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T. & R. Bulletin

Devoted to the Interests of the Transmitting Amateur

— The Official Organ of —
THE TRANSMITTER AND RELAY SECTION

of

THE RADIO SOCIETY OF GREAT BRITAIN,
53, Victoria Street, S.W.1



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The EDITOR will be glad to receive articles and illustrations within the scope of the BULLETIN. The illustrations should preferably be double size and should be original. Contributions should be addressed to 53, Victoria Street, S.W.1., and marked EDITORIAL, ADVERTISEMENTS, Etc.



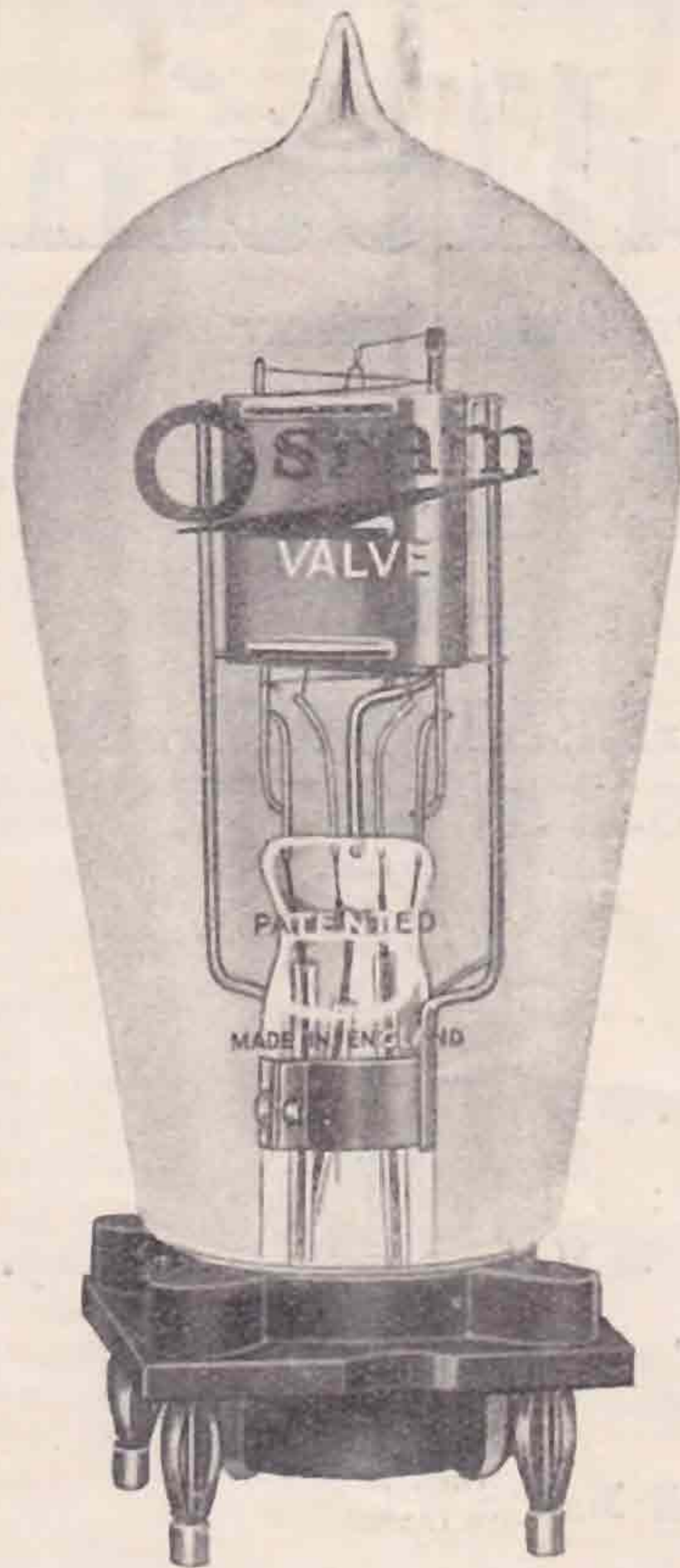
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VALVES

T. & R. BULLETIN

The only British Wireless Journal Written and Published by Amateurs

DECEMBER, 1925.

No. 5.

Notices.

I HAVE great pleasure in announcing that the British Amateur has received another recognition of the excellent work he has done in the past. The Admiralty has asked the T. & R. Section to co-operate with them in the forthcoming experimental voyage of the "Yarmouth" which sails early in December on a voyage to Hong Kong for the express purpose of testing out the short waves as a means of communication.

The schedules published on other pages are given to the Members of the T. & R. Section in strict confidence, and are in no way to be published. The results attained are also to be kept confidential by members, and it is on this understanding that I am circulating details through the medium of the BULLETIN.

I hope to arrange for two-way communication in every free period which, from the schedules you will see occur every half hour, and I have suggested that we utilise the 23-metre wave during the hours of daylight and 24/46 metres during hours of darkness.

Full details as to sailing date and further news of this test will be sent in due course to all those who signify their desire to participate seriously in these experiments. Please send me a card before December 10, 1925.

You will realise now that we have now been asked to co-operate with two branches of the Services, i.e., the Navy and the R.A.F., and it is to be hoped that the remaining branch of the Services will realise the excellent work which is being carried out by our Section, and enlist our services in due course for similar tests.

The Annual General Meeting of the Section will be held on December 18, 1925, at 6.30 p.m., in the Institute of Electrical Engineers, and will be preceded by a tea at 6 p.m., kindly given by our Brother Member, Mr. E. D. Ostermeyer (5HR).

We earnestly request you to forward all suggestions and requests in regard to the new session to the Hon. Secretary, not later than the December 10. If any of you have complaints to make in regard to the running of this Section, please do send in your complaints so that these can be discussed and rectified.

We still want more Members, and there are and must be a large number of transmitters in the country who would like to join us; therefore it is up to every member to bring along one new member as a New Year's gift to the Section. Now is your chance to bring up the strength of the Section to full strength.

Another point is, although a number of Trans-

oceanic test permits were issued, one still hears only the same old regular call signs on the air. We want more signals going out from this "little island"; let the world hear what we can do; A's and Q's can be worked comfortably on 50 watts, as our good friend, Frank Neill, has proved; also Naylor, with 15 watts.

Informal meetings have been arranged for January 8, 1926. Mr. Blake on "The Ionisation of the Atmosphere"; January 29, Mr. Alford on the "Power Super-Heterodyne"; February 19, Mr. Secretan on "The Crystal-Controlled Transmitter."

Say, fellows, don't you read your BULLETINS? If you do, how is it that only a handful of Members turned up at the last meeting on the 20th November, when Mr. Minvalla gave us a most interesting talk? Mind you all turn up in force to the Annual General Meeting!

Mr. Kenneth Alford will speak on January 29, 1926, at the Institute of Electrical Engineers, on "Power Super-Heterodyne Sets."

Mr. Secretan will speak on February 19, 1926, on "Crystal Controlled Transmitters." Members are asked to give their support by attending these two interesting discourses.

G. MARCUSE (2NM).

Oooh!

We hear on good authority that a project is afoot to call a meeting of those who suck their juice from batteries. The object is to protest against certain call signs, notably such as N-O-OO and N-O-QX, on the ground that the usual mode of keying when using batteries, being in the negative power lead, such calls lead to a great consumption of the precious juice. 5YM.

Appreciation from an Advertiser.

The Editor, T. & R. BULLETIN,

"... you will be pleased to hear that my clients have had a number of profitable enquiries through their advertisement. Please repeat the insertion for six months."

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The above is an extract from a letter recently received. It pays to advertise in the T. & R. Bulletin.

EDITORIAL

The Amateur to Help the Admiralty.

ON other pages we publish full details, etc., of tests and experiments which the Admiralty is carrying out and in which our members are asked to co-operate. This is the first occasion on which the amateur has been taken into the official confidence as a body, and we do hope that all members will show that their skill and knowledge is of service to the State. It is our first official job, and we hope that it is the forerunner of many, for there is nothing more satisfactory than to know that our hobby, pastime or scientific investigation, term it what we will, is of benefit to our country. You have now an opportunity to justify the existence of the transmitting amateur—put your weight into it.

Organisation.

Two or three issues ago I asked for volunteers to look after the interests of the BULLETIN in various centres and to act as "area sub offices." I am now able to lay the following plan before members:—

Irish.—F. R. Neill, Esq. (5NJ), "Chesterfield," Whitehead, nr. Belfast, Co. Antrim.

North Britain.—S. R. Wright, Esq., A.M.I.R.E. 14, Bankfield Drive, Nab Wood, Shipley, Yorkshire.

Area: Northumberland, Durham, Cumberland, Westmoreland, Yorkshire, Lancashire, Cheshire, Derby, Nottingham, Lincoln.

Mid-Britain.—Captain H. J. B. Hampson (6JV), 477, Earlham Rise, Norwich.

Shropshire, Leicester, Rutland, Cambridge, Huntingdon, Northampton, Warwick, Worcester, Hereford, Stafford.

South and South-East Britain.—F. A. Mayer, Esq. (2LZ), Stilesman's, Wickford, Essex. (DX reports.)

F. L. Stollery, Esq. (5QV), "Fairmead," Vista Road, Clacton-on-Sea, Essex. (Articles.)

Area: Essex, Suffolk, Bedford, Oxford, Hants, Sussex, Hertford, Buckingham, Berkshire, Surrey, Kent, Isle of Wight, Middlesex.

West and South-West Britain.—2LZ and 5QV (temporary).

Area: Cornwall, Devon, Somerset, Dorset, Wilts, Gloucester.

Wales, North and South.—R. F. Palmer, Esq. (6TD), "Bryn Teg," Llains aintffraid, Montgomeryshire.

Scotland.—No volunteers yet. Please send direct to Head Office.

The above-mentioned members will be responsible for the collecting of DX reports and articles, etc., for the BULLETIN, and other members will assist greatly by proffering their assistance to these gentlemen and keeping them supplied with material. We want every area to be represented in our columns month by month. Let the other fellows know what you are doing.

Birthday Wishes.

There is a saying that fools step in where angels fear to tread, and since we are all designated as fools sooner or later in life, we venture to step into the present controversy concerning the delicate subject of Broadcasting. The amateur transmitter could, should he so wish, say quite a lot on this subject and at a time when a lot of criticism is being levelled against the quality of Broadcast programmes, and also co-incident with the third anniversary of the birth of Broadcasting, we think that it is the unanimous opinion of those interested in the technicalities of the science that those responsible for the spade work, i.e., the engineering staff, have done thoroughly well in a comparatively short period of time. The excellent quality of direct transmissions, the overcoming of difficulties in land line simultaneous, and many other matters have earned the ungrudging admiration of everybody, and we all, I am sure, wish the "big noise" every success in their present experiments on re-broadcasting distant transmissions direct.

The Radio Society of Great Britain.

The parent Society is about to issue a new edition of their handbook. Those members who are, as yet, unaware of the activities of the Society would do well by writing for this interesting handbook, if they do not receive a copy during the next week or so. A number of interesting lectures have been arranged for the near future (see page 17).

The "T. & R. Bulletin" and Advertisers.

I am receiving a large number of congratulatory letters on the expansion of the BULLETIN. You will all, of course, realise that our circulation is small when compared to the great circulating figures of the trade papers, and that, therefore, building up the BULLETIN at this date has been uphill work and has entailed a considerable amount of self-sacrifice and real hard spade work. In order to be able to give you this little magazine we have been forced to get advertisers, and this was not an easy matter, even though our charges are low. We ask you now to do all in your power to assist us. Buy only from advertisers whenever possible, and let them know that you are a T. & R. member. Use the columns of the BULLETIN for learning, discourse, sales (small ads.) and buying. Gain for us new members and help to establish the Section. By so doing you will assist yourself in your work as well as us. Thank you!

THE EDITOR.

Change of QRA.

2MD has removed from Oulton Broad and is now located at 9, Nacton Road, Ipswich. On the air again shortly.

Third National Convention at Chicago.

I HAVE just returned from a six months' tour of U.S.A. and Canada and I thought a few notes on the Yank amateur and his methods of work would prove interesting.

To become a transmitting ham in the States is a very simple matter. The conditions are that the applicant shall be able to do 10-12 words a minute, code and answer a few easy questions on the operation of a transmitter, provided you are an American citizen and can pass the above tests your licence is granted. There is no age limit. This licence gives you the right to transmit at any time, a $\frac{3}{4}$ metre, 5 metre, 20 meter band, 40 metre band, 70-90 metres, 150-200 metres, are their official working wavelengths. Phone is only allowed on 150-200 metres; inputs up to 1 k.w. are allowed, unless you are near a Government station, when this is dropped down to $\frac{1}{2}$ k.w.

One is allowed to transmit during broadcast hours provided no interference is caused.

In case there is no radio inspector near you for your examination you are allowed to answer the radio part of the paper by post; as to code, a declaration, to the effect you can do the required speed, made before a public notary, is quite sufficient. I met one ham who got a licence this way and operated his station for five years before he was formally examined!

For the purpose of radio the country is divided into nine divisions, each in charge of a radio inspector who has control both over the broadcast and amateur stations. He deals with all complaints, and in a good many cases is a ham himself. The greatest institution in the country is the American Radio Relay League, run for the good of the amateur by amateurs; the reason the Yanks have so many more privileges than us is that they support ARRL, and it fights their battles for them. We have got our T. & R. Section; it is growing a bit each day, and though it can never hope to have the power in this country ARRL has in America, it does do a lot of good; it can do a lot more if we support it instead of writing to Marcuse saying the T. & R. Section is no good, but giving no suggestions for its betterment.

My only excuse for the above paragraph is that after seeing what organisation can do for the amateur in radio, and has done in the U.S.A., I am firmly convinced that by standing solid behind the T. & R. Section we'll get a lot more than by being independent.

To return to the Yank. After seeing dozens of their stations and always getting a wonderful reception, I went to the ARRL Third National Convention at Chicago, and had there the best time of my life; the only trouble with our Yank ham's hospitality is that at times it is a little overwhelming. The Convention was held at the Edgewater Beach Hotel, on the shores of Lake Michigan, one of the best hotels in America. It has got its own bathing beach, tennis courts, outdoor cabaret, ball-rooms, etc. It also has a nice idea of how to charge, that didn't worry the hams a bit. They got four to six in one room and cut the expense that way. One ham, 3BVA, was a bit short of money, but

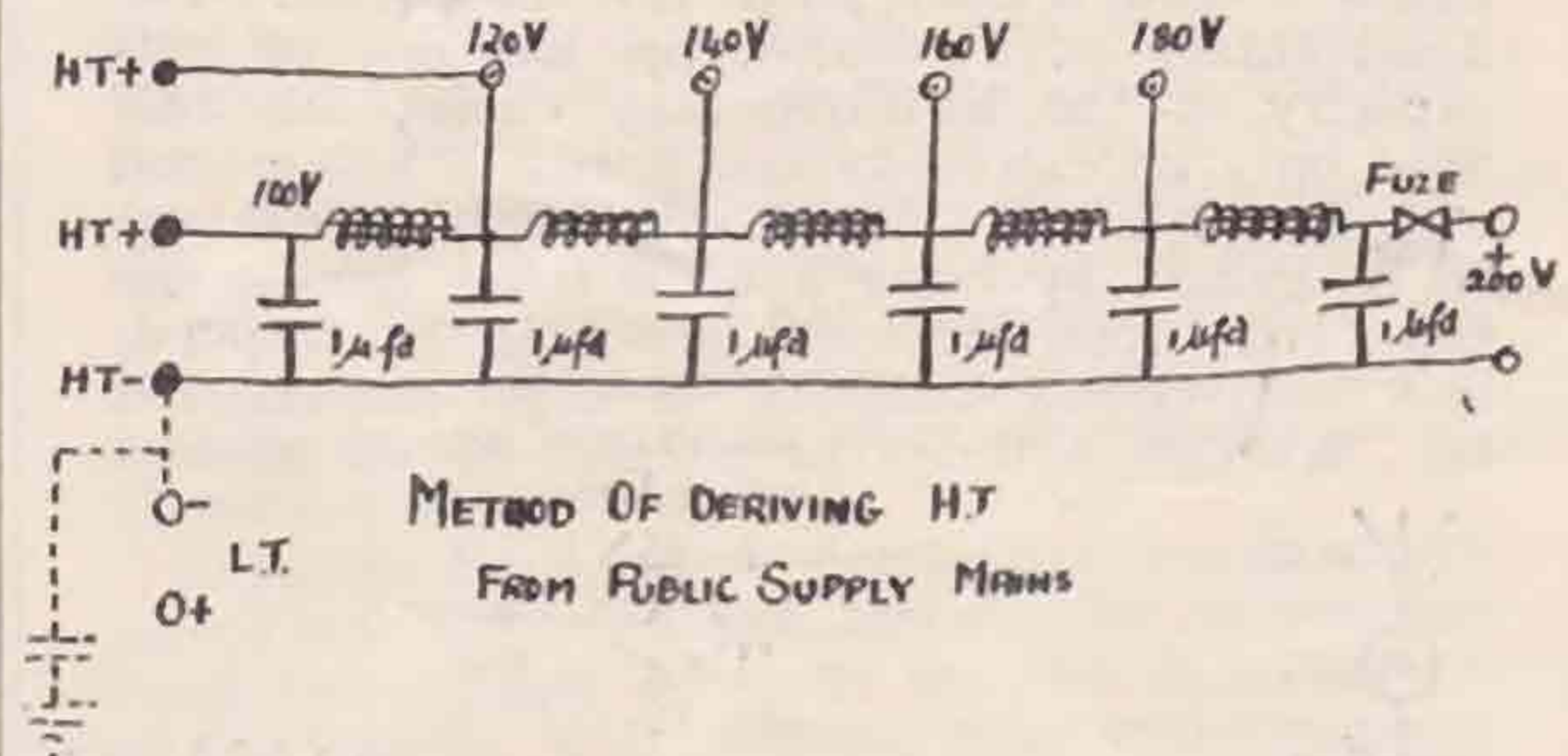
(Concluded on page 18)

Economical H.T. from D.C. Mains.

