



# T. & R. Bulletin

Incorporating

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

(BRITISH EMPIRE RADIO UNION)



Vol. 4. No. 7. January, 1929 (Copyright)

Price 1/6



Type 587-B.

The 587-B. Filter is superior to most devotees' requirements. Where the consumption of the last stage does not exceed 30-40 MA. the Type 387-A. SPEAKER FILTER suffices. Currents up to 40 MA. will not affect audio fidelity.

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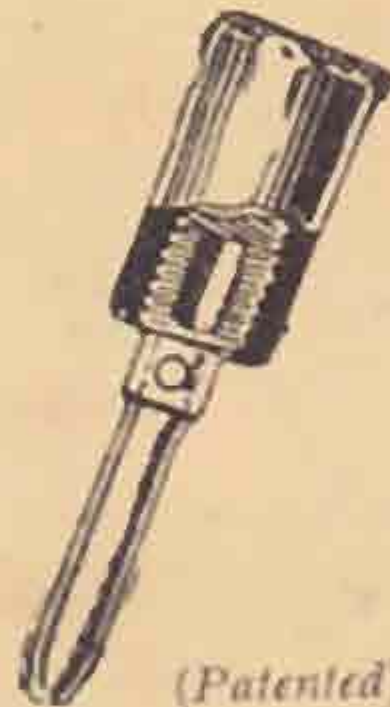
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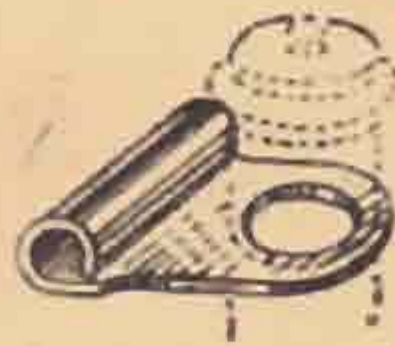
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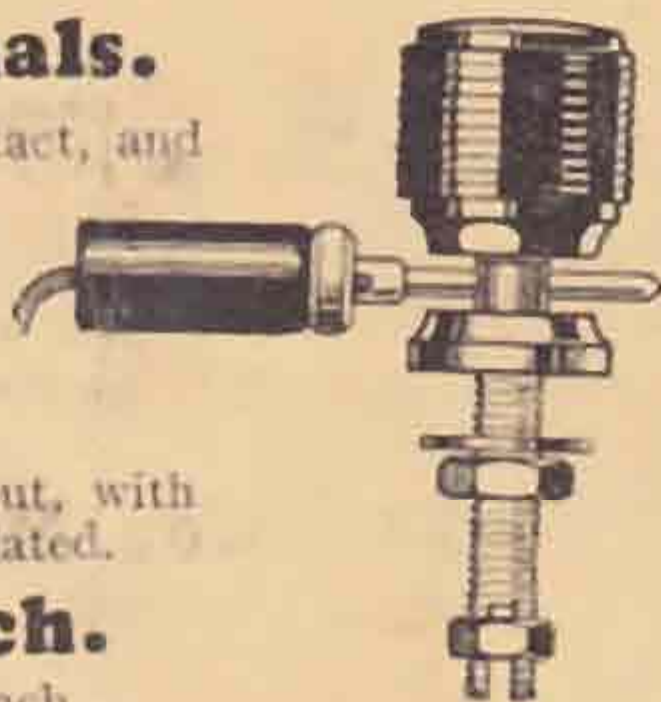
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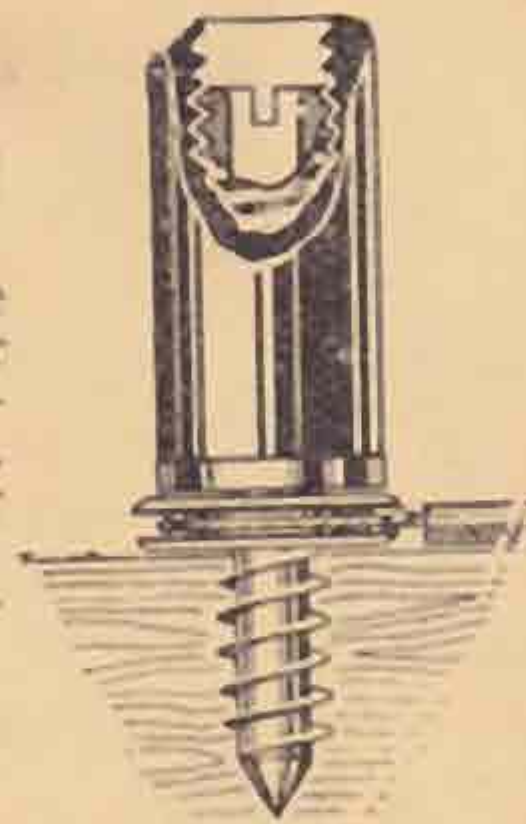


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# 1929

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**STANDARD CRYSTALS.**  
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*See also advertisement on page ii of cover.*

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A.R.R.L. Handbook, by HANDY	4/-
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1929.

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# T&R

# BULLETIN.

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

*All correspondence and matter for publication to be addressed to the Hon. Secretary, 53, Victoria St., London, S.W.1.  
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JANUARY, 1929.

Vol. 4. No. 7.

## SOCIETY NOTES

Our new President, Mr. Gerald Marcuse (2NM), whose portrait we reproduce on this page, will be welcomed by all members of the R.S.G.B. in many lands. He has been linked up with amateur radio for so many years that his name and call sign are known to all, not only in this country but in America and on the Continent. For the British transmitter he has performed great things, serving on the Council of the R.S.G.B. as secretary of the old T. & R. Section, and latterly as Acting Vice-President. He has also acted on various committees and done valuable work for us in Post Office negotiations. He is an honorary member of many Societies abroad and Vice-President of the I.A.R.U. We extend every possible welcome to him and trust his term of presidency will be a happy one.

\* \* \*



Our annual general meeting, reported elsewhere, went through satisfactorily. We would have liked to have found a better balance sheet, but there were

various features which had to be treated as liabilities, and, taking it all round, it was surprising to some of us that things were not worse. One of the bad items was the log-book and annual published last year. This entailed a heavy financial loss which had to be covered by other resources. Again the maintenance of the BULLETIN during the summer months was most difficult. However, we kept the flag flying and trust we shall not have to face such difficulties again.

\* \* \*

It is not often we venture to counteract statements made in the daily Press regarding amateur transmitters but last month we felt compelled to protest against certain statements made in one of the popular papers when reporting details of an elusive broadcasting station. These were to the effect, stated to have been given by an official of the B.B.C., that transmitting amateurs were only permitted to work after broadcasting hours. This statement appearing in a daily paper was liable to



cause so much trouble for transmitters that we felt that a direct contradiction was necessary. We at once got in touch with the British Broadcasting Corporation, who assured us forthwith that no such information had been given. We thereupon sent a long written statement to the editor in question requesting that it be inserted in the next issue of the paper. As evidently other amateurs had taken similar action, either upon their own behalf or in the cause of amateur radio generally, the editor evidently made a selection from each which was reproduced in a somewhat distorted form.

\* \* \*

Unfortunately, our daily Press objects in a very vigorous manner to having to correct any of its previously made statements and invariably refuses to insert any correction whatever, as such an action obviously discredits the value of general information given. We have had experience of this before when the misinformation given took a great amount of living down, especially when it could be utilised to advantage in support of arguments against amateur workers. How much better it would be if the editors sought the advice of a Society such as ours before committing themselves to information open to correction. Naturally we are always ready to deal with these matters and give accurate information to the best of our ability. In the previous instance quoted we actually wrote a personal letter to the editor offering our services at any future time. This letter was not even acknowledged.

\* \* \*

What has 1929 got in store for us? We say that at the beginning of each year, and yet somehow we get to the end of it without anything very startling happening. Certainly we cannot look back upon 1928 as being an eventful year of novelties in radio work. We have had some improvements in details of apparatus such as valves and loud-speakers, but there has been no outstanding feature to record. Television, although much talked about, does not appear to be yet of practical account and we still occasionally get "technical hitches" in both our broadcasting and amateur transmissions. In spite of our some 2,000 amateur transmitters in this country, we do not appear to have overcome the trouble due to fading or to elucidate the mysteries of the Heaviside layer. Static still interferes with our work and we still appear to be at the mercy of the Valve Makers' Association. While we have considerably reduced the number of watts required to carry our messages across the oceans, my preferred prize to the first man to get over the herring-pond on the output of a single leclanche cell still remains in the jeweller's shop.

\* \* \*

Still with twelve months before us and the huge band of experimenters all searching for the elixir of radio transmission, surely something should turn up. It is absurd to think that all the wonders of radio science have been yet unravelled. There is still fame and fortunes hidden in this great game of ours. We shall not, however, find them by merely repeating the performances of others in well-known paths. We must strike out on pastures new and introduce originality into our work.

We are delighted to publish a short note from Mr. W. A. Bousfield, our only member in Tasmania. Coming as it does in the midst of typical English winter weather this message from the apple country gives us a taste of the joys of their delightful climate. We hope that Mr. Bousfield will use his good offices and help us to extend the British Empire Radio Union into his country.

\* \* \*

And in conclusion, the writer of these notes has to say farewell to his readers. Although the members of the Society were good enough at the annual general meeting to elect him again as editor, he has since encountered business changes which prevent him taking up the position. He only took over the duties temporarily last year upon the resignation of Mr. J. A. J. Cooper, until someone else was found, but somehow the temporary work became more or less permanent. He trusts that the same courtesy and forbearance which he has enjoyed during the progress of his amateur efforts will be extended to his successor, and finally bids all his sincere thanks for these and their ready assistance in carrying on the BULLETIN during that period.

### New Irish Free State Call Signs.

Contrary to our usual practice, we publish a complete list of new Irish Free State calls. In view of the rather sweeping changes we consider it advisable to give the publicity of our columns to our Irish friends and we take this opportunity of wishing them good luck with their new call signs.

C. L.

## Forthcoming Events.

FEBRUARY 15.—Debate at City Electric Restaurant, Ludgate Hill, London, E.C. Subject: Should Telephony on the 7,000 KC. Band be Abolished? The debate will be opened by Mr. J. Clarricoats and Mr. G. W. Thomas will oppose.

MARCH 22.—Lecture at the Institution of Electrical Engineers.

### SPECIAL NOTE.

The December Issue of the Radio Citizens' Radio Call Book can now be obtained from Headquarters. Price 4s. 6d. (4s. to Members).



# Let's Put Up an Aerial.

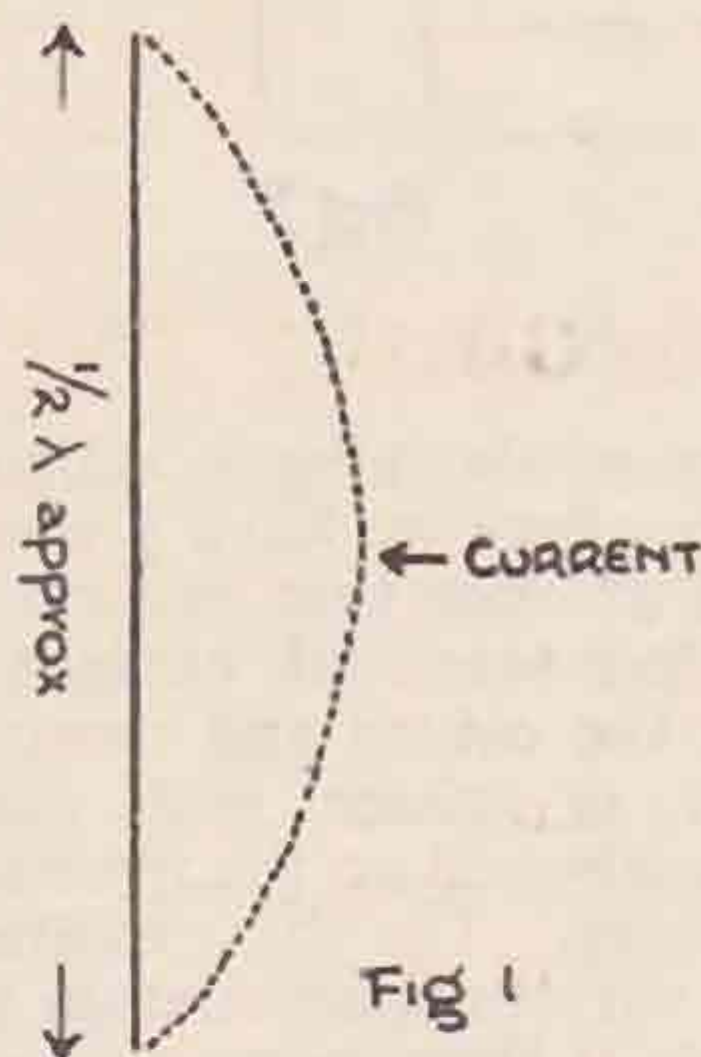
By KENYON SECRETAN, (G5LF.)

Sure, splendid idea, but the weather is hardly suitable for outdoor work. Never mind, it'll be fine enough in the morning, and my idea of putting up an aerial entails several hours of designing the thing, and on paper instead of cutting a lot of wire, and getting it up all wrong. If a job's worth doing at all it's worth doing properly, so let's go to it in my way.

We require some pencil and paper and some fixed ideas as to waves we want to work on, do we want to have the thing directional at all? Shall we go all out for long distances at the risk of a QSA2 report from the next county, or shall we put up something which will make our signals sound good nearby at the expense of perhaps the last ounce of long distance capabilities? Let's survey the whole thing generally.

