



# T. & R. Bulletin

Incorporating

The Journal of the Inc. Radio Society  
of Great Britain

(BRITISH EMPIRE RADIO UNION)



Vol. 4. No. 6. December, 1928 (Copyright)

Price 1/6

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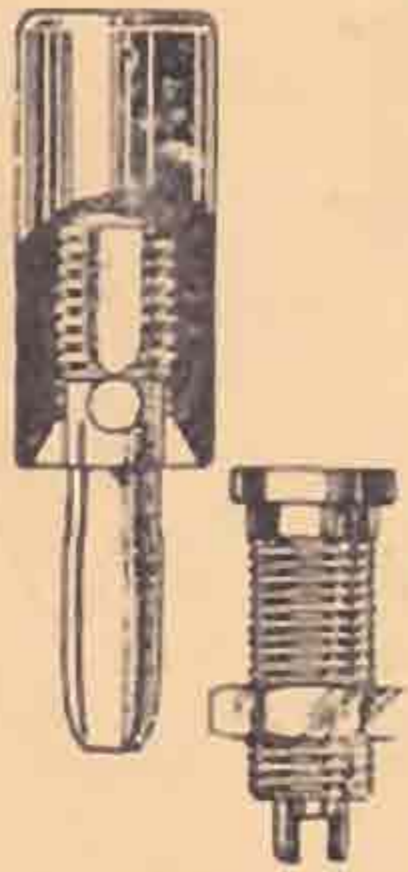
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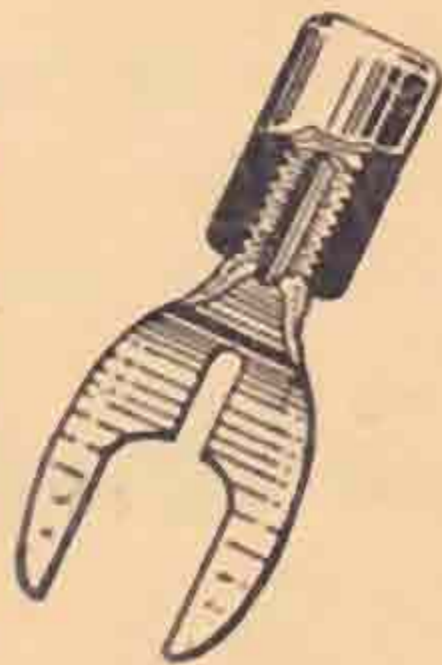
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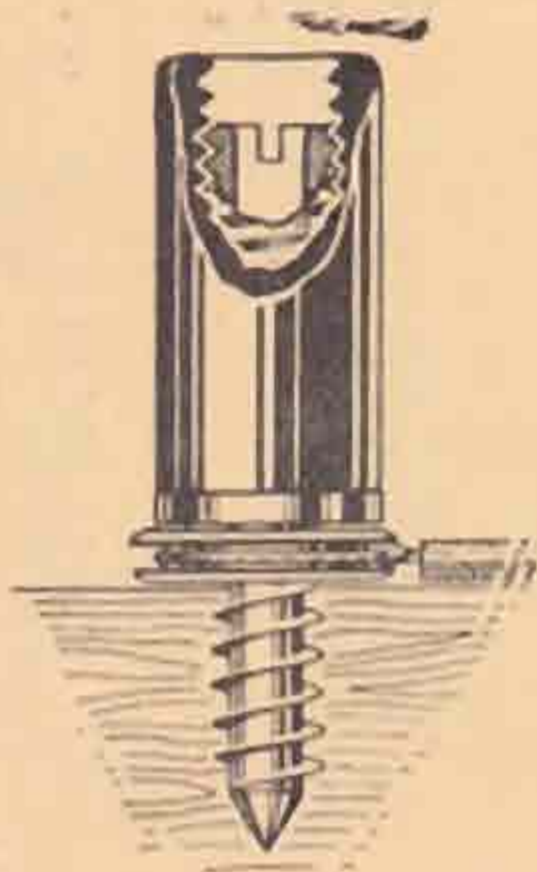
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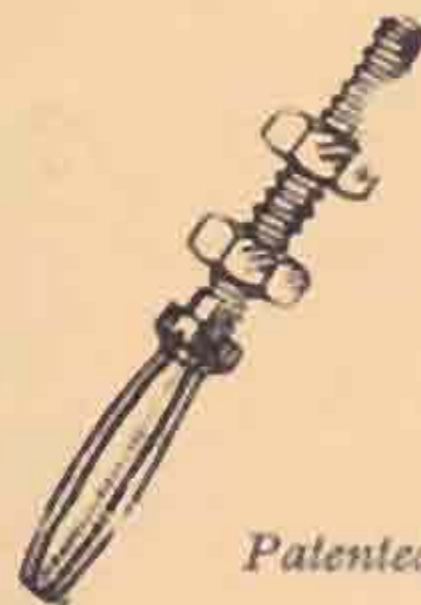
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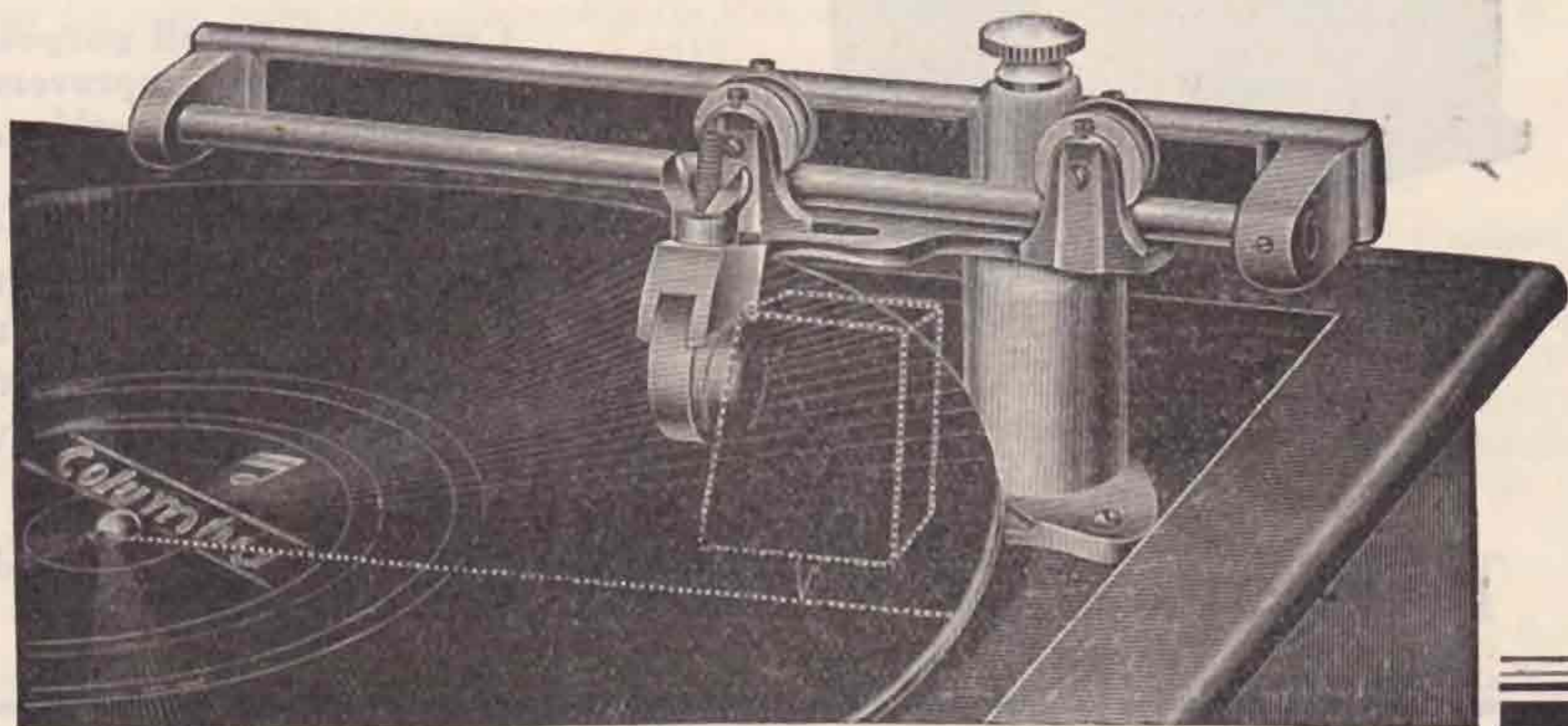
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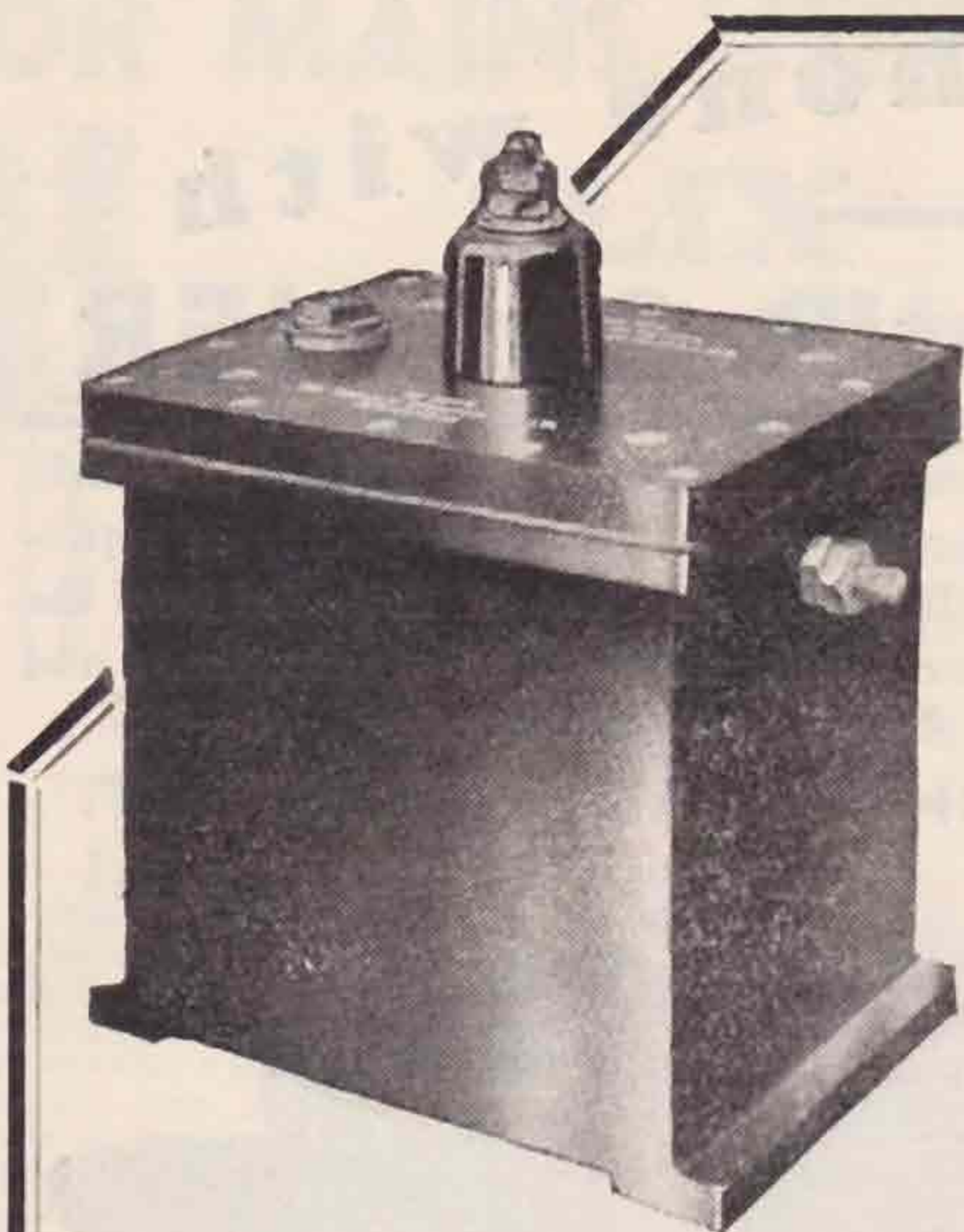
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# T&R

## BULLETIN.

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

*All correspondence and matter for publication to be addressed to the Hon. Secretary, 53, Victoria St., London, S.W.1.  
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DECEMBER, 1928.

Vol. 4. No. 6.

## SOCIETY NOTES

The B.C.L. next door! A number of letters received recently at headquarters indicate that some of our members are not conversant with some of the unwritten rules of our Society. Unwritten because they are not printed in any part of our constitution or bye-laws, although they actually, in fact, existed in the rules of the old T. & R. Section when it was an independent body. The principal one which we refer to is that all transmitting members are pledged to study their broadcast neighbours and to observe the closed houses until 11 p.m., unless they can transmit without causing interference. This rule has been strictly observed by all the older members, and as a consequence the amount of complaint has been extremely small.

\* \* \*

The above rule is simply applied. It means that any transmitter can work on short wave if he can make his transmissions so selective and free from key clicks that his radiations cannot be heard upon neighbouring broadcast receiving sets. Quite a number of amateurs have been able to accomplish this, and by carrying out tests at pre-determined times have proved the safety of their sets. Others, perhaps the majority, have wisely preferred not to risk the venture and have refrained from any transmission until 23.00. We have received assurance that no notice is taken of complaints received after this hour. It is, therefore, up to transmitters to study the selectivity of their transmission, particularly being careful with regard to key clicks.

Now for the reason of this precaution. If you study your licence you will see it stated that your station must not be used in such a manner as "to cause interference with other stations." Therefore you are legally entitled to transmit at all times. So says the Postmaster-General, but there is, however, a power stronger behind him whom we must all recognise, viz., public opinion. It must be remembered that all the transmitters in this country are a mere fraction compared to the vast thousands of broadcast listeners. Suppose, for instance, that only one transmitter refused to be reasonable or was so selfish that he persisted in transmitting to the annoyance of all the broadcast listeners in a neighbourhood. They might get together and raise such an outcry which might lead to the total extinction of all amateur transmitting facilities. In other words, the whole of the amateurs would suffer for the misdeeds of one.

\* \* \*

Now this Society has always, and always will, stand up for the just rights of the transmitter, and is proud of the fact that owing to the considerate action of all members, its relations with the authorities, the British Broadcasting Corporation, and with the general body of listeners is most satisfactory. A few isolated cases of complaints have arisen from time to time which have been easily dealt with. Most amateurs have, however, had complaints from neighbours direct who have considered that their reception has been interfered with. There is also a certain class of listener who is inclined to blame the amateur for



every atom of Morse interference they hear. An instance of this occurred to the writer some years ago. While sitting in his dining room one evening a gentleman called with the request that transmission would cease as it interfered with his reception. Upon being assured that no transmission was taking place, he invited me to come round to his house to hear myself. Arriving there I was able to take down some maritime messages from G.N.F., much to his chagrin. I thereupon advised him to refer his complaint to the Admiralty.

\* \* \*

Of course another trouble is the general condition of the average broadcast receiving set. Many are still in use which are equipped with a single inductance coil and coupled reactance in the plate circuit of the detector valve. We encountered one of these the other day while making an evening call. It was grinding out the 2LO programme with a good healthy backwash of 5GB behind it, coupled with sundry bursts of Toulouse, Hamburg and FFB. The owner explained what he had paid for the set and seemed satisfied. When asked how he was going to get on when the alternative programmes came in, he appeared overjoyed in the fact that he would hear two programmes at once and would therefore get double value for his money. It is from such sets that complaints arise. Fortunately, the modern up-to-date broadcast receiving set, with its screened grid high frequency stages, its avoidance of reaction and its loosely coupled tuning arrangements, so ably described by such journals as the "Wireless World," is doing much for selectivity and, incidentally, benefiting the transmitting amateur.

\* \* \*

Quite a number of transmitters have actually converted their neighbours' sets to loose coupling or shown the owners how to carry it into effect. Much good work can be done in this way, and broadcast listeners always appear ready to take the advice of a transmitting amateur when given in a friendly and helpful manner. Most B.C.L.'s put up aerials far too long, often over the limit laid down in their licence, in the vain belief that they will get better results thereby. These are the people who complain that they cannot cut out the local station to receive foreigners and spend their time constructing wave traps for the purpose. A few yards off the aerial is good advice for them. Again look to the earth. It generally goes round the house nailed up with iron staples and finishes in a twist round an oxidised water tap. If only B.C.L.'s would spend some of the time and money on their earths that they spend on their aerials they would be happier all round.

\* \* \*

The gales during the middle of November have taken their toll of aerial masts. It is surprising that in these essentially practical days people pay so little attention to making a good engineering job of the fixing of the aerial mast. If placed in the ground, it is rarely planted to a greater depth than about two feet, the reason being that earth is not easily removed from a small hole at a greater depth. Further, very few broadcast masts have any form of stay on them. They are generally

planted against the end wall of the garden in order not to lose a foot of the coveted length, and consequently a stay to withstand the aerial pull would have to be placed upon the adjoining property. The consequence is that directly the wind arrives they subside upon the ground, often doing damage to their owner's property. A neighbour of ours had two masts, apparently fixed to the fence. They both blew down, bringing the fence with them; a somewhat costly catastrophe, as a number of fine rose trees were damaged, besides the fence. As they looked like going up again on the repaired fence, adding to the hideousness of my outlook, I offered to provide for the lifting of one end upon my own mast if the poles were left permanently down. This suggestion was readily accepted and will give my neighbour increased height, balance the weight of my own aerial, and thus relieve the side pull and deduct two from the forest of aerial masts which disfigure our suburban neighbourhood. Much good work could be done if neighbours would only get together and agree to radiate their aerials from one common centre pole.

\* \* \*

As this number will be the last appearing before Christmas, the Editor takes the opportunity to wish all his readers a "Happy Christmas and a Prosperous New Year."

\* \* \*

It has been brought to our notice that many stations do not take advantage of the excellent service of calibration signals by G5YK, and continue to transmit through the period, making reception of the signals difficult. It would be very appropriate if members would make a note of the times advertised and refrain from transmitting over the period which is only 10 minutes.

## Forthcoming Events

DECEMBER 21, at the Institute of Electrical Engineers, commence at 6.15 p.m., tea at 5.30. Annual general meeting, followed by a lecture or discussion.

JANUARY 11, at the Institute of Electrical Engineers, commence at 6.15 p.m., tea at 5.30. Presidential address.

## Calibration Service.

Calibration signals will be transmitted from G5YK on December 23, as follows:—

14.00 G.M.T.	7,050 K.C.
14.05     "	7,250 K.C.

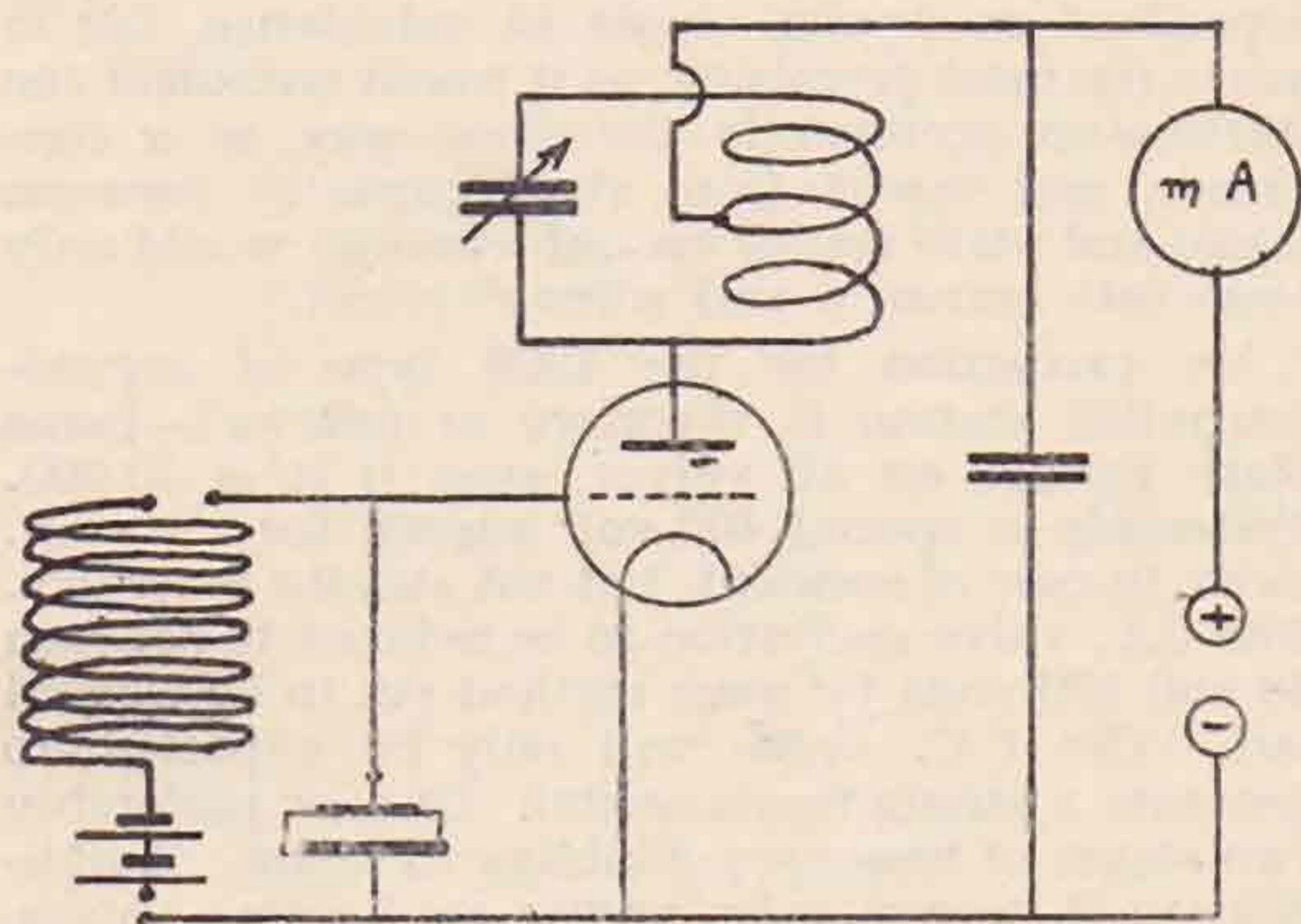
A similar schedule will be transmitted on January 13, commencing at 10.00 G.M.T. The call is R.S.G.B., DE G5YK, followed by the frequency used and a one minute dash.



# Crystal Control.

By A. HINDERLICH (G2QY).

The writer has already written two fairly lengthy screeds on this subject, one of which appeared in "Experimental Wireless" for January, 1927, and the other can still be obtained from the R.S.G.B. sales department. Both of these were more concerned with the preparation of the quartz specimen and the initial difficulties of getting the thing to work somehow than in an appreciation of the underlying principles. Having done a little work on getting oscillators to work on higher powers, it is possible to go over much the same ground from a different basis, leading to quicker and better appreciation of the principles involved.



Let us start with the familiar circuit of Fig. 1. When the grid choke is disconnected at both ends, a tested piece of quartz placed between the electrodes, a suitable coil used in the plate circuit, and a suitable valve such as the PM3, LS5B or DE5B is used with full filament emission and plate voltage above half the maximum advised for the particular valve, there should be not the slightest difficulty in obtaining oscillations, as shown by the drop in plate current when the condenser is set to the right value. Every crystal should be tried at first in this circuit (without the grid choke) because it is quite obvious that with only one coil oscillations can only be due to the crystal.

The next step is to take the curve between condenser setting and plate current, for free grid (grid choke removed). Now the grid choke is replaced, the bias battery is connected up, and then disconnected on the earth side (the plus terminal). The curve is taken again. Theoretically, the grid is free, and as the choke is disconnected, the two curves ought to be identical. They never are. The difference ought to be small, but with quite a number of alleged chokes there is a totally different curve. Obviously such a coil is not a choke at all, but in conjunction with stray capacities is giving us some mad sort of T.P.T.G. circuit. Before going any further it is essential to find a coil that will act as a genuine choke.

