. Bryant, 32, Westcott Place, Swindon.
- „ 53. A. Wainwright, 144, Chapel Street, Swindon.
- „ 54. B. G. Russell, 34, Dinsmore Road, Balham, S.W.12.
- „ 55. D. Lewry, 131, Trevelyan Road, London, S.W.17.
- „ 56. J. C. Wilson, 53, Green Lane, Northwood, Middlesex.
- „ 57. T. Key, 41, Harley Road, Willesden Junction, London, N.W.10.
- „ 58. W. E. Rowles, Selwor, East Bay, Colchester.
- „ 59. H. W. Freeman, "Woodside," Leavesden, Watford.
- „ 60. J. L. Harman, 506, Chester Road, Erdington, Birmingham.
- „ 61. H. C. H. Edington, 137, Muswell Avenue, London, N.10.
- B.R.S. 62. A. M. Robertson, 27, Ladysmith Road, Edinburgh.
- „ 63. Unassigned.
- „ 64. R. G. Lyon, 37, High Street, Aberystwyth, N. Wales.
- „ 65. H. W. Rutledge, 59, Montholme Road, London, S.W.11.
- „ 66. S. A. Rock, 41, London Road, London, S.W.17.
- „ 67. S. W. Hocking, 40, Hill Road, Mitcham.
- „ 68. R. B. Williamson, Underfell, Kendall.
- „ 69. Unassigned.
- „ 70. P. Lowry-Mullings, 17, The Grove, London, N.W.11.
- „ 71. Capt. W. F. How, Balnacarron House, St. Andrews, Fife.
- „ 72. A. F. Elton-Bott, "Francisca," Barlow Road, Hampton, Middlesex.
- „ 73. S. Howard, 7, Churchfield Road, London, W.3.
- „ 74. L. N. Blackburne-Maze, 66, Acacia Road, London, N.W.8.
- „ 75. A. Sears, 29, Barbara Street, Islington, London, N.
- „ 76. R. G. Elliott, Moat House, Gestingthorpe, Essex.
- „ 77. J. G. Murray, Dryden House, Oundle, Northants.
- „ 78. F. H. Salisbury, 39, Holdford Road, Witton, Birmingham.
- „ 79. D. J. Beattie, 399, Manchester Road, Burnley, Lancs.
- „ 80. A. J. E. Forsyth, "St. Aubyns," Gold Tops, Newport, Mon.
- „ 81. C. Taylor, 3, Colomberie, Jersey, C.I.
- „ 82. K. R. Frasier, 109, Hagley Road West, Birmingham.
- „ 83. E. W. Rawlings, 22, Caxton Gardens, Weston Road, Guildford.
- „ 84. A. C. Smith, 9, Greenaway Gardens, Hampstead, N.W.3.
- „ 85. C. E. Harwood, "Erlesdene" Park Road, Hale, Cheshire.
- „ 86. A. G. Burgess, 26, Gunnersbury Park Gardens, London, W.3.
- „ 87. J. D. Matthews, 183, Copland Road, Glasgow, S.W.
- „ 88. C. C. Mortimer, 86, Magpie Hall Lane, Bromley, Kent.
- „ 89. Unassigned.
- „ 90. T. C. Platt, 34, West Street, Stalybridge, Cheshire.
- „ 91. G. A. Chapman, 109, Cheriton Road, Folkestone.
- „ 92. F. Appleton, "St. Muir," Leicester Road, New Barnet, Herts.
- „ 93. J. Woodage, 10, Woolneigh Street, Fulham, S.W.6.
- „ 94. H. J. Horsley, 165, High Street, Ramsgate.
- „ 95. E. McLoughlin, 19, St. John's Square, Wolverhampton.
- „ 96. D. McInnes, Reform Square, Campbeltown, Argyll, N.B.
- „ 97. W. H. R. Radford, The West Lea, Cropwell Butler, Notts.
- „ 98. J. Speakman, 33, Walton Road, Stockton Heath, Warrington.

- B.R.S. 99. E. P. Crowther, Caldecot Cottage, Caldy, near West Kirby.  
 „ 100. W. Hibbert, "Gothlans," Bushey Wood Road, Totley Rise, Sheffield.  
 „ 101. R. Campling, 19, Salisbury Road, London, E.8.  
 „ 102. R. L. Varney, "Fairview," The Avenue, Sunbury-on-Thames, Middlesex.  
 „ 103. C. Pidd, 16, Horncastle Road, Boston, Lincs.

## Wavemeter Calibration.

By H. C. PAGE, G2AFG.

Having read several letters in previous BULLETINS lamenting the lack of an easy and inexpensive method of calibrating a wavemeter, the writer feels that perhaps the following method would be of use to some people.

The method employed by the writer uses the harmonics radiated by a crystal set tuned to a broadcasting station.

As nowadays the B.B.C. stations keep fairly accurately to their allotted wavelengths, a wavemeter calibrated from their harmonics should be fairly accurate. In any case an error of 1 per cent. or 2 per cent. of the fundamental wavelength would not be very serious.

The first step to be taken is the working out of the harmonics of, say, 2LO down to about the twentieth.

A sheet of squared paper should be prepared and marked along one side the range the wavemeter will cover, say, from 50 to 18 metres.

The crystal set should now be tuned to, say, 2LO, and the phone terminals short-circuited. Then the short wave receiver should be placed about four or six feet from the crystal set and the condenser dial adjusted to about 45 metres, where an harmonic will be picked up quite strongly. Having tuned this in to near the silent point, the wavemeter should be switched on and tuned to the receiver wavelength.

The position of the wavemeter dial should be read and plotted on the graph. This should be done as far down the scale as the harmonics can be heard. Having done this and plotted the points on the graph, it will be found that sufficient points have been obtained to draw a very satisfactory graph.

At the writer's station it was possible to follow the harmonics down to about twelve metres, but this, of course, depends on the strength of the signal received in the crystal set.

A wavemeter calibrated by this method checks out quite nicely with WIZ, 2XAF and WIK. Do not be upset if it does not check out with the European short wave commercial stations. These stations never seem to keep to their advertised wavelengths.

The construction of a suitable wavemeter is left to the taste of the reader. It is hardly necessary to add that either heterodyne or absorption wavemeters may be calibrated by this method.

## Notes and News from the Areas.

*Note—Owing to great pressure on our space we have been compelled to hold over the QSL report and "Calls Heard" until our next issue.*

## Southern Notes.

Prepared by 2LZ and 2ABK.

Bearing in mind that "summer" is now with us, we can get an idea as to why so few reports are to hand.

However, one or two new stations have come to light with reports, so we must wait and look forward to an overflow towards the winter.

We want to make these notes interesting OM's, so please drop us a card whenever anything worthy of note happens.

Tnx, OM's! Now for reports.

**KENT, by 2MI.**

Only one report has been received by post at 2MI—this from BRS31, who reports absolutely ND.

2MJ says he is going O.K. on 45 with his tuned-plate, tuned-grid circuit.

2MI is working local phone on 150 metres, and really means to build his 45-metre set soon. A visit was recently paid to 6 QO's station.

2QN has been heard on the air again with his "mangle" after a long absence.

The following did not report:—2UD, 5JG, 6VV, 2AOV, 5DT. Why, OM's?

**OTHER DISTRICTS.**

6WQ reports modulation tests on 150 metres to see what percentage of modulation could be obtained with C.C. He finds 75 per cent. to be about the maximum, due to the resistance of the crystal to frequency changes.

A relay of Langenberg has been used (well received here, OM.—2ABK), and altogether 15 valves were used in the transmission.

6WX wants to get in touch with any transmitters within 20 miles of his QRA—"Hainault," Laburnham Road, Maidenhead, Berks.

2BHC rebuilt receiver, much to his OW's delight, as she sees a bit of him now. Best RX GLKY. His dead spot trouble is now cured. Dope no longer needed.

6GZ in action again, QRT since 1923. Working only on 150-metre band, but reports give R4—5 at 2,000 miles. His MO T15's get red hot, so larger bottles are to be installed.

6FD reports usual European QSO's and G fone on 45. He wants QRA of EZ66C. Anyone know, pse?

2HJ reports 17 European QSO's, best being ED7CH, using 8 watts AC.

Valve rectification has been tried, but, owing to blowing bottles, a chemical rectifier is being built. He had a visit from NU—6RN—ICUE.

6NZ reports building a new transmitter, a Hartley on 45 metres. A special series of tests are being carried out on this wave, and all reports, far and near, are wanted.

5QV has had a hectic time trying out various types of Hertz aerials 23 metres. He got R6 from Sydney, Australia, on vertical  $\frac{1}{2}$  wave voltage feed. A full wave, Zeppelin feed, was then tried, and got R6 C.W. and R2 fone from Morocco. Also busy with local work on 150.

5QK had their first field day on June 26, but owing to rain QRM all the morning, the apparatus was housed in a garage. With a flex aerial 15 ft. high, QSO was established on 150 metres with 5OK, 6WQ, 6QO and 5QV. All reception on loud-speaker so all could hear. Quite an enjoyable time was spent, 26 being present, including 2MC, 2LZ, and 2ABK. Another is to be held on August 14, and it is hoped that it will be a FIELD day this time. Hi!

BRS42 reports more good reception on 20 and 40-metre bands on his vertical indoor aerial. 30 NU's alone. But no 6th districts. Hi!

5OK reports local fone on 150 metres, and 5SN is rebuilding. BRS91 is a new member. Welcome, OM! Only fone is being received at moment. Best RX EAR55, Barcelona. Receiver: Hartley-Reinartz 0-V-1. He wants tips on learning code.

2ABK busy with 15-metre reception, and reports transatlantic fone on 17 metres. A Neon wavemeter has been constructed, and calibration curves are now taking shape.

2LZ has burst out with some F.B. fone on 150 metres, but is very QRW business, so gets very little time.

Now OM's if your notes are not here now let them be next month, so get on with them now. Tnx.—2ABK.

# London Area.

## East London Division.

By 6LB.

6LB is still trying to get his Armstrong going, but has had very little luck.

He uses a Hartley for QSOing Europe, and amuses himself calling stations on the Armstrong. Still, it's good Morse practice. He is running a series of tests with EN's, OAX and OGR to determine the range of oscillating receivers on 45 metres.

It is hoped to have some useful dope for the BULLETIN in a few weeks' time.

6LL is doing a little work on 150 metres, but is directing most of his energies towards 8 metres, for which wavelength he now has a permit.

6UT is still receiving reports from the U.S.A., but has had bad luck in not getting actual QSO.

2BXM is swatting Morse with view to a radiating permit, and is building a 2-10 metre receiver. (Dope for BULLETIN, OM?)

5AR is experimenting with a grid drive meter, and is still running a schedule with 5QV on Sunday afternoon.

2KT has been trying 90 metres with little luck.

The QRP Transmitters' Society, whose headquarters is in East London, have obtained permits for portable 8 metre experiments. Their two stations, 6LL and 6TA, are operating near Roydon, Herts., on Sundays during July and August, and they would appreciate reports from members who hear them. It was pleasing to note that East London was well represented at the recent London area "hamfest," and a little more enthusiasm in reporting activities would be very welcome.