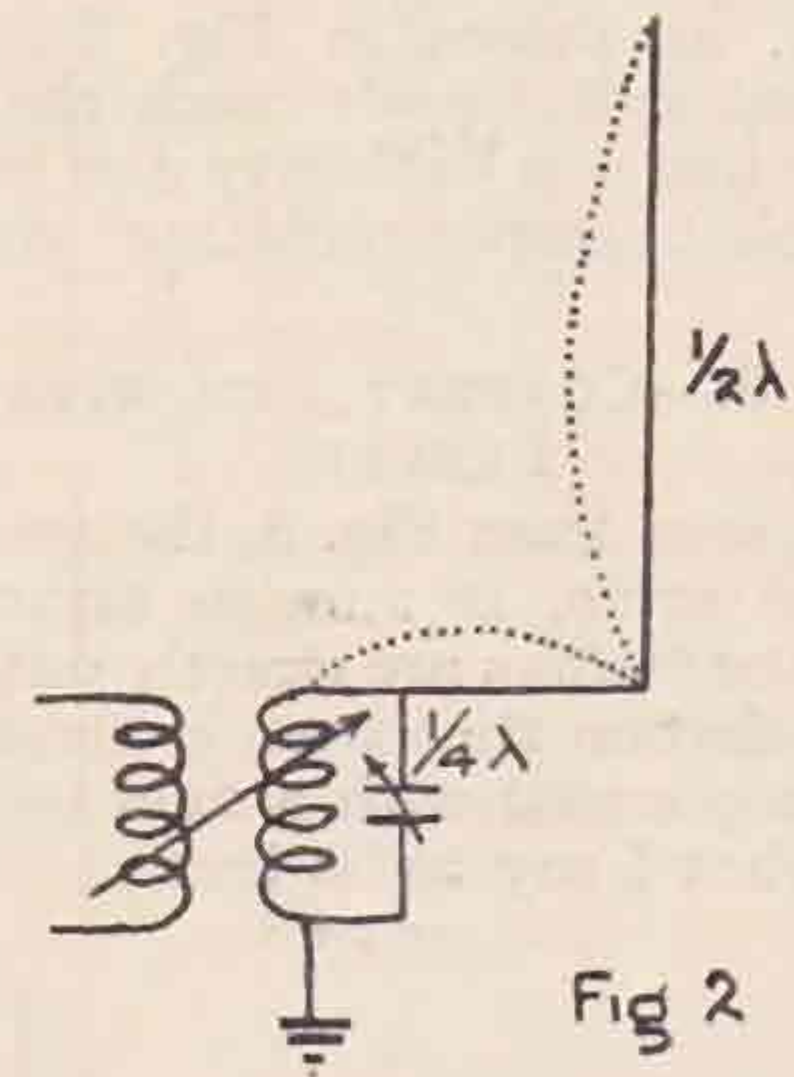
All, I am sure, will forgive me if I refer to wave-lengths instead of frequencies in aerial design, as I find it easier and, I think, most will agree with me as we proceed with our task.

You will notice that I never refer to a so-called "Hertz" aerial. All aerials are alike, but some are coupled direct, and others are fed by one or more radio frequency lines, the essential thing is that both aerial itself and feeders must be cut to the correct length, just the same as the inductance in the grid circuit of our short-wave receiver must be of a certain definite size if it is required to tune to any given wave-length.



Right now let us assume firstly that we wish to put up a system which will be non-directional, primarily most effective for transmission over long distances. A single wire vertical aerial not connected to earth will radiate equally well in all directions in the horizontal plane at low angles, and is considered particularly suitable for most amateur requirements, although a horizontal system will be described later for those who prefer it. The cutting of the system to the proper length, etc., remains the same at all wave-lengths, and therefore I will try to give suitable constants which may help you when designing your own system.

It is suggested that our vertical aerial be one half wave-length long. One moment, please, for a small diversion. As all are well aware, our aerial will be influenced as regards its natural period by any and every object coming within its field, so that when one speaks of such and such an aerial doing so and so, one is referring to an aerial slung in free space over a perfectly conducting earth.



As we all know, such a state of affairs is impossible, and one must compensate for trees, houses, etc., when cutting the aerial, and a figure of 5 per cent. is frequently used as a useful constant to get the aerial to correct proportions. The formula for half-wave systems, however, which I have found most valuable over all classes of locations, is 44 per cent. of the wave-length upon which it is proposed to transmit.

To proceed with the design, then, of our vertical wire, and assuming that we want to work on 42 metres, we must cut our wire 44 per cent. of 42 metres long, *i.e.*, 18.48 metres; to reduce this to yards, I always multiply by 70 and divide by 64 (though you probably have your own way), which gives us a length of wire 60 ft. 7 in.

Good enough. Now we've no idea what your local conditions are, so we shall have to describe several ways of feeding this wire in the hope that one of them will be possible for you.

FIG. 1.

Now I don't know about you, but I always like to know what's going on inside the station. I've no use for foolish little lamps up in the air and goodness knows what, I like my meter in the shack so I can see what I am doing; and for this reason, since an R.F. ammeter is a current measuring device, we must somehow contrive to have a current loop in the station. Right, for ever keeping in mind Fig. 1, let's consider the various alternatives.

### Scheme 1.—DIRECT CURRENT FEED.

We will cut our wire in the centre and insert a coil to couple it to the transmitter; this will imme-



diately put up its natural frequency, so we will insert a condenser to get it back to where we started from. Now let's bend the thing so that the coil comes into the shack, and couple it to the anode coil.

There we have Scheme 1, which is a rotten system, but it is leading us along the road to something better.

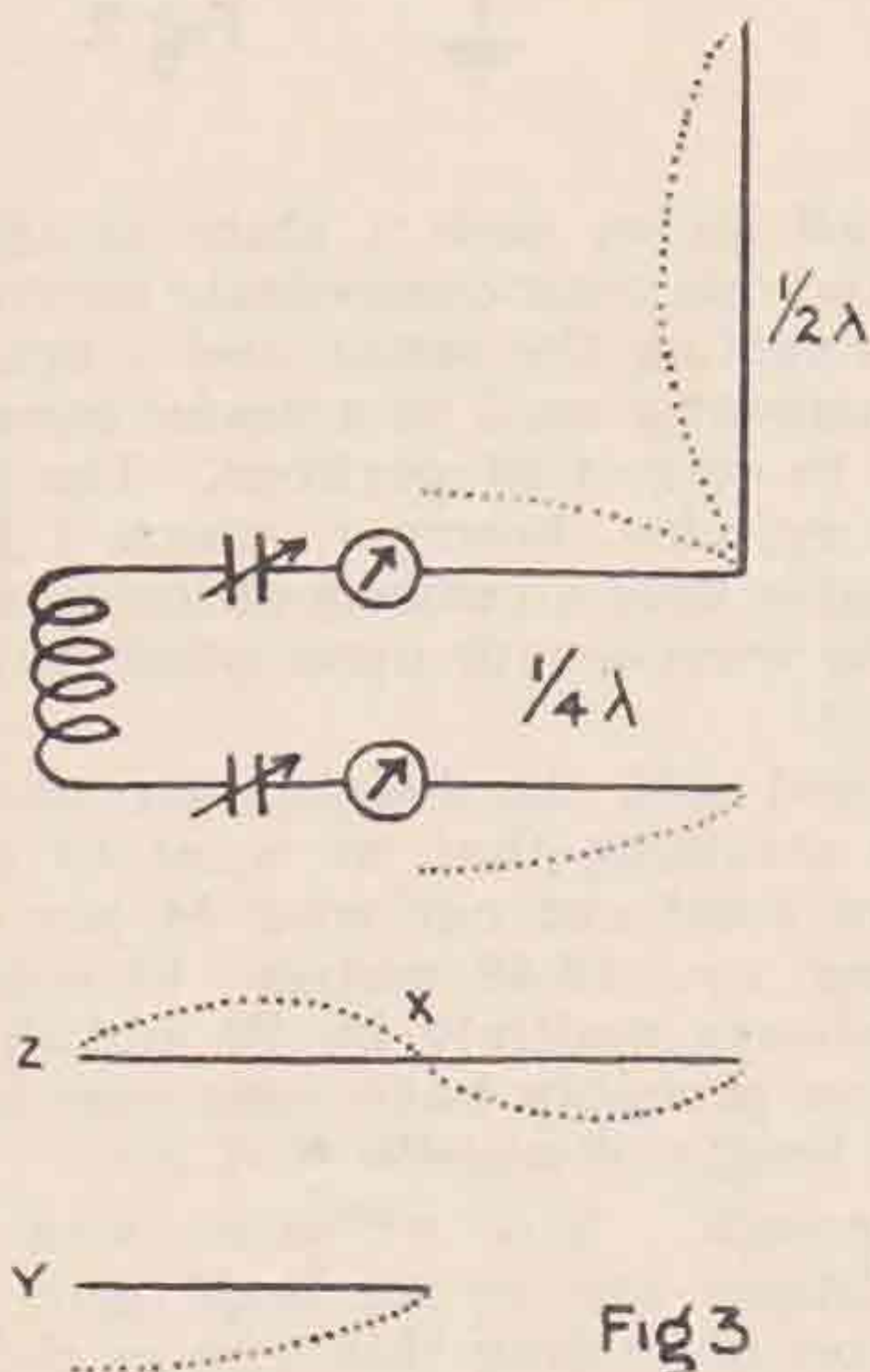
**Scheme 2.—VOLTAGE FED WITH ONE R.F. LINE.**

One word on the fundamentals of radio feeder lines. This is important and must never be lost sight of. For voltage-fed systems radio lines *must* be  $\frac{1}{4} \lambda$  long, or odd multiples,  $\frac{3}{4}$ ,  $\frac{5}{4}$ , etc. It is so simple to grasp this if you just draw it on paper (see Fig. 2). For current feed, lines *must* be  $\frac{1}{2}$  or even multiples,  $\frac{2}{2}$ ,  $\frac{4}{2}$ , etc.

Scheme 2, as shown in Fig. 2 is better than Scheme 1, but still doesn't reach the ideal, since a single feeder line is a barbarity due to the fact that it is impossible to stop it radiating. And so we come at last to

**Scheme 3.—CURRENT FED WITH DOUBLE FEEDERS.**

As can be seen from Fig. 3, the system, although precisely the same, is now so arranged that the currents in the feeders are exactly out of phase and, therefore, radiation therefrom is almost zero. You can test this yourself with a field indicator, and it will prove what I say to be true.



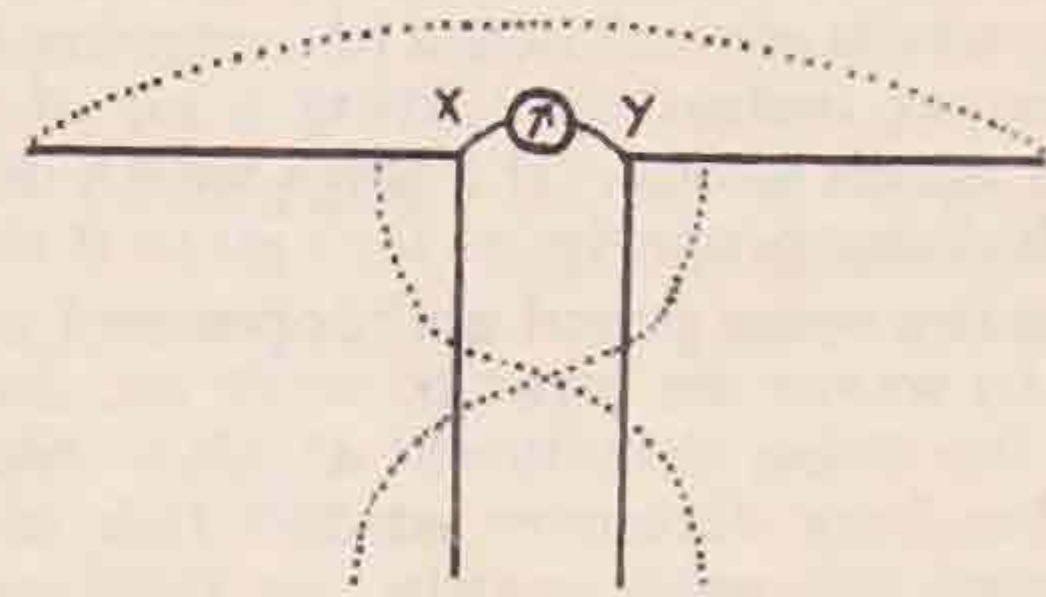
We have inserted a coupling coil and two series condensers, so that we can adjust the wave in such a manner as to get our nodes and loops where we want them. Obviously, we want to feed large voltage and no current into the aerial at point X, and therefore, since our feeders are  $\frac{1}{4} \lambda$  long, this is paramount to saying that we want current loops at points Z and Y. We have aerial ammeters in each line, so all we have to do is to tune the feeders to maximum on the meters with the full knowledge that all then will be well.