Having settled that all-important point (the writer strongly favours the use of ordinary plug-in coils, not because they are extra efficient, but because they are so extremely convenient) any available valves should be tried with full plate voltage, to find out which will probably be the best. The condenser-setting plate current curve should be taken for each valve with free grid.

Some interesting information can be obtained by using a high-resistance voltmeter as a grid-leak in place of the bias battery. The Sifam model has a resistance of about 24,000 ohms, and takes about 6 milliamps for full deflection. When the grid current and voltage across the "leak" are plotted against condenser settings, it will clearly be seen that the leak is only a way of applying bias in accordance with the amplitude of the grid-swing. If we take the family of curves for various values of grid bias, of condenser setting against plate current, we can form some idea from their intersections with the original curve for free grid of what grid-swing we had when the grid was free.

Under the latter condition the grid could never have gone so positive as to start appreciable grid current, and at the point of intersection the free grid bias and the applied bias must have been equal. Consequently we can say to a fair degree of accuracy that at the intersection of the curves the grid-swing was twice the applied grid bias. Hence we can derive a curve showing the relation between condenser setting and grid-swing for free grid. Although the argument does not strictly apply when the grid is not free, as the grid excitation may have altered, that curve is going to be of great use later on.

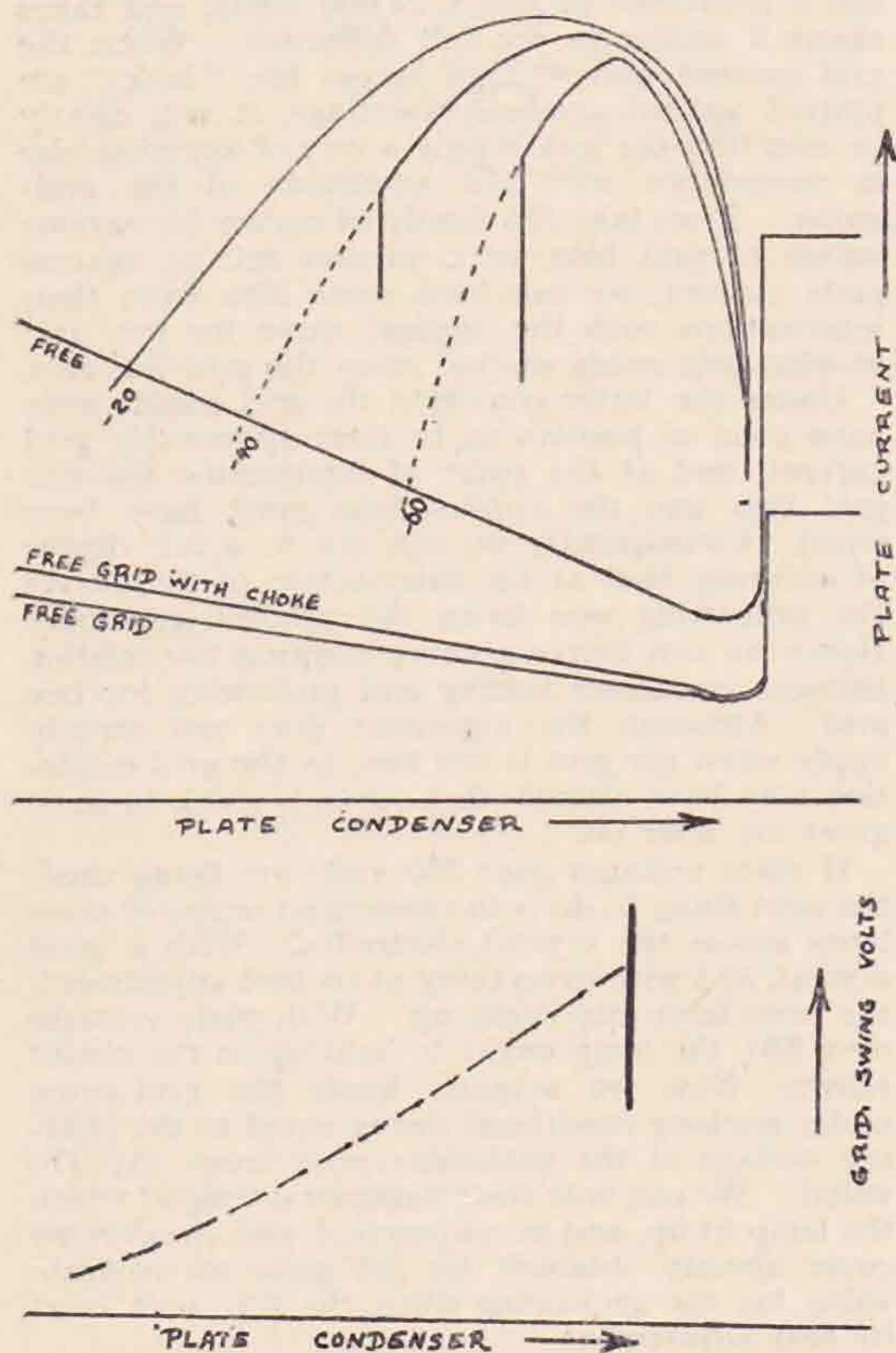
If plate voltages over 250 volts are being used, the next thing to do is to connect an ordinary neon lamp across the crystal electrodes. With a good crystal, and with everything at its best adjustment, the neon lamp may light up. With plate voltages over 350, the lamp ought to light up in the circuit shown. Now we actually know the grid-swing under working conditions (being equal to the striking voltage of the particular neon lamp, say 170 volts). We can note the condenser setting at which the lamp lit up, and in conjunction with the derived curve already obtained, we get quite an accurate value for the grid-swing when the C.C. unit is at its best adjustment.

Looking at the valve characteristic, we see that the conditions under which the valve is being worked are perfectly absurd. Probably the measured value of grid-swing is about five times what the valve was meant to handle. The extra excitation is only giving a tremendous amount of harmonics, without making much difference to the fundamental. But when we try a little harmonic analysis of the wave form to be obtained under these conditions, we find that the proportion of second harmonic varies in a most critical manner with both grid swing (dependent upon condenser



setting) and with grid bias (which in the case of the grid-leak also depends upon condenser setting).

Unfortunately, the conditions usually met with in practice have led to the belief that a crystal-controlled valve ought to have a strong second harmonic in the plate circuit. Actually, the difficulty is to reduce the grid excitation to a reasonable value which will not strain the crystal unduly. It is the voltage across the quartz that fractures it. Harmonics can be produced with much greater ease and reliability in a valve specially arranged for the purpose. By biasing a valve down to the bottom bend, and exciting the grid from a separate source, very little difficulty is experienced in getting frequency doublers to work. The whole superstition of difficulty in getting frequency-doublers to work in crystal-control has arisen out of the fallacy of expecting the first or crystal-controlled valve to generate a strong second harmonic.



So far the writer has not succeeded in working out a satisfactory method of doing this. All he can do at the moment is to draw attention to the need for a solution of the problem of making a C.C. valve *less* lively, and to point out some of the ways that will *not* work.

A condenser in parallel with the crystal, or in series with the crystal (including an air-gap as a special case) do not have the desired effect. True, the voltage across grid and filament of the valve is reduced, but the voltage across the quartz is not, and the neon lamp is not available in the case of the air-gap to measure the voltage. A condenser anywhere else merely makes oscillations very difficult to start.

Theoretically, the obvious thing to do is to inject a counterphase voltage somewhere. With ordinary neutralisation the neutralising condenser introduces somewhat similar difficulties as when connected straight between plate and grid. That leaves one other way—put the counter-voltage into the grid choke. This method is largely dependent on precise values of inductance, but it seems the most promising, as it would not affect the starting-up problem in the same way as a condenser, and (apart from stray capacity between choke and plate coil or special winding) would only come into action as and when required.

My prediction for the 1929 type of crystal-controlled station is therefore as follows:—Same plate voltage on all valves, even if it is 10,000. Preferably a special 400-volt supply for the C.C. valve in case of accident, but not strictly necessary. The C.C. valve excitation to be reduced to between 40 and 100 volts by some method yet to be worked out. The C.C. valve will only be expected to generate a strong fundamental. One, or preferably two stages of frequency-doubling to follow. Amplification if necessary by proper modulating valves, or, alternatively, by the frequency-locking method described by Goyder in Patent 274,660, with special emphasis on the need for *weak* oscillations when the control is removed.

The monotonous purity of the true crystal-controlled note to be relieved if desired by the deliberate introduction of ripple on the same lines as telephony. Telephony either by grid modulation or by adaptation of Western Electric Patent 268,048.

As these notes were being written, the November Proc. I.R.E. arrived. They contain articles on the utilisation of the screen-grid valve, and a mathematical investigation on frequency variations in crystal oscillators.

The other difficulty in the way of the more widespread adoption of crystal-control has been the necessity of several sources of plate voltage. If one puts more than 400 volts on the plate of the C.C. valve, the crystal will probably crack, not because of the 400 volts, but because of the grid-swing developed in the circuit shown. If a circuit can be found that will not give rise to these excessive grid excitations, but will permit of oscillations being readily started, then a great advance in technique will have been made.

### K.C.-Metre Charts.

The Society are obtaining a few kilocycle-metre charts, available to members at 6d. each. They should be at Headquarters shortly after this number appears.

These charts give the conversion of K.C. to metres, or vice versa at a glance, the conversion factor being taken as 3. It extends from 10 to 30,000 K.C. or metres, and there are in all 3,000 conversions worked out. We think the chart would be a valuable asset to any amateur station.



## The New Operating Procedure.

On January 1, 1929, the provisions of the International Radiotelegraphic Convention of Washington, 1927, come into force. From then on amateurs will be internationally recognised, and will be governed by the same rules and regulations that apply to commercial stations. The Convention has made many alterations and additions to the general procedure used in the past, and amateurs *must* familiarise themselves with these changes. The haphazard way in which prefixes, intermediates and abbreviations have been used in the past must be discontinued. We receive our instructions from the G.P.O., which is, to a certain extent, governed by the Convention.

There are certain bands of frequencies exclusively amateur, and others which amateurs share with commercial and mobile services. Within

these bands we are allowed a certain freedom. Outside these bands we shall be trespassers, and the penalty will not be as light as it has been in the past, when we have been caught off wave. It will do nobody any good; better far refrain from transmitting than risk being caught. Remember that the commercials don't want us there at all; also there is, in future, to be a convention every five years. In 1932 we may ask for more territory in the now unexplored portion of the spectrum. All other services are sure to ask for more in all parts of the spectrum, and they regard the amateurs as the first people whose territory shall be divided up. If we have been on our best behaviour for five years, and have shown that we can operate our stations in an efficient manner without causing interference to other services, we stand a better

### Table of Distribution of Call Signs.

<i>Country.</i>	<i>Call-sign.</i>	<i>Country.</i>	<i>Call-sign.</i>
Chile ... ..	CAA-CEZ	Brazil ... ..	PPA-PYZ
Canada ... ..	CFA-CKZ	Surinam ... ..	PZA-PZZ
Cuba ... ..	CLA-CMZ	USSR ... ..	RAA-RQZ
Morocco... ..	CNA-CNZ	Persia ... ..	RVA-RVZ
Bolivia ... ..	CPA-CPZ	Republic of Panama ... ..	RXA-RXZ
Portuguese Colonies ... ..	CRA-CRZ	Lithuania ... ..	RYA-RYZ
Portugal ... ..	CSA-CUZ	Sweden ... ..	SAA-SMZ
Roumania ... ..	CVA-CVZ	Poland ... ..	SPA-SRZ
Uruguay ... ..	CWA-CXZ	Egypt ... ..	SUA-SUZ
Monaco ... ..	CZA-CZZ	Greece ... ..	SVA-SZZ
Germany ... ..	D	Turkey ... ..	TAA-TCZ
Spain ... ..	EAA-EHZ	Iceland ... ..	TFA-TFZ
Irish Free State ... ..	EIA-EIZ	Guatemala ... ..	TGA-TGZ
Republic of Liberia ... ..	ELA-ELZ	Costa Rica ... ..	TIA-TIZ
Estonia ... ..	ESA-ESZ	Territory of the Saar ... ..	TSA-TSZ
Ethiopia ... ..	ETA-ETZ	Hedjaz ... ..	UHA-UHZ
France and Colonies and Protectorates	F	Dutch East Indies ... ..	UIA-UKZ
Great Britain ... ..	G	Luxemburg ... ..	ULA-ULZ
Hungary ... ..	HAA-HAZ	Kingdom of Serbs, Croats and Slovenes ... ..	UNA-UNZ
Switzerland ... ..	HBA-HBZ	Austria ... ..	UOA-UOZ
Ecuador ... ..	HCA-HCZ	Canada ... ..	VAA-VGZ
Republic of Hayti ... ..	HHA-HHZ	Commonwealth of Australia ... ..	VHA-VMZ
Dominican Republic ... ..	HIA-HIZ	Newfoundland ... ..	VOA-VOZ
Republic of Colombia ... ..	HJA-HKZ	British Colonies and Protectorates ... ..	VPA-VSZ
Republic of Honduras ... ..	HRA-HRZ	British India ... ..	VTA-VWZ
Siam ... ..	HSA-HSZ	U.S.A. ... ..	W
Italy and Colonies ... ..	I	Mexico ... ..	XAA-XFZ
Japan ... ..	J	China ... ..	XGA-XUZ
U.S.A. ... ..	K	Afghanistan ... ..	YAA-YAZ
Norway ... ..	LAA-LNZ	New Hebrides ... ..	YHA-YHZ
Argentine Republic ... ..	LOA-LVZ	Iraq ... ..	YIA-YIZ
Bulgaria ... ..	LZA-LZZ	Latvia ... ..	YLA-YLZ
Great Britain ... ..	M	Free City of Danzig ... ..	YMA-YMZ
U.S.A. ... ..	N	Nicaragua ... ..	YNA-YNZ
Peru ... ..	OAA-OBZ	Republic of El Salvador ... ..	YSA-YSZ
Finland ... ..	OHA-OHZ	Venezuela ... ..	YVA-YVZ
Czecho-Slovakia ... ..	OKA-OKZ	Albania ... ..	ZAA-ZAZ
Belgium and Colonies ... ..	ONA-OTZ	New Zealand ... ..	ZKA-ZMZ
Denmark ... ..	OUA-OZZ	Paraguay ... ..	ZPA-ZPZ
Netherlands ... ..	PAA-PIZ	Union of South Africa ... ..	ZSA-ZUZ
Curaçao ... ..	PJA-PJZ		
Dutch East Indies ... ..	PKA-POZ		



chance of having our demands favourably considered at the next Convention. At the present time our G.P.O. has thought fit to allow us to use only part of the band allotted to amateurs, and have reserved tolerances at the edges of all the bands. Further, the width of these tolerances increases as the frequency increases, which indicates that we are not regarded as being able to control our transmitters so accurately at the higher frequencies. This is probably true of most of us, but there is no reason why these tolerances should not in the future be reduced slightly, when we have shown the authorities, by the absence of complaints, that we are not backward in the technique of high frequency radio transmission.

If any British station hears a fellow amateur outside his proper band, let him call the well-meaning, though careless, amateur and tell him he is off wave, but don't let him hold communication, otherwise he may be penalised as well.

All the provisions of the Convention can be obtained in book form, printed both in English and French, and can be obtained from R.S.G.B., price 3s. post free. A copy of this book should be on every amateur's operating table, but for the benefit of those members who do not yet possess a copy, we are giving some extracts from it, so that they may not be completely in the dark next year.

We advise every amateur transmitter to give up the old procedure and commence using the new on the first day of next year; by doing so he will be adhering to the terms of the Convention, and if every amateur changes on the same day there will be as little confusion as possible.

Amateur call-signs all over the world shall consist of:

"The letter or letters indicating the nationality and a single figure followed by a group of not more than three letters."

This means that the old idea of international

## Selections from the New Q-Code of Abbreviations likely to be used by Amateur Transmitters.

Abbreviation.	Question.	Reply.
QRA	What is the name of your station?	The name of my station is . . . . .
QRB	How far are you from my station?	The distance between our stations is . . . . . miles (or kilometres).
QRE	What is the nationality of your station?	The nationality of my station is . . . . .
QRG	What is my exact wavelength in metres (or frequency in K.C.'s)?	Your exact W/L is . . . . . metres (or frequency . . . . . K.C.'s).
QRH	What is your exact wavelength in metres (or frequency in K.C.'s)?	My exact W/L is . . . . . metres (or frequency . . . . . K.C.'s).
QRI	Is my note bad?	Your note is bad.
QRJ	Are my signals weak?	Your signals are too weak to read.
QRK	Are my signals good?	Your signals are good.
QRL	Are you busy?	I am busy (with . . . . .), please don't interfere.
QRM	Are you being interfered with?	I am being interfered with.
QRN	Are you troubled by atmospherics?	I am troubled by atmospherics.
QRO	Shall I increase power?	Increase power.
QRP	Shall I decrease power?	Decrease power.
QRQ	Shall I send faster?	Send faster (. . . . . words per minute).
QRS	Shall I send slower?	Send slower (. . . . . words per minute).
QRT	Shall I stop sending?	Stop sending.
QRU	Have you anything for me?	I have nothing for you.
QRW	Shall I tell . . . . . that you are calling him?	Please tell . . . . . that I am calling him.
QRX	Shall I wait? When will you call me again?	Wait until I have finished with . . . . . I will call you immediately (or at . . . . .).
QRZ	Who is calling me?	You are being called by . . . . .
QSA	What is the strength of my signals (1 to 5)?	The strength of your signals is . . . . . (1 to 5).
QSB	Does the strength of my signals vary?	The strength of your signals varies.
QSC	Do my signals disappear entirely at intervals?	Your signals disappear entirely at intervals.
QSD	Is my keying bad?	Your keying is bad and your signals are unreadable.
QSE	Are my signals distinct?	Your signals are sticking.
QSO	Can you communicate with . . . . . direct (or through the medium of . . . . .)?	I can communicate with . . . . . direct (or through the medium of . . . . .).
QSQ	Shall I send each word or group once only?	Send each word or group once only.
QSU	Shall I send on . . . . . metres or K.C.?	Send on . . . . . metres or K.C.
QSV	Shall I change to . . . . . metres or K.C. for the rest of our communication?	Change to . . . . . metres or K.C. for the rest of our communication.
QSW	Will you send on . . . . . metres or K.C.?	I will send on metres . . . . . or K.C.
QSX	Does my wavelength (frequency) vary?	Your wavelength (frequency) varies.
QSZ	Shall I send each word or group twice?	Send each word or group twice.
QTR	What is the exact time?	The exact time is . . . . .

The abbreviation is followed by a note of interrogation when it is to be understood as a question.



intermediates and prefixes that we have used in the past will no longer be used, and, further, that the G that we have previously tacked on to the call now becomes an integral part of the call-sign and must, therefore, *always be transmitted*. The "letter or letters indicating the nationality" are taken from an international list in which various groups of letters are allotted to different countries. Thus, the letters assigned to Australia are VHA to VMZ; Australia would, therefore, allot any of the letters VH to VM to be the letters indicating the nationality in Australian amateur call-signs. A list of these letters is given.

The old list of "Q" signals has been altered in many respects, and a list of those abbreviations that are likely to be more generally used by amateurs is given. It cannot be too strongly emphasised that all transmissions carried out in 1929 *must* be in accordance with the revised rules. Only the literal meaning of the abbreviation should be used and the interpretations that we have given the old "Q" signals must be forgotten. QRI in future means "your note is bad," and therefore "your QRI is FB DC" is piffle. Use only the correct signal when transmitting and don't use any "Q" signals in their wrong sense in letters and articles.

In addition to these "Q" abbreviations, a list has been compiled of other abbreviations for use in general and special working, and a selection from this list of miscellaneous abbreviations is also given.

The R-code of signal strengths has been altered and only reads 5 as maximum. Further, the R is no longer sent, so that it is really wrong to call it the R-code. Signal strength will in future be sent as follows:—

QSA?: "What is the strength of my signals?"

QSA4: "The strength of your signals is 4."

1. Hardly perceptible; unreadable.
2. Weak; readable now and then.
3. Fairly good; readable, but with difficulty.
4. Good; readable.
5. Very good; perfectly readable.

It appears that the above scale of signal strength only goes up to what we have been in the habit of calling R7. It makes no allowance for a very loud signal such as we have called R9, or loud-speaker strength. This seems to us to be quite in order, as a signal that is louder than our old R7 is too loud to be comfortably read, and would naturally be reduced in strength at the receiving end to a more reasonable value.

- C Yes.  
 N No.  
 W Word or words.  
 AA All after (*to be used after a note of interrogation to request a repetition*).  
 AB All before (*to be used after a note of interrogation to request a repetition*).  
 AL All that has just been sent (*to be used after a note of interrogation to request a repetition*).  
 BN All between (*to be used after a note of interrogation to request a repetition*).  
 BQ Prefix of reply to a request for a correction.  
 CL I am closing my station.  
 CS Call sign.

(Continued in next column.)

## A Few Suggestions About Q.S.L Cards.

BY THE MAN WHO HAS HANDLED A LOT.

Owing to the changes introduced by the recent Radio Telegraphic Convention, quite a lot of us will be wanting fresh supplies of cards, and the time is opportune to point out some of the details that make for good design. It is not intended to lay down the law what should be done, but you will find these remarks useful in making sure that nothing important has been forgotten.

Most small jobbing printers have peculiar ideas which they try to foist on unwary customers, and a proof should always be obtained and carefully examined before allowing the lot to be printed. Watch particularly for these points: Weird and unsuitable founts of type. Extravagant rules and borders. Greasy coloured ink that will not take ordinary writing. Lines of heavy little dots which perform no useful service, and often obscure the writing. The space between the printing should bear some logical relation to the probable length of what will be written there. The card to be of normal postcard size, and of such a quality as will take writing clearly without running.

As regard the matter to appear, the accepted order will be somewhat as follows. On the top line your QRA, with a rule below. Then some such phrase as:—

To Radio Your CW Sigs recd. here working  
 at GMT 1929 Fone card wk'd. calling

QRK QRI QSB QSX cycles QRM  
 QSA QRI QSC  
 QRN QRG

Then the special reports you wish to give, particulars of your station, then QTU with times in G.M.T. and days of the week, PSE or TNX QSL via RSGB, 53, Victoria Street, London, S.W.1, good wishes and signature.

Just a word about abbreviations. There are four possible sorts: 1. The new Q code, which is automatically available to foreigners in an authoritative translation, and should therefore be used whenever possible exactly as written and not given new meanings; 2. Certain scientific abbreviations, to be found in all scientific textbooks. 3. "Ham language." Is it worth printing the very latest abbreviation, especially when it only differs by one letter from the proper word in English? Of course, some of the older ones are better known abroad than ordinary English. Above all, please don't try to *improve* upon "Ham language." 4. Your own inventions. These should never be used. The saving on printing space is very small, and the recipient cannot look the abbreviation up in a dictionary.

- 
- MN Minute or minutes.  
 NW I resume transmission.  
 OK Agreed.  
 RQ Signifies a request for correction.  
 UA Are we agreed?  
 WA Word after (*see note after AA*).  
 WB Word before (*see note after AA*).  
 XS Atmospherics.  
 ADR Address (*see note after AA*).  
 PBL Preamble (*see note after AA*).  
 RPT Repeat or I repeat.



## Those Articles.

From time to time we find little appeals from the Editor for more articles and still more articles.

Let us for a moment consider the question and see how each and all of us can do something to fulfil the Editorial wants.

Most of us are amateur authors, and naturally feel somewhat diffident of putting our ideas into print, but we must remember that essentially the Society's journal is for amateurs; of another sort, true; but amateurs all the same.

Most of the things we do as an amateur radio man would be looked upon with askance by the professional.