Come on, OM's. Reports to me by the 2nd of the month.

## Southern District Reports.

By 6PG.

There is still only a very small proportion of the hams in this district—the largest, by the way—who go to the slight trouble of sending their reports regularly. What is the matter, OM's? Is it YLitis or is it "too much fag?" Surely, if you are still keen on the game you must be doing *something*? Well, then, let's have it, even if you are only crystal scratching. Don't forget—10th of the month at the latest.

### REPORTS.

2CB has been QRT the latter half of the month owing to holidays. He has, however, had 12 QSO's, best DX being EAR9—"gud stdi R5"—on 6 watts from hand generator.

2CX has not been on the air much as he has been busy moving the set into a shack in the garden—this owing to pressure of people who actually want to sleep in the room next to the radio room. He has been up on 200 metres, but thinks that London hams must have forgotten that it exists. Altogether he is having a pretty thin time, as he has no mains, his mangle has bust for good, and his bottle shows signs of losing its emission. Hard luck, OM!

2BQH sends a very good report of reception on 20 metres and 40 metres. On 20 metres he has received 9 NU5's, 8 NU6's, 4 NU7's, and also NC9AL, 9BZ, NE8AF, and others. On 40 metres he has a host of NU 5's, 6's and 7's, SS2BN and many OA's and OZ's. Altogether it is a jolly good report, OM! He also sends a specimen of his QSL, an extremely neat and patriotic one, giving lots of useful information.

5BY does not report, but 2BQH says that he has nearly 300 NU cards, all QSO's. This seems very good, but why not tell us about it, OM?

6TA has been very QRW, but on 23 metres 50 watts valve RAC has managed to QSO SB, SC, NU and TUN, also report from SA, all giving R5 or more DC. He thinks this wave F.B., but very uncertain.

BRS25, writing while on holiday, reports that he has only logged 140 stations, but 87 of these were on 20 metres and practically all in daylight. They include 37 NU's (all districts), 3 NC's, 2 SC's and 1 SB. He intends to stay on this wave for the next month or so as he thinks it most interesting.

6HP has now QSO'd all Europe except EJ and EW. Best DX for June was ER5AB R4, but QSO spoilt by QRN. He had 186 QSO's with average QRK of R7, including EPR5, ERR4, ESR7. Input 9.6 watts. 6HP is QRN for tests day or night, and would like to make some schedules.

2SC will soon be settling down in his new QRA, and hopes to report regularly.

6PG has been on the air very little since May last, but is busy arguing with the local Council about his new QRA. He has managed to don the cans a few times with fair success. He has managed to complete a combined receiver and transmitter, packing up very small, to take away to annual training with the T.A.

5RZ has not reported this month, having not yet returned from his holiday in Norfolk.

5GQ has been doing the usual 150 metre work with 8.5 watts and has at last succeeded in getting pure D.C. with A.C. filament Choke control is shortly to be set up and the aerial is to be raised from 20ft. to 70ft. Best DX on 150 metres is 45 miles in daylight.

Once again, you fellows, do send in your reports regularly because we hear hosts of you working and we want to know what you are doing.

By G. A. EXETER (6YK).

Our first gathering as members of the London area has come and passed, and I am personally extremely pleased to have to report that the attendance and spirits of those that came exceeded even my optimistic expectations! I hoped for about 20, but we got nearly 30, and should have had even more but for the intervention of the eclipse, which attracted quite a number of members.

I do not think that I am going beyond facts when I state that I am certain that those who came had a very pleasant evening, and certainly I, for one, was sorry to leave when the time came. We were especially pleased to welcome our good old friend 2KT, who, though far from perfect in health, did his share in helping to entertain us and giving us some delightful reminiscences of R.S.G.B. history.

Great thanks and credit are also due to 5AD and 5KU, who arrived on the scene early to give a fillip to the evening. 5AD's handsome contribution to the decorations in the shape of the Section badge made in flowers was, indeed, a work of art, and proves that he is really a thorough asset to the society in being ready to do his utmost for it. We believe that these two members were instrumental in bringing along the "first" 40 metre "noisemaker" ever put into operations, under the call of 2MUT. Details of its work were also available.

I am only just giving a brief outline of the evening, because of space considerations, but I will endeavour (with the grace of 5TR) to point out a few things that were brought up during the after-dinner proceedings. First of all, much was said concerning the society and its present relationship to the old T. & R. section. Apparently there is dissatisfaction amongst some of us because of the threatened loss of interest by the governing body in the transmitting amateur. Members feel that they are not going to retain all their old privileges. I should like to say that the fusion was solely in the hands of the members of the T. & R., and as has been said before, we are so strong in numbers that I cannot see any possibility of us losing much ground. We have a lot to gain if we only proceed in the proper manner, and I feel sure that if we only meet as we met on June 20 that all our troubles will be righted. It is only by gatherings like that, where formality is dispensed with, and where everyone is at liberty to voice his opinion, that we shall arrive at a proper working basis. I ask you all to do your utmost to attend these affairs, which will in future be held very frequently, and get to know how things are being dealt with and also to bring before us your own pet grievance. We also had quite a lot said about our country members. Now, this is an item that is directly associated with the welfare of the R.S.G.B. Frankly, they are our mainstay, and I confess that we can do little to enable them to get the advantages of the society to the extent we here in London do. The whole matter is a different proposition, and as the BULLETIN is our only means of reaching them we must do our utmost to make this messenger as satisfactory as we can. Reports of our activities and other things interest them, but, as was pointed out at the dinner, the things that help them are the articles published. Good technical articles are hard to get, but at least every member can produce some definite result of research that would be very much appreciated. After all, we are research workers, and our licences are given us for that purpose, and therefore our reports under these columns should be not so much reports of DX as of results gained in certain lines of experimental work. Get busy, fellows, and just run off a few notes of anything interesting to fellow-workers in the country and let our Editor have them for publication.

Our only other opportunity of doing something for country members will soon be here in the form of the Convention.

Do not forget that we are expected to do all we can to entertain them while they are in town and make them feel sorry to leave us at the end. I am pleased to say that I have had a fair number of responses to my appeal for accommodation with fellow-members for these prospective visitors. Will any member in London or its suburbs who can manage to accommodate one or more members for the time they are here *please write me immediately*.

I am certain to have more applications for accommodation than I have arranged for up to the present, and I must have more.

Here, now, is a chance to do something for the Society and its members, so just do as I ask, please, and help us all.

I do not like to conclude this report of our little gathering without expressing my grateful thanks to all those present for the good wishes that were extended to me on my approaching marriage. By the time these lines are in print this episode will be over, and I shall certainly retain a very affectionate memory of my evening with you all, and sincerely trust that I shall be able to add to it in the future and remain such good friends as we are at present. I nearly forgot to mention that 6LB and 6PG were responsible for a good bit of musical entertainment, and their efforts were enjoyed by one and all. 5HS also did his share in giving us a few hints on the Y.F. Hertz.

I am also pleased to say that an offer has been made for a small lecture hall to be placed at the disposal of the Area for lectures when the I.E.E. is not available. We should make use of this, and I should be pleased to hear from anyone who can give us some form of talk or discussion on the subjects we are interested in during the coming season.

NOTE.—The next "Hamfest" for London on the same lines as that of June 29 will be held on September 7, and members wishing to attend please write immediately. We want to make this better, if possible, than the last, so just drop a card and mark the date on your calendar.

#### REPORTS.

These are very brief this month, no doubt owing to the holidays, but if I don't get a few more for next time I'm going to come round with a big stick!!! I've tried persuasion, so now I'll try force!!! So just jump to it and let me have something.

## Western Division.

By 6YK.

6BB has had 76 QSO's during the month, adding EE and EI to his list. A report has been received from ETPL22 giving R3 sigs with 4.25 watts of Chem. Rec. A.C. He is trying various aerials out and is erecting one especially for NU work.

6HU has been 9RW exams., so has been off the air, but is starting again now.

6WN reports 29 QSO's during June; best DX EAKE R3 on 5 watts and SMXU R6 on the same power. He has worked 12 countries since QSYing to 45 metres. He has had no luck on 23 (but intends to keep on trying, I hope). Experiments to eliminate interference to B.C.L. sets have met with little success, but it has been found that open circuit crystal sets are most affected.

6YK has been doing a fair amount of work on 23 metres with 9 watts input and using the 45 metre C.F. Hertz. NU is worked fairly often, but contacts seem erratic on this frequency, and the aerial is being altered to half wave at 23 metres to see if any improvement results.

## North London Division.

Area Manager, 6CL, 107, Friern Barnet Road, N.11.

Reports by August 10.

Considering it is the summer season when all radio is supposed to be in a state of lethargy, it is gratifying to find more and more stations reporting each month.

The London Area managers realise what a lot can be done by personal contact, and every effort will be made during the next few months to get in close touch with all active stations in the London areas.

The following stations were visited by 6CL during the month:—2AXL, 5AD, 5KU, 6PN, 6PP, 2YQ.

Now for the reports.

5AD is now using a current feed Hertz (Levy antenna) with a Mesny push pull oscillator. Using 30 watts, four U.S.A. districts were worked on first tests. QRH was 23. He hopes to have two D.E.T.I. valves going shortly; only five watters are in use at present!

5KU—of hay wire fame—worked eight OR's, also OZ and Costa Rica. Several western districts of U.S.A. were worked, also Canada, Brazil and Argentine. Input was 50 watts. Break in is now being used on 20 metres. This is functioning well, with the usual QRQ possible on that wave.

6PP has joined forces with "that other QRP merchant," and has had much success with an input of 2 watts from dry batt. Several Danes and Germans have been worked at good R strengths. He finds London stations report him QRZ, but immediately before or afterwards is QSA on the Continent. (We know, OM!)

6PN, owing to the intervention of a holiday period, has been rather inactive.

Some interesting work with a C.C. transmitter has been carried out, and a valve modulated wavemeter covering all wavelengths constructed. (What about some "Bull dope," OM's?) Hertz aerial systems are now being tried out.

2AJI, although QRW, has reported. He has recently finished a L.C. Hartley transmitter. A total of 70 countries have been logged (wherever do you find 'em all, OM?) He is interested in oscillating crystal transmission, and would be glad to hear of anyone similarly interested.

BRS12 is rebuilding his receiver. Conditions have been patchy during the month. He is studying transmission principles and is applying for his full licence shortly. He will be glad to assist any station with reports.

BRS92 sends his first report. He is mainly interested in fone work and has been listening to sheds from EH9OC. He is experimenting with a Hartley short wave receiver. He mentions June 11 as a remarkable day for DX. (I noticed terrific QRN—6CH).

2AXL is busy logging DX, and is also experimenting with a modified Colpitt's oscillator. He hopes to be on the air shortly.

5GU reports 58 QSO'S with GC6VO as best QRB. He is unable to operate at night owing to QRM from the "mangle." (Anyone

help with a suggestion?—6CL). The new circuit seems to have improved his note permanently—pure D.C. now being the invariable report.

5HS says conditions during June were only fair on 23 metres. Best DX was NU6AZS and 6DFE and the usual "fives" and "nines." 1st, 2nd, 3rd, 4th and 8th districts are so easy to work that he longer counts them as DX. (6PP, doesn't it make you weep?)

