A YEAR OF PROGRESS

T. & R. Bulletin

THE JOURNAL OF

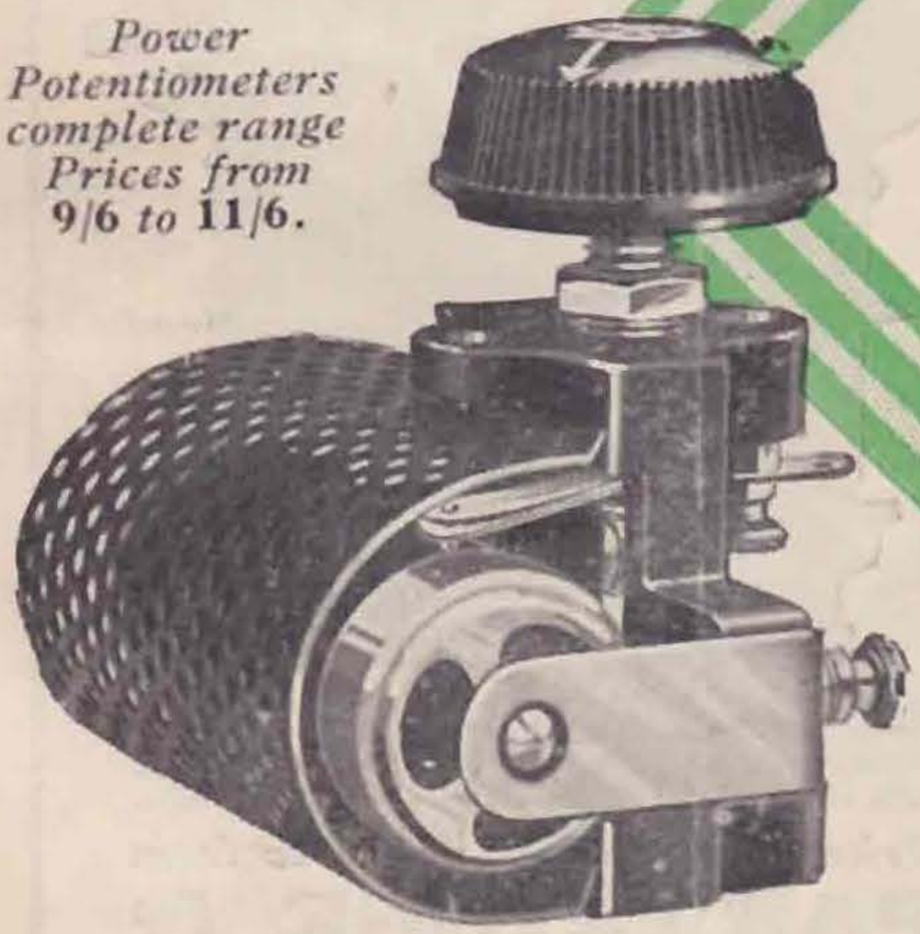
The Inc. Radio Society of Great Britain

AND THE

British Empire Radio Union

Vol. 6. No. 7. JANUARY, 1931 (Copyright) Price 1/6

WHERE DISSIPATION IS A VIRTUE



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Metal escutcheon, bronze finish

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The capacity of each condenser in a simple unit was measured at various parts of a 180-degree scale, having first adjusted the trimmers so that the minimum value was the same in each case.
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The "Tub" consists of three separate condensers mounted on a common spindle and mounted in a die-cast frame. Each section is separately screened and totally enclosed, and each rotor independently earthed. Trimmers are provided for any necessary adjustment.

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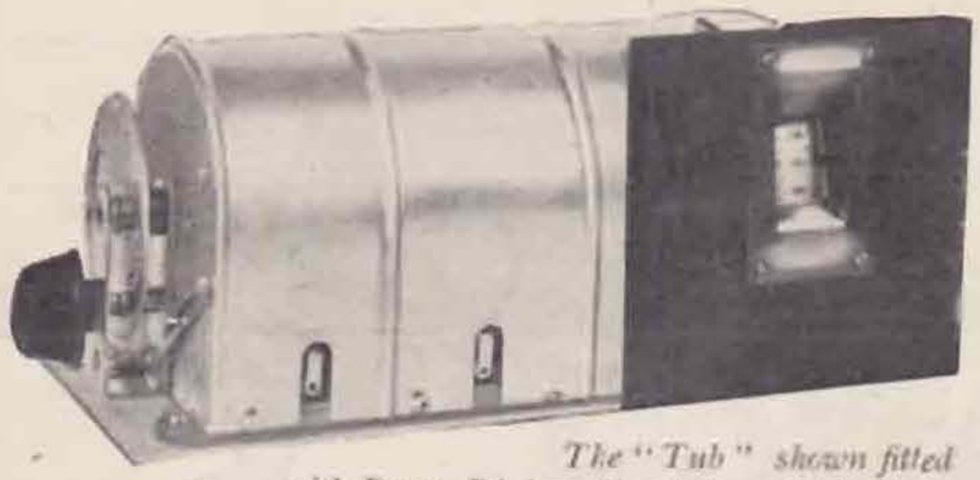

The "Tub" shown fitted with Drum Dial reading but controlled by end drive.

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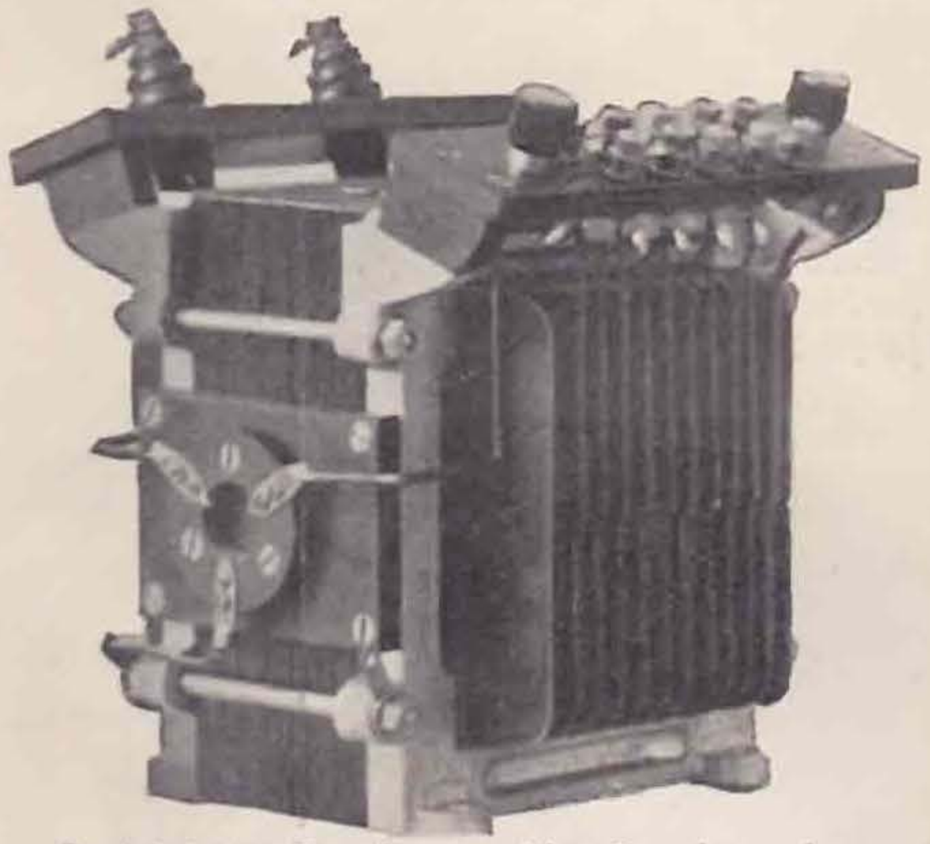

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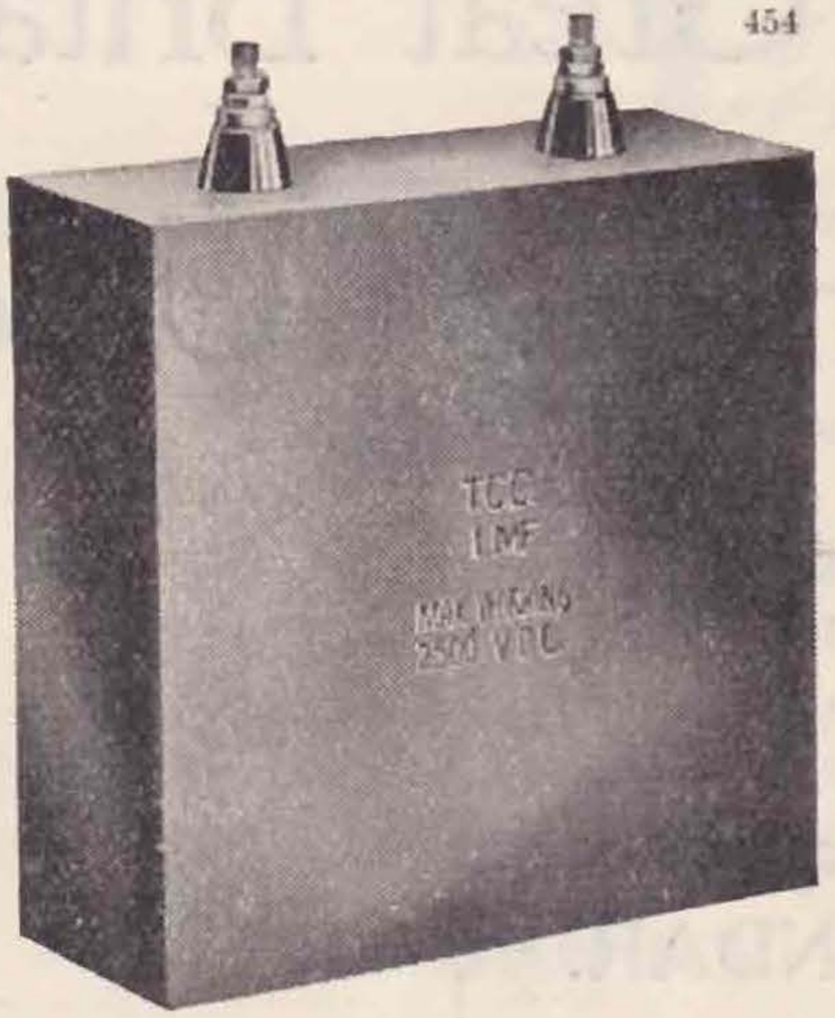

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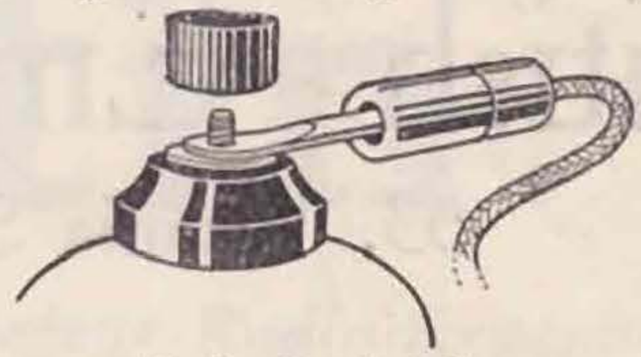

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Incorporates the Clix Resilient Socket and Solid Pin. All metal parts entirely insulated under every condition of use. No spade or other tag required. Supplied in Black with full range of markings.
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Complete terminal, **8d.**

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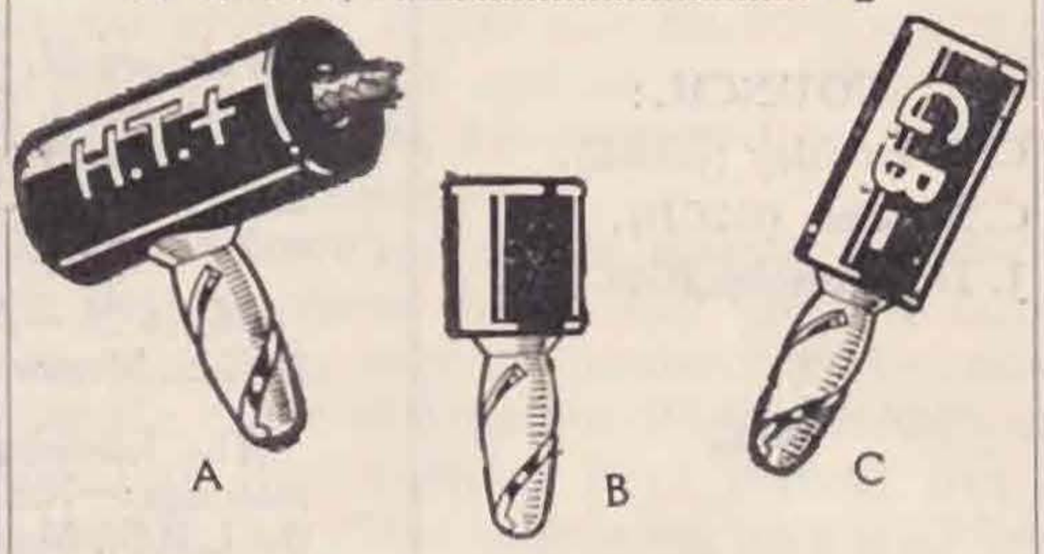

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THE INCORPORATED

Radio Society of Great Britain

AND THE

British Empire Radio Union

53, Victoria Street, London, S.W.1 (Phone: VICTORIA 4412)

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Honorary Editor:
G. W. Thomas (G5YK).

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C. Brookes (G2CB).
J. D. Chisholm (G2CX).
A. D. Gay (G6NF).
H. B. Old (G2VQ).
T. A. St. Johnston (G6UT).

R.S.G.B. CALENDAR.

January 15.—Joint R.S.G.B. and Lensbury Radio Society informal meeting at the Headquarters of the Lensbury Radio Society, 16, Finsbury Circus, E.C.2.

January 30.—At the Institution of Electrical Engineers, Savoy Place, W.C.2.: Presidential Address by Mr. H. Bevan Swift, A.M.I.E.E., subject, "An Historical Survey of Amateur Radio," with an exhibition of some early radio apparatus. Commence at 6.15 p.m. Tea at 5.30 p.m.

February 13.—At the Lensbury Radio Society's Headquarters, 16, Finsbury Circus, E.C.2.: Lecture at 6.15 p.m. By Mr. D. N. Corfield, D.L.C.Hons., on "Filters for Radio Purposes."

February 27.—At the Institution of Electrical Engineers, Savoy Place, W.C.2: Lecture and Demonstration by the Gramophone Co., Ltd., Hayes. Commence at 6.15 p.m. Tea at 5.30 p.m.

March 25.—At the I.E.E.; Lecture by Mr. E. C. S. Megaw (by permission ofthe G.E.C.).

The following dates are also booked for meetings:—R.S.G.B., April 29; jointly with the L.R.S., March 13 and April 10.

DISTRICT REPRESENTATIVES:

1. J. Browne (G2XB).
2. T. Woodcock (G6OO).
3. J. Noden (G6TW).
4. J. Lees (G2IO).
5. F. W. Miles (G5ML).
6. R. C. Horsnell (2ABK).
7. H. C. Page (G6PA).
8. R. C. Neale (G6GZ).
9. G. Courtenay Price (G2OP).
10. S. J. Buckingham (G5QF).
11. L. H. Thomas (G6QB).
12. T. A. St. Johnston (G6UT).
13. H. V. Wilkins (G6WN).
14. H. Harding (G2HH).

Scotland: J. Wyllie (G5YG). *Wales:* B. F. Phillips (G5PH). *N. Ireland:* C. Morton (G15MO).

B. E. R. U. REPRESENTATIVES:

Canada: C. J. Dawes (VE2BB).
Irish Free State: Col. M. J. C. Dennis (EI2B).
S. Rhodesia: S. Emptage (VP9SR).
Hong Kong: P. J. O'Brien (VS6AE).
Newfoundland: Rev. W. P. Stoyles (VO8MC).
Ceylon & S. India: G. H. Jolliffe (VS7GJ).
New Zealand: D. W. Buchanan (ZL3AR) and C. W. Parton (ZL3CP).
Iraq: H. W. Hamblin (YI6HT).
Kenya, Uganda & Tanganyika: G. F. K. Ball (VQ4MSB).
Egypt and Sudan: C. E. Runeckles (SU8RS).
South Africa W. H. Heathcote (ZT6X).
Malaya: G.:W. Salt (VS2AF).

T&R

Bulletin

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

JANUARY, 1931. Vol. 6. No. 7.

Honorary Secretary's Report.

IN presenting an Annual Report covering the activities of a scientific organisation, one is faced with the problem of extracting from a mass of information dealing with past events that which can be said to have definitely influenced the future progress of that body.

In the case of our own Society, the events which stand out most clearly appear to point in one definite direction.

Throughout the past year we have had abundant proof that the time is not far distant when we, as home members of the Radio Society of Great Britain, shall be called upon to represent the amateurs of the Empire.

History seems to be repeating itself: way back in 1913, after Mr. Rene Klein and a handful of enthusiasts had formed the London Wireless Club, it soon became apparent to them that a wider field must be covered. Thus, from a purely local Society a National Radio Organisation grew and now we, their successors, are faced with a similar, but much larger problem, for we foresee that this National Society must soon pass into its own as the Radio Society of the British Empire.

Three years ago the idea of inviting Colonial amateur groups to join the Radio Society of Great Britain was mooted. For some while the response did not appear promising, until suddenly the method of approach was changed. Instead of seeking for support from groups, we placed our aims and objects before individual Colonial members.

Those of us who have watched month by month have marvelled at the manner in which the new appeal has struck home. To-day, through that publicity which has brought fame to its originator, Arthur Watts, we have enrolled on our books several hundreds of Colonial friends who are looking to us in Great Britain to uphold the cause of Amateur Radio throughout the Empire and the world at large. The British Empire Radio Union is at present but a name given to identify our Colonial membership, but behind this name is growing up a tradition which will, we believe, eventually rank equal to that held by the parent body.

We have seen during 1930 the establishment of the first Empire Link Stations. Through these stations, owned and operated by world-famous amateurs, we expect to effect a liaison which will enable the executives of the B.E.R.U. groups at home and abroad to deal rapidly with matters affecting the policy of Empire Radio. The aim of your Council has been to appoint two British E.L.S. for communication with each part of the Empire. To date about 20 such British stations have been recognised.

The past year has seen, too, the appointment of B.E.R.U. representatives in practically every Dominion and Colony.. Through these members we shall continue to receive reports dealing with the activities of the amateurs in their respective countries, besides which we have on the spot men who understand far better than we in England their prevailing conditions.

They are thus able to suggest to us lines of action which, but for their advice, we could not possibly appreciate.

It is fitting, therefore, that at this time we should express our appreciations to all our overseas representatives who have done so much to further the B.E.R.U. cause during 1930.

Two events which have served to show the usefulness of co-operative amateur radio are still very much in our minds to-day. We refer to the "Loyal Relay" and the assistance rendered to the crew of the "Southern Cross." The story of both of these achievements has passed into history through the pages of our BULLETIN, but we can, with justifiable pride, feel that the value of Amateur Radio is something which will continue to live for years to come.

The idea of the "Loyal Relay" appealed to amateurs throughout the world, and we believe that on future occasions there will be even greater keenness than was shown during 1930 for the honour of passing the loyal greetings.

We are hopeful that at least one other day in the year will be set aside as an occasion for testing the strength of our Amateur Radio Network—we have in mind a "Remembrance Day Message" to the British Empire on November 11.

Convention, 1930, gave their unanimous support to an Empire Radio Week; this has been fixed for the period February 22-28, 1931. The object of the week is to promote Empire friendships. We feel confident that the results will more than justify the task which will be ours in deciding who shall have the honour of first holding the "British Empire Radio Union Challenge Trophy."

So far our remarks have been mainly concerned with those outside our own islands, but we must not allow our thoughts to carry us away from the vital work which has been done at home.

Two phases of effort present themselves as being of paramount importance. We refer to the preparation of the BULLETIN and the organisation of Contact Bureau. It is difficult to adjudge the amount of voluntary work which has been carried out by the Honorary Managers of these two Sections.

We have seen our BULLETIN change into a journal which would evoke praise from even the most academical student of radio technology. The transition has been slow and paved with difficulties, but through them all Mr. Thomas has emerged with success.

The preparation of an amateur radio magazine is no easy matter, and without your assistance it would not be possible, but to the man primarily responsible for its production we owe a debt of sincere gratitude.

Of Contact Bureau, we feel very much the same sentiments. Cornwall from London is DX on many occasions, and is certainly not within the normal "after-dinner telephone call" area; therefore, of all our section managers, we should be inclined to think that Mr. Powditch is in the most difficult position, for situated as he is remotely from any of us in London, he is often forced to make decisions without the benefit of his colleagues' advice. That his decisions have been wise ones is proved by the extraordinary list of achievements which have been made possible through the Contact Bureau Section.

The March tests on 28 M.C. will long remain impressed in our memories as being the best supported in the annals of the Society. The co-operation of all concerned must have been particularly gratifying to the person who had made himself responsible for their organisation. The Society is more fortunate to have among its members one who is willing to do so much to further the true experimental side of its work, and through the medium of this report we offer our most cordial thanks to Mr. H. J. Powditch.

To-night we have before us the Annual Balance Sheet of the Society. Do you realise the work which has been done in order that we may stand on a firm financial footing? Your Honorary Treasurer has, through his prudence and wisdom, made this possible. By eradicating useless expense and by judicious economy on all occasions, Mr. Ostermeyer has succeeded in presenting a financial statement which, from a moment's study, will show that our position is now stronger than at any time during the past few years. His untiring efforts are somewhat masked, but on these occasions we are enabled to see the results of his labours on our behalf.

On several occasions recently we have had in mind the establishment of a Club Room in London: such a project is at the moment impractical, but we venture to suggest that the time is not far distant when the fulfilment of a desire near to many of us will be attained. An increasing membership is the key to this ideal: may 1931 place us considerably nearer to our goal.

The past year has seen the introduction of new membership certificates. The design of these and the W.B.E. certificates has been commented upon very favourably. This work was carried out (under the direction of Mr. Watts) by Messrs. Bradbury Wilkinson. W.B.E. certificates have now been awarded to about 50 members situated in many parts of the Empire.

To our vast membership outside London, we have normally but two outward means of showing the value of co-operative association. These two means are the BULLETIN and the QSL service. Week in, week out, myriads of cards pass through our QSL section, many dozens of queries require careful consideration, whilst much time is required to dispatch and pack the overseas cards. Mr. Chisholm has carried out his duties ably and well, and has, through his personal visits to the amateurs of Europe, done much to bring before them the advantages of membership with the Radio Society of Great Britain.

The gathering together of amateur call signs and addresses has again been admirably carried out by Mr. Pilpel, and although to many his efforts may appear small, we, from personal knowledge, appreciate to the full the large amount of work which has been carried out under his direction.

Socially, the Society has continued to progress. Through the medium of District Conventionettes, our provincial members are beginning to break down barriers which have seemed impassable, whilst we in London can look back at the 1930 Convention and say with sincerity that it was the most successful of them all.

The London members' opportunities for meeting one another have been doubled this winter, through the able assistance of the Lensbury Radio Society,

who have given us the hospitality of their Lecture Theatre for the purpose of holding informal discussions and social gatherings. We voice the thanks of all London members to their Honorary Secretary, Mr. D. Wilkes.

Our formal meetings at the I.E.E. have been, on the whole, well attended, and it is our duty to place on record our thanks to all who have given us lectures and demonstrations. Our especial thanks are due to Messrs. Mullards, Burndept, Siemens, Igranic, Ferranti, the M.L. Magneto Syndicate, Ltd., and the Telegraph Condenser Co., Ltd., for their practical assistance.