Think of those hay wire transmitters and receivers, with cotton reels and tea-cup insulators, those test-tube chokes, and all the myriads of other un-professional ideas we see at every station—but nevertheless, they function. And so then with our articles. They will be, unless we are gifted well with a journalistic touch, be amateurish, but they are for amateurs and will be read by amateurs who will not be critics providing the article contains something of general interest.

Those who are doubtful about their literary skill are reminded that the Editorial Committee are always prepared to assist in the preparation of articles, for it is realised that a little extra finishing off may improve the reading out of all proportion.

And now about the type of article.

Broadly speaking the BULLETIN caters for any article on any subject connected with the study of Radio Communications.

An article describing the latest 50 k.w. broadcaster is as welcome as that of the write-up of your latest low-power 30000 KC receiver, providing that within the article there is something which is either novel or new. Redundant matter (unless of historical interest) is boring, but new ideas, however simple, are of value.

An avenue which we seem to have missed and one which our contemporary "QST" seems to use, is the culling from various sources descriptions of various new devices or theories. There must be numerous technical journals—not only in English—wherein is published from time to time articles concerning subjects likely to be of interest to the Society membership, and it is suggested that therein is one valuable source from which abundant useful information might be obtained. The question of copyright and author's permission are matters to be taken care of, but the Editorial Committee are prepared to consider applying for permission to reproduce an article which has been copied from a contemporary journal. Members are therefore asked to remember this source, and whenever an opportunity occurs to forward to the Editor a copy

of the article or an abridged version thereof.

A good example of this abridgment is noted in the November "QST," Mr. Harold Westman, Technical Editor, having published abridged extracts of an article which appeared in the "Proceedings of the American Academy of Arts" on the subject of "Frequency Stabilisation by Magnet-Ostriction Oscillators."

Numerous other sources from which subject matter for articles can be obtained will occur to members, but the following two obvious ones are mentioned:—

1. Lectures given at local Radio Societies, extracts from which can be published.
2. Performance reports on new types of apparatus.

Having now briefly discussed the general sources let us come back to the more personal side and consider what type of article the average man can himself write.

There are seemingly endless subjects which could be made interesting, so a few only will be listed in the hope that therein will be found the "something" which will prompt our members to get busy and answer the Editorial command.

### NON-TECHNICAL.

1. Descriptions of amateur conditions in other countries.
2. Holiday trips.
3. Station Logging.
4. Operating Advice.
5. Attracting Membership.
6. Area Meetings.

### TECHNICAL.

1. Ideas about Aerials.
2. Ideas about M.O.P.A. Systems.
3. Ideas about Keying.
4. Ideas about Crystals.
5. Transmitter Design.
6. Receiver Design.
7. Measurements of fairly simple character.
8. Valve Characteristics.
9. Station Descriptions.
10. Power Supplies.
11. Wavemeters.
12. Oscillators.
13. Sound Aerial Erection Ideas.

And so we could extend the lists. It does not matter who you may be you *must* have done just something differently at your station—you must have studied something we have not all studied. You must have thought of something we have omitted. Let us then—your fellow-amateurs—know about these "somethings" and get straight away and do a write-up on it. We want articles always—and still always.

**HAVE YOU WRITTEN THAT ARTICLE YET?  
IF NOT LET US HAVE IT NOW.**



# Transmission on 28MC.

By W. F. FLOYD (Exhibitioner in Mathematics, London University).

The generally acknowledged difficulties with all ultra high frequency transmission arise from instability of the apparatus—electrically speaking. One method of overcoming this difficulty is to utilise a piezo-electric crystal and to increase the output with one or more amplifiers. A cheaper way of stabilising a transmitter will appeal to a large number of amateurs.

It is well known that the Wheatstone arrangement of a circuit will produce a perfect balance whatever the peculiar conditions of the particular

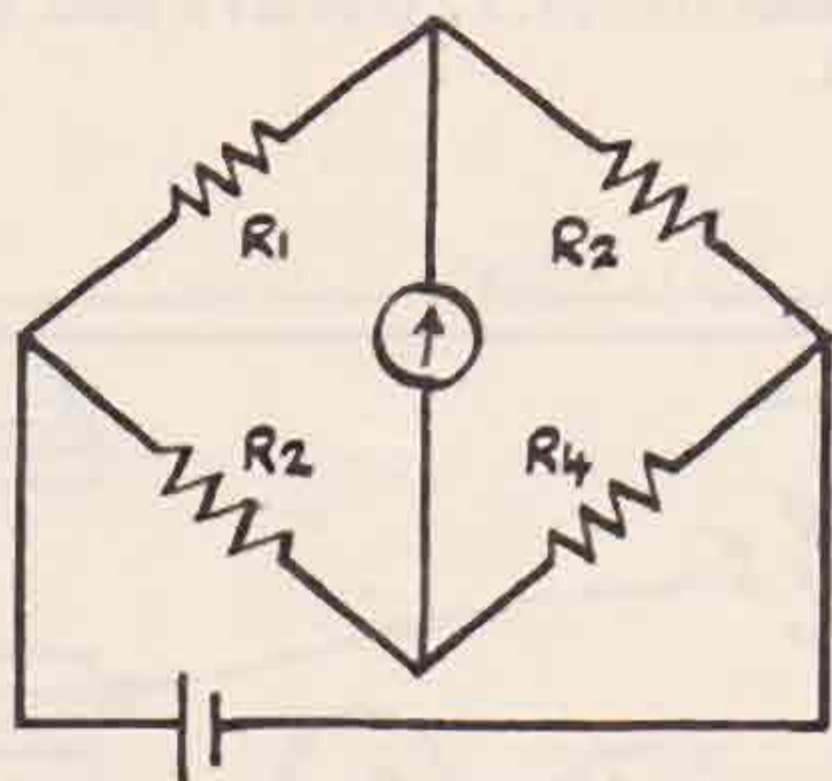


Fig 1

circuit. Diagram (1) shows the ordinary Wheatstone net for direct current measurements. When a balance is obtained we know that the following condition holds :—

$$\frac{R_1}{R_2} = \frac{R_3}{R_4}$$

Let us now consider the circuit shown in Diagram (2). This shows an ordinary oscillator in which the inter-electrode capacity is used for the tuning circuit. The circuit can be re-drawn as shown in (3), where  $L_1$  represents that portion AB of the inductance,  $L_2$  the portion BC,  $C_1$  the grid anode capacity in the valve  $C_2$ , the result of the placing of  $C^1$  and  $C^{11}$  in series. P and Q represent the parts of the bridge to which the *oscillating* potential are applied, and S and T are the two points of no potential when a perfect balance has been obtained. Applying the ratio condition we obtained above for the standard bridge we see that :—

$$\frac{\text{Resistance of } L_1}{\text{Resistance of } C_1} = \frac{\text{Resistance of } L_2}{\text{Resistance of } C_2}$$

i.e.  $(L_1\omega) \times (C_1\omega) = (L_2\omega) \times (C_2\omega)$

i.e.  $L_1 \times C_1 = L_2 \times C_2$

i.e.  $\frac{L_1}{L_2} = \frac{C_2}{C_1}$

Now  $L = \pi^2 n^2 d^2 lK$ .

Where  $\pi = 3.1416$ .

$n$  = number of turns of wire per centimetre.

$d$  = diameter of coil in centimetres.

$l$  = length of coil in centimetres.

$K$  = Nagaoka's Factor which depends upon the ratio of  $d$  to  $l$ .

Thus  $\frac{L_1}{L_2} = \frac{l_1 K_1}{l_2 K_2}$

And since  $K$  varies inversely as  $d/l$ ,

Then  $\frac{l_1 K_1}{l_2 K_2} = \frac{l_1^2}{l_2^2} = \frac{L_1}{L_2}$

i.e.  $\frac{C_2}{C_1} = \frac{l_1^2}{l_2^2}$

Referring to the circuit diagram (2) we have

$$\frac{1}{C^1} + \frac{1}{C^{11}} = \frac{1}{C_2}$$

also  $C_1$  equals the inter-electrode capacity of the valve, and this can be adjusted as is required by the optional condenser  $C^{111}$  connected between the two electrodes.

Let us now consider a concrete case where the inter-electrode capacity is one-ninth times the added capacity of  $C^1$  and  $C^{11}$ .

We have  $\frac{C_2}{C_1} = \frac{9}{1} = \frac{l_1^2}{l_2^2}$

Hence,  $\frac{l_1}{l_2} = +\frac{3}{1} \dots$

[The negative root has a further significance which need not be investigated now.]

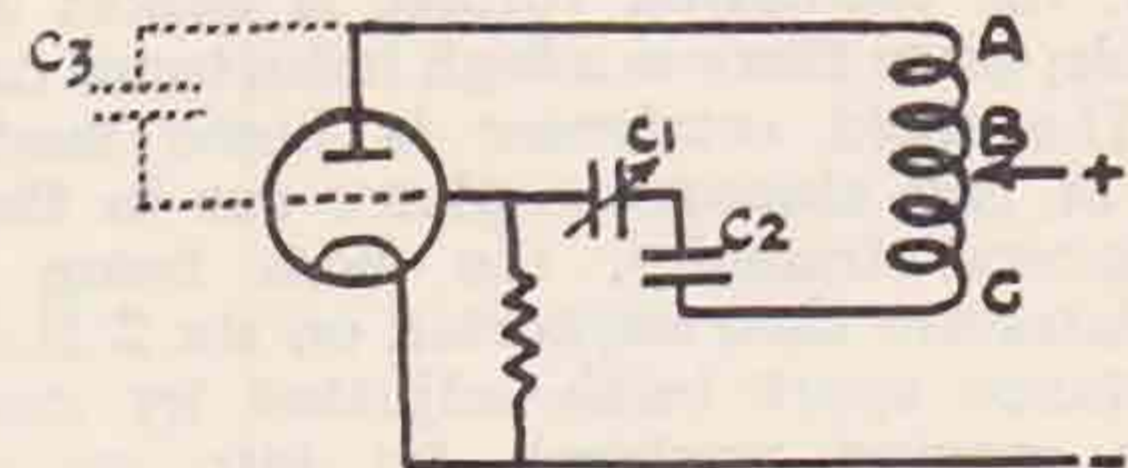


Fig 2

This tells us where to make our centre connection to the coil, shown at B in diagram (2).

It is not, of course, essential to employ two condensers as shown at  $C^1$  and  $C^{11}$ , but it must be remembered that we are dealing with very high frequencies which tend to jump a gap more readily than do the lower and better known frequencies. Only recently the writer was working with a very high frequency oscillator—about four or five metres—when, on depressing the key in the high tension lead, a big spark was observed to jump across two radio frequency lines. The power was not more than it was usual to use when dealing with the lower frequencies, and it can only be presumed that the spark was due to insufficient insulation for the order of frequency employed. Should a spark jump one condenser there will be always the second to protect the grid from damage.

### CONSTRUCTIONAL DETAILS.

Fig. (4) gives the circuit diagram of the apparatus, and Fig. (5) shows the baseboard lay-out of the various components. There is no necessity to use a low-loss valveholder. The reason for this has been



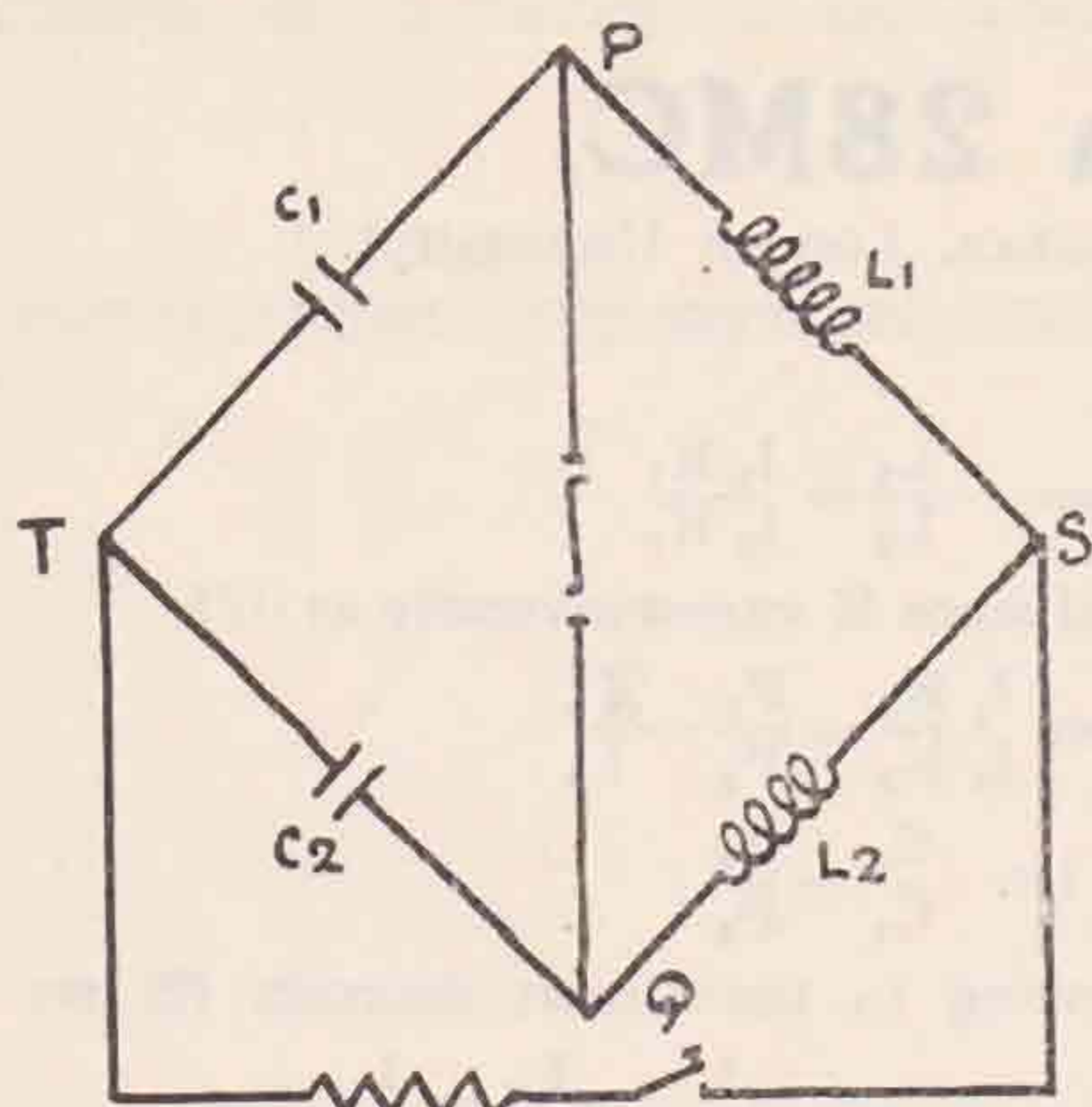


Fig 3

explained in the previous article; it is this: the tuning circuit employs the inter-electrode capacity of the valve to determine the frequency of oscillation. Thus, if we use a very low-loss holder practically all the control of frequency will depend upon the inductance in circuit.

The two condensers are not absolutely essential to the successful working of the set. There are two reasons for using the two in place of one. Firstly, the grid end of the inductance is at anode potential (D.C.), and with high voltages the small variable condenser is liable to break down, and secondly, the oscillating voltage is almost as high as possible, since there is a high inductance capacity ratio. The fixed condenser is home made and consists of two aluminium plates cut in the form of equilateral triangles, the sides being 2 ins. These plates are then supported on six 2 B.A. rods (the distance apart being adjusted by means of ordinary spacing washers), let into an ebonite base, the position of the rods thereby forming a regular hexagon.

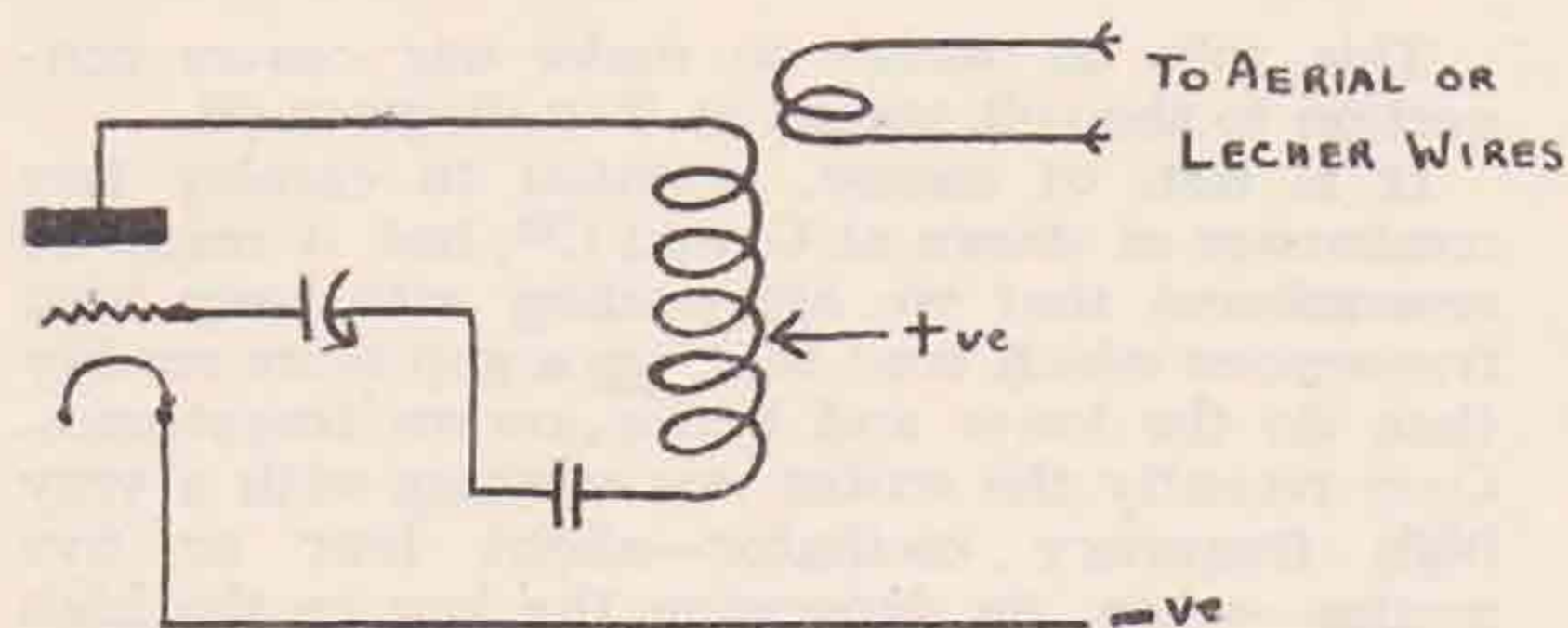


Fig. 4

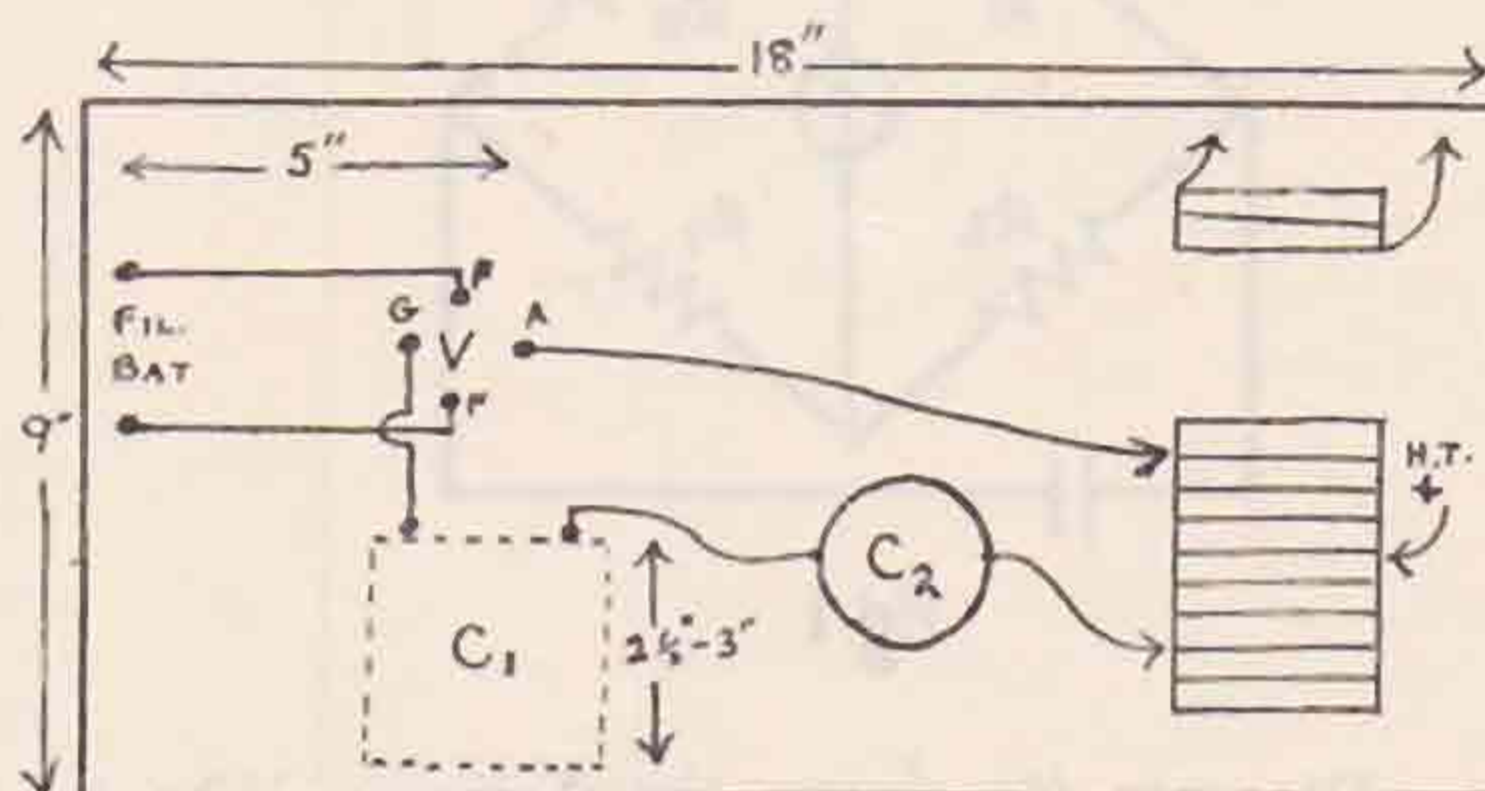
The variable condenser is made by Ormond Engineering Company, and has three sets of vanes, the moving vanes not being connected directly to the rest of the circuit. Hence there is a very steady and easy control of the frequency.

The coil is also home-made and consists of eleven turns of gauge 10 bare copper wire wound in solenoid form with a diameter of three inches, each turn being spaced by three-eighths of an inch. The coil is air-spaced and supported in solenoid form by means of three pieces of celluloid through

which each turn passes. To preserve the rigidity of the coil it was coated with a solution of celluloid in amyl acetate. This cements the celluloid to the wire.

The aerial is connected by means of a coil of similar construction and dimensions to the main inductance, except that there are only three turns on it. This coil is very loosely coupled to the main tuning inductance at the anode end. The aerial is a matter of individual design, and as local conditions and space limit these no definite statements ought to be made in this respect.

Three wires only are connected to the set (excluding those connected to the loose coupled aerial). These are the two filament connections and the H.T. positive. The negative H.T. is connected away from the apparatus direct to the filament supply. If the set is correctly balanced there is no need to employ a condenser in the oscillator across the H.T. positive and the negative filament lead.



- C1 Variable Condenser (Ormond Regd DN 721874.)
- C2 Fixed Condenser

It will be observed that nothing has been said about a grid leak for the oscillator. So far it has been found that working with low power the grid filament resistance within the valve has been sufficient. With greater power it may be necessary to use one to prevent excessive heating.