6CL has been fairly busy during the month, but managed some 60 QSO's, mostly short distances. Tests have been made in an endeavour to reduce B.C.L. troubles. Keying in a single turn coupled to the aerial coil seems to be the most successful so far. Tests during eclipse week with DYMT were arranged, but except for the morning of the eclipse no European DX could be worked between 0500 and 0700 G.M.T. Input was 0.7 watt.

An interesting series of tests to Australia have been arranged through Mr. Harris, of Enfield, New South Wales. He is QRX for low power signals on most mornings at 0630 G.M.T. and at 2030 G.M.T. evenings.

I am asked by SMWF, DYMT and K4CL to thank all the London and provincial hams who signed the souvenir cards at the London area hamfest.

## Mid-Britain Notes.

(Area Manager: H. J. B. HAMPSON, 6JV.)

Reports from all sub-areas indicate that so-called summer is with us, and even if an excess of ultra-violet rays is inconspicuous at the moment (it is as cold as charity to-day, and we have got the hump), we know that summer must be here, just because many reports aren't.

Nobody is blaming anyone, of course, and it is not possible to record even a mild grouse, because circumstances have combined (useful phrase, that!) to prevent any marked activity at this station during the month. We are going to save our pennies and buy—no, you are wrong—not a new bottle, but a slave to grub about the garden during "growing time," so we can spend more precious moments with the key and phones. A.O.F.B. members will know that this is not the title of a new "Vat."

#### Shropshire.

Reports to 5SI.

5SI has been sawing and planing and making a beauteous cabinet for his gear. Now the gear has got to be unpacked and made to fit the cabinet. What humorist remarked that a thing of beauty was a joy for ever? We have not heard about 6TD this time, but would risk a guess that he has been feeding the ducks!

#### Leicestershire.

Reports to 6WW.

6WW reports that much of his time was occupied in preparation for the Eclipse tests. As he was one of the stations chosen for radiating during the few vital seconds of totality, he naturally felt that nothing must be left to chance. The transmitter operated satisfactorily during the tests, and reports indicate that a steady signal was radiated. Thanks are due to 6GF, who assisted at the transmitter, and to 5GW, whose co-operation in reception at Portsmouth was invaluable.

6WW promises a description of the transmitter at an early date.

WANTED.—Leicestershire Hams to report to 6WW at Glen Barn, Ashleigh Road, Leicester, by the 5th of the month. Please note.

#### Cambridgeshire.

Reports to 2XV.

5YX has been QSO South Africa again, also Brazil, and out of five test calls raised six Yanks and worked five of them. This on 5 watts 23 metres. Why use a big bottle? 5YK has had good results lately. He has had a report from AI2KT, and has worked SC2AH and SBIAD, as well as eleven Yanks. Although A.C. is used for plate and filament, the QSB is often reported as crystal. This on 23 metres, too.

2DB has changed over to full wave rectification, but has not been on the air very much. It is thought that he is more likely to suffer from tennis elbow than keying blisters.

2XV is rebuilding for QRP 23 and 32 metre work, and will be functioning by the time these lines appear in print.

5JO has not reported, but has been heard pumping out some good fone on 170 metres.

#### Huntingdonshire.

Reports to 2XV.

Bad attack of Summeritis here—no reports to hand.

#### Northampton.

Reports to 6TR.

Old BRS30 has come out as fully fledged G6TR, complete with real live radiating permit. This is FB, and we congratulate him on skipping the A.A. "half-way house."

6TR has worked 25 stations on 1½ watts already. He is "under instruction" from 5YX, and so will probably have got his W.A.C. next month. Meanwhile, 6TR and 5YX are camping out together—and we wonder what they find to talk about (when the primus doesn't blow out and they aren't hunting for the butter?). QRM! QRM! in that tent there may be—but QSS never! Mr. Shaw has been busy with exams., and says that when time has permitted him to pick up the phones static has been the main thing bagged.



**Warwickshire.**

Reports to 2BPI.

BRS3 reports good reception of South American signals, and it is reported that a little wet weather would bring increased activity. The exact significance of this is not fully grasped, but if this isn't a joke—well, well!

BRS29 asks for information regarding the QRA of SS2BN. He reports bad QRN.

2BCA has obtained H.T. accumulators for the receiver, and will be active again soon.

2AFS has been suffering exams. He is now rebuilding. Ditto likewise 2BKY, who is also making up a 5-metre receiver.

5ML has worked SA and SB frequently, using tuned grid, tuned plate transmitter. H. is changing over to crystal control.

2BPP is now 5QP, but has not reported. Please see that this is changed next month, OM.

2BPI has been turning his attention to the QSB department. He wishes to hear from anyone who has listened to CG, the Montreal Beam station on 26.269 metres at the time of the B.B.C.'s relay.

2BLM is again changing QRA.

**Worcestershire.**

Reports to 6AT.

6AT is the only station reporting this month, and his activities have been restricted. He has worked seven countries on 8 watts fone, and has received a report from British Guiana.

**Staffordshire.**

Reports to 5UW.

Only one lonely report from Staffs. Why this, OM's? This will not do. We have got to place Staffordshire where it ought to belong—among the best counties. Now then, 2VG, 2TN, 2KK, 5CW, do please back up the county and send your monthly reports to 5UW by the 5th of the month.

2BOC reports that reception conditions have been rather indifferent, with very prevalent QRN throughout the month.

**Wolverhampton and District.**

2AAD is to take his Morse test shortly, and hopes to record a new call sign for these columns next month. Best of luck, OM, and don't forget to report your activities regularly.

2OQ is away on holiday, while 2YV is QRW with choral societies. Hi!

5AF is constructing a S.W. transmitter, and expects to make his debut on 45 metres very soon. Reports on his signals will be welcomed.

5LK has reduced his input to 2 watts, and reports better results than previously obtained on 10 watts. He is testing fone at weekends with extreme QRP portable transmitter operated from a trailer-caravan. Reception reports are requested.

5UW was on holiday during the first part of the month, and met 2SW, 5XD, 5XY, 6IA, and 6KO, and thoroughly enjoyed meeting these OM's. 5UW finds that DX is better on 32 metres than on 45 metres.

Using half-wave C.F. Hertz with 48 waves input, Mesny circuit, the following countries have been worked: 11 in SB, 3 in SA, 4 in SU, 8 in NU, 1 in NC, and 1 in NE, also NXWOBD (believed to be U.S. Expedition to the Arctic Circle), 2 in OA, and OIC (Danish boat at Buenos Aires). Total QSO's outside Europe, 32; in Europe, 6.

6HT has acquired a large bottle, and is busy building a transformer for filament heating.

6UZ reports being too busy for DX, but promises to get going again very soon, and to "show 5UW exactly what real DX is like."

2NV, 2RR, 2WN, 5NU, 5PR, 6OH, 6BH, 6PB have not reported this time. It is to be hoped that they will do so in good time next month.

**Norfolk.**

Reports to 6ZJ.

5UF (Cromer) has been working with 5 watts from D.C. mains. He has just obtained a 50-watt Trans-oceanic permit. He has been testing aerial systems, and is now using a 36 ft. semi-vertical aerial. He will welcome visits from any members who may be staying in Cromer district during the summer months.

6ZJ has been rebuilding, and now derives his H.T. from accumulators. He has his eye on a few possible recruits.

6JV has nothing to report, except very welcome visits from 5QV and 2XV.

2BWB is changing QRA and at the moment is confronted with aerial difficulties. 110 volt battery supply for house lighting purposes has cheered him a little, however.

## Scottish Area Notes.

By GC5YG.

June is notable in the Scottish Area chiefly for the excellent 23-metre work of 6KO and 6IZ. The former is QSO NU every night, and the latter reports working NU 1, 2, 3, 4, 8, and 9th Districts in the short space of a few hours, truly a remarkable performance.

Conditions generally were fairly good, but apart from the 23-metre work already referred to, nothing special in the nature of DX has been reported. A stork has visited the home of 6KO, and the result is a lively junior "OP." Congratulations OM, I hope his QSB is F.B. D.C.!!

6MS spends alternate week-ends in London, while his ship is loading cargo, and would like to visit some of the London amateurs, particularly in the South and S.W. districts, as he is located at Penge when in London.

Solar Eclipse transmissions were carried out by 6IZ and 5YG, with apparently a fair amount of success. 6KO and BRS6 desire to acknowledge the pleasure of visits from 5UW and NUICUE respectively.

**No. 1 District (by 2WL).**

(Reports by the 5th of each month, please.)

2FV reports inability to do any amateur work owing to pressure of business.

2WL rebuilding at present.

5XQ has made a very good start, and reports 36 QSO on 45 metres, all "G's," as he does not have a foreign permit yet. Best DX, Bristol and Swansea, with an input power of 1½ watts. He has also been QSO 6WL with an input of one watt. Normal power is in the region of 8 watts derived from an anode converter, and when using this power R8 reports have been received from London. The QSB is usually reported RAC or even A.C., but an improvement is hoped for. The aerial circuit consists of a half wave, voltage feed, Hertz.

5YG has not done much QSO work, having been engaged in the construction and testing of a special 100-metre transmitter for the Eclipse tests. An interesting report on the station's 45-metre signals has been received from British Guiana. The station will be QRT till the beginning of September, when it is hoped that a start will be made with a new transmitter and new generator.

6MS has not found time for any amateur work in June.

6NX keeps pegging away, and reports 80 QSO on 45 metres, covering all Europe. Results seem very consistent, as reports under R6 are rare. As the date of the conversion of the house mains from D.C. to 25 cycle A.C. is close at hand, Mr. McDade is considering the building of a motor generator.

**No. 2 District (by 6IZ).**

(Reports by the 5th of each month, please.)

6IZ reports 33 QSO, one on 45 metres, with an input power of 5 watts, and 32 on 23 metres with an input power of 20-25 watts. The 23-metre QSO's embrace NU 1, 2, 3, 4, 8th and 9th Districts, Austria, and "Cham" (ship bound for Montreal—ORB, 1,800 miles). Best reports, NU4QY (Florida), who gave "R3 steady," and NU9ANZ (Nebraska), who reported "R4 D.C. FB, and all OK through bad QRN." The station QSY to 23 metres on June 5, and ran schedules with "Cham," NU8ALY, and 1BYV.

6VO.—17 QSO on 45 metres, including G, EN, and Faroe Islands. Power at no time exceeded 2 watts, derived from H.T. accumulators. Best report "R6 and very steady," from Faroe Islands. On this occasion the input was only 1½ watts. Schedules have been recommenced with G5GU and G2BI.

2BQK, having received his A.A. licence, has begun to get his transmitting gear together, and hopes to qualify for a radiating licence when his probationary period is completed.

**No. 3 District (by BRS6).**

(Reports by 5th of each month, please.)

5JD is occupying his time at present with research in the direction of quality in broadcast reception. High values of H.T. are in use, and exceptionally good quality has been achieved, making use of a reed-driven cone.