Our thanks are also extended to the Council of the Institution of Electrical Engineers, who have, as in previous years, permitted the Society to hold regular lectures within the Institute.

During the 1929 Convention a decision was made to appoint a country member to act as Provincial District Representative. Those of us who were responsible for the suggestion were not at all certain as to the efficacy of such an appointment, as we realised that a provincial member, in order to act as a direct link between the provinces and London, would be called upon to make greater sacrifices on his time than possibly any other member of Council. Fortunately for the Society, your choice fell upon Mr. H. B. Old, of Nottingham.

To attempt to record the work which he has done as Provincial District Representative would be futile, but we can say with certainty that his influence and guidance has assisted us in no small measure in gauging the wishes of the provincial membership.

Without exception, he has attended every Council and Committee meeting in London, and has been present at nearly every District Conventionette. Those of us who are best able to judge his work thank him on behalf of the provincial membership for all that he has done.

The assistance rendered by our District Representatives has proved of inestimable value to Headquarters, and it is of interest to note that two of our first Area Managers are still carrying on their work as of old. We refer to Mr. Jack Wyllie and Captain Courtenay Price. The new blood introduced this year in many districts will, we are sure, produce far-reaching results to the benefit of the provincial membership.

We have noted with much interest the success attained by such Districts as have already organised a Letter Budget, and we hope that the extension of the scheme will follow in Districts which at present have no budget in circulation.

The decision made at Convention whereby only items of general interest appear under District Notes in the BULLETIN has met with support from all quarters.

Your Council have prepared a statement outlining our views regarding the policy to be followed at the forthcoming International Conferences. This statement has been forwarded to the Headquarters of the International Amateur Radio Union.

Briefly, we have stated that we wish the present 7 and 14 M.C. bands to remain exclusive amateur allocations; further, that we wish a portion of the 3.5 M.C. band to be given over for exclusive amateur use; further, that we have no objections to the 28 and 56 M.C. bands being shared with experimental stations, and, finally, that a definite allocation around 112 and 224 M.C. should be granted on either an exclusive or shared basis.

We feel confident that our interests will be safeguarded by the British Government Delegates at these Conferences.

The relationships between the licensing authorities and the Society continue to be of the most cordial nature. During the year a large number of high-power licences, as well as many low-power trans-oceanic permits, have been granted.

The opening up of the 3.5 M.C. band for week-end work has done much to relieve the pressure on the higher frequency bands, and we look forward with expectancy to the time when a definite portion of that band will be allotted to British amateurs.

The stand at Olympia again proved to be the amateurs' Mecca. As a direct result of the work carried out voluntarily by the London members, a very large influx of new members occurred. During October a record total of 116 new applications were approved by Council.

During the year quarterly broadcast talks have been delivered and a number of new members obtained as a result of the publicity given.

One of the most interesting signs of progress noted during 1930 has been the vast increase in the number of British receiving stations. The figures since January 1 have been nearly doubled.

This report must, of necessity, conclude with a word or two of regret. For two years Mr. Marcuse has ably fulfilled his duties as President to the Society. During this period he has watched with interest its progress, and we are sure that he feels proud of the record which now passes into the annals of amateur radio.

He leaves the presidential chair carrying with him the sincere thanks of us all, but his loss will, we are certain, not prevent him from continuing a close and personal interest in the work of the Society, which he has done so much to create. We are confident that in his position as Past President he will offer us the benefit of his vast personal knowledge of matters connected with the policy and welfare of our Society. We, who for many years past have been directly connected with him at H.Q., understand fully how valuable his services have been, and on their behalf I ask him to accept our most cordial and loyal thanks.

Your new President needs no introduction. For many years he carried the brunt of the secretarial work, and at the same time prepared and edited the T. & R. BULLETIN. Since 1929 he has held office as Acting Vice-President, and during this time has done much to further the cause of amateur radio, not only at home but abroad. His intimate knowledge of past and present-day conditions, coupled with years of experience in electrical matters, has made him eminently suitable for the position, which is to be his, we hope, for the next two years. He carries with him the knowledge that those around him will do everything possible to make his tenure of office in every way successful.

Finally, we wish to record our thanks to Miss M. Gadsden, for the efficient and conscientious manner in which she has carried out her duties at Headquarters.

(*Continued on page* 191.)

Alternating Currents.

By M. F. Somerville (G5SV).

IT is assumed that everybody knows what an alternating current is, i.e., how it differs from direct current, and so I will start by considering how we can measure its value. Fig. 1 shows a curve of an alternating current which rises to a maximum of 2 amperes every half-cycle. Now, if we measure the value of the current at A, we find it is zero, at B it is 1 ampere, and at C it is 2 amperes, so it seems rather a problem how to measure it if it is different at various points on the curve. Actually, we don't measure it by its maximum value (I_m) but by its effective value (I), commonly known as the Root Mean Square (R.M.S.), which is $\frac{I_m}{\sqrt{2}}$ or .707 I_m. The R.M.S value of an alternating current can be found by multiplying its maximum value by .707, or, in other words, $I_m = I \times \sqrt{2} = I \times 1.414$. Of course a moving coil instrument will not show any

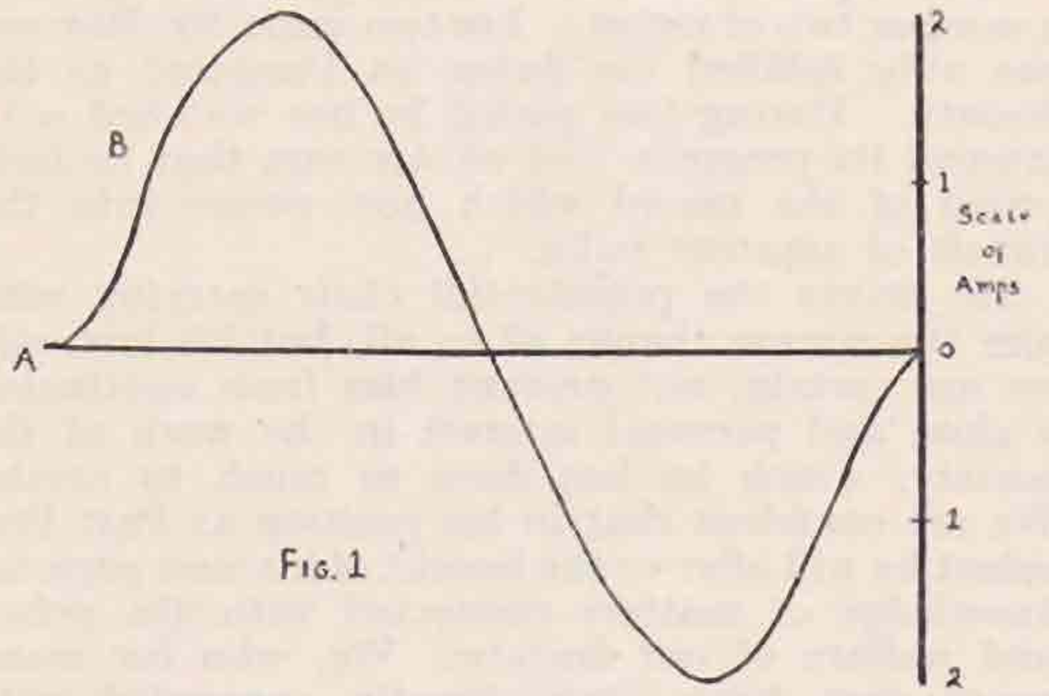


Fig. 1

deflection when an alternating current is passed through it, but a hot-wire ammeter will give a reading which is the R.M.S. value, and the maximum value can be found by multiplying the ammeter reading by 1.414.

We talk about R.M.S. values of alternating voltage in exactly the same way, and if an A.C. voltmeter is showing 200 volts, then the maximum value of the voltage will be $200 \times 1.414 = 282.8$ volts, and the voltage will be rising and falling between 0 and 282.8 volts.

In Fig. 2 (*b*) the loop AB is being rotated in a uniform field. BC is drawn at right angles to AB and represents the direction of motion of AB at the instant shown, when it has turned through an angle θ. Its length can be taken to represent the angular velocity of B. We will draw BD vertically from the point B, and DC horizontally from D. BDC is now a triangle of velocities, and the velocity line AB has been resolved into two components, viz., BD representing the horizontal velocity of B and DC representing its vertical velocity. Since B only generates an E.M.F. when moving vertically (i.e., across the magnetic field), the length of BD at any instant will be a measure of the rate of cutting of lines of force by B, and therefore the voltage generated.

Now let us consider how BD varies in one revolution of B. Fig. 2 (*a*) (*b*) and (*c*) shows three positions of B as the angle θ varies from O° to 90°. In Fig. 2 (*a*) the angle θ is O°, and BD is 0, therefore no E.M.F. is generated. In Fig. 2 (*b*) $\theta = 45°$, and BD is a certain length which represents the voltage generated. In Fig. 2 (*c*) $\theta = 90°$,

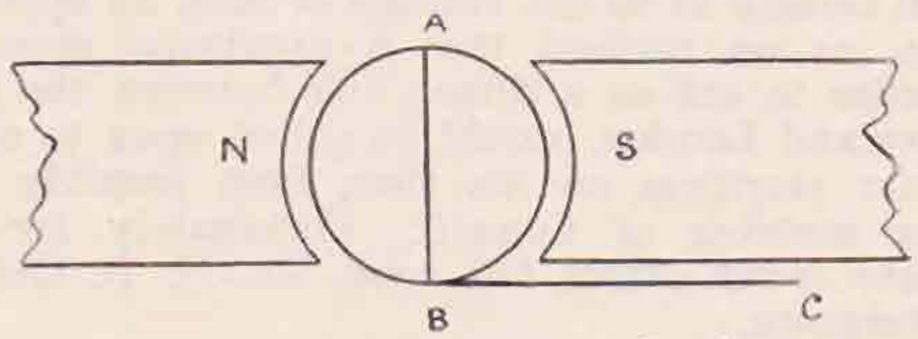


Fig 2 (a)

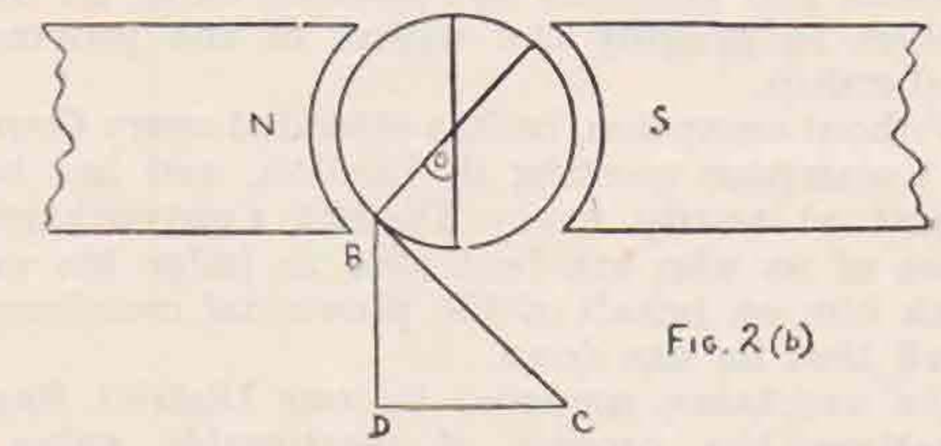


Fig. 2 (b)

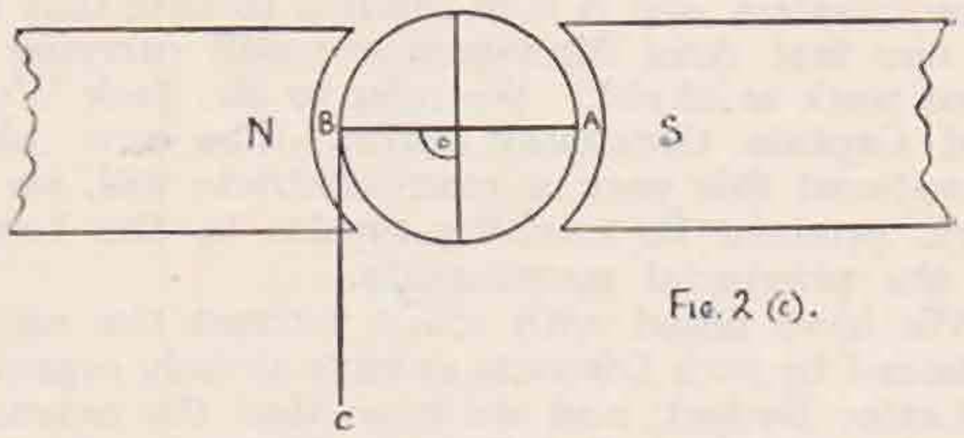


Fig. 2 (c).

BD = BC, and therefore the voltage generated is a maximum.

Now, $\frac{BD}{BC} = \text{Sin}\angle BCD$. $\therefore BD = BC \text{ Sin}\angle BCD$.

But BC is a constant, $\therefore BD =$ a constant $\times$ Sin$\angle$BCD. Obviously, $\angle BCD = \theta$, $\therefore BD =$ a constant $\times$ Sin θ. Now, BD is proportional to the voltage induced at any moment (v), and if V_m is the voltage when B is opposite the centre of either pole, obviously v will be a fraction of V_m depending on the angle θ through which B has turned. In other words :

$$v = V_m \text{ Sin } \theta.$$

And this is the first formula to be learnt.

Now let us express the angle θ in circular measure. For a two-pole machine, f revolutions take place every second. Now one revolution is 360° or 2π radians, and therefore f revolutions (each of 2π radians) take place every second. In one second $2\pi f$ radians are swept out. This is called the

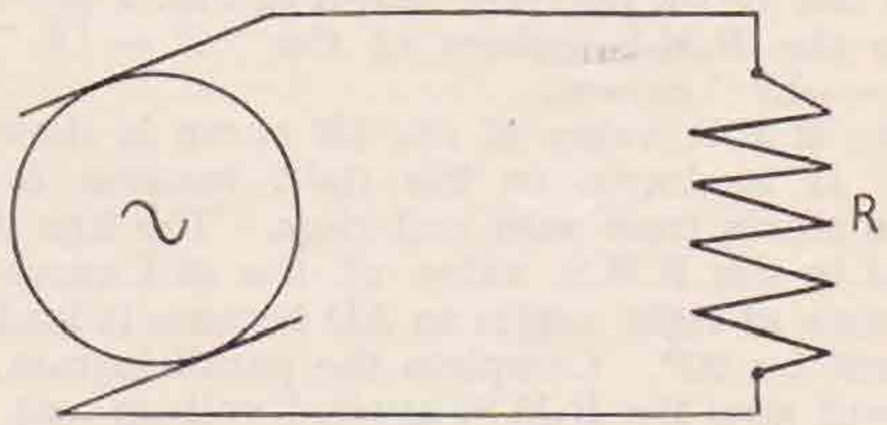


Fig. 3 (a)

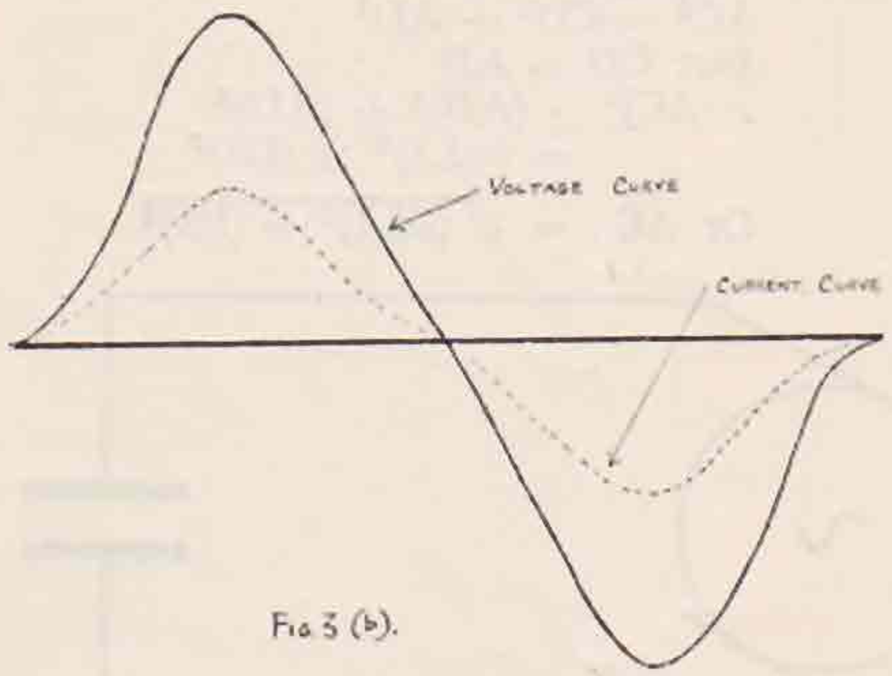


Fig. 3 (b).

angular velocity, and is generally denoted by " ω " (omega). So now our original formula $v = V_m$ Sin θ can be written as: $v = V_m$ Sin ωt volts. Similarly, in a circuit to which an alternating voltage is applied, $I = I_m$ Sin ωt.

Fig. 3 (*a*) shows an alternator giving an alternating voltage of sine form connected to a resistance R. The current flowing will rise and fall with the voltage as shown in Fig. 3 (*b*). The current is then said to be in phase with the voltage. This is only true, of course, if we neglect any inductance of the armature winding.

If an inductance is placed alone in the circuit, then, neglecting any resistance, the current curve will be as shown in Fig. 4, where it is seen to be lagging behind the voltage by a quarter of a cycle,

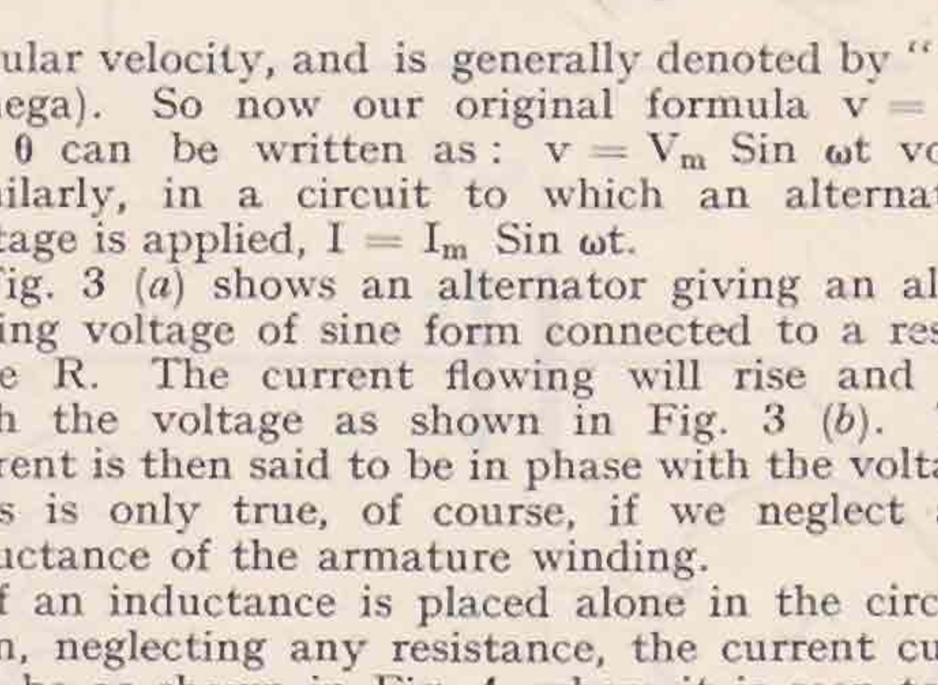


Fig. 4.

or 90°. The current is then said to be 90° out of phase with the applied voltage. If an alternating voltage is applied to a condenser, then the effect is just the opposite to inductance, and the current leads the applied voltage by 90° (Fig. 5*a*).

In a circuit containing resistance, capacity, and inductance (in series) the curve is as shown in Fig. 5 (*b*), where the current flowing against the resistance is in phase with the applied voltage, the current flowing against the inductance lags behind the applied voltage by 90°, and the current due to the capacity leads the applied voltage by 90°.

We will now consider how Ohm's Law applies to an alternating current circuit containing inductance only.

The induced E.M.F. across an inductance of L henries is equal to L × rate of change of current in amperes per second.

The maximum rate of change of a current which reaches a maximum value of I_m amperes, in an

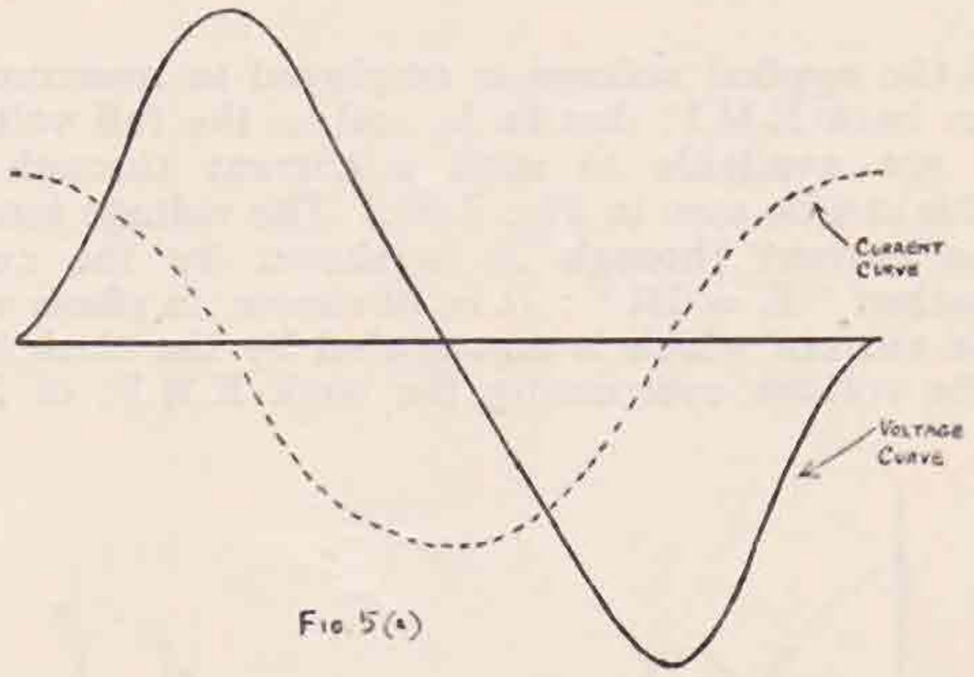


Fig. 5 (a)

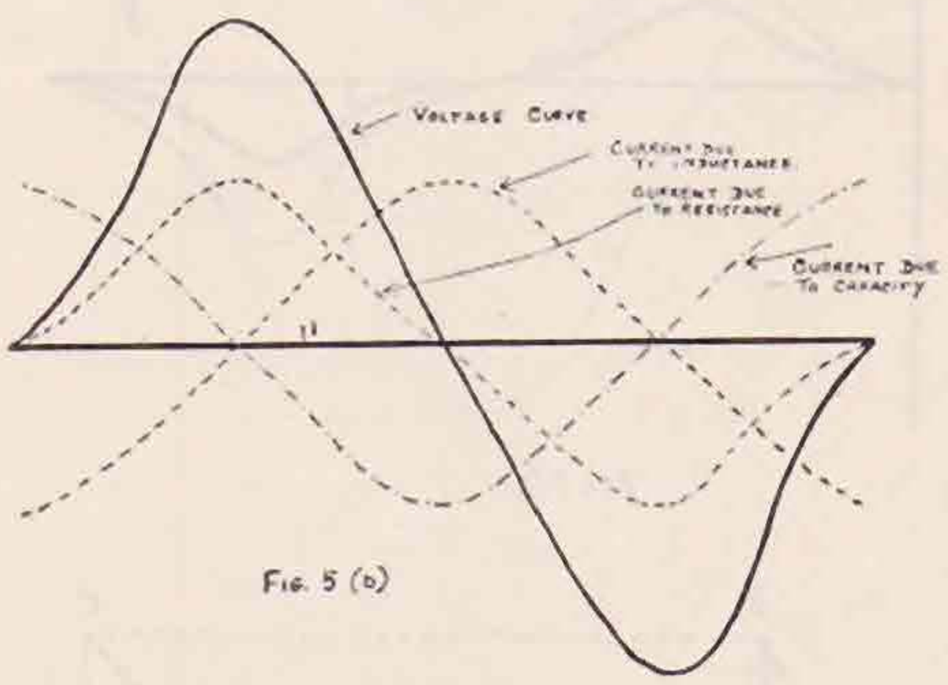


Fig. 5 (b)

armature bar revolving with an angular velocity of $2\pi f$ radians per second is $2\pi f I_m$ amperes per second. And, as $2\pi f$ can be written as " ω," this becomes ωI_m. Hence, the value of the induced E.M.F. is an inductance of L henries when a current of I amperes is flowing is $L \times 2\pi f I$ volts,

$$= \omega L I \text{ volts.}$$

Therefore, if V volts are applied to an inductance of L henries at a frequency of " f " cycles per second, the current flowing will be

$$I = \frac{V}{2\pi f L}$$

This is the second formula to be learnt, and is " Ohm's Law " for alternating circuits containing inductance only. The expression " ωL " ohms does not represent ohms in the true sense, but it is used for mathematical purposes. It is known as " Inductive Reactance " and is generally denoted by " X_L."