*Addendum.*

Since the first experiments with this circuit the writer has been successful in obtaining oscillation at an estimated frequency of about 300 mega-cycles, and at every frequency between that and 30 mega-cycles.

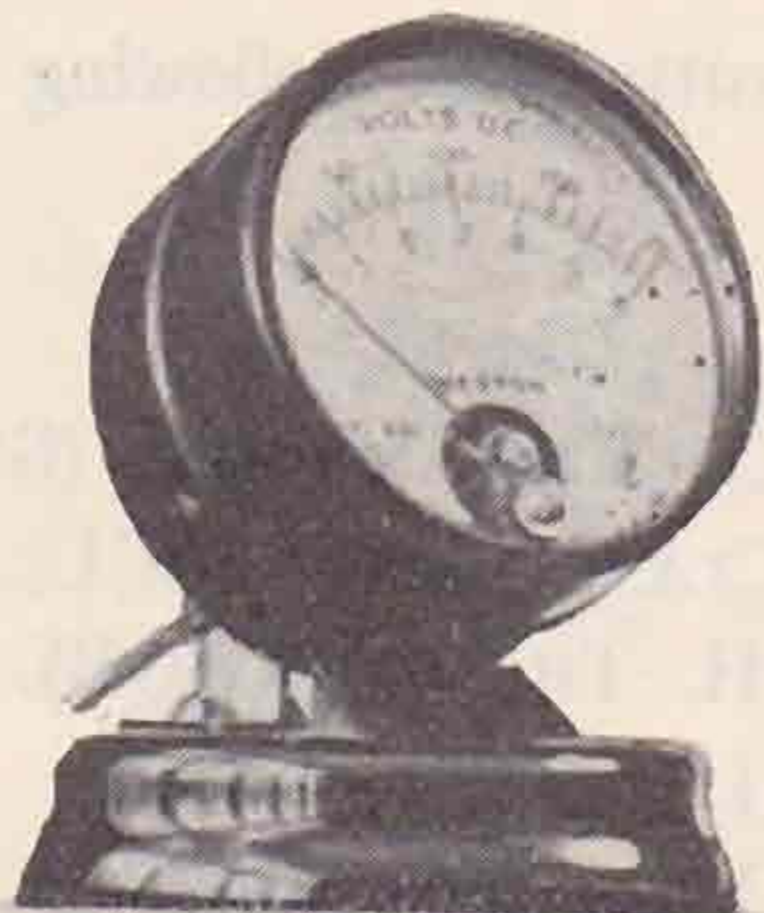
**Strays.**

Mr. M. S. Urquhart, OA6MU, Hawkstone Street, Cottesloe, Western Australia, wishes to arrange a schedule with a reliable British Station on the 7,000 K.C. band.

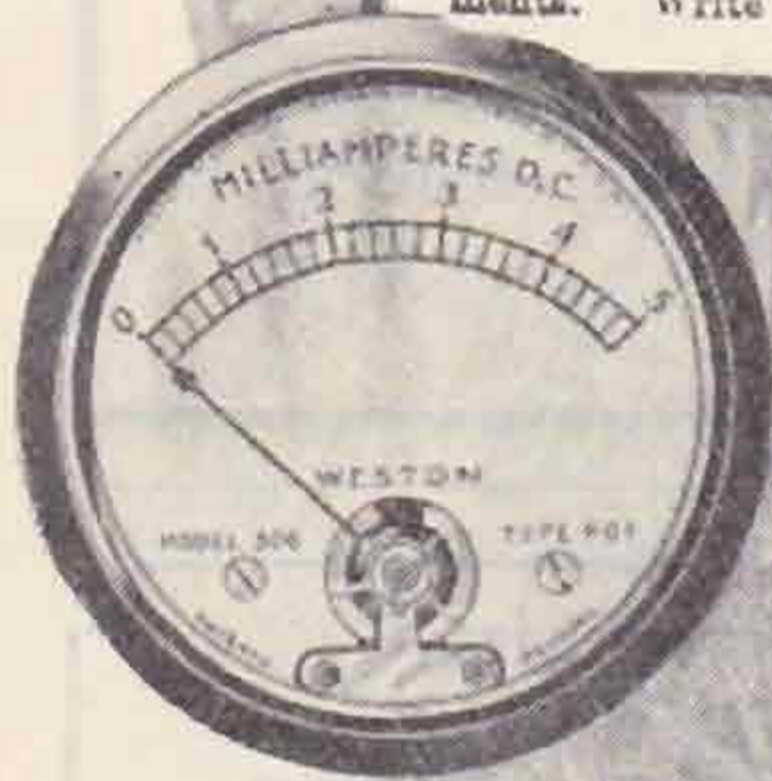
Mr. W. F. Floyd, G5WF, is anxious to find six or eight amateurs near London who will co-operate with him in a series of experiments on Polarisation effects and the Heaviside layer. The series will take about six months to complete. Will those interested please write direct to G5WF.



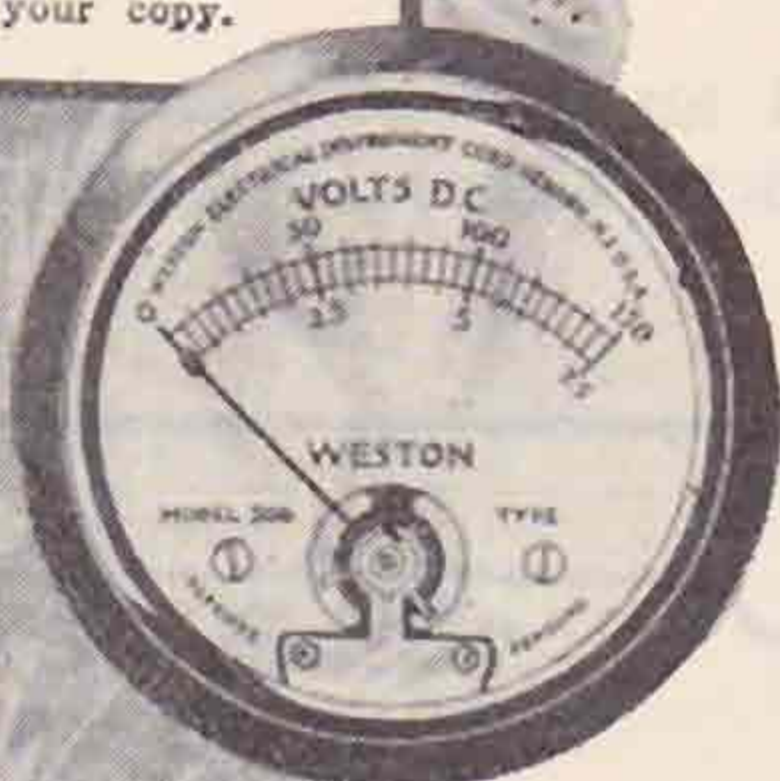
# Weston sets the world's standard



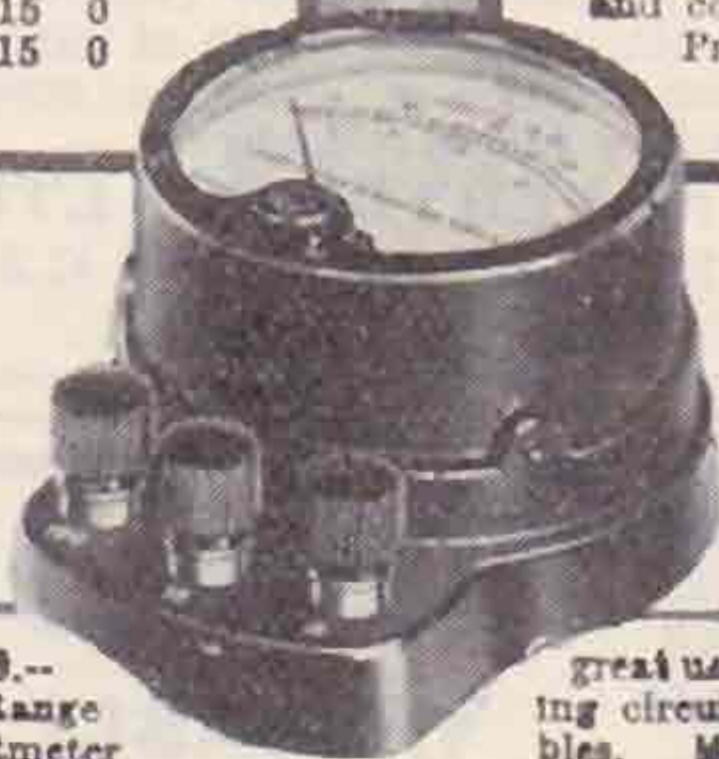
Model 506.—Pin Jack Voltmeter with High Range Stand, measures High and Low Tension Voltages. Price: £2 10 0  
The Weston Free Booklet "Radio Control" explains the uses of this and other Weston Radio Instruments. Write for your copy.



Model 508.—Mil-Ammeter should be placed in the H.T. circuit of the valve to ensure correct operation and check distortion. Panel mounting type. Prices: £1 15 0  
£2 15 0



Model 503.—Panel Voltmeters ensure permanent accuracy. With a high internal resistance of 125 ohms per volt, they make practically no load on the batteries. Neat and compact. Prices: £1 15 0  
£2 15 0



Model 489.—Double Range D.C. Voltmeter is a necessary portable testing instrument for every radio enthusiast. It is of great use in tracing circuit troubles. Made in various ranges with different sensitivities. Similar instrument for A.C. Model 528. Prices: £3 15 0 £7 5 0

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City 0191



## District Representative Election, 1929.

In accordance with the rules of the T. & R. Committee, the following have been elected to the posts of District Representatives.

### District.

- No. 1 J. C. HARRISON (G5XY).  
 No. 2 S. R. WRIGHT (G2DR).  
 No. 3 J. NODEN (G6TW).  
 No. 4 E. R. MARTIN (G6MN).  
 No. 5 D. P. BAKER (G2OQ).  
 No. 6 G. W. THOMAS (G5YK).  
 No. 7 H. C. PAGE (G6PA).  
 No. 8 C. W. TITHERINGTON (G5MU).

### District.

- No. 9 G. COURTENAY PRICE (G2OP).  
 No. 10 J. CLARRICOATS (G6CL).  
 No. 11 L. H. THOMAS (G6QB).  
 No. 12 L. J. FULLER (G6LB).  
 No. 13 H. WILKINS (G6WN).  
 No. 14 J. WYLLIE (G5YG).  
 No. 15 H. ANDREWS (G5AS).  
 No. 16 C. MORTON (G15MO).

The appointments for Districts 3, 6, 11 and 12 were made by Committee at their last meeting, and the Ballot for Districts 4 and 13 resulted in the election of Messrs. Martin and Wilkins.

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## Contact Bureau Notes.

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

Since I wrote last month's Notes, the great event has come about, and America has been linked to Britain on 28 MCs. Full details have been given elsewhere, and it is probable that even the news printed this month was out of date before the ink was dry.

I must heartily congratulate all the stations concerned in the first trans-oceanic 28 MC work, viz., G6LL, GW17C, G2OD, G2FN, G6DH, and G5VL. They were not disheartened by months of failure, but, having a sure belief in the possibilities of this band, plodded on improving, testing, comparing results, till finally they were able to put Britain into first place for low-power 28MC DX.

G6DH, with his 3 watts input, managed to be heard on the other side, and G2FN, with 8 watts, input, worked California.

Do you notice that all the men who have done anything on 28 MC are either Group Centres or members? This shows that we have got the real stuff in the groups, and I shall be surprised if all the pioneering work on this band is not done by Group people.

G5YK, assisted by G6LL, will be supplying you with news of this band every month, and I am sure they will give you the results of the recent organised Group tests on November 10 and 11.

Join up, fellows, and get into a group on 28 MC and do some worth-while pioneer work. Who will be the first to link us up with the other four continents?

I have another announcement to make which is of the greatest importance. Mr. T. L. Eckersley has kindly consented to act as Hon. Technical Adviser to CB on problems of propagation and kindred subjects. Mr. Eckersley requires no introduction to radio men, and I feel that his kindness in associating himself with our work is not only an honour to CB, and to the R.S.G.B., but to the very amateur movement itself. It will be of interest to the ultra-short wave people to hear that he was in touch with Australia on 28 MC in March, 1926, and more recently got signals across the Atlantic on a wave of 8.75 metres.

It is possible that another well-known authority on radio work will consent to act as adviser on other matters.

GW17C is very kindly making all the sketches for CB Notes, and I have to offer him my very best thanks for his timely assistance.

These 28 MC results rolling in to CB infected me with the microbe, and I tried for hours to make a very good maker's valve oscillate at this frequency. I had no success whatever until I got a valuable tip from 5MO, who put me on to Triotron valves.

I do not intend to use these pages to boost any one product, but I cannot but pass on the information that to my mind the TD2 valve of this make is a real discovery. To show you that it is efficient, despite its foreign origin and low price, I may say that on my first afternoon's listening on 28 MC, I received eight American and Porto Rican stations at very good strength, including dists. 1-2-4-8-9.

What about a group on picture transmission? I have an offer from a prospective centre if I can get five others to make a group.

I want to hear from a few members who have a good knowledge of the fundamentals of wave propagation, a transmitter which is capable of world-wide range under normal conditions, ability to make accurate measurements with simple apparatus, and a fair amount of spare time. This is for a very special group, and there is a wonderful opportunity waiting for five suitable men.

G2OD gives me some details of his successful 28 MC transmitter. The aerial is a voltage-fed double-wave horizontal Hertz R.F. line eight feet long. An 84.3 crystal is used, being doubled in the usual manner, and the final output stage is an Osram S.W. 250 run with an input of about 65-70 watts, showing no signs of heating. The circuit is a Colpitts, and is very easy to adjust with a total absence of body effects, due, doubtless, to the centre point of the condenser system being anchored to the filament. The filaments are heated by A.C., but the CC keeps the QSB pure DC.

His receiver is an ordinary two-valve one, and the fading period of the W signals was found to be of very slow duration. It was quite dark at G2OD when the first contact with W was made.

G2OD's trouble, like that of many others, is constant QRM from motors on an adjacent road.

G6VJ, who is now G6XC, has been doing some tests on 23 metres, and finds a half wave semi-vertical aerial much better than a full wave one, which is higher in the centre than the ends; but if the full wave aerial rises to the mast and then back above itself in a horizontal span, the results are extremely good.

I have had one application from a member for "Magnetostriction Frequency Control"; anyone doing this work?

G6FY reports that CB is well known in Germany, whence he has just returned, and that the first phrase that a German ham learns after "Whisky and Soda" is "Contact Bureau"!

I had a charming letter from EK-4DK, who sends also some notes on Skip distance. He uses QRP and refers to the winter conditions of 1927 on 45 metres.

Two factors largely govern Skip: Weather and distance. The distances of 400-600 km. and 800-1000 km. are the most important. In the first, the "skip" first appears in the beginning of September from 21.00-21.30 GMT onwards. From October stations within the shorter distance can be worked only until 1900 GMT, and from November to the beginning of February even only until 17.15 GMT.

Stations at a distance of 800-1000 km. fade out at 17.15 GMT, but come back again at 20.15 GMT, and the strength is strongest just before and after fade out. EK4DK adds that, of course, the weather affects changes in the propagation, and he has noticed a point which may be of interest; the "skip" comes evenly without fading when the barometer is at a minimum, but sets in slowly and

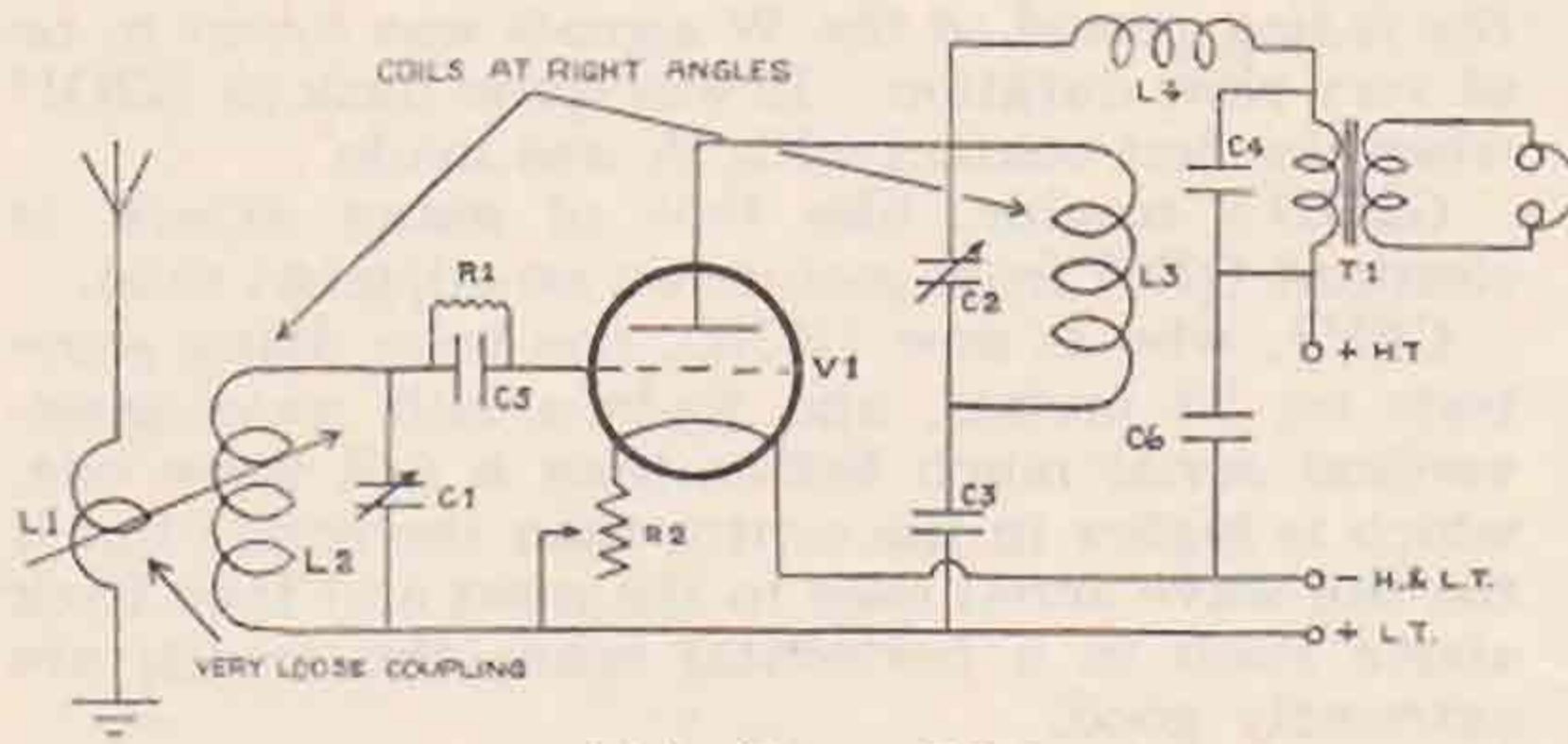


with strong fading when it records a maximum pressure. The QRK at this time is often greater than normal.

I am asked from time to time to supply technical information, even to the design of complete transmitters, and much as I should like to help members when my knowledge permits me to do so, it is impossible to run a technical information bureau AND a CB. At the same time, I have tried to help when time has permitted, but I should be grateful if members did not address requests for designs to CB, as I hate to refuse.

I was sent some information about "Threshold" Howl, which originated in a short-wave laboratory which must be nameless. It was to the effect that this was due entirely to unsuitable grid condenser and leak. Personally, I "hae ma doots," but this is no unusual cause, I know.

A sketch is shown this month of the T.P.T.G. receiver of BRS42. L1=1 turn No. 16 D.C.C. 2" dia., L2=2 turns ditto, L3=2 turns ditto, L4=75 turns No. 36 D.C.C. basket coil. C1=0.0003 mfd, C2=0.0002 mfd, C3=0.002 mfd, C4=0.0003 mfd, C5=0.0001 mfd, C6=0.05 mfd, R1=4 megohms, R2=30 ohms, T1=Ferranti 1:1 output transformer, and V1=PM4. Threshold Howl was bad, but the following adjustments reduced it at BRS42: (1) dim detector filament; (2) reduce detector plate volts; (3) use detector valve of about 9,000 ohms impedance; (4) reduce G.B. of the amplifier valves.



10λ RX AT BRS 42

GROUP 1A.

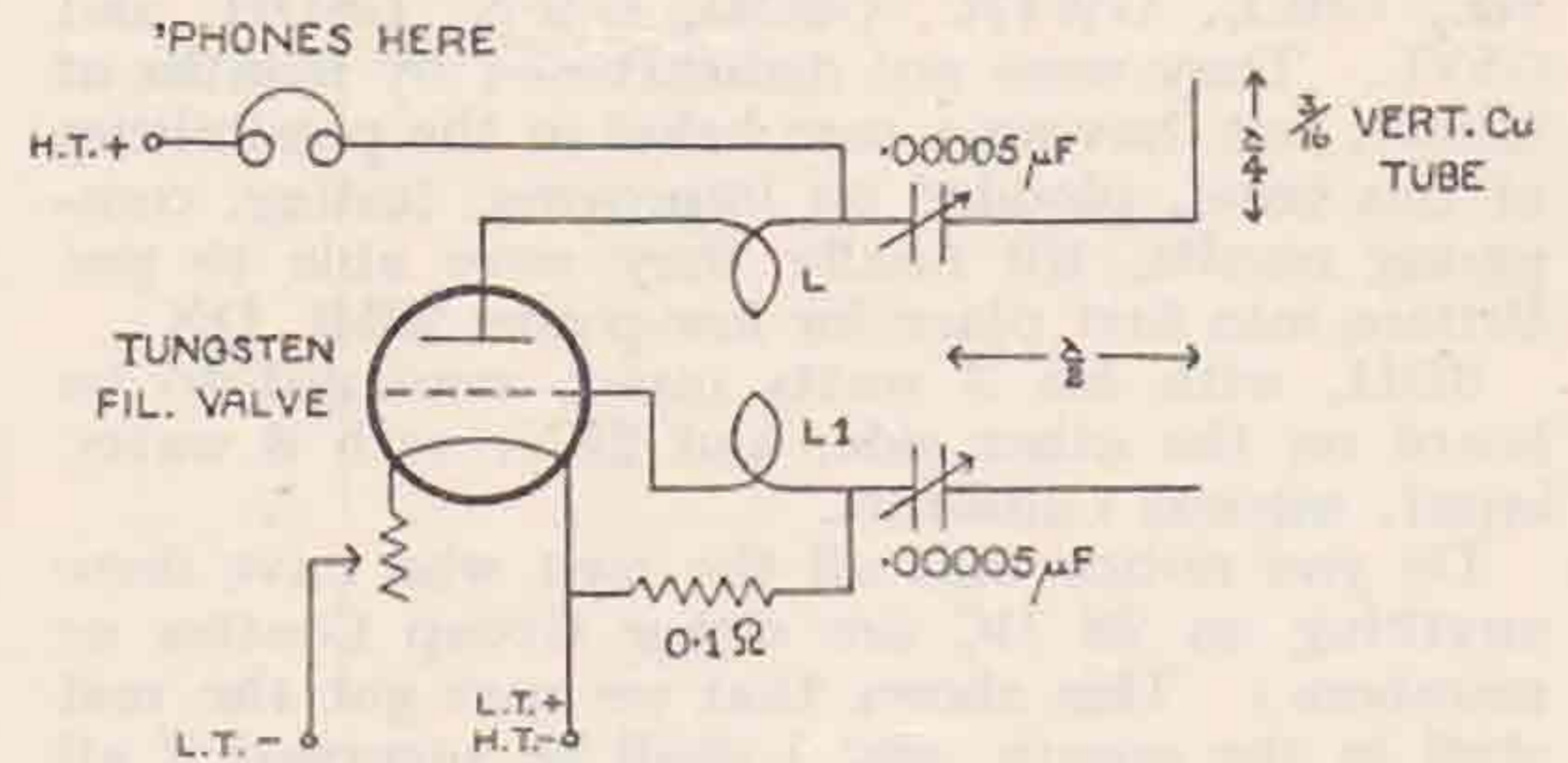
G2FN's DX on 28 MC is fully reported, and is a real credit to our old friend AI2KT. G2NH is logging W stations, but will not be transmitting again on 28 MC until the TX is CC. G6DH, using 3.08 watts from 220 volt D.C. mains to a DE5, was heard by W2JN. His TX is an ultra-audion, grid condenser=.0003 mfd, leak=100,000 ohms anode resistance. He uses a horizontal Zepp. 21 metres long, and the centre of the feeding coil is earthed. The set is suspended by strings and damped by folded towels! G6DH is sure that 28 MC signals are affected by clouds. He says RKV's harmonic is good before 11.00 GMT, and he thinks that Russian stations would be heard then. He also reports that G6GC heard FM8DOT at 10.00 GMT on that frequency, and he passes on the information that OA7DX and OA7CW are on 28 MC 09.00-09.15 week-days, and 02.15 GMT on Sundays.