6KO.—70 QSO, 12 on 45 metres (G's), and 58 on 23 metres (NU's and SB's). Best reports on 23-metre signals come from SBIAD, who gave R7, and an NU report of "R6-7." Input power 10 watts from hand generator. QSO NU every night except one (good old stork!—5YG). Still using DET1 for 23 metres.

BRS6.—During last 14 days of June heard 6 continents, 48 countries. New countries or districts added by reception of OA7CW, NU9AWA, ARSLHA, ER5AB, FMTUN2. Schedules are being run with GC6KO, NU8JQ, and NUICUE.

BRS71.—QRT till September.

**No. 4 District (by 2TF).**

(Reports by the 5th of each month, please.)

2BFQ, in conjunction with BRS62, carried out some observations in connection with the Eclipse tests. He reports his inability to find the transmitting station allotted to his area for observation, but carried out signal strength observations on American 2XD. The D.C. mains presently supplying power for 2BFQ transmitter are shortly to be converted to A.C., but fortunately of 50 cycle periodicity.

BRS62.—Activities were largely those of 2BFQ. A start has been made with the construction of a power transformer, which, when built, will be suitable for supplying power to a transmitter. (A good sign, this, OM—5YG.)

## Channel Islands Notes.

By 2ZC.

We have had a visit from G2SO, who came over to Jersey with Mrs. 2SO and the junior ops. His coming here was the outcome of our hopes that some of the gang would visit Jersey, and this suggestion appearing in the T. & R. BULLETIN did the trick. This is FB, and we hope others of the gang will follow his lead. He visited 6OX, 6PU, 6HZ and 2ZC, working GW15C at the latter's station.

It does us good to hear and exchange views with others, and his visit left a pleasant impression behind. Now, OM's, who is to be the next, especially as 5YX says he cannot come now.

Little DX has been done by anyone during June, and there is little to report. The subject of QSL cards has been taken up locally, and it has been found that a large number of stations (principally Belgian and French) either do not return the courtesy of a card sent to them after a QSO, or carelessness comes in in the process of redistribution. We have under consideration either not sending cards to those who do not seem to acknowledge them, or of refusing to QSO at all! If everyone did this the Ham world might recover from a growing slackness, which, after all, is only a courtesy.

5GW has warned 2ZC to "stand by for erecting gear" about July 17, so Hams can look out for him after that date, as he will be on the air again. Some of us hope to get over for the Convention.

#### REPORTS.

6OX is still without an aerial, but he hopes to get one up soon. Good luck, OM, when you do. We've missed you.

5GW reports reception only, and is QRV for reception on 23 metres. He adds he is learning golf!! (Shouldn't, OM—its even worse than blowing bottles for bad language, and wastes valuable QSO chances!!!—2ZC.)

2ZC has been away a month, and was QRT, but has started morning observations of "QSS and signal swing" again. Any decided alteration or variation might please be QSR'd to him, as his tuning and input (8.5 watts) are fixed for these tests. Together with 2SO, a visit was paid to 6PU, where a demonstration of "mangle plus keying" was given. It was F.B. to watch, but N.G. to do. Hi!

6HZ is having QSB trouble, having developed a chirp and a sort of A.C. note, from what used to be a chirple D.C.

## Irish Free State Notes.

By 11B.

If one can judge by the reports received, and not received, there has been very little doing in I.F.S. during the past month, and I attribute this to the counter attractions of summer rather than to any slackness on the part of GW transmitters. From my own observations, as well as from reports received, reception conditions have been, on the whole, poor, with much trouble from X's.

12B reports that he has been off the air for refitting during the early part of the month. Since his refit he has only been occasionally on the air and has nothing of interest to report. For a short time he was down to 23 metres, but has now reverted to 45 metres, as he found things very slack on the shorter wave.

13B reports that he will be on the air during the latter part of July and the whole of August on both 23 metres and 45 metres, and he would welcome reports from anyone hearing his signals.

14B is still yachting, and is off the air.

15B has, I think, left Ireland; we are sorry to lose him.

16B has removed from his former QRA to 2, Albert Road, Sandycove, Co. Dublin, and he expects to be soon on the air from that address.

18B has nothing special to report.

11C has been off the air, but hopes to be working again before long.

12C, owing to pressure of business, is definitely off the air until the winter.

14C, having now passed his exams. (congrats, OM), reports that he will be at the key again almost at once.

15C reports some good European DX, his sigs. being an average of R5. His best QSO was EU1UA, who reported his sigs. R6.

17C, using an input of 8 watts, reports QSO's on 45 metres with most of Europe, the Faroes and Tripoli. He tried a Hertz aerial, but has now reverted to his old inverted L. On 23 metres he has worked several European countries, his best being EC2UN and EC2YD, and also NU 1, 2, and 8 districts, his best being NU8ALY, who reported him R4 p.d.c. when his input was 8.1 watts. He is easily the star GW station for this month.

11B has been away during a great part of the month and has nothing of any interest to report.

The following have not reported:—17B, 19B, 13C and 16C.

## Northern Ireland Notes.

By 5NJ.

PRACTICALLY all our stations are on holidays at present, and the Notes this month will therefore be very brief.

6JA, 10 watts on 45 metres. Fifty-five QSO's during the month, mostly with G stations.

6WG, 8 watts on 45 metres. Thirty-one stations worked, local and Continental. Best DX, EA-W3 (Vienna) R4, just before sunrise here. Best report, R 6-7, from D-7JO during darkness

here and full daylight at 7JO. A hand generator is now in use, and both receiver and transmitter are worked off the same accumulator.

5HV, 8 watts on 45 metres. About 50 QSO's since May, including various Europeans.

2AFD, Excellent reception work is still continuing at this station. Practically all other stations are QRT for holidays.

All reports by 12th of each month, please.

## Northern Notes.

Area Manager: S. R. WRIGHT (2DR).

REPORTS are distinctly thin this month, no doubt due to hams being busy in other directions, but nevertheless there are some excellent reports among the few I have received. The number of hams who fail to report is on the increase, I regret to say. OM's, you might send just a postcard, even if you have not touched the key all month, for it shows that the interest is still there even if the DX hound slumbers in his kennel pro. tem.

A Lancashire ham again smites the starred rectangle hip and thigh, and there is no doubt that 5MQ is doing mighty good work, considering his 9-watt input. It shows what can be done during the summer months anyway. Congratulations to you, OM.

Will hams please note I am wanting a collector for the Notts, Derby and Lines. Area? 5CD has had to relinquish the post, and I take this opportunity of thanking him for his efforts on my behalf, and on behalf of the T. & R. Offers for this job should be sent to me immediately or to 5CD. I hope one or two of you will be keen enough to take the job on.

Now for the reports:—

#### Star Station this Month.

5MQ, MR. E. MENZIES,  
School House,  
Fazackerley, Liverpool.  
(For Details, see Lancashire Area.)

#### Yorkshire.

(Reports to 2DR by the 8th.)

BRS26 reports 200 stations logged on the 20m. band, including V.S.lab, 10NU 6th, and 1NU 7th districts. Solar Eclipse tests were also carried out, but very little done on the 30-40m. band.

6OO has been busy on the 23m. band. EC2UM was worked on 3 watts (R4), and NU1DM on 4 watts (R4), and MU1BUX (R5 on 8 watts). Keep it up OM.

6YR. I did think you were dead, OM! He has done little of late, but is working Europe on the old dry batteries. (Have they grown whiskers yet, OM?) LA-1A asks if anyone heard him during the eclipse? Rake in 6WD to the fold OM.

6IG is using 34 watts from batteries and a half-wave Hertz. 65 QSO's mostly Europe, but has several good DX items. NC, 1DM (R5), EU, O9RA (Moscow), CHAM (in Mid-Atlantic), R7 and 11ZA Rome (R5). 23 metres is the next move here.

2BOQ reports little done except a new transmitter built. He has heard 127 stations of which 43 were NU's, including NC, 1BI.

6DR has 86 contacts on 9.6 watts Hartley. The best were NU-2MD (R7) and two other 1st district MU's. Phone has been reported by EF-8A (R7) and EB-4UA (R6), both in daylight. Crystal control is being tried here.

6TY, 112 contacts, covering all Europe, on 20 to 24 watts, R.A.C. Best DX was EAFK (R4). Here again crystal control is being experimented with and should be in working order next month.

6BR has little to report, having done practically no working during the month.

6XL has not touched the key, but made up for that by coming up to Giggleswick School on eclipse morning and taking charge of the 2LO receiver for 2DR, who was thus free to observe Manchester. I am afraid 6XL had an uncomfortable night!

2DR has done nothing this month, except work inside the station. A removal took place from a temporary QRA back to the shack and improvements made at the same time. All spare time has been put into eclipse experiments for the Radio Research Board. I hope to be on 32 metres and 90 metres by the time these notes are in print.

The following did not report:—5SZ, 5US, 2XY, 2IH, 5KZ.

#### Lancashire.

(Reports to 5XY.)

5MQ hits the starred rectangle this month. He was only working 13 nights, but made excellent use of them. 89 contacts with U.S.A. (1, 2, 3, 4 and 8), also Brazil and ARDL. Power was the modest 9 watts, as usual; w/l 33 and 23 metres. He gets R7 in the States but only R2 to R3 from E of Great Britain. Reports from countries East would be appreciated.

5MS has also done good work, having 115 contacts including Russia, Tunis and 54 MU's (1, 2, 3, 4, 8 and 9), 3 MC's, and Newfoundland. On 23 metres, with 50 watts, R.A.C. The best DX was MU9DB (R5). Has altered aerial to Zeppelin type, using 3rd harmonic with improved results. Valve trouble here.

5XY has not been on much this month, owing to business and holidays. He has worked a few Yanks on 23m., and was reported by NA7BU (Alaska) on 33m.



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### Isle of Man.

(Reports to 5XY.)

5XD is the only hero this month but is QRW exams. Has done good phone in Europe on 45m. and will shortly be heard on 23m.

Now then, Lancashire, what are you doing? Three reports, including the collectors from a county your size will never do. Buck up, OM's!

### Cheshire and North Wales.

(Reports to 6TW.)

2SO is still struggling with the C.F. Hertz. Three weeks of the month he was on holiday visiting Channel Islands hams. He finds the C.F. Hertz works "locals" better than other aerials he has tried. Congrats. on your article, OM. Send 'em along.

2MF is reported to be trying 45m., but having difficulties. Write to 6TW or myself OM and we will help if we can.

2BOW is expecting full licence. Send your new call letters to 6TW please, OM, and good luck.

6TW has been busy trying local work on 45m. phone. He also logged 2WJ all through the eclipse and found the work very interesting.

Will Cheshire and N. Wales members please send in a few reports? Only two or three reported this month.

### Northumberland, Durham, Cumberland and Westmorland.

(Reports to 2AIZ.)

6QT reports 27 QSO's with 4 or 5 watts from batteries. Best DX EI-1FC (Rome) and ER 5AB (Bucharest). This station is shortly appearing on 23m. on the break-in system.

6YV has been off the air most of June but reports 16 QSO's, including NU-10, SB-2, SC-1, and VS 1AB. Best DX SC-2AS (R5) and NU-7GB. All this on 23m., power 50 watts, full wave Hertz. Rebuilding is about to take place here.

