

**THE T. & R.**

# BULLETIN

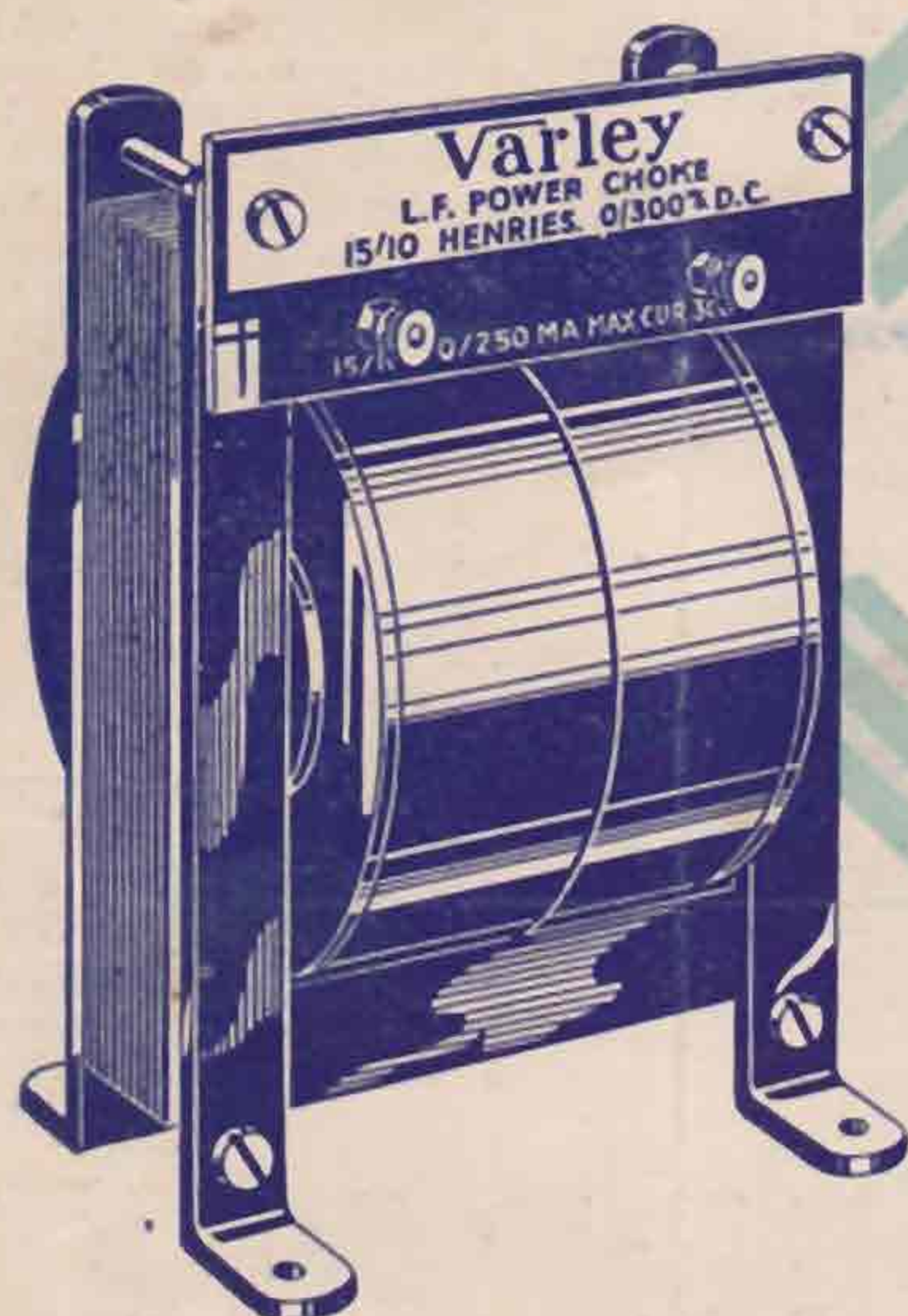
THE INC.  
**RADIO SOCIETY**  
OF GT. BRITAIN

AND THE  
**BRITISH EMPIRE**  
**RADIO UNION**

Vol. 8 No. 5 NOVEMBER, 1932 (Copyright)

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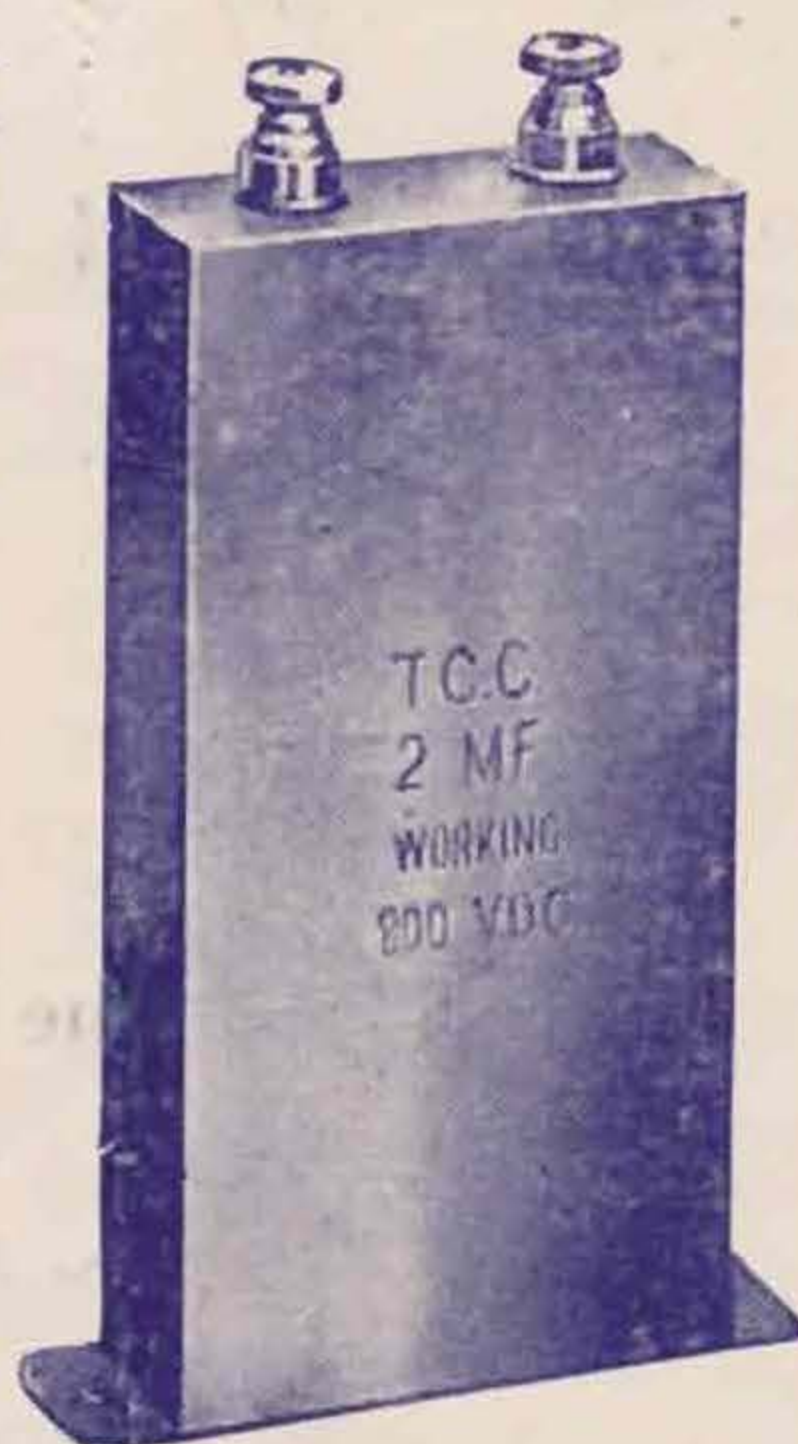
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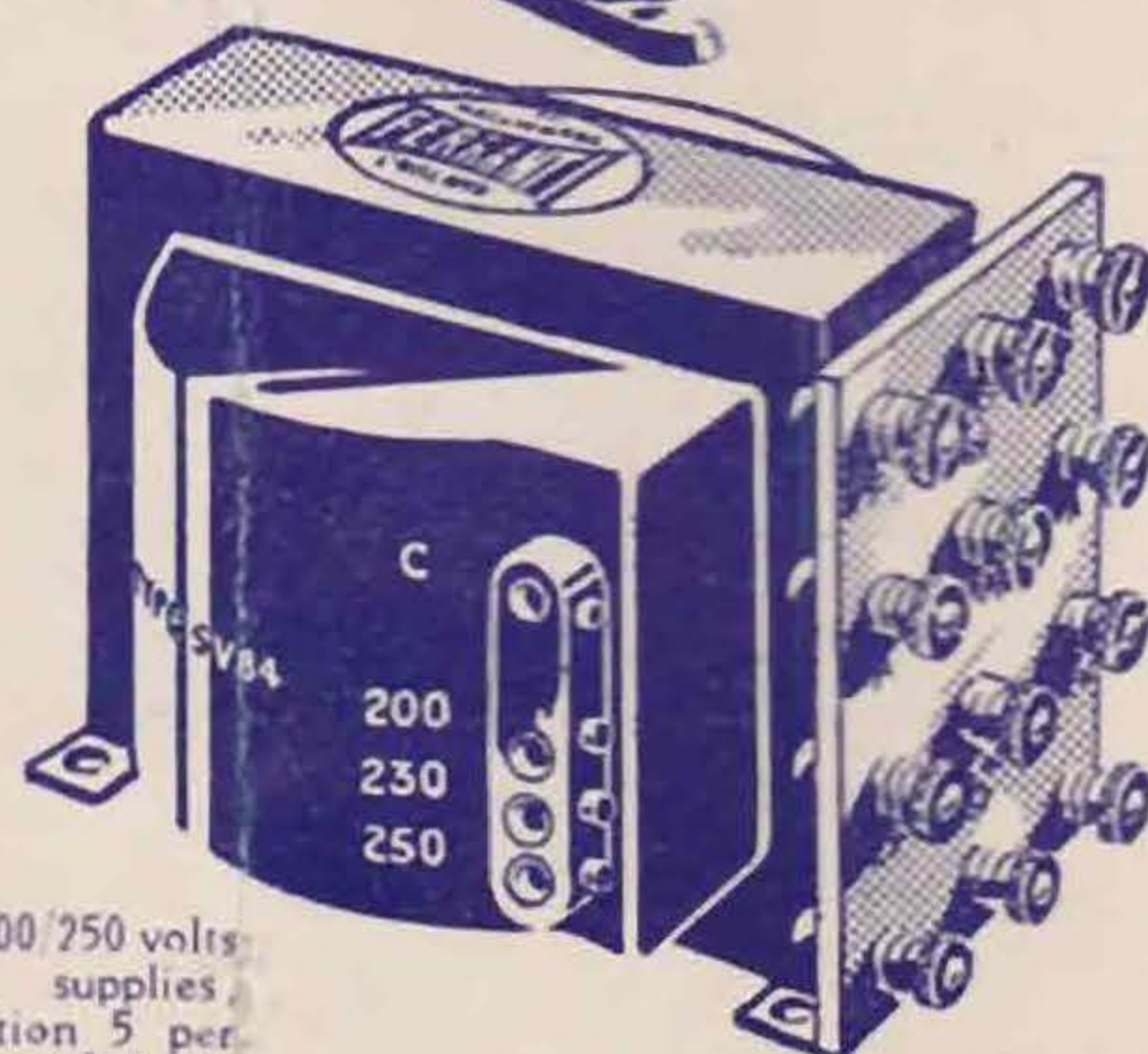
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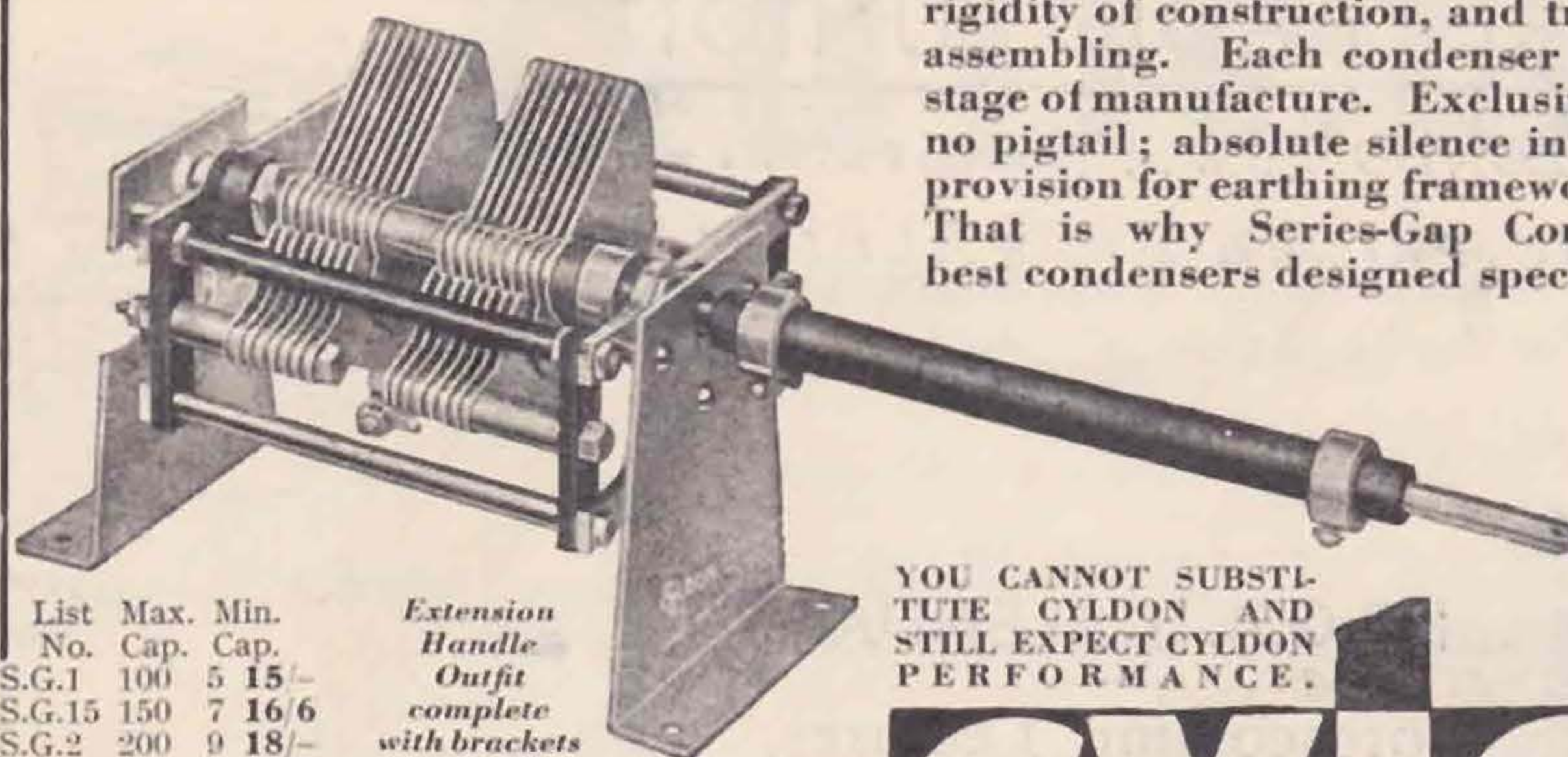
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## R.S.G.B. CALENDAR.

### Forthcoming Lectures.

1932.

November 25. Lecture on Television by Mr. T. M. Lance. Followed by a demonstration arranged by Mr. Walter (G5CV) and the Baird Television Co., Ltd.

December 20. Annual General Meeting. Lecture by Dr. Raynor. International Co-operation for the Study of Radio Propagation and Developments in the Measurement of Frequency.

1933.

January 27. February 24. March 31.

## OFFICERS FOR THE YEAR 1932

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All correspondence should be addressed to The Secretary (or other officer concerned), The Radio Society of Great Britain, 53, Victoria Street, London, S.W.1. Insufficiently addressed letters may be considerably delayed.





# Bulletin

***The only Wireless Journal Published by Amateur Radio Experimenters  
in Great Britain***

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*Temporary Editorial Committee: J. J. Curnow (G6CW), J. W. Mathews (G6LL), A. O. Milne (G2MI).*

*Advertising Manager: H. Freeman.*

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NOVEMBER, 1932.

Vol. 8. No. 5.

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## THE MADRID REPORT.

OUR Ambassador to the Conference at Madrid has returned, and we have pleasure in presenting his report in this issue. First of all, we must express our united gratitude to our Acting Vice-President, Mr. A. E. Watts, for the splendid work he has done upon our behalf. To give up the extensive time from his business, and undertake a journey of such length, to say nothing of the arduous labours he performed, was a true gift upon his part in the cause of British amateur radio, and we all owe him our grateful thanks. Furthermore, we are able to congratulate him upon the results of his work, for it is certain that he has been able to materially stabilise the position of the radio amateur as a legitimate participant of the ether. Together with our old friend, Kenneth Warner, and Mr. Segal, they fought the battle of the amateur with great success, and achieved results of which they may be justly proud.

We are also particularly gratified at one statement in his report: the kind support and assistance he received from the officials of the British Delegation. One and all, they considered that the amateur had established his right to consideration, and supported him in every possible manner. There can be no doubt that the statement made by Mr. Watts regarding the support given by the amateur to the services recently had much to do with the help we received from official quarters.

As regards the wave-bands, as the report shows, there is still some doubt with regard to the ultimate fate of the 1.7 m c. wave, owing to the pressing claim of various countries who require it for small boat services. We understand that vigorous efforts are being made upon our behalf to retain it, and we can only hope that they will be successful. It would appear that the other amateur bands are fairly safely secured to us. Of course, it is too early to shout yet, as the decisions of the Sub-Commissioners have to be ratified by the main body, who will have the final word.

At all events, we can be very satisfied with the progress of the Conference up to the present, and feel that very good work has been done in the cause of amateur radio. We hope that in our next issue we shall have an equally cheerful outlook.



# THE OPENING STAGES OF THE MADRID CONFERENCE, 1932

By ARTHUR E. WATTS (G6UN), *Acting Vice-President and I.A.R.U. Delegate.*

In presenting a *résumé* of the work carried out during the first two months of the Madrid Conference, I wish to make it clear that it is not possible at this stage to state definitely that the many decisions reached by the two main Commissions affecting amateur matters will become law.

Every change, however small, has to receive the approval of the Conference as a whole, and the final

in Copenhagen, is now "an old hand" in these *affaires internationales*, and, as a result, he has no difficulty in locating the key men of each delegation. He lost no opportunity in effecting introductions for me with delegates of many countries, and showing me how the Conference does its work. Reverting to the Conference itself, I found on my arrival that the first few days had been spent in selecting chairmen



[Photo by Marion, Madrid.]

*Sub-commission of the Regulations Commission, Chairman Herr Giess. On extreme left are Mr. Canete, Editor of "Radio Sport," Mr. A. E. Watts, and Mr. Warner.*

plenary sessions are not expected to take place until the end of November.

I do not consider it necessary to explain in detail the underlying reason for convening this Conference, but I think it may be of interest to mention that no less than 67 Governments are represented, and this time the U.S.S.R. are taking part, so that, providing the U.S.S.R. sign the Convention, we may expect their amateurs and commercial stations to work in accordance with it. It will be readily appreciated that the primary duty of the I.A.R.U. Delegation, which consisted of Mr. K. B. Warner, Secretary of I.A.R.U. and A.R.R.L., and myself, was to effect personal contacts with as many of the men that mattered as was humanly possible. I should like to pay a very warm tribute to the help extended to me in this connection by both Mr. Warner and Mr. Segal, of the A.R.R.L. The former having been present at the Washington Conference and at the two C.C.I.R. meetings at The Hague and

and reporters, and dividing up the work amongst the various commissions. There are actually seven commissions, but only two affect amateurs, the Technical and Regulations Commissions.

For ease of operation, all technical matters, including frequency allocations, are dealt with by a Technical Commission. This Commission is subdivided into two Sub-Commissions to deal with technical proposals affecting the Washington Articles.

The first of these Sub-Commissions is under the chairmanship of Col. Angwin (Great Britain), and its duty is to investigate all proposals affecting Article 5 (Frequency Allocations).

The second Sub-Commission, under the chairmanship of Herr Steidle (Germany) is dealing with Articles 3, 4, 6, and 16 of the Washington Convention.

The second Commission, known as the Regulations Commission, has to deal with all matters affecting Regulations, and its three Sub-Commis-



sions are under the chairmanship of Herr Giess (Germany), Herr Engset (Norway), and Herr Boetje (Netherlands). Sub-Commission 1 dealt with Articles 2 and 14, Sub-Commission 2 was to deal with Articles 14, but found it advisable to refer it to Sub-Commission 1, whilst Sub-Commission 3 concentrated on Articles 6 and 33. In the event of a Sub-Commission coming to a deadlock on some question, it is referred to a small sub-Sub-Commission for further consideration. Its full title would be "Sous sous commission de la sous commission 1 de la commission des Règlements."

So much, then, for the *modus operandi*. It sounds complicated, but is not so when you have once grasped it. The difficult part is to keep track of all the proposals and the sous-commissions, etc., who are going to discuss them.

As mentioned earlier, our primary duty as an amateur delegation was to effect contact with official Government delegates to make sure they had all the information they required, and to see that the best possible case for the amateur was put forward. As the British delegate, I had realised from the beginning the necessity of obtaining the sympathetic support of our own Government delegates, several of whom I had had the pleasure of meeting in London. As to how far we succeeded, I leave you to judge, suffice it to say that all, without exception, of the British Delegation did all they could to assist me. Mr. F. W. Phillips, head of the British Delegation, had already given us a definite assurance that, as far as possible, Great Britain would press for the *status quo*. It was, therefore, with much confidence that I interviewed both Mr. Phillips and other British delegates, and urged them to continue their support of this principle. As will be seen later, when the full story of Madrid is published, these gentlemen did more than support our cause, they opposed all attempts to wrest from us any part of our present frequency bands.

I had the pleasure of learning at first hand that the support which we had been able to render H.M. Services had gone a very long way to help us.

During my stay I had the opportunity of meeting all of the Colonial and Dominion delegates, who were ready to give their support to our cause. In this connection I wish to mention the names of Mr. Esson (New Zealand), Mr. Crawford (Australia), Col. Lenton and Mr. McLachlan (South Africa), Mr. Edmunds (India).

I now propose giving some details regarding the decisions reached during September and October which have a bearing on amateur radio, but I must again point out that these all have to be ratified by plenary sessions before they can be regarded as definite.

ARTICLE 1.—*Definitions*.—Washington defined the term "Private Experimental Station" as:

- (1) A private station intended for experiments.
- (2) A station used by an "amateur" that is to say, a duly authorised person interested in radio technique, with a purely personal aim, and without pecuniary interest.

Madrid recommends the provision of three distinct headings:

- (1) An amateur station: same definition as in Washington Convention.
- (2) A private experimental station: a private station intended for experiments with a view to the development of radio technique or radio art.

- (3) A private communication station: a stationary or mobile private station, not open to public correspondence, and authorised solely to interchange communications dealing with the private business of the licensee(s), with other stationary or mobile "private radio-communication stations."

ARTICLE 5.—(*Distribution and use of Frequencies*.)

Paragraph 7.—The all-important table of frequencies is still under discussion. The Sub-Commission has agreed that 3.5, 7, 14, 28, 56 mc. bands should remain as now, but this has to be confirmed. The 1.7 band is causing a lot of difficulty, owing to several European countries wishing to take this band exclusively for small boats.

Paragraph 18.—Clauses 2, 3 and 4 will, with a slight change to Clause 4, be transferred to Article 6. (These clauses refer to Power, Harmonic Emissions and Call Signs.)

ARTICLE 6.—(*Service of Private Experimental Station*.) The title is to be changed to read: "Amateur and private experimental stations."

Paragraphs 1 and 2.—The U.S.A. proposed radical changes, to these paragraphs, which deal with communications between amateur and private experimental stations.

After discussion, the proposals were dropped, the British delegate being opposed to the proposed changes.

Paragraph 3.—An Australian proposal to make it compulsory for an amateur to pass a 12-words per minute morse test was dropped, as were several other proposals, and this paragraph remains practically unaltered.

Paragraph 4.—A Cuban proposal to limit the power input of an amateur station to 50 watts was not supported, and therefore dropped.

Following Paragraph 4 comes the Clauses 2, 3, and 4 from Article 5, Paragraph 18.

ARTICLE 14.—*Call Signs*.

Paragraph 1.—Has been changed to cover the three grades of stations mentioned under Article 1.

Paragraph 2.—The British proposal to eliminate the use of the figures 0 and 1 has been adopted for all services except amateurs.

ARTICLE 17.—*Calling and Listening Waves*.—It is anticipated that a calling and distress wave for small boats will be fixed just outside the 1.7 mc. band.

ARTICLE 33.—*C.C.I.R. Meetings*.

During my visit, I tabled a request with Mr. Phillips that the I.A.R.U. should be officially invited to take part in future C.C.I.R. meetings. Mr. Phillips stated that he saw no objection to this proposal, and is supporting it. I anticipate that this will be agreed to by the Conference.

With one month still to run, it will be obvious to everyone that many matters of importance are still in the melting pot, especially the question of frequency allocations in the band 1715-1000 kc. I hope in the course of the next month that we shall learn something definite about this subject, as I realise the interest its outcome has for us all.

Since my return I have kept regularly in touch with Mr. Warner by telephone, and the minutes of meetings has been forwarded to me every week.

In conclusion, I should like to thank the members of Red Española, and especially Captain Roldan, and their indefatigable secretary, Señor Uriarte, for all their kindnesses to me.



# METHODS OF MODULATION.

BY A. M. HARDIE, M.A. (G5FP).

(This Article was awarded 1st prize by Awards Committee for competition as announced in our June issue.)

**B**EFORE proceeding to discuss methods of telephony control it is perhaps advantageous to review briefly the theory underlying these methods.

In the first place what is meant precisely by the word modulation? Modulation consists in the variation or inflection of tone. We speak of the modulations of the human voice, meaning the variations of tone, or primarily, the changes of frequency in the vibrations of the vocal chords. But when we speak of the modulation of high frequency oscillations as produced, say, by a triode generator we do not *generally* mean the variations of tone (or periodicity) of the high-frequency oscillations (apart from frequency modulation), but variations in amplitude. It is principally amplitude modulation that we shall investigate.