BRS26 finds a bright clear day best for logging W stations. G6QT finds, contrary to G2FN, that a high L/C. ratio is needed in both TPTG coils. BRS98 is hearing W stations. The notice of special 28 MC tests from the ARRL arrived after the tests had finished!

GROUP 1B.

It is regretted that G6RB and G6PI have had to resign from the group for unavoidable reasons, but G6WT and another will take their places. G6OH has done little, due to business. G5VL is receiving W stations, but wants to know why his Hertz correction factor is 1.352 instead of 1.5? If my latest information is correct, G5VL has worked a W station on 28 MC!

G6LL, the 28 MC hero, is having difficulty in improving the efficiency of the PA. Uses vertical aerial and 50 watts. G5SY has been sending regularly on 28 MC, and gets stable oscillation with HF amplifier in RX down to 5.4 metres, using a DEL210 for detector. He has been QSO G6WT at



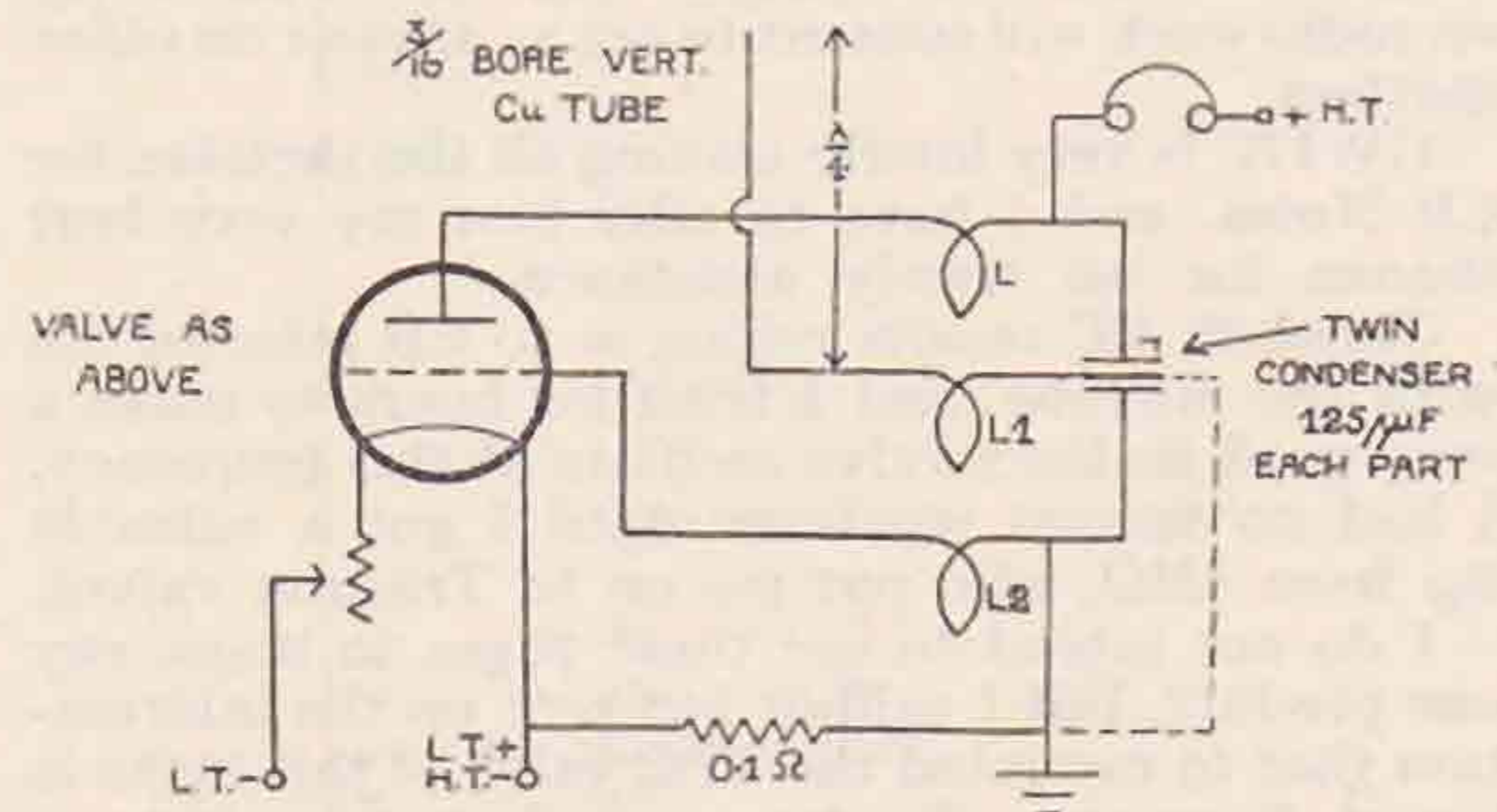
5-10 METRE CIRCUITS

R6/7 with 10 watts. G5SY would like to know if he is the first to get real DX (W6UF) with a screened HF stage? G5VL reports that W6XV was using 6 k.w. in the aerial, but is shut down for a time. WIBYD heard and called G5VL on October 28, but was not heard by G5VL, who is still kicking himself!

GROUP 1D.

2BWB resigns on leaving for a temporary stay abroad (hope you are FIT again soon, OM), and GI5MO fills the vacancy. This group supplies some good stuff on transmitters: tests with ultra-audion on 14 and 28 MC show that it gives a steadier note, higher input at same voltage, and better efficiency than the Hartley. Regeneration control has greatly improved this circuit; this is effected by connecting a neutralising condenser between grid and filament negative. This reduces no-load M/A, keeps valve cool, reduces creep, and eliminates undesirable harmonics. The output with this

ALTERNATIVE SET.



control is as good as that given by a TX without it, and double the input. GW17C's TX gave trouble lately, but the removal of the filament chokes cured it. GW13D and 17C both use half-wave



vertical Zepps. Howl in RX is sometimes caused by loose jack connections, frayed fone cords, or microphonic valves. If RX will not oscillate on 28 MC, try a HF choke in the negative L.T. lead. An unearthed shield is best at GW17C for cutting out mains hum.

GROUP IC.

G5YK has not been successful in making contact on 28 M.C. yet, but is on each week-end. His locked C.C. amplifier has proved very efficient, and the degree of lock splendid; 15 watts to an A.T.40 as F.D. locks about 90 watts to an SW/50 and would probably control even more.

G6WN has a good RX log, and has conquered T.H.! He is having trouble with high feed and bad note in LS5 transmitter.

G5WF uses a balanced bridge type of transmitting circuit, and will describe this soon in the "BULL." (F.B., O.M., bridge methods seem to pervade all branches of electrical work and should be more developed, in my opinion, in radio transmitters.—GI6YW.)

G2BXM has a good log and hopes to have a two-letter call soon.

BRS142 has had to resign from IC due to pressure of other duties.

GROUP IE.

G5KU, though very busy, is planning a S.G. receiver, followed by a limiting amplifier with variable action from straight L.F. to zero grid swing. He favours high C circuits for 28 M.C. transmission, and will experiment with MOPA with frequency doublers and S.G. power amplifiers, if available.

G20D is maintaining consistent skeds with WIAQD each Sunday on 28 M.C. Best results seem to occur on bright sunny days, and "motor" QRM appears to be worst on wet days—probably because of decreased insulation resistance of car chassis to earth.

If 28 M.C. becomes an ordinary channel of communication, G20D prophesies that car ignition systems will have to incorporate an efficient screening device.

GROUP IC.

G2HJ has dropped out through lack of time, but G6WN comes on in his place. G5YK is transmitting on 29.07 MC with CC. BRS142 suggests the Reinartz circuits given in sketch as being worth trying out on this frequency. They are suitable for TX or RX; L1=L2=L=1 turn 1" dia. No. 12 bare copper. When used as a RX the filament rheostat is the control of reaction.

Group 4A (optimum reception times) supplies me with the chart shown here, and I hope that this feature will be of use to the membership. The group is one under strength, and I want someone, preferably in Ireland (according to the Centre 2AUH) to come in and help along the good work.

The group on Hertz aerials has "fizzled out," and I have received no report from Group 2A (Skip).

Group 6A is still held up for want of members. Will members who are willing to work on "cloud effects" please send their names along and assist G5PL to get this group going.

G2CX is starting Group 1F on 28 MC work, and I am very glad to be able to get such another man to take on a 28 MC group. He is using 10 watts to

an ordinary DET 1, but hopes to have the SW model going soon. He is receiving heaps of W stations on that wave.

I hope to be present at the annual general meeting in December, and during my three days' stay in London I hope to meet members of CB and hear their views and suggestions for the future activities of this section.

THIS MONTH'S FAIRY STORY.—GI5MO is so strict about using MC in place of the obsolescent "metres," that he asked me to lend him a megacycle tape measure to enable him to cut a new 14 MC aerial!

To help those people who think that megacycles get further than metres, I suggest a new rule for half-wave aerials: the length in feet (theoretically) is 492.1 divided by the megacycles.

New members this month: G2BI, G6LB, G6TZ, BRS7, G2CX, GW13D, and G6WT (total, 132).

LATER NEWS.

BRS42, whose TPTG receiver is shown this month, is hearing Australians very well on 10 MC in the mornings when using only a detector valve. He is also hearing 28 MC signals and has found that using a CT25 valve cuts out any trace of howl.

The contact between G5VL and USA on 28 MC is confirmed in a letter to CB; he worked WIBJD and W2TP. I understand that G6YQ and GW18B have also got across on this wave.

I am grateful to Mr. F. E. Handy (A.R.R.L.) for having a notice re November 11 28 MC group tests broadcast through the A.R.R.L. O.B.S. network, and to G2FN and G6WT for practical help in the way of stamps for use at CB.

STATIONS AUDIBLE DEC. 20 TO JAN. 20.

COUNTRY.	14 M.C.	7 M.C.
Australasia ...	11.00—16.00 OD—(Fone) 18.00—18.30	OA-OZ 08.00—09.30 —15.30 OP14.30—16.00
South America	19.00—20.00 Doubtful	20.00—02.00 —16.00—08.00
North America	East: 12.00—20.00 Central: 15.00—20.00 West: 15.00—19.00	All day except 12.00—19.00 All day except 10.00—22.00 14.00—16.00 NX heard 17.30
Asia ...	11.00—18.00	AQ15.30—18.00 AG abt. 22.00 AI about 15.40 Generally 12.00—18.00
Africa ...	North: 10.00—14.00 South: 17.00—20.00	06.00—09.00 and 18.00 18.00—23.00
DX Europe ...	Any time during daytime	Any time



# The Valve as an Oscillator and Amplifier.

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

## PART I.

As the whole theory and practice of modern transmission depend so much on the performance of the valve itself it is well worth while for those who hope to understand the former or to achieve the latter to try to get a clear idea of how the valve operates. In writing these notes on the valve the writer has tried to strike a *media via* between the purely theoretical and the entirely non-theoretical point of view, and in so doing he will probably succeed in disgusting the theorists and boring the practically minded. This effort is therefore dedicated to those who, like the writer himself, have already learnt a little and want to learn a little more.

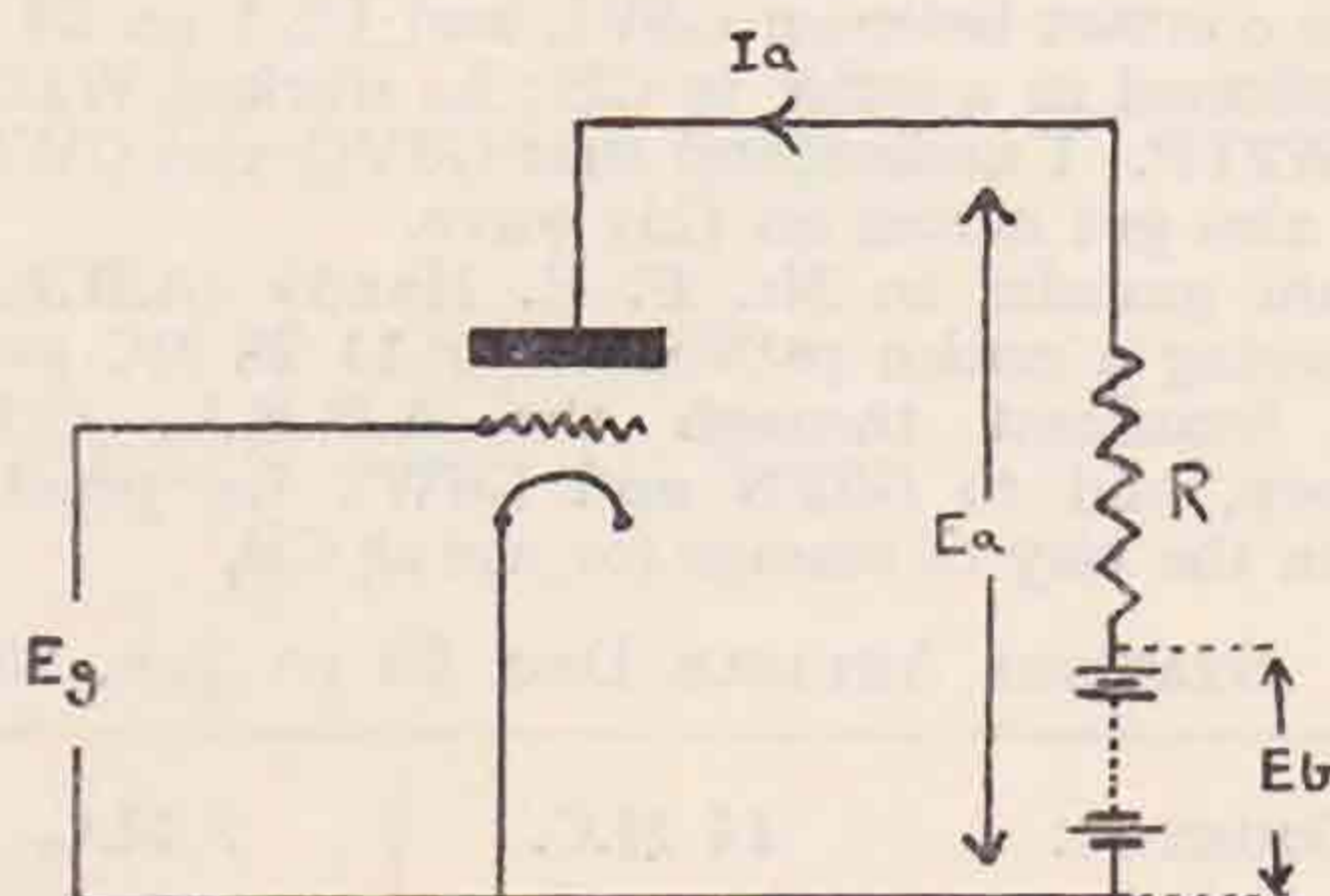


FIG. 1.

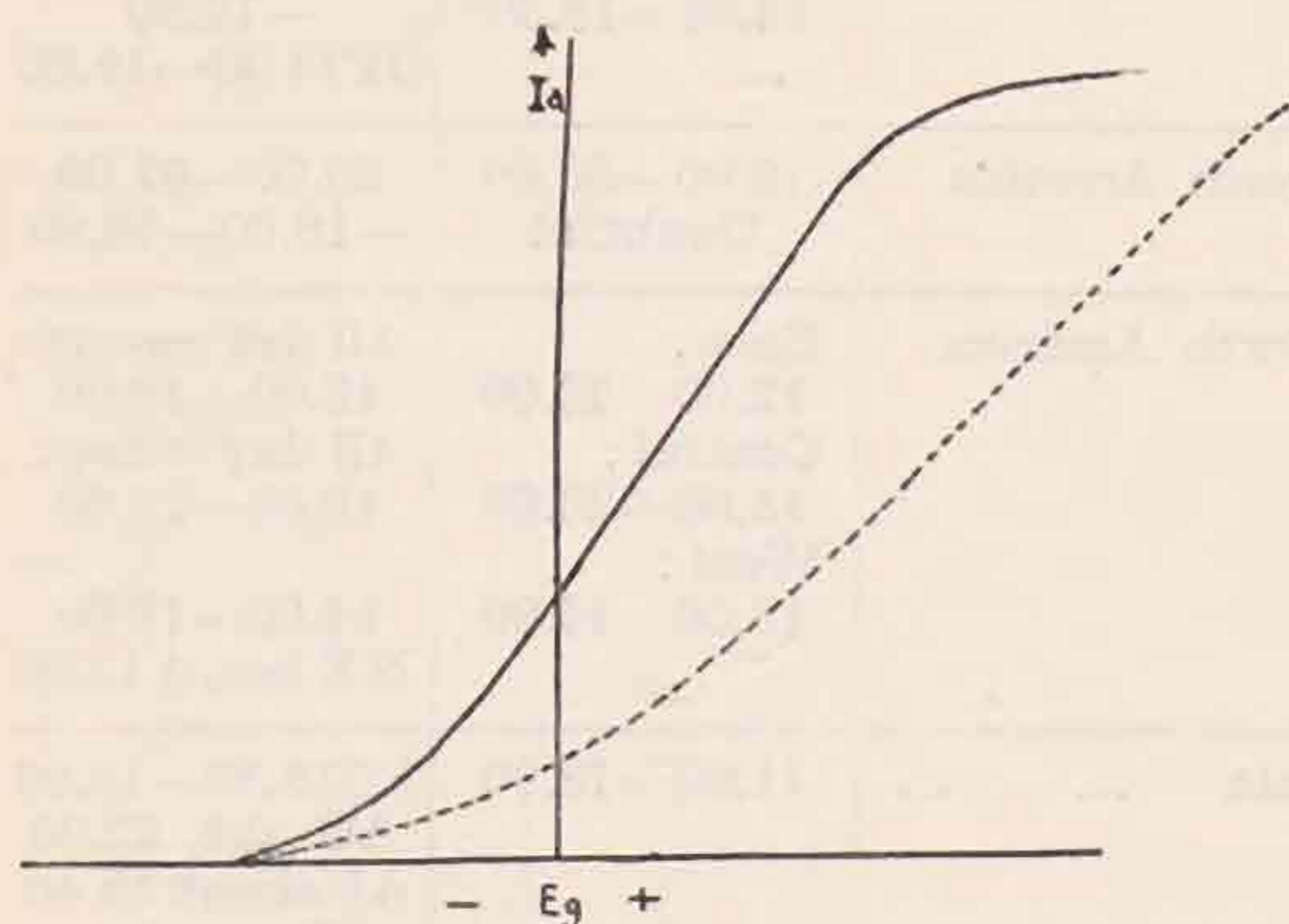


FIG. 2.

Let us first consider what the valve consists of from the electrical point of view. Reduced to the simplest terms, we may say that the valve is a device which has an input and an output circuit, and that if we vary the voltage applied to the input circuit the current in the output circuit will vary. Figs. 1 and 2 illustrate this. The input circuit to which the voltage is applied consists primarily of the grid and filament of the valve, and the output circuit in which the current flows

consists primarily of the anode and filament. In order to make this current flow we must have a battery in the anode circuit, the function of this battery being to give the anode a positive potential which enables it to attract the electrons emitted by the filament. We will call the voltage of this (H.T.) battery  $E_b$  (see Fig. 1).

Consider first the very simple case shown in Fig. 1. A voltage  $E_g$  is applied between grid and filament and a current  $I_a$  flows between filament and anode. If we assume the battery voltage to be fixed  $I_a$  will depend only on  $E_g$ . Fig. 2 shows how  $I_a$  varies with  $E_g$ . This is the ordinary grid voltage— anode current characteristic of the valve. The full line represents the curve as usually taken with no resistance in the anode circuit and the dotted line shows the effect of introducing a resistance  $R$  (Fig. 1) into the anode circuit, the H.T. voltage  $E_b$  remaining the same. We see that the effect of the resistance is to make the curve less steep, that is to say, for a given change in  $E_g$  we get a *smaller* change in  $I_a$ . The main point, however, is that in any case if  $E_g$  is increased (*i.e.*, made more positive)  $I_a$  will increase. Since the resistance  $R$  is connected in the anode circuit  $I_a$  flows through it, and in doing so causes a drop of voltage  $= R \times I_a$ . The actual voltage applied to the anode will therefore be the H.T. voltage less the drop across the resistance, *i.e.*,  $E_a = E_b - R \times I_a$  (see Fig. 1), and it is evident that as the anode current increases the anode voltage decreases and *vice versa*. Now, as the anode current is, roughly speaking, proportional to the grid voltage, it is evident that *an increase in grid voltage causes a decrease in anode voltage and a decrease in grid voltage causes an increase in anode voltage*. This is true for all practical valve circuits, and if the reader is not convinced about it he should re-read the above argument until he is, as this fact is of fundamental importance in all valve circuits.

It follows from the above that if we apply an alternating voltage to the grid a corresponding alternation of anode current will be produced and this alternating anode current will be in step or in "phase" with the grid voltage, while the anode voltage will be maximum negative when the grid voltage is maximum positive, that is in "phase opposition" or "180 degrees out of phase."