BRS-44 reports good conditions on the 20m. band. Says NU's are good on 19-21m. about 7 a.m. He has devoted quite a lot of attention to 5 metre work lately.

Hi! This gang requires a shake-up 2AIZ. Three reports from four counties when there are dozens of active men. Give a hand, fellows, and let 2AIZ hear from you. Notepaper free if you are short!

### Notts, Derby and Lincs.

(Reports to 5CD.)

5BD has had 67 QSO's in 15 countries using 10 watts, from a hand/foot generator. Best DX and first contact with U.S.A. was NU-1AKM (R5). Congratulations on this, OM.

5CD has nothing much to report and has experienced poor conditions on 45m. He is changing QRA this month and hence his resignation as collector for this area. Offers for the job to 2DR as fast as you like.

6UO had 46 QSO's using 1.8 watts and a PV6DE valve. Best DX Jersey. He is building a new 23m. transmitter. Has trouble in QSOing by phone.

BRS45 has put up a 35 ft. mast and finds he gets heaps more QRM on his big aerial than on his indoor one. He thinks the QRM QRK ratio is no better than on the indoor.

2ABA has been busy with alterations and put up a 35 ft. mast also. Gets a good many NU's on 20m. but no G's. Try 23m., OM.

2AHP is awaiting the G.P.O. brass pounding test. Good luck to you, OM.

2BLG has received a full permit. Let 5CD have your call sign, OM., please.

2BZT sails this this month to take up residence in Rhodesia. Good luck to you, OM. He hopes to QSO the gang from there with 50 watts of C.C. on 34m. The nearest town is 35 miles away. Some walk to charge your batteries OM! Hope to QSO you over there.

BRS34 reports little doing, but has kept schedules at week-ends and crammed Morse consistently in preparation for elevations to the transmitting ranks, and passed the brass-pounding test O.K. Good man! He took a portable on an all-night journey to Giggleswick for the eclipse and unfortunately didn't see the sight owing to cloud.

BRS97 is duly welcomed to the fold. He also reports no G's on 23m.

The following did not report:—2IX, 2VQ, 5DM, 5KW, 5OD, 5QT, BRS48.

WANTED, a collector for this area. Offers to 2DR.

## South-Western Notes.

Area Manager: G. COURTENAY PRICE (2OP.).

THE outstanding items for the month are (1) the absence of reports; (2) the persistence of atmospherics; (3) the remarkable strength of 2XAF during the total eclipse. I have had great pleasure in calling on 2BI (Calne) 2GW (Chippenham), and 5FS (Bristol) during the month and found all three stations full of interest and the respective "hams" full of enthusiasm. I shall be away from my station during the first fortnight in August.

2BI is experimenting with different antennae and is going to build a new transmitter for 23 metres.

2GW is packing up ready to change QRA.

2OP has nothing of interest to report.

5BK has been away on holiday.

5FS is settling down at new QRA and is going strong on crystal control.

6JK has been QRW but has worked 63 stations during the month, G, GI, power 4-9 watts, D.C. mains. Best DX Belfast, fone R5 4 watts. C.W. Glasgow R6 5 watts. Trouble with QSS (feeders radiating).

6UG has also been away. He proposed rebuilding and is re-designing power supply plant.

BRS28 (Bristol) arranged a schedule with SB7AA from July 1 to 10 at 22.00 hrs. G.M.T. on 36 metres. Will any BRS who heard his signal during this period kindly send him details? On July 3 OA5BG was heard at 21.50 G.M.T. on 32 metres—an unusual occurrence for midsummer.

BRS80 nothing of interest to report except the remarkable strength of 2XAF during eclipse.

## Danish Notes.

By ED7MT.

7BJ has done some 20m. work. He had a funny accident with a Swedish ham, who answered him on a 22m. CQ. 7BJ worked both with Xmitter and RX on 22m. band. The Swedish ham worked Xmitter and RX on 77m. and thought he was working on the 70m. band! Hi!

7BX works occasionally from a summer QRA.

7DM spent his holiday in Svanike on Bornholm. He works as XED7DM from this QRA. His power is 7-8 watts.

7EW have only worked his schedules this month.

7JO has now started his new Xmitter, and uses a power about 30 watts. He says that conditions for DX work are impossible owing to a terrible QRN.

7MT has also only worked schedules. He claims a R7 report from NI3BH to ED7XT, because every detail in the report checks with a CQ DX call; power was 12 watts.

7XU works regularly U.S.A. from his summer QRA in Karise. Power only 100 watts raw A.C.! Hi!

7PRS was a call sign specially used for a portable camping station operated by 7BJ, 7EW and 7MT. QRA near Faxe Ladeplads 60 k.m. airline from Copenhagen. Power used 1-8 watts. H.T. was obtained from a 120-volt accumulator. Though the Hertz aerial was only 5m. high, and badly screened by trees, the results were excellent. We had many QSO's with our friends through Europe. Mal. QRK in England was given as R6 by G5KZ. Sweden and Bornholm were worked on phone. The following countries were worked on ten days: E (a, c, d, f, g, k, m, n and r). A schedule was kept twice daily with old 7JO. The last day we had several QSL cards on the tent wall. Hi! This trip was the first with portable short-wave radio here in Denmark, and we had much pleasure of it, so we will surely try it another time again. We beg all those who have logged the signals of 7PRS kindly to send a detailed report to 7MT. We beg to excuse that our wave was 76m. and not as published in "W.W." 75m.!

P.S.  
DEAR SIR,—Possibly have the photo of 7PRS interest beside the report. The photo shows from left 7MT behind the microphone, receiver and Xmitter. The station was installed in a big tent for twelve (12) persons.

Yours faithfully,  
E. POULSEN (ED7MT).

## German Notes.

By EK4CL.

Indeed, I am highly pleased to forward here the first report concerning short-wave activities in Germany.

It may interest the G's that the greater part of K's are unlicensed stations (please send all cards under cover), but still we trust that things will improve after the international convention at Washington.

All British lists of "Calls heard" are welcome, and will be published in our periodical "CQ." We invite the G's and BRS's to send their lists over to QSL Section, DFTV, 19, Blumenthalstrasse, Berlin, W.57, or via G6CL.

Moreover, we beg you to send all cards for German ham's now to the above-mentioned address, as they get QSR'd to the respective amateurs the quickest way without any fee. Tx, OM's.

QRN was very bad during the month over here. However, some of our "big men" continued to QSO the "Zedders" and "Aussies," EK4UAH being QSO OA7EW, and EK4DBS working with OZ2BX. Also North and South America are regularly worked by 4UAH, 4ACI, 4ABF, 4UU and some more stns.

Fone is used by some K's with much success, e.g., 4MARS got fone contact with Uruguay and EKNr27 was heard in the Philippines. Reports on modulation and QRK are always appreciated. 4YAE will be on the air with c.c. on 32 metres.

AEQ is the official call sign of the aeronautical observatory of Lindenberg near Berlin. AEQ hopes to QSO with amateur stations; QSB dc, inpt about 80 watts, QRH varying from 30 to 60 metres; pse QSL via DFTV.

Here are the wave-lengths of the German commercial stations; AGA=15.0 metres; AGB=26.5 metres; AGC=27.5 metres; AGK=11.0 metres.

May I welcome heartily any British ham who visits the Berlin Wireless Exhibition (September 3 to 12); Berlin amateurs will be very pleased indeed to greet foreign hams and to show them their "outfits."

## Dutch Notes.

Prepared by ENOCX.

Due to summer time, with its heavy QRN, only very few of us are regularly on the air. Since a few weeks an increasing interest has been noticed in experiments on the 20 metre band, and many nice results are obtained.

ENOCMX is one of our biggest brasspounders, but very sorry his QRA is still unknown in the whole country!

ENOVN is doing fine work on 20, and is making many QSO's with U.S.A.

ENOCY once was playing with very high power, and was reported R6 in Tasmania.

ENOWM will be on the air again when summer is over. He is now learning Charleston. (Pse, OM, only use this science on hamfests, not in radio! Hi!)

ENOGA is reported over the whole world very QSA, and is operating with only 20 watts pure A.C.

ENOCO cracked his crystal and is now weeping all the day!

ENOCX is still doing fine work on QRP and hooked up his first "NU" with only 2, 4 watts input on a lone receiving valve in his transmitter.

ENRO15 did some splendid work during the solar eclipse.

## Q.R.A. Section.

Mr. C. R. Ponting, BRS28, writes me that he has been in communication with the Radio Operator of KDO, s.s. *Esparta*, a ship belonging to the United Fruit Co., U.S.A., and running between New York, South America and the West Indies. This ship operates on 33 metres, and is regularly in communication with amateur stations, and the operator is particularly anxious to achieve contact with Europe.

There are two other vessels of the same line, who are hoping to get into touch with amateurs. They are:—

s.s. *Zacapa*, radio call KLE.

s.s. *Carillo*, radio call KDE.

QSL's for these three vessels can be sent to:—

c/o NU2UO,

*The New York Times*,

Times Square, New York, U.S.A.

Mr. Ponting is also the first station to report signals from NN1NiC (ex NNM3Y). This is a U.S. Naval Station in Nicaragua, and the QRA is:—

Capt. F. E. Pierce,

U.S. Marine Corps,

Observation Squadron No. 1,

2nd Brigade Marines,

Managua, Nicaragua.

Capt. Pierce's station operates on 33.1 metres, and he called England every Sunday during July between 06.00 and 07.00 G.M.T. Did anyone hear him? He is anxious to receive reports from England, and is looking forward to a QSO.

How about fixing up a sked?

Our old friend D. B. Knock (OA2NO), whose change of QRA is in this issue, hopes to be working again by the time this notice is read by members of the R.S.G.B.

He says that "G" stations on 23 metres are QSA in Australia, and that he will, in consequence, work on the 20-metre band, so please look out for him.

From A. G. Burgess, BRS86, I have received the following information:—

There are two coastguard cutters, the U.S.S. *Modoc* and the U.S.S. *Tampa*. Both of these vessels do ice patrol. When on this duty both use the call NIDK, but off patrol the former uses the call NIVD and the latter NITC.

Both QSO amateurs, and the QRA for QSL is:—

U.S.S. Coastguard Cutter *Modoc* (or *Tampa*),

c/o Boston Navy Yard,

Boston, Mass., U.S.A.

I have a letter from the U.S.A. for G2BG, and shall be glad of his QRA, in order that I may forward it on.

M. J. Thorpe (VS1AC), member R.S.G.B., informs me that their intermediate is used with numbers as follows:—

VS 1's—Straits Settlements.

VS 2's—Federated Malay States.

VS 3's—Unfederated Malay States.

## Q.R.A.'s Found.

EAFK.—E. Hauser, Spitalgasse 19, Vienna 9, Austria (Inf. 2AUH).  
EAKL.—W. Blaschek, Klosterheuberg, Bahngasse 29, Austria (Inf. 2AUH).

ENPB7.—N.V.V.R. K. Beintema, Arts, Petrus Hendriksstraat 19A, Groningen, Holland (corrected QRA).