FOR those amateurs possessing D.C. mains on the three-wire system, in which the middle or neutral wire is earthed, the accompanying diagram may be of interest.

In the more usual methods of deriving H.T. from D.C. mains, employing a lamp and potentiometer, or Neon lamps, certain expenditure is necessary, and, moreover, a certain amount of wasted current is taken from the mains, and the ripple is not easily overcome for headphone reception.

With the method shown here, no hum is noticeable on headphone reception on any wave-length, the system being particularly suitable for short-wave reception below 50 metres, in conjunction with Marconi D.E.5 Power Valves, which oscillate freely down to 15 metres, provided a good low-loss valve holder is used for the detector valve.



The unusual feature, which completes the efficiency of this very simple method, is the earthing of the filter arrangement via the earth of the set, and *not* via the main's earth.

In this method, adopted by the writer, and which has been in use without any attention for over two years, separate tapplings for each valve, of any required voltage, are available, and only a few milliamps of current are taken from the mains.

The diagram is self-explanatory, and the components used may be found in most Amateurs' junk boxes.

Chokes are old Ford Coils, the condensers are made from old used $\frac{1}{4}$ -plate negatives, and copper foil, and the whole is easily mounted in a box 10in. x 6in. x 6in.—G6BT.

Our Next Issue.

Our next issue will go to press earlier in the month as we wish you to have this number before Christmas. We hope to present you with a specially cheerful number, and will welcome humorous articles and the like for this purpose. If every member with talent lends his assistance in this matter, our Christmas number will be something really out of the ordinary in wireless publications. Will area sub-offices please note that we want all material by the 16th, at the latest.

Subscriptions.

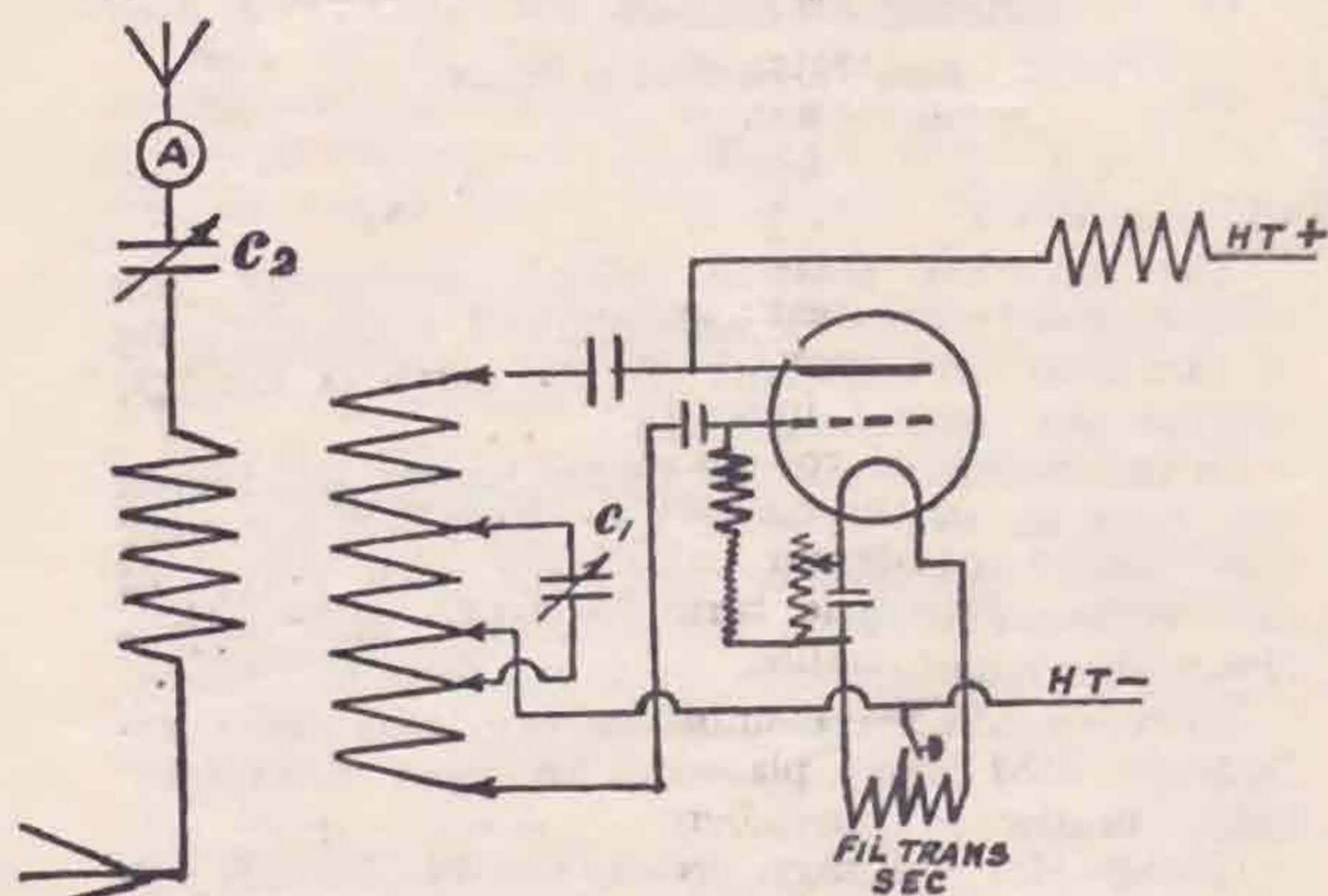
Many members are still in arrears with their subscriptions, do please send them along as soon as possible.

The Hartley Circuit and Its Adjustment.

BY H. BEVAN SWIFT, A.M.I.E.E.

WE suppose that the Hartley Circuit in its many forms is more used than any other by amateur transmitters. It seems to adapt itself to amateur requirements better than more complicated circuits, and this is no doubt due to the fact that the oscillation circuit is more under control. For C.W. telephony it has shown its superiority on all wave-lengths.

The varied forms of the Hartley circuit are numerous. We have the coupled and direct circuit, the direct coupled and the loosely coupled grid coil, the series and parallel H.T. feed. Dealing with the latter construction first, I suppose that opinion is fairly evenly divided, although there is a very great advantage gained from the parallel feed owing to the fact that the H.T. voltage is kept off the coils and the aerial, and (in fact) only exists in quite a small portion of the circuit. The disadvantage is, of course, the loss due to self-capacity in the high-frequency choke, but this need only be extremely small with a well-spaced and designed coil. At all events, the advantage to be gained by being able to freely handle the taps, etc., upon the coils is not to be despised, and easily counter-balances the slight loss referred to. Whether a direct or coupled circuit is used



COUPLED Hartley Circuit

FIG. 1.

is more a matter of wave-length and selectivity than anything else—certainly for short wave work the coupled circuit has to be used almost exclusively, and thus enables the closed circuit to be sharply tuned and have its constants easily adjusted.

As regards the merits of fixed grids or movable grid coil, there is a strongly divided opinion. Where telephony is to be used, the latter is better, as it enables sensitive control on modulation to be obtained, which feature is not as easy when a fixed coil is used with variable turn taps. The latter nearly always means the presence of "dead-end turns," which absorb power and give coarser control of coupling.

The Hartley circuit has the great advantage of flexibility, and is particularly suitable for short-wave working. The ease of tuning the oscillatory circuit to any desired wave-length without undue

interference from either the grid or anode turns is the principal characteristic in its favour, and renders it particularly suitable for use by experimenters.

Figure 1 shows a conventional coupled Hartley circuit in the form most favoured by the writer. It will be noticed that parallel H.T. is used, and the grid coil forms part of the main solenoid. It will also be noticed that the closed circuit is carefully tuned by the variable condenser C_1 . This condenser must obviously be a good one, as the voltage is high and the current flowing into it large. Upon very low wave-lengths many do not use this condenser, relying solely upon the taps for tuning purposes, and the self capacity of the coil to gain the necessary oscillation and tuning.

It is commonly thought that the aerial coil is aperiodic, and will drag itself into tune with the closed circuit to any setting of the latter. This is only true to a certain extent, for if the tuning of the aerial is widely different, power will undoubtedly be absorbed in the attempts of the coil to drag itself into resonance.

In practice, the number of turns should be carefully adjusted, while fine tuning can be adjusted by the series condenser. Under such circumstances, the coupling between the two coils can be loosened, with a corresponding gain in sharpness in tuning.

In all transmitters, the main object to be attained is efficiency. This qualification embraces many features. The first is maximum output for minimum input; secondly, steadiness and stability in radiation; and thirdly, a clear and sharp signal. The first of these is generally indicated by the aerial ammeter as against the input watts. In short-wave working, a difficulty is introduced immediately in the fact that when we are working below the fundamental wave-length of the aerial, it is difficult to know what power we are actually putting into it. A hot wire or other form of ammeter placed near the transmitting set fails to give any indication of any current in the aerial itself. It is obviously disappointing to experimenters accustomed to high aerial current readings on 200 metres with quite small powers to bravely see their ammeter needles at zero, with powers ten times greater. Many, when trying to right matters, tighten up couplings and alter constants to get a reading. Such a procedure only makes matters worse, and it is far safer not to search for the missing current by such means. The only way of checking is to get reports from a reasonably nearby station outside the static field as to the amount of power going out. Even this method is open to objection for short-wave work, owing to the peculiar variations distance produces, a matter which still has to be properly investigated. (On 5 metres at 5 TR, we have used a distant meter in the anode of a valve detector and a telescope for observation purposes with great success.—Ed.)

Steadiness of wave-lengths and note is a matter which should receive far more attention from experimenters. It is hopeless to expect reports from distant stations when your wave-length is wandering, or your note is unreadable. The station with the clear readable note, even if a weak one, is the one to get answered. Many workers lose sight of this very important point, and continue to push unreadable matter into the ether, which

is, of course, ignored by all. They continue to do this because station indications show maximum output.

One of the features to be studied in connection with "notes" is the control of the grid coil. Obviously, when we are adjusting for maximum efficiency, we reduce the grid coupling as much as possible, with the idea of keeping down plate current. This can, however, be carried too far, with the result that the set is only on the verge of oscillation and liable to become unstable in result. It is better here to increase coupling slightly to gain more rigid control, even at the expense of slightly reduced efficiency.

The setting of the anode tap is also another point affecting the stability of the set. A large ratio of plate to grid turns always results in high plate currents; consequently, there is a distinct temptation to reduce plate turns beyond a really safe value. The wave-length is, of course, governed by the tuning condenser and its respective taps. Beyond this, the grid coil will affect the wave-length, while the plate turns would have little effect.

All these adjustments should be made with the aerial coil entirely removed, that is to say, upon the closed circuit. When the aerial coil is subsequently coupled, there will be a slight alteration in wave-length due to mutual induction and absorption, but this can be readily readjusted by the closed circuit variable condenser. It is best to reduce filament temperature, and also H.T. pressure, while adjustments are being made. Valves are expensive, and it is wise not to risk softening through non-oscillation or other mishap.

Do not forget, also, that the wave-metre (if of the absorption type) will itself cause a variation in wave-length in its application to the closed circuit inductance; therefore, keep the coupling as loose as possible to get reliable readings and maintain the wave-meter in position afterwards. Coupling should be so loose that the small bulb usually employed is only just glowing. The Neon lamp wave-meter is preferable, however, on account of the lower current absorbed, and, consequently, less interference with the transmitted signals.

Body capacity may also be a serious feature, and results in wandering wave-lengths. This can be avoided by keying as far away from the transmitter as possible. I have also found that altering the tuning of the receiver adjacent to the transmitter affects the wave-length of the latter, even when the valves are switched off. In other words, the tuned circuit consisting of inductance and capacity of a receiver set will absorb part of the radiation, even at distances of ten or twelve feet. It is, therefore, advisable to shield the receiver completely from the transmitter. (There are cases when a closed tuned circuit have been known to absorb the whole of the output.—Ed.)

Do not make adjustments while keying. Such an action will surely cause your signal to fade out at the station receiving you, with consequent loss of reply (and temper). Adjust filament resistances, taps, etc., before you start and have mercy upon your friends.

Much can also be done by suitably arranging the components of your set so that they do not mutually interfere. For instance, the radio frequency chokes should not be parallel to the main inductance. It should be at right angles to it,

and as near the plate of the valve as possible. Remember, the low self capacity of the choke is the greatest importance, or you will fail to attain high efficiency. The best one is a spaced single layer coil upon a squirrel cage formed of ebonite rods.

Do not omit to use a small radio frequency choke in your grid leak circuit. Not only will this make for higher efficiency, but will save your leaks burning out frequently. A very small choke is all that is necessary; too large a choke will hinder the free discharge of the grid. (This choke may be of No. 40 d.s.c. wire.)

Do not forget that short-wave radio frequency currents will not flow through filament resistances. They must be shunted by condensers whenever they form part of the oscillating circuit. This same remark applies also to short-wave receivers, and is frequently the cause of poor reception. Also, do not put grid bias cells in the high frequency circuit. It appears silly to make this statement, but I have twice recently seen it done.

Many of the mysterious variations in wave-length of some transmitting stations are, I think, due to varying capacity in the H.T. supply. Particularly is this the case with stations obtaining their feed through step-up transformers from an A.C. source of supply. Under such circumstances, the core of the transformer should be efficiently earthed. This will prevent fluctuations in earth resistance on the supply mains, making capacity changes in the set. The same remark applies to filament transformers.

Of course, the greatest enemies to constant wave-length are swinging aeriels and changeable weather conditions. These, however, are outside the scope of this article, and, perhaps, most experimenters know how to keep the trouble down.*

Perhaps the greatest disadvantage of the Hartley circuit is its tendency to oscillate at the frequency of the grid circuit instead of the aerial. This is due to the use of too many grid turns in respect to aerial or, in the case of closed circuit systems, the tuning condenser coil. Providing the ratio of the aerial to grid turns is large, there will be little of this occurring.

Too much care cannot be exercised over the selection of the plate-blocking condenser. It must be always remembered that this has to stand the full H.T. voltage pressure, and yet be able to pass the radio frequency currents without hindrance. A breakdown in this condenser would be the short circuiting of the H.T., and possible destruction of the gear. The condenser should, therefore, be a large one, with safe spacing of specially selected mica. The capacity should not be too large, .002 mfd. being a suitable size for short-wave work†.