Figs. 3 and 4 illustrate the A.C. case. This is still quite simple and the ideas are exactly the same as before, but as the symbols are rather numerous we had better make sure we understand exactly what they stand for. To bring the circuit nearer the practical case grid bias has been included and the voltage of the grid battery is  $E_{og}$ . It is usual to use the suffix  $O$  to indicate steady voltages or currents. Since we are neglecting grid current for the present this  $E_{og}$  must be the actual steady voltage on the grid.  $E_g$  is the actual voltage at any instant between grid and filament.  $E_g$  is the alternating voltage applied to the



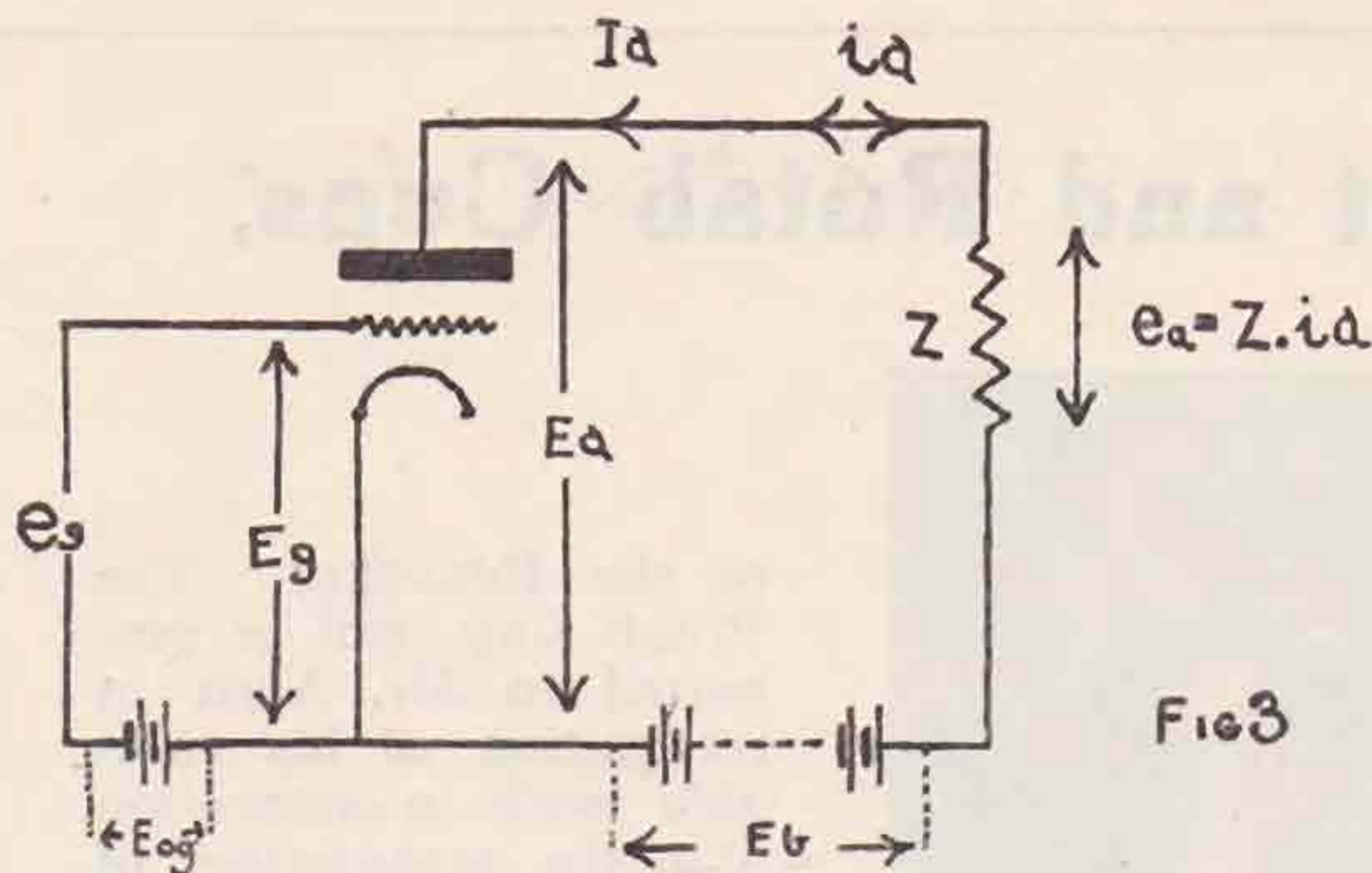


FIG 3

grid. On the output (anode) side the corresponding symbols are:  $E_{oa}$  the steady voltage on the anode (this is  $E_b$  minus the drop of D.C. voltage in the anode circuit),  $E_a$  the actual voltage between anode and filament (instantaneous),  $e_a$  the alternating voltage across  $Z$ , i.e., the output voltage.  $I_{oa}$  is the steady anode current,  $I_a$  is the instantaneous anode current, and  $i_a$  is the alternating anode current caused by and in phase with the alternating grid voltage  $e_g$ .

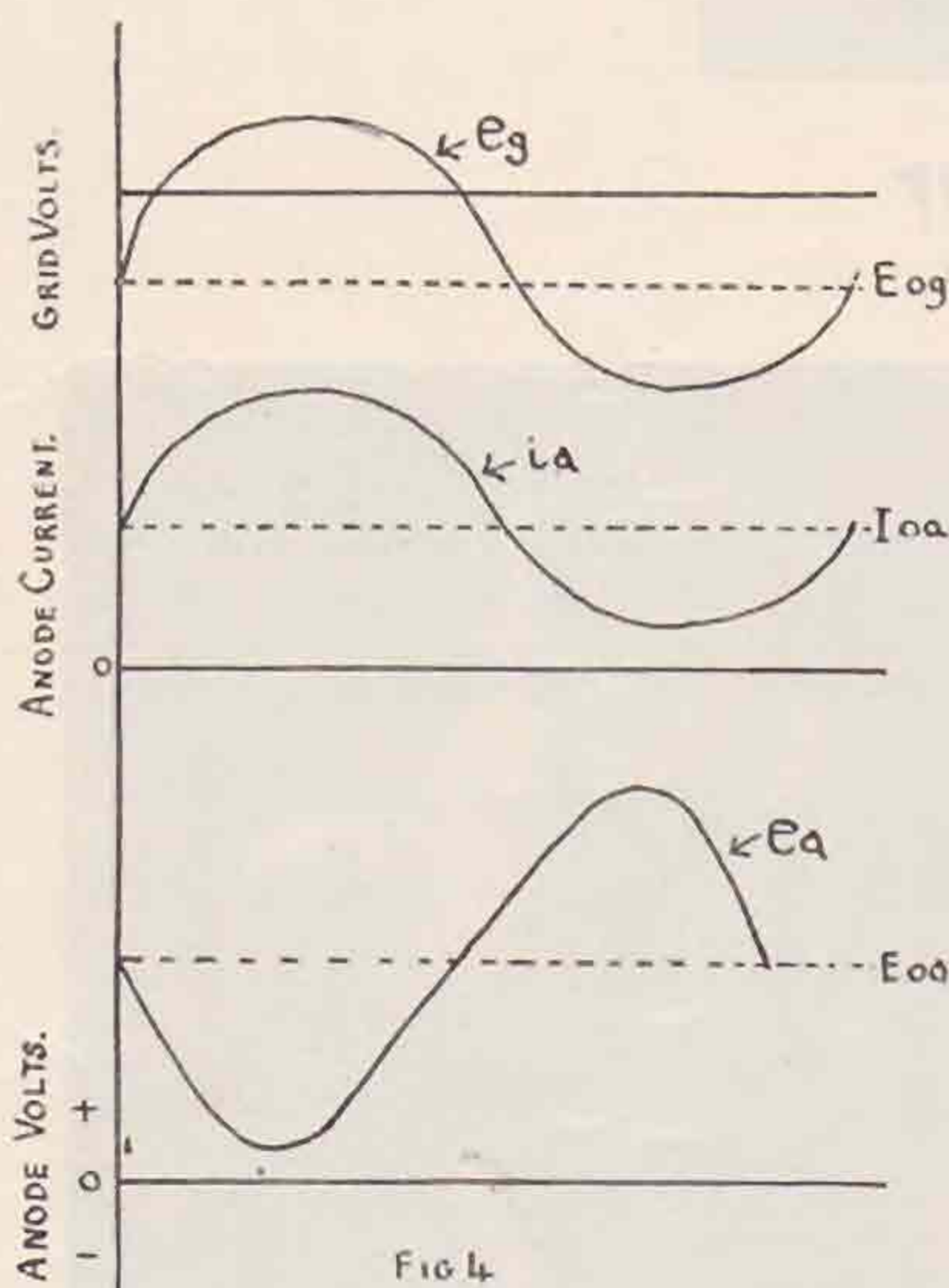


FIG 4

We have put  $Z$  instead of  $R$  in the anode circuit to indicate that we are now dealing with an A.C. resistance or "impedance" which may contain inductance, resistance and capacity, but the argument is just the same, and at any given frequency  $Z$  will have a definite impedance of so many ohms. Fig. 3 is in effect a representation of a simple amplifier in which grid current, the impedance in the grid circuit and the inter-electrode capacities are neglected. If the circuit of Fig. 3 is really understood it is half the battle in understanding the operation of practical amplifier and oscillator circuits, and the effect of taking into account the omissions mentioned in the last sentence is not hard to grasp. Even the final step

from the separately excited amplifier to the self-excited oscillator will be found quite an easy one. All these points will be dealt with later on. Fig. 4 should be studied in conjunction with Fig. 3. It shows the approximate relation between grid voltage, anode current and anode voltage, one complete cycle being shown. It will be understood that the horizontal scale is time. The anti-phase relation between  $e_g$  and  $e_a$  should be noted. It should, perhaps, be pointed out that the "steady" values,  $E_{og}$ ,  $I_{oa}$  and  $E_{oa}$  are simply the averages of the instantaneous values,  $E_g$ ,  $I_a$  and  $E_a$ , that is the values which would be read by D.C. meters in those circuits, but in point of actual fact the voltages and currents are really varying all the time as shown by the sine wave curves and the instantaneous values are given by the distance from the zero line to the curve at any instant.

Under practical transmitting conditions the shapes of the curves usually cease to be true sine waves, particularly the anode current. This will be explained later and practical curves will be found.

In the next part of this article we will discuss the characteristic curves of valves and show how to find the working characteristic for amplifiers and oscillators and how to derive some interesting information from it.

### Battery H.T. Supply.

Some very interesting details have just reached us of a new form of battery H.T. supply, and for the information given we are indebted to G2AUX, Mr. J. Douglas.

G2AUX appears to be one of those unfortunate people who have no mains and are unable to obtain super-power batteries, generators, etc. His first experiments were with the wet Léclanche battery, but these were found to be very inefficient and costly to keep in order. He then turned his attention to Daniell cells. These proved so satisfactory in the experimental stage that he is building a battery of them to give 150 volts. Although the voltage per cell is only about 1.1, currents of 200 m/as. can successfully be drawn from a cell without materially shortening its life.

The glass jars were of the ordinary commercial variety as sold for wet Léclanche work, as were the porous pots, both of which he obtained from the Eton Glass Battery Company. The cell is assembled as follows: the porous pot and the usual zinc rod, which must be well amalgamated, are placed in the glass jar, and a solution consisting of 2 ozs. of zinc sulphate to one pint of distilled water is poured around the pot until it is within half an inch of the top. Inside the porous pot a piece of copper foil is placed, and the bottom of the pot filled to one quarter of its depth with copper sulphate crystals. A saturated solution of copper sulphate is then poured in the pot until the levels both inside and outside the pot are the same.

To ensure freedom from creeping, the jar should be well waxed at the top, and the porous pot should be soaked in hot paraffin wax, top and bottom, for one-quarter depth. When run down the cell is easily renewed by adding more copper sulphate to the porous pot, and perhaps a new zinc when required. The solutions should be changed every three or four months and the cells washed out.



## The Wortley-Talbot and Rotab Cups.

In response to many requests we have pleasure in publishing photographs of the Rotab and Wortley-Talbot cups, which have recently been won by Mr. T. P. Allen (GI6YW) and Mr. J. W. Mathews (G6LL). It will be remembered that the Rotab Cup was presented several years ago by Mr. Gerald Marcuse. The Wortley-Talbot Cup has recently been presented by Dr. Wortley Talbot, as announced in the last issue



of the BULLETIN. The Rotab Cup will be presented to Mr. Allen in recognition of his valuable work in connection with the organisation of the Contact Bureau. The Wortley-Talbot will be presented to Mr. Mathews in recognition of his pioneer work on the 28 Megacycle band.

Both of these cups will be presented at the annual general meeting to be held in London on Friday, December 21, 1928.

THE ROTAB CUP



Mr. T. P. ALLEN



THE WORTLEY-TALBOT CUP



## Dominion Representatives.

The attention of our many Dominion members is drawn to the following rule governing the appointment of Dominion representatives —

"Each of the British Colonies and Dominions may appoint a representative as considered necessary by them, and these may in their turn appoint assistants or sub-district representatives.

"If the particular Colony or Dominion considers it proper they may establish a headquarters of the British Empire Union in their own country, but for the purposes of administration in London each country as a separate area, and all correspondence of a political nature shall be addressed through the Dominion or Colonial manager. Each Dominion or Colonial area shall be self-governed as regards matter or policy."

The Council of the Society welcome the appointment of Dominion or Colonial representatives and feel that the extension of British Empire Union into our Dominions and Colonies will be beneficial to the Society at home and to themselves overseas.

The Council suggest that members of the R.S.G.B. in each Colony or Dominion get together and appoint an official representative who, when elected, will be in a position to appoint a British member to represent his Dominion or Colony at all committee meetings of the Society.

The Council have pleasure in announcing the following appointments of representatives:—

Irish Free State: Col. M. J. C. Dennis, C.B., GW11B.

Channel Islands: A. M. Houston Fergus, G2ZC.

## The Mullard Company's Dance.

The first dance at the new Royal Horticultural Hall was given recently by the Mullard Wireless Service Co., Ltd.

At the dance over 1,500 of the guests were members of the Mullard staff. They came from the large new factory at Balham, the whole of which is devoted to the manufacture of wireless valves. That in itself is a comment on the growth of a comparatively new industry which has created employment for many thousands of people and has brought entertainment to millions. It is an example of what can be achieved by scientific research allied with commercial enterprise.

Eight years ago the Mullard Company was formed and started manufacturing valves at a small factory in Southfields. Under the leadership of Mr. S. R. Mullard it has a man unusual in type, in that he combined scientific knowledge with a keen business sense and an almost boyish enthusiasm which enabled him to laugh at difficulties.

Under his kindly leadership the small workshop and handful of employees has grown to the fine modern factory and the staff which, for the wireless industry, must be considered immense.

## Stray.

G6BW says that a good H.T. accumulator rack can be made in a strong oak framework, the accumulator units resting on strips of plate glass let into the sides of the frame. As the units touch the glass strips only, this provides for maximum insulation, and at the same time is tidy and compact.

## Activities on 28 mc.

Nothing very startling has been done on this frequency during the last month, although several more G stations have succeeded in working America. From the point of view of those stations that are active on 28 M.C., perhaps the most interesting thing this month were the tests held on November 10 and 11, during which time the conditions were, unfortunately, poor, though several contacts resulted.

On November 11 G5VL worked W2TP, given R4 and W1BJD given R5. On the 18th, he raised W1XAM, but the latter broke down. G2FN worked W6UF at 16.30 G.M.T. on November 11, and was reported R5 using 8 watts; he also worked W1AQD. GW17C worked W2JN, and GW18B worked W1AQD. These are apparently the only DX contacts made this month, though quite a number of U.S.A. stations have been heard over here; calls-heard lists follow. Two reports on the November tests have been received from U.S.A.: one from W1BJD, who received G5VL at R5, the only G station he received that week-end; and another from W2TP, who received G6LL, G5VL and GW18B.

It is reported that W6UF has received G2OD, but unfortunately failed to raise him.

G5VL uses 45 watts to a centre-feed Hartley, a DETISW valve and a semi-vertical full-wave Hertz aerial.

November 25 appeared to be absolutely blank as far as DX was concerned, no U.S.A. stations being heard over at all to the best of our knowledge. For the past fortnight 28 M.C. conditions have been getting steadily worse, and November 25 was the first Sunday that no W stations have been heard here since the end of September. It is hoped that the conditions prevailing during these six weeks are the normal state of affairs, and not those prevailing on the 25th, otherwise 28 M.C. will not be of as much use as we had hoped.

It is requested that all stations working on the 28 M.C. band send in any reports not later than the 28th of the month to either G5YK or G6LL, in order that these notes may be as complete as possible.

Calls heard on 28,000 K.C., November 11:—

By G2FN: W1AQD, 1CUI, 2AYR, 2JN, 2AOL, 2CJV, 2AZO, 2CCW, 2TP, 2ACN, 5WD, 6UF.

By GI6YW: W1BLV, 1CH, 2CDR, 8CPR, 2BAC, 1BSU, 9BGQ, K4AGF.

By BRS25: W2JN, 2BDA, 2BC, 2BJV, 2ACN, 2BG, 1XAM, 5WZ.

By G6LL: W2ACN, 2BJV, 2BUG, 2BG, 1XAM, 1ZL, 2BDA, 2AYR, 1AQD.

By G5SY: W2BDA, 2AY, 6UF, 2BD, 1XAM.

By G6WT: G2KF, 2OD, OA2AZ, W2JN, 1AQD, 2BVL, 2BJV, 2AOL, 6DWP, EUR625.

By G2BXM: W2BG, 2BJV, 1XAM, 2CMU, 1RV, 2XC, 6RUF, EF8CT.

By G5VL: W2JN, 2ACN.

By GW17C: W2JN, 2BJV, 2AVG, 1AQD, 2TP, 2ACN.

W2ACN reports hearing G6L during November 11 tests at 1450 G.M.T. He also states that W2TP heard 18B calling him (W2ACN) on the same day just after he had shut down. He says he is on every Sunday 1245 to 2200 G.M.T. and his wave is 10.28 metres.



## Membership.

### NEW MEMBERS.

- J. MEARS, 30, Elm Road, Grays, Essex.  
 W. VAN D. PATERSON, c/o The Edinburgh Tyre Re-rubbing Co., Abbey Street, Edinburgh.  
 W. F. L. CASTLE, Thornhill House, Darfield, Yorks.  
 J. C. COOK (CR2AA), c/o W.U. Telegraph Co., Horta, Fayal, Azores.  
 E. M. CORSEPIUS (CR2AB), c/o W.U. Telegraph Co., Horta, Fayal, Azores.  
 J. H. HARKER (6HK), 31, Ruskin Avenue, St. Giles, Lincoln.  
 G. GOLDING (2AFM), 5, Elm Road, Shoeburyness.  
 C. E. BELL (Associate), 33, Belgrave Square, Monkstown, Dublin.  
 J. W. DEEHER (2AQG), "Donna Nook," Kingsgate, Bridlington.  
 S. W. R. HOWELL, Portland Hotel, Hove, Sussex.  
 C. H. KING, C.S.I., C.I.E., Walldown, Whitehill, Hants.  
 G. BLACK (2BKB), 27, Parma Crescent, S.W.11.  
 R. O. ABEL, "Kingsley" Tolworth, Surbiton.  
 H. V. SCOTT (GI5OT), 44, Hawker Street, Londonderry.  
 J. C. TAYLOR (Associate), Warkworth, Onslow Crescent, Woking.  
 E. BATHO, Chaffey Moor, Bourton, Dorset.  
 R. A. ROWDEN (2BGT), 15, Pennsylvania Road, Exeter.  
 F. T. CARTER, Flat A, Gleneagle Mansions, Streatham.  
 Miss A. J. BURNS, Alhambra, Carlisle, N.B.  
 F. K. MORTON, 5, Ophir Gardens, Chichester Park, Belfast.

### B.R.S. NUMBERS ISSUED.

- 218.—W. VAN D. PATERSON, c/o The Edinburgh Tyre Re-rubbing Co., Abbey Street, Edinburgh.  
 219.—W. F. L. CASTLE, Thornhill House, Darfield, Yorks.  
 69.—A. G. Wood, "Crophorne," Old Catton, Norwich.  
 220.—Miss A. J. BURNS, Alhambra, Carlisle, N.B.

### B.R.S. NUMBER RELINQUISHED.

- 142.—R. JARDINE (now 6QX), 76, Staines Road, Ilford.

## Foreign Representatives.

In accordance with the Society Rule which permits of each Foreign Amateur Radio Society nominating one of its members as British representative, the Council have pleasure in announcing that the following gentlemen have been duly nominated and accepted by Council.

Such representatives will receive honorary membership of the Society during their period of activity as British representatives.

Belgium.—Paul de Neck, Esq., 312, Rue Royale, Brussels.

Denmark.—Helmer Pedersen, Esq., 22, Steinfeldtsvej, Helsingør, Denmark.

Holland.—J. H. Koen, Esq., Nvir, Utrecht, Holland.

Italy.—Ernesto Montu, Esq., Secretary ARI, Milan, Italy.

Spain.—Miguel Moya, Esq. (EAR1), Mejia Lequerica 4, Madrid.

## Notes and News from the British Isles.

### Special Note.

New district representatives take office from January 1, 1929, and members in the newly-formed districts will help considerably if they send their monthly reports for inclusion in the January BULLETIN direct to their new representatives by December 20, unless they receive contrary instructions.

### District Representative Reports.

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

1. Head the report:—

District Number .....

Area Representative :.....(G...).

Address.....

2. Refer to each station as G—.

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

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

(County).

Representative :..... (G.....).

Address .....

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

6. Omit "asides" as much as possible.

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

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

## London Area.

Representative: J. CLARRICOTS (G6CL).

The Hamfest on November 13 was not so well attended as expected; this was possibly due to the lack of advertisement (although there were two references in the October BULLETIN), but I am more inclined to believe it was due to apathy. However, "Hamfests" have come to stay and we hope that with our new districts properly organised in London, we shall be better able to keep in touch with those members who we know are keen, but who require that little extra personal acquaintanceship to get them interested in the social side of the Society.

I am very pleased to announce that our old friend, Fuller (G6LB), has taken office as East London Representative, and that L. H. Thomas (G6QB) has been elected for South London. The Western Division appointment is still to be settled, but whoever is elected will, I am sure, do all he can to back up the other Representatives and help to make the London Area the centre of "Ham Radio" in Great Britain.

The general meeting is fixed for Friday, December 21, and I am to remind you that your vote is essential if you wish to put in a keen Committee.

"Progress" must be our motto for 1929, and in taking leave of you as London Area representative, I wish to offer you all my sincere good wishes for Christmas and the New Year.

### Northern Division.

Representative: G6CL.

G6PP reports the worst spell of conditions for three years. He has carried out local C.C. tests with G5MU on 7 M.C. band and has now got his note just right. Thanks are due to Mr. Piepel for his work in connection with the recent QRA supplement.



G5HJ will soon be on C.C. on 7 and 14 M.C. He has been testing on fone on the lower frequency, and has had gratifying reports from Denmark.

G6DP and G5UM are working on 160 metres, but no direct reports have been received.

G2AX, G5QF and others have all been busy on 1929 designs, but no details are available.

G6CL has now got things reasonably satisfactory for the new requirements. The resonator described by G2NH has been built and I can but repeat his words: "Go ahead, O.M., you will never regret the time spent on the job."

The excellent monitor box described in QST for October has also been built and found to be very useful.

A calibrated crystal supplied by the Xtal Oscillating Co. is being used for checking all transmissions, and an excellent R.F. choke made by the "Lewcos" people has been tested and found to be very efficient on 7 and 14 M.C.

#### SOUTHERN DIVISION.

By 1G6PG.

G2AI is continuing tests with DE6 valves and VF Hertz. Results are very satisfactory, good reports being obtained from EI, EA, EC, EW. He thinks his results show that the VF Hertz does not radiate as a double inverted L as has been supposed. DX reports are wanted on QSB.

G6XP has been on 21.27 C.C. practically the whole month and I has QSO'd U.S.A. most nights and had some R7 reports with 10 watts. Also had reports from FE and AG. The 40-metre band is not used much owing to QRM.

BRS125 has now returned from South Africa and is rebuilding at present.

G6PG has been very QRW of late, but is hoping to get things going soon.

#### EASTERN DIVISION.

By G6LB.

G6LB is still QRT pending a contemplated change of QRA, but is busy preparing his receiver for 1929.

G6LL is still active on 28 M.C., but has suffered in efficiency owing to the loss of his vertical aerial in a gale. The same gale also left him without his 50-foot mast. 7 M.C. phone is still being carried out.

G6UT still receives reports from the Antipodes, but has had no DX QSO's on the new bands.

G5PD is recovering from his accident, and we hope to hear him "on the air" soon.

G6FY has received his new permit on the strength of an absorption wavemeter checked by a crystal resonator, and is still trying for 35 M.C. permits for his CB group.

#### Western Division

By G6CL.

G6WN worked a fair number of Europeans and AG. They are awaiting their W.A.C. certificate. They have been listening on 28 M.C. and have logged several Americans. A new US rectifier is going in shortly.

BRS72 has been receiving on 28 M.C. and has logged W2JN, W2XG and W1AQD. The circuit used is the same as that used by the QRP society on their 8-metre tests. A PM3 is used for the detector. Skeds are wanted on this band.

ZARV has been testing C.C. with help from the G5MU and 2BFA article recently published. A new zincite crystal valve transmitter has been tested. (An article is promised.)

### Mid-Britain (East).

Representative: H. J. B. HAMPSON (G6JV).

I must apologise for the fact that last month's notes were too late for publication owing to unavoidable QRM.

In forwarding his Cambridge notes this month, 2XV breaks the news that he will not be able to undertake the duties of sub-area manager during the coming year.