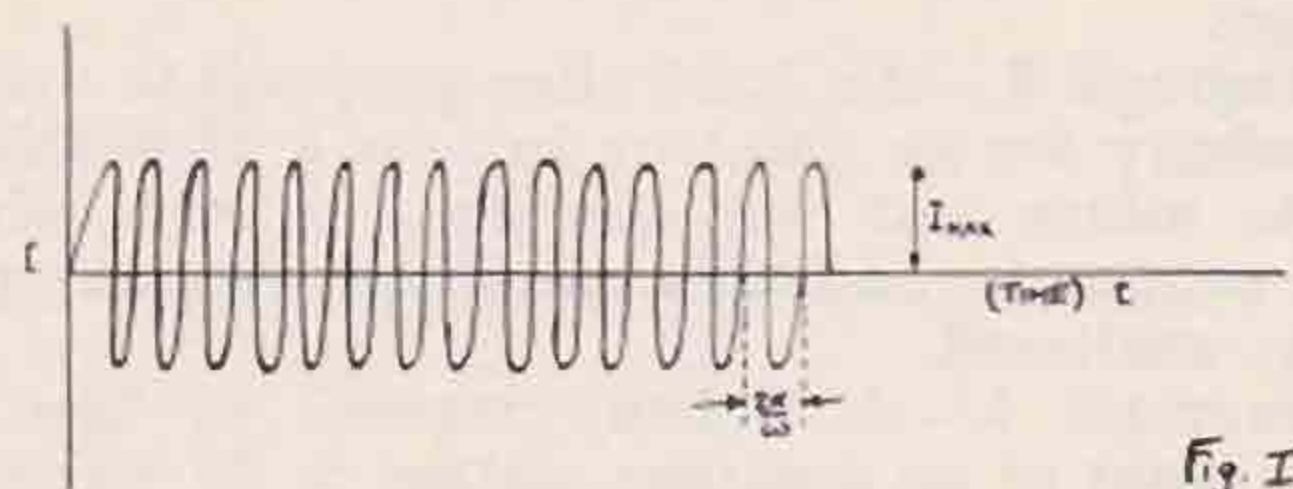


Fig. 1

Consider a continuous high frequency wave (Fig. 1). Let it be represented by  $I_{\max.} \sin wt$  where  $I_{\max.}$  is the amplitude and  $w = 2\pi \times \text{frequency}$ . Now suppose we have a generator of *low* frequency oscillations at our disposal and we adjust it to produce a pure tone of amplitude

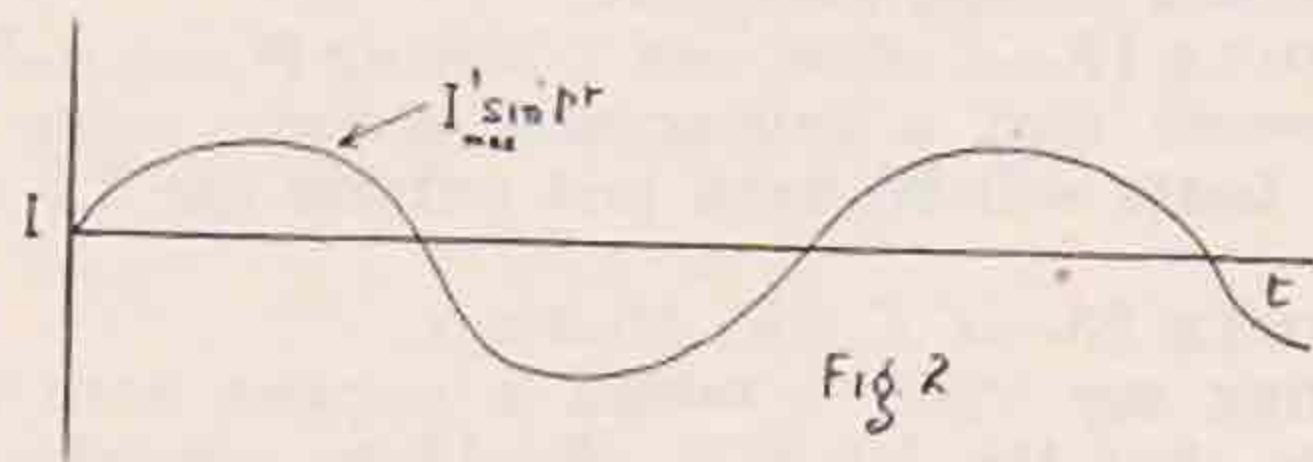


Fig. 2

$I'_{\max.}$  This may be represented (Fig. 2) by the graph of  $I'_{\max.} \sin pt$  (here  $p = 2\pi \times \text{frequency}$ ). If we impress the low frequency on the high frequency oscillations the result is represented in Fig. (3). The high frequency wave is said to be sinusoidally modulated and the mathematical representation of it is therefore

$$I = (I_{\max.} + I'_{\max.} \sin pt) \sin wt.$$

It might be argued that if we impress  $I'_{\max.} \sin pt$  on  $I_{\max.} \sin wt$  the result should be  $I_{\max.} \sin wt + I'_{\max.} \sin pt$ . The graph of this function would be something like Fig. 3A and quite unlike the real state of affairs. It is obvious that Fig. 3 represents the actual modulated wave. If we graph  $I_{\max.}$  alone, a straight line results. (Fig. 3B).

Now add to this  $I'_{\max.} \sin pt$  and we have the audible frequency. The multiplying factor  $\sin wt$

indicates that the foregoing two terms ( $I_{\max.} + I'_{\max.} \sin pt$ ) form the "envelope" or outline of the graph of the high frequency oscillations  $I_{\max.} \sin wt$  after modulation as shown in Fig. 3.

Expanding this, we have :

$$\begin{aligned} I &= (I_{\max.} \sin wt + I'_{\max.} \sin pt \sin wt) \\ &= I_{\max.} \sin wt + \frac{I'_{\max.}}{2} 2 \sin pt \sin wt \\ &= I_{\max.} \sin wt + \left[ \frac{I'_{\max.}}{2} \cos (w-p)t - \frac{I'_{\max.}}{2} \cos (w+p)t \right] \end{aligned}$$

The expression within the brackets is obtained from the second term in the line above and is merely the converse of our old friend  $\cos A - \cos B = 2 \sin \frac{A-B}{2} \sin \frac{A+B}{2}$ .

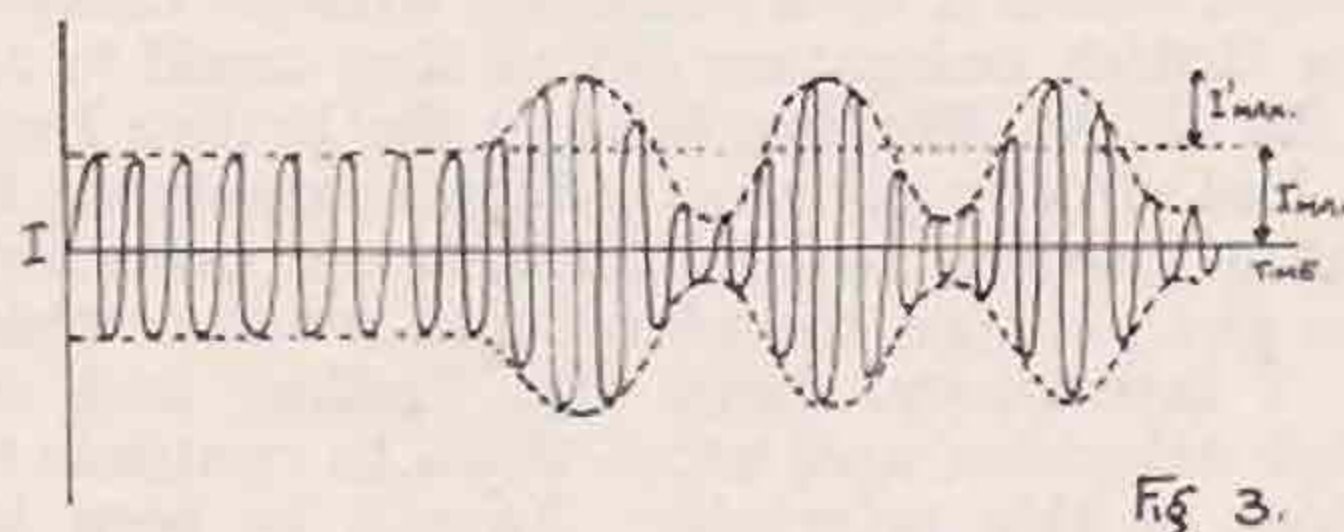


Fig. 3.

Now this expression for the modulated high frequency wave is interesting.  $I_{\max.} \sin wt$  is our original high frequency wave and is termed the "carrier wave."  $\frac{I'_{\max.}}{2} \cos (w-p)t$  represents a wave of amplitude  $\frac{I'_{\max.}}{2}$  and of frequency  $\frac{w-p}{2\pi}$ , i.e.,  $\frac{2\pi \times \text{H.F.} - 2\pi \times \text{L.F.}}{2\pi} = \text{H.F.} - \text{L.F.}$ , that is, the difference between the high frequency and the low frequency.

Similarly  $\frac{I'_{\max.}}{2} \cos (w+p)t$  represents a high frequency wave of amplitude  $\frac{1}{2} I'_{\max.}$  and frequency  $\frac{w+p}{2\pi}$ , i.e., h.f. + l.f. Thus our original sinusoidally modulated wave has three components—

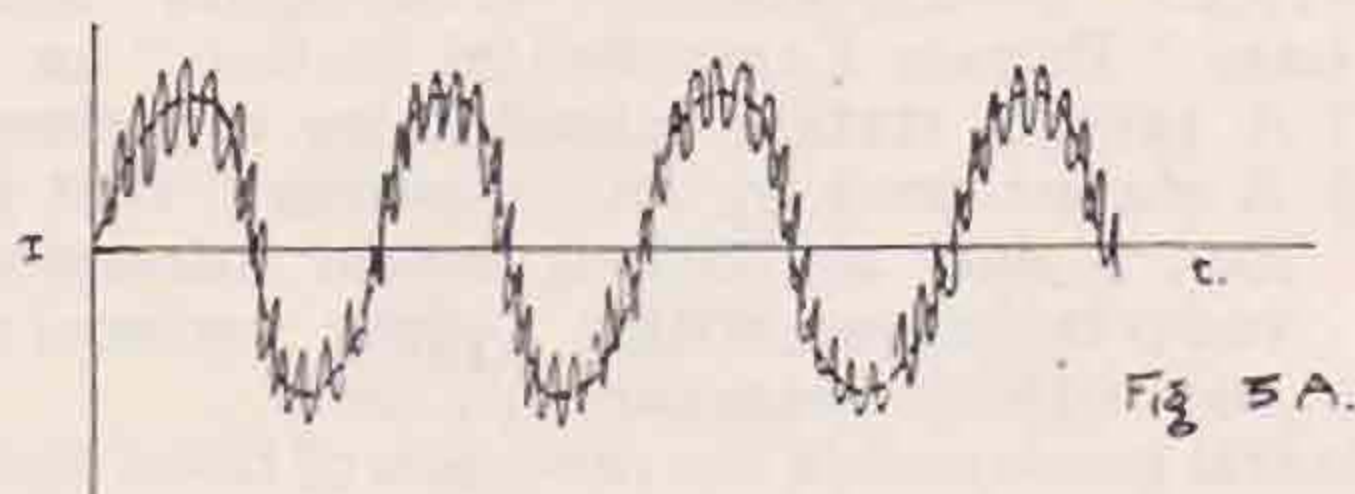


Fig. 3A.

a carrier, and two "side band" frequencies. To fix our ideas suppose the unmodulated h.f. wave has a frequency of 2 megacycles or 2,000,000 cycles/sec. and the low frequency 1,000 cycles. The modulated wave has three components, first,



the carrier wave of 2,000,000 cycles/sec., second, the upper sideband of 2,001,000, and third, the lower sideband of 1,999,000. It must be noted, however, that this holds only for a pure sine wave of 1,000 cycles totally devoid of harmonics. It is extremely difficult for one who cannot follow the above trigonometrical formulæ to visualise and accept this statement. But let him rest assured. If mathematics show that it is the case, then it certainly is a physical reality. So much, then, for a pure sinusoidally modulated wave.

Next let us supply ourselves with a good speech amplifier and microphone. If one speaks into the microphone, the vibrations of the vocal chords cause alternate compressions and rarefactions of the surrounding air which actuate the microphone diaphragm in sympathy. If the microphone is of the carbon granule type (as most amateurs' mikes are) the varying pressure (always in sym-

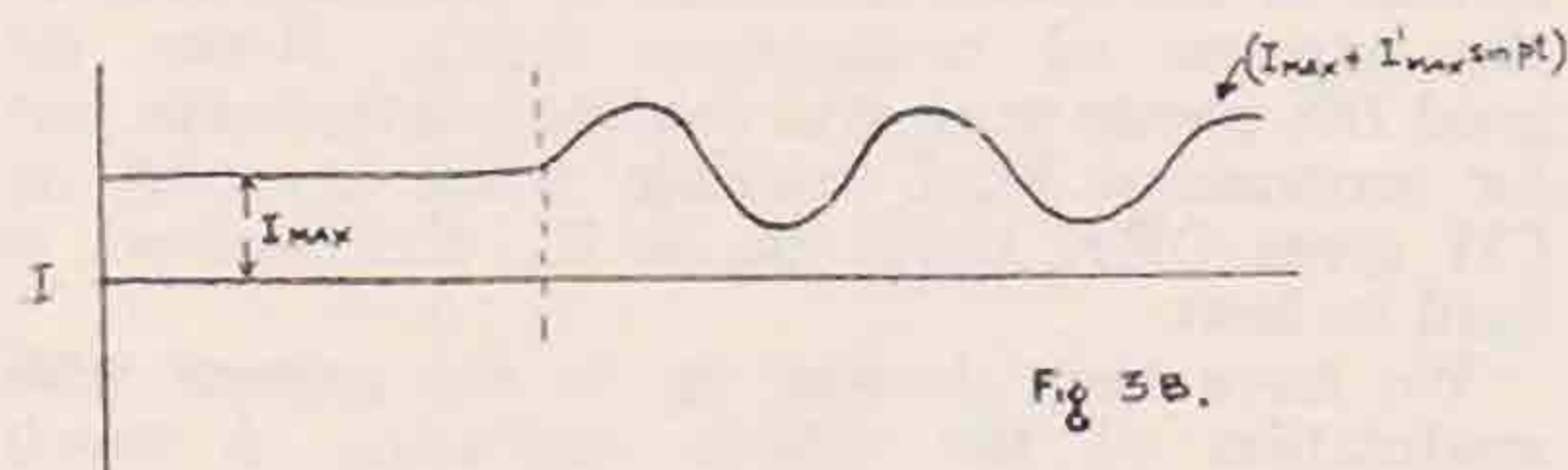


Fig 3B.

pathy with the sound waves) causes the ohmic resistance of the granules to vary. Hence, depending on the loudness and tone of voice, a sympathetic low frequency current flows in the mike circuit and can be applied to our amplifier. If now the output of our amplifier be impressed (exactly how it is impressed will be discussed later) on the high frequency wave we cannot say that the result is a modulated high frequency wave consisting simply of 3 components. The low frequency oscillations are no longer pure sine waves, and are themselves constantly varying in frequency and amplitude. Hence the resultant modulated wave consists of  $I_{\max} \sin wt$  (i.e., the "carrier wave"), together with upper and lower sidebands which are constantly varying in width. Probably at some instant of time the wave could be simply represented by three components, but since each h.f. component in the speech frequencies has two h.f. components in the resultant modulated wave, the

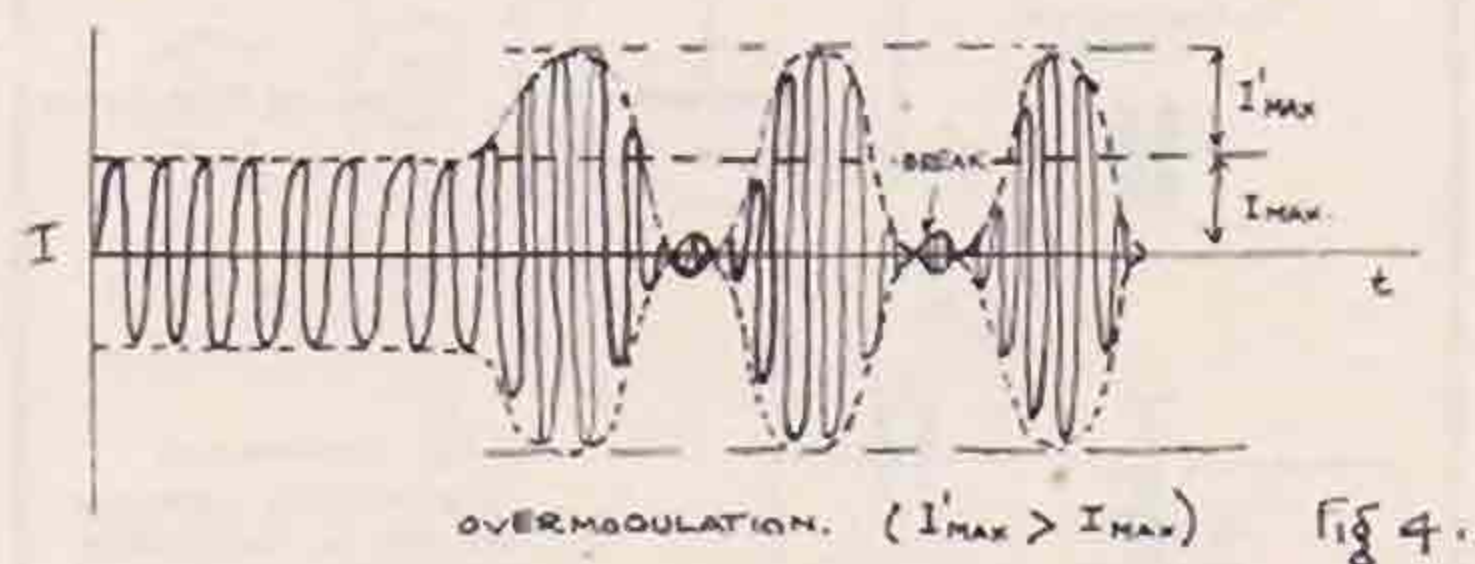


Fig 4.

form is in general extremely complicated. Depending on the characteristics of our amplifier the sidebands may vary up to the carrier frequency plus or minus 10,000 cycles. Let us return again to the pure sine wave form, and examine Fig. 3. If we are modulating at, say, 1,000 cycles, the loudness of the note reproduced on a receiver will obviously depend upon the height of the ordinate  $I'_{\max}$ , i.e., on the amplitude of the low frequency "envelope" of the original high frequency wave. It follows that if  $I'_{\max} = I_{\max}$ ,  $I$  varies from zero to  $\pm 2I_{\max}$ .

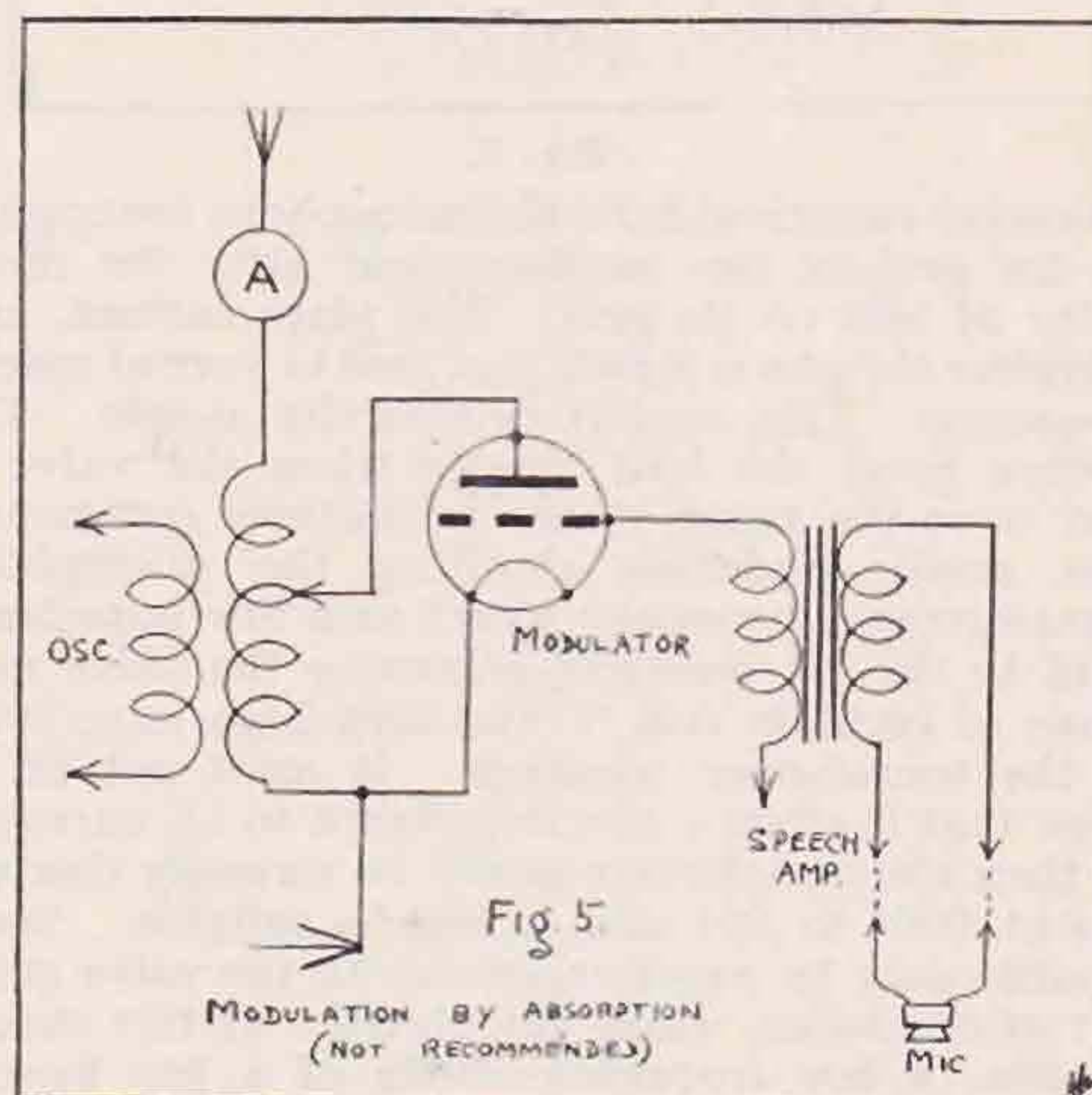
The h.f. wave is then said to be completely modulated. This variation occurs at the low frequency (say, 1,000 times per second), which is too fast for sluggish hot-wire meters to follow. With complete modulation the speech can be received at as great a distance from the transmitter as the carrier. When  $I'_{\max}$  is less than  $I_{\max}$ , that is, with partial modulation, the carrier can be received further than the speech.

When  $I'_{\max}$  is greater than  $I_{\max}$ , the condition is represented by Fig. 4. It will be observed that breaks or discontinuities occur. This is, of course, detrimental to good quality and must be prevented. The degree of modulation is therefore the ratio  $\frac{I'_{\max}}{I_{\max}}$  and the percentage modulation  $\frac{100I'_{\max}}{I_{\max}}$ .

100 per cent. modulation is desirable, but is generally avoided on account of the danger of overmodulating.

Let us now examine the various methods of modulation. These methods may be roughly divided into two classes (1) modulation of the high frequency output of the transmitter; (2) modulation of the power input to the transmitter.

The simplest method of modulating the h.f. output of the transmitter is to insert the microphone in the aerial feeder, variations of microphone resistance with speech modulating the aerial current. This method, though simple and inexpensive, is poor practice and definitely not to be recommended for serious work. In addition to modulating the current in the aerial, the rapid



changes of resistance in the feeder usually modulate the frequency as well, causing a wide frequency spread and resulting inevitably in bad distortion. Added to this fact, which alone is quite sufficient to condemn the method, the aerial current must be reduced to a value which will not damage the microphone—usually in the neighbourhood of 0.1 to 0.2 amp. For the 10 watt man on 7 mc. or 14 mc. this may not entail great sacrifice, but—PLEASE don't do it!

Another method of modulating the h.f. output is known as "absorption control." The arrangement is shown in Fig. 5. The microphone is followed by one or more speech amplifying valves the output of which causes variations of potential



on the grid of the final or modulating valve. The load across the L.C. circuit in the aerial (constituted by the modulator and amplifier) is thus varied at speech frequency. The system is very difficult to adjust, but can be made to give good results, although liable to introduce frequency modulation. It is very seldom used.

One of the nicest forms of control for low power transmitters is "grid control." The simplest form of this method of modulation is shown in Fig. 6. It involves the insertion of a microphone and high ratio transformer in the grid circuit of the oscillator.

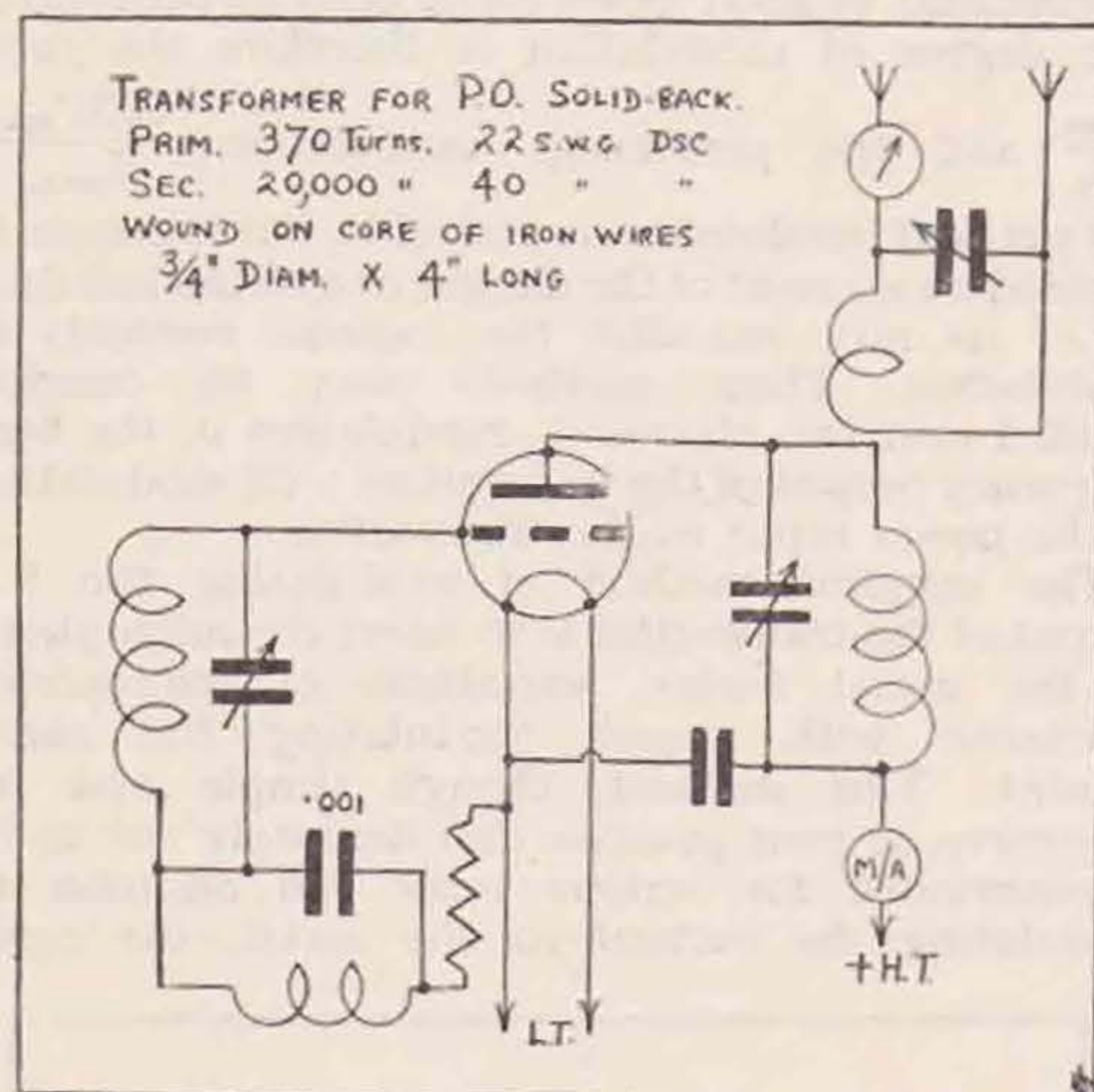


Fig. 6.