Chiefly to explain to you what I have said about the length of feeder lines, I am just going to describe,

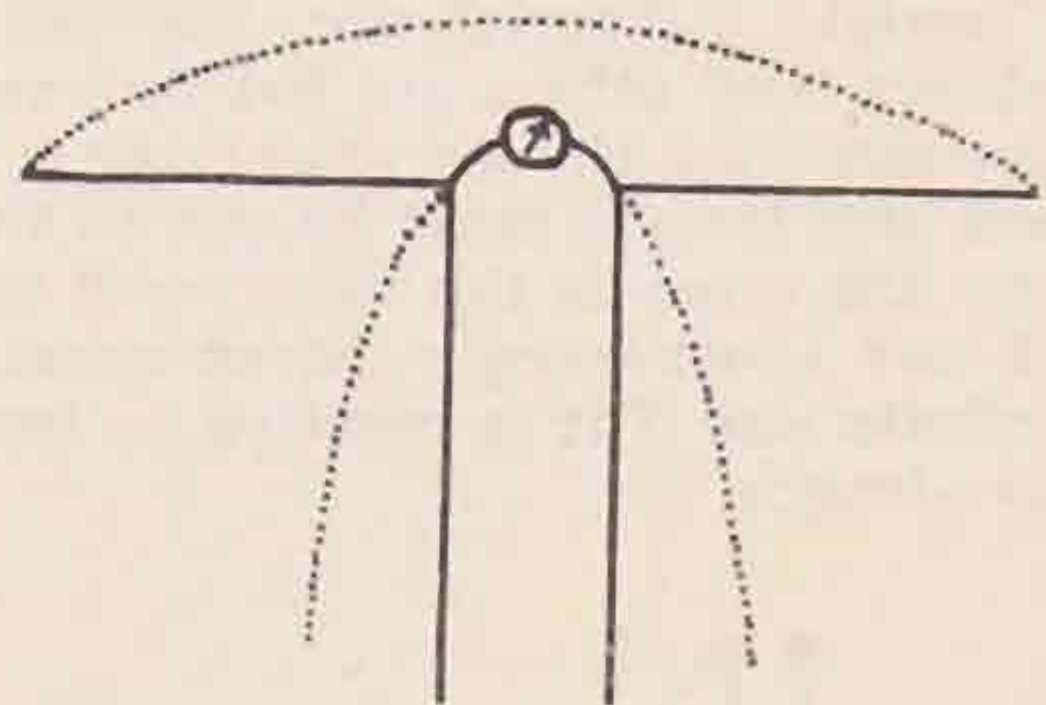
at the risk of boring you, a current-fed horizontal system.

Now I have stated as an indisputable fact that for voltage feed lines *must* be  $\frac{1}{4} \lambda$ , and for current feed  $\frac{1}{2} \lambda$ , the reason is simple if one draws out the disposition of the wave formation on paper.

With current feed our object is to feed large currents into our aerial at a place where there is maximum current.



That point will obviously be at X and Y (Fig. 4). This is rather difficult, but I want to try and show you what will happen were we to use feeders  $\frac{1}{4}$  wave-length long. (See Fig. 5.)



You see, the whole thing is ridiculous, but look at Fig. 4 again where we have  $\frac{1}{2}$  wave feeders, and it will be seen at once that my statement is true.

Now isn't that beautiful, current just where it's wanted up at the centre and down in the shack, and  $180^\circ$  out of phase with consequently no radiation. A final word on the mechanical construction of feeder lines. The thing to aim at is that the lines shall not vary in their relation to one another. It matters little if they swing as a whole, but you must try and keep them firmly together. As regards their distance apart, I suggest 1-200th of a wave-length, and with spreaders of  $\frac{3}{8}$ " wood boiled in wax and fitted with tiny button insulators at each end. Tether the line down, wherever possible, remembering that it's not radiating, and therefore can go round corners, through walls, or wherever you like.

ED. NOTE.—We think that the use of waxed wood for feeder spacers to be rather unsatisfactory owing to the possibility of soot and dirt collecting as a thin conducting film along the wood. A glazed porcelain or glass tube should be better from this point of view. Readers' ideas as to how glass tubes may be easily and securely fastened to the feeders will be welcomed, also their comments upon the use of various materials for spacers.



## Annual General Meeting.

The Acting Vice-President (Mr. G. Marcuse) took the chair at 6 p.m.

The Hon. Secretary read the notice convening the meeting. The minutes of the previous annual general meeting, held December 2, 1927, were considered as read and approved.

The Hon. Treasurer moved the adoption of the annual balance sheet. This was seconded by Mr. Ostermeyer and approved.

The Hon. Secretary read his report, as follows:—

The work of the Society has continued during the year with satisfactory results. Early in the year the Society was invited by the Postmaster-General to collaborate in the drafting and consideration of the terms of amateur licences as they applied to amateur working. This work was dealt with by the Licensing Sub-committee, who, after correspondence and interviews with the Post Office officials, agreed the main points of the provisions and made certain recommendations. The Society wishes to express its gratitude for the consideration shown by the Post Office authorities during these negotiations and for the concessions granted.

A number of formal and informal meetings have been held during the year at which many subjects of interest to amateur radio were discussed. A departure from usual procedure was lately initiated by the Committee in the holding of two of the meetings at the City Electric Restaurant, Ludgate Hill, in the hope that more members might be induced to contribute to the discussions. Some difficulty has been found in obtaining lecturers willing to come to the Society's meetings, and the Secretary hopes that members able to introduce lecturers will bring them to his notice.

The annual convention of the Society, held September 29 and 30, was most successful, and numerous provincial and some foreign members attended. Special features were the visit to the General Electric Research Laboratories and the largely-attended dinner.

The monthly magazine, the T. & R. BULLETIN, has been maintained throughout the year and has added many features of interest. Earlier in the year some difficulty was experienced in finding advertisers to take up space, owing, mainly, to the limited and special character of the circulation. Latterly there has been a slight improvement in this respect, but the revenue obtained is still far short of that desired to cover the cost of production.

The Society took the usual stand at the Olympia Radio Exhibition in September, and it is considered that the number of new members obtained fully justified the outlay, apart from the advertisement propaganda and interest. Many members attended and sent contributions in the form of photographs to the stand.

The Society published in May its Annual Log Book and List of Call Signs. Owing to the lateness of production due to change of hands in the preparation, this was not the financial success which had been anticipated. It has, in fact, contributed largely to the deficit already noticed in the financial

balance sheet. It has been decided not to venture upon a further issue next year, but an agreement has been made with the publishers of the Citizens' Radio Call Book, of American origin, that this may be obtained on special reduced terms for the benefit of the members next year. It will also be regarded as the official call sign book of the Society, the compilation of the British amateur signs being under the supervision of the Society's QRA representative.

It has been decided to publish a full list of all members of the Society early next year.

The Society has been able, in response to invitations issued, to make associations with various foreign and Colonial societies who have appointed representatives to make a regular contribution to the BULLETIN. These representatives have been granted free membership of the Society during their office as contributors.

The Society has affiliated various Colonial radio societies under the British Empire Radio Union scheme during the year.

The work of the International Amateur Radio Union, of which this Society is the British representative, has not had much scope during the year except in the fact that the Society were ably represented at Washington by the Secretary, Mr. K. Warner, to whom all radio amateurs are indebted for the excellent work he did in protecting and furthering our interests. It has recently been decided that the permanent headquarters of the I.A.R.U. shall be established at Hartford, U.S.A., altering the original scheme evolved in Paris of making each representative country act in turn.

The Society's work in conjunction with the Wireless League in the scheme for the approval of wireless dealers has progressed. Owing to the curtailment of the activities of the Wireless League, the meetings of the Joint Committee have now been transferred to Victoria Street. There are some 220 registered dealers, and the joint bank balance shows a substantial sum. It is considered that, when this becomes better known, it will be a source of permanent income.

The Sales Section of the Society has been maintained and covers the usual badges, notepaper and other sundries.

The meetings of the Wireless Organisations Committee at the B.B.C. have been attended by the Society's two representatives, and various matters taken up on behalf of members and affiliated societies.

The Contact Bureau, established by Mr. Allen, has evoked increased interest and has a large number of working members. Divided into groups, each furnished with a definite programme, it cannot fail to be of ultimate service in the solution of radio problems.

The QSL Service section has increased in usefulness to the members for the exchange of QSL cards.

The Society were fortunate to secure earlier in the year the services of Mr. Wellstead as Assistant Secretary, and the Hon. Secretary wishes to express



his gratitude and satisfaction with the services he has rendered.

The adoption was moved by the Chairman and seconded by Mr. Megaw. Carried unanimously.

The Chairman presented the ROTAB cup to Mr. Allen in respect of his services to the Society in organising the Contact Bureau, giving some remarks regarding the original of the cup. Mr. Allen thanked the Society for the honour accorded him.

The Chairman announced that Dr. Wortley-Talbot was unable to attend to present the cup to Mr. Mathews in respect of his work upon 28KC, and made the presentation for him. Mr. Mathews replied expressing his appreciation of the honour and stated that he considered that the Society was greatly indebted to Dr. Wortley-Talbot for presenting so handsome a trophy.

The Chairman reported that the ballot forms sent out in the December issue of the BULLETIN were incorrect, and new forms were sent to all corporate members, and that the new elected Council would be announced at the meeting upon January 11. He then called for two members to act as scrutineers, and Messrs. Chisholm and Alexandre were elected to the positions.

The meeting next proceeded to elect the T. & R. Committee, and the following were elected to the positions:—

1. Mr. Mathews, proposed by Mr. Thomas, seconded by Mr. Clarricoats.
2. Mr. Marcuse, proposed by Mr. Simmonds, seconded by Mr. Alexandre.
3. Mr. Clarricoats, proposed by Mr. Marcuse, seconded by Mr. Ostermeyer.
4. Mr. Allen, proposed by Mr. Mathews, seconded by Mr. Megaw.
5. Mr. H. Bevan Swift, proposed by Mr. Thomas, seconded by Mr. Ostermeyer.

6. Mr. Hinderlich, proposed by Mr. Scott, seconded by Mr. Chisholm.

A vote of thanks to the retiring President (Capt. Ian Fraser) was moved by the Hon. Secretary and seconded by the Chairman. Carried unanimously.

A vote of thanks to the officers and retiring Council was moved by Mr. Alexandre and seconded by Mr. Royle. Carried unanimously.

The Hon. Secretary reported that a motion referred to the annual general meeting by Council at their meeting on July 10, 1928, had been inadvertently omitted from the agenda. This was to seek the sanction of the meeting to permit the amendment of the Articles of Association to allow the date of the annual general meeting to take place at the annual convention. This was proposed by Mr. Thomas and seconded by Mr. Clarricoats. Mr. Gregory raised the question of cost and Mr. Thomas stated that the fee charged was only 5s.

Mr. Clarricoats proposed that the minutes of the annual general meeting be published in the BULLETIN, and this was agreed to.

Mr. Alexandre raised the question of the charge made by the QSL section, and it was pointed out that these rules had been published and agreed to.

Mr. Inman proposed that lectures be given in all branches of amateur radio work during the coming year, but that a reasonably high standard be maintained technically. Mr. Simmonds seconded. A discussion followed in which Messrs. Allen, Clarricoats, Megaw, Alexandre and the Chairman joined. The motion was then put to the meeting and carried.

Mr. Allen then opened the discussion upon the work of the Contact Bureau.

The Chairman proposed a vote of thanks to Mr. Allen, which was carried with acclamation.

The meeting adjourned at 8.3 p.m.

## New Prefixes.

As an amplification of the article which appeared in the December BULLETIN, we give below a list of the new Official Prefixes which have been adopted by the various Governments. We wish to state that this is not an official list, nor complete, but we hope that it will prove of some use to members.

Portugal	...	...	...	...	...	CT
Roumania	...	...	...	...	...	CV
Germany	...	...	...	...	...	D
Irish Free State	...	...	...	...	...	EI

Norway	...	...	...	...	...	LA
Belgium	...	...	...	...	...	ON
Denmark	...	...	...	...	...	OZ
Netherlands	...	...	...	...	...	PA
Brazil...	...	...	...	...	...	PY
Sweden	...	...	...	...	...	SM
Poland	...	...	...	...	...	SP
Canada	...	...	...	...	...	VE
Australia	...	...	...	...	...	VM
New Zealand	...	...	...	...	...	ZL

**THE OSCILLATING XTAL COMPANY, CAMBRIDGE, is the House to consult when considering Crystal Control in any form.**



# Notes on a Crystal-Controlled Transmitter.

BY C. H. RAMSDEN (G6BR).

The need for crystal-control had long been felt at G6BR, because dead constant frequency is so necessary when comparing transmitting aeri-als and conducting angular propagation experiments. Therefore, when the 1929 conditions were published, a C.C. transmitter was designed for operation on the 7,000 and 14,000 kc. bands, and the construction thereof put in hand at once. The adjustment and operation of this transmitter is described below. Not much stress will be laid on the constructional details, because all amateurs like to work out their own ideas. A list of component values is appended to this article.

The transmitter comprises three stages:—Crystal Oscillator (CO), Frequency Doubler (FD), Power Amplifier (PA). For work on the 14,000 kc. band the PA functions as an FD, giving a maximum output of 15 watts. As the set is intended for 10-watt work a further stage is unnecessary. On the 7,000 kc. band the PA will give 20 watts output. In order to get the input down to the authorised limit the PA plate voltage is reduced.

It has been found at 6BR that battery grid bias affords no improvement to the working of the transmitter. In the FD stage a 20,000 ohms grid-leak is used. In the PA a 20,000 ohms leak is used when this stage works as an FD, and 5,000 ohms when as a PA.

An aluminium screen separates the CO from the FD. This screen is not absolutely essential, nor is the provision made for neutralising the FD. Neutralising is essential in the PA stage, and the process will be described in due course.

The CO plate coil is a "Baltic" plug-in type. The other coils are wound with No. 10 gauge copper wire, and rest on glass dowels fitted into wood blocks and raised 1 in. above the baseboard.

THE CO.—The successful operation of the transmitter depends upon the use of a first-class crystal. A first-class crystal must be accurately calibrated,

must be absolutely reliable and must be free from harmonics, except those related to the fundamental. Such a crystal was supplied to the writer by Messrs. R. A. Weber, of Hither Green Lane, London, together with a suitable holder for £5 15s.