The Hartley circuit can be adapted to any of the usual modulation methods for telephony, choke, or absorption control, all being suitable, while for very small powers the secondary of the modulation transformer may be used as the grid leak.

H. B. S.

* We think that the subject of wave-length change is worthy of an article from the pen and experience of some of our members.

† We suggest that, for short-wave work, it is of great advantage to have the blocking condenser variable, and that in any case a very small value of capacity is often quite sufficient. Readers may, however, have other views.—Ed.

Southern Notes.

PREPARED BY G2LZ.

THE past month has been a very poor one generally for the DX enthusiast. Contrary to expectations, there has been very little doing in the way of long-distance work. Very few reports have been sent in, and those which have arrived complain of poor conditions. American signals have been very erratic from day to day. I have worked Americans before 8 p.m. in the evening and as late as 10 a.m. in the morning, and then signals have disappeared almost completely for several days. The Australians and New Zealanders are now beginning to come through again, after a short spell of inactivity, due, mostly, to bad QRN at their end. The best time for working Australia now is in the evenings, about 7 to 8 p.m., and New Zealand in the mornings, between 7 and 8.30 a.m.

The most exciting innovation of late is the way signals are coming through from the East. For several weeks past the Philippines have been heard, and several other stations around China and Hawaii. These signals come through mostly between 1 and 4.30 p.m. The Philippines seem to fade out at sunset, but a station in China does not appear to fade out at all. The first two-way working with the Philippines was effected on the 9th inst., when G2LZ established communication with Pi—IHR, whose QRA is Lieutenant Hayden P. Roberts, Fort McKinley, Manila. Since then G2OD has effected the first two-way contact with China, by working GFUP, whose QRA is not at present for publication. A sharp look-out should be kept for these Eastern stations, and every endeavour made to get two-way regular working with them. One of the most important stations to get into touch with is Hu—NUZQ, situated in Hawaii. If we can work this station, we shall have a 24-hour communication East and West. The following have also been heard: Pi—ICW, Pi—NUQG, and PNP, situated, I believe, at Peking. Another thing is that the Australians can be heard daily quite strong during the times the above stations come through. So far, I don't think that anyone has worked Australia at mid-day.

Another record has been established by G2SZ, who worked two of the American sixth distant stations. This is the first two-way working between Great Britain and this area.

One of the most peculiar features of the 40-metre wave-band is the way all the local signals disappear almost completely after sunset. During daylight European signals arrive with terrific strength, but at night-time everything seems quite dead locally, and hardly a station can be heard.

DX Reports.

6LJ has worked three Z's and A—3BQ several times, also as many U's that he has heard. He has been off for about two weeks, due to his 250 watter developing a crack in the pip.

6TD bemoans the fact that no one round his district has done anything of late. To make matters worse, he has been limited in his power supply due to the burst dam disaster in his neighbourhood.

6JO has been rebuilding and is now on the air with a 50-watter. Although he has done very little on the transmitting side, he has sent in a

most comprehensive list of calls heard, which does him great credit. This will be found in the list of calls heard.

2SZ reports the first two-way contact with U—6VC and U—6CTO. He has been doing a lot of phone work lately and has worked phone to several U's, Z's, Baghdad and HBK India. Also, he has been heard very QSA in Cape Town on 23 metres. He has recently been appointed an Official Wave-Length Station (OWLS), and sends his wave-length at the end of each transmission.

2XY has worked six U's, one of them at 7.45 p.m., and NTT. Also, he has been in touch with GB—I, whose QRA is not for publication, but states he is in the South-East corner of Europe. (Those who think this is a station in Iceland, please note.)

5SI has been ill for some time, and reports very little doing so far as he is concerned. He is one of the low-power stations, only 11 watts, and finds the present conditions very unfavourable for low-power DX work. He asks me to cancel the paragraph about him in the last issue, as one or two items are not quite correct; also to add that the Z station he worked on 11½ watts was Z—2AE, not Z—4AK. I might mention that the report on 5SI in the last issue was not sent to me by him, but by another station who had been following his transmissions.

20D has not reported, but I have heard him working GFUP in China on phone, which is a record. This is the first two-way with China. Further particulars on this will be given later, as soon as permission is given to publish the QRA of GFUP.

2LZ has been on the air daily, and has been in two-way QSO with the following: U's: 1KA, 1SW, 1CMX, 1CMF, 1AAO, 2AMJ, 2ZV, 2AHM, 2CXL, 2HJ, 3AFQ, 4IO, 8BUK, 8CBI, 9BEQ; C: 3AA; Z's: 2AC, 2XA, 4AR, 4AS; A's: 3BQ, 3EF, 3BD, 5BG; Bz's: 1AB, 1AC, 1AF; O: A4Z; Pi: IHR (first two-way QSO), GFUP (China), GHA (Malta), HBK (India). Several experiments have been carried out in the re-radiation of the B.B.C. station at Daventry on 45 metres. The best DX report on this reception is from the Hobart Radio Club, Hobart, Tasmania.

5QV has been in communication with Australia for the first time, and has worked several Americans. He is very keen on establishing the first two-way contact with the Canadian fourth district, and will be pleased to hear from anyone who has heard any of these stations. He has a schedule every Sunday morning with a Canadian four, and would like the co-operation of any other DX British station. Time, 5 a.m.

2NM has not been quite so active of late, principally due to illness in the house. He has been doing some excellent phone work lately, principally with HBK (India) and America. In fact, we very seldom hear 2NM on morse now, it is nearly all phone work with him.

2AO has not sent in a report, but he has started on DX work again. I have often heard him working the A's and heard him in communication with GFUP.

5NJ has worked three A's and also American first and second districts. All the stations were raised with *one* short call. He has a maximum

(Concluded on page 10)



MOVING COIL FLUSH TYPE MILLIAMMETER.

Make Sure of your Data by Using Good Meters.

Accurate Record is the Secret of Successful Experiment. Every Meter sent from "The Croft" is guaranteed against electrical or mechanical fault. Readings on Moving Coil Meters are guaranteed accurate within 2 per cent. Below is a range of Popular Models.

Moving Iron Instruments.

The Patented Movement in these Meters enables **Dead Beat** Readings to be obtained.

Voltmeters, Type HV30.

Pocket Type 0-6, 8, 12, 15v.	8/-
Ditto, Double Scale 0-6-120v.	11/9
Cases for above	9d.
Flush Type Panel Mounting 0-8v., 0-15v.	7/6

Ammeters, Type HA30.

Charge and discharge, to match flush type Voltmeters 5-0-5, 10-0-10, 15-0-15, 20-0-20 amps. ... 7/-

Moving Coil Instruments.

Fitted with the latest balanced movement, pivoted on jewels, and controlled by opposed springs. Supplied either flush fitting or projecting with side terminals.

Voltmeters, Type HV35.

Single Scale 0-6, 20, 30, 60, 120v.	25/-
Double Scale 0-6-120v.	27/6

These meters are of high resistance, approx. 70 ohms per volt.

Ammeters, HA35.

0-1, 0-3, 0-6	25/-
----------------------	------

Milliammeters, Type 53MA.

0-2, 5, 10, 20, 30, 50ma.	25/-
0-100ma.	30/-
0-300ma.	32/6

A good meter is a sound investment; send for one to-day. Please state Reading and Call No. when ordering. Particulars of larger meters gladly sent on application.

Other items of interest for the Month.

Best Quality Mahogany Cabinets for $\frac{1}{4}$ in. Vertical Panels. Just the thing for putting out of harm's way those wanderers "scudding about the bench." In three sizes: 6 x 5 x 5 in. deep, 4/9; 10 x 8 x 7 in. deep, 10/9; 12 x 9 x 8 in. deep, 14/9. If you are in need of any special size or type of woodwork, please send for quotation. All work of "Croft" quality.

QSL Cards

Of the highest quality and distinctive in appearance: 100 for 7/6; 250 for 11/9; 500 for 18/-. If these are not already known to you, kindly write for sample, sent on request.

Spring Grip Terminals.

A really useful terminal, stocked in black and red for quick "hooking-up" for either plain wire or tag ends: 3/9 per dozen.

ALL GOODS CARRIAGE PAID IN THE UNITED KINGDOM, ORDERS FOR CABINETS, CARDS, ETC., OF £1 AND OVER LESS 10 PER CENT. TO MEMBERS OF THE T. & R.

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Tel.: Willesden 1665, Radio 6QA.

Northern Notes.

PREPARED BY 2DR.

THERE is a dearth of news from the Northern hams this month, and the rebuilding fever seems to have caught hold badly here. Not a single report from Lancashire either. Yet one hears plenty on the air; but perhaps they are so busy brass pounding that they have not the time to let me have a report! Send a line for next month, fellows, please. What I should appreciate more is the offer from some prominent Lancashire DX expert to collect reports, and let me have them not later than the 16th of each month. This applies to all Northern counties, and it would be a real help, as I have a very large area to cover. So rally round and give an over-worked sinner a lift.

I sent out over 100 letters to the best-known men in my area, and received only six replies! Not a very encouraging start, was it?

I am perfectly prepared for a jolly good slanging for this, but if you send along a report at the same time, I shall stand the slanging willingly.

Now for this month's report.

2XY (Leeds) has worked GB1, U-NTT, and the following U's: ICMF, 1PY, 1KL, 1SE, 2BIR (and this in a "dry" country!!) and 2WR. ICMF was worked at 7.45 on a Sunday evening, which is rather early. He has tried many aerials out for 45 metres (I beg your pardon, hams, I should have said 6666.7 kilocycles!!), but has camped on the Hertz as being the most satisfactory. Thereby hangs a tale. One morning, bright and early, 2XY was busy on the key, when he felt there was someone looking at him. Turning round, he was horrified to see a "face at the window." Records are not available to show how high 2XY's hair rose. It was an indirect descendant of the late Sir Robert Peel, demanding to know the meaning of "that there blinking light!!" Apparently the flash lamp bulb was keeping the home fires burning in the traditional manner. F.B. O.M.

5MO (Newcastle) heard A-6AG at 2.30 p.m. G.M.T. on October 15, and since then has logged the following between 2 p.m. and 5 p.m.:—A's: 3BD, 2YI, 3BQ; 2XA; Phillipines: NUQG, PIICW, IHR, GFUP; Pekin: PNP; U: NEQQ; Hawaiian: NUZQ; and South African: OA3E.

Signals seem to fade out about an hour and a half before dusk and reappear about an hour later. Whether this is due to silent periods has not yet been discovered. A schedule has been fixed for the Phillipines by radio, and particulars may be had from 5MO.

Other work by 5MO includes logging first QSO between Australia and South Africa at 3 p.m., October 26 (G.M.T.). South African stations logged between 3 a.m. and 4.30 a.m. on 35-40 metres: A3E, A4L, A4V, A4Z. Strength, R3/R4 on two-valve Reinartz. Chillian 2LD heard and worked until 10.30 a.m. May I ask 5MO when he sleeps?

2CC (Stocksfield) has been heard by KFUH in the Tahiti Islands (South of Honolulu), but I have had no direct report from him this month.

5SZ (Morecambe) is rebuilding both transmitter and receiver. Having a report that his note was like 25-cycle A.C. the other day, he began to look

round his "firework box" (smoothing unit). Discovered a spark between the iron-core choke and the brick wall of 2,800 volts magnitude!!

2VO and 2IH are both rebuilding, and have nothing to report.

2DR, after a heap of work, has settled down to a tuned grid circuit with a Hertz aerial.

A little bird has whispered that there are two Northern hams having outside shacks; I believe they are 5MO and 2DR, who are cursing the advent of paraffin stoves. Both these unfortunates have suffered from superfluous emission of carbon from these atrocities. The net result in both cases has been a complete dismantle and clean out. Rumour also has it that domestic QRM has been very QSA in these two stations!!

Southern Notes—Continued from page 8.

power of 90 watts, and uses a Hertz aerial. Reports give him as R6 in Australia.

Several of the Southern stations have not sent in reports this month. I have not heard them on the air much lately, so presume they have not much to report. I should like to hear from more of our stations, especially the low-power ones. Everyone likes to know what the other man is doing, so please endeavour to send me in a report as soon after the end of the month as possible, if it is only on a post-card. Now then, Southerners! Make a note of this in your diary and keep the ball rolling.

Say, OM—

Wouldn't it be wonderful—

If a certain ham near London could send his call without making the dash in the D miles too long;

If all the 45-metre G stations were exactly on 45 metres;

If the R.I. came round to measure our power input;

If 2NM's sigs. were reported QRZ;

If some of those sixth district hams could hear us;

If WIZ stopped calling ABC;

If 5DH called CQ only three times (please, please, Ed.);

If the majority of our low-powered stations came down to short waves;

If we all trooped back to 200 metres;

If we had no "quiet hours";

If Hertz aerials grew on trees;

If the N.P.L. gave us some standard waves;

If every G ham contributed something to the BULLETIN. 6LJ.

Good Wishes.

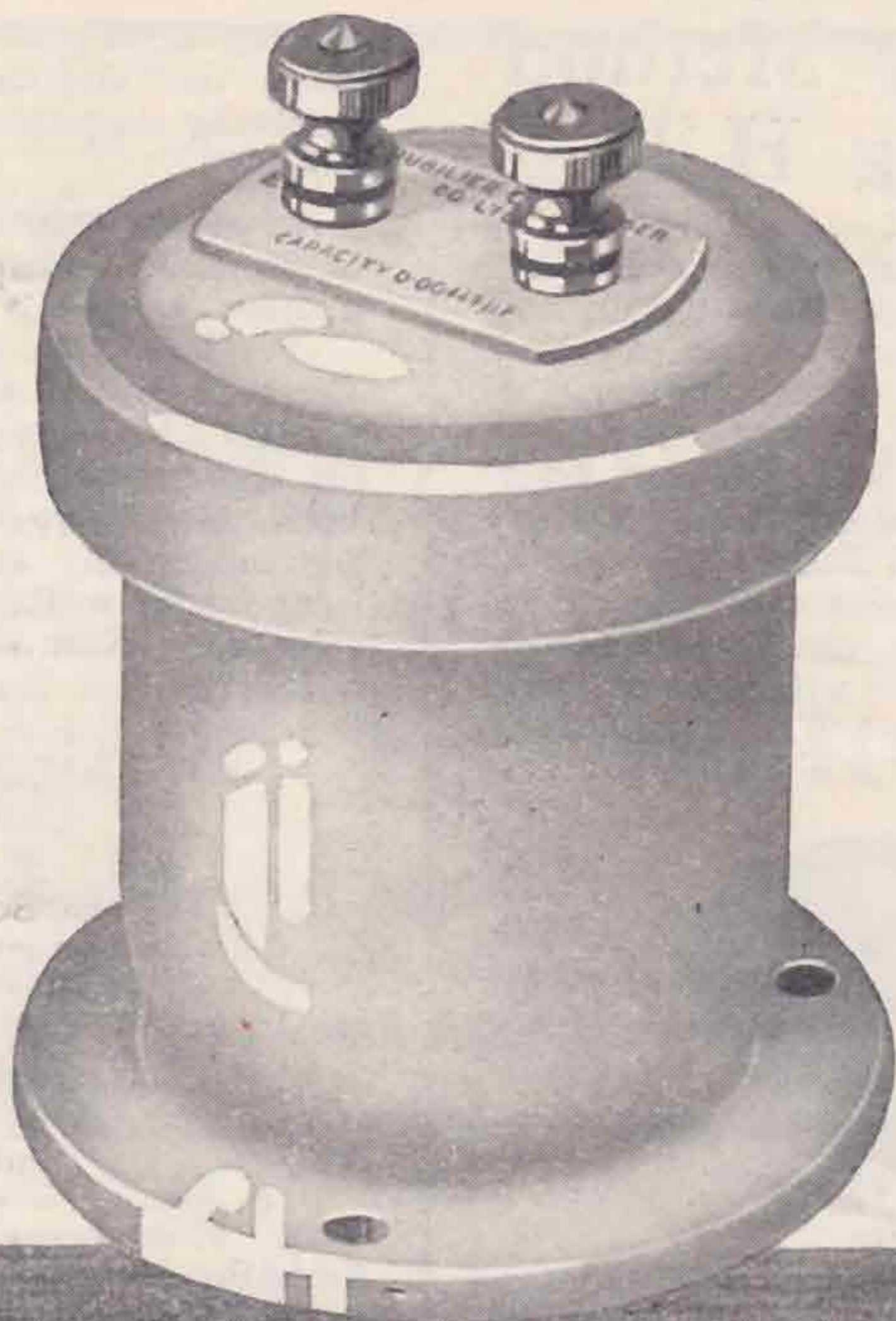
To the Editor of T. & R. BULLETIN.