We will now try and find out what " Ohm's Law " is for circuits containing inductance and capacity.

Fig. 6 shows an alternating circuit containing an inductance L and resistance R. Obviously Ohm's Law does not hold good in this case as part

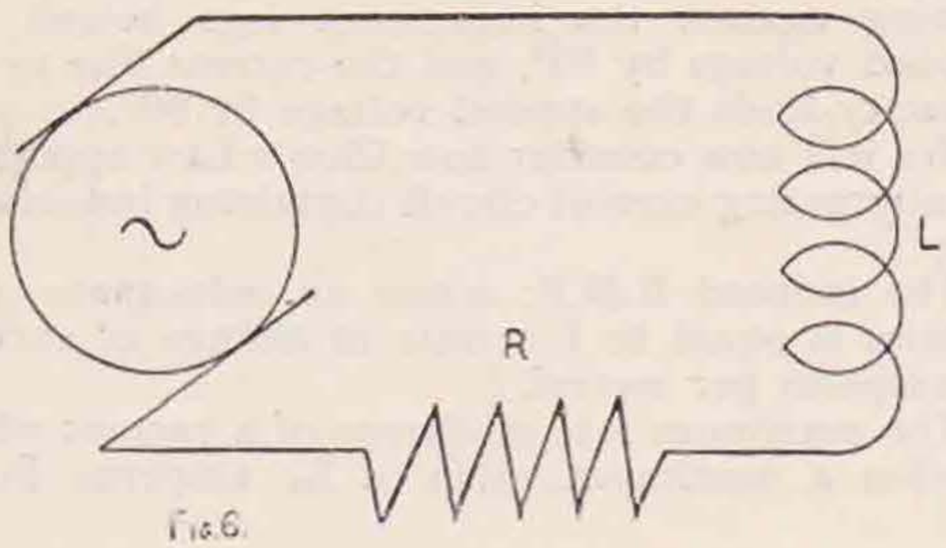


Fig. 6.

of the applied voltage is employed in overcoming the back E.M.F. due to L, and so the full voltage is not available to send a current through R. This can be seen in Fig. 7 (*b*). The voltage forcing the current through R is shown by the curve marked " E = IR " ; it is, of course, in phase with the current which is represented by the thick line. The voltage overcoming the back E.M.F. of L is

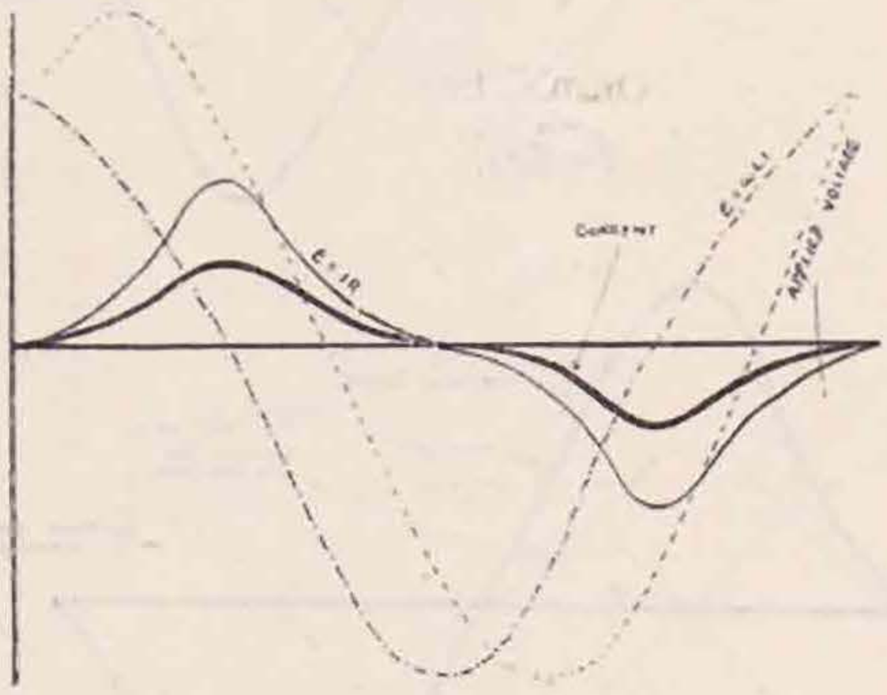


Fig. 7 (*b*)

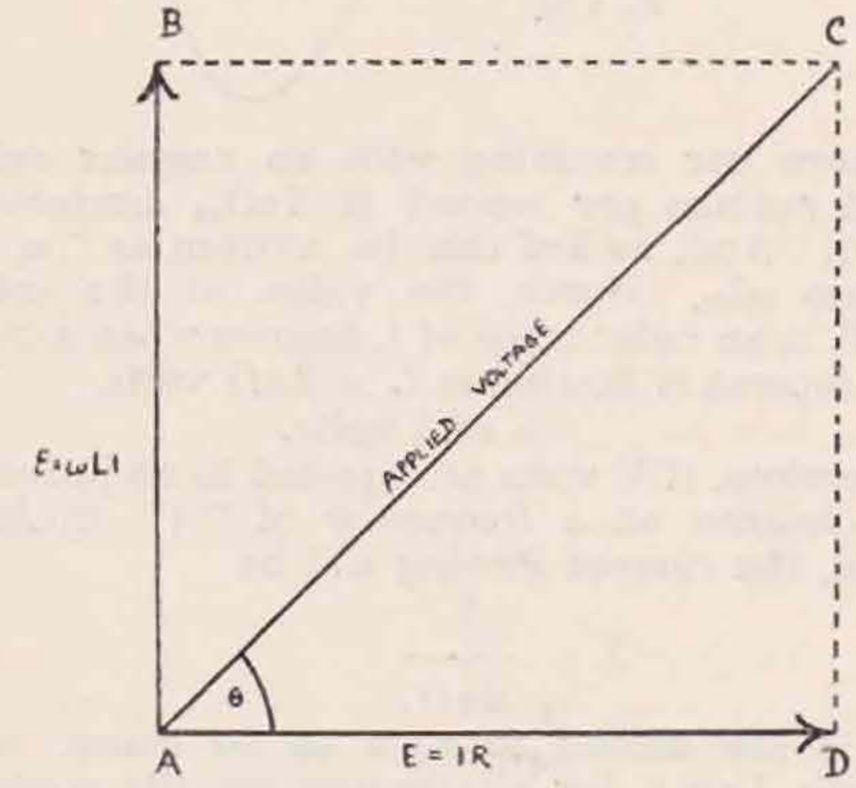


Fig. 7 (*a*)

shown by the curve " E = ωLI " and is leading the current by 90°. The curve marked " Applied Voltage " is the total voltage required to supply these two voltages simultaneously, and is found by adding together the ordinates of the two curves at every instant, taking into account their direction.

The value of the applied voltage to send a current of I amperes through R and L can be determined from the vector diagram shown in Fig. 7 (*a*), which gives the R.M.S. values of the " E = IR " and " E = ωLI " curves.

The R.M.S. value of the IR curve is shown by AD. It is drawn to the right because the IR curve starts from zero and rises. The line AB is equal to the R.M.S. value of the ωLI curve, and is drawn at right angles to AD because it leads the current by 90°. Complete the parallelogram, and AC will give the R.M.S. applied voltage and gives the angle by which the current curve lags behind the applied voltage. Now

$$AC^2 = CD^2 + AD^2$$

But $CD = AB$

$$\therefore (AC)^2 = (AB)^2 + (AD)^2$$

$$= (wLI)^2 \times (IR)^2$$

$$\text{Or } AC = \sqrt{(\omega LI)^2 + (IR)^2}$$

Fig. 8.

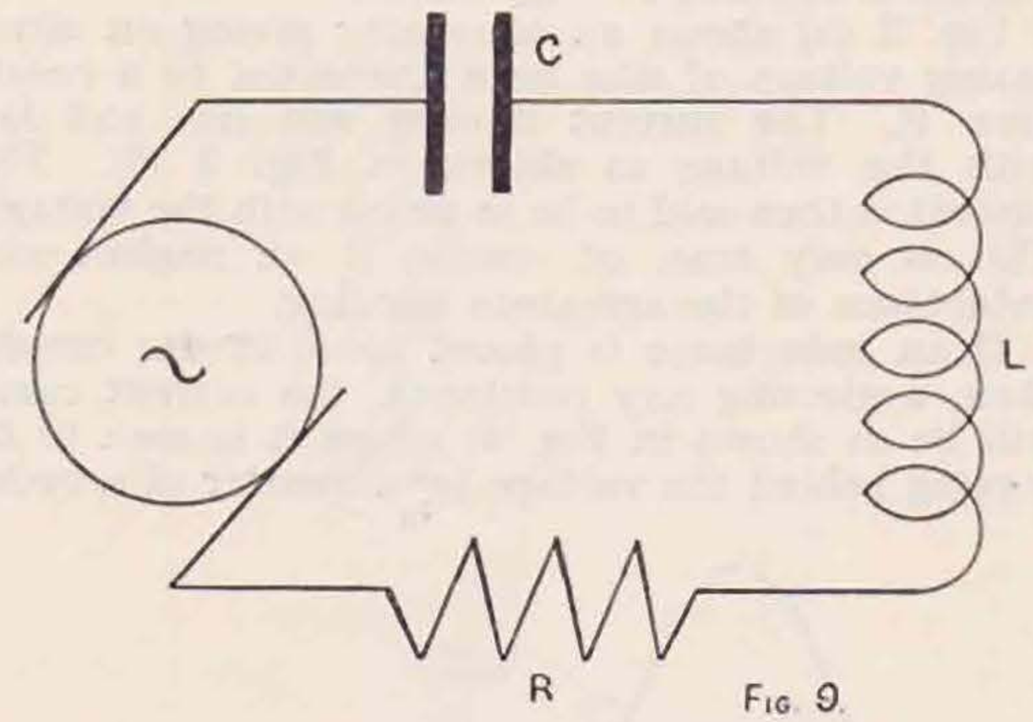


Fig. 9.

But AC represents the R.M.S. value of the applied voltage.

$$\therefore V = I\sqrt{(\omega L)^2 + (R)^2}$$

$$\text{or } I = \frac{V}{\sqrt{R^2 + (\omega L)^2}}$$

This is the third formula to be learnt, and is " Ohm's Law " for A.C. circuits containing inductance and resistance. $\sqrt{R^2 + (\omega L)^2}$ is called the impedance, and is generally denoted by " Z."

Now let us consider the effect of a condenser in an A.C. circuit (Fig. 8). We have found that the current due to capacity leads the applied voltage

by 90°, and it is assumed that the formula "Q = CE" is understood. (Where Q is the charge introduced in coulombs; C is the capacity of the condenser in farads; and V is the pressure applied in volts.)

It was stated before that the maximum rate of change of an alternating current of I_m amperes was $2\pi fI_m$ amperes per second, and in the same way the maximum rate of change of a charge of Q_m coulombs is $2\pi fQ_m$ coulombs per second.

$$I_m = 2\pi fQ_m$$

But $Q_m = CV_m$

$$\therefore I_m = 2\pi fCV_m$$

$$\text{Or } V_m = \frac{I_m}{2\pi fC} = \frac{I_m}{\omega C.}$$

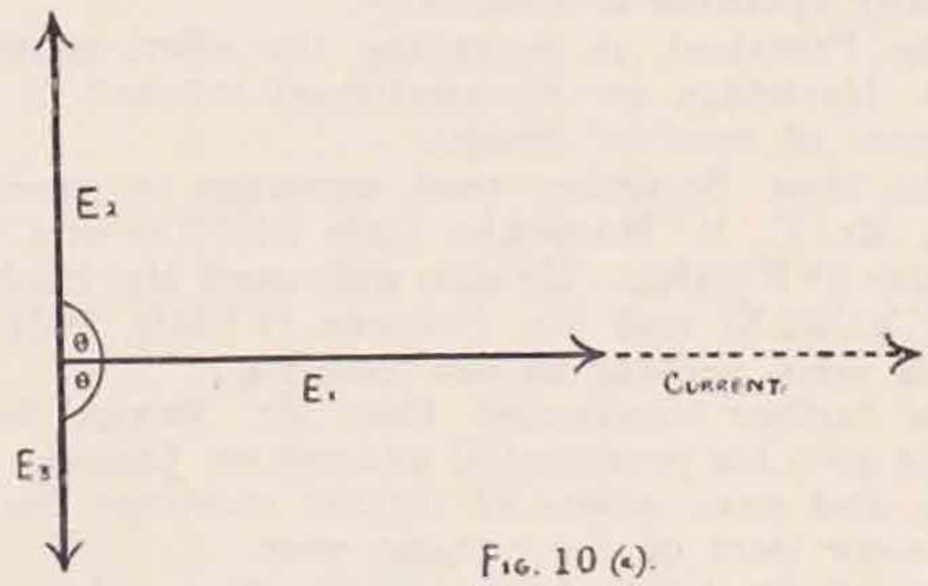


Fig. 10 (a).

"Ohm's Law" for A.C. circuits containing capacity only is, therefore, $V = \frac{I}{\omega C}$ and $\frac{I}{\omega C}$ is known as Capacitive Reactance, being generally denoted by "X_c."

We now know three versions of "Ohm's Law":—

(1) For Resistance only it is $I = \frac{E}{R}$

(2) For Inductance only it is $I = \frac{E}{2\pi fL}$

(3) For Capacity only it is $I = 2\pi fCE$

But as in nearly every case in Wireless Telegraphy there are all three factors in the circuit, a new version of "Ohm's Law" must be found to deal with this (Fig. 9). With these three factors the applied voltage has to supply:

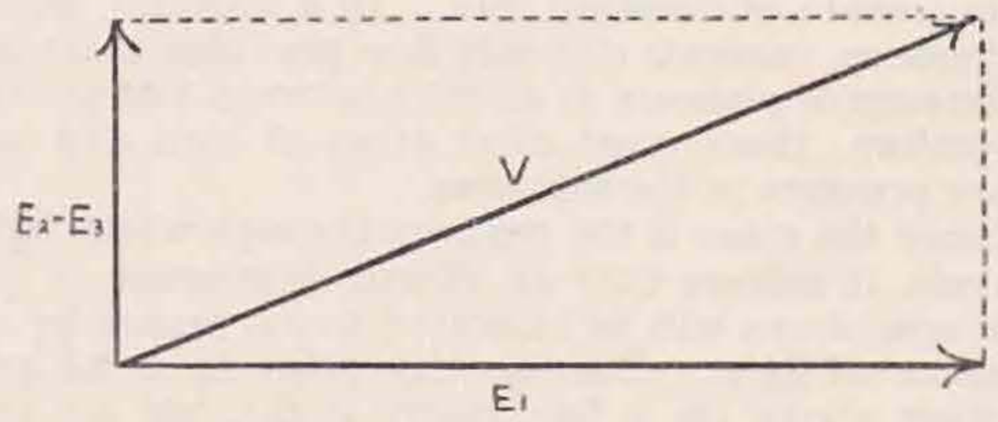


Fig. 10 (b)

(1) A voltage (E_1) to send a current through R;
(2) A voltage (E_2) to overcome the back E.M.F. of L, and
(3) A voltage (E_3) to overcome the back E.M.F. of C.

Fig. 10 (*a*) shows a vector diagram of these three voltages. E_1 is in phase with the current, E_2 is leading the current by 90°, while E_3 is lagging by 90°. As E_2 and E_3 are exactly opposite in phase, we can draw (10*b*) another diagram showing their resultant $(E_2 - E_3)$, and now it is an easy matter to find the resultant of the two vectors.

$$E_1 = IR \text{ and } (E_2 - E_3) = \left(\omega LI - \frac{I}{\omega C}\right)$$

$$= I\left(\omega L - \frac{1}{\omega C}\right)$$

The resultant applied voltage is such that,

$$V^2 = E^2 + (E_2 - E_3)^2$$

$$= I^2R^2 + I^2\left(\omega L - \frac{I}{\omega C}\right)^2$$

$$\therefore V = I\sqrt{R^2 + \left(\omega L - \frac{1}{\omega C}\right)^2}$$

$$\text{Or, } I = \frac{V}{\sqrt{R^2 + \left(\omega L - \frac{1}{\omega C}\right)^2}}$$

And this is "Ohm's Law" for an A.C. circuit containing resistance, capacity, and inductance in series. It will be seen that if ωLI is greater than $\frac{I}{\omega C}$, the resultant current will lag behind the applied voltage, and *vice versâ*.

What We Would Like to Know.

Who was responsible for the calibration of RPK's wavemeter?

* * *

Whether that F station who uses raw A.C. has succeeded in putting out some readable 'phone yet?

* * *

Which Russian station will be the first to drop "EU" in favour of "RA"?

* * *

Whether any of the QRP merchants have ever had a QSO with a negative potential on the plate?

* * *

Why letters addressed to G2ZC often turn up in New Jersey, U.S.A.?

* * *

When somebody is going to win G6PY's trophy, and who it will be?

* * *

Who will be the first airman to bring us back a piece of the Heaviside Layer?

Hon. Secretary's Report—(*Continued from page* 187.)

Through her efforts the office routine is again running smoothly, and the days of unanswered correspondence are, we hope, gone for ever.

To all who have contributed to the progress of the Society, and to the easing of my personal duties, I offer cordial thanks.

J. C.

Minutes of Annual General Meeting.

Held at the Institution of Electrical Engineers on Friday, December 19, 1930.

IN the chair, Mr. Gerald Marcuse (President). Present, about 120 members.

The minutes of the previous meeting were taken as read (having already been published in the January, 1930, T. & R. BULLETIN).

In the absence of Mr. E. Dawson Ostermeyer (honorary treasurer), the financial report was read by Mr. Arthur Watts, who complimented the treasurer on his excellent work, and emphasised that a considerable saving had been effected by reducing office expenses. He pointed out that this had been made possible to a large extent by the honorary secretary taking over the greater part of the work previously dealt with by a paid male secretary. The balance sheet was unanimously approved.

The honorary secretary (Mr. John Clarricoats) read his report on the year's working. (This report is printed in another page).

The report was unanimously adopted with acclamation.

The President announced the result of the Council elections, which were as follows:—President, H. Bevan Swift; acting vice-president, Arthur E. Watts; hon. secretary, John Clarricoats; hon. treasurer, E. Dawson Ostermeyer; Council members, Messrs. C. S. Bradley, C. Brookes, J. D. Chisholm, A. D. Gay, H. B. Old, H. J. Powditch, T. A. St. Johnston, and G. W. Thomas.

He reminded new Council members that the names of their sub-committee members should be forwarded to the hon. secretary prior to the first Council meeting (January 21, 1931).

Mr. Ockleshaw was unanimously elected hon. auditor for the year.

The President proposed a vote of thanks to the scrutineers, Messrs. Clarke and Charman, which was unanimously approved.

The President announced that as a result of negotiations with the G.P.O. the 80-metre band would now be open for the use of members between the hours of 8 p.m. and 8 a.m. daily. This statement was received with applause.

Capt. Hartridge announced that he proposed offering a cup which would be awarded to the member designing the most efficient short wave super-heterodyne or super-regenerative receiver. He made as a condition that the set shall have actually operated satisfactorily.

The President, in accepting the offer, thanked Capt. Hartridge for his continued interest in the progress of receiver design.

The Hon. Secretary read messages of greeting from Mr. C. E. Runeckles (late SU8RS) and Mr. Perkins (VK2GK). He also welcomed Mr. Hudson (late VU2ZX) and Mr. Osborne (ZT1H), both of whom were present at the meeting.

He further announced that Mr. Bevan Swift would give his presidential address on January 30, 1931, and gave notice of further meetings during the early part of the coming year.

He regretted the absence of Mr. Runeckles, who was still in Cairo, and announced that the Wortley Talbot trophy would be presented to Mr. Runeckles at a later meeting.

Following the business meeting, Mr. Oliphant, B.Sc. (Burndept, Ltd.), lectured on the "Design, Construction, and Application of Gramophone Pick-ups."

Mr. Marcus Scroggie assisted with the demonstration, whilst an interesting discussion followed. The President, on behalf of all present, thanked the lecturers and the Burndept Co. for their assistance.

A Speculation.

By Geoffrey H. Ramsden (G6BR).

ONE of the radio problems which is still awaiting an indisputable solution is the problem of fading. Two theories are advanced to account for this phenomenon: (1) interference between ground and reflected or refracted rays; (2) variation in the consistency of the Heaviside Layer. In the following article the writer submits a theory which, as far as he knows, is original, though, there being nothing new under the sun, it has probably been stated before.

To begin with, can we find a common physical event which will compare with fading on short waves? Yes. If an aeroplane is flying at a thousand feet or so, the noise of the engine will wax and wane to an observer on the ground just as short-wave signals do in the telephones of a receiver. Now, in the case of the aeroplane engine, the fading is due to changes of density in the intervening medium through which the sound waves travel, that is to say, air currents. In considering the case of wireless we find we have a pervading medium, the ether, through which the wireless waves travel. Our theory, then, supposes that the ether is subject to currents just as is the air, in other words, that it is in a state of constant flux. In a medium, liquid or gaseous, currents will only flow provided there is a difference of pressure or density between two points. Therefore there must exist areas of high and low ether pressure in the universe.

Since the ether is the medium through which light travels, it follows that an etheric depression in the universe above will be indicated to our senses by an absence of light. Bearing this point in mind and looking above on a fine starry night, we are immediately impressed by the presence of two dark, pitch black pits in the brilliant Milky Way. Our theory accepts the premises that these two pitch black pits are, in reality, areas of low pressure in the ether. At first this may seem fantastic, but a little consideration will show that it is not really so.

Throughout Nature there is movement—nothing is still. In the two great terrestrial mediums, sea and air, there is a perpetual condition of flux and, as a result, vortices. Is it probable that this law of motion, of ebb and flow, does not apply to the cosmic medium, the ether? Is it probable that, by chance, in the one part of the heavens where stars are clustered together in millions there are two vast spaces entirely devoid of stars? To the writer the answer to both these questions appears to be "no." Therefore our theory accepts the contention that the Black Pits in the Milky Way are areas of low etheric pressure. From this premise we argue that throughout the universe there is a centripetal flow of ether towards the centres of the Black Pits, tending to fill up the depressions just as the wind tends to fill up a cyclone over the earth. It may be asked, if this is so, how comes it that stars do not appear in the pits as ether enters them? The answer is that in terms of the vastness of space and the infinity of time our lives are too incalculably insignificant for us to notice any change. Thousands of years hence, if records of observations made to-day are available, it will be noticed that stars have appeared where formerly there was void, and perhaps that stars have disappeared if the depressions are moving across the heavens.