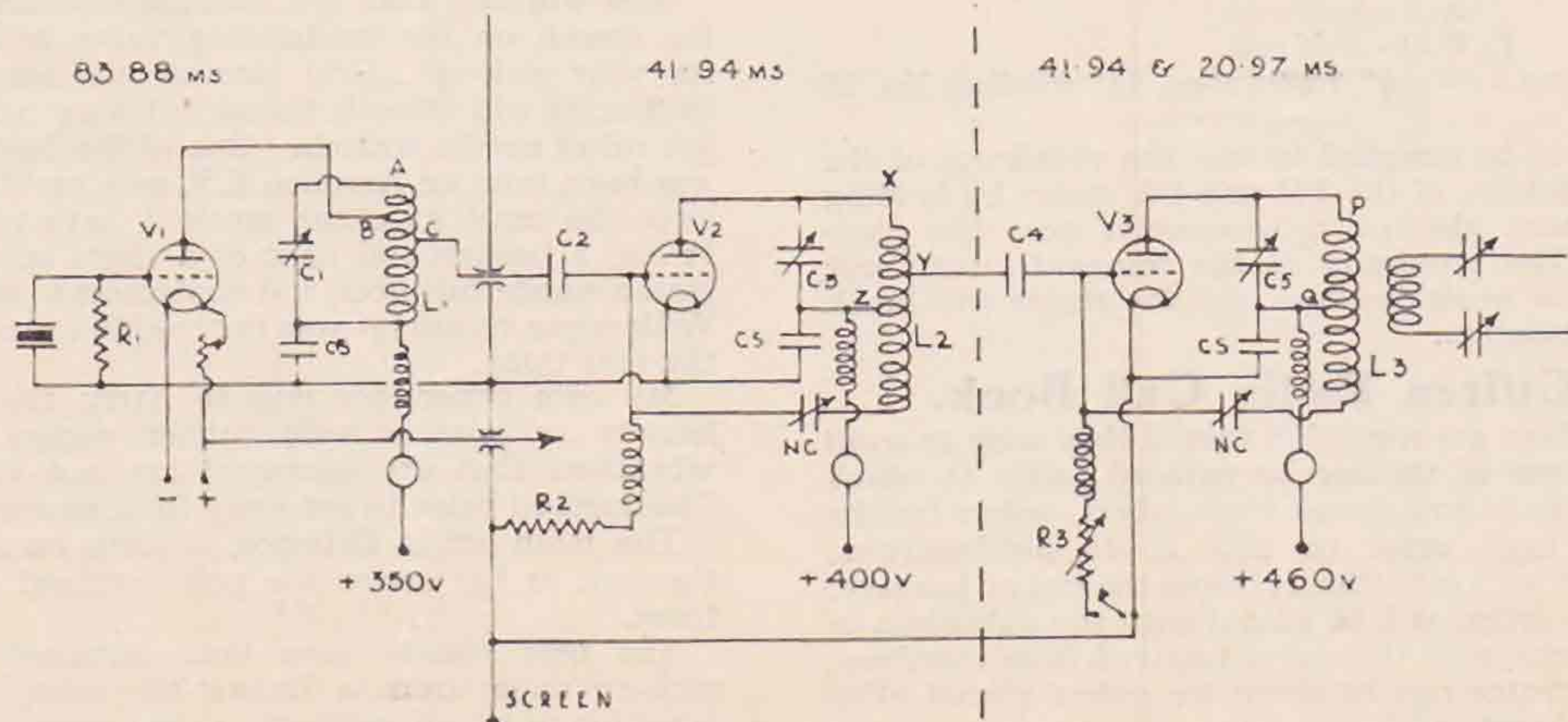
Beginning with the CO tuning condenser at minimum, the capacity is slowly increased. As the plate circuit comes into resonance with the crystal the plate milliamps fall slowly, then rise sharply after the point of resonance has been passed. The tuning is adjusted to the point of absolute resonance and then the condenser is eased off slightly towards minimum capacity.

A milliammeter is really essential in this stage. In the adjustment of the FD and PA a method will be described whereby milliammeters may be dispensed with if the station exchequer insists. Before adjusting the FD, the CO must be working correctly and developing full power.

THE FD.—Begin with the CO switched off. Hold a neon tube on the plate end of the FD coil and swing the condenser from maximum to minimum, watching the tube for indication of "pirate" oscillation (*i.e.*, glow in the tube). If such oscillation is present, the stage must be neutralised. Having done this, switch on the CO and with the FD condenser set at maximum capacity and the neon tube still held on to the plate end of the FD coil turn the condenser towards minimum. As the double-frequency point is passed, the neon tube should flash. The circuit is then tuned until maximum glow is obtained at this point. To verify that the stage is frequency doubling, turn off the CO, and the neon tube should be extinguished.

THE PA.—The adjustment of the PA is performed in precisely the same manner, tests for undesirable self oscillation being made with the CO and FD switched off.

NEUTRALISING is performed in both stages in





like manner. Take the case of the PA. The CO and FD are switched off, and the neon tube is held on the plate end of the plate coil. The neutralising condenser is set at minimum capacity. Swing the tuning condenser from maximum capacity towards minimum. As soon as the tube glows increase the capacity of the NC until the glow is extinguished. Continue down the scale until the neon tube cannot be made to glow at any point. At this stage the PA is not necessarily correctly neutralised, because there may be oscillations present which are too feeble to affect the tube. Therefore, listen on a receiver for signs of oscillations on the range of wavelengths covered by the PA plate circuit. If such signs are present, increase the capacity of the NC until the band is quite silent.

It should be mentioned that in the FD and PA, at the extreme minimum capacity there is a tendency to self oscillation, no matter how carefully the stage may be neutralised. This tendency may be ignored, provided that it does not occur within 30 condenser degrees of the double-frequency setting.

If a Zepp. V/F Hertz is used, and if the feeders are the correct length, a large current should be present in each feeder at the station end. When the feeders have been balanced a slight adjustment of each of the transmitter tuning controls may be made to gain an increase of feeder current.

KEYING.—The key may be inserted in series with the PA grid-leak. If the PA has been properly neutralised no trouble will be experienced with an unduly strong "spacer."

#### COMPONENT VALUES.

Referring to Fig. 1:—

R1=100,000 ohms.

R2=20,000 ohms.

R3=5,000-20,000 ohms.

CS=.002 mfd.

NC=Neutralising Condensers.

C<sub>1</sub>=.00025 mfd.

C<sub>2</sub>=.002 mfd.

C<sub>3</sub>=.0003 mfd.

C<sub>4</sub>=.0005 mfd.

C<sub>5</sub>=.0003 mfd.

V<sub>1</sub>=D.F.A.S.

V<sub>2</sub> and V<sub>3</sub>=L.S.5.B.

TAPS.—L<sub>1</sub>.A-B=4 turns.

A-C=12 turns.

L<sub>3</sub>.X-Y=3 turns.

X-Z=half coil.

L<sub>3</sub>.P-Q=half coil.

CHOKES.—6"×½" test tubes, 2¼" winding No. 38 D.S.C.

Do not be tempted to test the excellence of the neutralisation of the FD and PA stages by holding a resonant absorption wavemeter near the plate coils. The proximity of the resonant circuit will upset the neutralisation, and the stages will break into oscillation.

### Citizen Radio Call Book.

Members are reminded that if they wish to avail themselves of the special reduced terms at which the above is now issued to members, orders for the March issue must be sent in to headquarters, together with remittance, before the end of January. As only orders will be placed with the publishers in accordance with the orders received from members, no guarantee can be given for orders placed after the 31st inst.

## "Gramophone Pick-Up."

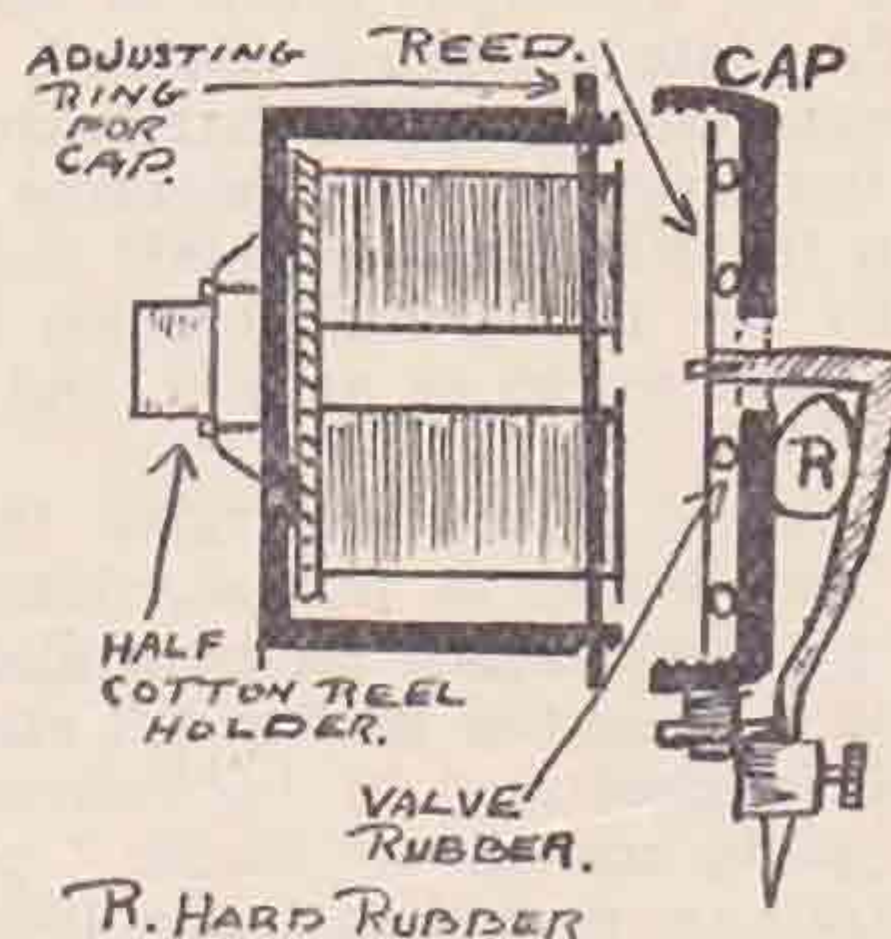
By H. S. PACE, G5HP.

They say a change is always a good thing, and I think it freshens your mind up to try out the lighter side of radio. At times I have heard amateurs put out some splendid records over radio. I find that for a short duration test they are very useful; therefore, why not try and put out the real "stuff."

I do not for a moment suggest that my own tests are perfect; far from it, but some of my own experience might be of use to a transmitter who thinks of trying it out, so that this little article may not be out of place.

Before we come to the transmitting side of "pick-ups" over radio, I have found that the best test is to try it out on a receiver first. I have been successful enough on this side that I have tricked a number of people by the fact that they thought the records were a broadcast station.

I had a friend working my pick-up from another room, and so into the receiver. On this principle it is largely a matter of grid bias and adjustment of H.T. The very best results were given by resistance capacity coupling, or chokes. The same applies to transmitting, but here at the moment I will deal with the L.F. transformer coupling.



I have found that the best valve is a D.E. 2 volts, but put 4 volts on it with an H.T. tapping of between 36 and 50 volts. Do not couple the L.T. direct to the valve, but adjust it *via* a rheostat, both for volume and quality.

You will find that the best filament adjustment for speech on the modulating valve is the same for your pick-up. Grid bias on the amplifier up to 9 volts will smooth things out very nicely, and get rid of needle scratch. One of the best I heard was built from an Amplion L.S. unit by 2DL; this gave the most excellent music I have yet heard. It had a background to it of a slight echo, which gave a wonderful effect, and no flatness to the music. With organ records it was impossible to tell it from the real thing.

My own experience was to damp the reed as heavily as possible with rubber wedges, so the vibrations that are conveyed are not too great. This method helps to get away from needle scratch.

The main art is Patience, to keep on adjusting the reed or bar across the poles without touching them.

The best results have been obtained from a pick-up made from a Brown ear-piece, the construction of which is shown in the figure.



## Tasmania.

By W. A. BOUSFIELD.

Tasmania is usually known as the "Apple Isle" owing to the large quantities of apples exported to Europe. Although the population is only about 200,000 people we have as many as 25 amateur transmitters who are well known for their efficiency.

The more active of these stations are all crystal-controlled and many of them have ground their own crystals. OA7CW, I believe, has succeeded in making at least 15. He has been known to ask a station to QRX while he grinds down his crystal in order to avoid QRM! The principal stations here are 7AH, 7DX, 7CW, 7CH, 7LJ, 7HL, 7JK, 7CS and 7BQ, and are well known in most countries of the world. 7CW has held two-way 'phone communication with GI5NJ and GI6MU, and came fourth in the recent A.R.R.L. world test, which was won by G5BY.

The existence of an extensive hydro-electric system in Tasmania makes the problem of power supply an easy one for transmitters. All their power is derived from the 240 A.C. mains, 7GH, by the way, is an engineer at the hydro station at Waddamana, in central Tasmania.

7CW, 7DX, 7LJ, 7CS and 7CH are actively engaged on the new 10-metre band and have accomplished some fine work. 7DX has been QSO OZIAN (QRB 1,000 miles) and 7CW has also been QSO OA6SA in Western Australia (QRB 1,600 miles).

A recent visitor to the capital, Hobart, was the Norwegian whaler "S.S. N.T. Neilson Alonso," with Chief Op. Olson on board. Mr. Olson is an old friend here and many acquaintances were revived. Using the call ARCX, this whaler is often QSO Tasmanian stations on the 32-metre band. She makes her base at Hobart and the small whale-chasing vessels are left here during the winter months. On this trip she has supplies for Sir George Wilkins, who is to join the expedition in the Ross Sea and make an attempt to fly across the South Pole. Broadcasting experiments are also to be carried out in conjunction with our local B.C. Station, 7ZL, and the Melbourne station, 3LO.