SIR,—The copies of the T. & R. BULLETIN which you have been so kind as to send to the office each month have been read with much interest by the members of the headquarters' organisation, and I express the opinion of all when I extend to you sincere good wishes for the future success of your splendid paper.

Yours sincerely,

A. A. BUDLONG,

Asst. to the Secretary,
American Radio Relay League.



DUBILIER

TRANSMITTING CONDENSERS

The small transmitting condenser illustrated here is one of the many specialised Dubilier products, and is particularly suitable for use in experimental and amateur transmitting stations.

Among the many purposes for which these condensers are used, we would like to mention the following:—

- (a) For use in low-power transmitters up to 100 metres as aerial series condensers, oscillating circuit condensers, grid condensers, etc. (Types S.W.A.F. 650, S.W.A.F. 700, S.W.A.F. 750, S.W.A.F. 800.)
- (b) As Anode Feed Condensers (Capacity range 0.00005 mfd. to 0.05 mfd. for working voltages up to 6,000 D.C.)

(c) As high-frequency by-pass condensers.

(d) As grid condensers.

Condensers for the last three purposes are scheduled as types A.F. 650, A.F. 700, AF 750 and AF 800.

They are enclosed in porcelain containers, so as to insulate the whole condenser when used at a high potential above earth (*e.g.*, as in the case of Anode Feed Condensers). The terminals are mounted on the porcelain lid, and this type of condenser is a most reliable and convenient unit for experimental use.

Prices from 25/- to 60/-, according to requirements.



DUBILIER

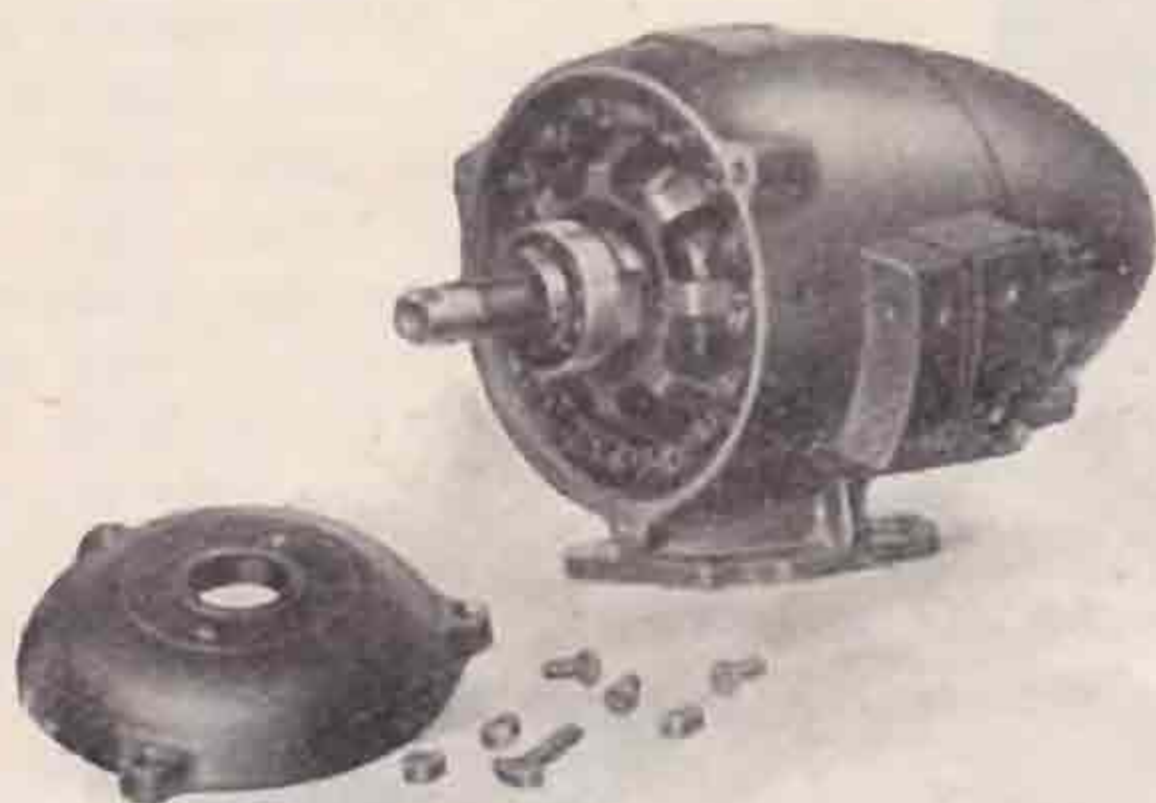
CONDENSER CO (1925) LTD

A Cheap, Easy Method of Obtaining H.T.

By G2IH.

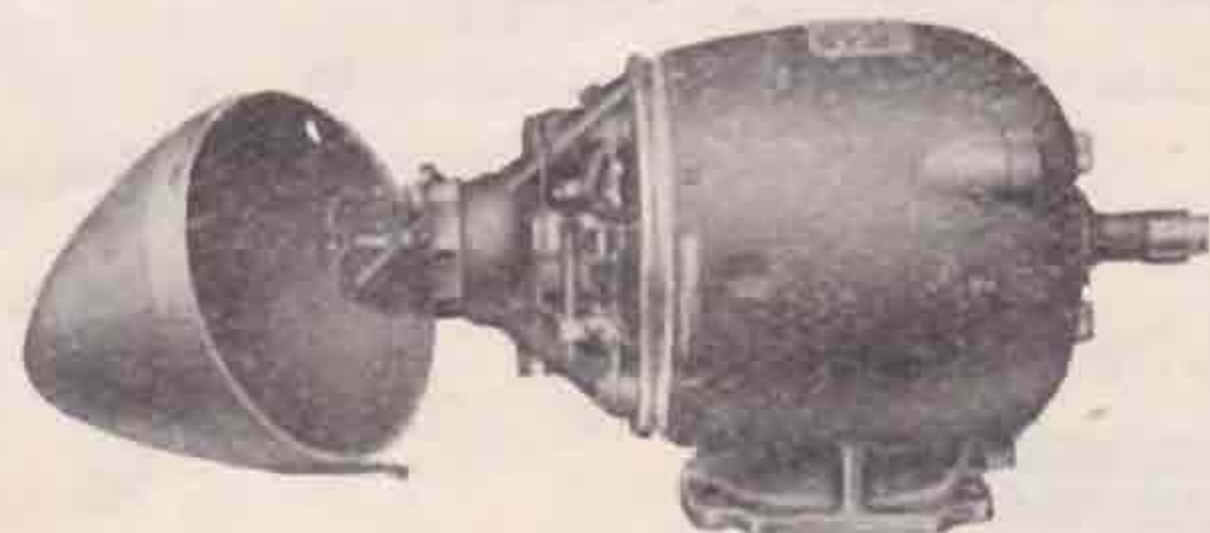
AFTER struggling for some considerable time to improve the "Calliope" (see dictionary) noise produced by his 50-cycle rectified and smoothed H.T. supply to the transmitter, the writer, as a result of several desperate hours of trying to solve the problem of "9d. for 4d.," decided to plunge into the unknown and try some other method of obtaining H.T.D.C.

Thus an ex-Government 52A-500 cycle alternator, see Figures 1, 2, 3 and 4, was purchased for the sum of £2 from one who was disgusted with the miserable attempt to revolve same by means of a small D.C. fan motor. *Splendid fellow.*



Fortunately, the writer possessed an "Invincible" ¼ H.P. split-phase A.C. motor, 230v-50 cycles, which, when new, cost between £4 and £5. This is a fine affair, and is handled in this country by the Swedish G.E.C., of London, and, of course, revolves the 52A Newton alternator merrily.

The two machines are mounted on a light, strong oblong type of wood frame, made of lin. square hardwood. This frame may be supported at each corner by inverted circular wood ceiling blocks, which engage the tops of four inflated rubber balls purchased from Woolworths! The result of this mounting is total insulation of all mechanical vibration between frame and floor, apart from the electrical advantage, if any. An open frame is specially mentioned, as a piece of solid board is resonant to the mechanical vibration of the alternator.



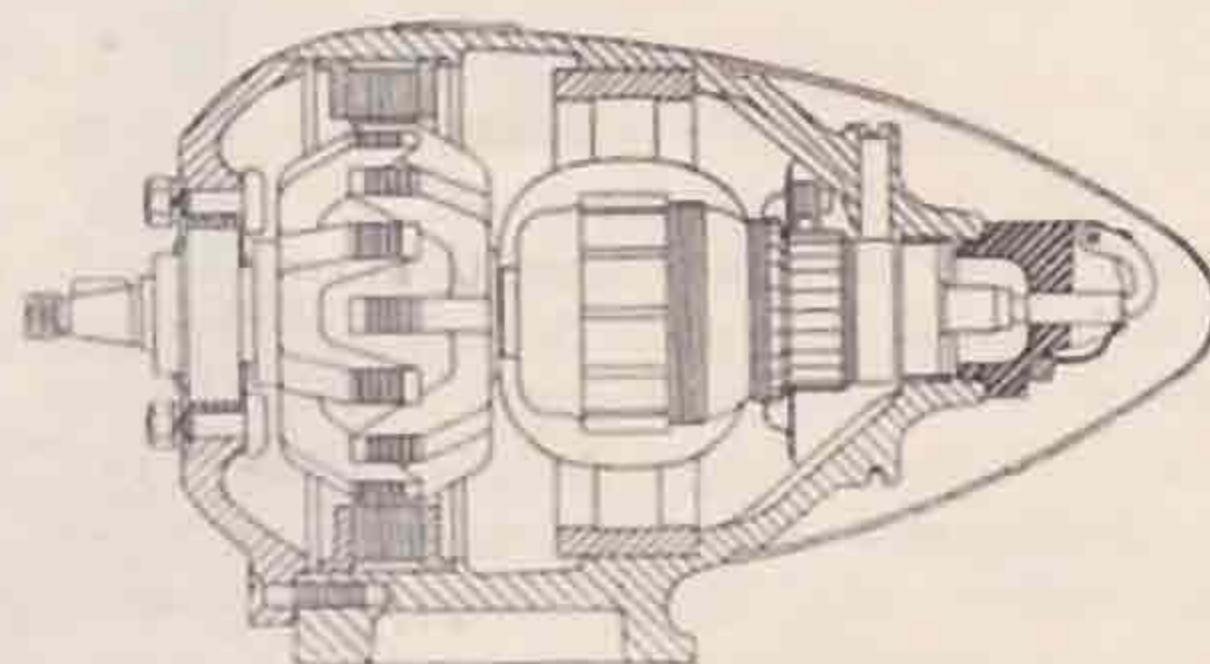
Having heard that 52A alternators were "hot stuff" when worked on load for long stretches of time, the aforesaid disgusted one had very kindly bored a series of ½ in. holes through the aluminium end cap periphery (at the pulley end of the machine). The usefulness of this "kink" is actively demonstrated by putting a lighted match near the holes when the 52A is revolving (the protective metal cone at the D.C. end being left off). Quite

a "cupful of wind" pours out of the holes and keeps the alternator down to hand heat, the revolving magnets forming a miniature centrifuga fan.

An old transformer connected across the mains to the motor delivers 4 volts at 11 amps. to a Dutch rectifier valve left in this country by OXP.

One hears of Dutchmen being stolid fellows. They are not half as stolid as that rectifier filament: 4 volts 11 amps. it consumes! But facts speak for themselves, the filament is under-run at 3.7 volts, the valve delivers the goods and should last indefinitely, and the input to the transformer is about 45 watts from the mains. Not too bad, after all! Now we can carry on calmly again.

The juice is half-wave rectified at about 1,000

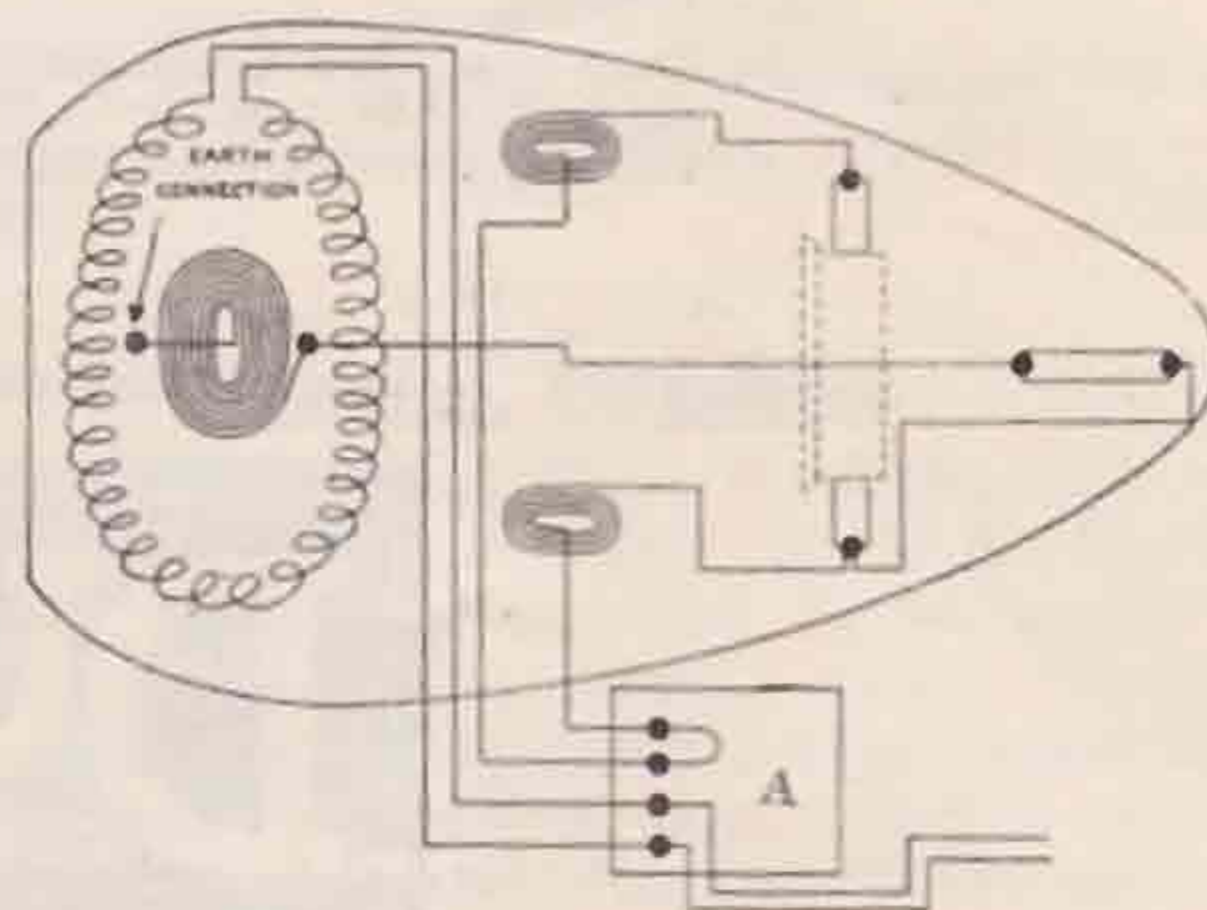


volts, after being stepped up by a transformer listed by Leslie, Dixon & Co., of London, as being suitable for use with 52A alternators. The transformers were made by the B.T.H. Co. to deliver 5,000 volts, and are rated at 0.2 K.V.A. (see Figure 5).

The writer stripped his and rewound the primary with 30 turns of 16 d.c.c. wire and the secondary with 3,000 turns of 28 s.s.c. A striking feature of these transformers is the smallness of the core, about 7/8 in. square in section, quite a puny-looking affair, however, considering the high frequency, and bowing humbly to the B.T.H. Co. the transformer was duly finished and has stood up well against a few serious shorts. (Why do these things always happen in the wee sma' hours?)