To proceed with the development of our theory. In the last paragraph we purposely used the word "vortices." Though our theory will show that the main ether drift towards the Black Pits is fundamentally at the roots of wireless facing on earth, that phenomenon with all its vagaries is actually due to cosmically local circumstances. A river may flow smoothly enough, but put into the middle of it a rock and you will get minute subsidiary currents, eddies and vortices in the immediate vicinity of the rock. Now ether cannot penetrate the electron, and since all matter is merely a concentration of electrons, matter in conglomeration is an obstacle to the flow of ether. The universe being curvilinear, every heavenly body is, as it were, a rock in the smooth flux of the ether, and thus, around each body, subsidiary currents, eddies and vortices are set up in the ether. In the vastness of space these subsidiary currents react upon one another from star to star, and since the heavenly bodies are continually changing their positions relative to one another consistency in the ether currents around any one of them is impossible. To these circumstances, then, our theory attributes wireless fading.

A physicist will say that the twinkling of the stars is due to the earth's atmosphere. Our theory states that the twinkling is really high frequency fading due to ether currents in interstellar space. Then why don't the planets twinkle? demands the sceptic. We reply that the signals from a local heterodyne do not fade in the earphones of an adjacent receiver. On the scale of cosmic space the planets are no further away from the earth than is the heterodyne from the receiver.

All the foregoing may be very great nonsense, but at least it should lead to a lively and interesting discussion in the columns of the BULLETIN.

Notes on a Simple Push-Pull Transmitter.

By D. W. HEIGHTMAN (G6DH).

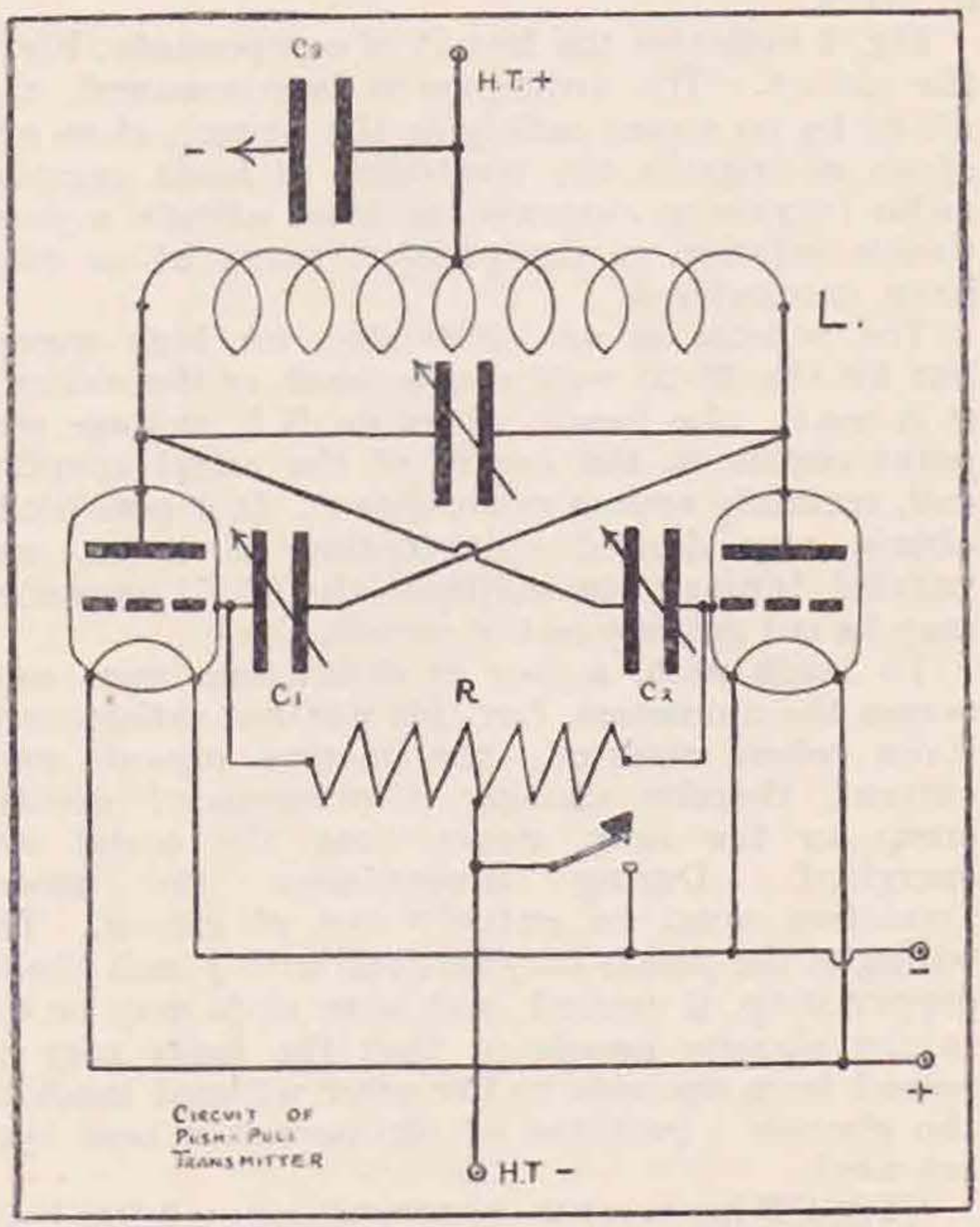
It was recently desirable to increase the output power at G6DH without an increase in H.T. supply voltage. To this end the push-pull type of transmitter was tried and was found to be very effective. The circuit is extremely simple and lends itself to a symmetrical and efficient layout. There are two chief advantages: (1) Greater output power from a given H.T. voltage and (2) an exceptionally stable note (often reported t9).

The component values are as follows:—

L for 14 M.C.: 5 turns No. 8 copper, 8 cm. diam. spaced 1 cm.
L for 7 M.C.: 7 turns, No. 8 copper, 8 cm. diam. spaced 1 cm.
C: .0003 mf.
C_1C_2: Good type variable low loss .0001 mf.
R: 50,000 ohms non-inductive centre-tapped.
C_3 not critical: .002 mf. generally helpful in keeping centre of coil at zero potential.
No rf chokes are necessary.

C_1 and C_2 are adjusted to give minimum plate current, and once set they can be left alone as they do not have to be altered when the frequency of the transmitter is changed.

This transmitter is used in conjunction with the usual antenna, which is either tapped direct on or coupled by a three-turn coil. Obviously it does not matter to which end of the transmitter coil the antenna is coupled. If a Zepp. fed antenna is used it would be worth while trying the split coupling coil arrangement mentioned in the Convention 28 M.C. discussion. (See BULLETIN for November, 1930.)



Simple Tuning Panels for V.F. or C.F. Antenna Transmission Lines.

By C. G. Livesey (VP3SRB).

IN the case of either the V.F. or C.F. Hertz type antenna, where one radiator may be used for three or more frequency bands, it is usually necessary to employ three variable condensers for "feeder-line" tuning: in conjunction with a pair of R.F. ammeters (in the V.F. type aerial), one in each transmission line.

Now, this all sounds very simple and straightforward, but in practice it is one of those annoying petty problems which are frequently met, where a compact and accessible layout has to be devolved.

The writer dislikes ebonite for high-frequency work, and prefers to use glass or porcelain wherever possible; however, it seemed that small ebonite panels were the only practical solution towards housing the feeder tuning apparatus, unlimited porcelain insulators not being available. A pair of panels were therefore arranged from ex. Marconi W.T. Co. ebonite, this being regarded as above suspicion, since it was formerly incorporated in transmitting commercial notices.

The panels, 9" square, one for each feeder-line, were mounted one above the other immediately behind and over the transmitter, separated by a vertical distance of approximately 2 inches, and each mounted upon a heavy white porcelain insulator attached to the wall. This reduced to a minimum the risk of surface, or capacity leakage to earth.

Fig. 1 indicates the layout of components; Fig. 2 the circuit. The arrangement is convenient, and whilst by no means satisfying the writer's ideas and *ideals* as regards the treatment of leads carrying radio frequency currents, at least affords a practicable solution of the problem many of us must have encountered.

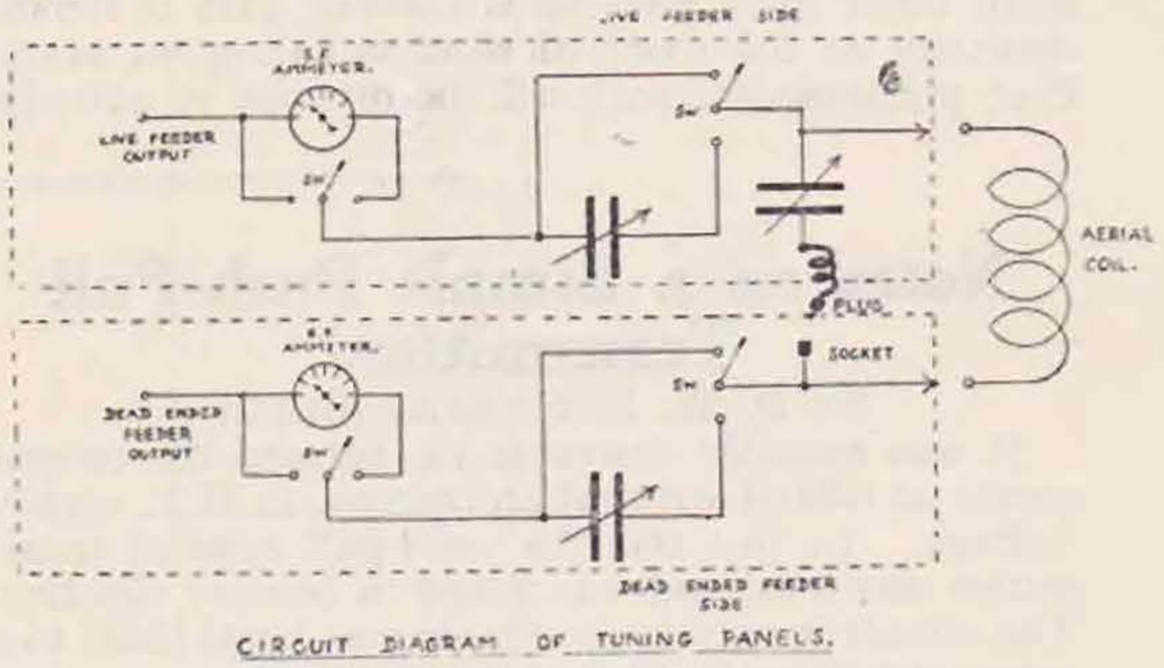
The scheme is *not* advocated for high power, but for the 10-20 watt station such as the writer's, it is neat; also losses, where an R.F. voltage zero point occurs in the centre of the aerial coupling coil, certainly appear non-existent. It is possible to obtain any desired combination of series, and parallel tuning; in addition the R.F. ammaters may be cut entirely out of circuit.

To begin with, a pair of shunt lines were used across the ammeters, but this was not satisfactory. Even when shunted, the meters passed some current, thereby causing a pronounced upward creep to the note, every time the aerial was energised. During transmission the feeder ammeters must be entirely out of circuit. The wiring of the panels may be done with ¼ inch pliable copper strip, if desired, and large slots may be cut in the ebonite panels so that the leads may be passed from one side to the other without touching the ebonite. Switches of the porcelain base type are used.

VP3SRB has recently been working on 3,500 K.C., using a 7,000 K.C. half-wave antenna. Theoretically there should be trouble in persuading this aerial to radiate on 3,500 K.C. By using a twelve turn 3½ inch diam. coupling coil, a series .0003 condenser in the dead-ended feeder and a .0003 condenser in parallel with the coupling coil, the system resonated perfectly.

With an input of 6 watts, C.W. was invariably R6-R7 on o-v-1 in Durban; R3 to R4 in the Cape—at night, this latter being about 1,300 miles distant. The ammeter in the live feeder indicated approximately .25 ampere, and a transfer reading of the anode milliammeter showed a "load" and "no-load" difference of 10 milliamperes. A good figure, where the input to the valve was 20 milliamperes at 300 volts, under "load."

The system evidently functions as an aerial-counterpoise, since the feeder ammeter readings are not equal in this case. It may not be scientific, but some arrangement had to be devised quickly for our annual South African 80 metre competition—this worked immediately, and well. These facts about the 3,500 K.C. band are given in order to show the usefulness of the switching arrangements. The feeder lines pass straight to the windown, from tee panels, a distance of two feet.



CIRCUIT DIAGRAM OF TUNING PANELS.

The tuning apparatus should be as close as possible to the aerial inductance. Should the ammeters be far removed from the voltage zero point which occurs (in the case of a V.F. system) at the centre of the aerial coil, misleading current readings will be shown.

A symmetrical relation should be preserved between the two feeders and their equipment.

It will be seen, from the figure, that switches 5W. cut in, or out, the series condensers and ammeters.

A heavy flex connection, with a soldered plug, is preferable for connecting the parallel condenser across the feeders, since there is no possibility of surface leakage, or capacity effects, between the two panels, when the plug is disconnected, and the parallel condenser is out of circuit.

The remainder of the arrangement is self-explanatory, wiring being left to individual choice. The results being obtained at this station on 14 M.C. certainly dispel any suspicions that losses might be occurring due to leakages, and the writer concludes by hoping that the simple design may be of use to some of our readers.

2 M.C. Tests, March, 1931.

Objects.—To investigate the possibilities of 2 M.C. for reliable long-distance communication with moderate power; to note how such reliability may be affected by weather and other physical causes, and to connect these, if possible, with the prevalence of static, fading, and so on; to investigate further into the directional properties of the band as noticed in the 1930 tests; to note the difference between daylight and darkness signal strengths of stations over 100 miles distant. In order to give additional interest the tests will be run on competition lines, with a trophy for the winning transmitter and a trophy for the winning receiving station. These trophies are at present held by G6ZH and G6YL respectively.

Dates.—March 8, 15, 22, 29 (Sundays), from 00.00 G.M.T. to 24.00 G.M.T. Each day will be divided into a *light* period (05.00-19.00) and a *dark* period (19.00-24.00 and 00.00-05.00).

General Conditions.—The tests are open to all R.S.G.B. members in the British Isles. Each participant must effect contact with other stations outside a radius of 100 miles from him. Special attention must be given to weather conditions and to their effect upon distant signals. The conditions under which static is present shall be particularly noted. Differences in signal strengths in *light* and *dark* periods shall be observed, together with any outstanding feature of reception from any particular area (directional effect of waves). One station may not be worked more than twice in one day—once in daylight and once in the *dark* period, with special attention to QRK on both occasions. Before completing a QSO four-letter codes (as described below) shall be copied by both stations, otherwise the QSO shall not count in the tests.

Allocation of Points (applying to home and foreign participants).—A QSO in the *light* period counts 2 points, in the *dark* period 1 point. Foreign QSO's count 3 points in the *light* period and 2 points in the *dark* period. To equalise the chances of a foreign QSO for all stations in the country, communication with the Irish Free State will count as foreign QSO (*i.e.*, 3 points and 2 points). Northern Ireland and the Channel Islands count as G (*i.e.*, 2 points and 1 point). Irish Free State stations count all external QSO's as foreign, but all QSO's with I.F.S. stations as 2 points and 1 point, *i.e.*, "home" QSO's over 100 miles distance.

Reporting the Results.—Reports of each Sunday's activities must be sent to G5UM to reach him not later than first post on the following Wednesday. In addition to the call sign of each station worked, his code letters as received by radio must be given in full. Full details of weather and radio observations (excluding, of course, such incidental things as local interference) must accompany each report, with, if possible, associations between physical phenomena (clouds, rain, etc.) with radio conditions (fading atmospherics, etc.).

Working.—Power is limited to 10 watts to the last valve. All P.M.G. regulations must be observed. Telephony or C.W. can be used, at the operator's discretion. Test calls MUST be short, and letter codes sent only when contact has been effected.

Receiving Stations must also observe connections between electrical and physical phenomena. They must log stations outside 100 miles radius, and *must copy the letter codes of every such station logged.* For every such reception of a station over 100 miles away receiving stations count 2 points for the *light* period and 1 point for the *dark* period. One station may not be logged more than twice in a day—once during the *dark* period and once in the *light* period. Here again attention will be given to fluctuations of QRK, the effect of local atmospheric conditions, exceptional signal strengths from one particular district, and so on. Reports on each Sunday's work must reach G5UM by first post on the following Wednesday, giving letter codes and call signs of all stations logged over 100 miles away, together with full details of observations made. There is no restriction on the type of receiver used.

Letter Codes.—These are of the utmost importance to the successful function of the tests. Each transmitting station intending to take part in the tests must send notice to G5UM not later than February 21, and will be allocated four four-letter codes, one to be used each Sunday, *e.g.*, G5VL, March 8, letter code will be XCBV; March 15, ABDW; March 22, PUWJ; March 29, LQBB. Letter codes must be reported correctly in every case by transmitters and receivers, otherwise the points claimed will not count. G5UM will be able to check up all reports from his list of participating stations and their letter codes. Apart from the valuable information that the tests are expected to yield on the relation between radio-electrical and physical phenomena (and the co-operation of all members is sought in obtaining this), it is certain that they will call for some really efficient operating all round.

Reports to G5UM, by the Wednesday following each Sunday's operations. An analysis of the data collected will appear in "C.B. Notes" in a forthcoming issue of the T. & R. BULLETIN.

Stray.

C. J. Mumford (ex-CT1BL) has arrived at Brazil. His address there is *c/o* the Western Union Telegraph Co., Fortaleza, Ceara, Brazil. His receiver is already fixed up, and he has heard G5BR and G6WT on 7 and 14 M.C. respectively. He hopes to get on the air with about 100 watts of C.C. as soon as the revolution season is ended!

Calls Heard.

By VK2JZ, A. S. MATHER, 14, William Street, Singleton, N.S.W., Australia.:—14 M.C. band up to December 4, 1930: ce3ab, f8pz, f8eo, f8cs, f8wab, g2vq, g6qb, g6wy, j1dv, j1ec, j1dr, j1do, j2px, j1tx, j2cb, ka1cm, ka4hw, oh2nm, oh3na, oh3nb, oh3np, oa4z, ok2si, ok2op, ear2i, pk4bo, pk4aj, pa0qf, uo3op, vu2bg, vu2ah, vs6ag, w4kh, w3cxl.

Apparatus Worth Buying.

Microfuses and Condensers.

YOUR representative has recently paid a visit to the works of Microfuses, Ltd., whose products are marketed by T.C.C. The fusing element of the microfu consists of a very thin film of gold mounted on celluloid strip, the gold used for same being so thin that newsprint can be be read through it with ease. This element is clamped between brass jaws and assembled in a glass tube with metal end-caps. The current-carrying capacity is varied by the thickness of the gold and the D.C. resistance is practically negligible, being 5 ohms for the 150 m.a. fuse. Two features are the absence of deterioration of the element and the speed at which the fuse blows. At an overload of three times its carrying capacity it fuses in 1/10th of a second, and at about eight times the capacity in 2 milliseconds. To prove this a fuse was placed in series with a 5 m.a. meter and the filament of a valve rated at .075 amp. and 100 volts D.C. was put across the circuit. At first a fuse to operate at 100 m.a. was used and, when it blew, the meter kicked to 2.5 m.a. only. A 200 m.a. fuse was then put in with the same result. Lastly, a 400 m.a. fuse was used, and even this blew instantaneously and left the filament intact. An excellent use for these fuses could be found in protecting the power amplifier of a transmitter from damage if accidentally overloaded, and in commerce they are used for protecting high-grade instruments. They can be obtained in various carrying capacities from 5 m.a., price 4s., to 1,000 m.a., at 1s. 9d., the price for all values above 50 m.a. being 1s. 9d. The ratings are the currents at which the fuses are designed to blow, and in practice it will be found that a 100 m.a. fuse will blow at from 90 m.a. to 120 m.a. approximately. For use with high voltages the long type microfu is recommended. T.C.C. will be glad to supply any information on this point.

The Telegraph Condenser Co., Ltd., have recently marketed a new type of mica condenser which is of especial interest to our transmitting members. These are not listed in their catalogue, but are known as 1,000-volt test (500 working) mica condensers made in capacities of .01 mfd. and .005 mfd., and sell at 4s. 6d. and 5s. 3d. respectively. Undoubtedly these are a real bargain and can be used with absolute safety on low and medium power amateur transmitters, as, for instance, in the T.P.T.G. set described in last month's issue where low power is required. These condensers are made in standard moulded cases of the upright type and provided with terminals (they are identical in appearance to the 001 mfd. standard mica condenser). These are constructed on the non-inductive principle. Having tested and used two of the .005 mfd. capacity, we have no hesitation in recommending them to members.

Varley All-Electric Receiver.

Messrs. Varley have produced an attractive pamphlet giving details of their Senior All-Electric Receiver and their Radio-Gramophone. The former is made as a transportable for use with either A.C. or D.C. mains and with a small indoor aerial or larger outdoor aerial. It is built into a panelled walnut cabinet and makes an attractive piece of furniture. The radio gramophone is of the console model, again for use off A.C. or D.C. mains, and incorporates a Baker super-power moving-coil speaker. Both these models may be obtained on hire-purchase terms, and full descriptive leaflets may be obtained from the makers.

Technical Articles are Wanted On—

Aerials.—A series of articles on aerial systems for S/W transmission treating both the theoretical and practical side of the design of the more popular types used by amateurs : total length about 10,000 words.

* * *

Filters.—A comprehensive article dealing with the design of filters in Power Supplies. The design of smoothing chokes may also be included.

* * *

Modulation.—Choke control and the various forms of grid control should be dealt with in this article and reference made to the approximate output required from the microphone amplifier to give certain degrees of modulation with stated powers.

* * *

Keying.—A summary of keying systems for C.C. and self-oscillator circuits, with special reference to clickless keying in all cases.

* * *

Will intending contributors of articles on the above subjects please communicate first with the Editor in order to save the possibility of two or more authors covering similar ground ?

Further articles are required on many other subjects. The BULLETIN is larger this year and we require more good articles to fill it.

* * *

Contributors to the "Calls Heard" section will assist if they will arrange their lists in strict alphabetical and numerical order ; please see page 198.

TO B.E.R.U. MEMBERS

The Quartz Crystal Co. have exported crystals to over 20 countries in all Continents of the World. We welcome B.E.R.U. members enquiries and we pay carriage on Crystals and Holders to any part of the World. SOUTH AFRICAN amateurs can obtain our crystals from stock at Messrs. RADIO SERVICE STATION, JOHANNESBURG. And DUTCH amateurs from Messrs. FARO RADIO, STILLE VEERKADE 1. The Hague.

For full price list, see the October, 1930, "Bulletin" or drop a P.C. to—

THE QUARTZ CRYSTAL CO. (G2NH & G5MA),
63a, Kingston Road, NEW MALDEN, SURREY.

Telephones : Malden 0671. *Kingston* 3385.

HIC et UBIQUE.

Scouts Assistance Scheme.

BY the kind co-operation of the local Scoutmaster and the Rover Leader (34th Camberwell B.P. Scout Group), one of our members, G6AQ, who is very keen on getting this scheme going, was able to give a short talk on the subject to a meeting of Rovers at Waverley Park (Peckham), S.E., on Monday, December 1. A letter from Mr. J. Clarricoats was read by the Rover Leader by way of introduction, and G6AQ followed with a brief rçsumé of the scheme. He also read an extract from an article written by Lord Baden-Powell as far back as 1923, wherein hope was expressed that something like the scheme suggested by the R.S.G.B. would be inaugurated in the future with the help of British radio societies.