Our local club, the Hobart Radio Research Club, is in a flourishing condition, and operates OA7HR on 32 metres. This club is affiliated with the Wireless Institute of Australia, the Australian Division of the I.A.R.U.

The writer is the sole member of the R.S.G.B. in Tasmania, but hopes to get more members from this state in the near future.

## Short Wave Coils.

By W. H. HEBDIGE.

Here is a good way of supporting short wave coils. The coil, made of 18 s.w.g. wire, is first "formed" by winding on a former of suitable size, which is then removed. Rubber strips are now cut, say  $\frac{1}{8}$ " wide, which are threaded between the turns, taking each strip of rubber both ways along the length of the coil. The ends of the rubber strips are then suitably tied with stout thread, and each turn of wire will be firmly gripped on two sides. Repeat this four or five times round the coil and mount in the usual way. The coil is now firmly supported by a good non-conductor.

## "Why Not Use Them All?"

By L. H. THOMAS, G6QB.

I expect most hams think by now that I have a large bee in my sun helmet on the subject of the lower frequency bands. I agitated, in company with G2NH, for more use of the (then) 90-metre band last year, with the result that about six stations used to work up there occasionally.

There was another result, though, and that was that the band has been taken away from us this year, and who can wonder? If we don't use a thing it is taken for granted that we don't want it, and we have been rewarded for our pains by a little blank space on the licences.

What I am going to say this time, however, is this, if some of us don't jolly soon wake up and use our other band—the 1,750 K.C. band—that will disappear as well. There certainly *are* some people "down there" now, but very few indeed. Most of them are working each other on the 7,000 K.C. band when they might be doing the same thing with greater ease and less QRM on 1,750 K.C.

For the love of Mike, OM's, do something about it. The 28,000 K.C. band is full of sigs. compared with the other one, yet both have their merits, and it is no sign of special cleverness to be always working at as high a frequency as you possibly can.

Judging by some of the 'phone turned out on 7,000 K.C., some of us might well go on the 1,750 band and learn a little more about methods of modulation before putting the horrible noises on the air.

If anyone wants a sked with me on 1,750 K.C. to start the ball rolling, I'm there whenever you want me. If we can get a dozen going regularly, I think there should be quite a useful amount of work to be done. Come on, OM's, please, and set up a few D.X. records for 1,750 K.C.

## K.C.-Metre Charts.

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

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

## Calibration Service.

Calibration signals will be transmitted from G5YK on January 20 as follows:—

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

A similar schedule will be transmitted on February 10, commencing at 10.00 G.M.T. The call is R.S.G.B., DE G5YK, followed by the frequency used and a one minute dash.



# A New Circuit for Crystal-Control.

By JAMES CROYSDALE, M.Sc. (G5US).

The following notes are intended for those who are interested in the less costly methods of crystal-control, namely, the "Pebble Lens" exponents. We have had several examples in these pages of what can be done with harmonic crystal-control, and a considerable number of our lower powered amateurs are using the methods outlined by G5MU and G2BFA.

The writer does not claim anything absolutely original in the method given herewith; it is simply an adaptation of well-known principles.

Probably the writer is not the only "pebble on the beach"; others may be using the same circuit. However, I am giving the following brief details for what they are worth, and, moreover, it is about time I contributed something to THE BULLETIN.

In the first place it is important, of course, to select a pebble having a strong harmonic somewhere above 7,000 kc., and this can be found according to the methods of G5MU. The pebble is ground to bring the harmonic within the 7,000 kc. band.

As to the rest, the circuit should be self-explanatory. The C.O. valve, DE5B, is best for the job, and oscillates at the fundamental of the pebble by arrangement of the number of turns in L1. The circuit C2L2 selects the harmonic (7,000 kc. band) which constitutes the grid circuit of a T.P.T.G. circuit. The P.A. valve, an LS5B is partially neutralised and slight bias applied to the

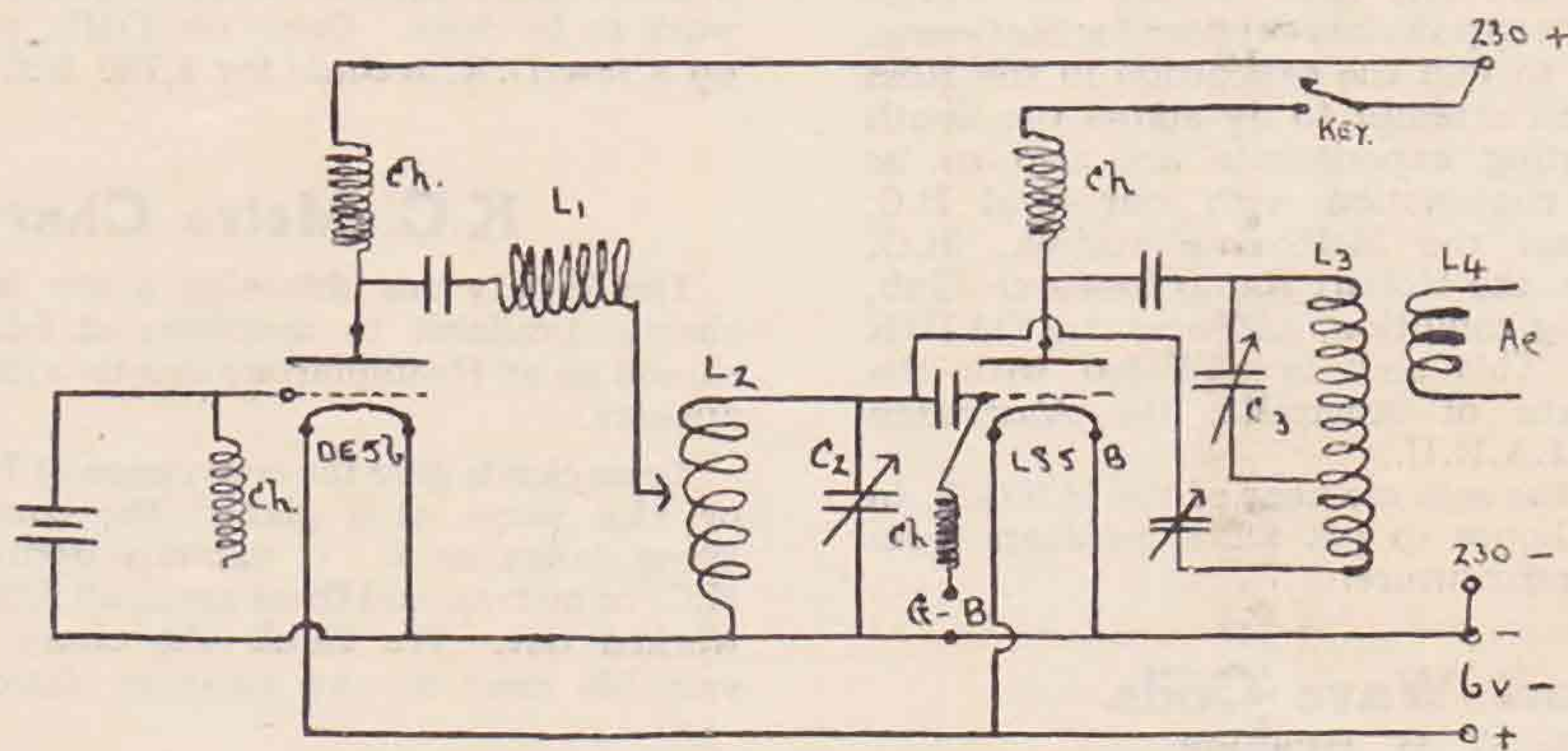
grid, so that it is just on the verge of oscillation. On switching on the C.O. the P.A. should oscillate readily. Of course, the aerial load to the plate coil of the P.A. introduces a certain amount of damping, which lessens the need for much neutralisation.

The tap from L1 to L2 is not very critical, and should be somewhere about the centre point.

Given a good pebble, carefully selected, this method affords quite sufficient depth of control for 10 watts or so, and should be found quite stable in operation. Although an additional valve is used, the writer thinks this gives more sharply defined signals and better depth of control than the usual single valve arrangement.

EDITORIAL NOTE.—It is really unnecessary to employ shunt-fed circuits on the plate of the C.O. as well as on the grid of the last valve. In either of these tuned circuits the H.T. potential (or grid potential as the case may be) could be fed direct through the coils, thus doing away with the necessity of using R.F. chokes in a position where they have to withstand full R.F. potential. Chokes are seldom perfect, and are often very imperfect, thus causing a leakage of the R.F. potential which we try so hard to conserve.

As the second valve is working as acting an oscillating amplifier, we would suggest that both bias and leak might constitute an improvement, though the writer does not say whether he has tried this.

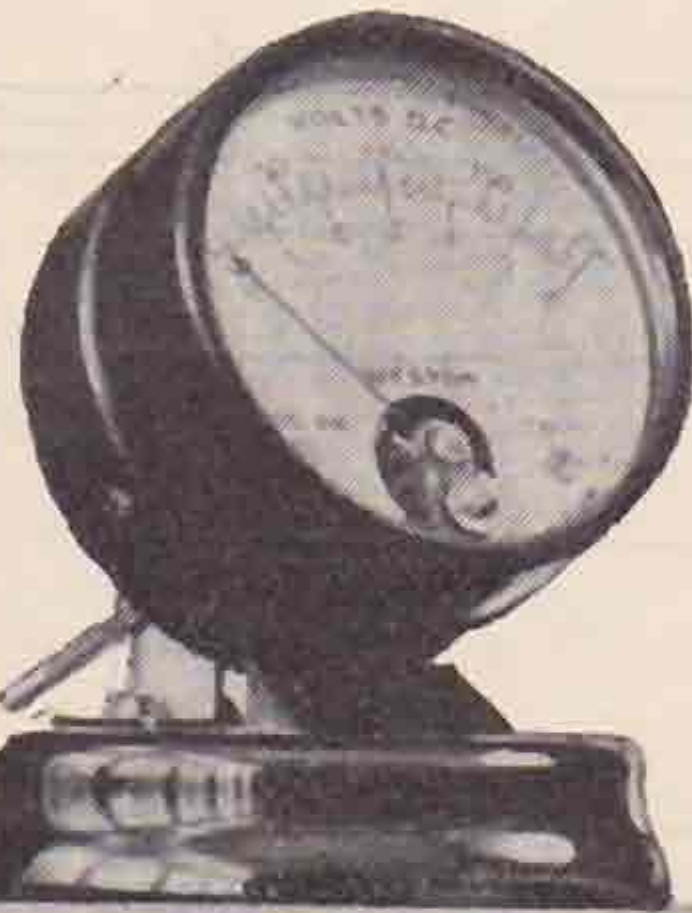


Ch. = Chokes. 180 turns 36 SWG. 1" diameter solenoid.

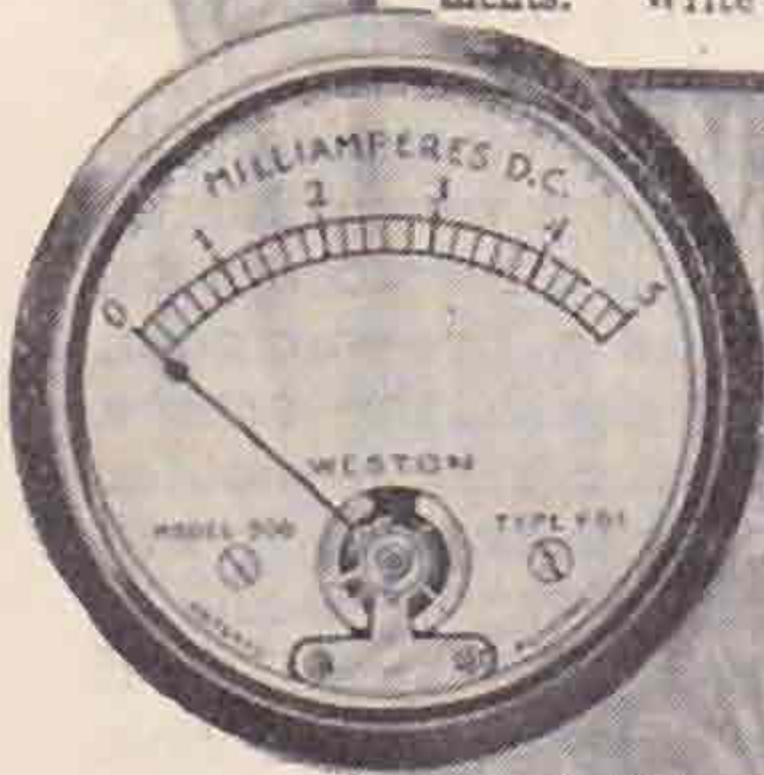
HAVE YOU WRITTEN THAT ARTICLE YET?  
IF NOT LET US HAVE IT NOW.