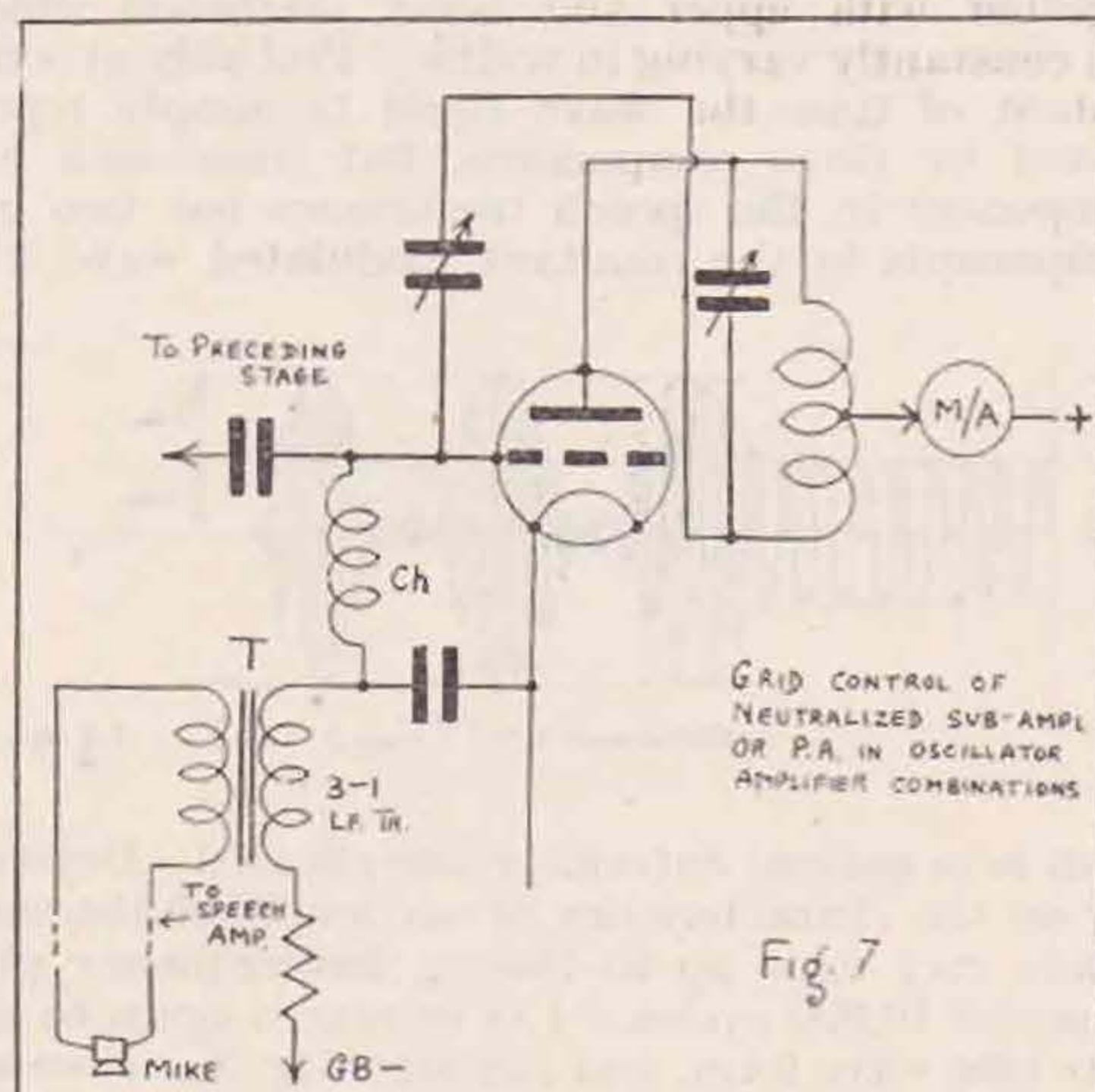
Potential variations from the microphone are applied to the grid of the oscillator and alter the mean value of bias on its grid. The plate current, and therefore the power input, is caused to vary at speech frequency. This sounds delightfully simple. The system gives the best results when the valve is just over the point where oscillations commence. The small condenser shunting the microphone transformer is necessary to act as a low impedance path to the h.f. currents, otherwise the valve may cease to oscillate due to the very high impedance of the transformer windings. It must not be so large that it offers a low impedance to l.f. currents, as then the transformer would be virtually shorted. About .0005 to .001 mfd. is usually suitable. Some trouble may be experienced due to the valve going out of oscillation when modulated. If this should happen, a low frequency choke of a few henries connected in H.T. lead may effect a cure. The data for a suitable transformer are given, suitable for use in conjunction with a solid-back microphone. It will probably be found that no great depth of modulation can be obtained by this method and that one or two stages of speech amplification must be added before a high percentage modulation results. This inevitably causes bad distortion due to the fact that the grid of the oscillator is being swung into grid current by the large applied speech potentials. Nothing can be done, for this is the serious limitation of grid modulation, the depth of distortionless modulation is limited by the linear part of the grid-voltage-anode current characteristic. The only cure is to reduce the speech input by some form of volume control. A good type is a variable

resistance of, say, 0- $\frac{1}{2}$  megohm across the secondary of the microphone transformer.

With regard to the design of speech amplifiers for grid control: if speech alone is to be transmitted no great pains need be taken to get a perfect frequency response, but the characteristic at speech frequencies should be reasonably good. If music is to be transmitted, and this is usually done nowadays by means of a pick-up, the straighter overall characteristic the better.

The anode feed milliammeter may show rapid fluctuations on modulating. Very small variations are permissible for reasonably intelligible speech, but to be content to leave the needle swinging violently is absolutely fatal. Reduce the speech input immediately. Moreover, wide current variations usually result in the old bugbear of self-excited modulated oscillators—frequency modulation. In practice it will be found that steady conditions in the anode feed can be obtained only at the expense of modulation depth. Hence for good DX phone work grid control is unsuitable, but for economical local working, when a report on CW gives QRK about R<sub>s</sub> to R<sub>9</sub>, the method is hard to beat.

We have been dealing up to the present with modulation of the simple oscillator. A much better method, in that it is less liable to result in frequency modulation, is the modulation of the P.A. stage in an oscillator-amplifier combination. The oscillator can be either a low power self-excited Hartley or T.P.T.G. working at 2 or 3 watts coupled to a 10 watt amplifier in one of usual ways. A word of warning—absolute stability of the oscillator is essential. Quartz Crystal Control here is strongly advocated, and if employed will amply justify its use. Experience with grid control of P.A. stages has shown that the best results are obtained, from the point of view of quality and depth of modulation, if the h.f. output is diminished somewhat by increasing the bias on the P.A. As an instance—the transmitter was DE5B driving an



LS5 at about 10 watts and the normal bias on C.W. was 60-70 volts in the P.A. A "local battery" type of microphone was followed by a P.M.2, transformer coupled to a P.240, and fed into the grid circuit of the P.A. through a 3-1 ratio l.f.



transformer—the only one available at the time. (See Fig. 7). The value of the bias on the P.A. was increased to about 120 volts. Not every amateur possesses a valve voltmeter, hence suitable combinations of valves in the speech amplifier to give the correct grid swing for the P.A. must be arrived at by experiment, although rough values may be judged from the valve characteristics. Grid control of the oscillator in a C.O.P.A. is poor practice and not recommended. It may be found that an imperfectly neutralised P.A. stage *appears* to give louder phone than a perfectly adjusted arrangement. If the P.A. self-oscillates, one is virtually modulating an oscillator. The same applies to all locked oscillator combinations.

At this stage in the discussion it might be profitable to give some details of how percentage modulation may be measured. It is well known that the aerial ammeter registers the Root Mean Square value of current. For those who are not clear on this point no apology is offered for recapitulating here, and those who cannot follow the mathematics can at least appreciate the results. The R.M.S. value of an alternating current or voltage is defined as "the square root of the average value of the square of the current (or voltage) over one cycle."

Consider one complete cycle of the Alt. current  $I_m \sin \omega t$  (fig.) It consists of a positive and negative  $\frac{1}{2}$  cycle. Now squaring a negative number gives a positive [e.g.  $(-2)^2 = +4$ ] so that  $I_{\max}^2 \sin^2 \omega t$  will be totally positive. The average value of  $I_{\max}^2 \sin^2 \omega t$  over an interval of time  $t$  is  $\frac{\sum (I_{\max}^2 \sin^2 \omega t \delta t)}{\delta t}$ . If, therefore, we sum up over a complete cycle and then take the square root of the result, we have the R.M.S. value.

Integrating over one cycle we have

$$I^2 = \frac{\sum (I_{\max}^2 \sin^2 \omega t t)}{t} = \int_0^t \frac{I_{\max}^2 \sin^2 \omega t dt}{t}$$

$$= \frac{I_{\max}^2}{t} \int_0^t \sin^2 \omega t dt = \frac{I_{\max}^2}{2\pi} \int_0^{2\pi} \sin^2 \omega t d(\omega t)$$

$$= \frac{I_{\max}^2}{2}$$

$$\therefore I_{RMS} = \frac{I_{\max}}{\sqrt{2}}$$

The hot wire meter in the aerial thus registers, not  $I_{\max}$ , but  $\frac{1}{\sqrt{2}}$  or .707 of  $I_{\max}$ .

When modulated (assuming a pure sine wave) it was shown that the equation of the wave became  $(I_{\max} + I_{\max}^1 \sin pt) \sin \omega t$ . Let us then find the R.M.S. value of this expression.

In the usual way,

$$I^2 = \int_a^t \frac{(I_{\max} + I_{\max}^1 \sin pt)^2 \sin^2 \omega t dt}{t}$$

Thus, over one cycle

$$I_{RMS} = \sqrt{\frac{I_{\max}^2}{2} + \frac{I_{\max}^1^2}{4}}$$

On our unmodulated signal the meter deflection is, say  $d$ , and proportional to  $\frac{I_{\max}^2}{2}$

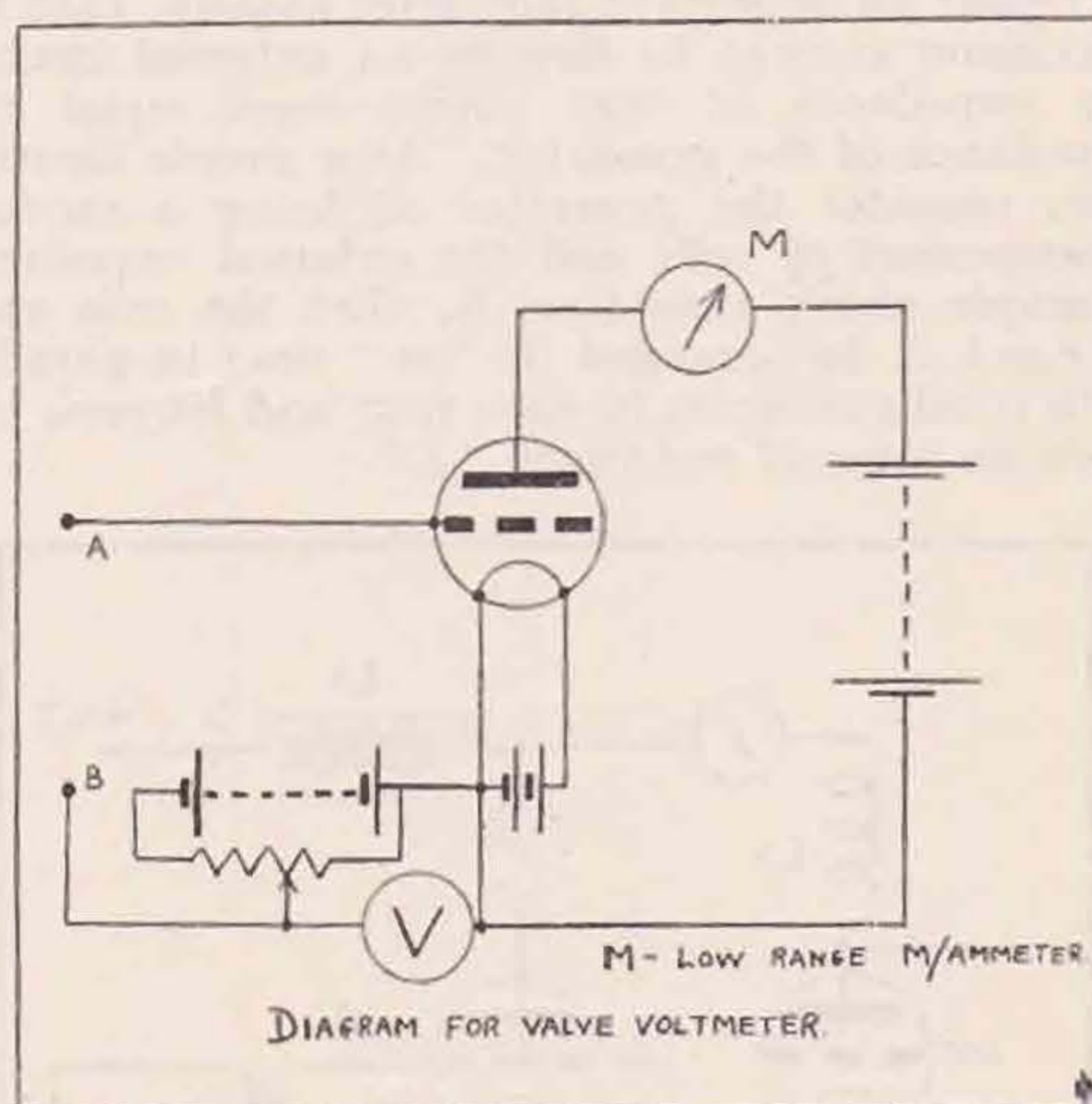
When modulated, the new deflection is  $d_1$ , proportional to

$$\frac{I_{\max}^2}{2} + \frac{I_{\max}^1^2}{4} \quad \text{Now, } \frac{I_{\max}^1^2}{4} \text{ is}$$

always positive. Hence the aerial current must rise with modulation. The percentage of modulation is given by

$$\frac{100 I_{\max}^1}{I_{\max}} = 100 \sqrt{2 \left( \frac{d_1}{d} - 1 \right)}$$

This is admittedly a rough guide as sinusoidal modulation is assumed for simplicity. The main thing to note is that the deflection must be upwards. On grid control of a C.O.P.A. insufficient bias on the P.A. will give "downward modulation." Increase of bias decreases this effect until a point is reached where there is no deflection at all. Thereafter the modulation is "upward." Too much bias results in overmodulation and "breaking"; hence the previous remarks about heavy biasing of the P.A. for grid control.



A much more accurate method is to use a valve voltmeter. Such an instrument is very easily constructed and should be in the equipment of every serious amateur. The schematic arrangement is shown A and B are the input terminals. Across these is connected the L.C. circuit which may be placed in the vicinity of the transmitter, or very loosely coupled to it and tuned to its frequency.

The method of measuring the percentage modulation is as follows:—

The valve is biased so that bottom-bend rectification takes place and the value of the anode current is noted. The coil is now loosely coupled to the transmitter and a plain C.W. signal sent out. The anode current will be found to have risen. This is brought back to the initial value by increasing the grid bias and carefully noting  $V_1$  the additional bias given. Switch off the transmitter temporarily. Adjust bias to initial conditions. Switch on and modulate either by sounding a prolonged "O-oh" into the microphone or by a constant frequency record. Again reduce the increased anode current to its initial value by manipulation of the bias, noting the new value  $V_2$ . Since the method depends on the measurement of



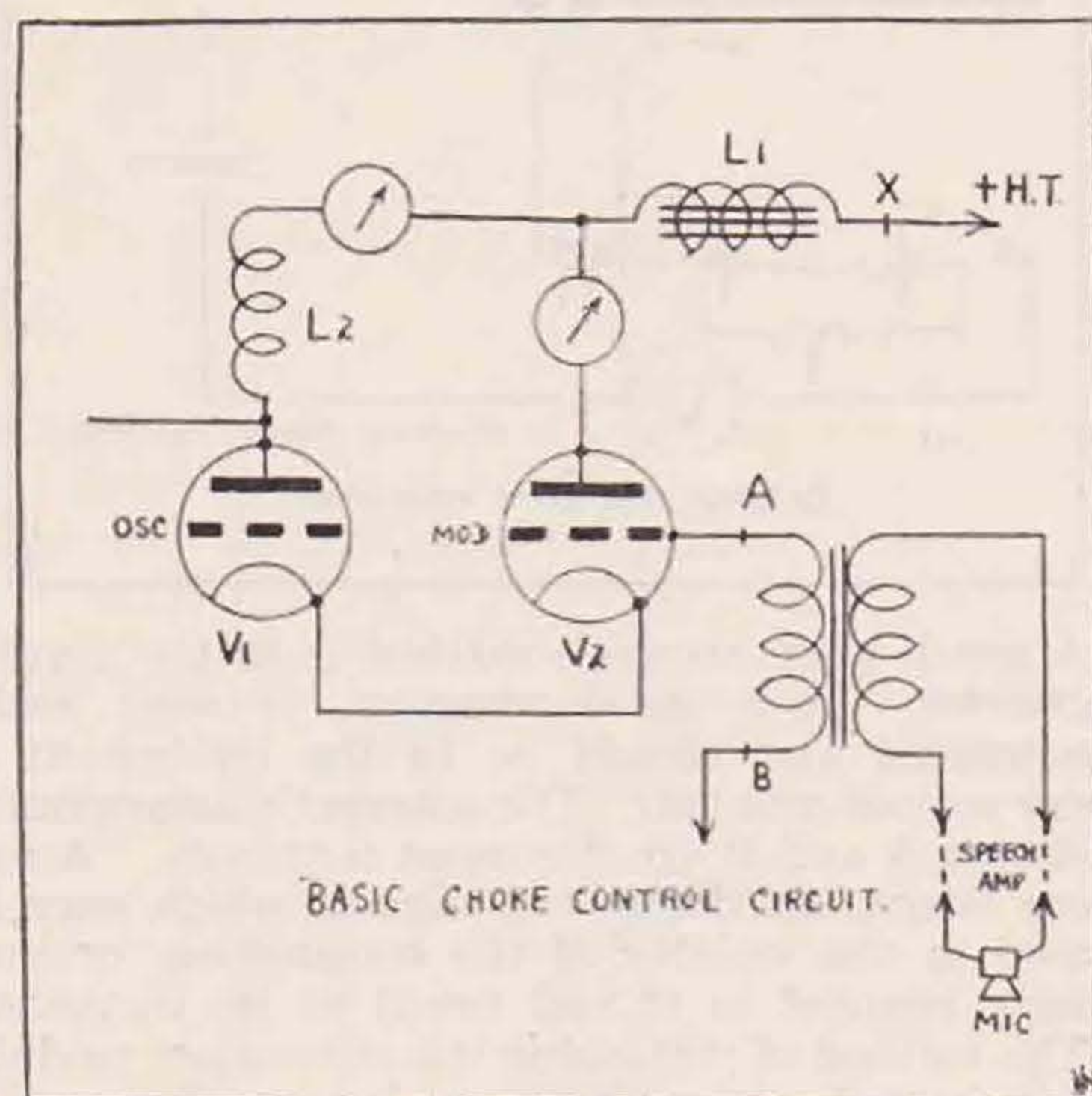
the peak value of voltage across A-B, the percentage modulation is given by  $100 \frac{V_2 - V_1}{V_1}$  i.e., we have a measure of the ratio  $\frac{I_{max}}{I_{min}}$  noted previously.

The only precaution to note is to keep the coupling to the transmitter constant throughout the test.

### Choke Control.

We come now to what is undoubtedly the best method of modulation—choke control, constant current control, or Heising control, after its inventor R. A. Heising. The method is practically universal to-day and affords 100 per cent. modulation without distortion when carefully adjusted. When incorrectly used the results are definitely bad, so that a good grasp of the fundamentals behind the method is essential to correct operation of the apparatus.

Before any explanation it might be advantageous to repeat an important fact here, namely, that for maximum current to flow in an external circuit, the impedance of that circuit must equal the impedance of the generator. As a simple illustration, consider the generator as being a random arrangement of cells and the external impedance a simple ohmic resistance  $R$ . Let the cells each of e.m.f.  $E$  be arranged in " $m$ " rows in parallel, with  $n$  cells in series in each row, and let each cell have an internal resistance " $r$ ."



Then, resistance of one row =  $nr$

resistance of  $m$  such rows in parallel =  $\frac{nr}{m}$

From Ohm's law Current =  $\frac{\text{Voltage}}{\text{Resistance}}$

$$\therefore I = \frac{nE}{R + \frac{nr}{m}} = \frac{E}{\frac{R}{n} + \frac{r}{m}}$$

Hence for  $I$  to be maximum,  $\frac{R}{n} + \frac{r}{m}$  must be a

minimum, i.e.,  $\frac{R}{n} = \frac{r}{m}$  or  $R = \frac{nr}{m}$

i.e., the external impedance must be made equal to

the impedance of the generator. It is well known that for maximum power output in the load circuit across a valve, the impedance of the circuit must equal the impedance of the valve. The valve is analogous to the batteries and the load to the Resistance  $R$ . This theory has a vital bearing on the subject of Choke Control as will be seen later.

The essentials of the method are shown in the skeleton circuit.  $V_1$  is a simple oscillator and  $V_2$  is the modulator. Assume for the moment that we have sufficient speech voltage across AB to swing fully the grid of  $V_2$  operating on the linear part of its characteristic. During a positive half-cycle on the grid of  $V_2$  the anode current to  $V_2$  rises and during a negative half-cycle it falls, but since the valve is operating linearly no change is, or should be, seen on the meter. Now, initially, a steady current is flowing in the H.T. + lead. During a positive  $\frac{1}{2}$ -cycle on the grid of  $V_2$ , the rise in anode current (at speech frequency) cannot result in any increase in the total current flowing, since the iron-cored choke  $L_1$  to the right of  $V_2$  offers a high impedance to any sudden change. Hence the rise in current through  $V_2$  must take place at the expense of the anode current flowing to  $V_1$ . Similarly during the negative half-cycle the fall in anode current to  $V_2$  results in a rise of current to  $V_1$ . The phase relationships are as follows:—

Denoting oscillator and modulator plate currents and potentials by  $I_o, I_m, V_o, V_m$  respectively, we have

$$\begin{aligned} \text{Increase in } I_m & \begin{cases} \text{decrease in } I_o \\ \text{decrease in } V_m \end{cases} \\ \text{Decrease in } I_o & \text{Increase in } V_o \end{aligned}$$

Hence  $V_m$  and  $V_o$  are in anti-phase. The point to note is that the current as measured at  $X$  is constant, assuming the choke  $L_1$  has a very high reactance at speech frequencies, and that as the result of the plate voltage swing of the modulator, the plate voltage of the oscillator is varied in anti-phase and at speech frequency. The choke  $L_2$  has a high impedance at radio-frequency and serves to keep the h.f. currents out of the modulator.

From the foregoing it is obvious that the wider the plate voltage swing of the modulator the fuller will be the modulation of the oscillator, i.e., its power output will be varied as its plate power input at speech frequency. Choke control is therefore purely a power control and as such is immeasurably superior to methods which depend on the linearity of the grid-voltage anode-current characteristic.

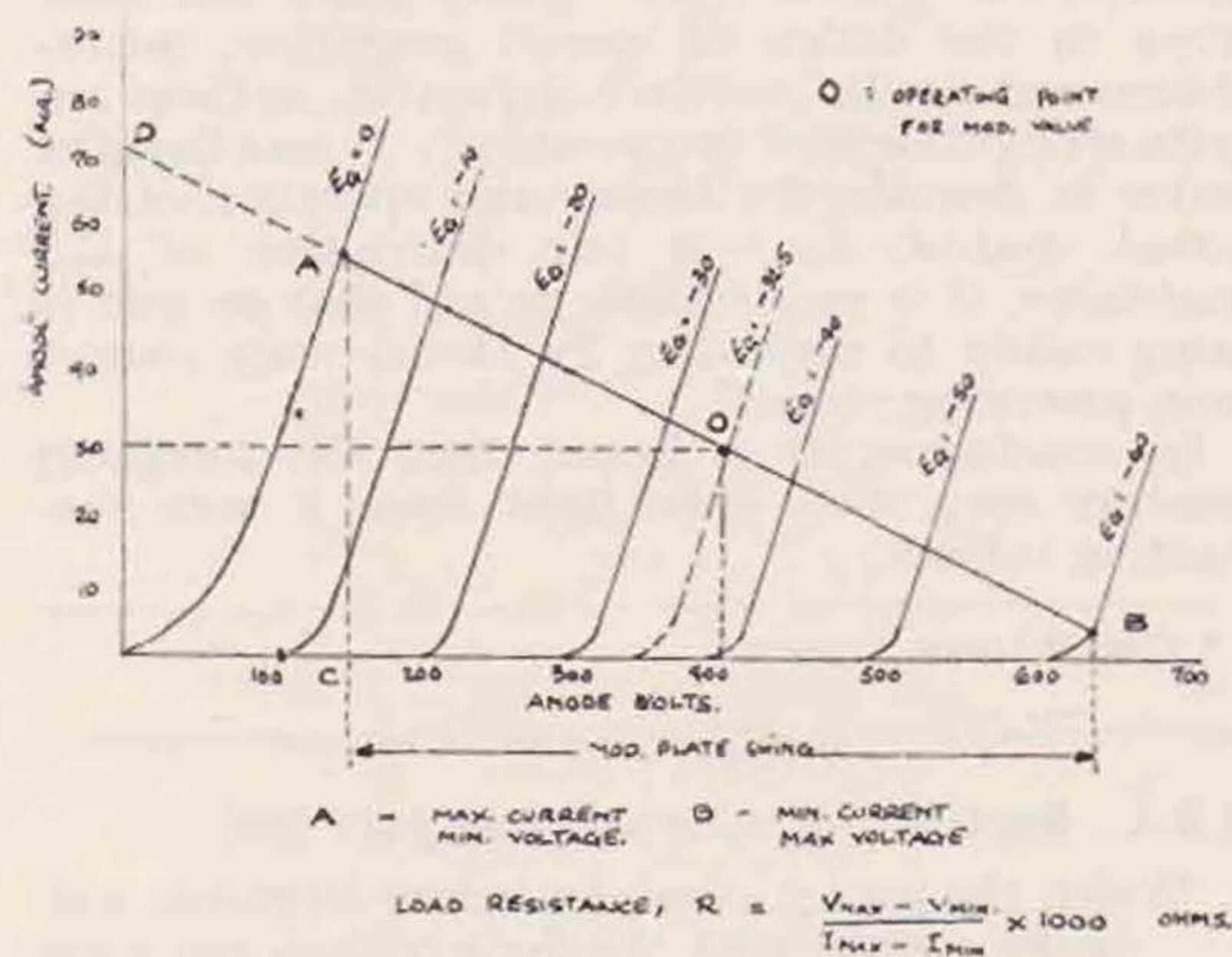
For complete modulation the plate voltage of the oscillator must be swung from zero to twice its mean value. It follows that to accomplish this the modulator valve should (theoretically) be at least as large as the oscillator. Practically it must be larger, for if we were to swing the plate voltage of a modulator (considered as a linear low-frequency amplifier) between these limits serious distortion must arise.

Moreover, whereas with a 50 per cent. efficiency in the oscillator we can feed 20 watts to an LS5 (say) and not heat the valve excessively, the modulator must stand the full anode dissipation of whatever we give it. We could not, therefore, completely modulate an LS5 oscillator under these conditions by an LS5 modulator, without serious



distortion and harm to the modulator. In practice one must either use a larger valve as a modulator or reduce the plate voltage to the oscillator by means of a voltage dropping resistance. Experience shows that a  $3/2$  ratio between modulator and oscillator voltages is the optimum. This resistance must be shunted by a large capacity condenser, say, 2—4 mfd. to bypass audio-frequencies.

The modulator valve is acting as a straight low frequency amplifier so that the proper valve to use in this position is some type of power valve. Most large power valves will give results of some sort, but for correct choice of a suitable modulator the anode-current-anode-voltage characteristic must be utilised. Let us assume an instance. We wish to completely modulate an oscillator running with 250 volts on the anode (say a P650 slightly over-run). The voltage swing on the oscillator must therefore be from zero to 500 volts. This must be the plate swing of the modulator in anti-phase. The first thing to do is to find the correct operating point for the modulator. Say it is 400 volts 30 m.a. Make a dot at the intersection of the 400 volt ordinate and the 30 m.a. abscissa. The correct value of bias is, say, 32.5 volts. The permissible grid swing on the modulator is then the bias value, i.e., 32.5 volts, on either side of the operating point. Now the plate swing must be 250 volts on either side of 400, i.e., from 150 volts up to 650 volts, and the grid swing is from zero to -65 volts. Mark a point where  $E_g=0$  intersects the



150 volt line and joining this to the operating point produce it to meet the  $E_g = -65$  volt characteristic. At this point drop a perpendicular and read off the anode voltage. It is 650 approximately. The load line should be fitted in *approximately* where the grid swing curves meet the 150 and 650 anode volt lines, so long as the plate swing of the modulator is symmetrical on either side of its mean plate voltage (400).