G6AQ met with a very friendly reception, and hopes that, having lit the lamp, as many of our members as possible will now come forward and keep it alight.

* * *

Silent Keys

We regret to have to record the death of C. W. Randall (VS3AB), one of the oldest transmitters in Malaya. Mr. Randall was manager of a rubber estate of 1,600 acres north of Singapore, and had been in the East sixteen years, originally going to Hong Kong. He regarded radio as a hobby to fill in the evening, though he treated it seriously, and had remarked that "there is something much more important in experimenting than pasting one's walls with cards." We extend our sympathies to Mrs. Randall and to the many friends in Malaya, at home in England and in other parts of the world, who will miss a keen amateur and a true friend.

First Contacts.

GREAT BRITAIN AND UNFEDERATED MALAY STATES.—VS3AB and G5XD at 14.40 G.M.T. on April 7, 1929, on 14 M.C. (The claim from G6WT in the November BULLETIN was with the *Federated* Malay States.—ED.)

GREAT BRITAIN AND HAITI.—G2GM and HH7C on 7 M.C., at 00.15 G.M.T., on July 23, 1930.

GREAT BRITAIN AND UGANDA.—G2GM and VQ5NTA, on 14 M.C., at 18.25 G.M.T., on July 30, 1930.

* * *

B.R.S. and B.E.R.S. Numbers.

Council have decided that in future all non-transmitting members will be given a B.R.S. or B.E.R.S. number.

This number will be used for official records only, unless the member concerned has intimated his desire to be given a distinctive number.

Members who at present do not hold either a full or artificial aerial call sign may apply for the B.R.S. number which has been allotted to them. All existing B.R.S. and B.E.R.S. numbers will remain unchanged.

B.R.S. and B.E.R.S. members are reminded that these numbers should be given up immediately a licensed call is granted. Headquarters should be immediately notified of such changes.

* * *

W.B.E.

W.B.E. certificates have been awarded to Capt. G. C. Price (G2OP), V. M. Desmond (G5VM), G. H. Ramsden (G6BR), H. C. St. John (VK2RX), Major L. J. Feenaghty (VK4LJ).

QSL Section.

There is nothing of interest to report for December except that it has been decided to maintain a weekly exchange of cards with foreign agencies instead of fortnightly as formerly.

The heartiest good wishes for the New Year are extended to all members from the Section.

J. D. C.

QRA Section.

New Prefix: ZC—Trans-Jordania.

NEW QRA's.

G2AX.—N. BLACKBURNE, 11, Sea Road, Bexhill-on-Sea, Sussex.
G2IH.—LENSBURY RADIO SOCIETY, Shell Corner, Kingsway, London, W.C.2.
G2OC.—L. R. SEAL, 90, Wollaton Road, Beeston, Nottingham.
G2PF.—N. HUGGETT, 6, Alexandra Road, Chichester, Sussex.
G2PH.—Portable of G2PF.
G2WA.—F. W. J. PIGOTT, 71, Nutfield Road, Thornton Heath, Surrey.
G2WV.—J. B. KERSHAW, 25, Stanley Gardens, London, N.W.3.
G2WW.—L. C. DAVIS, jun., 24, Fallowfield Avenue, Hall Green, Birmingham.
G2WX.—S. BORGARS, 28, Welldon Crescent, Harrow, Middlesex.
G2XT.—J. R. WILSON, 23, Salters Road, Gosforth, Newcastle-on-Tyne.
G2ZM.—G. E. CLARKE, 4, Lankester Road, Royston, Herts.
G5BS.—C. S. BRADLEY, 8, St. Margaret's Terrace, St. Leonards-on-Sea.
G5LS.—R. W. H. BLOXHAM, 12, St. Michael's Avenue, Westoe, South Shields.
G5MI.—I. F. MEIKLEJOHN, Royal Signals Mess, Aldershot.
G5OS.—E. P. OSCROFT, "Outlook," Beeston Fields Drive, Bramcote, Notts.
G5PH.—B. F. PHILLIPS, 144a, Cwm Road, Bonymaen, Swansea.
G5QH.—C. W. H. BEGBIE, 5, Eastern Terrace, Brighton.
G5XH.—L. W. HOOKE, 104, North End, Croydon, Surrey.

G6IY.—A. Pacy, 36, Beverley Road, Barnehurst, Kent.
G6SR.—S. Rowden, Rosebank, Pilrig Street, Edinburgh.
G6US.—N. E. Read, Dene Well, Middle Drive, Darras Hall, Portland, Newcastle-on-Tyne.
2ABQ.—R. Cave, Holiday House, Mill Lane, Walton-on-Naze, Essex.
2ABW.—E. Gaukrodger, 4, Montrose Villas, Chewton Road, Keynsham, Somerset.
2ACD.—W. O. Took, 46, The Hornet, Chichester, Sussex.
2ADC.—F. S. Mizen, 28, Brunel Road, Bridgewater Road, near Bristol.
2AMZ.—F. R. Drew, Frampton Cotterell, near Bristol.
2ANJ.—E. F. Baker, 5, Currie Road, St. John's, Tunbridge Wells, Kent.
2ANS.—J. Cuthbertson, 15, West View, Aklam Road, Linthorpe, Middlesbrough, Yorks.
2BAJ.—J. F. Stanley, The Frith, Aldington, Mersham, Kent.
2BXZ.—W. A. Clark, 89, Laburnham Avenue, Garden Village, Hull.

The following are cancelled :—GI2OO, 2BCQ, 2BZT. M. W. P.

NEW MEMBERS.

A. E. R. Buckle (BRS443), 12, Deodar Road, Putney, S.W.15.
H. L. Lidington (BRS444), Homeleigh, Parkhurst Road, Bexley.
W. L. Millar (BRS445), 3, Parker Street, Dundee, Angus, Scotland.
A. L. McLean (BRS446), 10, Mazenod Avenue, West Hampstead, N.W.6.
R. M. Sloan (BRS447), 5, Clarke Avenue, Ayr, Scotland.
H. Davis, 41, Hunter Road, Thornton Heath, Surrey (G2AQ).
J. S. Stewart (BRS449), 12, Garrioch Crescent, North Kelvinside, Glasgow.
T. S. Wood (BRS450), 6, Zion Place, Gravesend, Kent.
E. W. Osborn (ZT1H), Beam Wireless Station, Klipheuvel, C.P., South Africa.
S. Pedrick, 3, Clifton Place, Glasgow, C.3.
C. A. Partridge (BRS448), 50, Litchfield Way, Hampstead Garden Suburb, N.W.11.
A. Everett (ZT6U), P.O. Box 930, Johannesburg.
W. H. Lucas (ZU6A), "Shenfield," P.O. Koekemoer, Transvaal.
R. J. Jeffrey (BRS451), 51, Fountainhall Road, Edinburgh.
J. H. Moore, Pothuparai, Peermade, P.O., South India.
J. B. Corbin (BERS24), 351, Mowbray Road, Chatswood, Sydney. N.S.W.
E. P. Metcalfe (VU2KH), Mysore University, India.
C. Cowan (VK2PZ), 139, Congewai Street, Aberdare, N.S.W.
Dennis Moore (BRS453), 27, Johnson Road, Lenton, Nottingham.
R. Stuber (HBR60), 97a, Thunstrasse, Berne, Switzerland.
W. T. McQuillen (G5PM), Royal Military College, Camberley
B. F. Larsen (LA2B), Vestsidens Apotek Fredrickstad, Norway
B. C. Okell (BRS454), Lyndale, Grange Road, Bowdon, Cheshire
H. Gordon Fagg (BRS452), c/o Imperial & International Comms Beam Wireless Station, Skegness, Lincs.
A. J. Peck (2ADM), 21, Geere Road, West Ham, E.15.
G. H. S. Balmain (BRS456), Alford, Castle Cary, Somerset.
W. A. Mead (BRS457), Addiscombe, Branston Road, Burton-on-Trent.
R. C. Ashton (BRS458), 41, Sithney Street, St. Budeaux, Plymouth.
V. J. Bartlett (BRS459), 11, The Circle, Tredegar, Mon.
W. C. Goult (BRS460), Holly Mount, Crown Hill, Rayleigh, Essex.
W. D. Gilmour (BRS455), 10a, Gipsy Hill, Upper Norwood, S.E.19.
W. E. Corbett, 68, Oxton Road, Birkenhead. Operator, G5WG, c/o Philips Lamps, Ltd., 25, Stanley Street, Liverpool.
P. Seymour (BERS25), HQ. A Flight, No. 8 (B) Squadron, R.A.F., Aden.
A. N. Le Cheminant (2BXP), 21, Raymend Road, Victoria Park, Bristol.

CALLS HEARD.

By ZT6X on November 2, 1930 :—14 M.C. : g6hp, 6rg, 6xq, d4wao, f8ex, 8pz, oh2nm, ok2op, 2si, on4au, 4uu, oz7v, pk1cx, 2wj, 4aj, 4bo, vk2cd, 2gv, 2hb, 3ju, 3lz, 3pa, 3wx, 5wr, 6sa, 7jk, vu2kt, 2bg, zl1ao, 1ar, zt2b, zs1c, zs4t, zs5w.

* * *

By G6RH, on 14 M.C., during December :—ct2aa, 2ac, ve1an, 1ar, 1be, vo8mc, vu2ah, x4m, zl3ar, zs4m, zt1t, w1aao, 1azd, 1bcb, 1bus, 1bxc, 1caa, 1cqr, 1cql, 1fh, 1nw, 2aeb, 2arb, 2buy, 2cfw, 2hj, 2ma, 2zg, 8auu, 8adm, 9fvw.

* * *

By 2BOC, E. A. C. Jones, 46, Lady Margaret Road, N.W.5, December 21 to 25, on 3.5 M.C. :—d4aba, d4afj, d4ijn, d4irg, d4nai, d4nzb, d4opg, d4pad, d4rzn, d4uan, d4vob, d4zug, eu2cb, eu2kbz, f8sk, g2dq, g2hd, g2lz, g2op, g2wp, g5xy, g6pa, g6so, g6yl, hb9nh, oh5nf, oz7xx, oz7ss, pa0ap, sm6ua, ts4sbr, w1adv, w1asy.

* * *

By W. Makepeace (BERS1), H.Q. Wing, 1st Battalion Worcester Regiment, Shanghai :—ac3xp, ac3zm, ac8ad, ac8em, ac8js, ac8we, ac8zw, au1ba, au1kal, j1dm, j1dq, j1dr, j1dv, j1dy, j3cs, j3da, j3db, j8mm, j9xx, ka1ce, ka1cm, ka1el, lu1ca, om1tb, pk1cx, pk3bq, pk4aj, pk4ce, vk2gv, vk2hb, vk2jz, vk3bq, vk3fm, vk3oc, vk5it, vk5jr, vk5wr, vs3kc, vs6ac, vs6af, w6eb, xeu2db, zl1ao, zl1ar, zl2ac, zl2bg, zl2bz, zl2dn, zl3ah, zl3as.

* * *

By ST6HL, Khartoum, Sudan, November, 1930 :—14 M.C. : ct1aa, ct1cw, d4wao, d4wer, ear21, ei2b, f8aly, f8bf, f8cs, f8eo, f8ex, f8fm, f8fo, f8nkt, f8pz, f8rhm, f8rj, f8ru, fm8bg, fm8eor, g2ao, g2cj, g2cx, g2dh, g2dz, g2lz, g2ma, g2ux, g2vq, g5jc, g5ml, g5qf, g5qv, g5vb, g5vm, g5yv, g6dh, g6gb, g6hp, g6lk, g6nf, g6qb, g6rh, g6ta, g6vp, g6wt, g6xn, g6zb, haf3d, j1ec, k4kd, lu1ca, lu1jm, lu2ca, lu3de, nkf, ok2si, ok3sk, on4ar, on4fe, on4fp, on4fq, on4is, oz5a, oz7ss, pa0da, pa0qf, pk3bq, pk4aj, py1ah, py1ba, py2aq, py2bk, py2qa, st2a, st2c, st3wt, su1aa, su8rs, v1yb, ve4af, vk2jp, vk2yk, vk3go, vk3wl, vk3wx, vk4af, vk4gk, vk5am, vp2sra, vp3rr, vp3sr, vp9sr, vq2ba, vq2ty, vq3msn, vq4cre, vq4crf, vq4msb, vs7ap, vu1se, w1aao, w1ae, w1ahx, w1akc, w1aqt, w1au, w1axa, w1axc, w1axu, w1bj, w1bje, w1caa, w1mo, w1zo, w1zz, w2aaw, w2ae, w2ajj, w2ano, w2anu, w2arb, w2ary, w2axl, w2bak, w2bd, w2bdh, w2bmc, w2but, w2cfo, w2rd, w2tj, w2sbt, w3de, w3jr, w3sj, w4aik, w4ba, w4ft, w4ja, w8avd, w8chq, w8cpc, w9adm, zl1aa, zs2n, zs4m, zs5u, zs6y, zt1t, zt6j, zu1d. 7 M.C. : au7cd, au7kah, ce1ah, ear2, ear104, eu4ko, f8bf, f8joz, f8kwt, f8pm, fm8ldc, fm8rc, g5pj, g6lh, g6lk, g6qb, g6rb, hb9q, ok2va, on4gn, on4jm, pa0fb, ts4sbr, vk4dw, vk4rm, w2bds, w4gw, w8cf, w8wk.

* * *

By W. Lockerby, Leading Telegraphist, 62 Mess, H.M.S. Royal Oak, c/o G.P.O., London, November 30, 1930, to December 6, 1930 :—7 M.C. : d4adf, d4lrm, d4rdw, d4sux, ear96, ear210, eu2dv, f8ex, f8fn, f8ho, f8jc, f8pz, f8sh, f8wok, fm8lc, g5jf, g5mi, i1ra, la2b, la2z, ok1af, ok1rf, ok2va, on4jj,

on4lo, pa0bl, sp3lz, xf8map. 14 M.C.: xg5sv, xg5ud.

* * *

By BRS273 (December, 1930) :—cn1cb, ct1cq, d4adf, d4bmr, d4nrg, d4wea, ear21, ear94, ear210, es2gu, es3fu, eu2bd, eu2km, eu5kl, haf2d, haf3bo, haf3c, haf3mx, lu2ca, lu3kc, oh1nf, oh2oe, oh2og, oh2or, oh3na, oh3nk, oh4nc, oh7nc, oh7nd, ok2ak, ok2op, oz1d, oz7t, pa0ib, pa0im, pa0mq, py9an, sp1ae, sp3dr, sp3em, sp31a, su1al, su8rs, sw2ai (QRA ?), vk2hu, vk2jz, vk2wu, vk5mf, w1aao, w3sc, w4ft, w8ay, w8dld, yi2nm, yl2ra, zl2by, zl2bz, zl2gw, zl3ar, zl3as, zl3bq, zl4ai, zl4an, zs5u, zu1d.

Correspondence.

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

Curing Trouble from Eliminators.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—I am indebted to Mr. Savage, the well-known expert on transformers and chokes, for the following smoothing hint, which I think worthy of passing on to my fellow readers.

I believe it is a common experience when using valve rectification for eliminator work for one to experience a certain amount of hum on tuning-in a carrier-wave, which hum disappears immediately on detuning. This so-called "tunable" hum is apparently due to the rectifying valve itself oscillating and can be definitely cured by loading the plates of the rectifying valve. A suitable capacity appears to be .01 mfds., and condensers of this value should be connected across either half of the H.V. secondary winding.

In conclusion, Mr. Editor, may I thank you for the very interesting publication I have the pleasure to receive each month.

Yours truly,
J. W. COVENEY, G5UL.

16, Rochester Gardens, Ilford, Essex.

Advertise Ourselves !

To the Editor of T. & R. BULLETIN.

DEAR SIR,—With reference to the Editorial on the front page of this month's BULLETIN, as to advertising the aims and objects of our Society, I agree with your remarks. Much can be done by co-operation.

I would suggest that during the coming year, 1931, all our members, so far as they are able, should adopt a similar plan to that of mine, i.e. :—

(1) Always wear the emblem of the Society.
(2) Advertise and explain the benefits of being a member amongst their friends, and endeavour to make interested parties either Associates or members.
(3) Ask them to assist in spreading the good news, especially abroad. I have been busy in Sydney, N.S.W., Australia, and am now trying my hand in South Africa.

It would be a fine achievement if we could ultimately enlist every British amateur at home and overseas in our ranks.

Wishing good luck and a happy New Year to everyone connected with the R.S.G.B.,

I am,
Yours faithfully,
ARTHUR H. BIRD (G6AQ).

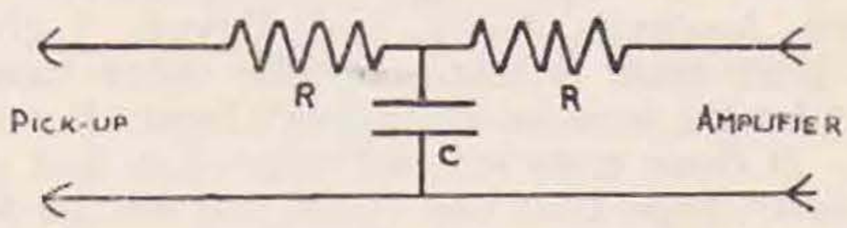
35, Bellwood Road, Waverley Park,
Nunhead, London, S.E.15.

Scratch Filters.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—With reference to "Inconnu's" article entitled "In the Course of Conversation," the following remarks on scratch filters may be of interest to the readers of our wonderful T. & R. BULLETIN.

The scratch which is observed when reproducing gramophone records electrically is the result of the slight unevenness in the bottom of the groove in the record. These give rise to semi-periodic currents of a high frequency, generally assigned at 5,000 to 8,000 cycles per second. The reproduction or otherwise of this scratch depends upon the manner in which the amplifier and loud-speaker will respond to upper frequencies of this order, so that the record is noticeably free from scratch when reproduced.



However, this is not a satisfactory solution, for it means that the upper notes are being lost as well. After experimenting with various filters, including the connecting of resistances, condensers and chokes in the pick-up leads and other parts of the amplifier, I have come to the conclusion that the best of all the systems which I have yet tried out is a resistance capacity filter as shown in the diagram :—

The values of this circuit should be so varied until the scratch is reduced to a minimum. The cut-off point occurs approximately at the frequency given by $f = \frac{1}{2} j \pi CR$.

Yours truly,
GRIFF THOMAS,
BRS352.

Memories.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—I was both interested and amused on reading "Memories" by "Oletimer" in the current issue of the BULLETIN. Both as to dates and activities "Oletimer's" case is almost exactly similar to my own.

Well do I remember the time when my first single valve—yes, the proverbial "French R"—operated for a few minutes weekly, as my schoolboy's exchequer provided but one flash-lamp battery per week.

Yours faithfully,
DOUGLAS H. JOHNSON (G6DW).

Coombe Pines, Kingston Hill, Surrey.

BULLETIN ADVERTISERS ARE YOUR HELPERS.

Contact Bureau Notes.

By H. J. Powditch (G5VL).

I AM not going to apologise for starting these notes with personal affairs because, were these put off to a later point, I should be wondering all the time how they were to be worded. To take the plunge ; G5VL says : " G.B., OM's and vy 73 " to all his friends in CB. At least, officially, for he hopes that many of them will continue to keep in touch with G5VL as such, and not as CB organiser. It's very nearly two years since GI6YW was forced to drop out and G5VL took on. Now, the latter in his turn hands over control and, in spite of the very nice letters, telegrams and even telephone messages from London, has to refuse to accept renomination for the job. Let it be added, in self-defence, that no such idea of dropping out was present when last month's CB notes were written. And also, all thanks are due to GI6YW and G6LL, who have been behind the scenes of CB work all the time.

Well, " Business as usual." When this comes into print, the 28 M.C. tests will be in progress. So far, things do not seem promising. G6DH suggests that partly it's a question of foreign hams failing to stick to the band during adverse periods. This view is supported by information from America, Australia, India, and Egypt. I give extracts later from letters. On the other hand, we have splendid promise of support from all over the world. If these tests are not so good as last year's, I sincerely hope that the effect will not be to discourage work on the high frequencies. G2ZN and his merry (?) band told us bad conditions were coming, and judging from the charming smile portrayed on a photo he recently sent to me, is now in the happy position of the man who knew—and had the courage to say so.

In this connection, G2ZN writes me making a definite forecast again. He says, basing the opinion upon the fact that there is a remarkable lack of sunspots : " From to-day (December 21) onwards, I should not be surprised to see a complete dud period on 7 and 14 M.C. On the other hand, the 2 M.C. people should bask in really good conditions again. The period under speculation covers only a few days either way of to-day." Let us hear how *you* find things agree with this forecast, please. Bouquets (or bombs) may be sent direct to ZN. XU2UU carries on the tale from Shanghai. "It appears we are in the midst of a phase of conditions not suitable for communication. I wonder if other parts of the world are experiencing a similar bad patch during October and November. Certainly, conditions are much worse than a year ago." So, we G's are not specially ill-favoured by conditions. Look out for XU2UU under a G call from the Plymouth area about March next—and, needless to say, give him a good welcome home.

In the circumstances Group Centres are asked to send their reports to Headquarters until further notice.

G6DH points out a careless phrase of mine in saying that his and G2DT'S 56 M.C. circuits (" Bull." for December and November) are two ways of getting to the same result. Let me explain that I had in mind more the possibilities of getting a transmitter to function than the merits of the two circuits. As G6DH gives his views regarding the merits of the two, I am giving his comparison. In G2DT's circuit (p. 170), the grid-filament plate-filament capacities will tend to fix a point on L1/L2 at the potential of the filament and this point will usually be the wrong position. In the Colpitt circuit (p. 128), these valve capacities are merely in parallel with the tuning capacities, so that the source of inefficiency is automatically compensated when tuning for lowest feed current. G2DT's circuit has an advantage when the inductance of the internal valve leads is comparable with the exterior tuning inductance (say below 3 ms. with QRP valves, and 5/10 ms. with QRO valves), as it becomes impossible to compensate for the valves' capacities. Also the possibility of double oscillation arises. G2DT's circuit, a series-tuned Ultraudion (or " Huxford ") oscillator, eliminates this. (In the above connection, it will be known that a valve will oscillate on the internal inductance with only exterior series capacity, I take it that this is the cause of the risk of double oscillation referred to by G6DH. But—don't try it with a valve you particularly cherish. G5VL.) G6DH also points out benefits in using split coil lay-out for all Ultraudion circuits, and that the grid coil should be smaller than the plate. He adds that from current literature it would appear that the super-regenerative receiver is being found essential for very high frequency work. The point was raised in these notes some time ago—anyone interested might drop a line to G6DH direct. Also, any stations who would care for a talk over frequencies round 2½ ms., please do the same.

A note to G6TW. G6DH wants to know from you whether the beam aerial on p. 174 is correct with a ¼-wave radiator. Seems to me that ½-wave is required. Hw ?

W . . . ., no, I don't think I had better give the call, says, " It is strange that more men on this side don't take 28 and 56 M.C. more seriously. . . . Most fellows feel that 28 M.C. holds some sort of bogey for the amateur. Fellows over here are so easily discouraged. If we had your power limitations, we should be better off. A situation of that sort develops initiative." Thanks for those few kind words, W . . . , we hope we will live up to your views. Seriously, though, OM G's, if our cousins feel like this, it's up to us to show we are what they believe, and stick to serious work.