Across the output of the rectifier valve are placed two T.C.C. 4 mfd. condensers in series, these condensers being rated at 1,000 volts and tested to 1,500 each. They cost about 16s. each.

Proceeding along the H.T. lead in a cautious manner, we come to a "scrap-made" L.F. choke, which was restored to its proud point of high



voltage from the scrap box. This choke consists of 350 turns of 18 d.c.c. wire on a laminated core

(Concluded on page 14)

CRYSTAL CONTROL *of* Amateur Transmitters

No transmitter to-day can be considered entirely efficient or to conform to modern practices, unless crystal controlled.

Write immediately for a crystal of the frequency on which you desire to work.

No two crystals will be supplied of the same frequency. Having control of the distribution of these oscillators, the elimination of interference is assured since no crystal controlled set will ever be able to operate on the same wavelength as another.

Quartz crystal oscillators are supplied suitably mounted and complete with N.P.L. Certificate, for any frequency.

Price from £4.

Write to-day :—

“SEC SELDOM SLEEPS”

EVERYTHING FOR THE TRANSMITTER.

SECRETAN & MALLETT LIMITED
149 Lowther Parade, BARNES, London S.W.13

3/4 in. square section, made of scrap "Stalloy" strips 12 in. long. The winding is wound in the middle of this in a few layers, the ends of the strips being bent back, interleaved and bound up tightly.



After leaving the choke we come to another H.T. condenser across the mains.

This was coaxed out of a mouldering T.V.T. unit by means of a screwdriver, and is the one which was across the contact breaker. The condenser is about 1 mfd. and has stood 1,500 volts safely in my case. This completes a power unit which has so far only been tested to 40 watts, this being due to the fact that the 4d. has not yet become 9d.!

The complete outfit, comprising motor, A.C. generator, transformers, rectifier, and smoothing unit is housed to its dislike, in a coal-house, or, as it has been stated in this journal previously, "in an outhouse." It is entirely automatic, being simply started and stopped by a D.P.D.T. switch on the operating bench. The arrangement delivers D.C. absolutely pure and steady. This latter statement has been confirmed many times by readers of this journal, and by "hams" overseas, the general reply to questions being "pure D.C.C.W. Vy. O.M." In conclusion, the writer would voice his complete satisfaction with the unit up to the power mentioned, though, doubtless, it would be equally satisfactory at treble the output. The total cost has been about £11 to £12.

I would be pleased to hear from any who make up this outfit, and would mention that the address of my station, G2IH, is not correct as stated by Messrs. Cassels handbook.

[Editorial Note.—We are indebted to Messrs. Leslie Dixon & Co. for the loan of the blocks used in the illustrations.]

Irish Prefixes.

It has been arranged through the medium of the Northern Radio Association (Ireland) that all Ulster amateur transmitters shall use the nationality prefix "GI" instead of "G" alone. This does not apply to the Free State, which is not under the "G's" as far as I know.—GI 6TB.

Technical Articles.

We are still in need of technical articles. Short articles on short and long-wave transmitters and receivers, fading, valves, power supply, etc., are very welcome.

Catalogues, Etc.

Messrs. The Marconiphone Co. have sent us advance particulars of their Marconiphone Type 21 two valve broadcast receiving set, which appears to be a very tasteful model and one with which trade members should do good business.

Calls Heard.

U.S.A. Stations—1ch, 1eb, 1ef, 1ga, 1ka, 1lw, 1my, 1pl, 1py, 1qm, 1rp, 1rf, 1si, 1sw, 1uw, 1yb, 1aae, 1aac, 1aaf, 1af, 1af, 1aff, 1ahl, 1ahv, 1aci, 1arh, 1auc, 1aya, 1axa, 1bad, 1bay, 1bhm, 1bzb, 1cal, 1cmp, 1ckp, 1cmf, 1cmx, 1xaw, 2be, 2bl, 2om, 2bz, 2cv, 2ds, 2dx, 2fc, 2gc, 2gy, 2qs, 2uk, 2wr, 2zv, 2aky, 2agq, 2ahm, 2amj, 2ahk, 2apv, 2bbx, 2bkk, 2bck, 2brb, 2cft, 2cas, 2egi, 2erp, 2cvj, 2cxl, 3bf, 3hg, 3nu, 3jo, 3lw, 3py, 3yj, 3afq, 3ahp, 3bnz, 3cdv, nell, nve, ntt, nivr, napg, nism (Cuba), 4eg, 4gw, 4je, 4rm, 4sa, 4ox, 4oi, 4we, 5go, 5jf, 5qk, 5uk, 5agn, 5zai, 8eq, 8er, 8es, 8jq, 8zu, 8adm, 8aly, 8aub, 8awa, 8ben, 8bgn, 8bpl, 9bw, 9zk, 9adk, 9brg, 9bvh, 9eji; Canadian Stations—1ar, 1am, 2ax, 2fo, 3nf; Australians—2cm, 2yi, 2ef, 2bd, 2bq, 2bg; N.Z.—22ac, 22ae, 22xa, 24ac, 24as, 24ag, 24ak, 24al, 24ar, 24as, 22cm, 22yi, 22ef, 22bd, 22bq, 22bg; Argentine—af1, aa8, as7, bl5, cb8, dm9, fb5, fc6, ga2; Brazil—bzlab, bzlav, bzlia, bz2sp, bzrgt; Chile—ch2ld, ch9tc; I dia—hbk; Malta—gha, gbl. 20 metre band wave-length: U.S.A.—1xu, 2xi, 2ahm; Canada—1ar; Italian—1as; British—2kf; Russian—rrp.—Between Oct. 12 and 18 and Oct. 25 to Nov. 8, 1925. 30 to 50 metres wave-length.—G6JO, J. RODGERS.

August, 1925: r4, 2lz, 4aa, 2nm; September, 1925: r3, 2ac, 2od, r2, 2ac, 2lz, r4, 2nm, r2, 6td, r4, 9ad, 4ak, 6tm, nut, 2nb, 4ak, 2sz, 5if, r4, 5uk, 2kz, 2yi, 2od, r3, 2k2, r4, 2kf, o-v-1 or 2 Weagent receiver. Telephony received from the above stations working speed considerably stronger than heard from kdka but not nearly as clear, due to either rough note or to audio frequency fading. Audio frequency fading referred to is very noticeable on kdka, but on 2nm it made the voice unintelligible and cut the music up into chunks at about 20 cycles. About 45 metres.—R. T. SCOTT, 68, Fisher Street, Christchurch, New Zealand.

British—2fo, 2it, 2gy, 2vx, 5ax, 5qt, 5pm, 5xo, 5nj, 6mu, 6do, 6ky, 6tm, 6dh, 6yu, 6ox, 6qb, 6td, 3ad; America—1ahl, 1anq, 1bhh, 1adf, 1bhs, 1apu, 1ch, 1cvj, 1axn, 1aof, 1vc, 1aci, 1awe, 2aim, 2wr, 2kr, 2fj, 2cpa, 2mm, 2cxl, 2gq, 2vc, 3qs, 4rm, 8zu, 8ada, 8jma, 8eq, 8eji; Argentine—aa8, 6al; Brazil—1ab, 1rg; French—8dd, 8yab, 8zb, 8wag, 8xh, 8eqn, 8ba, 8qr, 8udi, 8gw; Sweden—smlz, smzv, smtn, smxu, smtx, smuk; Spain—ear9, ear1; Italy—1eo, 1as, 1bb; Holland—nowb, nobx, nisp, npb10; Australia—2tm, 2yi, 3ef; New Zealand—3am, 4ag, 4as, 2ac; Miscellaneous—1lag, kiz, gcs, 1kk, s2nm, ky8, 9br, h9ad, bw3, d8zm, s2ax, s5nf, zxx, skk, bh6, s2co, ch9tc. All on o-v-1. Pte qrk mi sigs on 45 metres and qsl "a card for a card om." Great Shelford, Cambs.—2XV.

British—2kf, 2oj, 2bd, 2cc, 2rq, 2sz (phone r8), 2dx, 2gy, 2fo, 2xv, 2nm, 5lv, 5ma, 5gv, 5in, 5ig, 5ag, 5yz, 5lf, 5gs, 5hx, 5ku, 5xo, 5mo, 5np, 6lt, 6fg, 6rs, 6bd, 6tm, 6td, 6vp, 6xd, 6vr, 6vq, 6vz, 6do, gcs (30 and 42 metres); French—8paq, 8hv, 8tok, 8eb, 8tk, 8jd, 8ydr, 8qr, 8du, 8xh, 8ee, 8ee, 8ldr, 8buc, 8owx, 8ef, 8an, 8ab, 8ic, 8aix, 8aiq; Italian—1ad, 1dp, 1bd, 1rm, 1rb, 1bu; Hollandish—oom, off, obbl, opm, oxx, ogv, okw, pibq, pmm (on 27 metres); Scandinavian—smzs, smtn, smxg, smucu, s2co, s2ab; Yugo-Slavian—7xx; Spain—7b; German—k4lv; United States—1bhm, 1xm, 1ac1, 1aq, 1ch, 2mm, 2uz, 2hj, 4tv, 5acs, 9kva, 9abi, wgy, wiz, wqo, fw; Australia—1qa; New Zealand—1ao; Belgian—pb3, bz2, bt2, bh6, bg6; North Africa—maroc; unknown—cby, 5yin, cu8, 4na, 9ad, 9br, 3dv, r2r (qra?) All between 0505 and 2359 GMT; on o-v-1 qrk? my sigs on 45 psc qsl 25 to 50 metres, Oct. 16 to Nov. 13.—G5YM.

American—1ana, 1be, 1ck, 1cp, 1arf, 2apz, 2bu, 2mk, 2ckz; Australian—2yi, 2cm, 2yh, 3bq, 6ag; Belgian—p2, w2, 4rs, a44; British—2co, 2nz, 2nb, 2kf, 5mo, 5oy, 5nn, 5nw, 5qu, 5ua, 5hu, 6td, 6od, 6yu, 6sd, 6al, 6lj, 6pt, 6tm; Czechoslovakia—2aa; Danish—7zm, 7ar; French—8co, 8tok, 8phx, 8su, 8ja, 8ee, 8th, 8to, 8ms, 8sa, 8dd, 8kvx, 8bw, 8gw, 88c, 8na, 8cu, 8ai, 8an; Dutch—okg, okw, owc, opm, ogot, oew, obx; Italian—ias, ibd, iay, ico, iau; Mexican—ik; New Zealand—ixa, 2hc, 4hs, 4ar; Russian—Signed rtd; Swedish—smfc, smxr, smuk, smtg, smgo; Swiss—hsb, 9br, 9ad; Yugo-Slavia—7xx; Miscellaneous—lpz, fw, bg, gob, npp, peg, ane, h2, o3x, nve, kzto, caqo.—Oct. 25; 50 metres and below.—6UZ.

Endless near U's! in addition: u6agw, u6cgw, bzlab, bzlav, bzlac, chleg, ch2ld, ch9tc, raf4, rcb8, rbal, jlaa, z1ao, z1ax, z2ac, z2ae, z2xa, z3al, z4aa, z4ag, z4ak, z4al, z4ar, z4as, a2cm, a2yl, a2lo, a2bc, a3bq, a3bm, a5bd, a5bg, xa7jb (? portable Australian). o-v-i.—G6TM, 127, West Erd Lane, N.W.6.

Wap almost every night qsa, wnp, on Sept. 11, r4 36 metres, nrri, Sept. 11 calling wap (nrri at Tahiti Society Islands 9,500 miles!). U—nrri, wap, wnp, laad, lare, laxa, lccx, lckp, lcmx, ler, lmy, 1nt, 1uw, 2ahm, 2cmf, 2cpa, 2cse, 3aha, 3lw, 4ask, 8avl, 8bre, 8don, 85f. Canadian 1ar, 2fd, Mosul 1dh.—E. J. ERITH, Wirchfield, Albion Road, Sutton, Surrey.

Another Appreciation.

We have to thank Mr. H. B. Grylls (2RB) for his acceptable gift of £2 2s. to our BULLETIN publishing fund.

A Field for Experiment.

By CAPTAIN P. P. ECKERSLEY, A.M.I.E.E.
Chief Engineer to the British Broadcasting Co.

I WROTE to Mr. Marcuse the other day, and asked him if I could do anything to help the journal. I expected it; it's on my own head; he told me to do an article.

The question is, what to write about; concentrating as one does upon the question of quality and broadcasting, one loses touch, perhaps, with other activities in connection with transmissions. Is it tedious as a twice-told tale, or dare I discuss methods of telephony control, and indicate what in my mind should be the trend in future broadcasting sets?

I know it is not a problem that confronts the T. & R. Section exactly, but sometimes it may be interesting to have a glimpse into an allied subject, and, after all, I suppose broadcasting is now the greatest activity throughout the world in connection with wireless telephony.

The ideal in a broadcasting set is to have an arrangement in which for every frequency, from 30 to 20,000 even, input gives a corresponding modulation on the output side. What prevents this? Why is it not possible to modulate the high frequency output by any lower frequency between the limits given? Put in a very broad way, one should realise that in every valve magnification system there is bound to be introduced certain capacity and inductance. Now the impedance of a relatively small condenser at very high frequencies may be quite considerable. If it is in a position to divert the voltage away from its proper work—if, for instance, in a choke control system it is connected between the high potential end of the speech choke and earth—then we lose modulation at high frequencies. Conversely with an inductance, which may have a very high impedance value at high frequencies, we get a cut off at low frequencies. What is the solution of this trouble? Briefly, it is to work high quality broadcasting sets on a low impedance system, *i.e.*, let the oscillating system considered as a resistance (after all it is feed 100 milliamps, voltage 1000 and the *resistance* is then equivalently 10,000 ohms) be low.

If we make the oscillating system of an impedance, say, of 2,000 ohms, then a capacity having an impedance of 20,000 ohms. at high frequency will be getting towards being negligible. It is interesting to note that with a given voltage, shall we say 10,000 volts, it is more and more ideal as the power is increased, provided the valve capacity (always a bugbear) does not increase as rapidly as the power. This is usually all right in practice, because one water-cooled valve can handle perhaps 10 K.W., and its capacity is not terrible.

Some figures are interesting—a 1 K.W. set on 10,000 volts has a general impedance value of 100,000 ohms, a 10 K.W. set 10,000 ohms and a 25 K.W. set only 4,000 ohms.

I think the ideal is to design towards a 2,000 ohm impedance. This, however, may present other difficulties, especially as the valve magnifications are reduced, more are necessary and the valve capacity increases. Add to this the instability that may occur, due to very open mesh valves, and it may be impracticable to consider high-power direct choke control sets at this impedance value.

I wonder whether, perhaps, we shall find our solution in using high frequency magnification on transmitters—design that is a choke control system of perhaps 5 K.W. using voltages of the order of 3,000 (resistance 2,000 ohms), and then add on what voltage we like a high frequency magnifier to give us 15 K.W. in an aerial, a mag. of about four times. Certainly at first sight this may appear a sound scheme. May I suggest that amateurs would find a lower power an interesting line of research in taking the modulated output from a small set, applying this between grid and filament of a "bigger bottle" and seeing what conditions are like. It is an economy.

P. P. E.

Statistical Department.