- NU10N.—W. B. Jennings, 26, Tapley Street, Lynn, Mass., U.S.A. (Inf. GC5YG).  
 VS1AC.—M. J. Thorpe, 1, Park Road, Penang, Straits Settlements.  
 VS2AC.—F. J. Barnett, Central Workshops, Selangor, Federated Malay States.  
 NI3SN.—Snorri Arnar, Box 354, Reykjavik, Iceland.  
 NITFHV.—Dr. Hans J. Vogler, Akureyri, Box 63, Iceland (corrected QRA by GFY).  
 AI2AJ.—Lieut. E. J. H. Moppett, "A." Cavalry Signal Troop, Roorkee, U.P., India.  
 LA1J (ex LA5B).—B. Lindemann, 24, Nubbebakken, Bergen (Inf. 6PP).  
 EMSMZ.—Radio SMZF, Vigge, Sweden (Inf. 6PP).  
 EK4SAR.—J. Kron, Wackenbergrstr 6, Saarbrücken, Germany (Inf. 6PP).  
 SB2ID.—O. Peixoto, Caixa Postal 103, Curitiba, Parana, Brazil.  
 SB2IG.—L. G. Moreira, 6, Rua Paula Gomes, Curitiba, Brazil (Inf. BRS86).  
 EKAEQ.—Mr. Fansen, Observatorium Lindenberg, Kreis Beeskow, Germany (Inf. 5BD).  
 ELLAIS.—T. Mehus, Stavanger, Norway (Inf. 5BD).  
 ED7LY.—J. Stannow, Rungsted, Denmark (Inf. 5BD).  
 ED7VA.—Steen Hasselbalch, Borupgaard, Snekkersten, Denmark (Inf. 5BD).  
 EMSMZY.—J. A. Holmgren, Balzarsgatan, 20A, Malmo, Sweden (Inf. Mr. Bruno Rolf).  
 NZEZ5.—Corpl. Karr, 4th F.A., Gatun, Canal Zone (Inf. 5KU).  
 NQ2CO.—Signal Corps, Cuban Army, Camp Columbia, Havana, Cuba (Inf. 5KU).  
 BZC.—The Captain, H.M. Signal School, Portsmouth (Inf. 6PP).  
 FN2A.—Dr. Stewart, Ekoy, Lagos, Nigeria.  
 FN2B.—Capt. Patten Thomas, Zaria, Nigeria.  
 FN2C (ex KMI).—Capt. Wilmot, Kaduna North, Nigeria. (Nigerian QRA's by courtesy of Capt. Wilmot, G6WT).

**G.**

- 2AQW.—J. T. Dickinson, "Kathera," St. Austell Road, Lewisham Hill, S.E.13.  
 2ASH.—H. M. Cooper, 51, Hastings Street, Glenelg (Inf. 2BCA).  
 2ASL.—G. Hume, 124, Eversleigh Road, Battersea, S.W.11.  
 2BQK.—J. M. Wilkie, 102, Stanley Street, Aberdeen (Inf. GC5YG).  
 2HH.—H. Harding, Treve Radio Service, Libanus Road, Ebbw Vale.  
 2WR.—R. D. Webster, 68, Norwood Road, Herne Hill.  
 5LY.—K. C. Lay, 3, Brands Hill, Colnbrook, Bucks. (Inf. G6KM).  
 5QP.—J. V. Parsons, Holland House, Holland Road, Sutton Coldfield, near Birmingham.  
 5XQ.—J. C. Adams, Tower JHill, Newton Street, Greenock, N.B. (Inf. GC5YG).  
 5YU.—C. F. Scruby, "The Retreat," Pack Lane, Kempshott, Basingstoke (Inf. G5MU).  
 6DP.—W. P. Dolphin, 53, Higham Road, Tottenham, London, N.15 (Inf. G5GU and G5MU).  
 6MN.—E. R. Martin, Castlemount, Worksop, Notts.  
 6SM.—S. G. Morgan, 3, High Street, Croydon.  
 6UQ.—H. J. Eaves, 7, Marple Street, Hulme, Manchester.  
 6WL.—J. Kyle, Hillend, Dalry, Ayrshire (Inf. GC5YG).

**Change of QRA.**

- G2JU now "Colinwood," Pinner View, Harrow.  
 2PY " 444, Upper Richmond Road, Richmond, Surrey.  
 2SC " 24, Park Avenue, Bromley, Kent.  
 5PN " 19, Highcroft Villas, Brighton.  
 OA2NO " 121, Hopetown Avenue, Vancluse, Sydney.  
 SU1CV " 863, Clemenceau Street, Montevideo (Inf. BRS6 and BRS86).  
 LA1J (ex LA5B) now 24, Nubbebakken, Bergen (Inf. G6PP).

**Change of Call Sign.**

2BLG	...	now	...	6MN
2BPB	...	"	...	5XQ
2BPP	...	"	...	5QP
2BWZ	...	"	...	2HH
BRS69	...	"	...	2BQK
SS3SE	...	"	...	VS1AC
ICSNI	...	"	...	NI3SN
KMI	...	"	...	FN2C

**QRA'S Wanted.**

SFV, SDR, YOL, URCC, ED7HM, EZ66C.  
 The QRA SECTION is collaborating with *The Wireless World and Radio Review* in the compilation of the QRA's for the new R.S.G.B. HANDBOOK, 1928, and we are now busy collecting all the new QRA's we can get hold of.  
 I need hardly remind members that we are dependent on them to supply us with all new QRA's and corrections.  
 I shall be glad to receive any new lists of calls from any country in the world. (Overseas members, please note!)  
 I am especially anxious that the British Section should be the most comprehensive list yet published, but there are still many "G" QRA's of which we have no information.

Information regarding any of the following will be greatly welcomed, and members will be doing a great service if they help to swell our list for publication. When sending new QRA's, please print them in CAPITALS to avoid errors:—

2's.  
 2ad, ah, ai, at, ax, ba, bf, bg, bj, bk, bl, bn, bp, bq, br, bs, bt, bu, bv, bw, cd, cf, cg, cj, en, cr, ct, cu, cv, dh, di, dk, dm, dt, dw, fi, fn, fo, fy, gb, gc, gh, gm, gx, hf, hi, ho, hu, hy, ig, ij, im, io, ip, is, ji, jt, jy, ki, kj, ko, la, lc, ll, lq, ma, mh, mp, mr, mt, mu, mw, ng, ni, nx, ob, os, ow, pa, pb, pk, pm, qg, qo, qt, qw, qx, rl, rn, rv, sa, sg, td, tj, ts, ut, uu, uv, vh, wc, ww, wx, xa, xg, xh, xs, yb, yc, yd, yi, za, zf, zh, zn, zx.

5's.  
 5ab, al, am, ap, ay, bf, bm, bo, bs, bx, bz, ch, ci, cl, cm, cn, co, cz, df, dl, dr, du, dw, dx, dz, fb, fc, fg, fk, fn, fo, fp, fy, ga, gc, gk, gl, gr, hb, hf, ho, ht, ib, ih, ij, il, im, iq, iu, ix, iz, jf, jt, ju, jv, kd, kj, kn, kq, kt, kv, la, ld, lg, lm, lq, lr, lt, lx, mh, mi, mm, mp, mt, mz, nb, nc, nf, ni, nk, nl, nm, np, nr, ns, nv, nx, oa, of, og, oh, oj, on, oo, op, oq, or, os, ou, oz, pa, pb, pc, pf, pg, pk, pt, pv, qa, qf, qh, qi, ql, qn, qo, qs, qw, qy, rg, rj, rm, ro, rr, rv, ry, sa, sb, sg, sh, sj, sp, sr, sw, sy, tb, tc, tj, to, ty, uc, ui, uj, uk, ur, ut, uu, va, vf, vh, vi, vj, vm, vo, vq, vs, vz, wf, wg, wj, wk, wl, wo, wr, ww, xa, xb, xf, xg, xj, xk, xl, xm, xv, ya, yb, yi, yh, yn, yp, yt, yv, yy, zb, zd, zi, zj, zl, zm, zp.

6's.  
 6ac, ag, ak, am, an, ar, as, ax, az, ba, bi, bk, bl, bs, bu, bx, ca, cb, cd, cf, cg, cm, cn, co, cr, cs, ct, cu, cx, cz, db, df, dh, dl, ds, dt, dv, dx, ff, fi, fj, fm, fn, fo, fp, fu, fx, ga, gb, gd, gi, gj, gk, gp, gs, gu, gv, ha, hj, hk, hl, ho, ic, id, if, ih, ij, ik, in, ip, iq, is, iw, jc, jf, ji, jn, jp, jq, jt, jy, kl, kp, kq, kv, ky, kz, la, lg, lh, li, lk, ln, lo, lp, lq, ls, lt, lx, ma, mf, mh, ml, mo, mr, ms, mv, my, na, nc, nd, nm, nu, nv, nw, ny, oa, oc, od, of, oi, oj, ol, oq, or, os, pc, ph, pi, pm, pn, po, ps, pv, pz, qf, qi, qj, qm, qn, qp, qq, qr, qx, rc, rg, rh, ri, rk, rn, rt, ru, rv, rx, rz, sb, sc, sd, si, sj, sl, sn, so, sp, sx, sy, tc, tf, ti, tj, tk, to, tq, tr, ts, tt, tv, tz, ua, ub, uh, ui, uj, uk, un, ux, va, vc, vd, vf, vg, vh, vk, vm, vq, vs, vt, vu, vy, wb, wc, wi, wj, wm, wo, wp, wr, wu, wy, wz, xb, xj, xk, xm, xn, xo, xq, xw, xx, yb, yl, zh, zi, zk, zl, zm, zn, zq, zr, zs, zt, zu, zb, zw, zz.

Quite a formidable list! Will you help me to reduce it?

**Correspondence.**

**Instructions to Correspondents.**

*We are always glad to hear from members. Correspondence published in these columns should be written clearly on one side of the paper and marked "For Publication."*

*All correspondence should be addressed to the Editor, T. & R. BULLETIN, who reserves the right to refrain from publishing any material which is lacking in general interest or for other reasons. Correspondence for publication will not be acknowledged.*

*Correspondence must be kept reasonably brief.*

To the Editor of T. & R. BULLETIN.

DEAR SIR,—EG2MJ and BRS88 propose to carry out a series of aerial tests. The type of aerials to be used by BRS88 will be an underground aerial 2 ft. deep, 40 ft. long, also a frame aerial 2 ft. by 1 ft., 6 ft. high. During the time 2MJ is transmitting his aerial will be lowered. We hope that some useful data will be the result of this test.

Yours faithfully,

C. C. MORTIMER (BRS88).

86, Magpie Hall Lane, Bromley, Kent.  
 July 17, 1927.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—Having recently had the good fortune to visit several of the East Anglia stations, I wish, through these columns, to voice an appeal which has been made by them all:—"Please give us provincials the long-delayed calibration waves."

It is nearly a year since 6UV made his last appeal. Why cannot someone give this service?

The provinces get little enough now except the "BULL." and card service. This little extra will please and help them.

Wherever I went I found first-rate wavemeters of all types, but not one had been calibrated with British signals of definite frequency. As one of the Essex men pointed out, the Yanks have a splendid calibration wave service, but it is given at unearthly hours for British listeners.