Information comes, via G6DH, that SU8RS has a rush of traffic, and has not had time for 28 M.C. working. Amongst DX stations who will be on the air are HC1FG, VK3WL, VU2FX. About a dozen W stations have written to the same effect, so—allowing for the ordinary ham's disinclination to

IF IT'S WORTH ADVERTISING, IT'S IN THE BULLETIN.

write letters, that should mean at least 100 standing by.

Special to 28 M.C. " Night-Owls."

G2VQ has, as usual, been helping forward tests by " Link " messages. In addition to HC1FG, his messages state that VK2HU will be on 28150 kc and ZL3AR on 28200 kc between 23 and 03 G.M.T.

For the 56 M.C. tests on February 1, 8, 15 and 22, there seem to be more interested than appeared likely. The general opinion runs that it is much simpler to get a receiver working in this band than has been anticipated, and, therefore, we shall have every chance of locating signals. F8PW has a super-het all mains receiver with one stage of S.G., H.F., S.G. detector, 2 S.G. I.F. stages, and usual second detector and one L.F. stage. This all works on 28 M.C. and 56 M.C. In addition, the " first part " can be worked as a super-regenerative circuit. Anyone of our 56 M.C. receivers beat this ?

March 8, 15, 22, and 29 for 2 M.C. I do hope that is right this month, as I've apparently slipped up twice running, and written 28 M.C., instead of 2 M.C. Two M.C. tests in March—just to make sure. G5UM is giving an article, together with this year's conditions and regulations on another page. So, I will leave it to him to tell this tale.

That " One watt week " suggested by G6PP seems to be welcomed by the QRP people. G6PP has sent in the rules and regulations he thinks best, and I hope these will be printed in BULL. next month. Dates arranged are April 11 to April 18. To give a sporting flavour to these tests, G5VL offers any radio goods to the value of £2 2s., to be allocated as G6PP chooses amongst the winners of these tests. G6PP is writing up the tests, and will have charge of the matter.

BRS310, who recently brought off another wonderful specimen of harmonic reception, gives the following details: EAR153 and G2LZ were heard QSO on 7 M.C. During a search on the 14 M.C. band, BRS310 was surprised to hear both again there, another quick change to 7 M.C. ensuring that fundamental working was still on 7 M.C. To carry through the test, BRS310 then hunted through the 28 M.C. band, and there also were both stations once more. The 56 M.C. receiver being hooked up, an effort was made to trace the signals there, and EAR153 was heard, now giving a report to CN8EIS. Again on December 14, G2CJ was heard on 7 M.C., and later copied solid on harmonic on 56 M.C. I asked BRS310 if his aerials had any harmonic relationship to the frequency, but they are 71 ft. to set in one case, and 73 ft. in another. In fact, he tried reducing to 63 ft. and encountered instability in receiver, harmonics appearing the same strength. It was noted that G5ML's QRK jumped some 80 per cent. on the 73 ft. aerial (as against 63 ft.), and also that harmonic reception was better from G2CJ with aerial pointing away from transmitting station.

BRS310 points out, from various experiments, that harmonic reception seems to be due to the transmitter. Yet, only now and then do we hear of a station carrying such reception to the extent outlined above. Another matter he raises is that to him signals appear to travel best when crossing isobars—tunnel effect signals only being heard when these have to travel on a line parallel.

BRS327 send a list of 28 M.C. stations heard this year. They are: May 21, UO1TH; May 24, W2FF; June 14, HAF8B; August 17, D4RW; October 14, SP3MB; November 8, FM8SN; November 9, I1RT and HAF8G. Observation has been kept on WQA almost every day since March last, and it has been found that this station was audible on most days after 11 G.M.T., fading out with darkness.

VE2AC-2AS is listening on 28 M.C. 12.30 to 13.50 G.M.T. All day Sundays and holidays. No sigs. have been heard there up to December 6. He will be on for the tests.

G6CL sends a translation of an article in " CQ " by D4UAB. Some points may interest the 3.5 M.C. enthusiasts. At first the station used to call " CQ " without getting many answers. Of late, three months have given some 350 QSO's on the band. He hopes for a " first " (?) W QSO soon. OZ and D stations are covering good distances with one watt. Open situations are greatly favoured for good results, cities are found poor. QRN is usually a nuisance, and commercial QRM very broad. QRK is said to be more badly affected by Wx than on higher frequencies. With 20w, working over 300 km. is possible in day, night strength is much better, and rises about an hour before sunset, dropping again some one or two hours after sunrise. A very steep drop in strength is noticed at midnight over comparatively short distances, long distance stations are not affected, or actually increase in strength.

It will be seen that we want two more members to complete G6NK's Group on Fading, etc. (2A). The call for volunteers is made.

A last minute letter from VU2FX (ex YI1LM) will rejoice the hearts of 56 M.C. people, as this station has a special permit to transmit during the 56 M.C. tests. He adds some interesting and, so far as I know, unique harmonic details regarding a case in February last, when G6HP received his second harmonic of 14 M.C. at R7, the fundamental being R4 only. The transmitting circuit used was Eccles-Mesny, " which seems to be pretty useful at generating harmonics." It occurs to me that this may be a case where the harmonic and fundamental both followed the usual " time of day " conditions for their respective frequencies, transmission being between 16 and 17 Baghdad time. VU2FX will be on the air with a MOPA set on 28 M.C. for these tests. The CC 28 M.C. set will not be working, a family of LS5B's in FD's having all succumbed in series.

Group Reports.

28 M.C. Work.

Group 1B.—G.C. G5SY has been moving, but hopes to get going this month. G6LL has hopes—now the generator is repaired. G6WY had trouble with SW1 and rebuilt to a DETI SW. W2JN has been heard there. (This sounds like old times, G5VL). BRS250 has been watching harmonics of WQS, WKP, WPE and WAJ, all heard on November 8, but not until 17.30. As these stations are all near Rocky Point, it was interesting to note that WQS and WKP, although located close together, were in opposite phase as regards QSS. WAJ did not fade out till 2½ hours after dark. A weak OK station was heard on November 8 and a CN on

November 23, so BRS250 is evidently there when needed. G5LU finds things very dull. G.C. agrees and points out that there was a large high pressure system on November 8 (see BRS250's report) over mid-Atlantic, another over Central U.S.A., and yet another over Western Europe.

Group 1C.—G.C. G6VP sends a very interesting note of the trials and tribulations of getting going in a new QRA. I gather that all will be past memories before he sees this. G6WN ops. have a new mains receiver which seems OK. They decide that a " RF line and coil " arrangement is the best lock for CC. Many harmonics are reported. G5YK reports poor conditions. He is trying a power FD (DET1SW) and says this tube handles 80w. very well with this arrangement. He intends to try directional aerials shortly. YI6HT sends photos. With the exception of ST6HL's harmonic, things have been dead. A report of his sigs. in August last from PA has just reached him. G6DH takes the honours with QSO's with SU8RS, SU8WY, and UODX. Has also pulled in harmonics of Trans-Atlantic phone. 2BIV describes his " Universal " receiver.

Group 1F.—G.C. BRS25 notes that only harmonics come across from U.S.A., and thinks it means apathy there. G2CX has an uncertain report of W2JN. OZ7T reports bad conditions in Denmark. He is on the air every Sunday, but has only worked OZ2U at 12 miles. The latter station is said to have heard CN8MT (? 8MOP), but was not able to QSO.

Trouble is experienced in getting PA to give output and higher FD voltages are to be tried. OZ7T comments on G6HP's remarks as to undesirability of potentiometer return for G.L. in receiver, and thinks that with some valves, a potentiometer is required to avoid TH. G2CX has been listening consistently and found November 23 the best day. Harmonics of WPE and WQB, R8 and (?) W2JN. An LS5D is found to work in last FD (where no other valve would), giving good output and locking PA well. A new PA stage for DET1SW is being built with coils on condensers and general lack of wire. G6HP finds only local stations and some commercial harmonics. G2DZ has been transferred from R.M.S. *Majestic* to S.S. *Belgenland*, which latter vessel is going on a world cruise till May, 1931. He promises reports if a 28 M.C. receiver can be installed. G5WK, after his excellent work in past, has partially sold up and is dropping out of radio. (We hope that OZ7Y will fill the vacancy in the Group.—G5VL.) G.C. BRS25 has listened every Sunday from 10 to 17 G.M.T. On November 16, three local stations were heard. On 23rd, WKD, WEX, WQP, and WQE in afternoon. Also G6DH and GFN harmonic and five locals. On 30th five locals, WKD and HJO, and on December 7 seven locals. Confirmation of the reception of ST6HL is to hand, but—it was harmonic! The transmitter used in ST was made for 28 M.C., but 14 M.C. coils were used, and no success had been had from the set. ST6HL will be working on 28 M.C. with (QRP) 40 w. D.C., and (QRO) 1 kw. R.A.C., more or less regularly on Sundays.

Fading, Blanketing and Blindspotting.

Group 2A.—G.C. G6NK is more than welcome with the members of his nucleus group to revive the old glories of 2A. G.C. intends to arrange some form of tests in a few months' time. He suggests that QRM noticed during heavy snow is caused by the kinship of snow to thunder clouds. 2AYX suggests experiments with radiator angles to control skip distances. On the suggestion of G6SV, the group have decided to study fog, cloud, etc., in relation to skip (the H.L. being already monopolised by 2B). G6SV promises radiation angles for Brookmans Park aerials for consideration. (Say, G6SV, can you push up one of 5XX's masts so that N. Cornwall is not on the fringe of that station's horizontal and vertical radiation? We can gladly supply dynamite, if wanted.—G5VL.) BRS426, who is a new member, also notes snow QRN, although G6SV does not notice " any excess."

Group 2B.—G.C. G2ZN writes: This Group has been very active, discussing many of the problems associated with fading, etc., and it was hoped to issue a summary, but as most of the points are still under discussion, we must wait till we have more evidence. The last two budgets have each exceeded 25 pages of close typed notes, so although we have not published very much to date, CB members will see that we have plenty to discuss. G.C., therefore, offers a few points that may be of interest, regarding some of the simpler things that effect fading, etc., of wireless signals. 2ZC, 2ZN, and 6PP agree that smoke has an absorbing effect, and cases are quoted. 6YL, CT1BK and 2ZC agree that owing to heavy ionization, barometric pressure systems affect signals. 2IM, 2ZC, 6YL, and 6PP agree in principle that QRN (being associated with barometric conditions) also affects signals. CT1BK, 6PP, 2IM and 2ZC agree as to the general behaviour, shape, etc., of the Heavyside Layer, 6YL has an open mind on the subject, while 2ZN is discussing the behaviour of signals, showing how, most of the phenomena we experience can be accounted for by other than the existence of the layer. Apart from a lengthy account of how such could happen, he is of the opinion that as 56 M.C. signals seem to pass outside the Heavyside Layer, light waves will be still less affected. On the other hand, the theory of 6PP, which is exactly the same as 2ZC's, is amply shown, by present conditions, of the Solar Cycle affecting the Heavyside Layer. Owing to bad conditions, we have no report from 2ZN as to sun spots of late, but from his theory it seems, on the face of it, to have a lot in it, and it will be interesting to see whether this forecast is as accurate as the one G6PP published, and which we note, the Editor of the BULLETIN quoted last month, as if it were now an accepted fact.

3.5 M.C. Work.

Group 4A.—G6RB reports that the following members have " signed on." The fact that there is no initial report this month is solely due to G5VL, who completely overlooked G6RB's request for some details. Sorry, OM's. The stations are G6RB, G2IP, G6WY, G6FO, G2NH, 2BZT, with possibly G2OP as reserve man.

56 M.C. Work.

Group 7A.—G.C. G2DT writes: G6LK has built a new Schnell receiver and is positively delighted with it, and to his surprise has discovered it requires six turns of 1½" diameter to get into the band. He also says that it is perfectly stable, and " works beyond all expectations." He will be running all

the Trans-oceanic schedules due in February. No items of interest from G6TW or GC worth publishing.

Group 7B.—G.C. G2OL has so much that he cannot deal with it, and leaves me to court general unpopularity by use of the "blue pencil." Well, OL, I always appreciate frankness! First, BRS310, whose doings have been referred to above, has a "Colpitt" receiver down to 1½ ms., and an "Ultra-audion" to 2 ms. He also submits a formula of his own composition for distances over which 28 M.C. and 56 M.C. sigs. should be heard. I think BRS310 will have to write this up for Mr. Editor or "Inconnu" to think over. G6XN has his receiver down to 2.2 ms., and a BCL set to 5.8 ms. He suggests a talk about 2.5 ms. with anyone interested, as it may, in his opinion, throw light on phenomenon not clearly marked on 5 ms. (G6DH is asking for collaboration there.—G5VL.) He states that G5QB heard some W harmonics on 5 ms. a long time ago, late on a winter's evening, and, if correct, it bears out BRS310. Also the time of reception would roughly coincide with BRS310's reception of FM, EAR, and EU harmonics. He adds, "Harmonics are as likely to give data as fundamentals, in my opinion." G6WN has got going and worked G2OL with a large hill between stations. Although "why G6WN should be R8 at G2OL's at the top of the hill, and G2OL only R4 at G6WN's at bottom, remains a mystery. Presumably a case of nearly vertical radiation." G2BY questions the penetration of QRO signals into HL, and suggests a benefit for QRP. G.C. G2OL has reached G6HP at 12 miles. The requisite coils at G6HP were manufactured in five minutes, and worked! G6HP has since heard several local harmonics on the band. On November 20, a field day intended to take place on Leith Hill was spoilt by weather. However, tests were made from Epsom Downs. Skeds made with G6VP, G6HP and others to listen for 28 M.C. harmonics and also skeds with G2OW at Chelmsford were spoilt, but sigs. were pushed out from a vigorously operated hand generator and sounded well some miles away. Further outings are proposed.

QRP Work.

Group 8A.—G.C. G5RV welcomes the proposed "1 Watt Week." He has been moving again, and finds it *does* interfere with radio. Please note QRA is now 44, Marconi Road, Chelmsford, but that the station will operate from 27, The Avenue, Sunbury-on-Thames. A split CF Hertz was found to radiate best in direction of length, *i.e.*, the opposite to an end-fed VF Hertz, erected in same plane. 2ABS finds things fallen off and puts forward some theories regarding QRO and QRP signals in relation to HL. G2WP finds 14 M.C. hopeless. He reports QSO SX1ON, Salonika, with 4w. on 7 M.C. G6LF tells of no DX (G.C. complains of monotony here), and is busy on 3.5 and 2 M.C. bands. G6MB also "monotonies" and finds QRP on 7 M.C. a waste of good juice. He joins in a discussion as to whether the comparative losses, due to heavier penetration of HL are greater on QRO than QRP. He puts three questions for general discussion. "B." seems to have a bearing upon above. The questions are: (A) Are the effects of the HL upon radio waves purely reflective, refractive, or a combination of both? (B) Do these waves (or radiations) possess the property of inertia, that is, have they mass? (C) Can anyone give polar diagram of the radiation from a half wave and a full wave end VF aerial. (Let's say that this runs up from earth to 10 ms. at free end, and is used on 40 ms. so as to get a start—this will give some sort of average ham aerial.—G5VL.) I see that G5RV qualifies his direction of radiation from two aerials at end of report. In the case of the split CF aerial, I gather this was a bent type with one end below the other, affecting (if I am correct) the effective height.

Group 2B.—G.C. G2VV has been active on 7 M.C. Good reports from Europe. At the beginning of the month VS was heard working RX on 7 M.C., R6/8. Heaps of DX heard on 14 M.C.—but none raised. Had a go at fone with R6/8 reports from Lancs, etc. G2OA and G5JF do not report. G6SO reports working G, PA, LA, and ON on 3.5 M.C. with 4 w. max. (FB.) G5CM reports SP on 3 w. and most Europe on 4 w. The hand generator is now tuning to a better note. A ½-wave CF aerial found not good. BRS309 is now "AA" station—call not yet to hand. Good business, OM. He puts in a good log and intends to go right off on a CC system.

Group 8C.—G.C. G5PH sends in a note of his new QRA. Activities stopped till two 40 ft. masts "point the way to the skies." G2AV still covers Europe with 3 w. of CC. G6PS reports UN7CC worked with 3 w. and 6 ws. with 10 ws. on 14 M.C. We are sorry to lose you, OM, but understand business compels you to drop out. G5AQ is busy with CC key and fone.

2 M.C. Work.

Group 10A.—G.C. G5UM reports: The most important event in the activities of Group 10A during the month has been the successful carrying out of an experimental relay, thus again proving the reliability of the band. This relay, which took place on December 7, was of a message concerning the Group's work. It was originated by G.C. G5UM, London, passed to G6ZH, Swindon (70 miles), who QSP it to G6FO, Newport (50 miles). This part of the relay was worked in daylight. After dark, at 1830 G.M.T., G6FO relayed the message to G5RX, Bacup (150 miles), and G5RX replied. His reply was relayed back through G6FO, and G6ZH to G5UM, this time in darkness. No difficulty was experienced in passing the message, and though G6FO suffered extreme QRM (practically all South Wales uses 2 M.C.), he copied the message solid from G5RX. All stations used under 10 watts.

A certain amount of fading was noticed after dark, but reports generally reveal that December 7 was an exceptionally good night for DX, and gave excellent conditions, apart from the general trend of good conditions now prevailing on 2 M.C. The weather, be it noted, was wet and foggy at times, with heavy squalls of rain throughout the day; in fact, altogether the type of dirty weather that is believed to be good for DX. So successful has this initial effort been that the Group are keeping a co-operative sked on the third Sunday of every month. They are hoping to get a test message round in half-an-hour on January 18. Other hams picking up anything of this are asked to report. G6FO will be found on 1854 k.c., G5RX on 1766 k.c., and G6ZH generally between them. G5UM is always right on the edge of the band on 1743 k.c.

Turning to individual reports, 2AZQ has returned

to radio after an enforced QRT due to business QRM. He resumes his investigations of weather effects, and reports December 7 exceptionally good. In 40 minutes on that day he logged 13 hams on 2 M.C., G6FO, G6QB, G6LR, G5TJ, G2HH, and G6ZR are among the best DX stations logged. He is anxious to start a sked with a transmitter at any time from 2230-2400 on Sundays. BRS164 also finds conditions improved, and his log of stations heard includes all the open-aerial members of Group 10A. The freak-harmonic question arises again, as BRS164 has heard D4OGR on 2 M.C., although he is not thought to transmit on the bands. A sked is being kept with G6FO at 2250 every Sunday night, but BRS164 definitely notes that G6FO is louder from 1800-2000 G.M.T. than later in the evening. G5RX is now on the air regularly with a push-pull crystal oscillator rig, and no PA stage. He finds this circuit one of the best he has tried, and raises distant stations with no difficulty. Two DE5B's or two B4's are used, with little appreciable difference. A 20,000 ohm grid-leak is an improvement, he observes. G5RX is keeping a sked with G6FO at 2315 G.M.T. every Friday, and is hoping to turn in some illuminating data as a result. G6FO, in addition to his several skeds, is calling test at 2300 on 2 M.C. on every possible evening for the next few months in the hope of effecting some more Continental QSO's. Overseas readers, please note! In order to reduce the possibility of QRM-ing BCL's he has built a QRP 2 M.C. transmitter for work during B.B.C. time. Incidentally, he creates no local interference, judging by the fact that his own radio-gramophone for domestic use can be operated on broadcast whenever he is transmitting on any band, except for full-output fone on 170 metres. However, the QRP set consists of a Hartley circuit. The aerial condenser tunes only a portion of the loose-coupled A.T.I., thus making for increased efficiency. G6FO comments on the excellent results obtained with the Cosmos SP55/R valve. One of these gives .4 amp. radiation with but 4 watts input, and is distinctly superior to the CT25X, as an oscillator. It only takes .1 amp. on the filament. Up to 25 miles or so, this QRP outfit gives practically equal QRK to the main transmitter. A schedule has been fixed with G2BI, Calne, Wilts, for Mondays and Thursdays at 1830 G.M.T., when this low power transmitter will be used. With 3 watts input and radiation, .33 it gives R7 at Calne. G6FO continues to work good daylight DX by asking 7 M.C. stations to QRX on 2 M.C. The latest is one with G2KO, Malton, Yorks. who gave FO R2 at 1030 on December 13. No report is to hand from G6ZH, who is very QRL with business. He has been on the air on some week ends, and has QSO all the other members. G5UM is now using the push-pull CO transmitter mentioned last month, and gets much better reports in consequence. Several distant QSO's have been made, and conditions have been found to improve gradually every month. G2ZN, with whom G5UM is collaborating on the sunspot question, thinks that the improvement should be even more marked, according to his observations. EI8B has been heard on 2 M.C. at R6, though UM's sigs. don't reach as far as Dublin, unfortunately!

Group 10B.—G.C. G6OO reports that G6MN has at last worked his station after efforts since Convention. G6MN is getting B.B.C. quality fone reports up to 50 miles with 8 w. He "likes the band and the group." G6UJ also with 8 w., has some very good work. A QSL from OK3SK giving R7, CC. Busy on a RC 3-stage speech amplifier. G6PS wants to drop out owing to business QRM. Sorry to lose you from this group too, OM. G6DR has a fundamental aerial and CP and has QSO'd up to 200 miles. G6OO reports him R6 on absorption modulation between plate and aerial coil. G2KO sends his 4 w. to many G stations and keeps chiefly to CW with good results. G.C. G6OO has rebuilt transmitter and modulator to push-pull Hartley and 9 w., choke control. He had a red letter day by exchanging radio greetings with G5UM, G.C. of 10A, QSOing G6MN, and later G6DR, G6UJ, G2UG on fone. G5QB and G5GY have also been worked.

Thanks for the good wishes, G6OO and all you other Group Centres and members. G5VL reciprocates them all. May your enthusiasm never wane, and your radiation never grow less.

Sun Spots. G2ZN regrets that the sun has not come up to scratch—so there are no spots visible—for November. Speaking seriously, weather prevented observations. But there is one later report at the start of these notes.

Nearly last, but by no means least for the month's doings, that very busy station, G2OP has, in addition to his other official duties, consented to take up the long-wanted aerial group if we can find support for him. Below are his introductory remarks on the subject. Back up, please, and write to G2OP that you will assist.

Antennas.

By G2OP.

The subject of antennas has been a pet of mine for many years. By it, I mean antennas and antenna systems. I have visited many stations during this time, and without belittling their efforts in any way, or wishing to disturb the ham spirit with which I have always been welcomed, I can't help feeling that all is not as well as it might be.

I quite agree that my own antenna is as bad as most others, and I am not satisfied that it does justice to my set. Many of us pay every attention to our transmitters to the very finest detail, but do we pay the same attention to our antennas? What is the use of the 100 per cent. efficient set that we all aim for when our antenna lets us down?

I have spent much time cutting up wire this last twelve months, and much money in buying more and more wire, and I have come to some definite conclusions. I am not prepared to burst forth into mathematics, and I am sure that nobody wants me to. Each type of antenna I have tried has been given what I call a fair test. By that I mean that I have tried it always keeping the transmitter and power the same for some weeks before altering the length or trying a different type.

I expect some of you have heard of a certain ham who nearly twelve months ago was said to be walking on the top of a ten-foot garden wall which was coated with ice. He is alleged to have had a Neon tube in one hand and a bottle of beer in the other, and was testing and demonstrating the voltage loops and nodes when—crash—and he is said to have fallen through the cucumber frame in his neighbour's garden. I know there is a certain element of truth in the story, and I also know that the neighbour is a long-suffering thump receiver and B.C. listener, but, 'nuf sed. (The story I heard was that the "ham" followed the "bottle."—G5VL.)

All antennas tried were of the Hertz variety, and the frequency used was 14 M.C.