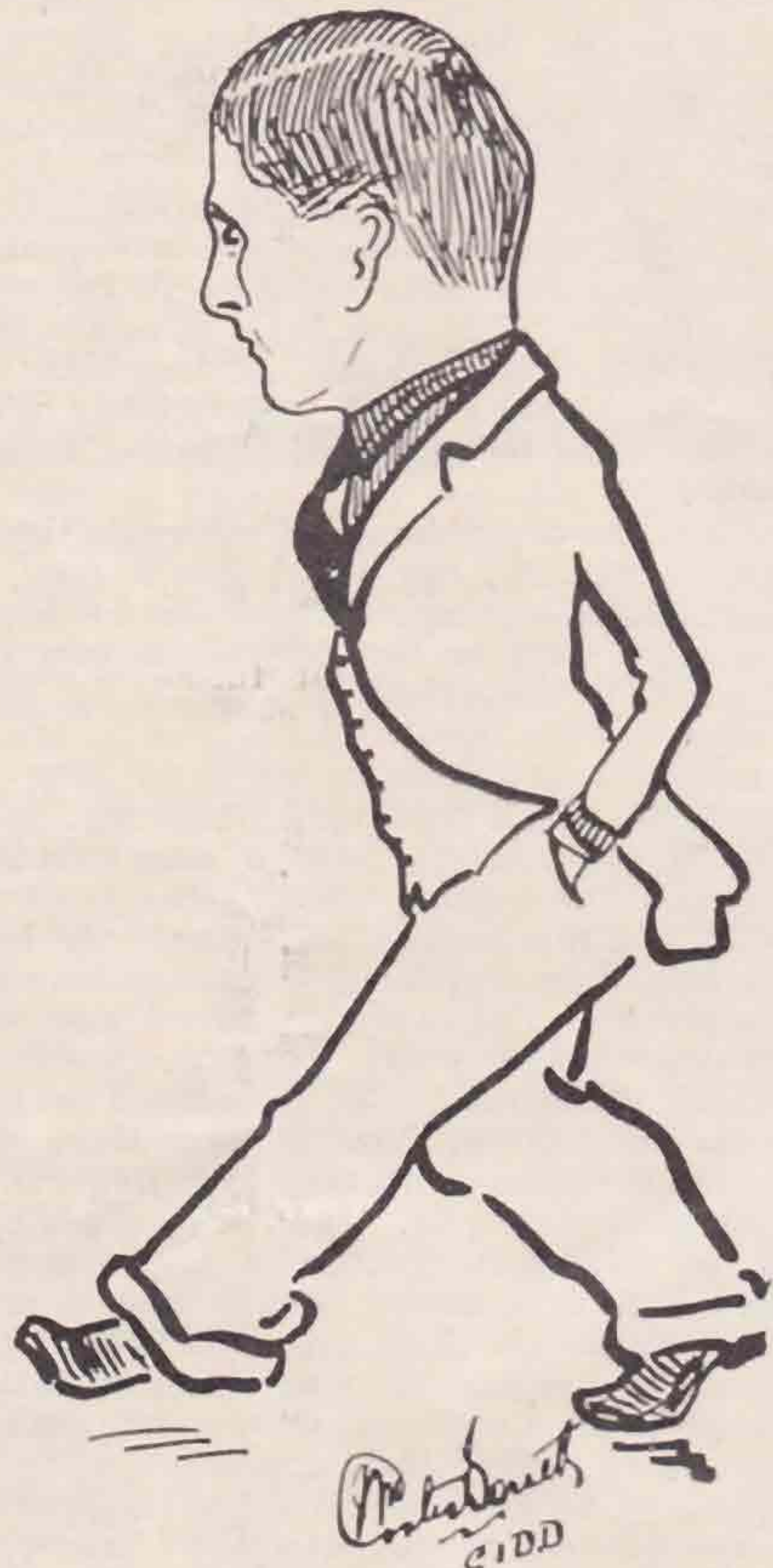
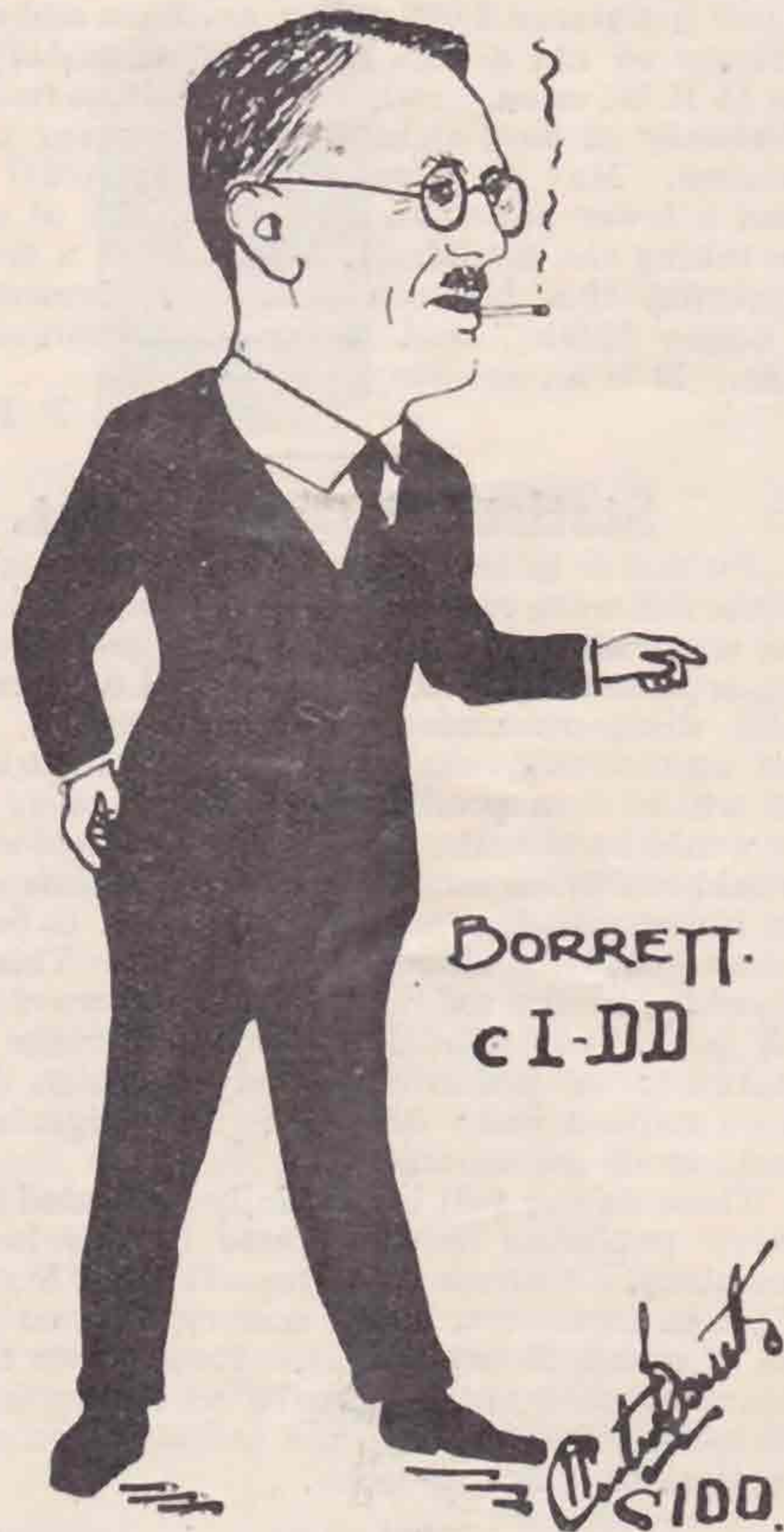
Elsewhere in these pages will be found accounts of the DX work carried out by our leading amateurs on short waves with moderately high power. We know that these short waves travel over considerable distances under certain conditions, but so far no data is available as to the nearest distance at which it is possible to intercept such signals. It would be of material assistance to all if members would kindly either carry out special tests in order to investigate the problem or furnish us with the results of tests already carried out. This report should take the following form: (1) wave-length; (2) power; (3) distance in miles between testing stations; (4) period of the day in which the tests were carried out; (5) strength of signals ("R" method of gradation).

These figures will be carefully tabulated and the result published in due course for the benefit of members. Address your reports to "Statistics," T. & R. BULLETIN, Radio Society of Great Britain, 53, Victoria Street, S.W.1. Please note that the figures should only relate to wave-lengths below 50 metres, and relate to the nearest point of interception, and not distance.

SMALL ADVERTISEMENT.

A. C. POWER UNIT for 230 volts 50 cycles—output 150 watts, comprising the following: Zenith Power Transformer 0.15 K.V.A.; Zenith filament transformer 0.038 K.V.A.; five Amrad S. Tubes; four 4 mfd. T.C.C. 1,500-volt condensers, wired to stand 3,000 volts; one Jewell 0.75 milliammeter with shunt; one Jewell 0-15 A.C. Voltmeter; one Zenith 350 ohm. 0.45 amp. filament regulating resistance; four switches, terminals, etc. The above, with the exception of the transformers, are assembled into a compact unit with ebonite panels on which are mounted the meters, switches and regulating resistance. The transformers stand at one side. All ready for plugging into mains. This outfit gives 1,000 or 2,000 volts rectified A.C. as required, for plate supply and 9 to 12 volts for filament heating. Separate switches for high and low power and filament supply. All in new condition and little used. QSO in America and Tasmania using this outfit. Sole reason for disposal, going in for higher power. Can be seen and tested by appointment. Parts cost over £30 before assembly; accept £20, lowest.—Apply, RADIO 5SZ, White Croft, Bare Lane, Morecambe.

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“OUR LITTLE TROUBLES.”

1.
Up on aloft the antenna hangs high
Catching the signals from out of the sky.
At the other end sits a “ham” with a smile,
Who takes out his key points and cleans with a file.

2.
He watches his clock like a cat does a mouse,
To be clear of the concert which fills every house.
He daren't touch his key till the concert is o'er,
Else he would soon hear from the person next door.

3.
He watches and waits till the minute does come,
Then he starts up his M.G. with such a sweet hum.
He gives a “test” call 'cos CQ's aren't allowed,
When comes a reply he feels very proud.

4.
One morning early he jumped out of bed,
With all good intentions to search for a “Z.”
He picked up a faint one and gave him a call,
Back comes an answer F.B. and all.

5.
When next he changed over to search for reply,
The “Z” was not there whate'er he may try.
He was drowned by a roar which chattered the
fones,
And sounded so harsh that it tickled “hams”
bones.

(MORAL)

So you see that “A.C.” serves us all such a dance,
What a pity that place is so near to us—France!!!
G2XV.

Correspondence.

THE RADIO SOCIETY OF GREAT BRITAIN.

To the Editor of T. & R. BULLETIN.

SIR,—I have to inform you that the following meetings have been arranged, and will take place at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, W.C.2, at 6 p.m. on the dates specified:—

November 25, 1925.—Ordinary Meeting: "A Review of Short Wave Developments," by Capt. W. G. H. Miles, R.M.

December 9, 1925.—Informal Meeting: Talk on "The Acoustics of the Headphone and Loud-Speaker," by Mr. A. E. Bawtree, F.R.P.S.

December 16, 1925.—Annual General Meeting: "Some Facts and Notions about Short Waves," by Mr. Duncan Sinclair.

The programme for the remainder of the session will be circulated in the near future. In the meantime you are informed that meetings will take place on the following dates:—

Informal Meetings.—January 13, 1926; February 10, 1926; March 10, 1926; April 14, 1926; May 12, 1926; June 9, 1926.

Ordinary Meetings.—January 27, 1926; February 24, 1926; March 24, 1926; April 28, 1926; May 26, 1926; June 23, 1926.

In the case of ordinary meetings and the annual general meeting, tea will be served in the Tea Room at 5.30 p.m.

Yours faithfully,

P. R. COURSEY, Hon. Secretary,
53, Victoria Street, Westminster, S.W.1.
November 18, 1925.

To the Editor of T. & R. BULLETIN.

SIR,—I have heard very complimentary remarks from different parts of Canada on THE BULLETIN.

Although we all think "QST" is the premier radio magazine of the world, we are delighted to see a British ham radio magazine in the field, and hope the day is not far distant when THE BULLETIN will grow in size and be looked for every month, as "Q.S.T." now is by Canadian amateur radio.

Wishing you every success.

Yours faithfully, W. C. BORRETT,

CID.D.

To the Editor of T. & R. BULLETIN.

SIR,—In your Editorial for the October issue, you are somewhat apologetic for the use of the word "ham," which you state may "be distasteful to many."

May I offer a mild protest against the growing use of "Radiese" in general correspondence, which, to my mind, indicates either laziness or "swank." The use of abbreviations in *transmitting* is as necessary and legitimate as the use of gramalogues and abbreviations in shorthand, but they are, in my opinion, discourteous in *written* correspondence, and I do not think it is a common practice among shorthand writers to use them when writing in longhand even to their most intimate friends.

I have asked my typist to transcribe this last sentence exactly as it is written in her shorthand notes, to show its similarity with "Radiese." Here is the result:—

The ys of abreviashuns n trnsmting ss nssr
& ljtmt s the ys of grmlgs & abreviashuns n shrtnd

& ljtmt s the ys of grmlgs & abreviashuns n shrtnd but th r n m nn dsrts n rtn crspndns & I d n th t s a kmn prk mng shrtnd rtrs to ys them when rting n lngnd vn to thr mst ntmt frnds.

I do not object to the use of the international "Q" codes in moderation even in correspondence, but letters filled with horrible abbreviations mostly imported from U.S.A. are most distasteful. Why should a correspondent *write* "hrd u wkg" when he means "I heard you working"; and, again, why drag "OM" into every sentence? Probably I am somewhat sensitive on the subject of advancing years and do not care to be incessantly reminded that I am an "old man."

Yours faithfully, WILL H. MERRIMAN.
Dorset House, Tudor Street, E.C.4.

To the Editor of T. & R. BULLETIN.

DEAR ED.—Surely Mr. Coué is well away with the T. & R. BULLETIN. Who will dispute me when I say that we now begin to look forward to the month's issue, and this only after four editions.

Well, the object of my letter, Ed., is to call your attention to Mr. Wright's admirable article in the November issue, and particularly to that paragraph wherein he comments on American neatness. Oh Ed. ! I am simply dying with laughter.

True, Mr. Wright says that he judges his opinion from photos of stations appearing from time to time in "Q.S.T." But, Ed., hasn't he any imagination? Can't he see the gink spending three weeks getting the station up ready for the camera man?

Take it from me, Ed., I've seen 'em—the hundreds of friends I made in America will, I am sure, not mind me telling the world what a heap of junk it is that's busting the ether night after night over there.

If you want a real good laugh gang, ask me some time to tell you what John Reinartz's joint looks like. The kindest big-hearted fellow in all this world, but—Oh, Ed. ! what a mess!

Should I be accused of exaggerating were I to say that in the whole of America they know no more about neatness than they do about beer. I am sure none of the Yanks I met and claim as friends will object to me telling you this, because the Yank is nothing if not honest.

Ed., when it comes to neatness the Yank's got nothing on us; I hope some of 'em may see this and write to you and tell you that I am right.

Fond 73's.

"SEC."

To the Editor of T. & R. BULLETIN.

DEAR EDITOR,—I read the fourth paragraph of your "Emissions" in the last issue with mixed feelings. First of all, surely quite a lot of useful work can be done without making a disturbance in the ether. Co-operation with other experimenters is very useful but not always essential. At the same time, however, I agree that transmitters seem very quiet these days (except, of course, stations like that of our worthy secretary!). One can listen all day Sunday and hardly hear anything of British stations. Here am I, the only active transmitter in the district and, so far as I can find out, there is no other active transmitter (medium or low power) within reliable range of my station. Where have they all got to?

Yours truly, A. B. RICHARDSON, G6FQ.

British Section I.A.R.U.

MUCH of interest is to be reported during the past month as a result of work done by members of the Section, and there is little doubt that pioneer work on 45 metres during this winter season is going to show that our Section is capable of holding its own in the production of new and useful work on this wavelength. After the first few months of contact with the Antipodes it became obvious that there were more difficult distances to work in other directions, and that, for instance, one's range East and West in our own hemisphere fell far short of that accomplished in working New Zealand. The fixing of schedules for the Northern hemisphere has consequently been a source of worry to the writer, and it was decided to base the times for these at first on the assumption that the best conditions for contact would exist when the maximum amount of darkness covered the distance being considered. This would appear now to have been a mistake from work of the last two or three weeks, and the matter will have to be considered afresh. Contact has been established with the Pacific Coast of U.S.A. at 8.00 a.m. G.M.T., and corresponding to midnight San Francisco time, in the middle of October. About the same time signals were first picked up from Australia and the Philippines at 2 p.m. in the afternoon, and on the 2nd of November two-way working with the latter was established from 3 p.m. to 4 p.m. corresponding to midnight Philippine time. It is remarkable that these two new contacts are respectively eight hours West and the same distance East, and the distance between them of eight hours across the Pacific tallies with the eight hours difference in the times of contact 8 a.m. to 4 p.m. in G.M.T. And it must be said that neither of these new facts correspond with our experience of the past.