This method of choosing a modulator from the anode-voltage anode current characteristic also gives the correct value of the shunt resistance, or plate load for the modulator. It must be carefully noted that, regardless of the type of valve used after the modulator, whether oscillator, P.A., or F.D., there is one correct value, and one value only

for the plate current of this particular valve. For consider the load line AB. The slope of this line (i.e., the tangent of the angle BAC) gives the correct value of the load resistance, i.e.:

$$\frac{V_{\max.} - V_{\min.}}{I_{\max.} - I_{\min.}} \times 1,000 \text{ (ohms).}$$

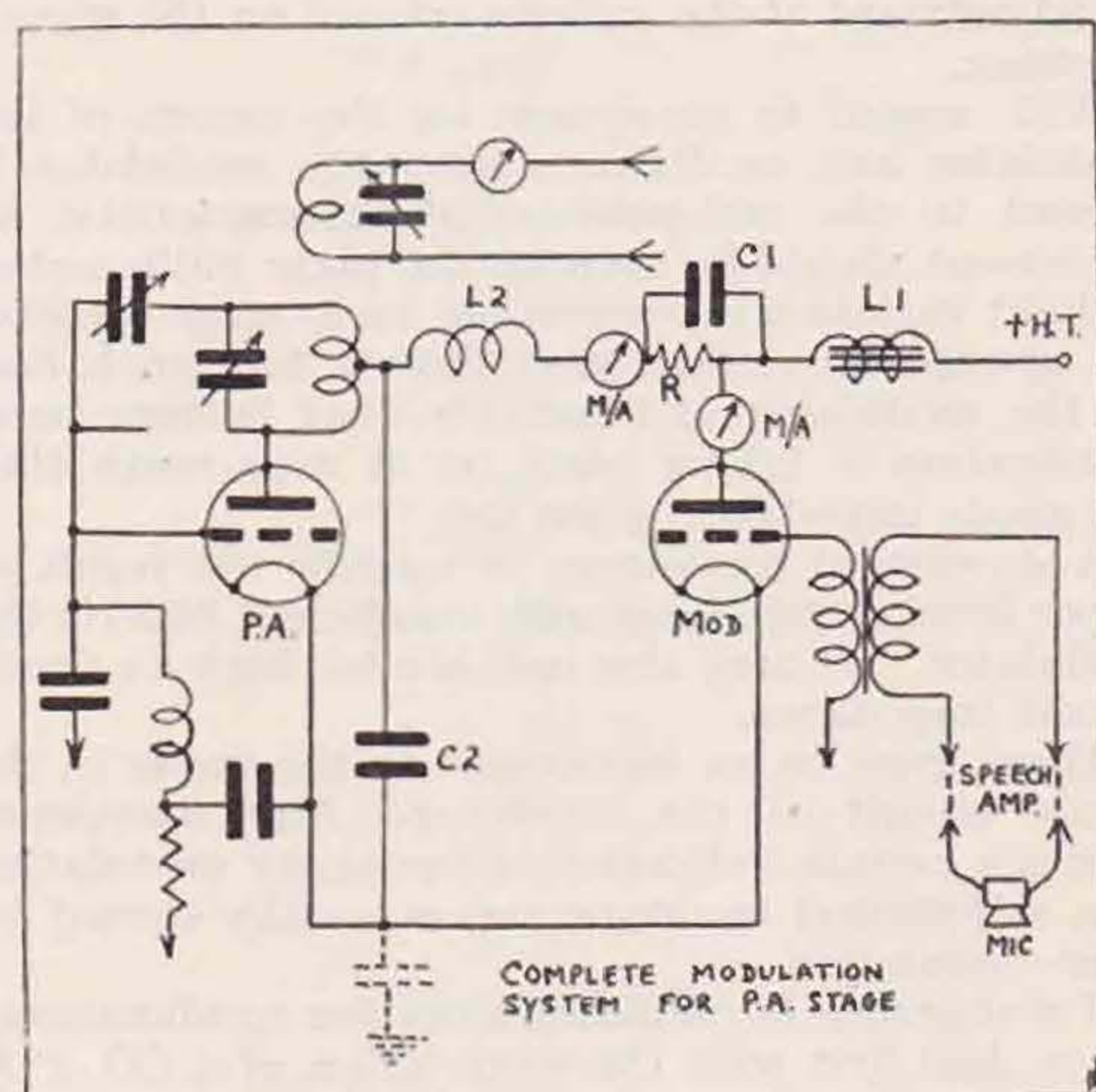
$$\text{Thus from the figure } R = \frac{650 - 150}{55 - 5} \times 1,000 = 10,000 \text{ ohms.}$$

The oscillator's anode voltage is 250 volts.

$$\therefore \text{The plate current is } \frac{250}{10,000} \times 1,000 \times \frac{2}{3}$$

The factor  $\frac{2}{3}$  must be incorporated since the ratio of oscillator to modulator plate voltage is approximately  $\frac{2}{3}$ .

The value of the current is then about 20 m.a. (approx.)\*



Do not attempt to get high aerial current and force up the anode feed to the oscillator. Remember that the modulator is working into its optimum load when the current is the value calculated.

If the modulator and oscillator were run at the same mean plate voltage, then the correct oscillator current would be simply the value given by the point where the load line cuts the zero voltage ordinate (OD) minus the modulator current, i.e., about 40 milliamps. OD represents the total current as measured at X in the skeleton diagram. It must be understood that this is merely a hypothetical instance and that the curves are purely fictitious. But the principle can be easily applied when the modulator characteristics are available. When operating both valves at the same mean plate voltage the degree of modulation is much less and is obviously given by the ratio of modulator plate swing to mean plate voltage,

$$\text{i.e., in case } \frac{250}{400} = 66\% \text{ (approximately).}$$

When both valves are of the same type and operated at the same plate voltage the feed to the oscillator must equal the feed to the modulator for proper control. This brings us back to the theory outlined at the beginning of this section that for maximum power output in the external load the resistance

\* This has turned out to be rather low for practice!



of the load must equal the resistance of the generator. In this case when both feeds are the same and both anode potentials are the same, the resistances must be equal, although the modulation will certainly not be complete. But note—under these conditions we are getting the utmost from our apparatus. It is hoped that these points are made clear, i.e. (1) that for 100 per cent. modulation the modulator must be run at a higher voltage than the oscillator (3/2 ratio approximately); (2) that the plate swing of the modulator must be symmetrical on either side of the operating point.

If a lower percentage modulation is sufficient the necessary oscillator plate swing is easily calculated, e.g., for 80 per cent. mod. of the above, the swing would be 200 volts peak on either side, i.e., from 400 down to 200 and up to 600 volts. Consequently the modulator grid swing can be diminished by adjustment of the volume control on the speech amplifier.

With regard to movement on the meters of the modulator and oscillator: since the modulator is biased to the mid-point of its characteristic no movement should be seen on the plate milliammeter. A slight variation is permissible for average quality. An upward movement may denote too much bias on the modulator and indicate that bottom bend rectification is taking place, or it may mean that the anode impedance is too low.

A downward movement is usually the result of upper bend rectification with insufficient bias on the modulator. It may also indicate too high an anode circuit impedance.

There must be no movement on the meter in the anode circuit of the oscillator. Any movement here is a certain indication of frequency modulation in a self-excited oscillator and is usually caused by over-modulation.

Turning now to oscillator-amplifier combinations, let us deal first with the modulation of a CO.-P.A. The method is the same as for the modulation of a self-excited oscillator except that the bias on the P.A. must be adjusted so that the power output is proportional to the plate power input. For this condition to hold the P.A. must be biased to approximately twice the cut-off value. The correct value is given by

$$\frac{\text{Anode voltage}}{\text{Amplification} \times 2. \text{ factor.}}$$

e.g., cut off in an LS5 is 400/6, say 65 volts, hence the correct bias when used as a modulated amplifier is about 130 volts. This means that to drive the P.A. to the correct anode current value for optimum load the excitation from the C.O. must be increased. Note—hard biasing and hard driving. Again, couple the aerial only as far as is compatible with the correct anode current value. If the current cannot be made sufficient even with tight-coupling, the excitation must be further increased, but on no account must the bias be lowered.

Needless to say, the anode feed meters must be steady in both P.A. and modulator stages.

The modulation of an F.D. by choke control is possible, but not recommended. Where an F.D. is occasionally neutralised and used as a sub-amplifier choke control of this valve may be carried out with advantage and economy. Deepest modulation will not, however, be obtained, since this is virtually grid control of the final P.A.

Since in most amateur phone transmitters modulation is done on the final stage, it is not thought advisable to enter into details of the choke modulation of preceding stages. The Radio Amateur's Handbook gives a very comprehensive account.\*

We have not yet mentioned what is known as the "Aberdonian Modulation system." Full details of this method appeared in the T. & R. BULLETIN of August, 1931, and it would be redundant to describe the system here. Little space has been given to the design of speech amplifiers, microphones and similar standard apparatus, as these are quite straightforward in operation. It was thought better to describe the theory and operation of the actual control, e.g., in our description of the modulator, it is unnecessary to add that its grid is being swung to maximum by an adequate output from preceding stages.

In conclusion, it is hoped that the foregoing remarks may shed some light upon a very fascinating subject.

\* Class B Linear Amplifiers.

#### Empire Link Section Report—(Continued from page 152).

VE1BV. Has worked 20 VK's and ZL's, and has been trying to fix things up with VQ4CRH, but ND so far.

G5VM has obtained notes for THE BULLETIN from VP2YB, and has not had too much time for work this past month, sends list of Empire calls heard.

G6WN has worked a new Empire country on 7 mc., VP1GB in Zanzibar. Has worked VK, VE and ZT on 7 mc., and 3YI's on 14 mc.

G5YG duly asked SU1EC for traffic, but got none.

As this is longer than I thought, I am leaving calls heard out until next month, when I hope to start a general "Calls Heard" being a combination of all stations.

H. A. MAXWELL WHYTE (G6WY).

#### Q.S.L. Section—(Continued from page 166).

3. Weigh the packet carefully before despatch, and make certain that the Society does not have to shoulder the all-too-common burden of excess postage.
4. Address the packet to QSL Section, R.S.G.B., 53, Victoria Street, London, S.W.1, which is the *only* address of the section.

Enclose no stamps, as the service is entirely free to members.

#### Corrections to British Empire Link Organisation.

ISSUED on 11-10-1932.

Please delete line—Nigeria ZD2A from Group A and insert at end of Group B.

Please delete—G5YG from Group A and insert in Group B.



## RECENT WORK ON THE 56 mc. BAND.

Discussion before the Society, September 30, 1932.

One of the most interesting discussions for some years took place on Friday, September 30, 1932, at the Institution of Electrical Engineers, London when Mr. E. Dedman, G2NH, opened the meeting by describing the 56 mc. experimental work carried out by himself and other members.

He mentioned that on the previous Sunday the first organised attempt had been made to effect contact between North, South, East and West London. He gave a description of the apparatus used at his station, and stated that, although no very definite theories had yet been formed, he believed that within a short time some useful commercial applications would follow. He had an open mind on the question of aerial systems, but considered that to obtain reasonably good results the aerial should be as high as possible above ground, whether vertical or horizontal in direction. He considered that the greatest drawback against work on these frequencies lay in the limitations of existing receiving apparatus. The use of regenerative receivers with their background noise prevents the reception of any but the loudest signals. Until such time as stable oscillators can be produced, he did not consider the chances of working distant stations were very good. He had found that a filament resistance in the quench valve circuit to be an advantage in reducing background noises.

Mr. Exeter (G6YK) contributed very interesting information regarding his 56 mc. transmitter erected in the basement of the G.E. Co.'s works at Hammer-smith, the output of which is fed to the aerial on the roof by means of a 300 ft. matched impedance feeder line. He mentioned that signals from this station had been heard up to 50 miles, using an input of 50 watts. Push-pull LS6A valves were employed. He expected to carry out tests with a crystal-controlled transmitter during November, and mentioned that the use of Tourmaline would probably overcome some of the existing difficulties. At the moment frequency doubling from 7 or 14 mc. seems the only practical way of ensuring a stable oscillation, as it is almost impossible to produce a commercial quartz crystal capable of operation on frequencies above 14 mc.

Mr. Exeter stated as an opinion that as the spectrum around 56 mc. is almost quasi optical, mistakes are being made by attempting to produce and receive oscillations in the same manner as we now receive and transmit Hertzian waves. He did not agree with Mr. Dedman that large aerials are efficient, in fact, he considered a fundamental 5 metre horizontal aerial was the most satisfactory transmitting system. Mr. Jessop (G6JP), who had been co-operating with Mr. Exeter, had produced a polar diagram showing that the transmitted signals are strongest in the direction opposite to the plane of the antenna.

Mr. Gay (G6NF) gave an account of his activities and details of his 56 mc. equipment. He said that from tests made, he believed that the best results were obtained from a high multi-wave aerial, as used for normal 7 or 14 mc. work. The smaller

aerials mentioned by Mr. Exeter may be more efficient if scientifically erected, but the average amateur was restricted when it came to erecting an aerial of the type required.

He had doubled his signal strength during local contacts by changing from a small 5 metre aerial to his normal 14 mc. Hertz aerial. Duplex telephony tests had also been made with G5KH, using this method. For reception purposes, he had decided that again the main 14 mc. aerial was superior to a small half-wave fundamental which he had erected. Regarding receivers, Mr. Gay said he considered that a straight circuit (using three turns,  $\frac{3}{4}$  in. diameter, for reaction, and two turns for the grid) was superior to the regenerative type; parallel tuning having been found satisfactory.

Mr. Mathews (G6LL), who has had considerable experience on 28 mc., was not in agreement with Mr. Gay on the question of receiver circuits. He considered the super-regen types superior, providing a peaked audio frequency transformer is used with a 200-cycle cut-off. With such a device, ignition noises are reduced to a great extent. Regarding aerial systems for reception, he stated that from results obtained recently he had found that signals transmitted from a 4 ft. horizontal single-wire aerial were only half as strong as those received from the same aerial erected in a vertical plane. Directional properties were noted when the aerial was mounted  $30^\circ$  from the vertical plane. He agreed that for transmission purposes the normal amateur multi-wave aerial is best unless an arrangement similar to that used by Mr. Exeter can be erected. For recent transmitting purposes he had found the LS5B valves superior to the LS5 type. During the field day tests, an input of 25 watts (500 v. at 50 mas) was obtained without difficulty.

Mr. Price-Jones (G5SA) gave some brief details of his own equipment, and agreed with Mr. Exeter that the study of 56 mc. phenomena must be treated differently to that effecting the lower frequencies. His tests had been carried out exclusively on his normal transmitting aerial.

Mr. Buckingham (G5QF) explained the apparatus used at the North London Field Day station, and mentioned that the 5 watt. signals from that transmitter had been heard in East and West London with the aerial in both a horizontal and a vertical plane. "Kum-bak" poles, to which a full-wave copper tape aerial is fixed, were used for the tests. The greatest difficulty encountered centred around the super-regen background noise on the receiver. The suggestion was made that a "mush filter" could possibly be introduced to this class of circuit. An indoor 15 ft. aerial had been found very satisfactory for reception purposes, G6YK being received at R7 consistently.

Mr. Johnson (G5IS) made some interesting remarks regarding reception results obtained in motor-cars. He had noticed that when listening to signals in a car going away from the station the strength was considerably lower than when the car was pointing towards the station. He mentioned



that the B.B.C. were continuing aerial experiments in connection with their projected 7 metre station, and to date the horizontal systems seemed more satisfactory, especially, when the transmitting and receiving aerials were in a common plane. For transmission purposes he favoured the use of a push-pull arrangement.

Mr. Walters (G5CV) said that his experience was limited, but he had found a low 6 ft. vertical aerial best for the reception of signals from G6YK at a distance of 16 miles. He commented on the falling off of interest in 56 mc. amongst North American amateurs, and hoped that this would not deter British stations carrying on with their investigations. He agreed that a new type of receiver was necessary before really satisfactory results could be claimed.

Mr. Jessop (G6JP), who had been collaborating with Mr. Exeter, considered that a resonant aerial was very necessary when working on these frequencies. He agreed with Mr. Walters and others that the present type of super-regenerative receiver was almost useless for serious work.

Dr. Curt Lamm (D4AFA), of Berlin, made a very entertaining contribution to the discussion, outlining recent progress made in Germany. He agreed with Mr. Gay that a high aerial is an advantage, and mentioned that he had carried out successful two-way work over a distance of 10 miles, using a transmitting aerial 160 ft. long. He considered that this type of aerial was satisfactory mainly because it was well suspended from surrounding objects. He considered that 56 mc. work should be regarded as quasi-optical in effect, as it had been established by many investigators that the angle of radiation becomes so nearly vertical that no reflection from the Heaviside layer occurs. The direct wave, therefore, becomes limited to the curvature of the earth in a similar manner as is found to occur with light waves.

He agreed that the super-regenerative type of receiving circuit was distinctly unsatisfactory, and urged that an attempt should be made to perfect a straight circuit, particularly from the mechanical

aspect. He felt that this class of circuit would eventually return to favour, but at the same time steps must be taken to stabilise the transmissions. The German B.C. were working on 7 metres, using a 6-stage circuit controlled by quartz oscillators. Three doubler stages were in use, whilst the aerial system is mounted on the top of the B.C. tower, 400 ft. above street level. This is fed by a constant impedance line, one feeder being inside the other, spaced 10 cm. An outer concentric tube is earthed.

Mr. Curnow (G6CW) gave some information about his station at Banstead, Surrey, which is 550 ft. above sea level. Reception had been effected on the 52 ft. dead feeder of his normal transmitting aerial. After giving details of the stations heard during the London Field Day, he mentioned that no grid leak had been used in the receiver!

Mr. Corfield (G5CD) outlined some experiments he had made with a receiver built around super-regenerative, and super-heterodyne principles. He had noticed an increase in amplification without an increase in background noise.

Mr. Clarricoats (G6CL) gave detailed information regarding the North London 56 mc. station built by Mr. Buckingham, and then proceeded to outline some views regarding 56 mc. problems in general. He suggested that possibly a crystal detector could be employed for local reception. He was not in agreement that 56 mc. work could be regarded as even quasi-optical in effect, illustrating his remarks with a diagram showing that the part of the frequency spectrum around 56 mc. was as far removed from optical or even quasi-optical frequencies, as those frequencies around 10,000 metres. He believed that the solution of 56 mc. problem lay in the discovery of an entirely new principle. He enquired whether cathode ray tubes could be used in some form to visually record ultra high frequency signals.

The President, Mr. H. Bevan Swift (G2TI), in summing up, thanked all those who had contributed to the discussion, and gave some personal comments of interest regarding work he had conducted with super-regenerative receivers. He formally moved a vote of thanks to Mr. Dedman, which was carried with acclamation.

## Empire Link Station Report for October, 1932.

In case it is not quite clear to E.L.S. Stations, it has been arranged that a report of activity, including any BERU messages handled, and list of calls heard (Empire), shall be sent in by the 24th of each month to G6WY direct. The idea being that we can all see what each other is doing, and if a station fails to report three months running, he is automatically cancelled, as it must be presumed he has no further interest.

G5ML got through message for S. Africa to ZS4M, who received it at R9! Also worked SUIEC, ZS6Y, VE1BV, who, on asking, had no traffic to report. Has sent in long list of Empire calls, heard.

G6WY handled both messages sent by amateur radio from G6UN at Madrid, and also passed reply message from SUIEC, who gave message to say that he would be on air with SU6HL every evening for BERU traffic between 18.30-19.30 G.M.T., on 14 mc.

G6RB reports conditions not too good for his zones, and has handled no actual traffic, but heard several Empire stations.

G5VL doesn't think the new scheme of six stations for three zones is any improvement, as it does away with the personal interest with one's opposite number, but has run reliable schedule with VE1BV, and stand by VE2BB, whom he states show very great keenness, and hopes are that a link will be formed through to VE4-5. Has worked VE4-5.

G6VP has arranged with KAILY to pass all traffic through to VS6, on his Saturday night schedule, and put the latest PS32 message through that way. Is also in constant contact with VE1BV, VP2YB, VQ4CRH-F. Has worked ZL weekly on 7 mc.

G5BJ has been very active, but finds it easier to work other people's zones, has had difficulty with his own. Unsatisfactory schedule kept with

(Continued on page 150.)



# Programme of Standard Frequency Transmissions from the National Physical Laboratory

(Station Call-sign, G5HW).

UNDER THE DIRECTION OF THE RADIO RESEARCH BOARD.

In connection with the work on the Radio Research Board of the Department of Scientific and Industrial Research, waves of accurately known frequency have been transmitted for some years past from the wireless station at the National Physical Laboratory for checking the calibration of wavemeters and other apparatus. Up to this year some 15 different radio frequencies were employed as being suitable for commercial purposes, and, in addition, a special standard frequency transmission was sent out to enable owners of amateur experimental transmitting stations to enjoy similar facilities. On account of improvements in radio frequency measuring technique, certain changes in the programme have recently been made which entail the replacement of the 15 radio frequencies by the transmission of a single audio frequency super-imposed on a radio frequency carrier wave.

This standard frequency transmission now takes place on the second Tuesday of each month in the form of a modulated wave (wave-length 830 m.), the modulation of which is derived from a continuously running frequency standard maintained at the National Physical Laboratory, and having a nominal frequency of 1,000 cycles per second. The accuracy with which this frequency is maintained is about two parts in 10 million, but during the transmission the exact frequency will be measured, and a correction to the above nominal frequency in terms of parts in 10 million will be made at the end of the programme.

After the preliminary announcement in Morse code, the standard modulation frequency will be sent out for one hour continuously. This frequency will then be changed by an amount of  $-2.5$  parts in a million, and the transmission will be continued for a further ten minutes. The object of making this change is to enable those receiving the transmission to decide whether their own frequency of 1,000 c/s is above or below that of the National Physical Laboratory standard.

At the end of the transmission an announcement will be made in Morse code giving any corrections necessary to the above nominal frequency.

The second standard frequency transmission referred to above, which is largely intended for amateur experimenters, will be maintained in the form of the emission of a continuous wave having a frequency of 1,785 kc. per second, i.e., wave-length approximately 168 metres. This programme is transmitted on the first Tuesday in March, June, September and December, commencing at 21.00 G.M.T. (9 p.m.). The programme consists of an announcement in Morse, followed by a continuous dash, the whole lasting ten minutes. This procedure is repeated for five similar periods, the whole programme lasting one hour. In this case no correction to the frequency will be announced, but it is considered that the frequency emitted will be accurate to at least five parts in a million.

The following time-tables give full details of the programmes of standard frequency transmissions described above:—

## TIME-TABLE FOR TRANSMISSIONS.

### I. Standard Frequency of 1,000 c.p.s.

Standard frequency to be used: 1,000,000 cycles per second.

Carrier wave frequency (nominal only): 360 kc. per sec. (wave-length, 830 m.).

Date: Second Tuesday in month.

Time: 10.40 to 12.00 G.M.T.

#### G.M.T.

10.40. Announcement in Morse code.

"CQ de G5HW (three times). Standard frequency transmission at 1,000 cycles per second."

10.45. Transmission of modulation frequency uninterrupted.

11.45. Modulation frequency changed by minus 2.5 parts in a million.

11.55. Announcement in Morse code.

"CQ de G5HW. Correction to standard frequency  
plus  
— x parts in ten million" (three times).  
minus

12.00. Programme terminates.

### II. Standard Frequency of 1,785,000 c.p.s. (1,785 kc. per sec.).

Standard frequency to be used: 1,785 kc. per second (wave-length, 168 metres).

Date: First Tuesday in March, June, September and December.

Time: 21.00 to 22.00 G.M.T.

#### G.M.T.

21.00. Announcement in Morse code.

"CQ de G5HW (three times). Standard frequency transmission at 1,785 kc. per second."

21.02. Continuous dash.

21.10. Announcement as at 21.00.

21.12. Continuous dash.

21.20. Announcement as at 21.00.

21.22. Continuous dash.

21.30. Announcement as at 21.00.

21.32. Continuous dash.

21.40. Announcement as at 21.00.

21.42. Continuous dash.

21.50. Announcement as at 21.00.

21.52. Continuous dash.

22.00. Programme terminates.

## STRAY.

With regard to the Iraq notes published in our September issue, we would like to point out that these were entirely sent over the air YI6BZ FB, DX, OM.



# "THE CRUISE OF THE SUSANETTE."

## From a Radio Point of View.

Part II.

By G5UW.

The *Susanette* left her moorings in the Avon at Tewkesbury, at 14.30 B.S.T., on Thursday, June 2, and coincided with the first appearance of the sun for many weeks. There were four persons on board, the skipper, the "mate," my brother, who was the "crew," and myself; G5UW, as cook and "sparks."

We proceeded down the River Severn, arriving at Gloucester about 16.00, where we experienced our first anxious moment, wondering if our craft would be able to pass under the low railway bridge, as the water was still far above normal due to the floods. However, we just managed to squeeze under, our unshipped mast lying along the cabin top, scraping the bridge girders. At Gloucester we locked out of the river into the Berkeley Canal, and proceeded along that delightful 17-mile stretch of water to Sharpness, where we moored up in the harbour at 19.30, too late to keep the G2OQ schedule. At 22.30 that evening the first QSO of the cruise was effected with G2OP, who promised to keep a benevolent ear on our doings all the way round the coast. High tide at 04.30 next morning necessitated our locking out from Sharpness Harbour into the Severn Estuary at that unearthly hour in the morning, and our skipper, equipped with the latest Admiralty charts, refused the services of a pilot, but, as it so happened, a steamer with a pilot on board locked out at the same time as the *Susanette*, so we merely had to follow in her wake as far as Avonmouth. By mid-day we were off Weston-super-Mare, but owing to the mist no land could be seen anywhere. While cruising down the Bristol Channel attempts were made to copy amateur signals, but owing to the vibration of the screw and the purr of the exhaust note only the loudest of the commercials were readable. The ignition system was not troublesome, but at no time during the cruise was it possible to use the receiver while under way unless the engine was switched off. However, on several occasions test calls were sent out asking for card reports on the transmissions while we were far out at sea, and all reports confirm the steadiness of the signals, held by the crystal, no matter how much pitch and roll was on the ship. All that day the mist permitted a visibility of less than a mile only, so that our compass and patent log had to be relied upon for navigating, while spring tides and a stiff breeze with cross-currents made fixing our exact location too complicated. At 15.30 we had had about enough of rough seas for one day, although nobody on board were in the least bit ill, so for comfort's sake we altered our course for the English coast and an hour later huge cliffs and coastline loomed up out of the mist a mile ahead, and for some time we were at a loss to know just where we were, and as Ilfracombe was the harbour in which we intended to spend the night we feared that we had run past that port

before turning in towards land. However, we shortly afterwards picked out the cliff railway connecting Lynmouth with Lynton, and thus, an hour later, we were lying snugly alongside the quay in the inner harbour at Ilfracombe. At this mooring, perhaps due to the fact that the quay walls towered above our mast and aerial at low tide, when we had to take bottom, signals seemed to come in only from the W. and S.W., or the phenomena may have been due to the high cliffs screening us from all the other points of the compass. Contacts were made with EI8D at 17.05, and G5UO, of Jersey, at 19.00, good R6 reports being received from each. On Saturday, June 4, we went out with the tide at 05.00, and cruised the whole day down the coast of Devon and Cornwall, the mist of the previous day had cleared slightly, which enabled us to keep nearer in shore and appreciate the magnificent landscape. Shortly after passing Trevoze Head the cliffs were closely scrutinised for a sight of G5VL's shack, but the haze rendered our binoculars almost useless.

We intended to lie at anchor that night off St. Ives in the bay, but the shipping forecast had hinted that the wind would probably change during the night to the N.W., which is the dangerous quarter for St. Ives Bay, so we very wisely, as it was afterwards proved, put into Hayle Estuary, just managing to scrape in over the bar in time. Hayle Harbour also dries out at low tide, and when on the bottom, the mast and aerial of the *Susanette* were actually below ground level, and signal strength on both receiver and transmitter were so adversely affected as to make a QSO impossible, contacts only being made from Hayle at high tide, and a contact with CT1HC, who reported signals at R6, T9, being the best achieved from Hayle.