Now for some debatable statements:—Firstly, as regards the correct length for the top—most of us say 66 ft., and leave it at that, and hope to drag it into resonance. Our good American friends give a simple formula for finding the correct length, viz.:

$$\text{Length of antenna in feet} = \frac{300{,}000 \times 1.56}{\text{Freq. in Kcs.}}$$

so that for a full wave affair on 14,200 kcs., our top should be 65 ft. 10 ins. I confess my ignorance in not knowing where the 1.56 comes from, but I am of the opinion that whereas 65 ft. 10 ins. might be all right in America, in England it should be longer, and in Kenya it should be shorter. In other words, the length of the top is governed by the part of the world in which it is used. Obviously, local conditions such as nearness to houses or trees will affect it as well as the angle at which it is strung up. Secondly, I gave the Bourne Brook aerial as described in QST for September, 1929, a good trial. It employs a single wire feeder and may be described as a matched impedance feed system. I found it quite good, in fact, I had some excellent results with it, but the full-wave type was very much more directional than the half-wave type. Another important point is that the single wire feeder should not leave the top at an angle other than a right angle, and should be at right angles for at least one-third the length of the top, otherwise the field of the antenna will affect the feeder. At the same time there should not be any sharp bends in the feeder itself.

Thirdly, feeders appeared to be a source of great loss, especially the long feeders as compared with the short ones. I had some interesting results, using the Zep-fed arrangement. In these experiments I kept the top in the same position, but used different lengths of feeders. Some gave me R7 is W and R4 in PY, whilst a different length feeder within a few minutes of the previous test gave me R7 in PY and R4 in W. Feeders do or should not radiate, so why this peculiar result?

Again, the whole idea of feeders is to keep the radiating top away from the house or shack so as to avoid losses, and to keep it as much in the open as possible. Time after time when I have worked some DX I have taken off the feeders and brought the aerial into the shack, keeping it at the same angle and used it as an end-on Hertz directly excited from a tank coil coupled to the P.A. plate coil, and almost invariably have been given greater strength of signals. No, it is not because I have put up bad Zepp feeders, or feeders of hopelessly incorrect lengths. I have studied the Zepp carefully, and although it is quite good, there are serious losses, more especially with long feeders.

Directional antennas is a subject by itself, and not many of us have the facilities to put up such systems. Some of our B.E.R.U. friends in the wilds, with plenty of room, might help us in this direction.

I could write at much greater length and give more interesting and unusual phenomena, and I admit that I have given no very definite results. My reason is this—the subject requires more and systematic investigation. I have always wanted to do something in connection with that all-important section—the Contact Bureau, and I think it is high time we had a group on Antennas; it is full of interest and yet somewhat neglected. I have, like most of us, got to earn my living, and scratch a bit more to buy junk with. Also, I have three important duties to carry out for the Society, so my time is somewhat limited, but I am willing and ready to start a group on Antennas, and am prepared to act as Group Centre until somebody who has more time than I have will take it from me. Many interesting articles have already appeared in the BULL. on the subject, and I quote the following to those interested as being some of them. May I appeal to all those interested and willing to undertake investigations to join and support such a C.B. group?

November, 1925.—Hertz Aerial by G2SZ.
March, 1926.—A Compact Hertz by G5KU.
September, 1926.—Secs Hertz by G5LF.
November, 1926.—Some Aerial Expts. by G5YM.
April, 1927.—Hertz Antenna by G5RZ.
January, 1928.—S.W. Transmitting Aerials by G6MU.
March, 1928.—Straightening out the Aerial, by G6JV.
January, 1929.—Let's put up an Aerial, by G5LF.
May, 1929.—Hertz Aerials, by G6UN.
April, 1930.—Directional Aerials, by G6CI.
June, 1930.—Aerials, by G6XC.
June, 1930.—Voltage-fed Zepp, by FO3SRB and FO3SR.
November, 1930. — The Zepp-fed Hertz, by VS2AF.

Review of Foreign Magazines.

ABSTRACTED BY G6FY.

SOME experiments on the use of ultra-short waves for broadcasting were conducted recently by Prof. Esau and the German Post Office, and are described in "Funk Bastler" for December 12. A 250-watt transmitter working on waves of six to eight meters was installed at the top of the G.P.O. building in Chemnitz, using a dipole aerial 3.5 metres long.

Various receivers were tested in the town and neighbourhood, and reception was found to be satisfactory within a radius of 6-8 Km. from the transmitter. The increase in signal strength with height of the receiver was very marked, and a short aerial was usually necessary for reception at ground level. Reception conditions by day and night did not differ appreciably. Interference from electrical

machinery was not so serious as on normal broadcasting bands, but trouble from car ignition systems was experienced.

The conclusion reached was that the ultra-short waves are promising for broadcast work, but need more careful investigation before they can be put to practical use.

The Telefunken Company have opened a station broadcating gramophone records and the Berlin programme on 7.05 metres. Times of transmission are Tuesdays and Thursdays, 16.30-18.30 G.M.T.

A novel type of wavemeter is described by D4ABR in the November "CQ." It consists of a valve arranged as a non-oscillating leaky grid detector, with a milliameter in the plate circuit. (Fig. 1.)

If H.F. oscillations are "picked up" by the grid coil, the plate current will fall to a value which reaches a sharp minimum as the grid circuit is tuned to resonance with the incoming wave. The calibration depends only on the constants of the tuned grid circuit, and is independent of battery voltages, etc., since the valve acts only as an indicator of resonance.

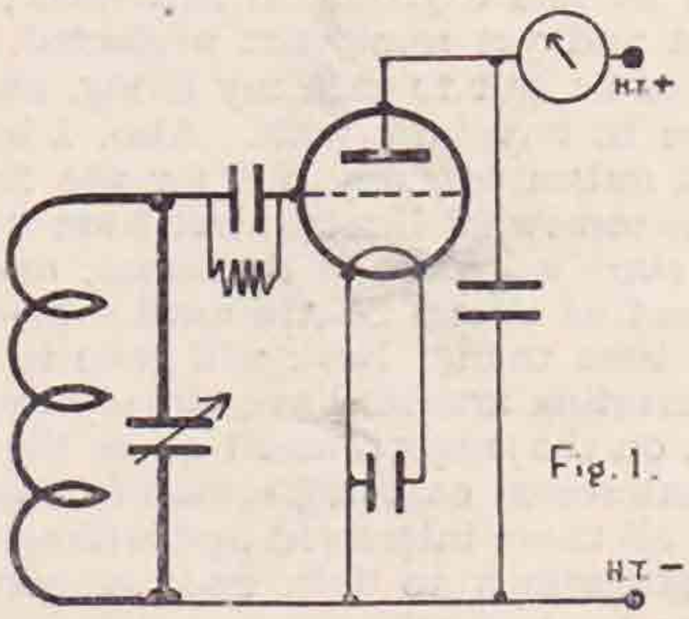


Fig. 1.

In the same paper, Dr. Stoye compares reception conditions during the early part of this year with variations of sun-spots and terrestrial magnetism, and shows that for the reception, in Europe, of DX stations in the Northern Hemisphere, signal strength starts to increase three days before the maximum of solar activity, but drops suddenly to zero when this maximum is reached.

The same issue of "CQ" announces the formation within the D.A.S.D. of an organisation on the lines of our C.B. Groups are being formed for work on various problems of wave propagation, transmitters, receivers, and aerials.

Reviving interest in the 80-metre band is evidenced by articles in "CQ" and "OZ" (the Danish ham magazine). "CQ" announces the offer of a transmitting valve to the first German ham making a DX contact (if possible with W) in this band before July 31, 1931. "OZ" announces test telephony transmissions on the 80-metre band by stations OZ7T, 1D, 7Y, and 7F; these transmissions serve the double purpose of test transmissions and of broadcasting short-wave news to E.D.R. members, and are at present made on Sundays at 09.30 (Danish time).

Some interesting dope on aerials is given in "Red Española" by F. R. Guerrero. Of the various types of Hertz aerials, this author prefers that of Fig. 2. It is a half-wave radiator, completely insulated from the feeder, which runs parallel with it for about one quarter the length of *ab*, at a distance of about 20 cm. The feeder may be of any length, and its degree of coupling to the transmitter is controlled by the variable condenser. As a measure of the radiated power, a the moammeter may be inserted at the centre of the aerial.

It was found that application of classical theory to the design of 14 M.C. aerials yielded absurd results, and some new equations, based purely on the author's empirical results, are given.

For the radiation resistance of such a half-wave aerial, the formula suggested is—

$$R_r = 150 \frac{l^2}{\lambda^2}$$

where l = length of aerial in metres and λ = working wave-length in metres. The formula also applies for a full-wave aerial, l being the total length of the aerial.

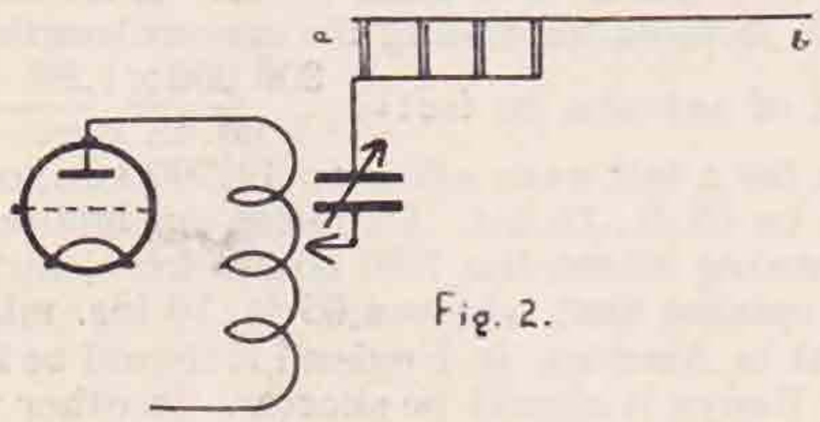


Fig. 2.

It follows that the current at the centre of a half-wave aerial when radiating an aerial power of 20 watts at 14 M.C., should be about 0.7 amp. For a full-wave aerial radiating the same power at the same frequency, the current at the antinodes should have about half this value.

We welcome the appearance of this month's R.E.F. Bulletin in new form as a full-sized magazine with the title "Radio R.E.F."

Some researches on the glow at the electrodes of electrolytic rectifiers are described by J. S. Forrest in the December "Philosophical Magazine." It is concluded that the glow is due to a glow discharge between the electrode and the electrolyte through a layer of gas of thickness of the order 10^{-6} cm., consisting of oxygen at several atmospheres' pressure.

A paper of interest to those studying propagation phenomena appears in the "Physical Review" under the title "The Ultraviolet Light Theory of Auroræ and Magnetic Storms," by E. O. Hulbert. This theory was first published about a year ago, and is concerned with the effect on the earth's upper atmosphere of a "flare" of ultraviolet light from the sun. The present paper clears up some points which previously were not fully explained.

28 M.C. Test Notes

The following items of interest have just come to hand, mostly through amateur radio channels:—

ZL2AC will be using a beam antenna for the 28 M.C. tests. XU2UU and VS7AP will be on each Sunday. VK2RC and VK2HC will both be on with automatic transmitters for considerable periods, the former with C.C. on 28.7 M.C. XU2UU has again penetrated to Australia and a few inter-Australian contacts have taken place. VK2HU says the best times for 28 M.C. out there are 23.00-03.00 G.M.T. and 05.00-07.00 G.M.T. during April and May.

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Preparing for the 2 M.C. Tests, March 1931.

By G5UM.

IT is generally agreed that we are approaching a period of bad conditions on the high frequencies with a co-incidental period of excellent conditions on the lower frequency bands—due, it is thought, to the effect of sun-spots on electro-magnetic wave propagation. The 2 M.C. tests in March will produce a bout of activity on our lowest frequency band hitherto unexcelled, even by the 200 metre tests of 1922. Every week-end sees literally dozens of newcomers to 2 M.C., and as some difficulty may be experienced by those accustomed to working on the shorter waves in making a start on 2 M.C., it is felt that a few notes on preparing for the forthcoming tests will not be amiss.

The British amateur transmitter shows a versatility in station design far ahead of that in America; for instance, a state of affairs brought about by the belief in that very true axiom, "The circuit you are most familiar with will be the best in your case." It is on account of this that one feels reluctant to recommend any particular type of transmitter for the 2 M.C. band. If you abide by this aforementioned saying you won't go far wrong! Nevertheless, one has been asked to give a few details for those about to start up on 2 M.C., so one hopes that what follows hereafter will be acceptable to those who have not yet sampled the delights of 2 M.C., while being at the same time a gentle reminder to experienced workers on the band not to forget the 2 M.C. tests in March.

Receivers.

Commencing with the receiver aspect, as being applicable to BRS, AA and open-aerial hams alike, it is a fairly safe assumption that if your coils are wound with three times as many turns as you use for 7 M.C. you will hit the 2 M.C. band satisfactorily. A high L/C ratio should be employed, in order to spread stations over the band. Twenty-five to thirty turns of 18 D.C.C. wire on a 3-inch "Becol" former, with, say a .0002 mfd. condenser, should suit most needs, but so much depends on individual conditions obtaining at different stations that it is extremely difficult to lay down any hard-and-fast rule concerning sizes of condenser and inductance—a fact that might be observed when reading that which follows on transmitter equipment. Many stations are equipped with valve-base coil receivers, and here, obviously, considerably more turns of wire would be required. One suggests 40 turns, layer wound, as an arbitrary figure.

It will often be found that if a small aerial is used it can be coupled direct to the grid coil—a perfectly legitimate procedure, if it is possible. If a completely loose coupled or aperiodic antenna is used, the coupling should be rather tighter than is customary on the shorter waves. Screened-grid stages give quite an appreciable amount of amplification, and can be used with advantage. Otherwise, the ubiquitous detector-and-one-L.F.—or two, if you like—is hard to beat.

Transmitters.

So great is the variety of transmitting circuits suitable for 2 M.C. work that it is quite out of the question for one to answer the query, "Which is the best?" Two main requirements stand out prominently, namely, that the note emitted shall be sharply tuned owing to the inordinate number of stations expected on 2 M.C. for the tests, and that the wave shall be rock-steady and clear-cut. The latter desideratum arises on account of the fact that long test calls are forbidden in the tests, so that listening stations will have to copy the distant transmitter without any QSZ. If it is decided to use crystal control (which, one submits, will be found easy to commence with, giving at the same time an irreproachable note) attempts should be made to reduce the strength of the spacer so that distant stations will find the marker easy to copy. It is better to be reported good "T8" rather than "T9 with a prominent spacing wave."

If it is not felt that crystal control should be used, wire up the transmitting circuit that you most favour. If in doubt, and if you do not intend to use crystal control, utilise the T.P.T.G. transmitter described in the December, 1930, issue of the T. & R. BULLETIN. This set is about the most adaptable to universal amateur use that one has seen described in any magazine before. This is rather a sweeping statement, as one is aware, but the "perker" in question is so simple to build, and with a little care will give an excellent note, that one has no hesitation in recommending it for the 2 M.C. tests. Snags may—and probably will be—encountered with the best of transmitting circuits, but the remedy invariably rests with the individual. Aim all the time at getting a good note. It will attract far more attention at R2 than will any rough or wobbly note at R7. What is, for want of a better term, known as snappy operating, will be called for, and inefficient notes will not be welcome in March. For crystal control work, the familiar 1 to 3 watt oscillator driving a neutralised 6 to 10 watt P.A. stage will be an excellent proposition, but must be worked, of course, on the fundamental of the crystal. If it is found that adequate output can be obtained from a lone crystal oscillator feeding into the aerial, all well and good. A push-pull crystal oscillator would probably be found more satisfactory, however. On 2 M.C. beware of resonating H.F. chokes in the transmitter. Personally, one finds the standard "Polar" choke about the best.

For self-excited transmitters use the T.P.T.G. if you are building a new 2 M.C. set, though the well-known Hartley, which has rather fallen from grace of late, will be found eminently suitable. The Ultraudion has many adherents and should be given a trial if the operator has already had some experience with it.

Valves to Use.

There are two standard types of crystal oscillator valve in general use—the DE5B and the LS5B. The latter has the slight advantage of better characteristics, but at the expense of over half an amp more filament current than the DE5B. The AC/HL is also a good C.O., if one has A.C. mains available. Continuous running off accumulators will not be found too economical, since the heater

takes one ampere—and one minute to warm up to work. The valve used in any power amplification stage must be able to handle the output from the master oscillator or crystal oscillator preceding it *with ample power in hand*. In the December BULLETIN G2XV mentioned the use of two LS5B's in parallel and neutralised. This is one possibility, but there are many more, all for the individual operator to decide once again. Oscillator valves for self-excited circuits are available in profusion. The CT25X is widely known—at sixpence a time—while the LS5 is an old-established oscillator. Everyone has not, however, heard of the P650 as an oscillator. This valve is literally produced for the man with limited mains voltage available, and is more efficient than the older LS classes. The warning not to overload the valve unduly will be almost unnecessary to those desiring good notes. Do not use more than 240 volts on a P650 or 500 on an LS5. The overloading then will be harmless.

Coils.

The question of suitable coils for the 2 M.C. transmitter will be regarded as a difficult one by many people. It should, therefore, be pointed out that no trouble need be expected in this direction. Inductances for 2 M.C. do not require those low-loss characteristics of higher frequency coils—though, of course, they will be more efficient if wound with bare 15 S.W.G. and not 24 D.C.C. wire! Those who wish—and have the energy—will find that 30 turns of copper tubing on a 5-inch former will easily cover the band with a .0003 mfd. condenser, but those who do not wish to go in for such elaborate coils will do well to obtain some of those ribbed formers put out by B. & J. Wireless or the British Ebonite Co. The latter firm produce some excellent 6-pin ribbed formers as well as suitable bases, and lengths of adequate size to accommodate 30 turns of 14 or 16 S.W.G. are, one believes, obtainable without difficulty. Everyone should read G5VL's article in the December, 1930, BULLETIN.

Concerning Coil Winding.

A loose-coupled aerial will be used by most participants in the 2 M.C. tests, but here, of course, the size of a suitable aerial inductance cannot be recommended. The rule-of-thumb method of using three times as many turns as are used on 7 M.C. again seems to apply. It will be found in most cases that the aerial coupling on 2 M.C. must be considerably tighter than on 7 M.C., both in the transmitter as in the receiver.

Aerials.

A long single wire aerial connected through the loose coupled aerial coil to a few wires constituting a counterpoise will be found ideal for 2 M.C. work, though no thought should be given to suitable feeders and other paraphernalia—these would have to be too large to be of any use. An A.O.G. aerial is hard to excel. Its attendant counterpoise need not be the subject of much trouble. Anything from one to six wires—flexes if you like—suspended six or eight feet above the ground will serve admirably, and with the aforementioned loose coupled aerial, will function as a current-fed system. Of the numerous types of short-wave aerial in use at present it is impossible to deal in detail, but all of these can be adapted for 2 M.C. with little difficulty.

(*Continued on page* 212.)

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Empire B.E.R.U. News.

AUSTRALIA.

By VK2HC via SU1AQ and G6RB.

Conditions on all bands are improving and VK stations are looking forward to the B.E.R.U. 28 M.C. tests next month with eagerness. Many local QSO's have been effected on this band lately—the best that between VK3BQ and VK4AT. On 14 M.C. conditions are very good and between 12.00 and 15.00 G.M.T. many European stations can be heard, and at other times of the day signals from all the other continents are well received. On 7 M.C. there is much local work being done, but DX from W and K6 is fairly good.

Other notes from VK have been received by post from VK6NO and WIA, but the above being the most up to date, have been printed. Further recent VK news concerning 28 *M.C. will be found elsewhere in this issue.*—EDITOR.

CANADA.

By VE2BB, Ste. Anne de Bellevue, Que.

We are glad to report better conditions for DX and many fine QSO's have been made with Europe on the 14 M.C. band usually between 13.00 and 14.00 G.M.T. and 23.00 and 24.00 G.M.T. ZL and VK have been consistent on the 7 M.C. band between 12.00 and 13.00 G.M.T., but except for a few harmonics, nothing is being heard on the 28 M.C. band. VE stations are looking forward to the B.E.R.U. Empire Radio Week, which it is hoped will be a great success, and join with me in wishing all G stations a happy New Year of prosperity and DX.

CEYLON AND SOUTH INDIA.

By VS7GJ, Frocester, Govinna.

Conditions during November have been extremely poor both on the 14 and 7 M.C. bands, except that a few S. American stations were worked on the former band. On 7 M.C. static has been very troublesome and only one or two VK's have been heard, and these at very weak strength. 14 M.C. has been little better, except for the S. Americans, and all signals have been subject to heavy fading. VS7AP and VS7GJ have been active, and the latter is very anxious to work Canada. He thinks that around about 01.00 G.M.T. would be the best time during December and January. All amateurs in Ceylon and S. India send their cordial New Year greetings to other hams throughout the world, and wish all B.E.R.U. stations the best of luck in the Empire Week.

EGYPT.

By SU8RS, Egyptian Signals, Polygon, Cairo (via G2GM).

Conditions have been very patchy here and have not remained good for more than a day or so at a time. SU8RS is now no more and his place on the air is being taken by SU1AQ. ST6HL has also changed call sign to ST2D and, with SU8RS, has been the only active station during December. SU1AA and SU1AQ will be on 28 M.C. for the January tests and for the Empire Radio Week in February.

HONG KONG.

By P. J. O'BRIEN (VS6AE).

During November conditions have been anything but good on all bands, although an occasional signal has been heard from Europe on 14 M.C. Conditions on this band for the time of year are far below normal, and this disheartening state of affairs has led to an exodus to the other bands—VS6AE to 28 M.C., and the rest to 7 M.C., which is very little better and contains three hefty commercials working off wave. VS6AC, VS6AE, VS6AF, VS6AG, and VS6AH are all active, but we have lost VS6AI and VS6AB to the Old Country—the latter is on nine months' leave and intends to visit as many amateurs during that time as possible.

IRISH FREE STATE.

After a slight improvement at the end of November conditions on 14 M.C. seem to have deteriorated again, at all events at the writer's station. 7 M.C. is about normal and 'phone QRM on this band is decidedly above normal! I am sorry to say that we have lost the " J. B." half of EI7C as he has left EI to take up professional duties at Chester. He is a great loss to EI and especially to the writer, whose more than right-hand man he has been for some years past. We all wish him the greatest success in his career and we hope to hear him on the air soon as a G. EI7C will be carried on by his brother, the joint owner of the station, until June, when it is possible that he also may leave Ireland. EI7C has always been one of our star stations, although, unfortunately, many of the organised tests have clashed with their more serious work and could not therefore be participated in.

I do not think that I mentioned in previous notes that the W.S.I. is now a member of the I.A.R.U.

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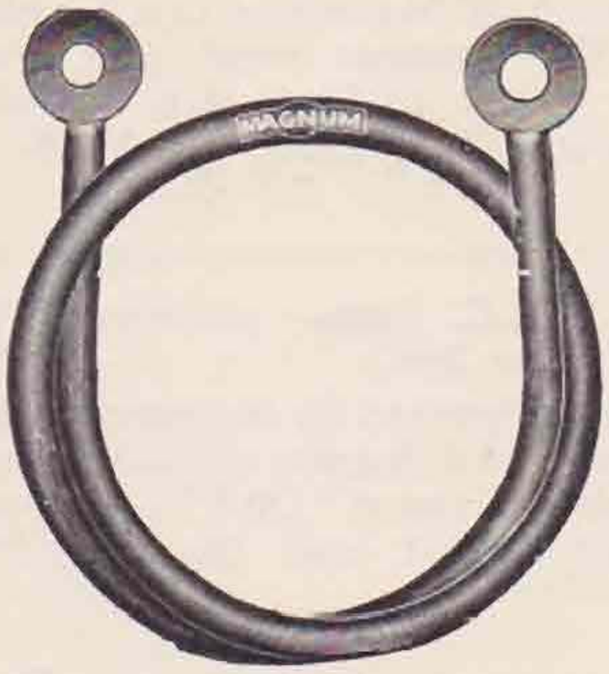

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KENYA, UGANDA AND TANGANYIKA.