This is sad and we shall miss his cheery and ever-punctual reports. Our best thanks are due to him for his untiring labours from the earliest days of the BULLETIN, and particularly for the interest and energy which he has always displayed as Recruiting Officer-in-Chief to the Area. Few members of the R.S.G.B. have been responsible for the introduction of more new members than Mr. Jeapes, and we thank him.

Mr. Blake (2BWB) has gone abroad under doctor's orders and we wish him a speedy restoration to full health.

And so—with the Old Mid-Britain Area divided, and the two remaining sub-area managers laying down the reins—I feel unequal to the task of reorganisation upon the new basis, and I therefore ask members of the new No. 6 District to accept my best wishes and to allow me to hand my wand of office to whomsoever they may select to represent them in 1929.

To those who helped me to build the Mid-Britain Area to the peak of its prosperity at the 1927 Conventionette I offer my warmest thanks.

Best wishes for Christmas and 1929 to all members.

#### Hertfordshire.

G8DG is at school in Malvern, but will be home from December 20 and hopes to work many stations on this call. He was G2MV previously.

#### Cambridgeshire.

By G2XV.

G5YK has at last sent in an official report on his past month's work, he has made a new screened grid H.F. S.W. receiver, using two stages of R.C.C. L.F., which he finds gives a much quieter background than transformers. A new mast has also been erected here about 50 feet high, with provision for a quick change of aerials. Quite a lot of time has been spent on the 10-metre band (30,000 K.C.) although results up to the present has been nil. This station will be very nicely settled down ready for 1929 when it arrives.

G6CR has done very little Q.S.O. work during the past month, but has been making many interesting adjustments, etc., to his C.C. outfit.

G5JO has been heard doing some good 7,500 kcs. telephony.

G2DB has got started again and is now overhauling receiver.

G5YX still pushing out a good signal and working most people that he troubles to call!!!

G2XV spent a lot of time this month on the new C.C. outfit and winding transformers. Conditions have been so bad that very few attempts have been made to QSO anybody.

#### Norfolk.

G5UF has worked Asia thus completing four continents QSO'd. He is about to change over to a half-wave ZEPP.

G2AAK reports having joined the C.B. with a view to co-operating upon 10-metre work. He reports "Nothing heard" above 3,500 kcs, although considerable time has been so occupied.

G6JV is rebuilding for C.C. in limited spare time.

### Mid-Britain (West).

Area Representative: D. P. BAKER (2OQ).

I am pleased to be able to report that considerable interest has at last been shown in a Conventionette, and I hope to be able to announce something definite in the next issue.

5ML seems to easily head the list for DX this month, and has been doing very creditable work.

5UW is getting on well with his MOPA, and from what I know of him in the past he will not be silent for long, and then some of us will have to look to our laurels.

#### Staffordshire.

Reports to 5UW.

It would appear that most Staffordshire stations are being rebuilt, judging from the silence of members as to their activities. No member has sent a written report, but as several have attended the meetings of the Wolverhampton and District Radio Transmitters Society, the following reports have been acquired verbally.

2NV has been carrying out tests with a megger to determine the insulation qualities of his aerial system, he says that within an interval of 30 minutes the resistance of his aerial insulators will vary from Infinite down to 300,000 ohms, and his insulators are considered of the best.

5LK has rebuilt a MOPA outfit and has had QSO with several Europeans on the 7,120 K.C. band. Is not quite satisfied with his neutralisation as yet.

5UW has constructed a MOPA set, using push-pull for the PA side, but the persistent gales have wrecked his aerial, and have not as yet permitted its re-erection, so that the new transmitter has not yet been tried out for DX.

6UZ has built a crystal resonator, and has spent a little time with the transmitter on 14,000 K.C. band.

2OQ has now finished his receiver, which is working O.K. and plans are out for the transmitter. He hopes to be on the air in the near future.

A very successful meeting of the Wolverhampton and District Radio Transmitters' Society was held at 5UW on November 14, when 13 members attended. This Society now has 25 members, every one a fully licensed transmitter; included in this number are seven WAC stations. This fact is put forward as a world record for a comparatively local Society. Are there any challengers?

#### Warwickshire.

Reports to 6CC.

2YX is understood to be busy up to Christmas.

2ZW has built a crystal-controlled transmitter and a heterodyne wavemeter. He has shortened his aerial with some success, and has worked several European stations.

5ML has finished his crystal-controlled transmitter. Preliminary tests prove successful. Many QSO's with OA, OZ, W, VE, FK and FO (A5L, A7L, A7Q). All stations report good signal strength up to R9 with an average of over R7. This station finds conditions improving on 14,000 K.C. band about 18.00 G.M.T.

6CC has been on the air only a few times, using a portable outfit kindly lent him by a brother ham. The chief work has been tests with feeders. Some crystals have been ground.

6CI is remodelling his M.O.P.A. to include a crystal. Several new countries have been worked, including Canary Islands.

6XJ with help from 6YD has been crystal grinding. They are building a crystal oscillator for 3,600 K.C.

BRS7 has built a super-heterodyne for the higher frequencies. He intends to work it up to 60,000 K.C.

Station visits: 5ML and 6CI to 6CC, and 6CC to 5ML and to 6CI, also BRS7 to 6CC.



## Southern Area

Representative: L. MAYER (G2LZ).

I am pleased to say we have a few more notes than usual this month, including reports from our friends BRS125 and EXG6FT, from South Africa and U.S.A., respectively.

BRS125 has visited many F.O. stations, and finds the S.G. valve in favour at A3Y and A7L. Average G strength there has been R3 on 20y, and hardly audible on 45 for QRN.

EX-G6FT writes from U.S.A. and says that he has receiver going on 18-60 metres, and hopes to get a T.X. going soon, also a 10m receiver. Sends 73 to 5QV, 2MI, 2MJ, 6VV, 6WI and all other old pals.

G6NZ and G2HJ have had new licence. G6NZ has already started work. One transmitter is C.C.

G5QV writes from a new QRA: "Sunnymead," Harold Road, Clacton-on-Sea. Has been testing out aerials on same transmitter adjustment and gets reports of no difference.

BRS142 is on 10 metres with C.B. Hopes for a radiating permit soon.

BRS144 reports 20 metres poor most of month, 40 metres fairly good. Best DX 5th District, U.S.A., AG and AS.

BRS42 reports OA5BY's fone as his best DX on 0-V-2 at RO-2. Listening on 10 metres, but heard no amateur stations. He wants QRH of NAA.

2AGC is busy at radio now and still experimenting with C.C.

G6LK (late 2BGS) of Cranleigh has just received his new call sign.

2BUW still trying for his full ticket, will be on 10 metres soon.

2ABK has been busy, but a few tests with R.F. chokes have been made, and finds the new "Trix" model very good. He visited 5SN and BRS191 and found pick-ups and amplifiers in the foreground at 5SN. BRS191 is on wavemeter construction and has 2ABK's for check.

Well, O'M.'s, this is the last month under the present Area scheme, so let us have your reports early, so we can end up the notes with a good show.

## South-Western Area.

Representative: G. COURTENAY PRICE (G2OP).

This month I welcome an increase in the number of reports, and hope it will be further increased next month. General conditions during October were bad, growing steadily worse towards the end of the month. Under the new area scheme I shall be very sorry to lose some good friends in Wiltshire and Dorset. The latter is so very far away that I cannot keep in personal touch with it, so I have no doubt that they will be better off.

G2OP is now settling down for the winter's work and hopes to be on C.C. soon.

G2OZ is working QRP (3 watts) T.P.T.G. 42-metre band, and is QSO EB and ED. Is using vertical aerial and wants dope on same from anyone with experience.

G2YX is doing very little, but hopes to be on C.C. soon.

G5VL doing very little, but has been trying things out on 10 metres. Got first report from U.S.A. on October 28, and has since worked two stations there.

G6JK is on new W/L's. Very little doing on 42 metres. EU' EM, FM and NU worked, but with difficulty. On 20 metres, ND Hopes to start experiments on 10 metres soon.

G6RB is now at new QRA, and did not get going till middle of month. Has tried a number of different antennas and finds a full-wave Zeppelin type going very well. Has fitted a screened grid for H.F. amplification and is working well to 17 metres. Is planning a new transmitter for C.C. for new waves.

G6UG has nothing of interest to report. Has done some preliminary work on C.C.

G6XB has been busy getting together wavemeter, crystal oscillator and a C.C. transmitter. Finds 40-metre band bad after 20.00 G.M.T. and 20-metre band worse than hopeless.

G6ZR is getting remarkable strength in England on 2 watts. Is starting on 150 metres and hopes G stations will use this band for local work.

BRS212 has heard W2JN on 10 metres. Kept two schedules with OZ at beginning of month daily.

## Scotland

Representative: J. WYLLIE (G5YG).

As far as the Area is concerned, October has produced nothing worthy of special mention in these notes.

There seems to be a feverish grinding of crystals taking place all over the Area, although few have apparently succeeded so far in obtaining the characteristic note from their transmitters, or yet consistent control from their "specs." Those making use of harmonic control are apparently experiencing considerable difficulty in getting it "deep" enough.

There is one point I should like to mention especially for the benefit of those who are licensed to work with powers well over the customary 10 watts. In order to have efficient C.C.T. you must be prepared to furnish adequate grid bias supply. This may seem a small matter, but is it? Are you aware that with certain systems of C.C. the grid bias necessary approximates 70 to 75 per cent. of

the anode voltage required for the valve. This means no small additional outlay, and has to be faced if efficiency with those circuits is desired.

Very few reports have been received from the whole area, and those which have materialised are practically negative from a transmitting point of view.

During the month I was pleased to receive visits from 2FV, 2MA, 2WL, G15HV, 5XQ, 6UU, 6WL and 6WZ.

Now, here is a proposition I have to make on which I wish particularly comments from the No. 1 District fellows. No comments being received, the proposition will be withdrawn.

Recently I have been successful on one or two occasions in getting the owners of, perhaps, six or seven stations to meet at my house. How all the visitors felt towards these gatherings I don't know, but I have received several letters of appreciation, and for myself, I must say that I found the exchange of ideas most helpful. Here, then, is my proposition.

Let the fourth Wednesday of each month stand as a fixed date, on the evening of which all transmitters free to do so will pay a visit to 5YG. This, of course, will be of more advantage to the No. 1 District fellows than the others, owing to their comparative close proximity to my station, but is also intended as an invitation to any of the others who may find themselves in Glasgow on that day. This, of course, does not mean that I shall not be pleased to see them at any time, but simply that they will be sure of meeting some of the other members at my house on that night. How about it?

I am pleased to announce that the Area will be responsible for the introduction of the second YL station in Great Britain. The lady concerned is Miss A. J. Burns, of Carlisle, who recently qualified as the only licensed sea-going lady operator in Britain. Miss Burns has joined the R.S.G.B., and as her application for a radiating permit has been lodged at the G.P.O., I hope she will be "on the air" before this issue goes to print.

## Northern Ireland.

Representative: C. MORTON (G15MO).

There has been very little activity "on the air" amongst the G1's this month, everybody being very busy building transmitters and receivers to fulfil the new conditions. With the exception of, I think, one or two, the new licences have arrived.

G16HI is spending most of his time grinding pebble lenses, and had the misfortune of breaking the best one in the batch.

G12CN has had little time this month. He is now crystal controlled on 7 MC.

G16WG.—Nothing to report here. He is rebuilding at present.

G15WD is working on 7 MC, using a new T.P.T.G. transmitter, and has been in contact with local stations, a few Europeans. His note is now pure DC from a hand generator.

G15OT is a new station in Londonderry, and is welcomed to "the gang." I wish him the very best of DX and good signals. He is at present on 7 MC with 8/10 watts input from DC mains and accumulators. He has worked FM and Canada, so far, also a number of Europeans.

G15HN is still using the hand gen., and has worked EF, EB, and EN. He intends to be on crystal control soon.

G16TW.—No DX and very little 14 MC work. His receiver is going well on 28 MC, and he has heard WI, 2, 4, 8, 9, districts, and Porto Rico on this band.

G15MO has not been "on the air" all month. The receiver has been rebuilt for 28 MC, and works well, U.S.A. stations being heard at good strength. A new valve rectifier is in course of construction, and will be working soon.

## Notes and News from British Dominions.

### Irish Free State.

Representative: COL. DENNIS (GW11B).

Things have been moving here during the past month, and I am glad to be able to report that two out of the three GW stations transmitting on the 10m. band have been in two-way communication with U.S.A., one of them, 17C, on two occasions—firstly on October 21, when he only missed by minutes being the first station in the British Isles to accomplish this feat, and again on November 11, and the other, 18B, also on November 11, on which date he was also called by another station, W2TP, but failed to QSO. By next month I hope to be able to report that all the GW stations on this wave have "got over." Another matter for congratulation is that practically every GW station on the active list is, or soon will be, crystal controlled, most of them using 2SZ's circuit, and several using "home-made" crystals as well. I have again to thank 17C for his assistance in collecting most of the following reports. Subject to confirmation at their next general meetings, the amalgamation of the I.R.T.S. and Wireless Society of Ireland, which I foreshadowed in my last notes, is now a *fait accompli*.



12B has not been very active, but has arranged skeds with several W stations for the near future.

14B is very active on 45m., and has worked many EU's, receiving good reports. He has a crystal on order as the result of a visit to 17C.

16B is active on 45m., and seems to be getting out well.

18B has worked many W stations on the 20m. band. On 8m. he was QSO W1AQD on November 11, and was also called on that band by W2TP, but failed to QSO. His input was 220v. to a DE5 valve. He is also experimenting with CC on the 42 and 21m. bands.

14C reports too busy for radio at present.

15C has good DX reports on 45m., and has built a 10m. receiver.

16C reports only European DX and has been spending all his available time on CC experiments.

17C is experimenting with CC on the 42m. band, best QSO so far EP3FZ R4 with 7 watts input. He has worked several W districts on the 20m. band with inputs of from 5 to 10 watts. On 10m. with an input of 300v. 34 m.a. to a LS5 valve, he has worked W2JN twice, R6 and R4 as mentioned above. He has been experimenting with a super regen. receiver.

18C reports many EU QSO's and has been grinding crystals.

11D has been heard on 45m. fairly often. Reports that the 20m. band has been "dud" at his station for some time past. He only works at week-ends.

12D is on the air again after a long absence, and expects to be more active now that the DX season is on us.

13D is CC on 42m., using "lenses." He has been experimenting on 10m., but has so far failed to get across the pond.

11B has nothing of interest to report, having been too busy for much radio work, but hopes to be more active in the near future. At his station, DX conditions have been uniformly bad during the past month, so far as his somewhat limited observation goes.

## Africa.

By G. LIVESLEY (FO3SRB).

### Division 4.—Cape Province.

A40, in October, established contact with Europe on 20m. every Sunday (look out for him, you G's on 20 (3SRB)), but conditions were not good. Other of his DX was SB, SA, and SC.

A9A, on September 30, was QSO with Madeira. This is very unusual.

A3Z worked Madeira also.

A40 was also QSO EF on October 2—on 20 metres at 9.10 p.m. (7.10 p.m. G.M.T.—so look for him, R.S.G.B. members).

He also heard EF, EG, EI and FK4MS—the latter station R6 steady D.C. (all on 20 metres).

### Division 5.—Natal.

Heard on Fone from here—A3U, A5L, A8K, A3N, A3A.

A3C has worked OD1JR and A12KW.

A6J keeps daily schedule with B3G. He uses 750 volts. R.A.C. on a DE5 loose-coupled Hartley.

DX conditions here in October are not favourable—only a few NU stations are logged in early mornings. No contacts are made.

### Division 6.—Transvaal.

A4E has changed his transmitting circuit to the ultra-audion—he finds much higher efficiency and easier control. The HF chokes were very critical, and he burnt out three before finding the correct one—once this is obtained, and the FR feed back is stopped, the circuit is delightful, and QSY only a matter of a few seconds.

A4E also says in September that weather is getting warmer, and both DX and local signals coming up in strength. During the latter part of the month the 32-33W band has been filled with European stations, at good strength, after dark.

QSO's have been comparatively easy, with good reports of my signal strength from their end.

NU6DTD, NU6EA, NU6EB, NU6BVH, OP1JR, ES2NAD, EF8GDB, NU7MO, NU6BUX, NU6EA again, EB4RS, NU6EB, NU6EA, NU6AOS were QSO'd in daylight, with the exception of ES, EB and EF—these three latter at 10.30 p.m. (8.30 p.m. GMT).

I am using the screened-grid valve for reception, with great success. The QRN is not amplified with the signal. My Grebe receiver is used without structural alteration—the aerial core of the Grebe is used as the anode inductance of the SG valve, and there is a very tight coupling to the grid inductance.

It has been observed that when weather becomes cold, the wipe-out starts early in the evenings.

The following Div. 6 stations are on Fone: A3Y, A6Q, A9R, A9F, A5B, A6R, A7T.

B3F is using a Baby Burgess transmitter, with an RE504 tube.

A6U was QSO OD1JR in August—he is using the ultra-audion, having scrapped his T.P.T.G. He can now QSY between 20m., 40m., and 80m. in two ticks!

On October 8 he QSO'd SB5AF at 10 p.m. S.A.S.T. (8 p.m. GMT). At both ends signals were R7 and steady.

Wipe-outs (in October) has been playing very strange tricks. In work between A8K and A6U; A8K has been wiped out at 8.30 p.m. (S.A.S.T.) and R6 at 10.30 p.m.!!

During one QSO between these two stations A6U says that A8K came through steadily all the time—yet he was himself R7 at first, and then R2!!!

(I particularly try to give times of the working of African stations in these Notes; it will help you to pick suitable hours, at the European end, for listening for them.—3SRB.)

### District 7.—S. and N. Rhodesia.

Area Manager: G. G. LIVESLEY (3SAB).

My readers of THE BULLETIN must be getting well used to the usual news from this division—i.e., no reports of anything from our twenty or so stations!

FO2SRB is the only Rhodesian station mentioned in "QTC" for September and October—he has been working telephony, which has been received in the Transvaal, and is spoken of as very good quality.

I am doing nothing here as yet.

Anyone who is working may as well pack up for a few months now.

QRN is reported very bad, and the rains and thunder should have begun about the middle of October—but they did not. There has only been one-eighth inch rain here in nine months. The last rainfall was in early February.

In 1927 the first fall of the rainy season here was October 8. So you can judge, friends, that things are looking astoundingly arid!

Cattle are dying in hundreds all over the country, and water supplies are nearly exhausted. The position is very grave. Average daily temperature for October, 95° Fahr. at midday (here). Winds N.E. to S.E.—strong—sky mainly clear of cloud, slight wind, torn drifts of cirro-cumulus, average temperature at dawn, 60° Fahr., at 9 p.m., 78° Fahr.

This isn't wireless news, but perhaps you'd like to hear it. You certainly don't see it in the "Daily Mail."

Of OM Whitman, of Buluwayo, our new member, I have no gossip.

The following is extracted from "Q.T.C." I think readers will find it worth reading.

#### TRANSMITTING CIRCUITS.

Tests at FOA40 (Kimberley, Cape Province).

Some tests were recently undertaken to determine the most efficient transmitting circuit for use at A40.

It is not claimed that the results in Table A are conclusive evidence of the superiority of any one circuit, or that my method was correct.

"Input no-load" and "input load" signify respectively "without antenna" and "with antenna."

"Transfer" indicates difference between "load" and "no load," which difference is assumed to represent the energy transferred to the radiating system.

Antenna current readings are not given, because they are only comparative, but the antenna current was actually directly proportional to "transfer" in every case; that is, the ultra-audion gave highest reading.

Although the Baby Burgess (much used in South African circles) is a persistent oscillator, the lack of a "feed back" control leaves much to be desired. This could be remedied by one of the methods suggested by Kruse in QST.

Excessive grid excitation, in the writer's opinion, is not a good feature, and the conventional "Baby" is prone to it.

Too much trouble was not taken with the Hartley; no doubt it could be made as efficient as any of the others, but "juggling" with "clips" is a poor business.

Circuit.	Input— No Load.	Input— Load.	Transfer.	Efficiency.
	M/A Watts	M/A Watts	Watts.	Per cent.
Baby Burgess ...	24—4.8	35—7	2.2	31.4
Hartley ...	12.5—2.5	22.5—4.5	2.	44.4
T.P.T.G. ...	10.0—2.	22.5—4.5	2.5	55.6
Ultra-audion ...	8.5—1.7	22.5—4.5	2.8	62.2

Constants: Input Voltage=200.

Wave-length=36.5 metres.

Antenna System=Current-fed Hertz on 2nd Harmonic.

The figures speak for themselves—the R.F. Chokes were made efficient for each circuit as it was tested.—FOA 40.

A40 neglects to give particulars of his valve, which rather spoils the usefulness of the article, in my opinion.—3SRB.

### Division 8.—British East Africa.

By L. J. HUGHES (FK1MS), of Nairobi B.C. Station).

(I should like to remark that this Division *always* sends in masses of interesting notes—yet it is far more isolated as regards position than those divisions of the Union of S. Africa. Hughes (FK1MS), who, I think, is one of our members, deserves much praise.—3SRB.)

Nairobi B.C. station began regular programmes on July 15 (call 7LO) on 90 metres.

This WL skipped too badly. 7LO is now on 150 metres. This is not received well in the Union—if at all.

Signals are good locally up to 40 miles on 150m., but fade like the deuce, and there is a background of strong QRN.

Sixty metres may prove a better wave-length. Power is 5 kw.!! The 150m. wave is picked up rather badly jammed by static at



Mombasa—very bad fading, and is commercially of no use. It has also been reported by GFTN (DUMRA) at Mikindani, south of old German E. Africa.

7LO will shortly work a simultaneous broadcast on 36 metres and 400 metres. If successful, Johannesburg may copy this. It is impossible, we have proved, to serve a 400 mile radius with one WL.

VQE, Pemba Radio, is going on short waves soon. Mostly he will work during the day. If he works at night, and you hear him, please QSL to DWT—Zanzibar Radio. Same QRA as VPZ: Zanzibar, which is now testing SW apparatus.

Dar-es-Salaam (Tanganyika Territory) is on the air now—GZI, using a Radio Communication Co. short-wave set—pure D.C. note. Power: .25 kw. actual input to oscillating valve. Antenna is variable in length and is coiled on a drum—WL can be varied from 15 to 80 metres; will probably work on 35 metres, like 3MS (VPQ). Look out for FKILM!

OM Alton, late 2nd op. of GJVN, Khandalla, is now Postmaster in Seychelles. He hopes to take up short-wave working when he gets settled down, and will be an acquisition, since he is a fine operator, with a long naval and commercial experience.

OM Wade—FX1MA—is working on 40 and 21 metres; usually QRV with call at 1500 on 40 metres. QRA: c/o Mauritius Radio. We welcome a new member in Tanganyika. OM Atterbury, of Dar-es-Salaam. He is a telegraph engineer by profession. His call is FK2DSM.

4MS, after a little working on 32 metres, is now back on 21, where he says that conditions are improving after a bad two months' spell. He has reported a few QSO's with England.

More about the wave-lengths of 7LO at Nairobi—36 and 400, the 36 will give us a range similar to the other famous "LO" stations, but we cast grave doubts on the 400 wave.

Long and bitter experience of QRN tells us it is retrogressive; the 150m. wave-length was a better frequency, with 30-40 for the short WL. In any case, there ain't any 35 for broadcasting, so it must be in the region of 31 or 40, according to allocation.

Heard a new station the other night. . . . French HYH—Dzau-dzil—Comoreo Islands. I QSO'd him with FK3MS to show there was no ill-feeling!

FOA5O came in well here on August 22 at 0530. He was calling CQ and working NU. It was broad daylight here. A5O did not hear 3MS (3MS uses high power, and is a commercial—3SRB).

#### GENERAL REMARKS.

##### New QRA's.

FOB3M.—H. Howarth, 29 B, Siemert Road, Doornfontein, Johannesburg.

FOB3N.—S. Ellis, 82, De Korte Street, Braamfontein, Johannesburg.