The following morning we put out over the bar, only to find that the gale during the night had raised such a big sea that to proceed round the dangerous Land's End coast to St. Mount's Bay under those conditions would have been foolhardy in the extreme, and, as it was, we had the greatest difficulty in avoiding being swamped before we got back over the bar again into Hayle and tied up to our old moorings of the previous night. Early on Monday morning, June 6, we again put out from Hayle, and this time found a flat calm beyond the bar, and made a record trip round Land's End to Penzance, where we dropped anchor in St. Mount's Bay, about a mile off shore. At 14.30 contact was made with ON4ND, who reported W5, R6, T9, with only very slight QSB, despite the fact that the yacht was rolling on a gentle swell. That evening we locked into the basin at Penzance, because local knowledge, never to be despised, advised that it would be dangerous to ride at anchor in the Bay should the wind get up during the night. From Penzance Harbour contact was made with G5ZG, of Leicester, the only contact



with the Midlands, and G5PE, of Scotland. On June 8 we put into Falmouth, and anchored among all sorts and types of craft in that fine stretch of water, and after a QSO with PA0GQ had the misfortune to break the filament of the LS5B output valve of the transmitter, and as I had no spare valve on board I searched all the wireless shops in Falmouth for a suitable valve without success. This mishap kept the set off the air until we arrived at Torquay, on Saturday, June 11, where I was successful in obtaining a new LS5B valve. At 17.40 we contacted with G5YV, of Dewsbury, while anchored in the harbour, but the G2OQ schedule failed at 16.30, although G5VM, in Birmingham, logged the call at R8. Perhaps the best conditions of the whole trip were experienced while at Torquay, D4LQH, 11IP, G5NP, G5CU, G6KZ all being worked, while a fine schedule was kept with G6JV, the R.N. College at Dartmouth, who were exceedingly useful in providing the very latest weather and sea reports. As the fine weather then prevailing seemed to be very settled, we decided to make an all-night cruise from Torquay to Poole, a distance of about 70 miles. We left Torquay Harbour at 23.15 B.S.T. on Sunday night, June 12, and very soon we were troubled to find a heavy mist lying low on the water, through which loomed up the lights of the Brixham fishing fleet, stretched across the seven-mile mouth of Torbay, and every time we tried to pass through the lines of craft we were frantically signalled by the nearest boat. The signals consisted of swinging to and fro a hurricane lamp, and were unintelligible to us; we hit upon the idea of morsing with an electric torch, but our query of PORT question mark, only resulted in more lamp swinging, so we tried our luck with STARBOARD, being answered once more with all sorts of funny signals, that we decided to give it up as a bad job, and steered a course straight through the fleet, taking care to stop our screw while passing over the nets, and so out to sea—quite an exciting episode while it lasted. Dawn found us about ten miles out at sea off Portland Bill, and we dropped anchor just off the beach at Swanage at 08.00 for breakfast. Prior to leaving Torquay we found we had sheared a key-way on the reverse gear mechanism, which prevented use of our reverse gear, and this defect was the cause of our running aground in Poole Roads, just off Sandbanks. However, we were tugged off into deep water, without any damage having been done to the yacht. Before leaving Swanage QSO was had with G5UI, of Ryde, and G6MY, but conditions later on in the day when at Poole were so bad that no contacts were made from that anchorage. On Tuesday, June 14, we left Poole, and cruised all round the Isle of Wight, and had the misfortune to run on to Cole Rocks, a mile or so at sea off Bembridge Point. Fortunately, with the help of the rising tide, and by lightening the ship, we managed to get off into deep water under our own power, much to the disappointment of a number of fishing craft that had quickly gathered round, and were standing by waiting for our distress signal to be run up so that we could be claimed as salvage. We were afterwards informed that the buoy that should have marked those rocks had very recently been washed away. The *Susanette's* keel had a rough time of it, but, luckily, the hull was not holed, but the excitement, while it

lasted, was most intense, half an hour bumping about on Cole Rocks is very exhilarating. We anchored that night in the River at Cowes, where it was found the bumping on Cole Rocks had broken the springs in the valve-holders of the receiver, so schedules could not be kept from Cowes. Next day I got on the telephone to G5TZ, in Newport, and fixed a schedule for that same evening, providing I could get the receiver repaired in time. That afternoon we left Cowes for Lymington, on the other side of the Solent, and in getting up our hook from the river bed brought up with it a few tons of chain and telephone cables connecting East and West Cowes. These we carefully lowered to the bottom again, with thanks. At Lymington, with the aid of a pair of scissors, a screwdriver and a soldering iron as big as a fist, heated over a primus stove, I managed to repair the broken valve-holders in the receiver, and hooked up with G5TZ as previously arranged. A few tests were carried out, during which TZ invited me over to the island to spend the following day with him, and, accordingly, I went over on the ferry to Yarmouth the following morning, where 5TZ met me with a car, and showed me round the island and later his shack, where the automatic switching and keying arrangement was much admired. I invited TZ to return to Lymington with me to see the *Susanette* and the portable, so, after fixing the automatic device to call at 18.00, we returned to Lymington to listen to G5TZ's station giving a short call. A further QSO with G5TZ the next morning was the last had on board, after which the set was packed up in readiness for the journey back to the Midlands by road.

To summarise, the transmitter worked exceedingly well throughout the whole cruise, and considering the tiny aerial used the contacts made were very satisfactory. Reports have since been received from all over the British Isles and most of Europe, with a report from Moscow as perhaps the greatest D.X. report received. The aerial did not appear directional in itself, but screening, most noticeable while at Ilfracombe, sometimes caused radiation and reception to be confined within narrow limits when operating the set in harbours. The input to the valve feeding the aerial never exceeded 400 volts at 30 mils., i.e., 12 watts, so that the overall performance was considered good. The only disappointment in the tests was the absolute failure to connect on schedule with the base station G2OQ in Wolverhampton, and although signals from the yacht were picked up in that town, they seemed to miss the aerial at G2OQ, who religiously kept the schedule throughout the cruise.

## STRAYS.

One of our members, Mr. E. A. Haskell, sailing upon H.M.S. Royal Sovereign in the Mediterranean will be glad to furnish reports of reception to any transmitter who cares for same. Letters should be addressed to him via his home, 104, Pretoria Road, Southsea.

\* \* \*

E. N. Adecock (2BLG) would welcome an article on the directional effects of various types of aerials.



# CONTACT BUREAU NOTES.

By H. C. PAGE (G6PA).

**T**HAT the winter is now upon us is quite evident by the amazing increase of material received at Contact Bureau. While this is published as soon possible, I am unable to guarantee publication of any material by a specified date. Space in THE BULLETIN costs money, and therefore it will sometimes be necessary to hold material over for a month or so. Please will those of you who send in material for publication keep it as brief as possible.

2AVR, the Group Centre of Group 2D, sends in a very interesting account of his observations on 2XAD during the eclipse. Fig. 1 shows quite clearly what happened to 2XAD so far as 2AVR was concerned. In his report, 2AVR remarks that conditions on 16 metres and above were really astonishing. The 7 mc. band in particular was most unpleasant to listen to, there being very bad QRN, and terrific QRM. The BCL band was also very lively. 2XAD increased from a faint carrier at the commencement of the eclipse to a good R4 at the middle of the phenomena. Signal strength then fell off rapidly until the termination. As conditions had been very poor previously, he is convinced that the Eclipse of the Moon had a positive effect on the radio conditions, but will only make a suggestion. He suggests that as the ultra violet light radiated by the sun is thought to be the ionising agent of the Appleton Layer, and was temporarily cut off by the earth's rotation, did the moon bend the waves earthwards and overcome the lack of free electrons which are required to bend the shorter, or daylight waves (14-20 m.) back towards the earth? We know that the moon causes the tides by gravitation (in conjunction with the sun, but the sun has not such a strong pull), could it have such a pull on the short waves in its Eclipse?

BRS865 has asked to be allowed to start a maths group in C.B., and I have asked him to outline briefly what he has in mind. Below you will find his suggestions.

For some time I have thought it would be an excellent idea to start a group devoted to the study of the mathematical side of radio, and now, with 6ND's help, this seems a practicable possibility.

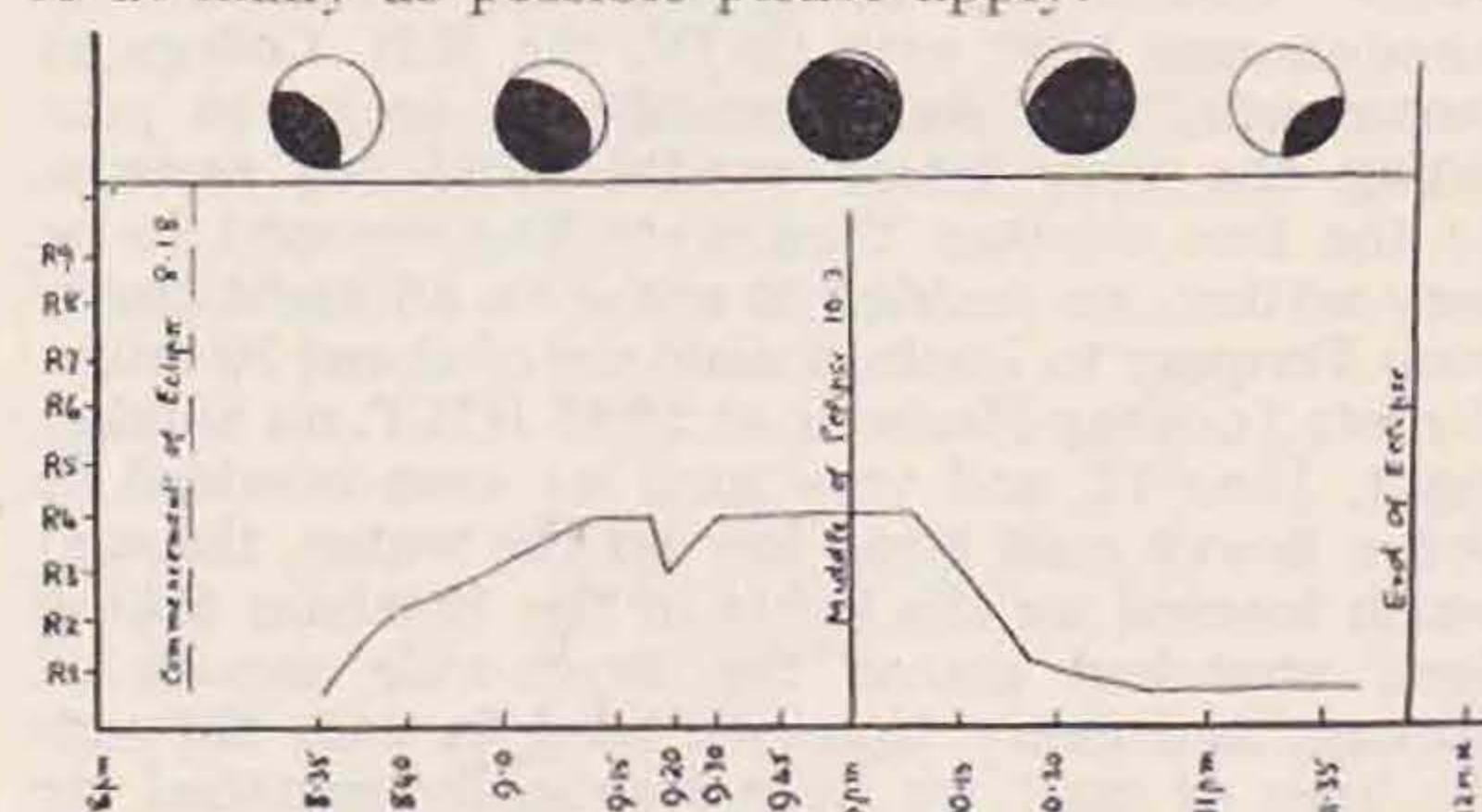
Firstly, as regards the aims of the group. There are numerous branches of radio, such as the use of Windom aerials and the range of ultra short-wave signals, which have had but little more than a practical examination by amateurs. The aim of the group is to put the experimental results into a mathematical form. To the average non-mathematical amateur this will seem very uninteresting, but among the very large number of members there must be some who have a genuine liking for mathematics, and who would like to make some use of them.

The standard of mathematics required for membership must be high, as anyone who has dipped into a good theory book will realise. The first essential is a general knowledge of differential and integral calculus, not necessarily very advanced.

A knowledge of algebra up to exponentials, and of trigonometry up to hyperbolic functions, is also necessary—and, of course, a general acquaintance with the mathematical side of magnetism and electricity. A tall order, admittedly!

The first work of the group will be to read up, and to get a general knowledge of the theory as found in modern text-books on the subject.

Please make your applications to me direct. My QRA is: 71, Tintern Avenue, Westcliff-on-sea, Essex. A large number of members is required so as many as possible please apply.



## 28 MC. Work.

G6VP, Group Manager.

The last month has witnessed indifferent conditions, and very few contacts of a DX nature have been possible. For all that, there seems to have been normal interest taken, and it is to be hoped that the dip in conditions will be nothing more than momentary. All Groups report again, and the following is a resumé of their work:—

**Group 1A.**—Group Centre G5MP states that conditions have seldom been as bad. He is off the air at the moment on account of taking up a new qra, but hopes to be active again in mid-November from London University, under call sign G2FI. He states that W8TI wants skeds.

G5FV has now got his 100-watt c.c. outfit working satisfactorily. For the 28 mc. tests he is trying to erect a  $6\frac{1}{2}$   $\lambda$ . vertical aerial supported by hydrogen balloons. (The group is breathlessly waiting for a spark, G5MP!)

G6OY, ex-2ARM, finds that G5FV, at ten miles, is very variable at times. He has not yet got his 28 mc. transmitter working well.

**Group 1B.**—G5SY Group Centre states that DX has been a complete failure during the last month, and goes on to say that evidently we have experienced much the same effects as VK last winter, and perhaps now we shall find similar conditions coming along with us as lookers-on. He does not expect an *exact* repetition, however, and advises everyone to keep a sharp look-out for a break.

All members of Group 1B listen specially from 10.00 till 10.30 G.M.T. every Sunday, and in this way it is hoped to get comparative conditions. He urges his members to keep this up, and asks everyone, whether an attached Group member or not, to forward him particulars of any signals heard during that period.



Both G5ML and G6WY have been obliged to temporarily leave the Group on account of representative affairs. There are thus vacancies in this, the oldest 28 mc. Group. Early applications should be made either to me, G6VP, or to G5SY direct.

*Group 1C.*—Group Centre G6VP's report is in keeping with other members' reports, and no DX has been heard or worked. He has been in touch with Hungary on another frequency, and was told that they were subjected to similar conditions over there. The G Station was heard through G6WN.

G6WN report nil, with the exception of the above. Schedules have been kept with SU1EC and G6LI without result. The only fundamentals heard were Rome and G5VB on October 9.

*Group 1F.*—Group Centre BRS25, complains of scarcity of reports. Personally he has only heard G6HP and G6WN.

2BHK has only heard G6HP.

2BZZ has been listening a lot, but has heard nothing, with the exception of G2OA and G2OI.

OZ7T is taking an active part in the Group again, and states that he had many European contacts during August.

G2OI sends in his first report, and states that he has made contact with G2OA every time they have tried. The distance is 38 miles. He has two TX's, one is a balanced Colpitts, and the other a push-pull self excited. He used 82.5 ft. aerial tapped direct onto the tank circuit making  $5/2\lambda$ , an alternative method of coupling being by means of a one-turn coil.

He has now changed his aerial to a split Zepp., 33 ft. by 33 ft., fed by 16.5 ft. feeders. The split top is arranged at an angle, one side full wave due N/S, and the other side full wave E/W, and will publish results in due course.

The Rx. is a straight Ultra-Audion which will go up to 56 mc.

### Fading, Blindspotting and Skip.

Group Manager, G2ZC.

Owing to the issue of our "Monthly News Sheet," for private circulation round the groups, including, as it does, all domestic notes of group interest only (i.e., changes in the groups, changes of addresses, call signs, etc.), in future I propose dealing with only the work of the groups that we might consider of scientific value, so far as publication in THE BULLETIN goes.

As the groups stand at present, the following are the G.C.'s of each: 2A, G6MB; 2B, G5GZ; 2C, 2ASX; 2D, 2AVR; and 2E, G5KU. Any questions regarding the work, etc., of any group might please be addressed to the G.C. concerned.

So far as the work of the month goes, 2A have started compiling synoptic charts from different countries, and these are being made out in connection with their observation scheme. This means a lot of work, but the group seem keen, and I trust that their labour will be rewarded. I mention this as possibly some R.S.G.B. member may wish some information on meteorological observation, and may be able to obtain this by applying to 2A.

An examination of 2C's report is of general interest, for while 2B made the original discovery that an earthquake effects short waves, 2C now go a step farther, not only in showing that this is so, but with our earthquake, in any part of the

world (this is important), we get definite connection between the earthquake, barometric pressure, and reception conditions. This rather tends to show that 2B, in compiling a monthly report on earthquakes, have been justified in this investigation, so co-operation may yet lead to some important discovery. 2C also note a connection with regards to the phases of the moon, which was also noted by 2B, some years ago. In passing, Group 2B are approaching the end of their fourth year of work, and are still practically the same in constitution, as when formed, and I do not think it out of place to wish them a "happy birthday," as they show that, though they may disagree on technical points, they are agreed in pulling their weight together, as a group. The outstanding feature of 2D's report is the observation taken during the eclipse of the moon. In passing, both 2D and 2E have each a vacancy for one member to complete the group, and I shall be glad to receive applications. 2D are on observation work with special reference to 14 mc., etc., while 2E are also on observation work, and would particularly welcome anyone interested in oscillograph work. Finally, I intend to close our groups at five in number, unless circumstances warrant additional groups, as I consider that better co-operation will result with that number than of having too many, and possibly greater concentration in solving problems may also result.

*Group 2A.*—Observation work is being continued, and an additional listening period has been arranged on Monday evenings. A full investigation into the effect of meteorological conditions on wave propagation is being carried out, and charts of signal strength are prepared for each listening period. An examination of some fifty of these charts has yielded the following facts:—

(1) Immediately outside the skip area comes a belt of good signal strength (R6 to R9).

(2) Outside the belt, areas of silence or weak signals (R1 to R5) may occur, but they do not take the form of concentric belts.

(3) Fading, when it occurs, is found on the extremes of the zones.

*Group 2B.*—Although this group has a budget of 18 pages of closely-typed matter, an extraction is difficult. Generally, the group have been discussing possible causes why earthquakes might affect signals, and while some interesting theories have been stated, no definite agreement has been arrived at. Amongst the ideas, one is that the physical friction set up causes a change of potential of the earth, and this in turn may affect the ionospheres, with far-reaching results, but there does appear to be combining of different phenomena, which all go to affecting signals. It would be rash to state that any one is the cause, but undoubtedly a combination of two or more does seem to fit the case. One member has submitted a paper on the cause of fading, and the group hope to examine this, and discuss it, with a view to its being accepted by the group, and a rough outline being published in THE BULLETIN, as it is an argument on somewhat different lines to those generally discussed.

*Group 2C.*—The graph scheme of observation is proving its value, and a connection has been noticed between earthquakes and barometric pressure, and reception conditions. When earthquakes take place in any part of the world, the barometric pressure



over Britain is low, and reception conditions improve on the days following the earthquake. It has also been noted that two days after the earthquake, pressure starts to rise over Britain. This has been noticed by several of the members, and there also seems to be a phase of variation of signal strength in connection with the phases of the moon.

An all-round survey of things likely to cause variations in reception is now being made by the group.

**Group 2D.**—This group deplores the conditions that have prevailed on the 14-15 mc. bands, thus hampering their work, for while they have been busy, they have little to show for it. They note that when W2XAD is received well, 14 mc. conditions are good for DX, particularly from W1, 2, 3, 4, 8 and 9, and VE1 and 2. The G.C. sends an astonishing report and graph of W2XAD'S behaviour during the eclipse of the moon, and I have sent this to C.B. Manager, and hope that he can include it in his own notes. They are about to discuss the heaviside layer next month. In the eclipse of the moon report, 2AVR finds a positive result, and would like to know why this should be so. An explanation from anyone will be welcome on this subject.

### Notes upon observations made during the recent eclipse of the moon.

The advent of the eclipse of the moon, on September 14, 1932, found me standing by on W2XAD for anything unusual, and I am pleased to say that the evening proved very fruitful.

Conditions from 16 metres upward were really astonishing, and signals were being received with a terrific strength. The 7 mc. amateur band in particular was most unpleasant to listen to—terrific Qrm and very bad QRN. I am also informed that the BCL bands were astonishing. Reverting to W2XAD, I found that QRK increased from a faint carrier at the commencement of the eclipse to a good R4 at the middle of the phenomena. QRK then fell off fairly rapidly to R1, and maintained that strength until the termination of the eclipse. As conditions had been very poor for the previous week, I am convinced that the eclipse of the moon had a positive effect on radio conditions, but how, I can only conjecture. I suggested the following to the group: As the ultra-violet light radiated by the sun is thought to be the ionising agent of the Appleton Layer, and was temporarily cut off by the earth's rotation, did the moon bend the waves earthwards and overcome the lack of free electrons which are required to bend the shorter or daylight waves (14-20 m.) back towards the earth? We know that the moon causes the tides by gravitation (in conjunction with sun, but the sun has not such a strong pull), could it have such a pull on the short waves in its eclipse?

However, I spent a very profitable evening, and it is unfortunate that other members of the group could not observe so that results could have been compared.

### Ultra High Frequency Work.

Group Manager G6XN.

Again a scarcity of reports. A letter budget was started last month, however, and there is every prospect of increased activity during the winter months.

2BHX reports considerable success during the recent local 56 mc. tests. He uses a 2-valve separately quenched super regenerative receiver, with loudspeaker, and a 15 ft. indoor aerial. Stations heard were G6YK, G5CV, G5KH, G6NF, G6UT?

G2OL and G6XN were only able to take part in these tests for a brief period, but logged some strong signals. G6XN was reported from Kingston, about 9 miles.

G2KB has been very active, and has obtained extremely interesting results from tests with a crystal receiver within 100 ft. of the transmitter. In particular, standing waves in space, due to reflection from metal objects, were detected. A full report is expected next month.

### 2 MC. Work.

G5UM, Group Manager.

The past month has seen a useful interchange of information among members of Group 10A regarding aerial systems for the 2 mc. band. The subject is one that has received inadequate attention in the past, and accordingly has aroused keen interest in the group.

While giving it as his opinion that the best aerial for the band would be a 264 ft. flat top tapped on to the tank coil, G5RX realises the practical difficulties that most people would encounter would put such a system out of court. After a great deal of work on various different modifications, including a 66 ft. aerial with a 66 ft. counterpoise, he has come to the conclusion that, under existing conditions, a 99 ft. (including downlead) wire functions most satisfactorily on 2 mc. when tapped direct on to the tank and used with an earth. The latter connection is removed when changing to 3.5, 7 and 14 mc.

"The counterpoise is one of the most important components in a 2 mc. antenna," remarks G2WS, who uses a 40 ft. one. It is vertical for most of its length, and is loose coupled with the aerial to the COPA tank. Loose coupling is found most efficacious with absorption keying, which is used on all bands. The aerial itself is the 7 mc. Zepp., with feeders shorted, which, of course, gives 80 ft. of radiating length.

G6FO, whose stimulating articles in THE BULLETIN on aerial systems are not easily forgotten,

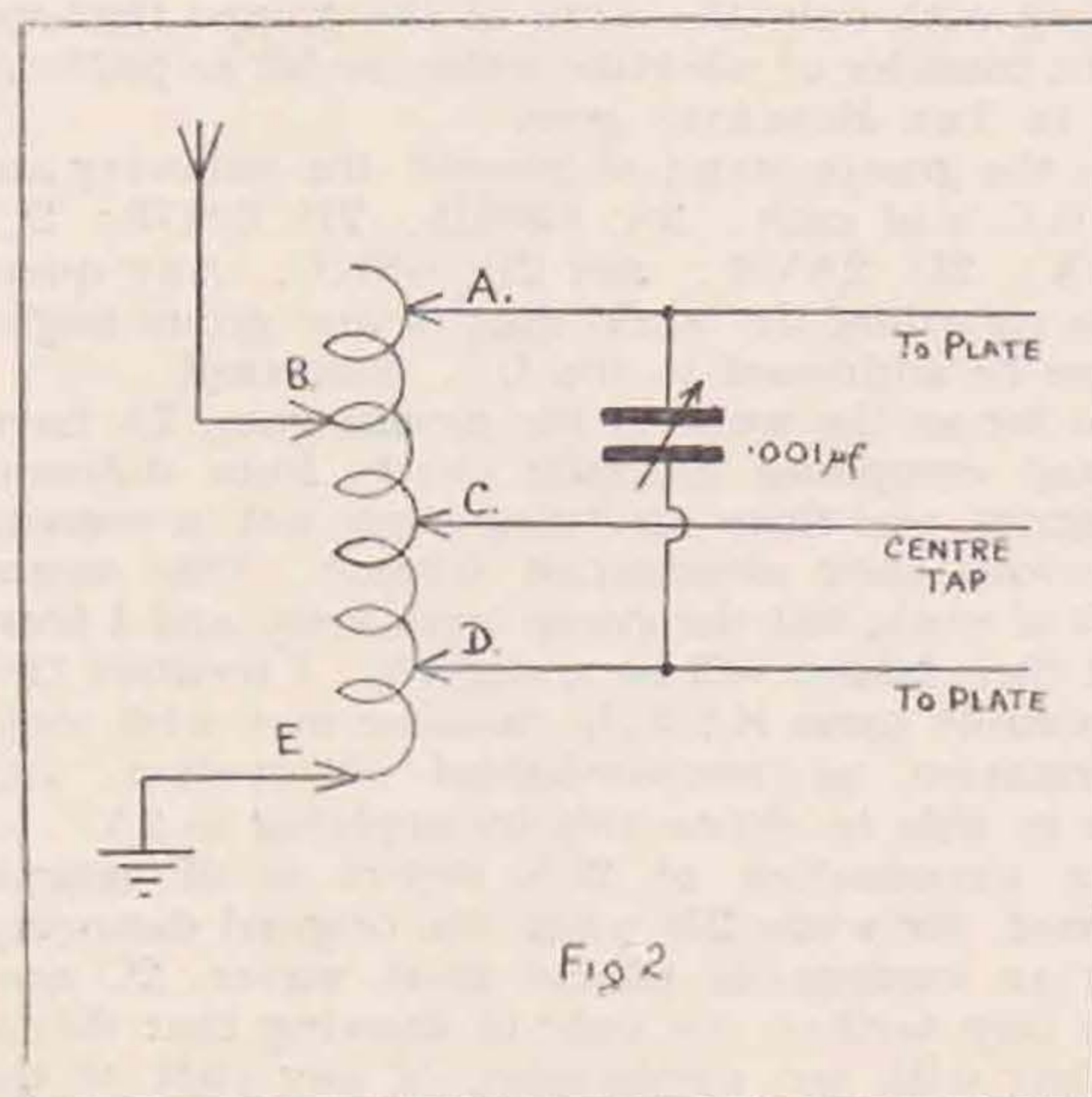


Fig 2



## AT YOUR SERVICE!

You read the "Bulletin" because you are a member of the R.S.G.B.; therefore you must be keen on Short-Wave work, both Transmission and Reception. But are you able to get all the information you want? How to make that RX perk on five metres and what to do about modulating a CC outfit? How to put up an aerial which is "correct" theoretically and the way to set about getting a two-letter call?

This is where we come in! We exist to provide not only information required in connection with BCL work, from P.A. equipment and Radiograms to catwhisker receivers, but also all the dope you are wanting to become either a transmitter or a more proficient one. We don't try and sell you gear (unless you cannot get it yourself) but we do offer you dependable, unbiased and lucidly written technical information on anything connected with Radio.

**TO OVERSEAS MEMBERS:** We understand your needs. Any gear can be supplied and constructional work undertaken. Send us your enquiry.

### What can we do for YOU?

**Charges:** 3/- per query; four or more, 2/6 each. Questions involving elaborate treatment are quoted for by return, while diagrams and sketches, executed by a Draughtsman, are included when necessary.

**QRA—**

**RADIO TECHNICAL AGENCY**  
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**NOTE.**—This business is controlled by a Transmitter whose call is familiar to most R.S.G.B. members.

## Q.C.C. Quartz Crystals.

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We can supply crystals to within 5 kcs. of your specified frequency FROM STOCK. A certificate of calibration is sent with every crystal, giving the exact frequency correct to plus or minus 0.1%.

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Telephone: Malden 0671.

## FOR BETTER CONTACT—CLIX



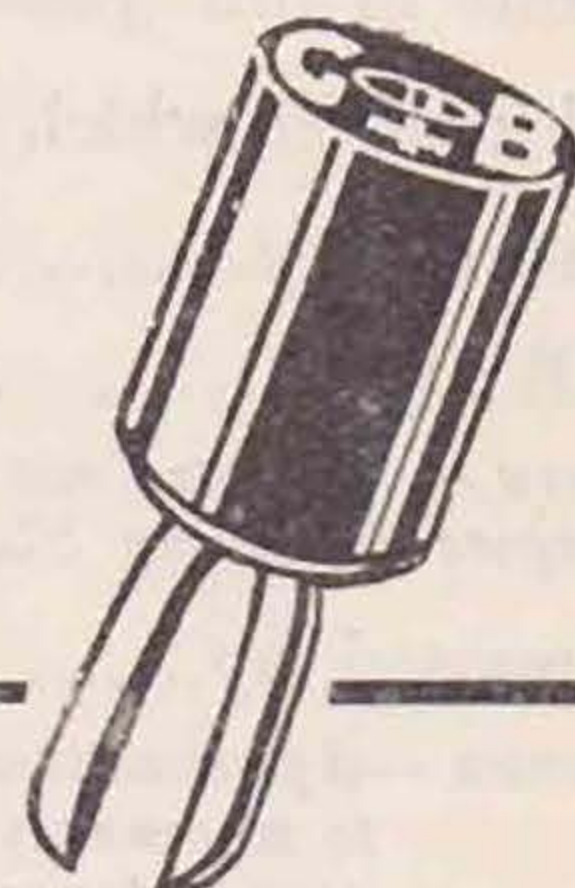
### PANEL TERMINALS

Specified for the R.S.G.B.  
"Universal" Receiver.