If for some reason or other this service cannot be rendered, perhaps an explanation can be given in the BULLETIN.

Yours faithfully,

J. CLARRICOATS (G6CL).

107, Friern Barnet Road, London, N.11.  
 July 11, 1927.

We received a letter from en-ØLY, with complaints that he had not yet received a QSL of his QSO with:

e.g.—2CB 5QB  
2DR 5TD  
2VQ 6CI  
2VS 6IZ  
2YQ 6LJ  
5FI 6QO and GFR

Pse QSR, OM's! Tnx.

en-φNY.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—I am including in this letter the application form for R.S.G.B., and you will oblige me much in proposing my candidature to R.S.G.B., with another OM, e.g., G5AU, 5MS, 6YK, or 6WL I QSO'd.

The results I obtained up to the day I wrote are the following:—

1st QSO: el 4CM Liege. My QRK R9.  
2nd " g 5AU London. My QRK R7.  
3rd " nc 1DM Caledonia Mines. My QRK R4.  
4th " ei 1PL Roma. My QRK R8.

Etc.

I had been working in May and June only for 15 days about, but I am making another xmitter, that should be ready in some days (150 watts).

Like I told you on May 22, at the R.E.F. Convention, I shall be pleased to meet with you in one month. I shall be at Mascot Hotel, in Russell, for 15 days from August 13.

With many thanks and best regards,

I am, dear O.M.,

Yours truly,

R. ALLARD.

EF8QOA (not licensed).

14, Rue de Pont, Neuilly-sur-Seine,  
Seine, France.

July 16, 1927.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—Just a line to tell you of my new QRA. Formerly my station 2NO was located at 102, Cremorne Road, Cremorne, N.S.W. The house is to be turned into flats, which necessitated the removal of the "big stick." Consequently, the next signals heard in EG from OA2NO will emanate from my new QRA, 121, Hopetown Avenue, Vaucluse, Sydney. I expect to be on the air by August or before. The station will be entirely owned, engineered and operated by myself, and will concentrate mostly on 23 metres, or whatever QRH in the 20-metre band is finally allotted to Aussie

"hams." Power will not exceed 200 watts input, and will start at 50 watts for a while. EG sigs are QSO here on 23—the best band for QSO Australia! Ask the boys to keep QRK on 23 through your summer—observations should be interesting. I was recently QSO NU4PX 10.30 p.m. here on 20 metres. He was R6 and used 40 watts input to a UX210 with 15 ft. of bell-wire in his room!!

How about the 20-metre band now?!!

Sincerely yours,

D. B. KNOCK (OA2NO).

56, Margaret Street, Sydney.

June 2, 1927.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—Reading Mr. Wilson's interesting article in the current issue of the BULLETIN, I was surprised, especially having regard to his concluding remarks, to find him guilty of a monumental blunder.

The word "knot" signifies a speed, and is the equivalent of "sea mile per hour." It would be manifestly absurd to describe a certain distance as so many "sea miles per hour," yet this, in fact, is what the writer of the article in question has actually done.

Yours faithfully,

T. W. BANNISTER.

6A, Pendennis Road, Streatham, S.W.16.

July 15, 1927.

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

DEAR SIR,—Would you publish, in an early edition of THE BULLETIN, the fact that I am now transmitting C.W. and phone on 23 metres, and would be glad of reports? Also very glad to arrange tests, if communications on same be addressed to me direct.

Yours faithfully,

EDWARD C. JENNINGS,

Lieut.-Colonel.

G5OC.

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

DEAR EDITOR,—After reading Captain Eckersley's very interesting article in the December (1925) issue and the request that amateurs may try modulating the local oscillation of a drive set, I feel I should like to add a word or two on the subject.

The system advocated works extremely well if one or two precautions are taken.

It is essential to see that the "big bottle" amplifies but does not oscillate on its own. To test for this either turn off the H.T. or the L.T. to the local oscillator when all radiation should stop in the aerial circuit.

This happy state of affairs can best be assured by as far as possible limiting the fields of the local oscillator coils and main closed circuit coil and then by "neutrodyneing" the big bottle.

This is easily done by moving up the earth clip 3 or 4 turns on the main inductance and then coupling the end of the induction remote from the plate clip, through a variable condenser of, say, .0003 to the grid of the "big bottle."

Also it will probably help the "neutrodyneing" a great deal to wind the drive oscillator inductance in the form of a low loss "Torus" and then use capacity coupling between the grid of the amplifier and the plate of the drive oscillator via another variable condenser.

Such a system as outlined above was in use at the writer's station for over a year and gave very satisfactory results.

Yours faithfully,

S. C. B.

## EXCHANGE & MART.

Many amateurs are on the look-out for second-hand apparatus at a moderate figure. Look through your junk and see what you have worth selling and turn it into money. This is your best medium for disposing of your surplus experimental gear.

NEWTON GENERATOR, 1,500volts 100m.a., also quantity of Transmitting and Receiving Gear. Offers Wanted, Perfect condition, State requirements.—2N.V., 33, Hazelbrouck Garden, Hainault, Essex.

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London, W.C.2

# "Gambrell" signifies "Efficiency"

WHEN you buy a "Gambrell" product you have the satisfaction of knowing that it has been produced by scientific instrument manufacturers with a long standing reputation for accuracy, quality and efficiency—a lasting source of satisfaction to yourself. The following products are chosen for illustration as each is of special value to the serious experimenter:—

## GAMBRELL TYPE "D" WAVEMETER

This Type "D" Wavemeter meets the needs of those experimenters requiring an instrument low in price and of a high degree of accuracy. When not in use the instrument is totally enclosed in its cabinet—a Battery is incorporated within same, and a switch enables the buzzer to be put in and out of operation without disconnecting the battery leads. The buzzer used is the new Gambrell Buzzer—a very great improvement over any other yet placed on the market.

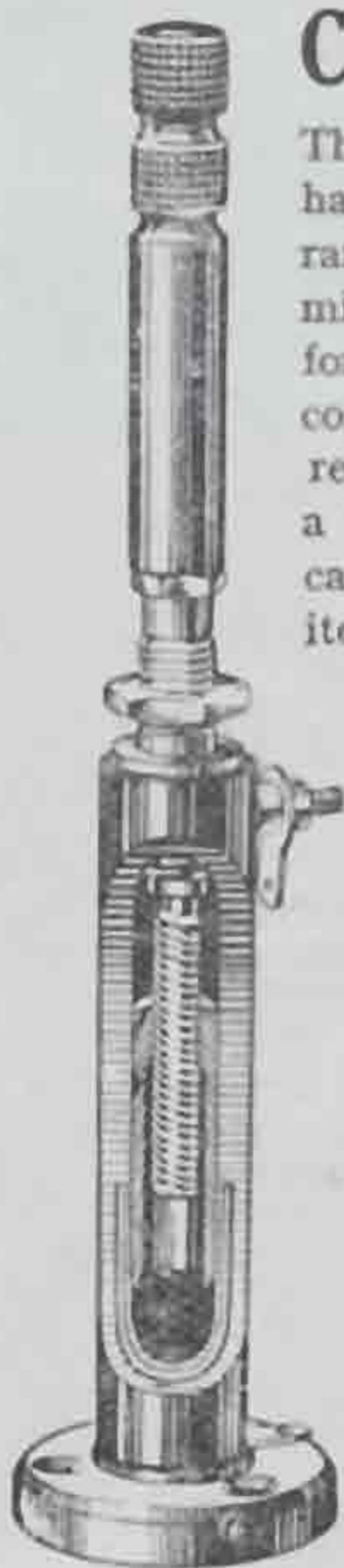


**PRICES:**  
"WAVEMETER TYPE D"  
(as Illustrated):

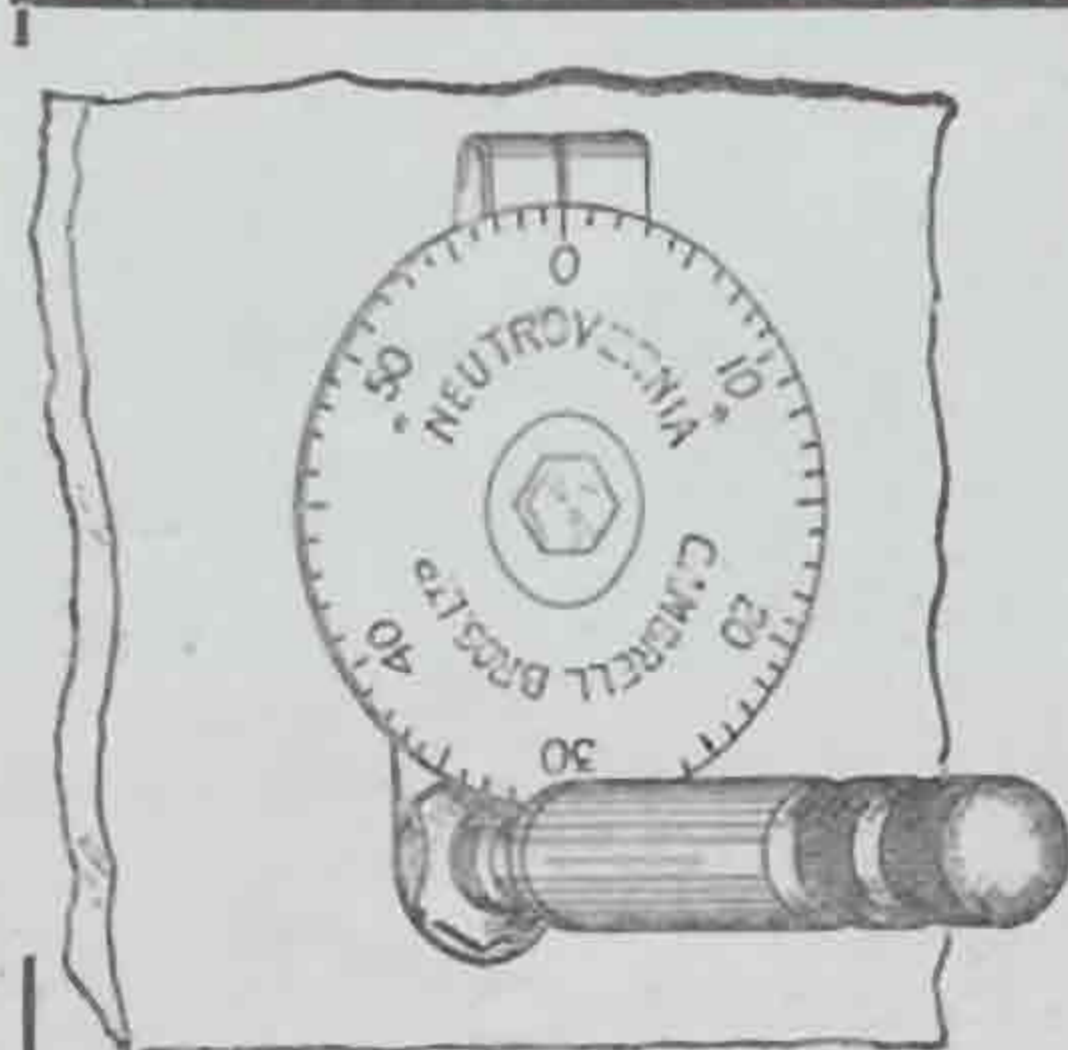
Complete with two coils and two Charts  
For 50 to 500 metres and 4½-volt Battery  
**£5 : 0 : 0**  
With Coils and Chart for 20 to 500 metres  
**£5 : 13 : 6**  
Can be calibrated up to 7,000 metres  
if required.