By VQ4MSB, Radio Station, Mombasa (via G2CJ).

Conditions during the month of November have been poor and static heavy, but there is much activitity in the division, and the following stations have been doing considerable work :—VQ4CRE, VQ4CRF, VQ4KTA, VQ4LMA, VQ4MSB, VQ3-MSN, and VQ5NTA. Ex-G2SC has now got a brand new call—VQ5KAB—and hopes to be on the air soon.

MALAYA.

By VS2AF, Glenmarie Estate, Batu Tiga, Selangor.

I very much regret to report the death of VS3AB, one of the oldest transmitters in Malaya and well known to many G stations. Expressions of regret have been received from all over the world, and B.E.R.U. is the poorer for his loss. The following stations are active :—VS1AB, VS8AF, VS2AF, VS2AT, and VS3AC. VS2AT is having difficulty with power supply as he has to take his L.T. batteries thirty miles to be charged—eight miles of this has to be walked through jungle ! VS1AB is not able to be on the air much because of business, and VS2AF is the only station regularly transmitting. Conditions have been poor during the month of November, so that we are taking the opportunity of overhauling the gear in readiness for the Empire Radio Week.

SOUTH AFRICA.

By ZT6X.

Conditions seemed to have changed in South Africa with the coming of the cooler weather and some of the weaker signals on 14 M.C. can now be copied as QRM from electric fans is much reduced. The antipodes can be heard well on almost any afternoon, and the 28 M.C. band seems to be much more lively. Between the hours of 06.00 and 16.00 G.M.T. many commercial harmonics can be heard on both sides of the amateur band, but severe fading commences about 15.30 G.M.T. HAF8B was heard on November 2, 1930, at QSA5 R7 calling " CQ ten."

Preparing for the 2 M.C. Tests—(*Continued from page* 209.)

A hot wire ammeter inserted in the antenna lead near the coil will serve as a definite indication as to how one is getting out—(Cries of " Oh ! "),—but only in exceptional cases will it read the true H.F. output current.

Conclusion.

Nothing has been said about telephony. Unless you are really serious about fone work as a line of experiment don't use telephony during the tests. This warning is given advisedly, in view of the horrid noises heard on 7 M.C. and to a lesser extent on 2 M.C. In experienced hands 2 M.C. telephony has covered several hundreds of miles, but far too many stations embark upon fone so lightly that no good purpose can be served. Therefore, in fairness to others, observe the watchword " If it's done at all it must be done well," when considering telephony.

On reading over the foregoing one is painfully aware of the sketchy way in which one has written on " Preparing for the 2 M.C. Tests," but once again indulgence is craved on the score of difficulty in meeting individual ham's problems. At any rate, it is hoped that from these efforts to assist some information will have been acquired by those in need of it.

NOTES & NEWS FROM THE BRITISH ISLES.

DISTRICT No. 1.

Representative : J. Browne (G2XB), Kenilworth, Beaufort Road, Ashton-under-Lyne.

SEVERAL of our usual contributors have deserted us this month and I hope this is only due to the holiday feeling. I should like to see more stations joining us in this as there are many active stations who do not assist us in what I consider is becoming the most important of our activities. I hope soon to see the day when all the active stations will send in their reports.

The Liverpool gang have, I believe, held a conventionette during the month, but I have not yet received a report on it.

The Manchester 1.7 M.C. gang were entertained by G6QA on December 14 and visited GTR, the radio at the Rochdale Fire Station. We have to thank G6QA and Mrs. QA for a very enjoyable day. BRS369 is now 2AWV and BRS303 is 2ACY. The following stations have reported active :—2AWV, BRS409, G2WP, G6RH, G6BJ, G2OI and G2DH.

DISTRICT No. 2.

Representative : T. Woodcock (G6OO), Santos, George Street, Bridlington.

The first of the series of monthly meetings was held in Hull on Thursday, at G2UG's shack, and proved a great success. Ten members (out of twelve notified) were present. The next in our series will take place on Tuesday, January 20, at G6PS's shack. Will members in District No. 2 (H) please note ? Similar monthly meetings have been held in District No. 2 (L) by G5TQ, in District No. 2 (S) by G6LF, and in District No. 2 (DN) by G5QY, all being very successful. Please note 2BIV (Sheffield District) has obtained full radiating licence ; his call is now G2XH. He will be a live wire in the 28 M.C. tests. Practically 75 per cent. of the active members of this district are using the 1.75 M.C. band pretty frequently and will make themselves heard in the tests. No. 2 District is out to hook some of the trophies for the North in the New Year ! G2RU sails for (?) as seagoing " op." this week, but will report on all G sigs. heard whilst at sea.

DISTRICT No. 3.

Representative : Joseph Noden (G6TW), Coppice Road, Willaston, Nantwich.

The only outstanding item with this month's work is from G5BR, and is to say that he was QSO on November 22, at 6.30 a.m. with U.S.A. on the 80-metre band, using 50 watts C.C., reported R4, and the W station came in R8. He also reports that he has found the 80-metre band exceptionally good.

DISTRICT No. 4.

Representative : J. Lees (G2IO), 17, Trevose Gardens, Sherwood, Nottingham.

The December meeting held in Nottingham was

attended by the following members :—G2HD, G2VQ, G2XS, G2IO, G5DM, G6MN, BRS366, BRS402, and Mr. Moore, The latter we welcome as a new member. The 1.75 band was fully discussed and some interesting points were raised by Mr. Moore on low frequency and moving coil speakers.

DISTRICT No. 5.

Representative : F. W. MILES, " Rydal," Beechwood Avenue, Coventry.

Conditions this month are certainly much better on 7 and 14 M.C. All Continents have been regularly worked on 14 M.C., the best times for VK and VU is around 13.00 G.M.T. South Americans have been coming in well at 23.00 G.M.T. since December 15, appearing after the W stations have faded out. The 3.5 and 1.7 M.C. bands are attracting interest to some members in the district, while others are preparing for the 28 M.C. tests, all of whom are using crystal control.

I am pleased to say another member is contributing to the letter budget.

DISTRICT No. 6.

Representative : R. C. HORNSELL, Hepani, Wickford, Essex.

I am afraid there is little to report for this district this month. The 3.5 M.C. band is being used a lot by this area, judging by my RX log.

Our Area Budget is lost ! I am endeavouring to trace it at the time of writing. I think we shall have to find a punishment for the culprits. Can any other D.R. suggest a way of speeding up ?

DISTRICT No. 7.

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

Please note my change of address. By the time this appears in print I hope to be more or less settled in.

Judging from reports received this month, conditions have not been at all good. It would seem that we are never to experience the ideal conditions which used to obtain on the 14 M.C. band. However, we have some compensation in the fact that the 1.7 and 3.5 M.C. bands appear to be improving steadily. Stations all over Europe and Northern Africa come in at very good strength almost every week-end. No doubt much more could be done on 1.7 M.C. if only the foreign stations would make more use of it.

A good deal of rebuilding seems to be taking place in the Area, but this is no doubt due in great part to the poor conditions. Lack of success in making contacts naturally makes one doubt the efficiency of the transmitter.

This month we have to celebrate the completion of one year under the Budget scheme. This has been a great success, and the number of contributors is well maintained. At the same time one feels that there are a lot of men in the Area who are not taking any interest in the work of the Area. This is to be deplored. Once more I would appeal to you to get in touch with me, and let me know something about your interests, and stations. Next year I hope to start a Budget Broadcast, but this will depend on the support received.

DISTRICT No. 13.

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

The December meeting was better attended, and the next will be at 7 p.m. on Sunday, January 18, at G2BY, 37, Paddenswicke Road, W.6. Reports seem scarce, but " the festive season " may account for this. Up to the time of writing eight reports are to hand and most stations have found conditions fair. The only item of news of interest is that G6WN have had their first QSO on 56 M.C.

SCOTLAND.

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

Might I start these notes by thanking all who were so kind as to send me greetings at Christmas and New Year. I was unable to acknowledge these direct, as I have scarlet fever in my home, and did not think it wise. Nevertheless, I most heartily reciprocate all the good wishes sent me, and trust that on this occasion you will pardon the general acknowledgment. I wish you all the very best of good luck and good health for 1931, and may success attend all your efforts.

For the reason indicated above, I personally have been out of the game, and also for the same reason found it necessary to postpone our next monthly meeting until Wednesday, February 25.

Once again I have to complain of the absence of reports—only G6RG and G6SR remaining conscientious in this respect—and I would only say that if this state of affairs continues, these notes will make a poor showing against those of the English Districts, North Ireland and Wales.

Mr. Powditch, of our Contact Bureau, indicated to me that quite a few of you signified your intention of taking part in the 28 M.C. tests, but it seems odd that the only information Scottish H.Q. had of your movements in this connection required to come from the South.

G6RG's report is most elaborate, and as I have a theory that in many instances bad conditions are to a certain extent local, i.e., confined to an area of a few square miles, in pursuance of this idea I quote a few dates given by G6RG, and will be obliged for any comment on them from anyone situated 100 miles or more from G6RG. His bad days are indicated at November 29 and 30, December 1, 5, 6, 8, and 12, while December 14, 17, 18, 19 and 20 are stated to be exceptionally good with a tendency to fall off on December 21. I shall be interested to have any comment.

Further to my remarks regarding 2ABL last month, Mr. Rowden is now on the air with the call G6SR, and has been doing exceptionally well on the 7 M.C. band.

I seem to be always complaining about something, and this time I have to hand a jolt to the Edinburgh men. Mr. Bamford, the District Officer of " D " District, made an effort on December 12 to inaugurate a series of monthly meetings in Edinburgh for the " D " District members on the lines of those already popular in " A " District. Mr. Rowden (G6SR) turned up, and he and Mr. Bamford spent a most enjoyable evening. Now I am particularly sore at the lack of support offered to Mr. Bamford, more especially in view of the fact that certain of the Edinburgh members gave me their promises to attend. There are over a dozen members in and around Edinburgh, so I think that further comment is superfluous. I do not know if Mr. Bamford proposes to repeat the experiment, but I for one could not blame him if he did not.

WALES.

Representative: B. F. PHILLIPS (G5PH), 144a, Cwm Road, Bonymaen, Swansea.

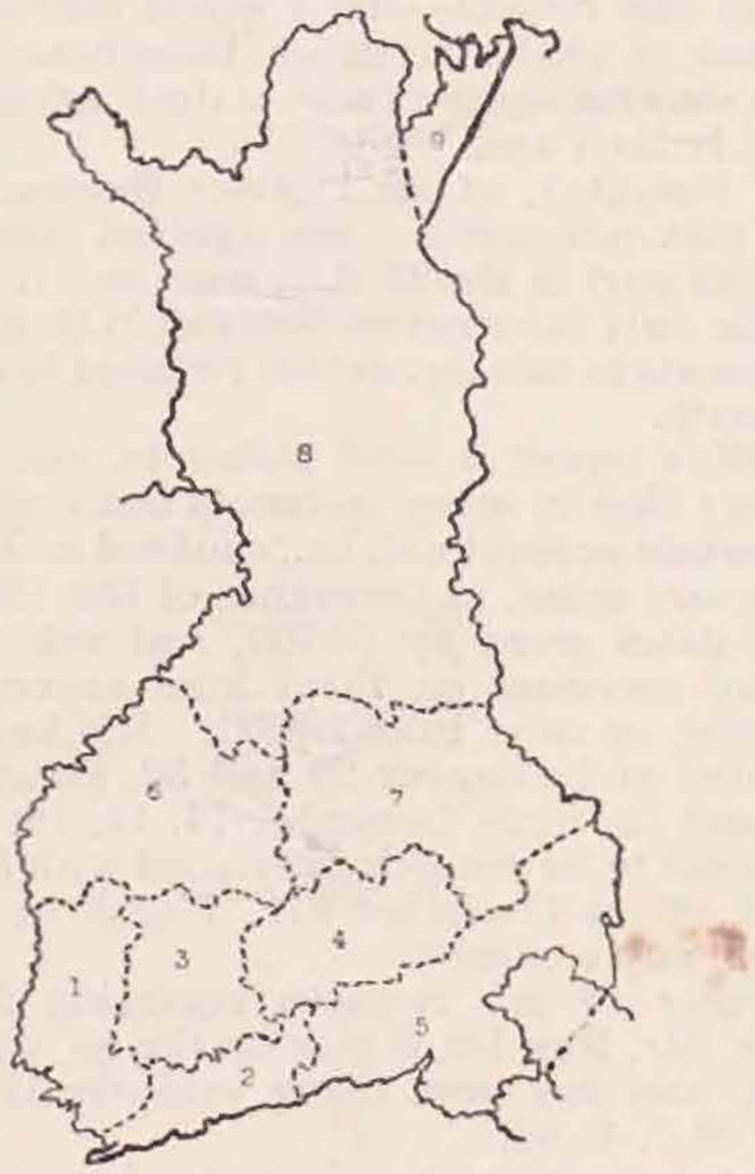
The D.R. wishes to arrange a conventionette in Wales during January or February. Will all interested in the district please write. G2AV, 2AMI, and G5OC have been active.

European Notes.

WE have this month some interesting information about Finnish amateurs. Finland has, we understand, ratified the resolutions of the Washington Conference and amateurs in this country have due regard, therefore, to the limits set down by this Conference. Restrictions have been placed by the S.R.A.L. (the Finnish Radio Society) on the use of A.C. input, and 'phone transmissions are prohibited on the 7 M.C. band.

Finnish amateurs have always aimed at good quality transmission, and at the beginning of November, 1930, some twenty-five stations were using C.C.

The S.R.A.L. has, as yet, no official organ, but it has at its disposal certain pages of *Radiosanoma*. The annual meeting of the society is held in February. Finland is divided into nine districts, each of which is coincident with an administrative province.



Membership of the I.A.R.U. has been applied for by the S.R.A.L.

General conditions in Germany are still poor, although we learn that there is in this country a great increase in the activity of amateurs on the 3.5 M.C. band. Some interesting tests were recently carried out in Berlin as to the audibility of the 7 M.C. ground wave from four different stations. Useful reports were received from over fifty stations.

On January 1, 1931, the new inter-European scheme of standard frequency transmissions was started and it is hoped this will be a great success in every way. More details of this next month.

In Norway the 3.5 M.C. tests at the beginning of November were a great success and the N.R.R.L. has applied for the unrestricted use of part of this band.

We should like to take this opportunity of congratulating the R.E.F. on the production of *Radio R.E.F.* This is now the official organ of the Reseau des Emetteurs Francais and the first number, an excellent issue, has recently been published.

SM7RV, through G2GM, sends New Year greetings to all British stations from the 7th District of S.S.A.

Notice to Contributors.

The Editor is pleased to have manuscripts submitted to him for publication, but would remind contributors that, owing to lack of space, a delay often elapses between the receipt of the MS. and the date of its appearance in these pages. All matter intended for publication should be written on one side of the paper only and preferably typewritten (double spaced). Diagrams should always be shown on separate *sheets. Rough sketches can be re-drawn by our draughtsmen. Photographs, if any, should not be smaller than ¼-plate as otherwise the reproduction will be poor.*

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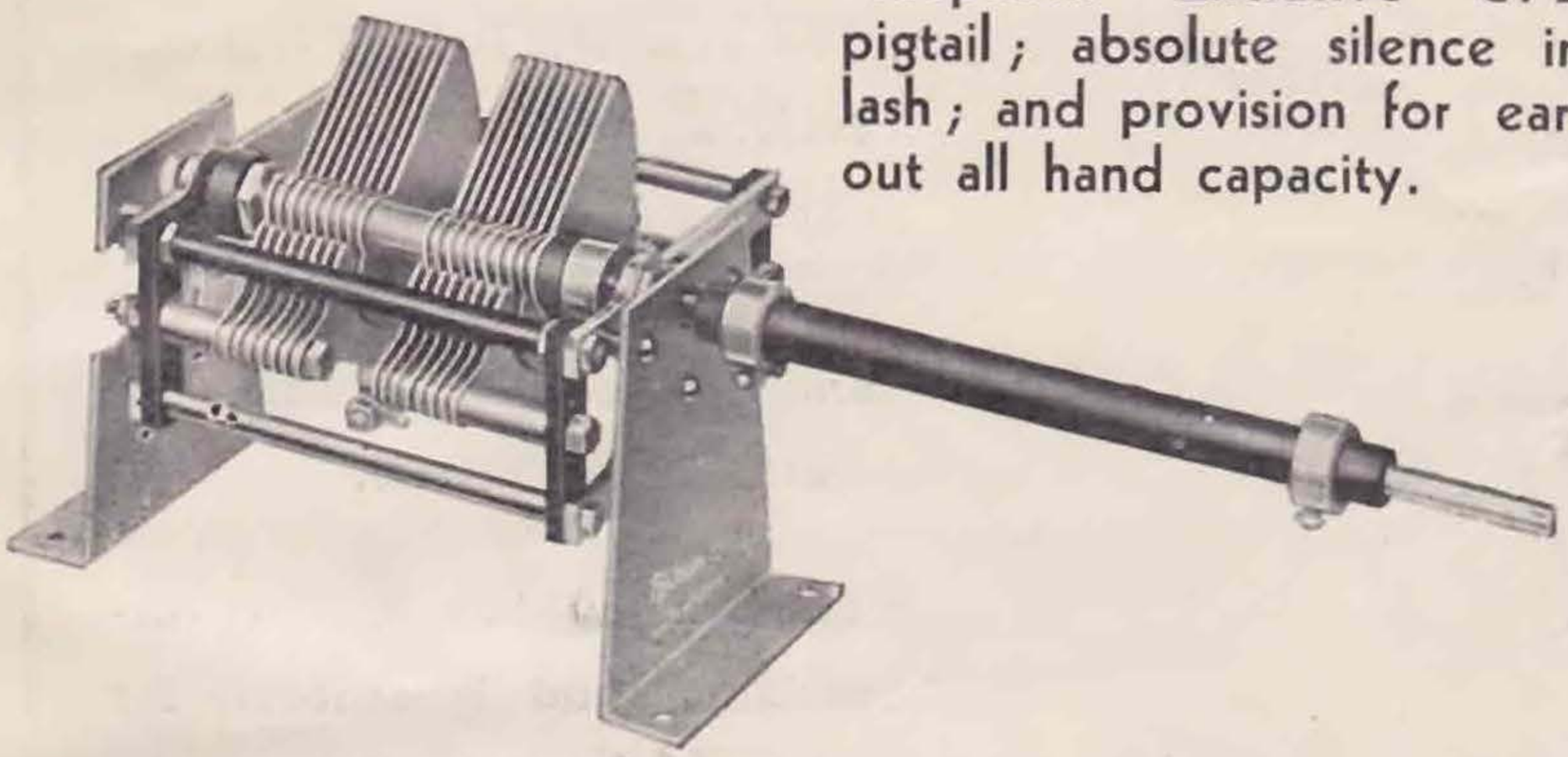

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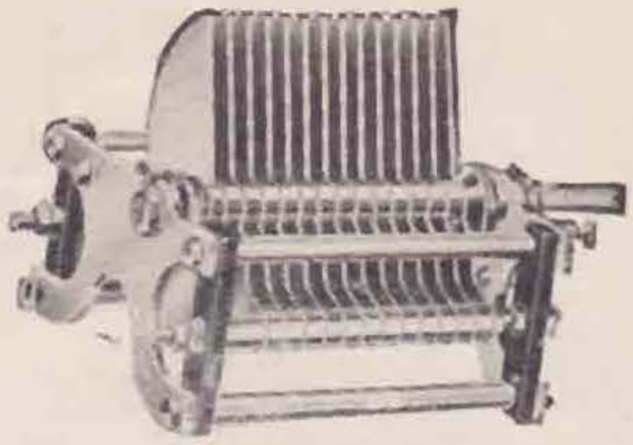

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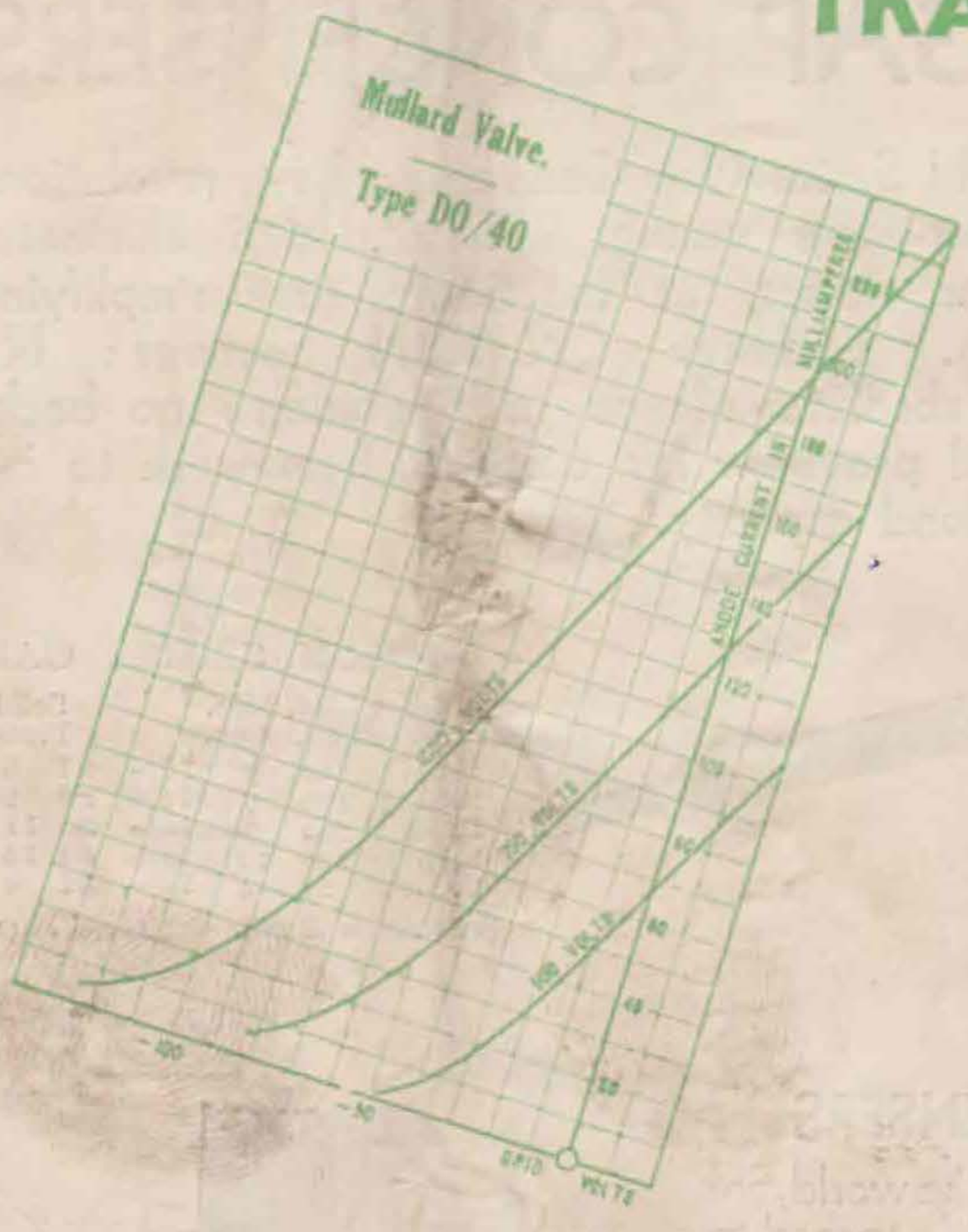

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