Clix Improved Terminals are very robust; have completely insulated and non-removable heads. Note the HEXAGON SHOULDER of type B which allows convenient fixing. Red or Black, with full range of easily read markings. Type A, 2½d Type B, 4d. with hexagonal shoulder

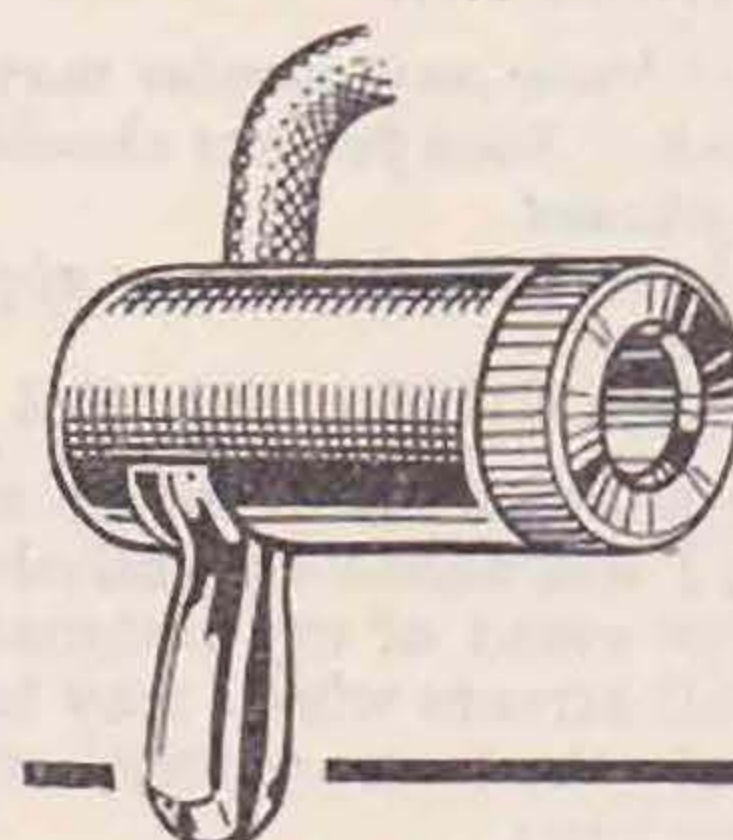
### "MASTER" PLUG

The Plug with positive METAL to METAL wiring. Widely variable and non-collapsible prongs giving firm grip and full contact with any battery socket. Specially curved ends for easy insertion. Full range of markings. 1½d.



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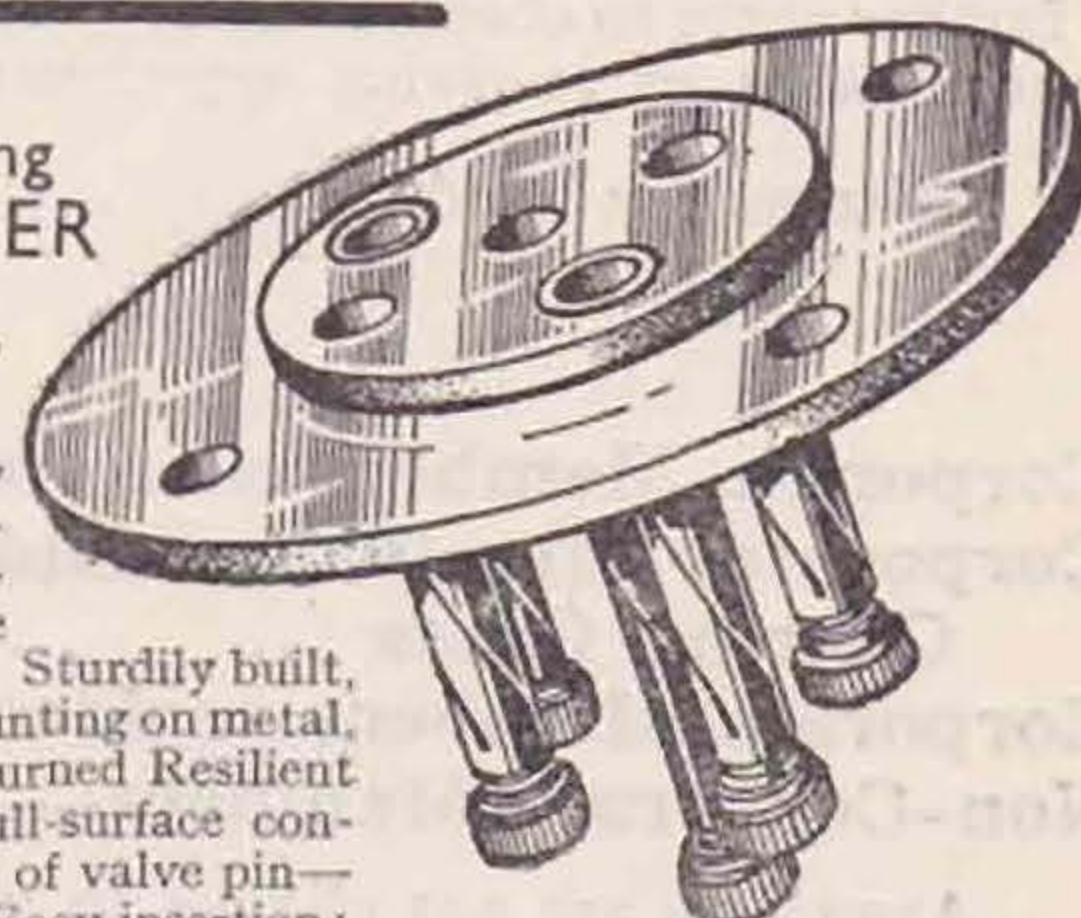
This plug was specially designed for Mr. Scott-Taggart's "S.T.400" Receiver. Whenever it is desired to apply the same H.T. or G.B. voltage to two points in a circuit, this double purpose wander plug quickly and efficiently solves any difficulty. 2d.



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# The Incorporated Radio Society of Great Britain.

Headquarters Society:—BRITISH EMPIRE RADIO UNION,

53, VICTORIA STREET, LONDON, S.W.1. ('Phone, Victoria 4412.

## APPLICATION FORM.

The Hon. Secretary,

Sir,—I beg to make application to be enrolled as a member, and shall be obliged if you will submit my name to your Council. I agree, if elected, to act and abide by the Rules of the Society as expressed in its Articles of Association and By-laws.

Signature.....

Name in full (please use Block Letters) .....

Address (to which all communications may be sent) .....

Nationality..... Age (if under 21).....

Call Sign.....

*NOTE.—Members not having Call Signs are allotted B.R.S. (British Receiving Station) or B.E.R.S. (British Empire Receiving Station) Numbers, which are used for identification purposes only.*

Proposed by..... Seconded by.....

*NOTES.—Applicants who do not know any member may accompany their forms by references in writing by persons to whom they are known. Such persons should be householders, and should state profession and length of acquaintance with applicant.*

*The Council reserve the right to refuse any application without reason.*

### UNDERTAKING TO BE SIGNED BY APPLICANT.

I, the undersigned, agree that in the event of my election to membership of the INCORPORATED RADIO SOCIETY OF GREAT BRITAIN, I will abide by and observe the Rules, Regulations and Articles of Association of the Society, and that in the event of my resignation from the Society given under my hand in writing, I shall, after the payment of all arrears which may be due by me at that period, be free from this obligation. I further agree to observe strictly the terms of any licence issued to me by the responsible authorities to operate transmission or receiving apparatus.

Witness my hand this.....day of..... (signed).....

### SUBSCRIPTION RATES.

Corporate Members and Associate Members (Town) ...	£1	1	0	per annum.
Corporate Members resident outside 25 mile radius				
Charing Cross ... ..	0	15	0	„ „
Corporate Members resident outside British Isles ...	0	12	6	„ „
Non-Corporate Members—Associates ... ..	0	10	0	„ „

Associates are not eligible to vote or receive individual notices of the Society.

Certificates of Membership and copy of the Articles of Association are issued to all members upon election.

### NO ENTRANCE FEE.

A copy of the Articles of Association may be inspected at the Headquarters of the Society, 53, Victoria Street, London, S.W.1, by applicants upon request.

FOR OFFICE USE ONLY.

Approved by Council.....

B.(E.)R.S. Number issued.....First Subscription Paid.....



turns in five closely-typed folios of useful information. With his new push-pull TPTG transmitter, he uses a method of direct coupling, which, while not claimed to be novel, is an interesting departure from generally accepted principles. In the Figure 2, A-B is two turns, B-C eight turns, C-D eight turns, and D-E six turns, being optimum values for greatest efficiency, giving .52 amp. aerial current. It will be seen that the centre tap is placed at the electrical centre of the tank coil A-D, not the whole of the inductance. The aerial and counterpoise are so tapped that an auto coupling effect results. Among the advantages G6FO experiences from the use of this layout are improved stability and quality of note, as compared with loose coupling, ease of QSY (merely by adjusting the .001 mfd. variable condenser, not the tappings), constant aerial current over the whole band, and ability to modulate 90 per cent., against 65 per cent. with loose coupling, both figures being obtained without any apparent frequency modulation. The present antenna is 80 ft. long, with twin counterpoise beneath. To sum up in G6FO's own words: "It is best to use direct coupling on 2 mc., and to radiate off as much wire as possible."

Two factors contribute to make the aerial problem particularly acute with G5UM, namely, that he operates solely on 160 and 80 metres, and that he has a maximum span of only 30 ft. in which to suspend an antenna. A third difficulty is that his positive main of the D.C. supply is earthed, with the result that direct coupling of an earth lead is impossible. Direct coupling of the aerial has been attempted; it did not improve results, and caused several burned-out aerial ammeters when branches from the tree-cum-aerial-mast touched the wires and made a dead 240 volt short to earth. Series-feed was tried, thus putting the plate coil at earth potential instead of at minus 240 volts when parallel fed. Direct coupling was still fruitless, but loose coupling gave similar results both with P.F. and S.F., and has accordingly been adopted. Comparative tests of a single wire antenna against a twin gave an overwhelming advantage for the latter on 2 mc. at all distances, and gave improved QRK on 3.5 mc. with stations over 300 miles distant. It is 29 ft. long, with 16 ft. downleads. A 30 ft. flex laid indoors in the opposite direction to the aerial, and an outdoor 30 ft. length of wire comprise the counterpoise arrangements.

### Television.

#### GROUP IIa REPORT.

G5CV, Group Manager.

Business and "exams." have prevented 2BFO and 2ARV (ex-BRS759) respectively from being very active during the last month. Both of them report amplifier trouble.

2AQW (ex-BRS869) is unfortunately troubled with an R3 (in speaker) D.C. hum due to mercury arc rectification being used at the power station. He states that no amount of smoothing will eliminate it, and asks whether it will affect the picture. (It is bound to be visible as a background, O.M., but provided the frequency of the hum is comparatively high, I don't think it will be too bad.—G.M.)

The receiver in use here at G5CV is now a crystal detector transformer coupled to a low gain three-

stage R.C. amplifier using the following sequence of valves, LS5B, LS5 and two P625A's in parallel, or one D060, depending upon the H.T. voltage used.

The crystal detector is of the Perikon type, employing two crystals in contact with each other. When receiving the 6.1 metre television transmissions from Long Acre, however, using a crystal detector of the Hertzite and cat's-whisker type, I have been told that certain "spots" on the crystal produce a phase change of  $180^\circ$ , giving a negative picture. Can anyone offer an explanation?

Nothing has been heard for some time from G6MS or 2A0B. What about it, O.M.'s?

### Review of Foreign Magazines.

A perusal of the recently received foreign magazines indicate a striking growth of interest in 56 mc. work. A new ham paper, the *Boletin* of the R.E.P., devotes considerable space to the description of 56 mc. apparatus; while the U.S.K.A. paper "*O.M.*" announces that the five-metre band is now open to Swiss hams. The most interesting reading is, however, undoubtedly provided by *CQ Zanzvir*, the journal of the South Dutch section of the N.V.I.R. The members of the southern section recently held a five-metre field day, when a number of automobile groups equipped with transmitters and receivers made efforts to communicate with each other and with a transmitter at a central point; these groups gradually increasing their distances from the centre, each in a different direction. Conclusions reached by the different groups varied considerably, some groups observing serious screening by hills, telephone wires, etc., whereas the most successful group observed no such effects! The best contact was effected over a distance of 12 km., with several intervening hills; signal strength was good, and only lack of time prevented tests over a greater distance.

On a later occasion, tests were made with a parabolic reflector behind the transmitting aerial. This was made in the form of a wooden framework, supported at 1.5 metres above the ground, and carrying a half-wave vertical radiator, behind which any number of half-wave reflector wires, up to nine, could be supported from a parabolic frame. It was found that with only three reflectors—one at each side of the radiator at half wave-length distance, and one behind at distance  $\lambda/4$ —, marked directional effects were obtained which were as good as those with the full parabolic curtain of nine wires.

Strong winds prevented further tests, but nothing daunted, the Zanzvir hams are proceeding to arrange tests from the top of the highest gasometer in Eindhoven! In all their tests, inputs of less than five watts have been used.

### Strays.

W2GO working phone will be glad to work with any G station on CW on 3.5 mc. BRS reports will also be welcomed. Sheds can be arranged either by writing direct or via 2BHX.

\* \* \*

T. F. Evans (VK2NS), of 193, Rocket Street, Bathurst, N.S.W., would like to get in touch with local hams with a view to co-operative work.



## HIC ET UBIQUE.

### R.S.G.B. Transmitting Tests.

The dates of forthcoming tests are as follows :—  
28 mc., December 3 and 4, December 10 and 11, 1932 ; Low Power, January 14 to January 22, 1933 ; 3.5 mc., April 1 and 2, April 8 and 9, 1933.

The Rules for these contests were published in the September issue of the BULLETIN (pages 89 and 90), whilst an amendment appeared in the October issue (page 127).

Two additional Rules should now be added to the General Rules :—

11. Only one contact with a specific station will be permitted each week-end.

12. Entry forms are not required.

Due to an oversight the points allowed for contacts between the Channel Islands and either Northern Ireland, Irish Free State or Scotland were given on page 127 of the October BULLETIN as 2. The figure should have been 3. Entries which have already been sent in for the 1.7 mc. tests will be amended by the Awards Committee.

### Reception Tests.

Dates and periods for the next tests are given below. For the 28 m.c. tests, it will be noticed that the periods allocated are clear of the dates for the R.S.G.B. 2B m.c. transmitting and receiving contests, as it is hoped that members will make a point of entering these contests, details of which are given elsewhere in this number of the BULLETIN. All reception test logs should reach T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4, by December 19. New participants for the reception tests can find on reference to the May issue of the BULLETIN the detailed procedure to be followed. Logs are circulated in budget form to all participants.

### Periods and Bands, Series No. 12.

Test Letter.	Date 1932.	Period G.M.T.	Band M.C.
A ...	Saturday, Nov. 26 ...	22.30-23.30	3.5
B ...	Saturday, Nov. 26 ...	16.00-17.00	28
C ...	Sunday, Nov. 27 ...	00.00-01.00	7
D ...	Sunday, Nov. 27 ...	08.30-09.30	1.7
E ...	Sunday, Nov. 27 ...	10.00-11.00	28
F ...	Sunday, Nov. 27 ...	18.30-19.30	14
G ...	Wednesday, Nov. 30	21.00-22.00	28
H ...	Saturday, Dec. 3 ...	23.00-24.00	7
I ...	Sunday, Dec. 4 ...	07.30-08.30	14
J ...	Sunday, Dec. 4 ...	09.30-10.30	1.7
K ...	Sunday, Dec. 4 ...	22.30-23.30	3.5
L ...	Sunday, Dec. 11 ...	07.00-08.00	7
M ...	Sunday, Dec. 11 ...	10.00-11.00	3.5
N ...	Sunday, Dec. 11 ...	17.00-18.00	14
O ...	Sunday, Dec. 11 ...	18.30-19.30	1.7

### Boy Scout Troops and the R.S.G.B.

We have pleasure in announcing that the 10th Finchley (London) Scout Troop have been granted affiliation with the Society. To enable them and other similar troops to make full use of the Society's QSL Bureau a special identification number will be issued. Their stations will be known as British Scout Receiving Stations (BSRS), the Finchley Troop being BSRS1.

Members at home and abroad are asked to assist us in bringing amateur radio to the attention of

other Scout troops. Council have fixed their annual affiliation fee at 10s., which includes a copy of the T. & R. BULLETIN.

### R.S.G.B Reception Tests.

Council have decided to cater for those members interested in the reception of amateur signals by organising reception tests in conjunction with the 3.5 and 28 mc. transmitting contests.

#### GENERAL RULES.

1. Entrants must be fully paid-up members of the Society and be resident within the British Isles.

2. The British Isles for the purposes of these tests includes England, Scotland, Wales, Northern Ireland, Irish Free State, Channel Isles, and the Isle of Man.

3. Contests extend from 12.00 G.M.T. on Saturdays to 24.00 G.M.T. Sundays.

4. Entries must reach Headquarters not later than 14 days after the end of a contest.

5. Leading stations will be awarded Certificates of Merit, whilst trophies may be awarded at the discretion of Council.

6. A report of the received signal Q(RK, QSA and fone) must be recorded before points can be claimed.

7. Only one call heard from a specific station each week-end will count for points.

8. For the purpose of scoring the four London districts will be counted as one. North Africa will be considered as comprising French and Spanish Morocco, Tunis, Tripoli, Algeria, the Canary Islands and Madeira.

9. Council's decision will be final in all cases of dispute. They reserve the right to amend or alter the Rules for these contests if deemed necessary.

#### RULES FOR 3.5 MC. CONTESTS.

The general rules as set out apply, with the following additions :—

1. Points may be claimed for the reception of amateur signals from any part of the world, providing the station heard is outside the entrant's district or country as the case may be.

2. Scoring will be counted as follows :—

Between :	Points.
English Districts ...	1
Welsh Districts ...	1
Scottish Districts ...	1
England and Wales ...	2
England and Scotland ...	2
England and Channel Isles ...	2
England and Isle of Man ...	2
Wales and Scotland ...	2
Wales and Channel Isles ...	2
Wales and Isle of Man ...	1
Scotland and Channel Isles ...	2
Scotland and Isle of Man ...	1
Northern Ireland and Channel Isles ...	2
Northern Ireland and Isle of Man ...	1
I.F.S. and Channel Isles ...	2
I.F.S. and Isle of Man ...	1
Channel Isles and Isle of Man ...	2
England, Wales or Scotland and Northern Ireland or I.F.S. ...	2
British Isles and Europe ...	3
British Isles and North Africa ...	6
British Isles and North America ...	6
British Isles and rest of world ...	10



## RULES FOR 28 MC. CONTEST.

The general rules as set out apply, with the following additions:—

1. Points may be claimed for the reception of amateur signals from any part of the world, providing the station heard is outside the British Isles.
2. Scoring will be counted as follows:—

	Points
Europe ... ..	1
North Africa ... ..	2
Rest of Africa ... ..	5
North America ... ..	5
South America ... ..	7
Asia ... ..	7
Australasia ... ..	10

## FORM OF LOG TO BE USED IN ALL TESTS.

Name : Address :  
Call : Contest :  
Apparatus used :

Date.	G.M.T.	Station Heard.	R.	W.	T.	Remarks.	Points claimed.
.....	.....	.....	.....	.....	.....	.....	.....

## More 56 MC. Tests.

Further organised tests by the London districts took place on Sunday, October 23, when the following stations were heard to be on the air:—G6YK, G6XN, G5KH, G2NH, G6NF, G5SA, G5CV, G2DZ, G6QB, G5IS, G2OL.

A number of contacts were made. Logs and letters received are being circulated to those contributing. Further tests have now been arranged for Sunday, November 20, and stations participating—both transmitting and receiving—are requested to send their logs to G6UT, who will circulate them in budget form. Tests will start up at 09.000 G.M.T. and conclude at 21.00 G.M.T. Stations mentioned below should keep to schedule to enable listening stations to know definitely when to expect signals on the band. Free periods to be used for contacts.

G.M.T.	Station.	G.M.T.	Station.
09.00-09.10	G6YK	14.00-14.10	G6YK
09.10-09.20	G2NH	14.10-14.20	G2NH
09.20-09.30	G5SA	14.20-14.30	G5SA
09.30-09.40	G6CW	14.30-14.40	G6CW
09.40-09.50	G6QK	14.40-14.50	G6QK
09.50-10.00	G2OL	14.50-15.00	G2OL
10.00-10.30	Free period	15.00-16.00	Free period
10.30-10.40	G6NF	16.00-16.10	G6NF
10.40-10.50	G5CV	16.10-16.20	G5CV
10.50-11.00	G6LL	16.20-16.30	G6LL
11.00-11.10	G5IS	16.30-16.40	G5IS
11.10-11.20	G6XN	16.40-16.50	G6XN
11.20-11.30	G2DZ	16.50-17.00	G2DZ
11.30-12.00	Free period	17.00-18.00	Free period
12.00-12.10	G6QB	18.00-18.10	G6QB
12.10-12.20	G5KH	18.10-18.20	G5KH
12.20-14.00	Free period	18.20-21.00	Free period

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

VQ3MSM, W. G. Manson; UO3WB, W. Blaschek; OK2LO, Jiri Chlup; G2ZW, S. C. Parish; W3JR, H. P. Breitinger; VK2ZW, S. U. Grimmett; VS6AH, G. Merriman.

## NOTICE.

## H.Q. OFFICE HOURS AND OFFICERS' ADDRESSES.

In order to provide an additional service for members, arrangements have been made for the office to open at 9.30 a.m. instead of 10 a.m.

Office hours are from 9.30 a.m. to 6 p.m. on weekdays, and from 9.30 a.m. to 12 mid-day on Saturdays. The office is closed between 1 and 2 p.m. daily.

The honorary headquarters staff are seldom in attendance during the day, but can be reached by telephone at their home or office addresses. For the convenience of members, the following are the names, addresses and telephone numbers of the senior officers:—

*President and Editor (pro tem.):* Mr. H. BEVAN  
SWIFT, 45, Ena Road, Norbury, S.W.16.

*Telephones:* Home, Pollards 1639; Office, Temple Bar 1088.

*Acting Vice-President:* Mr. A. E. WATTS, 58, Woodside Avenue, Highgate, N.6.

*Telephones:* Home, Tudor 3970; Office, Clerk-enwall 1128.

*Hon. Treasurer:* Mr. E. DAWSON OSTERMEYER, 59, Gordon Road, South Woodford, E.18.

*Telephone:* Buckhurst 1942.

*Hon. Secretary:* Mr. JOHN CLARRICOATS, "Ciel," Hartland Road, Friern Barnet, N.11.

*Telephones:* Home, Finchley 3512; Office, Palmers Green 1101.

Members are requested to note the above information, and thus avoid disappointment when in London.

## No. 1 District Conventionette.

HELD IN LIVERPOOL ON OCTOBER 9, 1932.

On Saturday evening October 8, we decided to hold an informal meeting prior to the official Conventionette, and eighteen members turned up to enjoy the evening.

At the business meeting, G2RV was elected to the chair, and it was started promptly at 12.00 hrs. The chairman read the report on the activities of the District during the last twelve months, and followed by explaining the absence of any representative from H.Q. Then several telegrams and letters were read from members wishing the meeting success, including a message from "Iraq." The date of the next Conventionette was fixed for the last week-end in May, and the R.N.W.A.R. scheme was discussed freely. It was decided to devote Tuesday evenings to experiments in the 56 m.c. band.

The meeting closed and we adjourned for lunch, after which several toasts were proposed, including "The Visitors," by G2QB. Replies were given by G5VM and G2II in a very able manner.

The visit to the motor vessel *Worcestershire*, in Birkenhead, proved a very enjoyable and interesting outing. The ship's long and short-wave transmitters were explained in great detail by a member of the Marconi staff, by whose courtesy we were allowed to visit the ship's installation.

We returned to the hotel for tea, after which we separated into parties, for station visits. Seventeen members went to see G2RV and then on to G2OA; fifteen to G5WG; some to G6GL, and others elsewhere.

So ended what was acknowledged to be the best Conventionette ever held in No. 1 District.



## R.N.W.A.R. NOTES.

During the past month the second meeting of the London District was held at the Admiralty, when over forty members were present. Arrangements have been made to provide training on Monday and Wednesday evenings for members capable of sending and receiving Morse at 20 w.p.m., whilst Tuesday and Thursday evenings have been set aside for the training of members whose knowledge of Morse does not exceed 12 w.p.m. On Friday evenings a beginners' class is conducted.

The Handbook has now been issued, and final acceptances are being received at the Admiralty.

The response to the scheme has been very satisfactory, over 450 applications for details having been received.

The Whitehall transmitter, which will shortly be operating on 3,740 kc., will be crystal controlled, and will transmit practices to schedule.

Call signs will be issued almost immediately to licenced members of the Reserve. These call signs will, however, only be used on Reserve frequencies for Naval work.

Steps are being taken to provide, as a reduced cost, accurate crystals for use on these frequencies.

The next meeting of the London District (to which R.S.G.B. members are invited) is to be held at 7 p.m., on November 23, at the Admiralty (Room 60), Whitehall, S.W.1.

All correspondence in connection with the Reserve should be addressed to Commander L. Saunders, R.N., Secretary, R.N.W.A.R. Committee, Admiralty, Whitehall, S.W.1.

## Call Books and Hand Books.

Owing to the adverse rate of exchange, it has been necessary to increase the price of these books from 5s. 6d. to 6s. per copy.

The price to non-members becomes 6s. 6d. per copy.

Headquarters have about one dozen copies of the latest edition of the Handbook available, which will be sold at the old price, 5s. 6d. These were bought before the exchange rate changed in October.

Copies of the latest call book can now be obtained.

## Alterations to the Society's Articles of Association.

Report of the extraordinary general meeting held on Friday, October 21, 1932.

A large number of members, under the chairmanship of the President, attended to discuss the various alterations proposed upon the agenda which had been sent to all members qualified to vote.

The President requested the Secretary to read the notice convening the meeting, and then proceeded to explain why it had become necessary to effect the changes proposed. He explained that the Articles were framed in agreement with the Board of Trade, and pointed out that, whilst they were wholly operative in 1926, there were many clauses which have caused difficulties in recent years.

In the main, the Articles of Association have been brought up to date, whilst the principles remained

unchanged. Deletions had been made in connection with those paragraphs affecting the General Committee (which no longer exists), this Committee having been set up originally to take care of the interests of the 200 or more Broadcast Listeners' Societies who were then affiliated. The proposed alterations had been agreed by the Board of Trade; this has to be done always in the case of companies such as ours.

The President moved, and Mr. Geo. Thomas supported, that the special resolutions be approved.

Before taking the vote the President called for amendments.

Mr. Grisdale (G5GZ) moved that Article 48 should be amended to read, "The list must include at least two names of persons who have not served on the existing Council as either elected or co-opted members."

The amendment was supported by Mr. A. C. Oliver (BRS667). The amendment was defeated, seven members voting in favour and about 50 against.

The resolution was then put to the meeting and was carried by a large majority.

The President formally signed the resolution, which was handed to Mr. Arthur Watts for submission to the Board of Trade.

\* \* \*

Council are pleased to announce that at their meeting held on Wednesday, October 19, it was unanimously agreed to grant to their hon. secretary, Mr. J. Clarricoats (G6CL), the usual honorarium of fifty guineas in respect of the excellent work he had carried out upon behalf of the Society in respect of the past year. In making the announcement, the President was able to refer to the excellent progress made by the Society and the large increase of membership mainly due to the unceasing efforts of their hon. secretary.

It was also decided at the same meeting that as the secretarial work of the Society had now assumed such large proportions, and was likely to increase, the time had arrived when it was incumbent upon the Society to employ a permanent whole-time secretary. By making this move it was considered by Council that the interests of members could be much more fully covered and the services increased. We hope to make a further important announcement regarding this matter in our next issue.

## Eclipse of the Sun Reports.

We understand from Capt. A. M. Houston Fergus (G2ZC) that he is still receiving a large number of reports from overseas members. As most of these reports are of extreme interest, he is preparing a final report for publication in a future issue of THE BULLETIN.

## Calibration Service.

Members are notified that owing to the complete rebuilding of 2NM for the carrying out of important tests of national importance on frequencies outside the amateur bands, 2NM will be unable to transmit the 3.5 mc's calibrations services until further notice.



## QRA Section.

Manager: M. W. PILPEL (G6PP).