The following calls have been heard between 2 p.m. and 5 p.m. PNP at Pekin, Philippines ICW, IHR, NUQG and GFUP, A3BD, A3BQ, A2YI, Z2XA, A6AG, U-NEQQ, Hawaiian NUZQ and South African OA3E, the latter on the occasion of first contact between O and A stations at 3 p.m. on October 26. A number of these stations have been heard working U.S.A. 6th District at this time, including those in the Northern hemisphere.

If we put ourselves in the position of one of the Philippine stations at midnight we know now from what has been accomplished that it is possible to work stations eight hours East or West at the same time. Returning to London's midnight, can we work the same? Is it possible? We want to know why not, and are going to ask stations at those distances to call us for the half hour preceding midnight G.M.T. during the next two months, so send along all reports of these stations logged at that time if they are located over 8,000 miles either East or West. At the week-ends, too, every endeavour should be made to QSO Eastern stations in the early afternoon, and eventually at noon in mid-winter contact should be possible with Hawaiian stations with the same percentage of daylight that has attended the recent work. Australian and Philippine stations have been requested by radio to listen for us on 44m. to 46m. at 3 p.m. in G.M.T.

(Concluded at foot of next column)

The Third National Convention at Chicago—Continued from page 8).

wanted to be at the Convention, so he "bummed" his way there, that is, he walked and begged lifts from passing autos; incidentally he came from 1,000 miles away and took a week to make the journey.

On the first day we got acquainted; everybody got hold of some gadget on which they could make a noise, and the fun started; you get 400 to 500 Yank hams all doing code on whistles, Klaxon horns—anything—and you get quite a bit of QRM.

I was surprised at the end of four days that anyone stopped in the place, except the hams; however, they suffered in silence. They love noise in America, so I don't suppose they noticed it like I did; still Chicago certainly knew there was a convention on.

We had a great banquet that night, and the worst part was drinking toasts in "iced water." The whole of the second and third days were spent in meetings, ARRL traffic talks, lectures by prominent radio men; the most interesting of these was the tale on "Crystals and Crystal Control," by Doc Taylor, of NRF. Then we had various manufacturers who wanted the hams to try their apparatus, a talk on "Railroad Emergency Work" (the amateurs run the railroads when the land wires break down), and so on.

The last day was spent in sports. At night we all went to dinner at a cabaret and everybody really let themselves go; they had all kept very quiet during the meetings. At the cabaret we were initiated into the "Loyal Order of the Derbyites," formed to protect the ham who wore a Derby hat (a bowler) from people who pushed it over his ears—his ears through wearing 'phones so much being close to his head, and as a consequence giving no support to the hat.

They are great on these mock initiations over there; the hams have dozens of these mock orders. This particular one was the funniest parody on a Masonic initiation I have ever seen. We parted, after formally finishing the convention, in the early hours of the morning, still good friends with the cabaret boss, which speaks well for his good temper. It would be a close race with the Oxford undergraduates on Boat Race Night, and the Yank ham on the last night of a convention. They work hard and play hard.

In conclusion, if any of you can attend the next National Convention in two years' time, do so; not only will you be given a wonderful time, you'll find the Yank ham is a great chap, very like ourselves, but on the average younger and more lively.

South Africa.—Signals have been logged at various times and a schedule is in the mail with them, but the best time appears to be 3 a.m. to 4.30 a.m. between 40m. and 35m., A3E, A4L, A4V and A4Z having been heard at good strength then.

QRA Section.—The work of collecting addresses and forwarding reports to amateurs in other countries naturally coming within the scope of usefulness of the Section, the Secretary would just like to say that he will be glad to help any member of the T. & R. in giving and locating such qras, but as the Section has at the moment no provision for expenses, postages sufficient to cover the request made should be enclosed.

W. G. DIXON, Hon. Sec., British Section.

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Radio Riffs.

One of our stations in the East had a Frenchman QRT aghast with consternation, when, momentarily forgetting the abbreviation, Q S S, he rapped out "Vous Fadez."

From 2UD (Chatham) that most interesting dissertation dealing with the epicurean propensities of worms and rodents as applied to dielectric of underground mains has not been forthcoming, but he has worked Southend and Westcliff with a 50-foot aerial buried six inches in the ground. Input 12MA and aerial current .001!

Just listen to one of our youngest transmitters (2MI Margate) putting clear speech across the Estuary with 60 volts dry cells H.T. on a D.E. valve. Received on 2 valves QRB 34 miles R4 with plenty to spare. Why do we foy armatures?

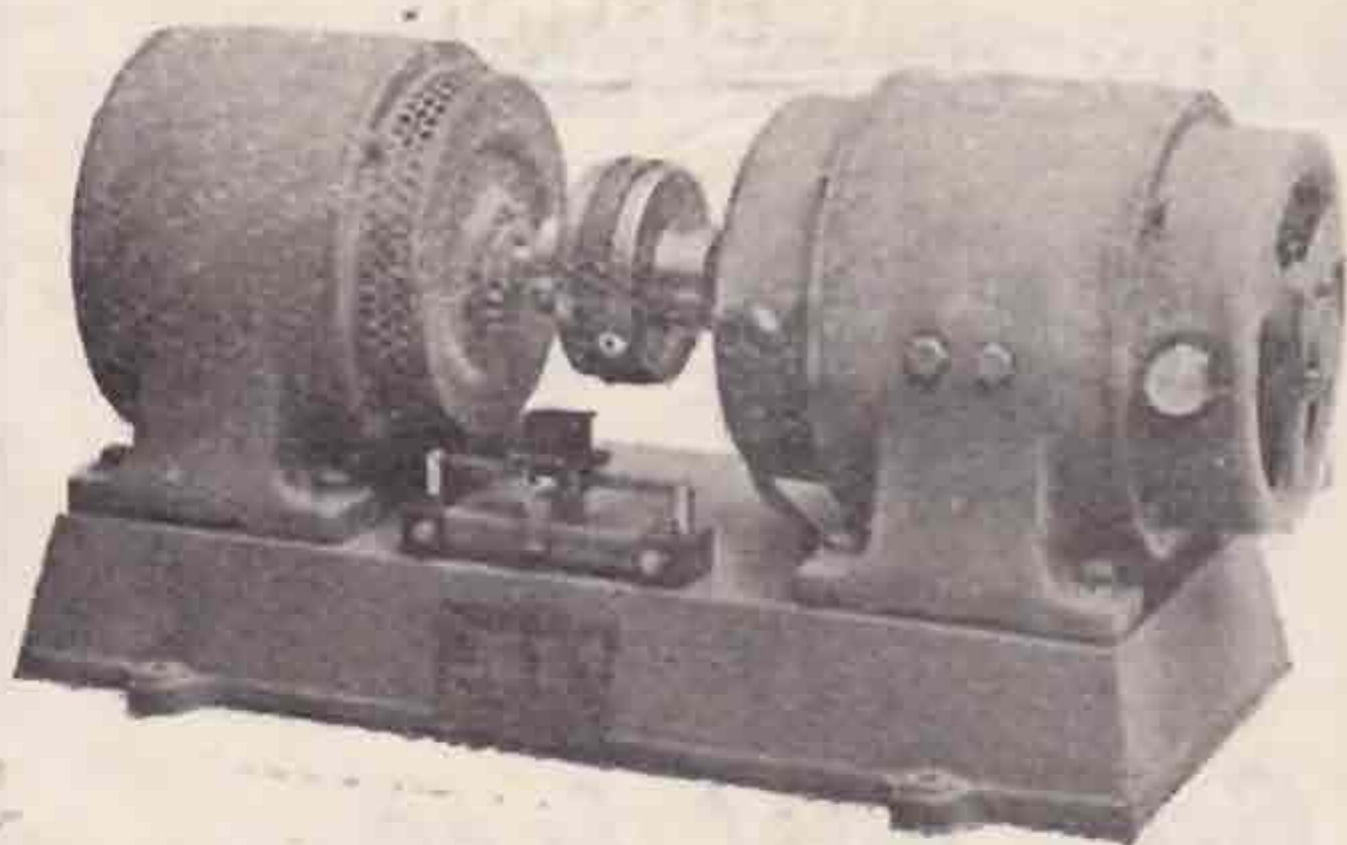
Strangely synchronising with a period of great QRM activity 5QV embarks on a special modulating test, utilising the services of the Band Pavilion Orchestra, brass band or solo instrumentalist. Last occasion, just as the Press photographer tapped at the door, the grid leak departed this life. Now, arrangements having been completed for another Brass Band Contest the M.G. put up smoke-screen No. 3 and requires the attention of the trouble crew. He hopes to be Mark 2 on wheels by the time you get this!

ETHERCOMBER.

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There's more than mere coincidence in the fact that with one or two exceptions—and we anticipate their conversion in course of time—all the "G" Stations which have achieved world-wide QSO use Mortley generators. Our machines are used by 2NM, 2KF, 5LF, 2LZ, 2CC, and 6TD, in addition to over 1,500 Government, Commercial and Amateur Stations.

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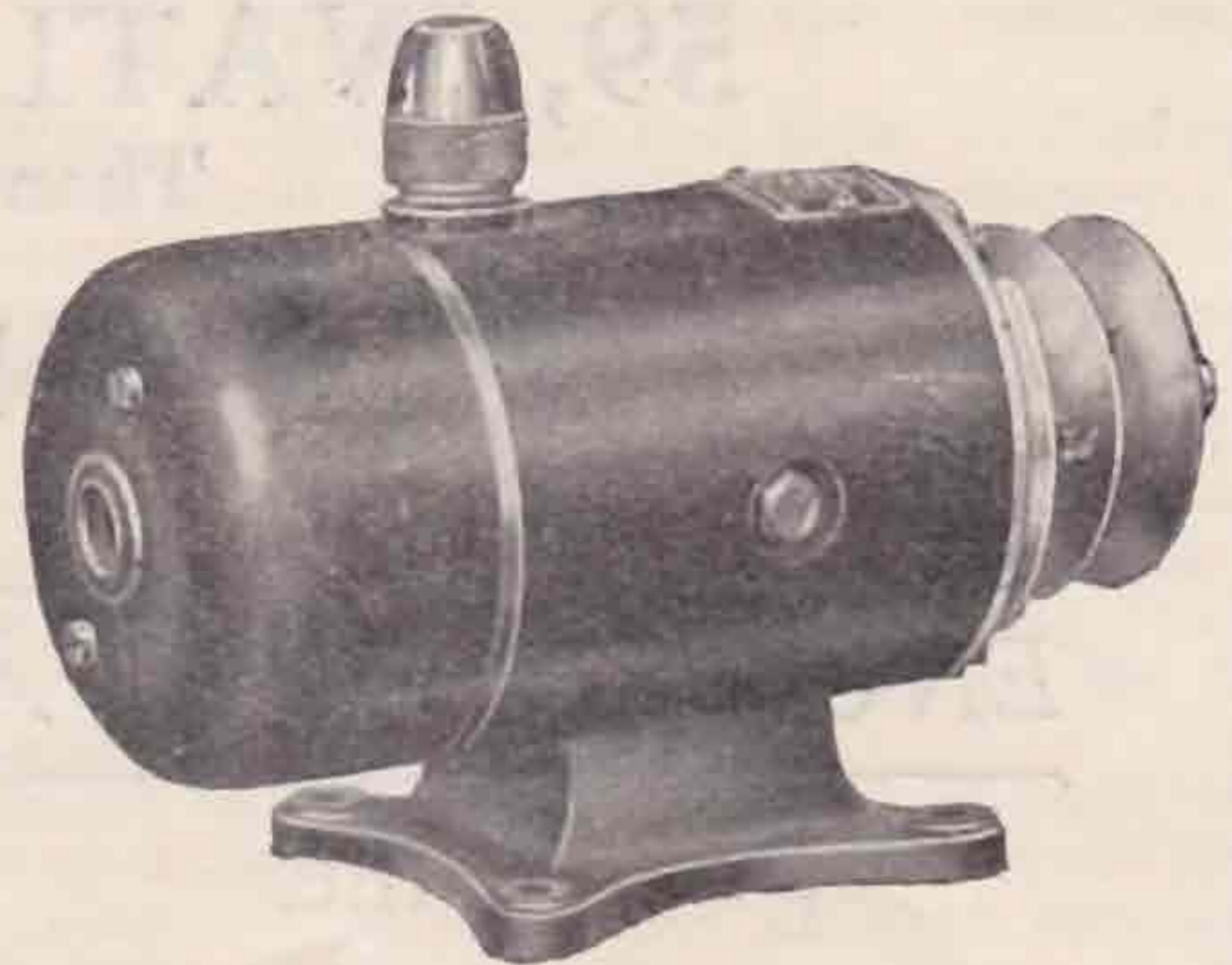
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Valves.

Low Loss "C" Osram for 17 metres, see Mr. Alford's Report. 4/- each; clips 1/-.

New Transmitting Cunningham American 5/50 watts, 17/6. Holders, 2/6. Dull Emitters, 2 filament .06. Microlux, 12/6. .06, Micro. 9/-.



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12 volt 8 amp., £3; 100 volt 3 amp., £4; 70 volt 25 amp., £10; 110 volt 20 amp., £12. All sizes in stock. Alternators, £3 10s.

Motor Generators.

220 volt A.C. or D.C., 8 volt 1.5 amps., 75/-; 25/350 volt 100 m/a, £4; 12/1,200 volt 80 m/a, £22; H.T. 2,000 volts 250 m/a, £25.

Condensers.

H.T. 2,000 volt 3½ mfd., 40/-; 2 m'd., 25/- each. Large stock all sizes to 65 mfd.

Wavemeters.

Service Forward 40/100 metres. Few at £3. 50/10,000 metres, £6 10s. All with new Sullivan Charts. Heterodynes and Townsends from £3 to £7.

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R.A.F. Steel Tubular, 5/- per 10ft. run. Large 2½ in. dia. 4ft. 3in. 5/-

Instruments.

.06 Filament Meters, 15/-. Plate m/a.s., 22/6. Micro ammeters, central zero, 35/-. Mirror D'Arsonval Galvos, £3. 7 range "All In" Precision Testing Sets 1 m/a to 6 amps., 1 volt to 120 volts, 57/6. 2,000 Instruments in stock, micro amps to 5,000 amps., and milli-volts to 3,000 volts, all types of English instruments.