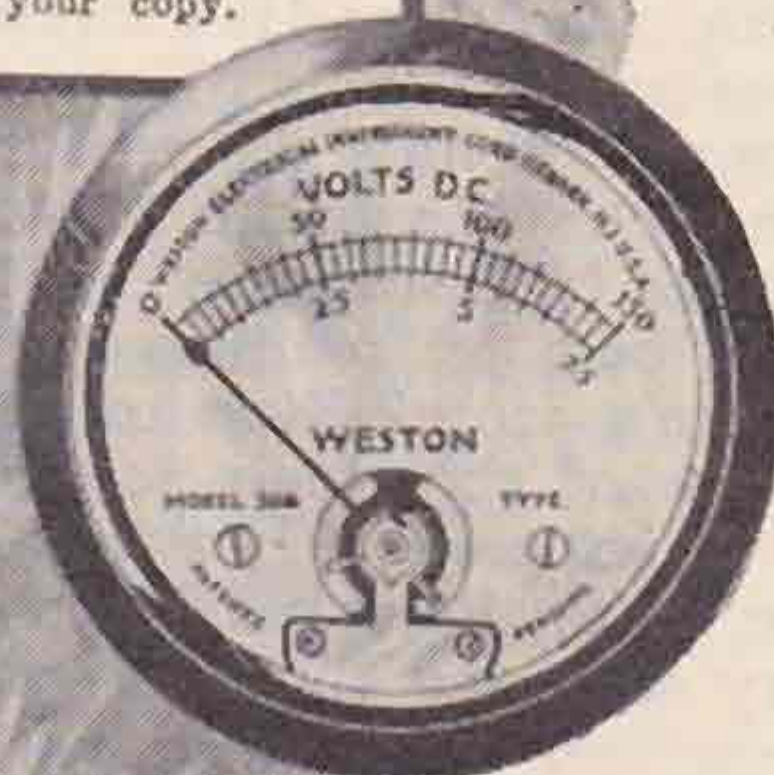
# Weston sets the world's standard



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



Model 506.—Mil-Ammeter should be placed in the H.T. circuit of the valve to ensure correct operation and check distortion. Panel mounting type. Prices: £1 15 0  
£2 15 0



Model 506.—Panel Voltmeters ensure permanent accuracy. With a high internal resistance of 125 ohms per volt, they make practically no load on the batteries. Neat and compact. Prices: £1 15 0  
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Model 489.—Double Range D.C. Voltmeter is a necessary portable testing instrument for every radio enthusiast. It is of great use in tracing circuit troubles. Made in various ranges with different sensitivities. Similar instrument for A.C. Model 528. Prices: £3 15 0 £7 5 0

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## ELECTRADIX RADIOS

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Blackfriars Sta. Met. Rly.

City 0191



## Concerning a Key.

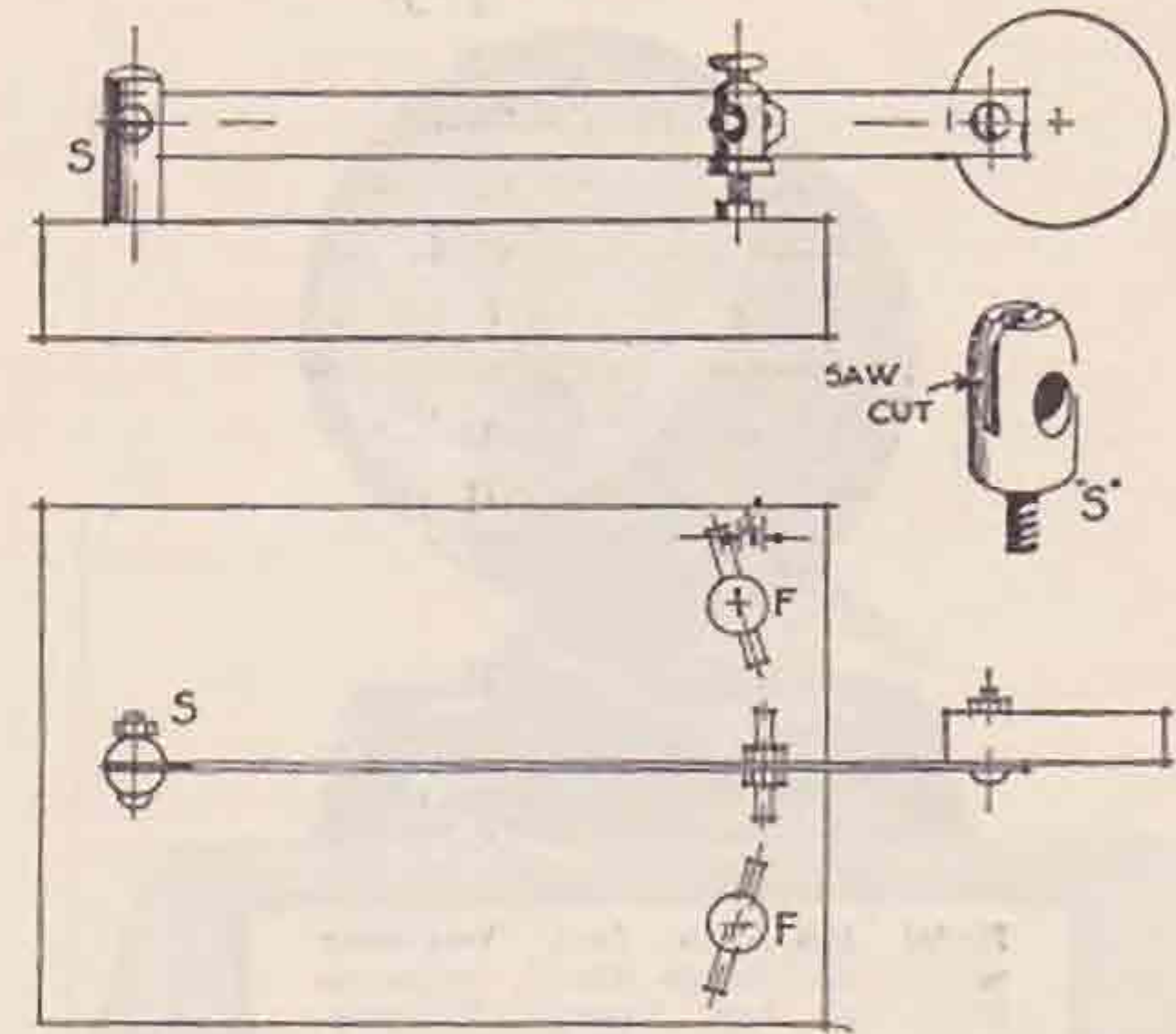
By EG-2HJ.

It is a peculiar fact, but an incontrovertible one, that British hams seem to be shy of showing any originality in the type of key they use, but stick steadfastly to the common or garden P.O. variety as though it was their only hope of salvation, with the result that their sending lacks swing and is often uninteresting. There are exceptions, of course, such as our old friend 5AD, who swings a very pretty bug; but Mr. Every Ham says, "No, sir, a bug is difficult to make, costly to buy, and far from easy to learn to handle." But softly, dear sir, I prithee, while such is more or less true, hast never heard of a sideswiper? A key that is, as the name implies, operated by swiping from side to side; or translated from the vernacular, by manipulating by the hand so that it oscillates in a horizontal plane. Such a key is cheap and easy to make; it will cost you a threepenny-bit anyhow, for the contacts; it is probably cheap to buy, if it can be obtained in this country; and it should not take much more than an hour or two to learn to handle, assuming you can send decent Continental on a straight key. And a point worth noting is that it does not tire one's arm to anything like the same extent as a standard British key, because the hand does not oscillate nearly as much.

Let me now discourse on the method of construction. Your first need is a base, and if you like you can use a piece of carefully polished ebonite or mahogonite, in which you drill your holes with great care and send away to be engraved. If, on the other hand, you happen to be like most amateurs, you will look around the shack for a chunk of wood, and maybe use a fragment of somebody's soap box; I cannot advise this course, as I prefer a harder wood, and in my case I found a piece of  $\frac{7}{8}$ -in. mahogany, which I reduced to an approximate rectangle measuring 4 ins. by 3 ins. As a matter of fact, I put a slight bevel around the upper edge, but this is not, of course, by any means necessary, although it looks nice when the YL comes to view the shack.

The next requirement is the arm of the key, and for this you raid someone's Meccano outfit and bag a  $5\frac{1}{2}$ -in. strip. If this cannot be done, don't rush out and buy a dozen strips, but take that hacksaw that has refused to cut for so long, remove the blade and snap off a piece about this length. This will be even better than the Meccano strip, except that it will be more difficult to put the contacts on. Now some means must be devised to hold the end of the strip, and this must be absolutely rigid. I used one of those split pillars that one finds supporting the contact point in an electric bell. In default of this, it should be possible to use a telephone terminal, making a saw cut in the middle at right angles to the hole, and passing a clamping screw through the hole of the terminal (see S in the sketch). This support is then mounted about half an inch from one end of the base and in the middle thereof.

Next the contacts are put on the arm, 3 in. from



the point where it is clamped. For the Meccano strip a headless 4BA screw about  $\frac{3}{4}$  of an inch long was passed through the sixth hole and locked with a couple of nuts so that the rod projects equally on each side; to the ends of this screw were soldered pieces of threepenny bit to act as silver contacts, and here let me suggest you use a pre-war coin, there's more silver in it! To finish the arm a piece of ebonite is screwed to the end to act as a thumbpiece. If a hacksaw blade is used it will be more difficult to fix the contacts; one might try soldering them directly on to the blade, or if you feel very energetic you might drill a hole through it and fix them as for the Meccano strip, but this method calls for much elbow grease, and is a bit hard on the drill, too.

Now mark the positions for the fixed contacts, about an inch from the arm on either side of it, and set about  $\frac{1}{8}$  in. behind the normal line of the contacts on the arm (see F in the sketch). At these points put a telephone terminal screwed just far enough into the base so that its hole is level with the contacts on the arm; it will not screw right home, but there will be a short length of stem between the base and the head of the terminal, and in order to keep the post rigid a nut should be locked hard against the baseboard. The fixed contacts consist of short lengths, about  $1\frac{1}{2}$  in. of thick copper or brass wire, say 10 SWG, one end of each carrying a silver contact, as on the arm. These are slipped through the terminals and adjusted to give a suitable gap, when they are clamped tightly in their supports. A wire is run from the two fixed contacts to form one terminal of the key, the other connection being taken to the arm.

That finishes the key, and before you put it on the air, ————— get some practice on it. It's not hard to learn, but it must be learnt, otherwise the gang will think a pup has got loose in an ironmonger's store, and not merely that someone has got a new key on the air. When you get it going though, you will not be in any hurry to use the old key again.



## Cheap Power.

BY HAROLD S. PACE (G5HP).

There is, I find, a large number of transmitters who have, unfortunately, no electricity in the house, or are a considerable distance from obtaining a supply. Driving dynamos with accumulators, and dry batts, are expensive, troublesome and not efficient, though useful for a short test.

I have met a large number who appear to have no idea of how to rig up a power plant for a few pounds, and trouble well spent. A large number of transmitters have a hand generator on hand, and I found that either you have to prevail upon a friend to do you a good "turn" or else one has to turn contortionist to manipulate the mangle, whilst adjusting controls, and with a sigh, saying "over."

The best is, of course, a small gas engine of about  $\frac{1}{2}$ -h.p. It does not require any wonderful knowledge to fix up. If a motor-cycle petrol engine is used, there are two main points to bear in mind, which applies to petrol or gas. Place it in a shed or garage, or build a small lean-to shed. On no account place your engine next to, or touching the house. If placed upon a cement bed, do not continue the bed to the house. Allow the earth between to absorb the vibration, as walls easily convey the vibration, however slight, and the OW might intervene.

If you place your engine, as I have done, in the garage, it is safe, but take precautions by screening with asbestos lagging, which is mixed with water, and applied as a heavy paste, on metal sheeting.

The exhaust box is a galvanised tank filled with coke, and sunk into the ground. The exhaust pipe from the engine is taken to the bottom of the box and connected with a union, although a pipe which is a good fit may be pushed into the box.

Fig. 1 will quickly convey the general lay-out.

Petrol engines of 4-h.p. are too noisy and big. It should be about 2-h.p. with magneto and controls. Owing to the light work it is called upon to do, it will practically require no attention, except oiling. Owing to no road vibration the valves will only require attention at the annual cleaning.

The ratio of sprockets B and C will depend upon the revs. required, as stated on dynamo. Owing to the small resistance offered to the engine, the engine is only required to tick over evenly, at about 60-70 revs. per minute; that will keep your engine (and your temper) cool. Make sure the number of revs. the engine will do slowly and evenly before you decide upon sprocket C. The chain is motor-cycle type. If you wish to run also a small lathe, drilling machine and emery wheel, then place longer shaft at A with an end bearing, and suitable pulleys. This method creates a new term—"How many watts to the gallon, therm or heat units?"

The starting-up handle must be of the car type, Fig. 2.

The sprocket C should be from a motor-cycle and bolted to a small  $\frac{3}{8}$  in. plate and threaded to screw on shaft, usually  $\frac{3}{8}$  in. dia.

The holding down bars are 2 ft. by  $\frac{3}{8}$  in. mild steel. When the sprocket C is screwed on there is enough thread to replace handle, and may be used as such.

The dynamo is shown facing the opposite direction to actual practice, as they are clockwise. I shall be pleased to answer any enquiry.

## Social Notes.

For 1929 the social affairs of the Society will once again be in my hands, and I would like to take this opportunity of expressing my thanks to all who helped last year with the social life of R.S.G.B. In all directions one can see the benefits which have accrued from the results of social intercourse between members, and those who were fortunate to be present during Convention have, I am sure, all endeavoured to establish a healthy "esprit de corps" amongst their immediate circle of amateur radio friends.

\* \* \*

I, personally, feel conscious of many shortcomings where the social welfare of the Society is concerned, and I do ask in all seriousness that those of you who have ideas about improving our social activities, not only in London but in the provinces, will write me without delay.