### NEW QRA's.

- G2FR.—L. FRYER, 2, Murray Villas, Heugh Road, Portpatrick, Wigtownshire.  
 G2LC.—A. WELCH, 19, Lincoln Gardens, The Drive, Ilford, Essex.  
 G2QJ.—This was erroneously printed as G2QC in the September list.  
 G5BS.—C. S. BRADLEY, 35, Amhurst Road, Hastings, Sussex.  
 G5RJ.—W. G. ROSE, 14, Park Way, Raynes Park, London, S.W.20.  
 G5UY.—D. B. FRY, 32, Parkhurst Road, Bexhill-on-Sea, Sussex.  
 G5ZF.—J. S. SOMERS, 16, Eldon Place, Woodhouse Lane, Leeds.  
 G6JQ.—W. W. STORER, "Sunia," Blanklyn Avenue, Leicester.  
 G6JZ.—C. FENTON, 18, Hill Top Road, Kells, Whitehaven, Cumberland.  
 G6OA.—F. E. ROGERS, 16, Silversea Drive, West-cliff-on-Sea, Essex.  
 G6OF.—M. SHAW, The Hollows, Marton Road, Bridlington, Yorks.  
 G6PO.—H. HILLGROVE, King Edward Cinema, Blackpool, Lancs.  
 G6VV.—J. A. MCKINNON, "Colaba," Randall Road, Chatham, Kent.  
 2ARV.—R. W. PEEL, 24, Temple Grove, Golders Green, London, N.W.11.  
 2AXA.—A. H. BRUCE, 15, Oldhill Street, London, N.16.  
 2AYJ.—P. J. MACFARLANE, 28, Meath Road, Ilford, Essex.  
 2BOU.—W. E. PAGE, 17, Green Lane, Letchworth, Herts.  
 2BVB.—R. V. ALLBRIGHT, 2, Palmyra Place, Newport, Mon.  
 2BYT.—B. J. BROWN, The Wick, Finghing Loe, near Colchester, Essex.

The following are cancelled:—2ABZ, 2BHH, 2BIT.

Please send all new QRA'S, changes of address, etc., to G6PP, 54, Purley Avenue, London, N.W.2. Telephone: Gladstone 1282. QRA'S, in order to be included in the following month's BULLETIN, must arrive not later than the 20th of the month.

### New Members.

#### HOME CORPORATES.

- R. J. PANKHURST (G5YF), 9, Shakespeare Road, Kettering, Northants.  
 M. E. TAPSON (G6IF), 115, Hadleigh Road, Leigh-on-Sea.  
 R. WALKER (G6QI), 18, Woodville Road, New Barnet, Herts.  
 R. TENNANT (G6OW), 65, Hillhead Street, Glasgow, W.2.  
 L. C. SNOWDEN (G6XP), Sandilands, Ashley Drive, Walton, Surrey.  
 J. J. DENTON (BRS973), 25, Lisburne Road, Hampstead, N.W.3.  
 J. G. BARTLETT (BRS974), 29, Gillespie Road, Highbury, N.5.  
 CAPT. G. ST. J. MARTIN (BRS975), "Claremont," Westville Road, Thames Ditton, Surrey.  
 W. C. FULFORD (BRS976), 290, Deansbrook Road, Edgware, Middlesex.  
 E. W. DEAN (BRS977), 1065, Burnley Road, Love-Clough, Rossendale, Lancs.  
 K. W. WOOD (BRS978), "Lulworth," West Side, Wandsworth Common, S.W.  
 I. C. I. LAMB (BRS979), 11, Duntrune Terrace, Broughty Ferry, Scotland.  
 DR. FRED CHAMIER (BRS980), Cecil Chambers, Strand, W.C.2.  
 E. J. SCUDDER (BRS981), Arethusa Bungalow, Church Alkham, near Dover.  
 F. C. BRIDGES (BRS982), 37, Lancaster Road, Southall, Middlesex.

- J. E. A. HUSCHMAN (BRS983), 16, Durham Place, Bonnyrigg, Scotland.  
 M. W. G. GRANT (BRS984), "Oban," 25, Castle Road, Kenilworth, Warwick.  
 A. C. V. MEADS (BRS985), 37, Bath Road, Bedford Park, W.4.  
 P. G. TOWNSEND (BRS986), 12, Pierrepont Road, Acton, W.3.  
 H. C. L. BURNETT (BRS987), 44, West Avenue, N.3.  
 A. RUSSELL (BRS988), 1, Orsett Road, Grays, Essex.  
 R. TENNANT (BRS989), 8, Filey Road, South Cliff, Scarborough.  
 G. A. MILES (BRS990), 40, Arthur Street, Well Street, Hackney, E.  
 F. J. U. RITSON (BRS991), Sele House, Hexham, Northumberland.  
 C. L. WRIGHT (BRS992), 27, Larch Street, Leicester.  
 F. H. COOPER (BRS993), Fairbank, Smeeth, Ashford, Kent.  
 A. W. ROBINSON (BRS994), 21, Estcourt Road, Watford, Herts.  
 G. E. BARROWS (BRS995), 44, Russell Road, Moseley, Birmingham.  
 H. W. YOUNG (BRS996), 4, Yorke Street, Milford Haven, Pem.  
 D. C. THURSTON (BRS997), 11, Electric Mansions, Electric Avenue, S.W.9.  
 R. W. PAGE (BRS998), 18, Shorncliffe Road, Folkestone, Kent.  
 M. V. LONGBOTTOM (BRS999), 10, Victoria Road, Waterloo, Liverpool.  
 L. G. BLUNDELL (BRS1000), 45, Monivea Road, Beckenham, Kent.  
 A. H. V. FREEMAN (BRS1001), 60, Highfield Road, Dartford, Kent.  
 A. W. GROVES (BRS1002), 290, Ashley Down Road, Bristol 7.  
 J. CRAWFORD (BRS1003), 129, Buccleuch Street, Glasgow.  
 P. D. BURR (BRS1004), 3, Westburn Drive, Aberdeen.  
 A. J. S. WILSON (BRS1005), 21, Courthouse Gardens, Finchley, N.12.  
 D. W. ALDOUS (BRS1006), 33, Shirley Terrace, Horns Road, Ilford.  
 DR. H. B. HOWELL (BRS1007), Tudor House, Tenby, South Wales.  
 E. B. W. FIDDIAN (BRS1008), 64, Heath Lane, Stourbridge, Worcs.  
 D. W. FRY (A), 26, Esmond Road, Bedford Park, W.4.  
 A. G. CORKE (A), 42, Croham Road, South Croydon, Surrey.

#### DOMINION AND FOREIGN.

- F. K. FLEEFELDT (DE1089), Ludwigslust (Meck), Germany.  
 D. JAVIER DE LA FUENTE (EAR18), Oficial de Telegrafos, Santander, Spain.  
 J. E. TOMPKINS (SU6SW), H.Q.M.E., R.A.F., Villa Victoria, Cairo.  
 N. THOMPSON (W3CPX), 715, 9th Avenue, Prospect Park, Pa., U.S.A.  
 M. MCKELVIE (ZL2CH), 344, Oriental Pole, Oriental Bay, Wellington, New Zealand.  
 G. H. SCARFE (ZU5D), c/o P.O. Box 49, Durban, South Africa.  
 E. W. BEDFORD (BERS142), Oonankande, Dolosbage, Ceylon.  
 S. P. O'ROURKE (BERS143), Muragalli Estate, Pollachi, South India.  
 A. D. TAYLOR (BERS144), The Armoury, Bhusawal (G.I.P. Railway), India.  
 W. J. SINNOTT (BERS145), Special Attached Section, Colaba, Bombay.  
 R. PATTERSON (BERS146), c/o Department, General Survey, Kaduna Junction, Northern Nigeria.  
 G. M. MANUELL (BERS147), R.F.A., "Olma," c/o G.P.O., London, E.C.1.  
 W. MUTTER (BERS148), c/o The Anglo-Burma Rice Co., Ltd., Post Box 1104, Rangoon, Burma.  
 E. G. B. ANNISS (BERS149), Mess 16, H.M.S. "Furious," c/o G.P.O., London, E.C.1.  
 R. H. SANBURY (BERS150), No. 5 (AC) Squadron, R.A.F., Quetta, India.  
 JOSEF REDLICH (FRS27), 26, Lambolle Road, N.W.3.

## APPARATUS REVIEWED.

Messrs. Varley send us details of their radio apparatus and components for the season. These include, besides their well-known lines, some new items such as wire-wound volume controls, oscillator, and intermediate frequency coils for superhets and a new pentode transformer with six ratios. There is also a new L.F. transformer known as the "Rectatone" designed for frequency compensation in L.F. amplifiers. A pentode output choke has also been introduced having an inductance of 45 henries at 40 m/a. The well-known Varley square peak tuner is now embodied in numerous sets, several of which, in attractive cabinets, were upon view at the recent exhibition at Olympia. The new wire-wound volume controls are interesting as the spindle has a threaded portion protruding at the back, so that it can be used for gauging. They are made in four values, i.e., 2,500, 5,000 and 10,000 ohms at 5s. 6d. each, and 50,000 ohms at 6s.



## CALLS HEARD.

By BERS120, at Ranikhet, U.P. India, between September 6 and 20:

g2ao, g2zq, g5yh, g6li, vk6ag, vp8ap, vulaa, yi6wg. At Calcutta, India, between October 1 and 15: vk2hw, vk3kr, vk3or, vk3wl, vk4gk, vk6cr, vk6fl, vk6gf, vs6ag, vu2kh, vu2lz, yi6wg, zcmz(?), zs2a, zs2d, zu5j, zu6w, 8ms, 9rm (Q.R.A. last two pse?).

By Jack T. Woodruff (W9PK), 7025, Yale Avenue, Chicago, Illinois. Heard between August 15 and October 11, 1932:

G2AK, G2MB, G2DZ, G2NH, G2ZQ, G5BJ, G5ML, G5SY, G6VP, G5YH, G6XB.

By V. J. Bartlett (2ANN), 11, The Circle, Tredegar, Mon., Sundays, August 21 to September 18 inclusive:

1.7 mc.: C.W., g2ak, g2ci, g2dw, g2gg, g2jg, g2mi, g2qi, g2ra, g2rj, g2zc, g5gy, g5iz, g5lo, g5mu, g5oq, g5pk, g5px, g5qy, g5rd, g5rx, g5uh, g5wb, g5wu, g5xb, g5xm, g6ai, g6bb, g6db, g6fo, g6gd, g6gu, g6gx, g6ik, g6nw, g6qc, g6rk, g6so, g6sy, g6vv, g6zr, g6zs.

Telephony: g2dq, g2dw, g2gg, g2ip, g2lz, g2qi, g5mu, g5pd, g5rd, g5sz, g5tq, g5uh, g6gu, g6gx, g6oi, g6pc, g6py, g6wf, g6zr.

By W. E. Lane (VQ4CRH), P.O. Box 570, Nairobi, K.C., July and August, 1932:

7 mc.: vk2nr, vk5ay, vq2xd, vq4crl, zelje, zeljm, zs5a, zt2l, zu5e, zu6w.

7 mc., Telephony: vq4crk, vq4kta, vq4nsa.

14 mc.: g2ak, g2dz, g2ii, g2nu, g2oa, g2op, g2ux, g2zq, g5bj, g5fv, g5ku, g5ms, g5nf, g5nu, g5pj, g5pl, g5pt, g5qs, g5sr, g5vl, g5vm, g5xa, g6cl, g6fn, g6gd, g6hf, g6py, g6vp, g6wy, g6xq, g6zr, gi5nj, sulaq, sulec, su6hl, vq4crl, yi2dc, yi6bz, zs6y, zilq.

By W9GFZ, 225, West Wesley Street, Wheaton, Ill.:—

August: g2ak, g2op, g2pd, g2zg, g2zq, g5bj, g5fv, g5og, g5qx, g5sy, g5tz, g5vl, g5wu, g5yh, g5yn, g6db, g6dc, g6gs, g6gz, g6hp, g6iz, g6ki, g6li, g6rb, g6vp, g6wy.

September: g2ao, g2by, g2di, g2dw, g2dz, g2ig, g2lw, g2nh, g2op, g2zq, g5bj, g5ku, g5ml, g5ms, g5pl, g5qx, g5sg, g5sg, g5sy, g5vb, g5vl, g5yh, g5yy, g6bb, g6ki, g6kq, g6qb, g6vb, g6vp, g6wk, g6wt, g6xb, g6xq, g6zs.

By BERS116, at various ports on the East Coast of Greece, September 12 to October 1 (via G5FN):

14 mc.: g2bi, g2dw, g2dz, g2ig, g2mi, g2nh, g2oa, g2vz, g2wn, g2xa, g2yx, g2zq, g5dm, g5fn, g5is, g5iu, g5ku, g5ml, g5oj, g5pl, g5pq, g5pz, g5tt, g5uc, g5ui, g6ae, g6bc, g6gd, g6nf, g6sy, g6up, g6us, g6wn, g6wy, g6zr, sulaa, sulec, sulcl, zs6y.

7 mc.: g2bj, g2zq, g5pq, g6wy, g6zr, sulaa, sulec.

## QSL Section.

It has been the practice of the Q.S.L. Section in the past to reprint, at this time of the year, the rules governing the use of the Section so that new members may take full advantage of the facilities the Society offers, with the minimum trouble to themselves, and, incidentally, to H.Q. The following information is therefore once again printed with the hope that it may assist members to make the fullest possible use of the Section.

J. D. C.

## THE QSL SECTION.

### AN EXPLANATION OF ITS FUNCTIONS AND USE.

The full use of the section is reserved exclusively for members of the R.S.G.B. and B.E.R.U., but non-members may, however, collect cards forwarded by foreign societies to R.S.G.B. which are intended for them.

The section gives to members a two-fold service. In the first place it collects and forwards to British amateurs cards which are received from the various Radio societies of the world, and secondly, it receives from members their cards for free distribution at home and abroad.

The methods of the section are best dealt with under separate headings, and are as follows:—

#### Cards for You.

These should be collected from the section by means of stamped addressed envelopes, and the following points should be noted:—

1. Envelopes must be stamped by the sender and clearly addressed.
2. The sender's call sign *must* be printed in block letters in the *top left-hand corner* of the envelope.
3. Envelopes must be of a standard size (6 in. by 4½ in.), or as near to these dimensions as possible. (Envelopes of the "paper bag" type and the commercial size cause the section much needless trouble and waste of time.)
4. If special instructions as to the number of cards to be sent in each envelope are to be given, they should be written immediately under the call sign in the top left-hand corner, and should be in the form "Wait for ..... cards." Envelopes are despatched where possible when there are three cards in the files for one call sign, and the above applies only if this arrangement is not convenient.

If it is not desired to go to the trouble of preparing envelopes for this purpose, it is possible to procure them from the section, already addressed and stamped to the value of 1½d., at a price of 2d. each envelope.

Your cards will be kept for three months if you have no envelopes at H.Q., and after this time they will be disposed of at the discretion of Council.

#### Cards from You.

The section is in a position to accept for distribution cards addressed to any amateur in the world, and a rapid exchange of QSL cards is maintained with foreign societies. These cards are sent in bulk at periods of a week or so, and it is, therefore, unnecessary to place each card in a separate envelope. The section would be grateful if the following points are borne in mind when cards are sent for distribution:—

1. Do not put any cards in envelopes, but sort the cards together in countries. (Photographs should be pasted to the back of the cards.)
2. Write the call sign of the station to whom the card is addressed clearly, and in large letters, so that it may be seen at a glance. If the space on the face of the card is insufficient or obscure, write it plainly on the back.

(Continued on page 150).



# Empire



# News.

## B.E.R.U. REPRESENTATIVES.

*Australia.*—H. R. Carter (VK2HC), Yarraman North, Quirindi, N.S.W.

*British West Indies, Bahamas, Bermuda, and British Guiana.*—H. B. Trasler, No. 2 Mess, Pointe à Pierre, Trinidad, B.W.I.

*Canada.*—C. J. Dawes (VE2BB), Main Street, St. Anne de Bellevue, Quebec.

*Ceylon and South India.*—G. Todd (VS7GT), District Engineers Bungalow, Nuwara Eliya, Ceylon.

*Channel Islands.*—H. J. Ahier (G5OU), Lansdowne House, 45a, Colomberie, St. Helier, Jersey, C.I.

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

*Hong Kong.*—P. J. O'Brien (VS6AE), 12, Kent Road, Kowloon Tong, Hong Kong.

*Iraq.*—H. W. Hamblin (YI6HT), Wireless Section, R.A.F., Shaibah, Basra, Iraq.

*South Rhodesia.*—S. Emptage (ZE1JG), Salcombe, Plumtree, Southern Rhodesia.

*Irish Free State.*—Col. M. J. C. Dennis (EI2B), Fortgranite, Baltinglass, Co. Wicklow.

*Kenya, Uganda and Tanganyika.*—H. W. Cox (VQ4CRF), Box 572, Nairobi, Kenya.

*Malaya.*—T. G. Laver (VS3AC), Government Electrical Power Station, Johore Bharu, Johore, Malaya.

*Newfoundland.*—Rev. W. P. Stoyles (VO8MC), Mount Cashel Home, St. John's East.

*New Zealand.*—D. W. Buchanan (ZL3AR), 74, Willis Street, Ashburton; and C. W. Parton (ZL3CP), 69, Hackthorne Road, Cashmere Hills, Christchurch.

*Nigeria.*—Capt. G. C. Wilmot (ZD2A), 1st Battalion Nigeria Regt., Kaduna, Nigeria.

*N. India and Burma.*—R. N. Fox (VU2DR), C/o VU2FX, Sgt. C. D. Connerton, Aircraft Park, Lahore Cantonments, Punjab, India.

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

## Australia.

Conditions on the 80-metre band have been pretty good lately. ZL, K6, and W 'phone signals best for some time. Some VK stations managed to QSO K6 and W on 'phone, but QRN getting too bad most nights now. Conditions on 7 mc. fair. Mostly W signals and a few OA's. Europeans have been heard in the early morning, EAR stations being the strongest. Conditions on 14 mc.'s, since the W sigs. faded out in August and September, very poor indeed.

Lately some Europeans, and a very few Asians can be worked.

Conditions on the 10-metre band *very* poor, and only a few on this band.

VK hams have been able to work on the 250-metre band, but this has been lately withdrawn.

## Egypt.

Conditions variable. The G fade out (20λ band) has changed from 22.00 G.M.T. on September 26 until as early as 16.30 G.M.T. on October 9, just 14 days. From the 9th to 17th a slight improvement shows G again coming in as late as 18.00 G.M.T.

SU1EC reports an exceptional QSO with G5IS on September 18, whose phone, using 15 watts input, was R8 at 100 per cent. perfect audibility on loudspeaker throughout QSO. Receiver—O.V.2

Western DX has been good, and W has been worked every evening between 16.00 and 17.30 G.M.T. from October 1 to 16.

SU6HL has been quiet during the last month, SU1AA and SU1EC being only active members.

## Canada.

The annual "wipe out" period, so troublesome during the winter months in this portion of the Empire on the 7 and 14 m.c. band, now shows signs of "lifting," with the result that reliable communications can now be effected with all Divisions. The 3.5 m.c. band is not affected to the same extent, and it is on this band that our keen hams are to be found.

Division 5 started a series of groups on similar lines to the Contact Bureau, they have been closely followed by Division 6, and I anticipate that most of the other Divisions will follow the example which will result in more serious experimental work being carried out by our members, especially on the higher frequencies.

DX conditions on 7 m.c. have recently improved, VK, VU and the VS6 stations (who were so hard to QSO during the B.E.R.U. Contest) are now coming in at good strength.

VE stations are the most difficult to work from South Africa, and if any of the Canadian hams would like to arrange skeds with South African and Rhodesian hams, I would suggest they make arrangements with the Editor of the BULLETIN for the times, dates and frequencies to be used, to be published at least say, six weeks before such skeds take place. Fully 75 per cent. of the B.E.R.U. members in this zone only want VE to obtain our W.B.E. certificates, and I presume the same will apply to the VE hams.

The formation of the R.N.W.A.R., on which H.Q. are to be heartily congratulated, shows that the British authorities are fully alive to the valuable assistance the amateurs would be to them in times of national emergency.



## New Zealand.

### RADIO EMERGENCY CORPS.

Communicated by J. B. ELLIOTT, (ZL3CC).

The Corps was founded by the New Zealand Association of Radio Transmitters, for the purpose of providing a readily organised means of communication to and from the scene of any tragedy or national calamity.

The inauguration of an Emergency Station at Napier at the time of the earthquake disaster last year demonstrated the effectiveness of such a system, and the necessity for a thoroughly organised scheme in New Zealand.

The suggestion that a Corps should be formed was first put forward by Mr. N. W. Laugeson, ZL3AS, Vice-President of N.Z.A.R.T. The proposal was taken up by headquarters in February last, and now the scheme has been organised throughout New Zealand.

The Post and Telegraph Department has granted a band of 100 to 105 metres, and has allotted call signs. The Corps is capable of establishing communication between any parts of the Dominion without delay.

Sections have been formed throughout the Dominion. Each section comprises at least twelve members, including the following officers:—Section leader, deputy section leader, equipment supervisor, assistant equipment supervisor, secretary-treasurer, and operators. Operators must be capable of operating at a speed of not less than 20 words per minute.

The organisation is under the command of Commanding Officer Mr. W. G. Ashbridge (ZL2GP), of Wellington.

Each section will provide mobile transmitting and receiving stations, with trained operators, ready to function at a moment's notice.

The apparatus consists in each section of two complete portable stations, one station called outpost station, and the other a zone station. The outpost station is a light portable set, capable of being transported by one man. The zone station is a transportable outfit of higher power.

In the event of emergency, the outpost station will be taken as near as possible to the scene of emergency. The zone station would act as intermediary between the outpost and the base stations.

The organisation of the Corps is well in hand. Sections are obtaining the co-operation of all utilities and public bodies.

Field days to test the apparatus have been held, and have proved most successful.

## Northern India and Burma.

*September.*—Conditions are improving rapidly, both on 14 and 7 mc. Europe and Australasia are coming in on 7 mc., while England is well received on 14 mc. in the Hills. VU2MN wants to know if EAR96 is a night watchman, he often hears him at 07.30 I.S.T. on 7 mc.!

VU2AH would be pleased to hear from Mr. Cherry, about whose new Q.R.A. several enquiries have been received, and also from any of the XZN gang, especially anyone calling at Karachi.

## Ceylon and South India.

By VS7GT.

*August-September.*—Conditions for the earlier part of the period July-August continued poor on all bands. Improvement, however, is now showing on 7 mc.

VU2JP's report confirms the above, and also states that after full-moon, and during the eclipse, conditions on 7 mc. and 14 mc. were very good indeed.

BERS106 reports distinct signs of activity on 28 mc. and 14 mc.

We welcome VS7RD, Mr. Dashwood, of Nanu Oya, to the active ranks as our latest recruit to amateur radio and B.E.R.U. Mr. Dashwood will shortly be active on 7 mc. with a low-power crystal oscillator, and he would appreciate reports on his signals.

VS7AL is QRT temporarily, owing to a generator failure.

VS7GT is still using low power on 7 mc., but hopes to resume communication with old friends on 14 mc. this month, when a long-delayed transformer is expected.

## South Africa.

Last month local conditions have improved considerably and DX on 7 mc. is now coming in well. Severe local QRM exists from the increased number of 'phone stations on the 7 mc. band. Arrangements are in hand for members of the S.A.R. League to stand by for the "Fairey Monoplane Flight" early next month, which we all hope will be successful. A number of hams have intimated their intention to participate in the 28 mc. tests in December. Several commercials have made their appearance on the 7 mc. band, and we are hoping that before these notes appear in print these will be eradicated and the band kept entirely for amateurs.

## Iraq.

By YI6KR (via G6WN).

*October.*—YI6KR leaves Iraq for Egypt at the end of October, and hopes to start work again with complete new outfit as SU6KR before the end of the year.

The stations at Mosul are being taken over by two new operators under call YI2FY. YI6KR would like to thank all stations for co-operation during the past.

Conditions on 7 and 14 mc. have much improved, although both are subject to heavy fading. We are losing YI2FU, who is going to India. YI2DC is now at Muscat, and is using XYI2DC.

## Channel Islands.

*From G5OU, Jersey.*—G2ZC is now active on 1.75, 3.5, and 7 mc. bands, but finds conditions bad on the latter frequency. He mentions that G6YU could only hear one G station during the Lunar eclipse. (G5OU). This is rather curious, as I worked both North of England G's and also Scottish "hams." "ZC" will be very pleased to have a call or report if heard on any of the above mentioned frequencies.



[illegible]



# NOTES and NEWS



# BRITISH ISLES

## DISTRICT REPRESENTATIVES.

### DISTRICT 1 (North-Western).

(Cumberland, Westmorland, Cheshire, Lancashire.)  
MR. S. HIGSON (G2RV), "Hebblecroft," Egremont Promenade,  
Wallasey, Cheshire.

### DISTRICT 2 (North-Eastern).

(West Riding, Durham, Northumberland.)  
MR. L. W. PARRY (G6PY), 13, Huddersfield Road, Barnsley,  
Yorks.

### DISTRICT 3 (West Midlands).

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

### DISTRICT 4 (East Midlands).

(Derby, Leicester, Northants, Notts.)  
MR. H. B. OLD (G2VQ), 3, St. Jude's Avenue, Mapperley,  
Nottingham.

### DISTRICT 5 (Western).

(Hereford, Oxford, Wiltshire, Gloucester.)  
CAPT. G. C. PRICE (G2OP), 2, St. Anne's Villas, Hewlett Road,  
Cheltenham, Glos.

### DISTRICT 6 (South-Western).

(Cornwall, Devon, Dorset, Somerset.)  
MR. H. A. BARTLETT (G5QA), "Donbar," Birchy Barton Road,  
Exeter, Devon.

### DISTRICT 7 (Southern).

(Berkshire, Hampshire, Surrey.)  
MR. E. A. DEDMAN, 63a, Kingston Road, New Malden, Surrey.

### DISTRICT 8 (Eastern).

(Cambridge, Huntingdon, Norfolk, Suffolk.)  
MR. S. TOWNSEND (G2CJ), 115, Earlham Road, Norwich.

### DISTRICT 9 (Home Counties).

(Bedfordshire, Hertfordshire, Essex, Buckinghamshire.)  
MR. F. L. STOLLERY (G5QV), "Kingsmead," Lancaster Gardens  
East, Clacton-on-Sea, Essex.

### DISTRICT 10 (South Wales and Monmouth).

(Monmouth, Glamorgan, Breconshire, Carmarthen, Cardigan,  
Pembroke.)  
MR. A. J. E. FORSYTH (G6FO), "St. Aubyns," Gold Tops  
Newport Mon.

### DISTRICT 11 (North Wales).

(Anglesey, Carnarvon, Denbighshire, Flintshire, Merioneth,  
Montgomery, Radnorshire.)  
[To be appointed.]

### DISTRICT 12 (London North).

MR. S. BUCKINGHAM (G5QF), 19, Oakleigh Road, Whetstone,  
N.20.

### DISTRICT 13 (London South).

MR. A. D. GAY (G6NF), 49, Thornlaw Road, West Norwood,  
S.E.27.

### DISTRICT 14 (London East).

MR. T. A. ST. JOHNSTON (G6UT), 28, Douglas Road,  
Chingford, E.4.

### DISTRICT 15 (London West and Middlesex).

MR. H. V. WILKINS (G6WN), 81, Studland Road, Hanwell,  
W.7.

### DISTRICT 16 (South-Eastern).

(Kent and Sussex.)  
MR. H. A. M. WHYTE (G6WY), Killiney, Worsley Bridge Road,  
Beckenham, Kent.

### DISTRICT 17 (Mid East).

(Rutland, Lincoln and E. Riding.)  
MR. A. E. LIVESEY (G6LI), Stourton Hall, Horncastle, Lincs.

### SCOTLAND.

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

### NORTHERN IRELAND.

MR. C. MORTON, (G15MO), 27, Bristol Avenue, Belfast.

District Notes for publication should be written as concisely as possible and should be in the Editor's hands by the 25th of the month preceding publication. They should be of a general rather than personal nature. Individual reports from County Representatives will not be accepted for publication.

### DISTRICT 1 (North-Western).

Five-metre fever has overtaken the Liverpool and Manchester areas! Following my request at the Conventionette that as many as possible should try this band and form a chain around the District, the interest and activity is very encouraging. G5WQ and G2OA lay claim to the first five-metre contact between Lancs. and Cheshire. G5CN has also been heard, over a distance of five miles on phone. The merits of this band was practically the sole topic of discussion at the meeting in Liverpool, and was the most interesting of all held.

A very long list of activity comes from Lancashire. Most members seem to be trying five metres while keeping an eye on the other bands and looking for DX. G2OI tells me that he can QSY to any band in six seconds! Sorry I cannot mention all those who are active, but it is encouraging to feel that so many are hard at work. A welcome is extended to G5YD, who is coming back after a long sojourn.

Trouble overtook many on their way home after the Conventionette. The Manchester lads who came by car struck a long stretch of fog, and arrived at their respective homes about 3.30 a.m. G2OI

could not get home, and had to stay the night with G6AX! The Birmingham lads arrived in Brum at 10.45. (Who said a four-cylinder Chrysler would not go with six up?) They left Birkenhead Town Hall at 8 p.m.!