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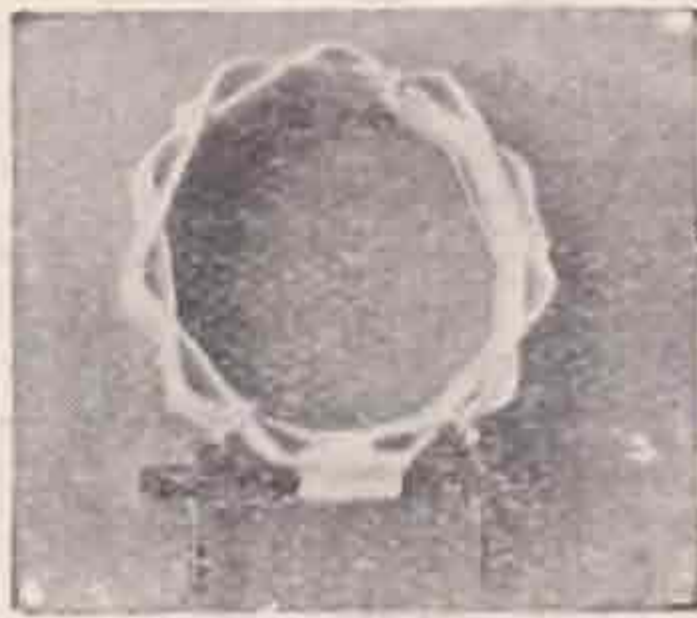
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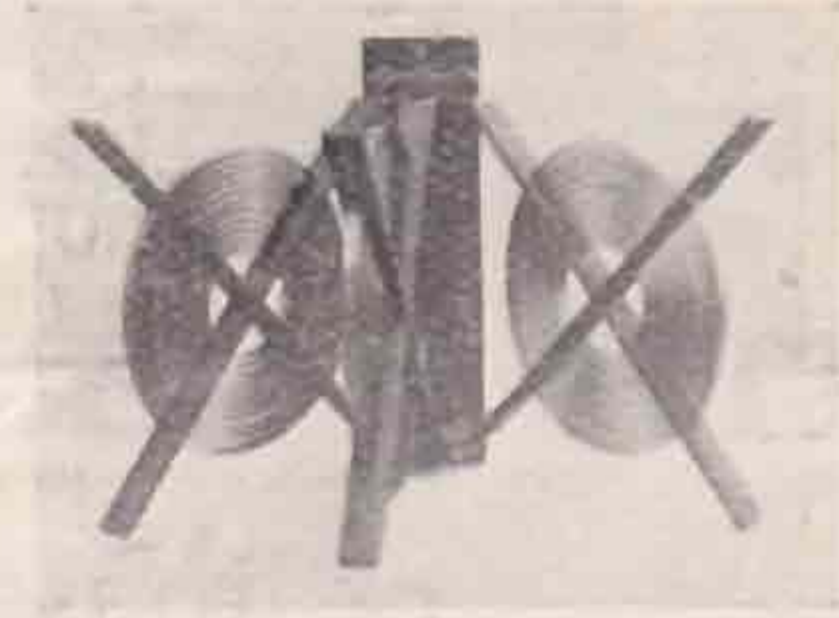


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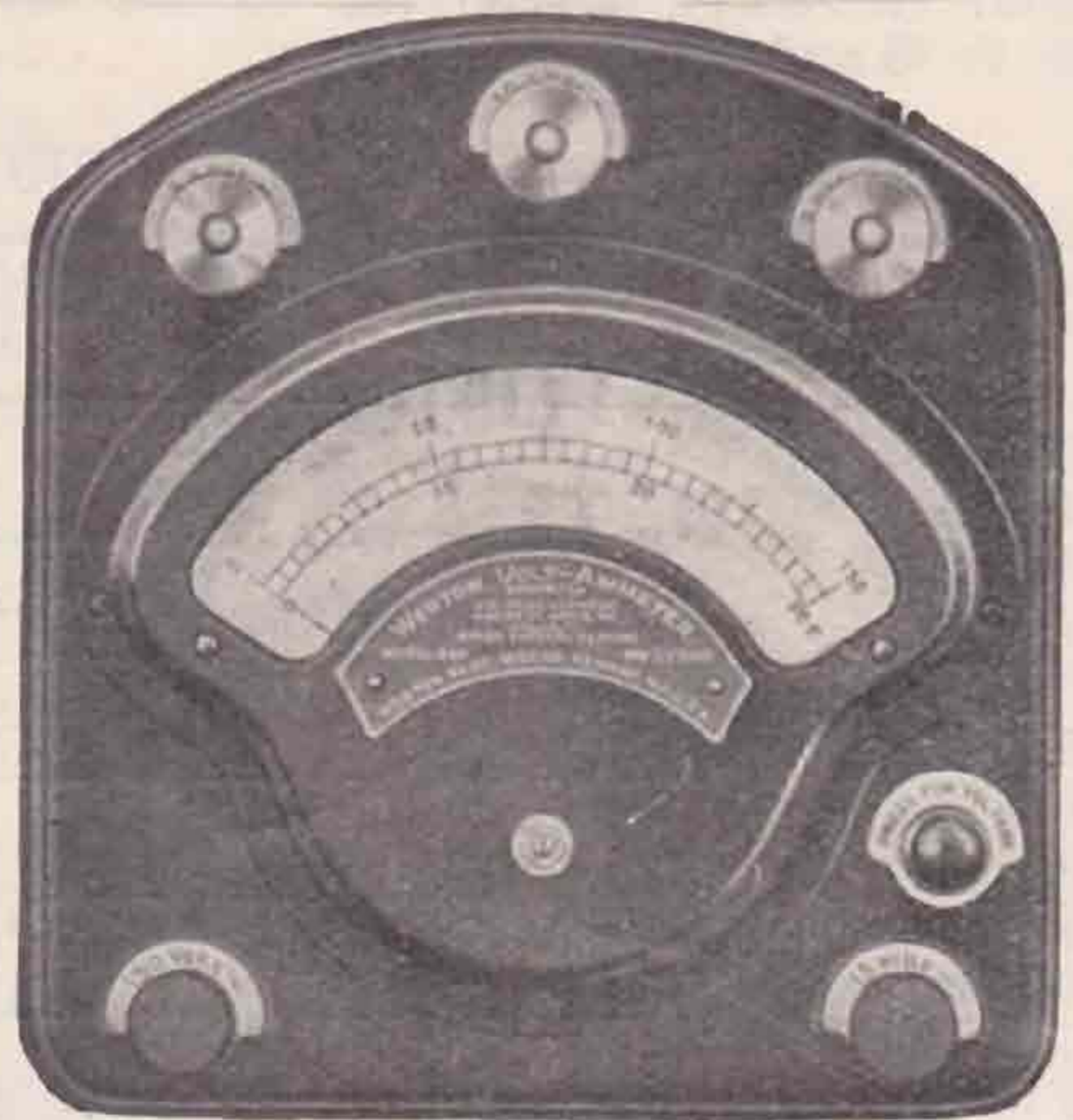
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"DA" Trooping Cruise, Experimental W/T Programme.

During the trooping cruise of "DA" it is proposed to carry out certain experimental programmes of W/T. Attached is a list showing in tabular form six different programmes, for which the following instructions hold good:—

Programmes "A," "C" and "E" will always be allocated to the *Odd* days of the month: 1st, 3rd 5th, etc.

Programmes "B," "D" and "F" will always be allocated to the *Even* days of the month: 2nd, 4th, 6th, etc.

Days change at 0000 G.M.T.

The figures under the columns headed "Horsea," "DA," or "Rinella" indicate the wave-length in metres to be transmitted by the appropriate station. Each transmission will consist of either code (dummy) or P/L messages, with the call sign of the transmitting station interspersed every few groups/words or so. In addition each transmission will bear a series number as follows:—

HORSEA.	"DA"	RINELLA.
12 metres : G1, G2, etc.	J1, J2, etc.	—
25 metres : K1, K2, etc.	—	—
29 metres : —	L1, L2, etc.	—
35 metres : O1, O2, etc.	P1, P2, etc.	Q1, Q2, etc.
48 metres : X1, X2, etc.	Y1, Y2, etc.	Z1, Z2, etc.
85 metres : V1, V2, etc.	W1, W2, etc.	—

2. From the time of leaving Portsmouth until departure of "DA" from Malta, programmes "A" and "B" will be carried out.

3. On arrival at Malta, Signal School's Experimental Officers will tune the Rinella short wave set to 35 and 48 metres.

4. From the time of departure of "DA" from Malta until her arrival back in England, programmes "C" and "D" will be carried out.

5. Whenever "DA" is in harbour, she will cease to participate in programmes "A," "B," "C," or "D" (which will, however, be continued throughout by the other station or stations) and will change to programmes "E" and "F." Her transmissions in these harbour programmes should give information as to the time and date of her arrival at and proposed departure from the port.

Programme Between Stations BYC, BYZ, and BDA.

Programmes "A," "C" and "E" will always be allocated to *Odd* days of the month—1st, 3rd, 5th, etc.

Programmes "B," "D," and "F" will always be allocated to *Even* days of the month—2nd, 4th 6th, etc.

Days change at 0000 G.M.T.

Each transmission will consist of either code or P/L messages, with the call sign of the transmitting station interspersed every few groups/words or so.

Each transmission will bear a series number as follows:—

BYC. 12m. G1, G2, etc.	25m. K1, K2, etc.
35m. O1, O2, etc.	48m. X1, X2, etc.
	85m. V1, V2, etc.
BYZ, 35m. Q1, Q2, etc.	48m. Z2, etc.
DA. 12m. J1, J2, etc.	29m. L1, L2, etc.
	35m. P1, P2, etc.
48m. Y1, Y2, etc.	85m. W1, W2, etc.

Dates on which programme commences will be promulgated by telegram.

PROGRAMMES.

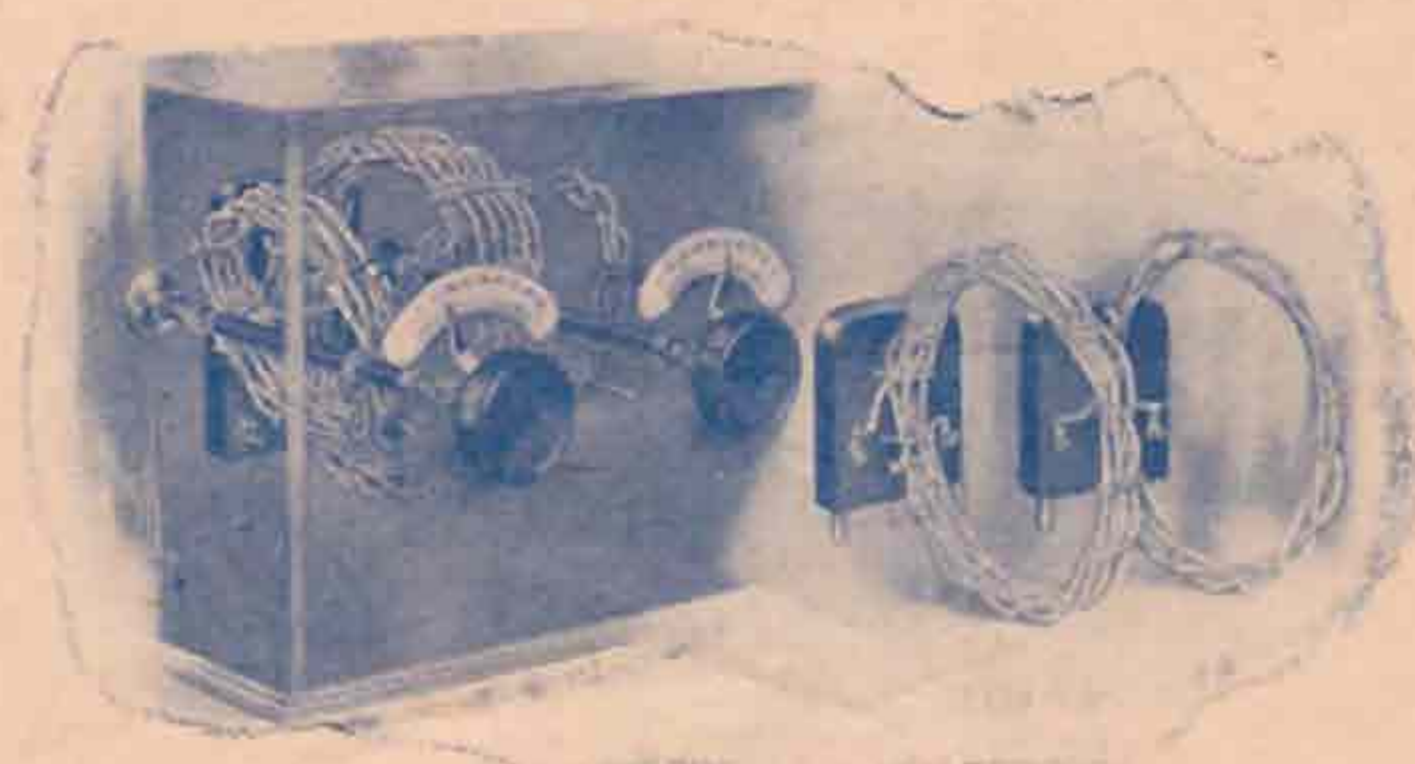
G.M.T.	A		B		C		D		E F	
	BYC.	DA	BYC.	DA.	BYC.	DA.	BYZ.	BYC.	DA. BYZ.	DA. DA.
0000-0015 and every 4 hours.	12		12							
0018-0030 and every 4 hours.		12		12						
0000-0015 and every 8 hours.					12		12			
0018-0030 and every 8 hours.						12		12		
0100-0115 and every 4 hours.	25		35		25		3			
0018-0130 and every 4 hours.		29		35		29		35		
0130-0145 and every 4 hours.									35	
0200-0215 and every 4 hours.	48		85		48		85			
0218-0230 and every 4 hours.			48		85		48		85	
0230-0245 and every 4 hours.							48			
0300-0330 and every 8 hours*	25	29	35	35	25	29	35	35		

* BYC. DA short wave intercommunication periods.

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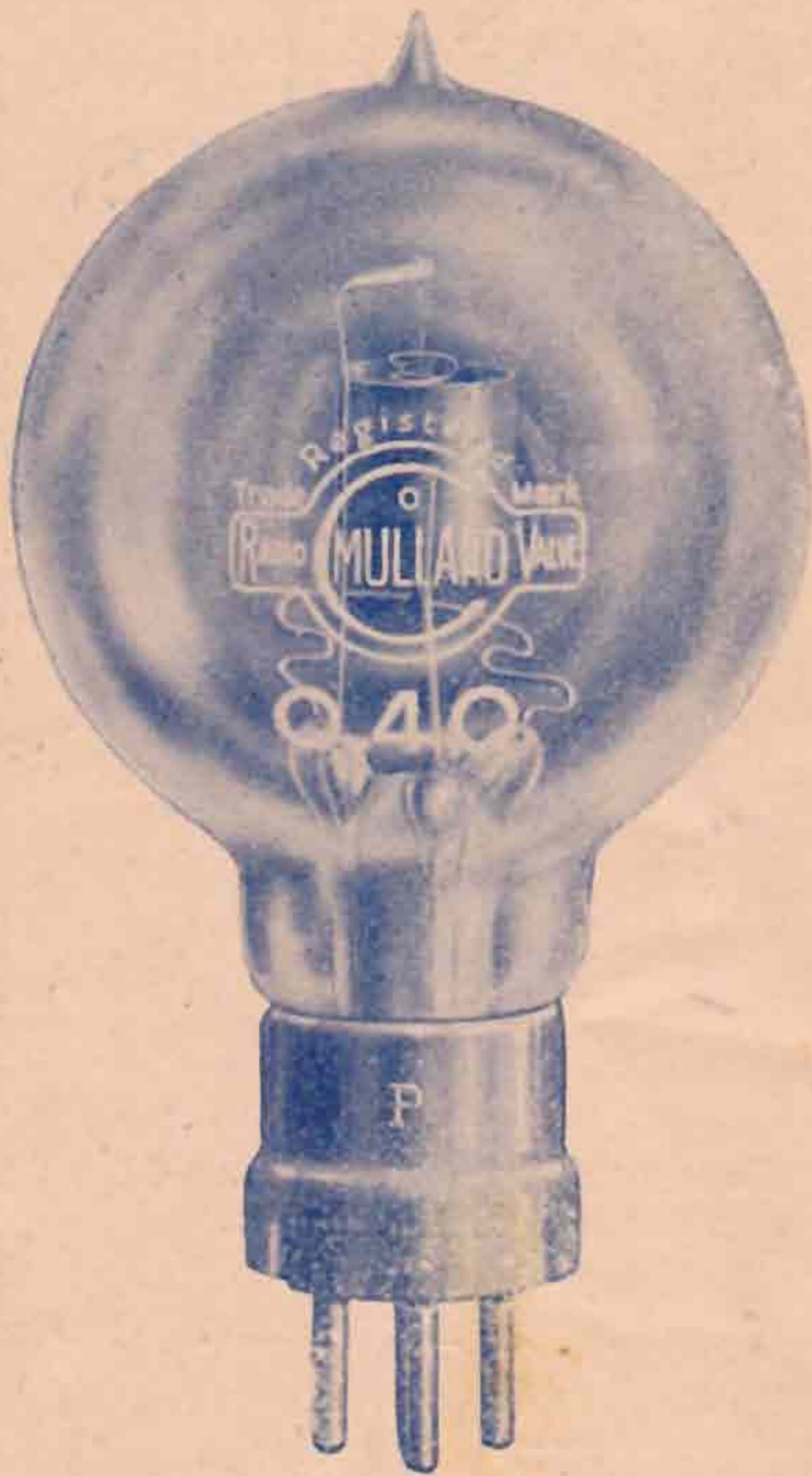
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were achieved
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