FK2DSM.—W. A. Atterbury, G.P.O., Dar-es-Salaam, Tanganyika, B.E.A.

FOB3A.—I. J. Van der Walt, 27a, 11th Avenue, Mayfair, Johannesburg.

##### Changes of QRA.

I de B. Clifford Fynn (FO2SRA), Department of Lands, Salisbury, S. Rhodesia.

FOA6N.—Major Swart, "Leigh," Bishopsleigh Road, Rondebosch, Cape Province.

##### New QRA's.

Three stations of the Anglo-American Corporation in N. Rhodesia. Call sign. Address.

FOHILL.—R. S. Page, Broken Hill, N. Rhodesia.

FOCHAN.—H. M. Norman, N'Changa, via N'dola, N. Rhodesia.

FOWANA.—W. Stenning, B'wana M'Kubwa, N. Rhodesia.

Station "HILL" uses 10 watts and a Baby Burgess transmitter.

One of our R.S.G.B. members, BRS125—E. T. Somerset—is in the Union. He has been welcomed and given "the freedom" of Division 6 of the S.A.R.R.L.

## Notes and News from Europe.

### Belgium.

We have to record with the deepest regret the resignation of our Hon. Secretary (Mr. M. Oremen, EB4FU), also of our "Cash Manager" (Mr. Hunnink, EB4UA), both for personal reasons. Mr. Ulrix (EB4OU), our well-known 'phonist, will take both jobs on his shoulders in the future.

Conditions for DX work have been very bad lately, and night after night it is impossible to work a distant station (especially U.S.A. stations) and even to hear one of them. This prevailed for October and the beginning of November.

Our training ship, *L'Avenir*, sailed on November 3 for La Martinique, and from there to Tampa Fla. Her call is XEB4WK, with a pure D.C. note, and on a QRH of about 9,400 kc., just a little above PCPP.

All hams are cordially invited to work her when possible, and will be gladly received on board, to have a look at the station when the ship is in Tampa harbour.

Please apply to the master, Captain Vandezande, or to the wireless operator, Mr. Vandelmans.

On telegraphy, good work has been done, despite the conditions, by EB4DI and 4RS, who worked Japan lately, a most difficult QSO from here. EB4BC, 4FP, 4AR and the usual DX gang, are still going strong whenever conditions permit.

EB4AU, Mr. J. Mahieu, who was second in the International contest, and who is well known by the W gang, has been severely ill for the last month, but we are pleased to record his complete recovery.

'Phone amateurs are more and more turning to the "Van Gasse" ckt, and 4AI, 4VG, 4TO and others are obtaining real good reports. EB4OU got an FB report from a French military station, UF2, situated at Fort Flatters, in the middle of the Sahara, a quite deserted spot 600 kilometres south of Ouagala, and puts on good press news to the above-mentioned sailing vessel, XEB4WK.

### Denmark.

By ED7SP.

Conditions in Denmark are at present excellent. During the day most Europe can be heard with quite good QRK, and QSO's are easily established. During the early mornings until about 8 o'clock, G.M.T., numerous OZ and OA stations are heard in the 9,400 kc. band, very often with just as good strength as European stations.

From 20.00 to 21.00 G.M.T. some China stations have been heard on about 8,500 kc. (QRK R5-8); also AG and AR, and a little later NX. About 22.00 to 23.00 G.M.T., sometimes earlier, SA, SU, SC and SB may be heard, and NU stations go in at full strength by midnight and during early mornings.

On 15,000 kc. only NU has been heard with regularity; during daytime this band seems to be rather quiet.

To help Danish hams to prepare for the 1929 conditions, E.D.R. has now taken up the work of calibrating wavemeters, and members of the Danish Organisation may have their wavemeters calibrated at very reduced prices. Further, as a good many Danish hams are going to have their sets crystal-controlled, E.D.R. is making arrangements to supply them with crystals, which may be had at moderate prices.

Also with regard to the 1929 conditions, E.D.R. had a discussion evening on November 22. 7JS began the discussion, "Reasons For and Means Against QSSS."

The Danish Expedition ship, *Dana*, is by this time in the Pacific Ocean and has on board the short-wave station OXQ (usual QRH 8,100 and 13,000 kc.), by which it is in daily connection with the Copenhagen station OXZ (9,850 kc.). Both stations can be heard Tuesdays and Fridays at sunrise. Reports will be highly appreciated.

### Holland.

By J. H. KOEN, B.Sc.

These few lines will form the first of a series of short monthly news bulletins from Holland written by the "official link" between the R.S.G.B. and N.V.I.R. Now that 1929 will soon be before us, matters are put on a firm basis by our national headquarters. Several new departments were officially opened: there is a traffic department, a sales department, a QRH department. The QSL department from now on has got a new address. In future all cards should be sent *via* Bouwman, Voorschoten, Holland. These three words take the place of "Pse QSL *via* I.A.R.U." which was the old-fashioned method of forwarding cards. It is hoped that the QRH department will be accepted by our Government as the official bureau for checking wavemeters.

Conditions for short-wave transmissions were very uncertain during October. The last week of the month mentioned brought us a considerable increased ship-distance after sunset. Twenty metres was quite "dud," only on a few mornings some high-power people succeeded in reaching the Antipodes. The last sensation that reached the writer's office was that ENODU got into touch with Portugal on 15,000 kc. during an hour; this contact was made in full daylight with 3 watts input. Signals were reported R6 and very steady. This was the first time that ODU hit the key on 20.

### Germany.

By E. REIFFEN.

DX conditions did not improve appreciably during November, the 14,000 kc. band particularly being totally "dead" on many days. At present German hams are getting ready for 1929. Unfortunately, we will have to dispense with experiments in telephony during the coming year because the Post Office is issuing no phone licences at all. Therefore, it is probable that in the future still more EK's will concern themselves with DX work, and we ask all foreign amateurs to send lists of German calls heard to the German Section of the I.A.R.U. (QRA: D.A.S.D., Berlin W57, Blumenthalstrasse 19), and they will be published in "CQ." We are always delighted to have "visual QSO's," therefore, will all our foreign friends who come to Berlin at any time please let us know beforehand, so that we can show them round and introduce them to the Berlin hams. Vy 73 to all.



## QRA Section.

Manager: M. W. PILPEL (G6PP), 54, Purley Avenue,  
London, N.W.2.

It is some considerable time since a list of QSL forwarding agents appeared in these columns, and in compiling the list below, I have attempted to make it as free from error as possible, even at the expense of some omissions. It will be noticed that there are several notable absentees, about which I had no definite up-to-date information, and I am relying on members to fill in the blanks, so that they can be published in this column at some future date.

Within the past few weeks all licensed Russian amateurs have been allotted new call signs arranged into districts. The calls are of conventional style, consisting of a numeral followed by two or three letters. The districts are as follow:

(1) Siberia, (2) Moscow, (3) Leningrad, (4) Volga, (5) Ukraine, (6) North Caucasus, (7) Trans Caucasus, (8) Turkestan, (9) East Russia.

QRA'S WANTED.—The addresses of the stations following are incorrect in the 1928 Annual. Will anyone having definite information concerning any of them, please send it on to me. Thank you.

G2JL, G2LU, G2GA, G2AF, G2OI, G2PN, G2RJ, G2RZ, G2UR, G2QU, G5HD, G5NA, G5ZU, G6FC, G6FS, G6FV, G6HD, G6IR, G8IU, G8UP, G8YY, 2AAF, 2ADF, 2AMF, 2BCC, 2BHR, 2BII, 2BNX, 2BQI, 2BTK, 2BUI.

And last, but by no means least, a Merry Christmas to all and the very best of luck in 1929.

### QSL AGENCIES.

ARGENTINE.—"Radio Revista," Lavelle 1268, Buenos Aires.  
AUSTRIA.—"Radiowelt," Wien 111, Rüdengasse 11.  
BELGIUM.—"Reseau Belge," 11, Rue de Congrès, Bruxelles.  
BERMUDA.—W. F. Horsington, Paget West, Hamilton.  
CEYLON.—"Ceylon Radio Times," P.O. Box 59, Colombo.  
CHILE.—L. M. Desmaras, Esperanza 555, Santiago.  
CHINA.—G. W. Fisk, 303, Victoria Road, Tientsin.  
CZECHO-SLOVAKIA.—Radio Klub Cesko-Slovensky, Praha 11, Slovansky Ostrov.  
DENMARK.—"E. D. R.," Holmens Kanal 5, Köbenhavn K.  
ESTONIA.—V. Suigusaar, Hõbe t. 4, Pernau.  
FRANCE, ALGERIA, MOROCCO, ETC.—M. Larcher, Boite Postale 11, Boulogne-Billancourt, Seine.  
GERMANY.—"D.F.T.V.," Berlin W57, Blumenthalstrasse 19.  
HOLLAND.—H. Bouwman, Voorschoten.  
HUNGARY.—"M.R.A.E.," Buday Lazslo ut. 5/c., Budapest.  
IRAQ.—C. D. Connerton, P.O. Box 117, Baghdad.  
IRISH FREE STATE.—J. B. Scott, 9, Upper Garville Avenue, Rathgar, Dublin.  
ITALY.—"A.R.I.," Viale Bianca Maria 24, Milano.  
KENYA COLONY AND EAST AFRICA.—"The Times of East Africa," Box 194, Nairobi.  
LETTLAND.—M. Karklin, Tvaika 34, Riga.  
LITHUANIA.—B. Eliashewitsch, Presidento Gatve 11, Kaunas.  
LUXEMBURG.—J. Wolff, 67, Avenue du Bois, Luxemburg.  
NEW ZEALAND.—F. D. Bell, Waihemo, Palmerston, Otago.  
NORWAY.—L. Salicath, Voksenlia, per Oslo.  
POLAND.—"L.K.K.," Bielowskiego 6, Lwow.  
PORTUGAL, AZORES, MADEIRA, ETC.—"R.E.P.," 15, Costa do Castelo, Lisboa.  
RUSSIA, AZERBAIDJAN, TURKESTAN, ETC.—"Radioliubitel," Ohotnif Riad 9, Moscow-Centre.  
SOUTH AFRICA.—"S.A.R.R.L.," Box 7007, Johannesburg.  
SPAIN.—"E.A.R.," Mejia Lequerica 4, Madrid.  
U.S.A.—"A.R.R.L.," 1711, Park Street, Hartford, Conn.

## QSL Section.

BY A. HINDERLICH, G2QY.

Having just completed the first month on this work, I would like to take the opportunity of reviewing the existing arrangements with a view to smoother and swifter working in the future.

Cards FROM abroad should be addressed to:—

QSL Section, R.S.G.B.,  
53, Victoria Street, London, S.W.1.

Communications from British stations are preferably sent to:—

G2QY,  
15, Lyncroft Gardens,  
London, N.W.6.

Any packets on which excess postage is demanded are not accepted, but are given back to the postman for return to sender. The post is then opened, and sorted into groups of Letters, Cards and Envelopes. Cards from British stations unaccompanied by the minimum of twopence in stamps are put straight into one of the sender's envelopes and returned to him. The cards now have to be sorted THREE times. Once into groups of Foreign, 2's, 5's and 6's, then each group according to letters, and finally into their respective envelopes. So far the work has been a real pleasure, and I don't care how much of it comes along, but now the trouble starts in large quantities, and will be referred to again under the headings of Envelopes and Missing Envelopes. Those envelopes which contain sufficient cards are extracted, and placed in the post.

Now for my worries, which actually take up more of my time than getting the post away. It may appear as though I were asking you to spend several minutes in order to save myself a few seconds, but when those seconds are multiplied by the number of envelopes in the files (about 500) and the number of times a week that the files are in use (about four) the answer is hours per week spent in messing about on unnecessary work.

ENVELOPES.—Awkward sizes cause delay because either a large envelope or the card has to be folded, when it probably traps others. Every stationer has a few sizes between 7" x 5" and 6" x 4", with the opening along the smaller side. Get a packet of them, pick out three or four, place them with the opening to the left, and write your call sign only (no "Radio" or "G") in the extreme top left-hand corner. Immediately below this, put any request you have, in the form of "Wait for 6 cards," or "Wait for 12 cards." Then write your own address as is customary, and stick a 1½d. stamp in the top right-hand corner. All this may sound silly, but it saves time.

QSL cards larger than normal post card size get folded when sent abroad. Originators of large cards, please note.

MISSING ENVELOPES.—The main source of trouble is that nearly half the active transmitters at any given moment have no envelope here. In a month we have already accumulated about 5 lbs. weight of loose cards, and the weight is going up every day. It will soon be impossible to keep them available for immediate despatch. We spend more time in raking through the same old duds than in dealing with a week's fresh arrivals. As far as we can see, the only thing to do in future will be to throw all cards, that cannot be placed in the recipient's envelope at the moment when the new mail is being sorted, on a heap that will only be sorted through again about once a month. We realise that many stations are unaware that their supply of envelopes has run out, so for this once only, here is a list of those stations for which more than three cards were waiting on November 19:—

2AV, 5UQ, 6DA, 6KO, 2AO, 2GF, 5BR, 5FQ, 5GS, 5HA, 5QS, 5TD, 5TZ, 5WQ, 5YX, 6NO, 6SO, 6TD, 6WL, 2AU, 2BM, 2CH, 2CB, 2CS, 2GH, 2HD, 2JU, 2QH, 5BQ, 5BY, 5IR, 5MU, 5NN, 5WK,



5WT, 5YU, 6AS, 6BY, 6JK, 6DH, 6PA, 6QC, 6SM, 6TX, 6UJ, 6UU, 6UY, 6WO.

**STAMPS.**—When sending your stamps, it will be of great assistance if you stick them by the edging, or very lightly by one corner to a separate scrap of paper, not on to one of the cards, or put them in loose, as they are apt to flutter out and get mislaid.

**"INTERMEDIATES."**—These are in a fair muddle now, but nothing to what is going to happen next year. Would you co-operate by always writing down the nationality letters (and in fact the whole call sign) exactly as you hear it? I get quite enough EGPG6H and EGG 5 OT and EG(G1)5WD and similar flights of the receiver's imagination to sort out as it is. If the other fellow sends you his country, you can help by spelling it out in full. This will be particularly useful to everybody concerned between December 15 and January 15.

Now let's see if I can't save some of your valuable time.

The addresses given above are quite sufficient. If you want to indulge in a little mild flattery by adding "QSL Manager," don't let me stop you, but your letter doesn't get to me any quicker.

If you want to write out "To Radio . . ." on the back of every card, carry on, but what the sorter is really looking for is the nationality letters and call sign. Just the name of the town in which the recipient is working does not help either—as a rule the call sign is sufficient, but if not, it's the full address that is wanted.

There is no need to write out "Via R.S.G.B." We do that ourselves with a rubber stamp. Cards for abroad go to the main amateur society, but if you have a definite preference in the case of Belgium, Hungary, Poland, Latvia, Esthonia, Roumania, Switzerland, and so on, then by all means say so.

Please do not think that because I have such a long list of trouble, I am really grouching at you fellows. It is just because those of you to whom I have written have been so quick to adopt my ideas that I venture to give the whole list, even though there be only a couple of offenders. It will also save my having to write to every newly-joined member.

Having had my little say, I should welcome comments and suggestions to make the work of the section of greater use to all concerned.

## EXCHANGE & MART.

Rates ½d. per word, minimum charge 1s. 6d.

**G6BB SELLING UP!**—Valves, U5 (new), £1; debased LS5, 15s.; DE5, 5s.; DE5A, 5s.; Transformers, 500-0-500 and 3-0-3 for 100-volt mains, 50s.; Heayberd 3½ amp. 3-0-3, 7s. 6d.; 0-6-16 for 100-volt mains, 10s.; 5 T.C.C. 2 mfd. condensers, 2s. each; Sifam milliammeter, 0-50 ma., 17s. 6d.; fixed and variable condensers, key, neons, resistances, etc.—Write requirements to G6BB, 31, Court Lane, Dulwich, S.E.21.

**TANTALUM AND LONIUM.**—Make your own battery charges for alternating current. Simple, reliable. Lionium rectifying Electrodes, 2-4 amps., 12s.; 6-10 amps., 16s. Also Transformers, Blue Prints and complete chargers.—BLACKWELL'S METALLURGICAL WORKS, LTD., Liverpool.

## "ALWAYS" RESISTANCES.

**PATENTS** obtained, Trade Marks and Designs registered, British and Foreign.—GEE AND CO., Patent and Trade Mark Agents (H. T. P. GEE, Member R.S.G.B., A.M.I.R.E.), 51-52, Chancery Lane, London, W.C.2. Telephone: Holborn 1525.

**WANTED**, "Wireless World," April 2, 1921, June 4, 1924, January 14, 1925, and "QST," September, 1923.—HUGH N. RYAN (5BV), 24, Woodhayes Road, Wimbledon Common, London.

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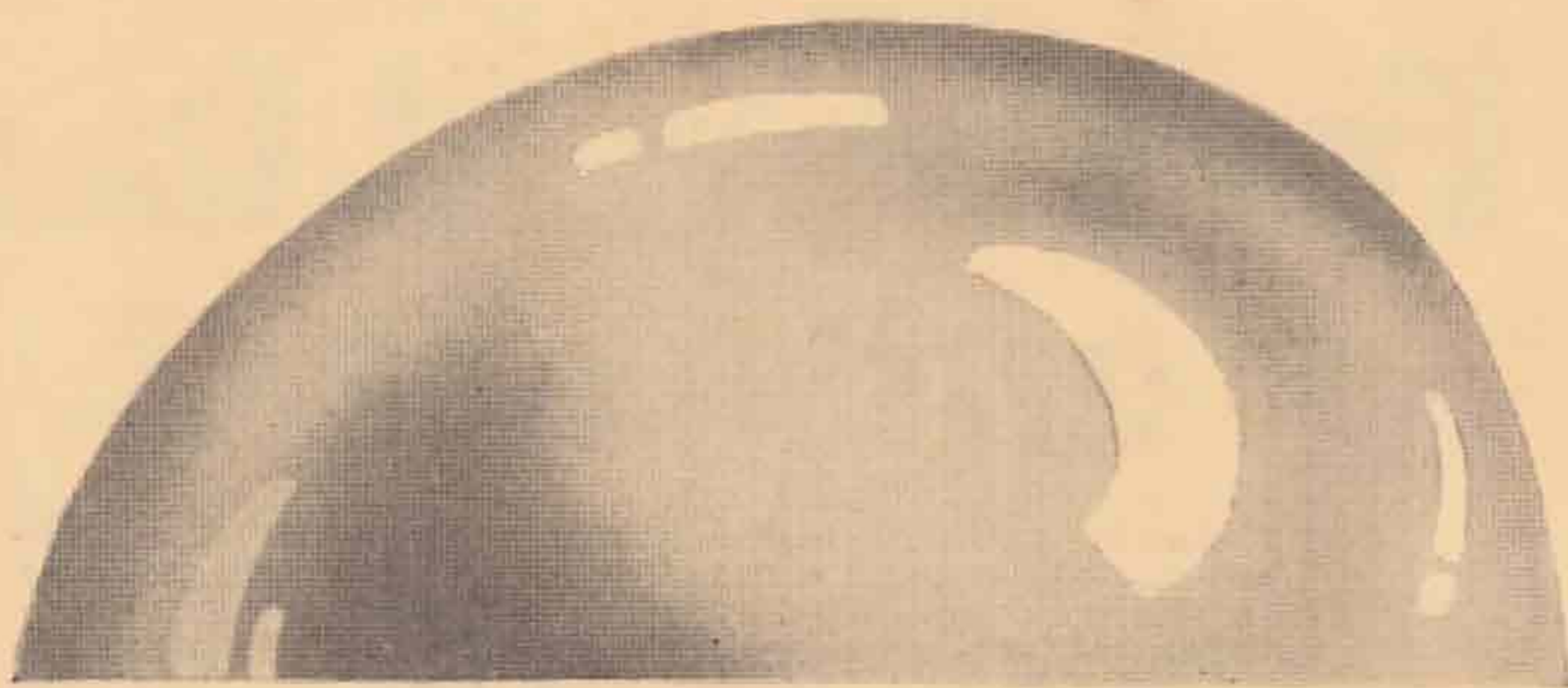
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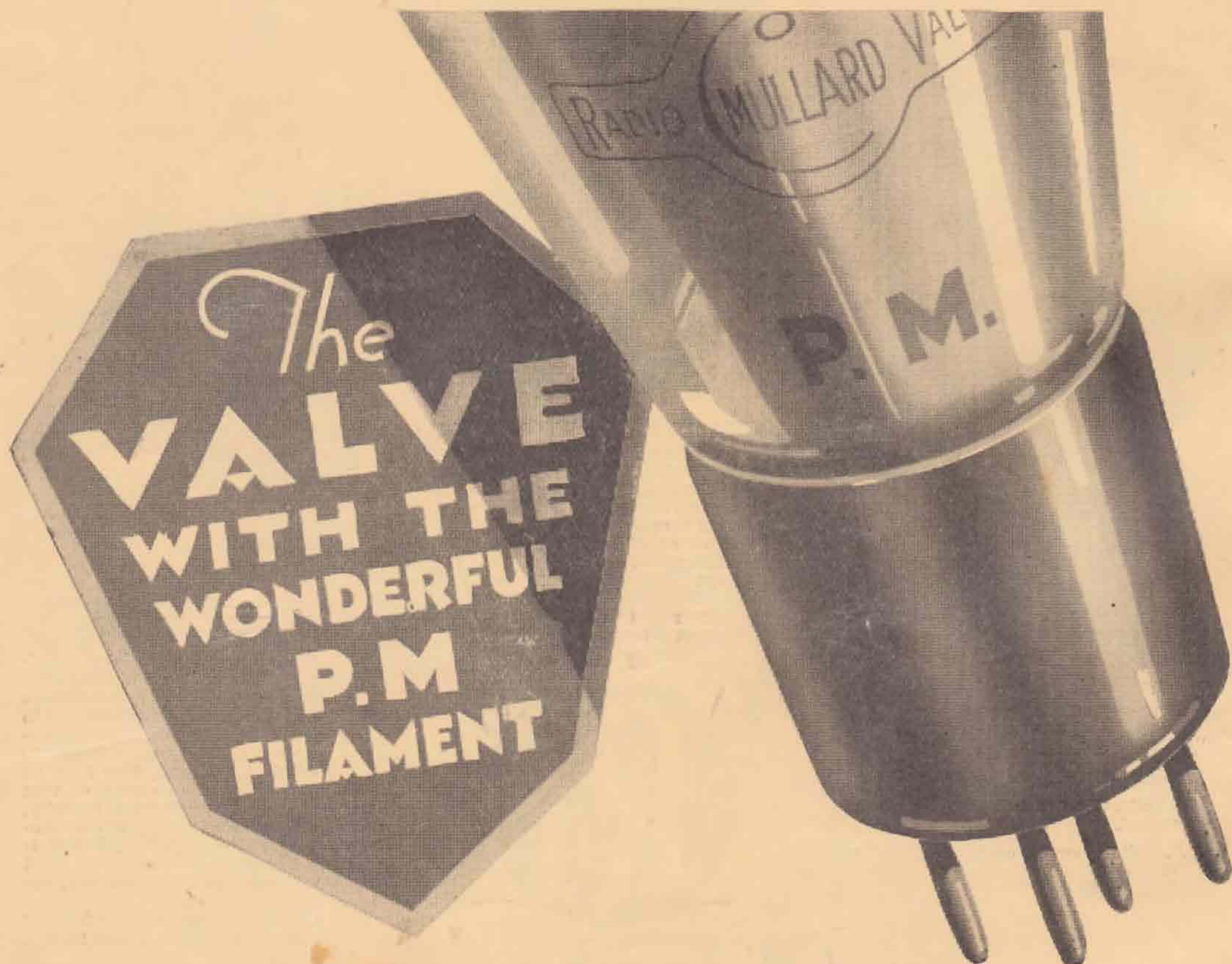
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