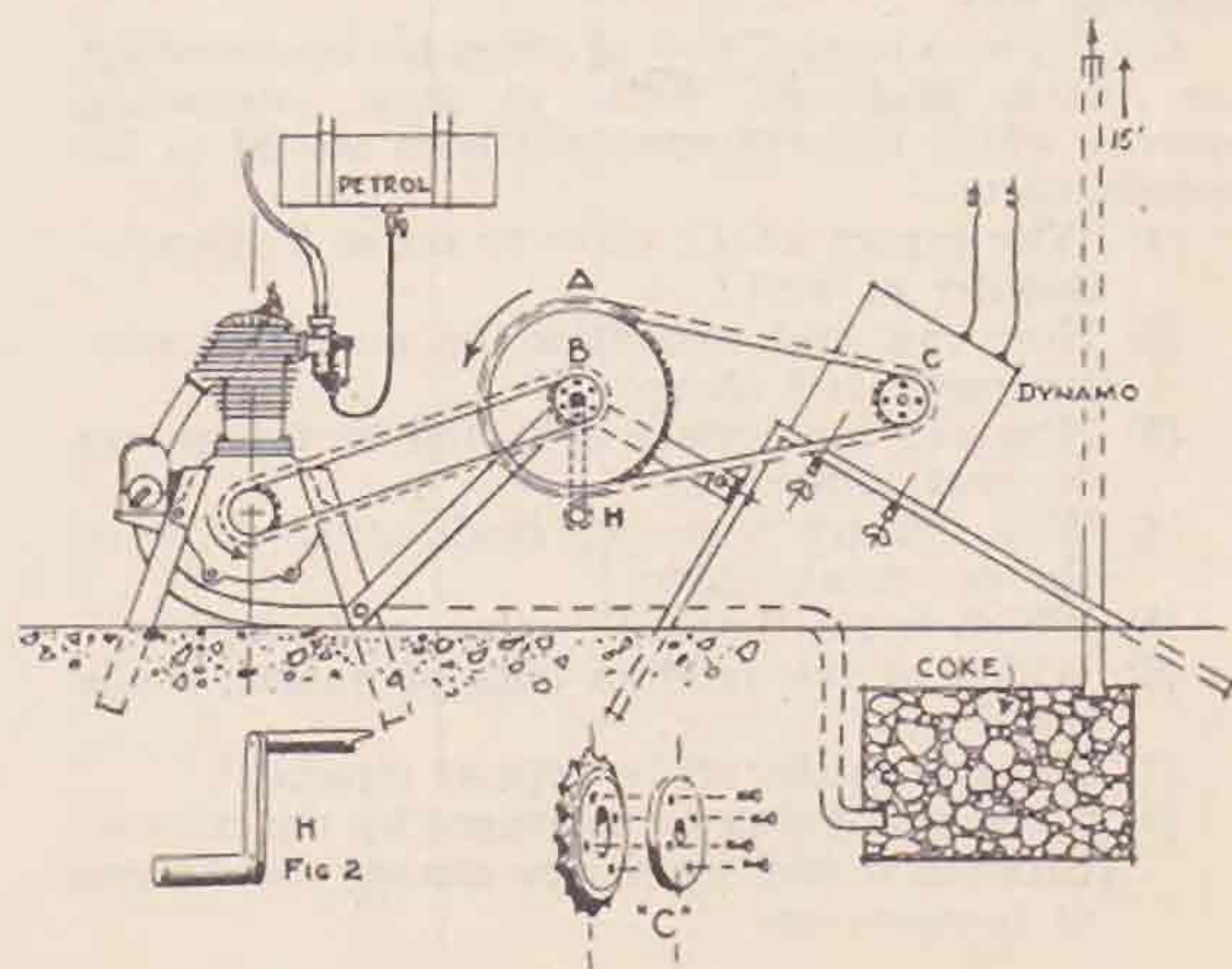
\* \* \*

I have decided that during 1929 to ask my three London District colleagues to join me on the Social Committee. I hope by that means to be able to get greater support at London functions and also be better able to entertain our many visitors. Mr. C. Bradley (G2AX), who has rendered able assistance in the past, will complete the committee. Mr. C. Brookes has now accepted the position of "Area Section Deputy," whilst Mr. J. W. Matthews is now responsible for Calibration Service and Care of Instruments. To all three I offer my thanks for their assistance during 1928.

J. CLARRICATS (G6CL),  
(Chairman, Social Committee).

## MIDLAND CONVENTIONETTE FEBRUARY 9.

See West Mid-Britain Area Notes.





## Contact Bureau Notes.

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

The Christmas season slackened up C.B. activities a little, and consequently there is less material for the present Notes.

May I take this opportunity of wishing everyone a very prosperous 1929: "1929" is now almost an expression signifying a high degree of transmission quality—may we work successfully towards that end during the year!

It is possible that some material which would normally have been in good time for this month's Notes will have to be held over until next month. This is due to the fact that the visit of the Hon. Manager C.B. to London could only be made possible by rushing his pre-Christmas work, and the Notes have had to be written a little earlier than usual.

Will Group Centres please note that Group reports must reach C.B. by the 7th of each month at latest. It is impossible to make proper sketches and "write up" the extracts if they are sent in at the very last moment, and as GW17C does the sketches there is a loss of a day or two in posting the material between C.B. and 17C.

Any Group reports received after this date will not be considered until the following month.

A member tells me he is having some success with the picture transmissions from 5XX. Can we get six enthusiasts to form a Group on this work?

G12WK thinks his immunity from anything like "Threshold Howl" is due to the fact that he uses separate H.T. battery for detector. By a plug and jack system he can use varying degrees of L.F. amplification, use amplifier for gramophone, or use it for speech amplifier for telephony.

GW11B writes *re* the mention of pitch for cementing quartz during grinding. He says that paraffin wax is even more effective and far more easily removed afterwards by warming and cleaning off with either carbon tetrachloride or petrol. Nothing but paraffin wax is used at GW11B even for holding large natural crystals during cutting. The only precaution necessary to ensure good hold is to have the quartz brought to the temperature of the melting wax.

G2QY, who joins C.B. and offers his co-operation on quartz problems, sends in some interesting queries which he says have not been solved to his satisfaction:—

- (1) Why expect a C.C. valve to act as frequency-doubler as well?
- (2) How can grid excitation be measured continuously and cheaply?
- (3) How can the voltage delivered by the quartz be best reduced?
- (4) Why not try a proper modulating valve in the power amplifiers?
- (5) Which is the best C.C. valve, and why?
- (6) Which of the random cuts of quartz is the best?
- (7) Can two oscillators be kept at zero beat?
- (8) Could grid-swing be measured by the relation [between it and frequency change due to rise of temperature?

- (9) Will the production of an audio-frequency beat note by heterodyning two crystals serve any useful purpose?
- (10) Wanted, a detailed design of a sealed crystal-holder.
- (11) Is single-side-band telephony on short waves possible?
- (12) Why is it that, when a freely-oscillating square crystal is cracked by excessive voltage and the smashed portion sawn off, the remainder is a poor oscillator? Also, why is it that if the remainder is used under the same conditions as smashed the original crystal, it controls satisfactorily with even higher plate voltages? Is such a *dud* crystal a satisfactory solution of high-power control?

That is a very nice little examination paper! I want letters on these queries, and I propose to publish the "Answers." I promise a "starred rectangle" for the name of the member sending in the best reply to any of these questions.

I also want another "examination paper" for next month; what about one from someone who feels perhaps just a little *at sea* with radio-technics and would like queries answered in non-technical language? I can imagine that someone might ask, for example, "What is meant by 'negative resistance'?" It would be unreasonable to ask for an answer in a few paragraphs to such a question as, "What is a high-frequency alternator?"

Send in your queries and I shall publish them and ask for answers in simple language. If desired, I will not mention names or call-signs. This "stunt" should be good fun if you fellows will gather round and play up.

G5CD wants co-operation in experiments on 7 M.C. side-band telephony. His co-operator should have a good supply of power for the several power valves necessitated by this work, and must be quite familiar with C.C. G5CD proposes to use both side-bands at first and then later to suppress one. He may try his gear at 2 M.C. for a start and raise the frequency if everything goes O.K. BRS or AA men could lend valuable assistance if prepared to make a special receiver, and help from someone living in or near London would be most valuable.

I am glad to welcome EN $\phi$ CX to CB; he is the first Dutch member, and I hope he can persuade some of his countrymen to join in the good work. The inscription "EN $\phi$ CX is a member of RSGB, OF COURSE! Wonder why?" is rather a good reply to another inscription I understand is appearing on certain cards.

BRS77 says that for all receivers working above about 30 metres a resistance of 50,000 ohms can take the place of the usual H.F. choke. A slight increase in H.T. volts will, of course, be necessary when this is used.

During the month the 6th group on 10 metres was formed under the Centre G2CX, and it looks like being a lively crowd: G2CX, G6HP, G5WK, G6TZ, BRS25 and EN $\phi$ CX. This group is 1F.



We have a few letters of the alphabet to spare yet, so send in your names.

BRS125, who has recently returned from South Africa, sends along the diagram of a very successful screened grid valve circuit for the shorter waves. He had no success with that given by Capt. Round in his book, but found this circuit, which BRS125 attributes to FO.A4V, very good indeed. The alterations required to the ordinary capacity-controlled circuit possessed by the majority of amateurs are very few and quite simple.

The small condenser in the aerial introduces damping, which makes the tuning of the R.F. stage comfortably broad. BRS125 kindly offers to answer any questions on this circuit, and says that EF and EB stations on fone come in at R8.

I am glad to be able to announce that Dr. Karl Stoye, the well-known German amateur, has joined up, and hopes to co-operate with a 28, 60 or 100 M.C. Group.

A new Group on skip and fading has been formed by G6XC, and its international character is a pleasant reflection of the widening influence of C.B. It is composed of G6XC, G2ZC, G6PP, G2AGQ (ex-BRS114), EP1BK and EK4DK. G6XC says: "I have received a reply in the affirmative from every member to whom I wrote, and that alone, I think, is typical of C.B." This Group will be known as Group 2B.

G2BFA has consented to run a group on quartz problems, and has already got 2QY and 5MU. This Group will be completed in a day or so, and will be known as Group 3A.

Group 5A is still held up on account of the 3,500 k.c. licence difficulties. G6FY, the Centre, tells me that the only way in which he could kill T.H. in his receiver was to put positive G.B. on the amplifier. A leak across the low-frequency transformer windings was as effective as battery G.B.

The first report from Group 1F is interesting.

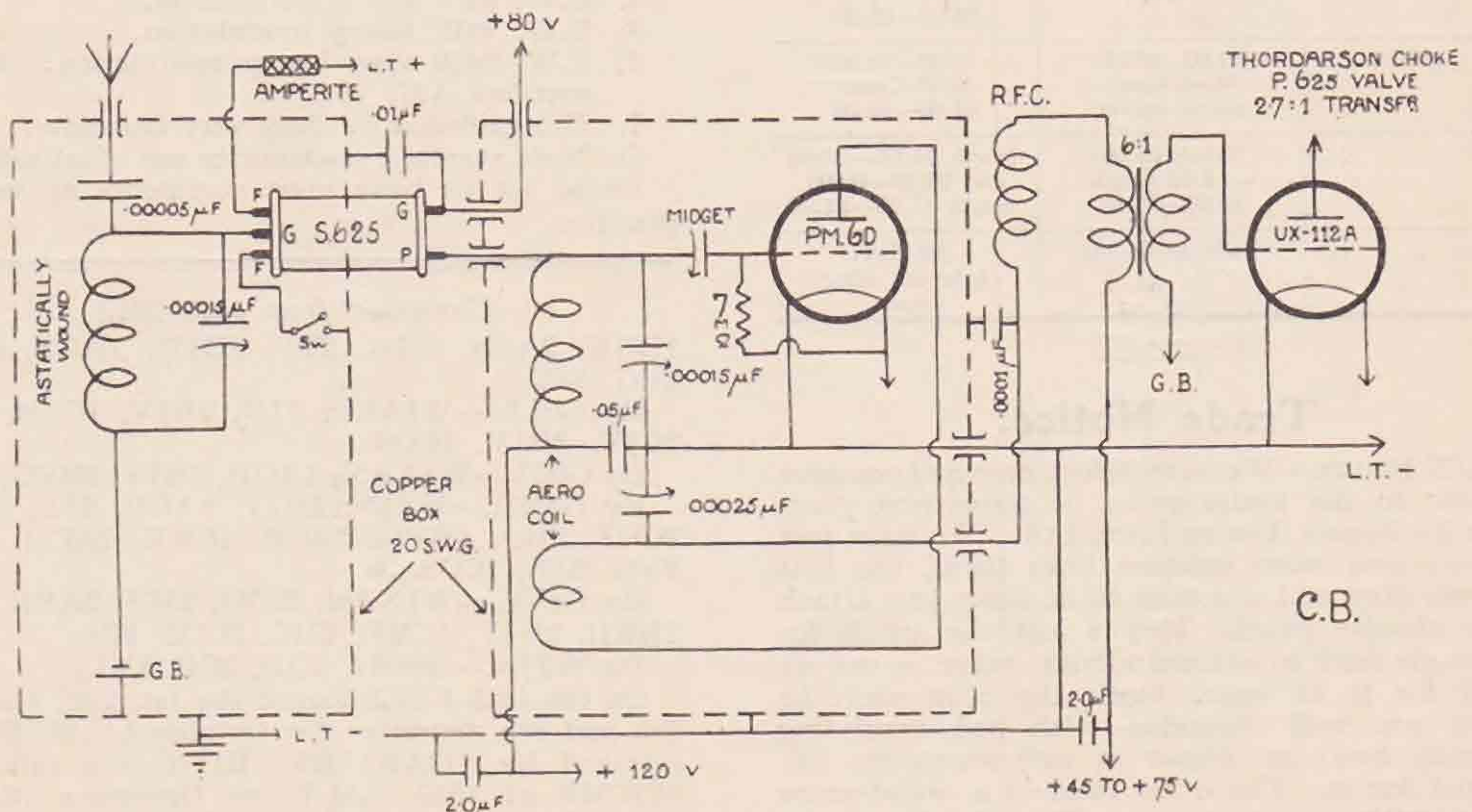
ENφCX is keeping the Group informed of 28 M.C. developments in Holland. Using 20 watts to a Hartley he gets strong local reports. He has noticed that when filament voltage is switched off the anode feed still continues to flow and the filament remains glowing. But after six demonstrations the valve went on strike. Considering that φCX is a B.Sc. (I am not sure that he is not now an M.Sc.) and trained to do scientific work, this announcement seems to me to be of immense importance, and I hope that this peculiar behaviour will be fully investigated.