Finally, I should like to express a word of thanks to all those who came along to the Conventionette and made it an outstanding success.

### DISTRICT 2 (North-Eastern).

The actual reports to hand this month are very few. I would like to point out that reports should be sent to the C.R.'s, viz.: Yorkshire, G5TQ, 32, Grange Road, Cleckheaton; Northumberland and Durham, G2AW, 5, Benson Street, Norton, Stockton-on-Tees.

The Leeds stations are active on 160 and 80.

Q6BX QSO with French stations on 160. The following stations are active: G6NP, 5IZ, 5ZI, 5YV, 5HB, 6DB, 6KU.

Sheffield.—A meeting was held on October 18, at the Angel Hotel, but was poorly supported, only seven being present, the usual rag-chew took place. G5NP is very busy working VK stations on 14 mc. round about mid-day each day. Conditions on this band appear to be good for DX about this



time. G6UF has got going again, and reports will be welcomed.

G6SK reports very fine business with a new receiver, S.G.-S.G. Det.-L.F.-pen. output, amazingly sensitive. ZL heard every morning on 7 mc., and VK, W, K, PY, RY and CM in the evening. Conditions have been excellent this month for DX, VK, ZL, WI, 2, 3, 4, 8, K4, CM, have been worked on 7 mc. The transmitter here is a CC TPTG P.A. A "Windom" aerial has been found to be the best.

G6WD again active, CC. G2JP has rebuilt a large transmitter (measures 2 metres long approximately), and has a fine note with 150 watts input.

2BAF has applied for a full ticket. In the meantime he is comparing results between a Hartley Tx and a TPTG PP.

#### DISTRICT 4 (East Midlands).

*Leicester.*—I have only received four reports again this month, and may I once again remind the members in this country to let me have a report by the 15th of each month, giving me details of their activities.

G6GF reports having done little work in radio during the past month owing to business QRM. He is at present building new RX, using S.G. untuned S.G., tuned detector and two L.F. stages with ganged tuning. (What about an article for the BULLETIN, OM.CR.)

G5VH reports activity nil on the short waves owing to business QRM and time spent rebuilding the BCL set.

BRS884 reports being active on all bands, and notices improving conditions on 14 mc. Is on sked with EARTBO, who is working phone on the 7 mc. band with 100 watt input.

BRS683 is busy studying for exams., and has not been active on radio for some time.

BRS992, a new member, reports being active on all bands. Welcome OM.

G6JQ is active on 7 mc., and has been testing phone. Has a sked with G6SR, but owing to conditions, has only kept it once.

#### DISTRICT 5 (Western).

An additional field day was held on October 16, and the hidden transmitter of G5HC was located near Tyndales monument. The first man home was G5JU, of Bristol, followed by BRS479 and 2ASX, both of Gloucester. About three dozen sat down to tea afterwards at the Falcon Hotel, Wotton-under-Edge, after which a good rag chew took place. The field days have been an unqualified success, and we have been particularly fortunate in having excellent weather for all of them.

The first meeting of the new year was held at Bristol on October 6, when there were about fifty present. It was suggested that a new Society should be formed, called BATS (Bristol Amateur Transmitters' Society), a particularly suitable name, in view of the amount of night work put in. An endeavour is being made to find a permanent QRA for the proposed Society in the form of their own premises, where, in addition to a club room, accommodation may be found for a library, workshop, experimental room, etc.

This month is the first birthday of the Wilts. letter budget, and a jolly good show it has been. The C.R. is to be congratulated on it.

There is no report from Oxfordshire this month

(will the C.R. please note), but I believe things are going quite well in that direction.

The District in general seems to be planning an attack on 56 mc., and I think that before long there will be great activity on this band.

#### DISTRICT 6 (South-Western).

The first round of the letter budget has taken place, and the results are really very gratifying. Due acknowledgment must be made to the London district for the idea of the budget in book form, with the left-hand pages left blank for comments. I would, however, stress the point that only those who contribute to the budget will receive it. One of the most astonishing things that has arisen out of the first round of the budget is the fact that there are only two members in this District who strongly support the S.G. valve as detector, all the others are in favour of triodes. Only one member thinks that an H.F. stage (tuned or otherwise) is any good below 25 metres. G5YB, of Plymouth, is using a TPTG, governed by xtal, with seven watts, and claims that this method of getting out is the best. His list of DX worked is certainly a proof of the theories. 6RP, of Tiverton, is having some bother with a good aerial system in a limited space, and would welcome any suggestions from other Hams who have got over the difficulty of a small garden, but, nevertheless, erecting an efficient aerial. Contributions to the letter budget also indicate that nearly everyone favours a 7 mc. xtal, and doubling once to 14 mc., rather than a 3.5 xtal and doubling twice. DX conditions for the month have been very patchy, and the best time for doing anything at all is between 17.00 and 19.00 G.M.T., although several VK stations are heard between 13.00 and 14.30 G.M.T. (This is, of course, on the 14 mc. band.) 5VL has worked all countries and districts in the North American continent except VE4, and 5SY has done the same with the exception of W7. Stations active are the following: 6KY, 5SY, 5QA, 6RP, 5WY, 5VL, 6XB, 5YB, 5QS, 2FN, 2ZP (whom I was delighted to see last Sunday). 6WS, BRS836. Once more may I say that my QRA is easily located, and a hearty invitation is extended to all Hams who may journey through Exeter. As Exeter is entered from the Honiton direction, turn sharp right up over the hill. The QRA is about 400 yards off the main London road. Visits this month have included 2ZP, 5SY, and the locals, 5WY and 5QS. The rest of you are only too welcome.

#### DISTRICT 7 (South-Eastern).

Activity in the area continues at a high level, although the last monthly area meeting, held at G5XH, at Croydon, was poorly attended, but this was probably due to the inclement weather. Will members please note that the December meeting will be held on Sunday, December 4, at G2NH's QRA, to commence at 14.30 G.M.T. sharp. As you will see from the notice on another page in THE BULLETIN, the Annual Conventionette for our area will be held at Southsea, and not at Tunbridge Wells, as previously arranged. No. 16 District Conventionette, at Tunbridge Wells, remains as arranged, of course.

Many stations in the area are rebuilding, probably as a result of the summer inter-station visiting which has been much more fully supported this year than ever before.



The October letter budget is full of interest, and those not contributing do not realise what information they are missing. The following contribute this month: G2DC, G6VP, G6GZ, G2DZ, G2GG, G2BI, G5JZ, G5UY, G6NZ, G6BU, G5RS, G2NH, BRS911, BRS343. G6NZ will be glad of skeds on 1.7 mc.

It is hoped to hold a mid-monthly meeting during the winter months at a Cafe in Guildford, at 20.00 G.M.T., on a weekday evening, and this subject will be fully discussed at the December meeting. If you cannot attend this meeting, and have any views on the mid-monthly meeting scheme, please get in touch with your CR at once.

#### DISTRICT 8 (Eastern).

No notes have been written for the last two months as there has been nothing of interest to report. Things seem rather quiet here, in general, but, wonderful to relate, Norfolk has been stricken with 56 m.c. fever! We hope that the interest will be prolonged for many months.

BRS785 is experimenting with automatic volume controls. He would like to hear from anyone using this system on short-waves, as he has experienced difficulties.

Several members from this district attended Convention. They wish to thank headquarters and the London gang for the highly enjoyable programme provided for them.

#### DISTRICT 9 (Home Counties).

The 1.7 mc. band is very popular in Essex, and most excellent work proceeds. When one compares the present quality of phone transmissions with those of three years ago, they show a considerable improvement, and it is doubtful if the quality of most stations in this country can be further improved. Their tests are often picked up in Lancashire. Our good friend across the estuary, G6PA, has been of great service to many in his untiring work of calibrating our numerous transmissions, and the present absence of anything approaching bad QRM is greatly due to his kindly help. There are very few reports this month, however, the D.R. makes personal calls on some scattered stations to keep in touch. BRS 891 (Sible Hedingham) and G5FB have recently been visited. G2WG is now on AC, and has been working duplex phone with G2LZ. G2HJ is rebuilding. G2QJ is inactive *pro tem*. BRS490 reported in person to CR, and we welcome a new member in BRS949. G6IH, G2KT, G6KV, G5VS, G2DQ, G2AF and all active.

#### DISTRICT 10 (South Wales and Monmouth).

The first meeting of the season was held at the Cardiff Technical College on Thursday, October 6, when the following were present:—G2PA, G5NS, G5WU, G6FO, G6PF, 2ANN, 2BNP, 2BRA, BRS727, and Mr. Bartlett.

The business discussed was principally with regard to the question of future meetings, as the Cardiff centre has been found inconvenient in many ways. It was finally decided to arrange them in Newport and Cardiff alternately and at a more congenial rendezvous.

The Letter Budget is in circulation again, and it is hoped to maintain it with at least ten regular contributions. Will all members note that the last day to receive letters for the Budget is the last day in

each month? The simplest possible date to memorise.

There are a number of stations active again, and G5FI has had considerable success on 7 mc. with a C.C. outfit, while G5WU is endeavouring to apply his 460 v. D.C. supply to his 1.75 mc. TX. This is not as easy as it sounds, owing to the alleged DC being 50 per cent. AC. The question really is whether it is to be treated as AC or DC. 2BRA, who gained a Certificate of Merit in connection with the last 1.75 mc. Tests, is now listening on the 56 and 28 mc. bands with a new RX, while G2PA puts out an occasional signal on 1.75 mc. after a long absence due to rebuilding. BRS766 becomes 2BNP, giving us a third AA man in Newport. At the time of writing this, 2ANN has not yet had his two-letter call. G5KK pounds brass on 20 m., having exhausted 7 mc.

So far as is known, no member in this District has yet shown any active interest in the R.N.W.A.R. I should be pleased to hear from anyone who has any ideas on the subject.

I regret to have to report that G6GW, C.R. for Monmouthshire, is finding it increasingly difficult to find any time to devote to R.S.G.B. affairs owing to business pre-occupations. He accordingly asks to be released from his obligations in that respect, and I should therefore be glad if someone would make a nomination for C.R. in his place.

#### DISTRICT 12 (London North).

All except the 7 mc. Morse, tests in this district have been discontinued owing to lack of support from the BRS stations. The 7 mc. is being carried on still by G5SL, who has about twenty enthusiasts who live within a radius of about six miles, some of whom are not members of R.S.G.B.

Three monthly meetings have been arranged as follows:—

November 19, 1932, at 19.30 G.M.T., E. R. Radford, G2IM, 33, Whitehall Park, London, N.19.

December 17, 1932, at 19.30 G.M.T., H. A. Clark, G6OT, 119, Wynchgate, London, N.14.

January 28, 1933, at 19.30 G.M.T., G. Bloomfield, 2ASG, 27, Belmont Avenue, London, N.17.

Will everyone attending these meetings please write and let them know a few days beforehand.

#### DISTRICT 13 (London South).

A contingent of South London amateurs recently visited the Rugby G.P.O. station. Our thanks are heartily given to G6WN, G5VM, and all others concerned, for the arrangements and most interesting visit.

Will BRS members in this district please communicate with the writer if they wish any tests arranged for their benefit. We are particularly anxious to be of the greatest possible assistance to them, and whilst individual communications would necessitate the employment of a secretary, your suggestions would be carefully considered and made use of via these columns. If every BRS member would furnish particulars of his line of interest, we might be able to make some arrangements for the future. A stamped addressed envelope will ensure a reply to any questions.

BRS677, Mr. W. B. Brown, of 137, Brixton Hill, S.W.2, has agreed to run a letter budget for BRS members. Our normal circular letter is still full up, so will those who want to contribute to the new one please write to BRS 677.



Activity on 56 mc. still continues strongly in the district, G2GF, G5AW, G5IS, G5KH, G6QB and G6NF are frequently to be heard operating in this band. G6NF is very busy on experimental work in connection with calibration, and unable to devote much time to any of the other bands.

#### DISTRICT 14 (London, East).

The last monthly meeting, held at Chingford, was very well attended, and members present welcomed the presence of our Hon. Secretary, who made one of his characteristic speeches, specially appealing to all to still further increase the membership of London's smallest—but most enthusiastic, district. The following changes were noted: 2BXO is now G6QK. Congratulations, Om's. The District are G6QK; BRS839 is now 2BKK, and BRS817 is 2AOA. Congratulations, Oms. The District are organising another field day, and the tentative dates are November 26, 27; further details will be announced at the next meeting, to be held on Tuesday, November 22, at the QRA of G6LL, J. W. Matthews, 178, Evering Road, Clapton, E.5, and at this meeting will be shown a cinematograph film illustrating the District's activities.

#### DISTRICT 15 (London West and Middlesex).

Twelve members, including several new, attended the last area meeting. The next is fixed for Wednesday, November 23, at G5CV's, 45, Fairfax Road, Bedford Park. Nearest station, Turnham Green; time, 7.30 p.m.

Under the new constitution, reports for the letter budget will be collected by my brother, who will compile a short report for THE BULLETIN from them, and pass the letters on to G6YK, who has undertaken to run the budget. I hope you will all support this scheme and help to make it one of the finest in the country. Reports should reach my address by the 20th of the month.

This month reports have come in from G2BY, G5CV, G5PQ, G6RS, G6VP, 2BXM and BRS642. All show considerable interest, and some contain good lists of DX, worked or heard on both 7 and 14 mc. G2BY seems to be the only one complaining of the lack of DX, but I think this is due to his location, as here plenty has been worked on both the popular bands.

#### DISTRICT 16 (South-Eastern).

As no reports have been received from either G2IG or G5JZ, I am having to find one from the Budget. Both Kent and Sussex, as far as G5JZ is concerned, have gone 100 per cent. on to 56 mc., and quite a number of stations are working there exclusively. Any tests that other groups would like to arrange with District 16, please communicate direct with G2IG, who will be very pleased to go up on the Kentish Hills, and G5JZ on the Sussex Downs, and have a field day. DX conditions are very good just now on 7 mc., and several Kent stations are getting ready for winter work on 3.5 mc. G2IG is looking after the Budget very well, and I am appealing to *all* new members in this District (Kent and Sussex) to write to G2IG, and ask him all about the Budget, and what a good thing it is to subscribe to. This appeal is directed more especially to BRS and AA men, who will pick up many useful hints in the arguments that are current every month. The outstanding work in Kent was done by G5OQ, who,

when working G6ND, reduced plate voltage to 8 volts, and was still readable.

#### DISTRICT 17 (Mid. Eastern)

(*East Riding of Yorkshire.*)—A Sub-Area Meeting was held at G6OO on October 6, and another at BRS738, on October 22.

The second Area Field Day was observed on Sunday, October 9, and the transmitter, manned by 6UJ, 6WP and 5VO, using the latter's portable call-sign, G6IC, located at Skirlington, ten miles from Bridlington, was tracked by three parties:—(1) G6OO and son; (2) G2QO, G5KD, G6OS and G2FS; (3) G5FV, BRS's 738, 859 and 967.

Party No. 2 located the transmitter after several hours. Weak signals being received made the task most difficult. Party (1) heard signals (*only*) once. Party (3) heard *no signals at all*!

G5VO and G6OO are still conducting satisfactory 56 mc. experiments.

We welcome to the voices and hunters of the ether, G6OF, G6OS, G6OY, BRS966 and BRS967.

G2UG and G6XC have left their QRA's, but we hope that they are still within the Area.

(*Lincolnshire.*)—I am sorry to hear that G6HK has been obliged to relinquish his office of County Representative on account of business pressure.

G2VH has left the Area for good. His active influence in the Grimsby Area will be greatly missed.

Stations known to be active are: G5LQ, G5CY and G5GS. G6LI is active on five bands.

(*Rutland.*)—I am pleased to announce that G6NO hopes shortly to recommence activity.

GENERAL NOTES.—Both in Lincolnshire and Yorkshire, 28 mc. is quite "dead." Numbers of contacts with VK are being made on 7 and 14 mc., on which latter band conditions are very good.

I shall be pleased to have the calls of those participating in the forthcoming 28 and 1.75 mc. tests. G6LI intends to compete in both of these.

### SCOTTISH NOTES.

Owing to lack of space, that portion of Scottish notes relative to new crystals was omitted from the September BULLETIN, and is consequently given hereunder for your information. The following new crystals are now in use:—G5ZX, 7,064 kc.; G6GQ, 7,145 kc.; G5YG, 7,155 kc.; G6FN, 1,853 kc.; G2FV, 3,562.4 kc.; 2BTT, 7,137 kc.; 2AWH, 7,182 kc.; 2BUT, 7,084 kc.; G6DU, 7,092 kc.; G5IM, 7,076 kc.; G6IB, 7,070 kc.; G6OW, 3,530 kc. and 1,783 kc.; 2ACG, 7,144 kc.; 2BDX, 7,117 kc.; G6ND, 7,074 kc.

#### CANCELLATIONS.

The 3,536 crystal recently transferred from G5XQ to 2BNU has been destroyed, and should therefore be deleted. G6MF 1,840 kc. crystal listed in October BULLETIN should be deleted and 1,887 kc. substituted.

There has been a good deal of movement during the September-October period. We have to chronicle with regret the loss to us of G5CL, who has gone south to Birmingham and will reside there permanently. A new station has started up in "A" district. The call is G6OW and the owner is Mr. J. Tennant, 65, Hillhead Street, Glasgow, W.2. Mr. Tennant, who is one of the earliest amateurs, returns to the key after 10 years' absence, and we wish him every success.



"C" District, owing to the fact that Mr. Sturrock desired to be relieved immediately, has appointed an interim District Officer in the person of 2BLJ, Mr. J. Hamilton, 10, Airlie Terrace, Dundee, to whom district communications should now be sent. Mr. Hamilton will serve until December 31, 1932, when the normal election of the 1933 representative will take place. This district held a very successful meeting recently at which it was decided, owing to the scattered membership, to hold three general meetings in Dundee during the season, with as many station visits as could be arranged in between. It was also decided to run a field day in the district, when the transmitting arrangements will be in the able hands of Mr. E. J. Allen (G5NW).

"B" District visited G5YG *en bloc* on Sunday, October 9, when opportunity was taken to discuss activities for the winter. This is going to be a "hot" district in the Society contests, and "C," "D" and "A" will require to look to their laurels.

"A" district is losing G5DK temporarily. Mr. Dykes leaves shortly for Manchester, where he will be residing for the next six months.

"D" district continues to hold its fortnightly meetings, which are being well attended, and a representative entry is anticipated for the various Society contests.

Five members have passed their G.P.O. Morse tests and await the issue of their call-signs. The call will be published next month.

In closing, may I say that G5YG is on 3,580 kc. each Saturday night (excluding dates of Society tests) from 22.00 G.M.T., and will be pleased to make contact with Scottish Stations.

## Strays.

Mr. T. N. Roe (G2VV) wishes us to draw attention to the fact that his QRA was incorrectly quoted in our last number. It should have been Farnham, Surrey. He hopes, however, to be shortly upon the air from a London address. He also wishes to apologise for his seeming neglect in returning QSL cards, due to business Q.R.M.

Mr. Dedman (G2NH) advises us that the above district will hold its Annual Conventionette at Southsea on June 24, 1933. It had originally been arranged that Districts 7 and 16 would amalgamate at the Tunbridge Wells Conventionette fixed for May 21.

## W.B.E. Certificates.

The following addition to the list published in the September issue should be made:—

ZUID, S. H. Walters.

## "T. & R. Bulletin."

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## Strays.

YI6WG will be listening for G stations on the 3.5 mc. band every week-end from 21.00 G.M.T. on Saturday.

Mr. A. E. Wood points out that his address was incorrectly given in our September issue. His correct QRA is 247, Leigham Court Road, Streatham, S.W.16.

G6NV, of 193, Brixton Road, S.W., would like reports on his transmissions on 7125 kc. between 6.0 to 8.0 and will acknowledge all reports.

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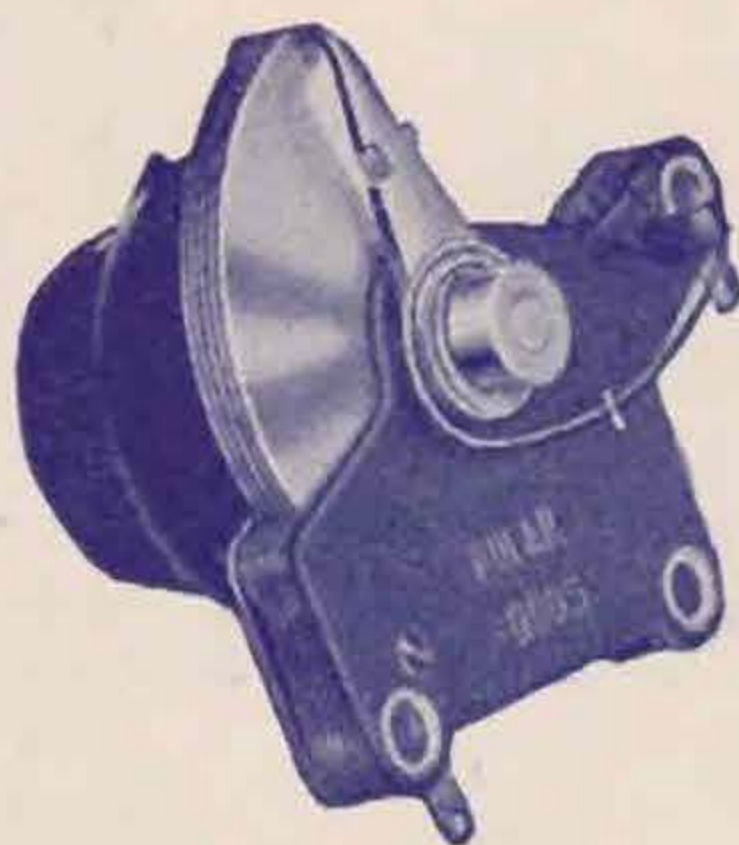


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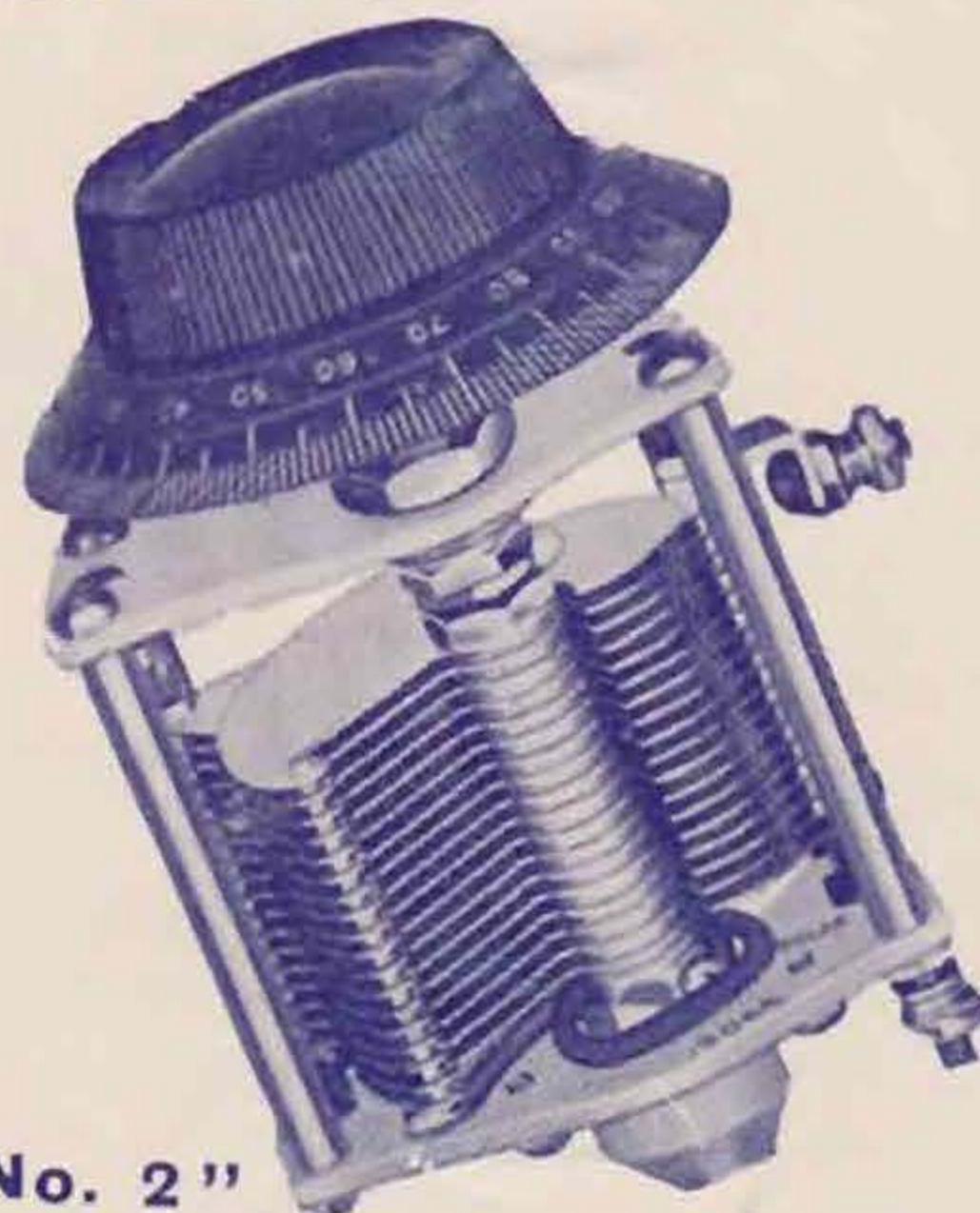
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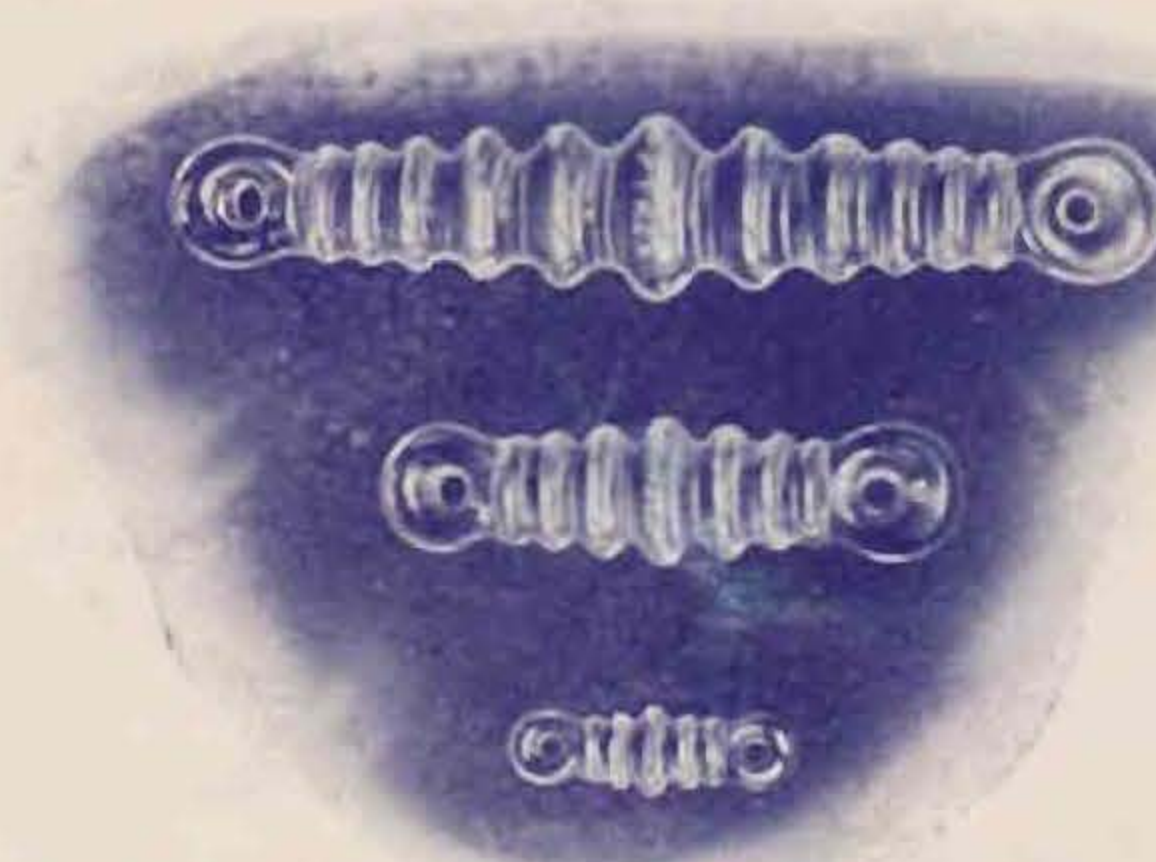
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