(HETERODYNE WAVEMETERS TO ORDER)

### NEUTROVERNIA CONDENSER

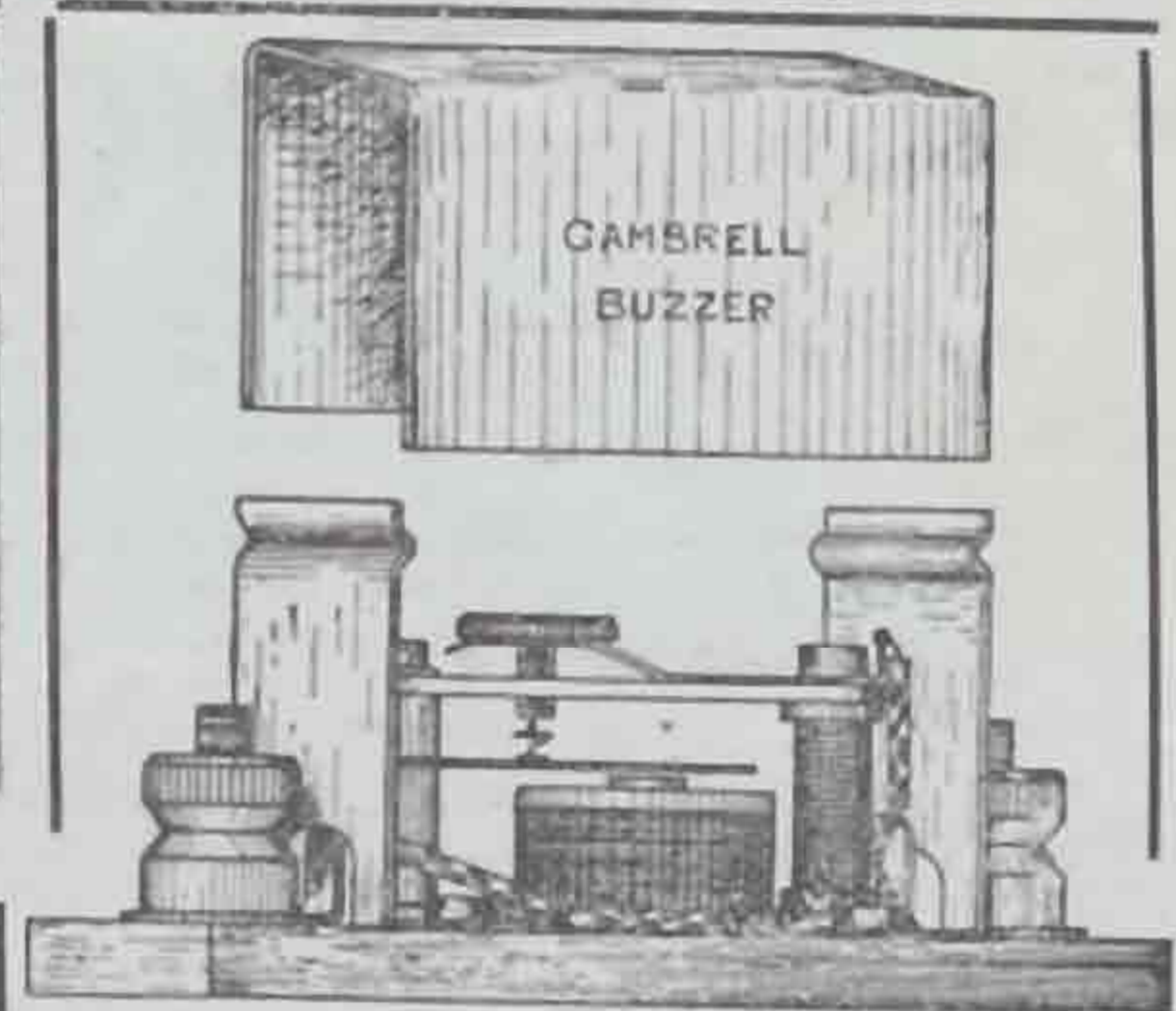


The best because—it has the widest capacity range approx. 2/38 micro-microfarads. It is ideal for use as a balancing condenser, a capacity reaction control, or as a vernier condenser. It cannot short—has ebonite di-electric. It is all enclosed, and, therefore, dust and damp-proof. It is a precision instrument throughout. It can be fitted with direct reading dial (see details and separate illustration). It can, as supplied, be used for either baseboard, on panel or through panel mounting, Price **5/6**



### If you fit this DIRECT READING DIAL

to the Neutrovernia Condenser (see details and separate illustration), it will enable you at any time to return to the Exact settings previously logged. This extremely useful Direct Reading Dial costs .. .. **1/8**



### GAMBRELL BUZZER

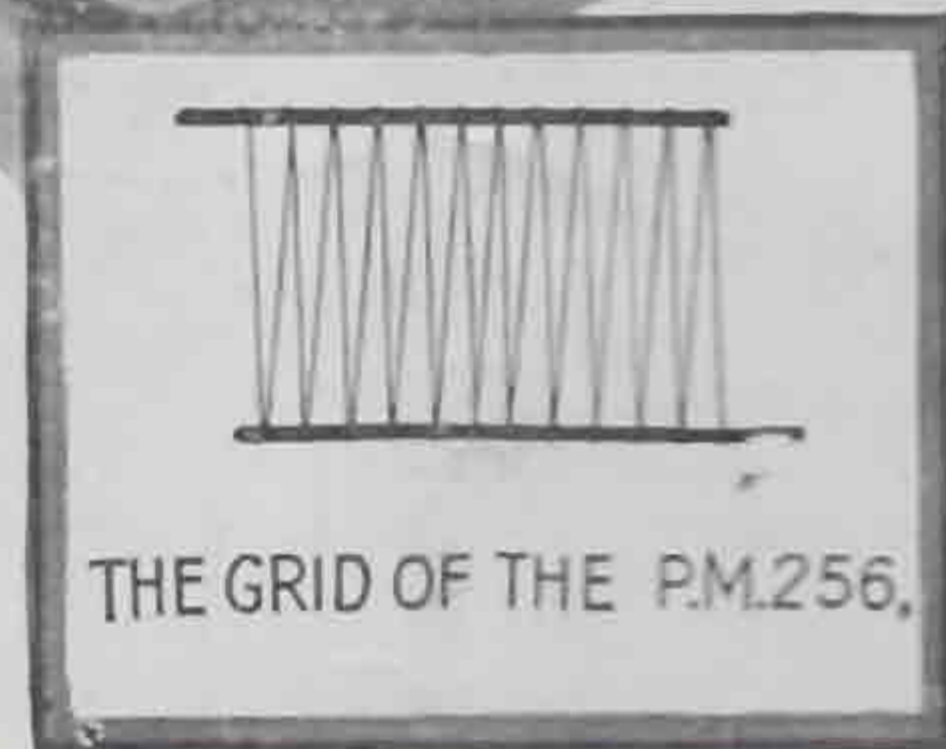
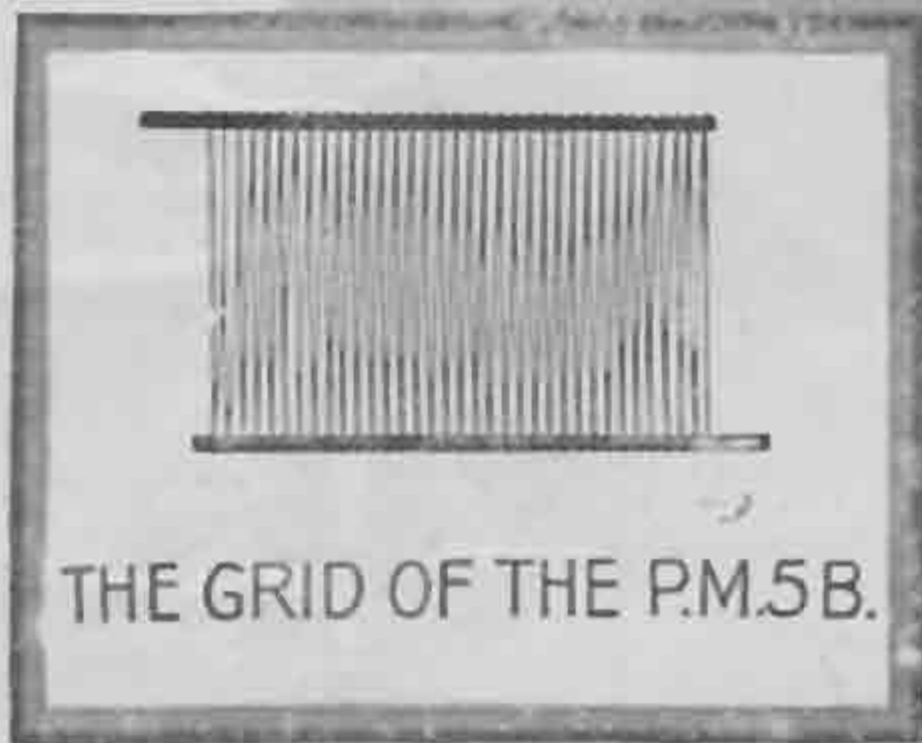
Here is the new Gambrell Buzzer—a first-class component, embodying a high and constant note with simplest form of adjustment, and yet compact. Mounted on ebonite and complete with shunt and terminals. Really good note. The best position is easily found by finger adjustment of the one knurled screw. Complete with dustproof cover, as illustrated **10/6**

**GAMBRELL BROS., LTD.,** 76 VICTORIA STREET, LONDON — — S.W.1

# THE DIFFERENCE!

In this photograph the matched electrode construction of the P.M.6 is disclosed with the anode displaced. Note the great length of the wonderful P.M. Filament.

The grids illustrated give a striking example of the matched electrode system in the case of only two of the series of Mullard P.M. Valves.



## MATCHED ELECTRODES

combined with the wonderful

## P.M. FILAMENT

MORE than a supreme filament in Mullard P.M. Valves . . . more than a master filament that has set a new standard for long life, toughness, economy and power . . . the wonderful P.M. Filament . . .

A system of matched electrodes, designed by Mullard Engineers to produce unequalled performance in every type of valve operation by completely utilising the vast energy of this master P.M. Filament to the best advantage in each case.

The result of this special P.M. construction and design is that a series of P.M. Valves has been produced from which, no matter what type of circuit you employ, positively pure and powerful amplification is assured from the first to the last stage, culminating in a final reproduction that is a delight and a revelation.

# Mullard

THE MASTER VALVE

ADVT. THE MULLARD WIRELESS SERVICE CO. LTD., MULLARD HOUSE, DENMARK STREET, W.C.2