G6TZ is making a C.C. set for 28 M.C. BRS25, in addition to hearing the usual W stations, has heard RKV of Moscow calling RRU at 10.26 G.M.T., which would raise hopes of European QSO's at this time. G6HP uses a debased DE5 and has been QSO many London stations with 4 watts. His 21-metre long aerial is tapped straight on to the anode coil. G5WK, after taking the emission off a RX valve, got a DET1/sw and is now using 10 watts to a TPTG. G2CX has scrapped his double-wave horizontal aerial and put up a 1/2-wave vertical Zepp., but beyond a drop in strength locally nothing has happened as yet.

Group 1G is now almost completed under the Centre G2YU, and he is arranging to keep in touch with his Group by schedules on the 7 M.C. band. FB.

Group 2A, skip, has been engaged mostly on theoretical discussions, but will be running a series of tests from January 6-13 between the hours of 16.00 and 22.30 G.M.T.

I really must give the palm this month to GW17C, who is making such a success of Group 1D. He got out a Christmas number of their budget, illustrated with photos of the stations and operators, and, as usual, faultlessly turned out. He suggests that for 1929 a new system of finishing transmissions might save a lot of TEST calls. He



SHIELD-GRID RX AT BRS125



suggests that all stations should sign off with either QRT or QRX, as is sometimes done now by individuals. This allows a listening station to know whether the transmitter has closed down or is searching the band for calls. Now for his group news:—5MO is busy with TX and RX. He is using 3 watts valve RAC to LS5 in a TPTG circuit. G6GC has a Mesny and is hearing plenty of W stations. 2AAK is moving to another room, as the tram QRM is too bad. GW13D has been on each week-end, and has been reported R3 by W2AER when using 10 watts at 280 volts D.C. on an LS5. He uses a  $\frac{1}{2}$ -wave vertical Zepp. At 17C T.H. is eliminated by using a loosely-coupled aerial and a choke-condenser output. The super-regenerator set is not working well, as G2ZC says it should—but there are no £10 condensers at 17C. 17C has worked 2JN twice during the month and had reports from W2ACN and W2BVG. Two members of Group 1D have now put 28 M.C. signals into W, and the others are trying hard to do likewise.

Group 4A supplies us with another list of probable reception times for the period January 20 to February 20. 2AUH, who acts as Centre, remarks that reception has been very bad during November this year, and that the South American reception tests fell through owing to an entire absence of signals. BRS136 came in to complete this Group.

New members: G2QY, G5WF, BRS77, BRS136, EN<sub>4</sub>CX, G5CD, BRS125, Dr. Stoye, G5MU, G2BFA. (Total: 143.)

CB. DX GUIDE.

	14 M.C.	7 M.C.
Australasia ...	10.00—15.00 OZ best 12.00 OA best 14.00	06.00—21.00 QSA 06.00—09.00
Asia ...	10.00—17.00 mainly AI and AQ	12.00—24.00 AF 19.00 AI 18.00 AQ 16.00 AC 20.00
South America ...	Nil	20.00—? 06.00—08.00
North America ...	12.00—20.00 West Coast about sunset	18.30—10.00 West Coast 01.00—10.00
Africa ...	North 09.00 —16.00 South 16.00—20.00	North 15.00—23.00 and 07.00—09.00 South 17.00—21.00
Europe ...	Fade at Sunset	All day fade out after sunset

### Trade Notice.

CLIX PLUGS.—We have before now had occasion to refer to the useful series of connecting plugs made by Messrs. Lectro Linx, Ltd. We have just received two more samples from them, the first a power plug and a socket to fit same and attach to an ebonite panel. This is just the article for the anode feed to a transmitting valve, a use we found for it at once. Both the plug and the socket are well shrouded with red insulating material, and the whole is well worth the 6d. charged for it. The other item is a wood-screw socket with insulated top. This should appeal specially to the breadboard constructor.

## Tone Systems.

Following upon a letter received from G6WD, the question of revising the unofficial T code now being used, for want of anything better, has received consideration. We here give some observations upon the compilation of such a code, and our ideas upon the subject, before inviting your comments, which will be carefully considered before any final recommendations are made.

(1) To avoid confusion, the new code must contain some other letter than T. We suggest N (for Note) which is not of extravagant length in Morse.

(2) If there are too few coded phrases, then the system is useless, while, if there are too many, it is too difficult to remember, and the less useful phrases get forgotten. Most of these codes in practice are cut down to five or six phrases, so we only propose starting with that number.

(3) While every type of note, from the best to the worst, should be provided for, the code should consist of graduations which will be unmistakable. Accurate graduation is rarely required, and if it is, then a full description is safer and quicker, in the long run, than reliance upon a code which has to be looked up both by sender and receiver.

(4) The code should be capable of translation into foreign languages.

(5) The new Q code contains three abbreviations (QSB, QSC, and QSX), which cover some of the points mentioned by previous codes. It is suggested that this new code be used in answer to QRI?

(6) The purpose of this code is to report upon the quality of the note heard. Hence phrases such as "good and steady rectified A.C." are begging the question, as such a note might well be produced by a D.C. generator.

Here are the suggestions:—

5. Pure C.W. (perfect).
4. C.W. with slight modulation.
3. C.W. with heavy modulation.
2. C.W. with very heavy modulation. Poorly rectified A.C.
1. Unrectified A.C. Any very bad note.

O. Note varying: transmitter out of adjustment. Please let us have your comments as soon as possible.

(Continued from page 161.)

1BGK, 2ACN, 2NM, 2TP, 2BVG, 2BRB, 2BJV, 2BG, 8ZG.

By G6LL.—W1AEP, 2JN, 2BJV, 1CFM, 2BG, 2CJV, 2BJV, 1COS.

By G6CL.—W1XAM, 1AQD, 2BJV, 2BVG, 2WS. By G5ML.—W2JN, 2BJV, 1AEP, 2TP, 2ACN, 2CUZ, 2BQ, 1BVL, 2BRB, 1CMR, 2ACH, 4NH, 5YG, 8ZN, 1COS.

By G5VL.—W1XAM, 2CVJ, 2WS, 2AYR, 2JN, 2BRB, 2BJV, 1CMF, 2BG, 2COS, 8ZG.

By W2JN.—G6DH, 2OD, 2CF, 5ML.

On the 16th G2FN logged the 1st, 2nd, 4th, 5th, 6th and 8th districts. On October 14, W2JN was received by FOA7Q R9. EI17C was called by W1CMF at 1555 G.M.T. on December 16, also G2FN by the same station at 1628 G.M.T. EI17C lost this contact through fading being bad.



## Activities on 28 m.c.

This record of activities on the 28 m.c. band really starts on November 25, and continues until the end of the year. Since the last notes were written, G5ML has appeared with a 28 m.c. transmitter, and made quite a splash of things from the very first time the key was pressed, which resulted in a call from W2JN. If that isn't luck——!

Taken on the whole, December was not a good month, with the exception of the 16th, which has been hailed as being about the best day for W stations for some time. More W stations are appearing on the air every week-end, also there is a slow increase in the number of G stations. All to the good, we shall one day have the 28 m.c. band as full as was our beloved old "45 metre" band.

That low power station, G2FN, has been at it again, though he has not spent so many hours at the key as some others have. On December 9 he worked WICMF, using 10 watts, on the 16th WICMF and W2BG with 9 watts, and on the 24th W2JN also with 9 watts. W2JN is doing simultaneous transmission on 10.56 and 10 metres (his figures); both are CC, but do not appear to come through at the same time.

G5VL has worked a few East Coast stations: WIXAM, W2BG, and W2JN. His calls heard lists are to be found below.

G5ML has worked W2JN, many times, and WICMF. He uses about 20 watts to a DO/40 valve, and a 15 ft. vertical antenna.

On December 2, G6CI noticed that for about half an hour about 15.00 G.M.T. no signals were heard, but they reappeared after 15.30 G.M.T. until about an hour later, when they all faded out.

G5YK noticed a slow fade-out extending from 1500 to 1530 G.M.T. on the same day, but did not note the re-appearance. He has had an unconfirmed report of reception by W2JN, but had no contact.

G6LL worked W2JN and W1COS on the 16th, which he states was the best day for a month, except for very bad fading which caused him to lose contact with both stations.

G5WK has been called by W2BG, but did not obtain contact; better luck next time, OM.

It is known that many other stations are using the 28 m.c. band, but they have not reported to headquarters, G6LL or G5YK, who prepare these notes. Will all stations using this band send in a report of their activities each month, so that these notes may be a true record of work done.

The February issue of the BULLETIN is to be a great 28 m.c. number, packed with all sorts of information about work on this new frequency and descriptions of some of the successful stations.

Calls heard on 28 m.c. during December:—

By BRS190.—W1AQD, 2JN, 2BG, 2BRB, G2FN, 2OD, 2CX, 2KF, 2NH, 5BY, 5HS, 6SM, 6HP, 6LL.

By EI13D.—W2BJ, 2BG, 1AQD, 1CMF, 1COS.

By BRS208.—G5LS, 5HS, 5BY, 6LL.

By EI17C.—W2JN, 1XAM, 2BJV, 2BRB, 2BG, 1CMF, 1COS.

By BRS25.—W1XAM, 1AQD, 1CMF, 1BVL,

*(Continued in previous column.)*

## Membership.

### NEW MEMBERS.

- J. MEARS (2ATD), 30, Elm Road, Grays, Essex (correction).  
 E. NICOLA (HBXX), "Villa Neerlandia," Lausanne.  
 A. C. GRIMES (2BVR), 67, St. John's Road, West-cliff-on-Sea.  
 P. BLANCHON (EF8WC), "La Rochette," per Four-neaux (Creuse), France.  
 H. HAZELDEN (2ALD), 41, Oakhurst Grove, E. Dulwich, S.E.22.  
 H. J. HUGHES (5RP), c/o Hughes & Watts, Ltd., Woodchurch Road, Birkenhead.  
 E. T. MANLEY (2FU), 49a, Arthur Road, S.W.19.  
 W. M. HALL (ZL2BH), 65, Wright Street, Wellington, New Zealand.  
 C. BRATESCU (CV5AF), Str. St. Elefterie 45, Bucarest 6, Roumania.  
 Lt. N. G. NEWELL (AYB), Royal Signals Mess, B.A.O.R., Wiesbaden.  
 E. F. KOCHLER (W9BEU), 9,032, Windom Avenue, St John's Station, St Louis, U.S.A.  
 D. C. WHITBURN (5BY), Box 920 H., G.P.O., Adelaide, S. Australia.  
 C. GRUNDY, 234, Rishton Lane, Bolton.  
 S. A. COUTTS, 1, Church Road, Horley, Surrey.  
 L. R. SEAL, 28, Dovecote Lane, Beeston, Notts.  
 F. J. GREER (VPG), G.P.O., Accra, Gold Coast.  
 M. GIBSON (2BAA), Beaufort, Hatch End, Middlesex.  
 A. FEITH, Vienna XIX, Furfangasse 3, Austria.

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

- 221.—S. W. R. HOWELL, Portland Hotel, Hove, Sussex.  
 222.—E. J. ROSENBERGER, 35, St. Mary's Mansions, W.2.  
 223.—C. GRUNDY, 234, Rishton Lane, Bolton.  
 224.—S. A. COUTTS, 1, Church Road, Horley, Surrey.  
 225.—L. R. SEAL, 28, Dovecote Lane, Beeston, Notts.

## Transmission Times of PCJJ—31 Metres.

EFFECTIVE AS FROM DECEMBER 6, 1928.  
THURSDAY.

18.00 to 20.00. Transmissions for India, Europe and South Africa, in English.

23.00 to 24.00. Transmission for Spain in Spanish.

FRIDAY.

00.00 to 01.00. Transmission for Brazil in Portuguese.

01.00 to 03.00. Transmission for South American Republics in Spanish.

18.00 to 20.00. Transmission for Europe in English.

SATURDAY.

00.00 to 01.00. Transmission to Dutch West Indies in Dutch.

01.00 to 04.00. Transmission for Central American States and British Possessions in English, French and Spanish.

04.00 to 06.00. Transmission for Australia and New Zealand in English.



## Notes and News from the British Isles.

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

1. Head the report:—  
District Number.....  
Area Representative .....(G...).  
Address.....
2. Refer to each station as G—.
3. Refer to wavebands as 56000 KC, 28000 KC, 14000 KC, 7000 KC, 3500 KC, and 1750 KC.
4. Subdivide your reports if you have appointed "county representatives," heading each one as follows:—  
(County).  
Representative ..... (G.....).  
Address .....
5. Use only abbreviations recognised by the International Convention at Washington.
6. Omit "asides" as much as possible.
7. Forward to H.Q. all reports by the 25th of each month.

### DISTRICT No. 1.

Representative: J. C. HARRISON (G5XY), "Highcroft," Ightenhill, near Burnley.

Well, I hope you have all had a very nice, happy Christmas with plenty of DX—and, if so, please let me hear about it. I think this area is easily the worst for reporting. There are plenty on the air—that I do know: I have a receiver! But send in those reports. Of course, I suppose most are rebuilding for 1929 conditions, so there is some excuse this time, only let me see what you have been doing by next month.

G2AJC has just had a shack built. He is using a PM4DX for detector and a Pentode for L.F., and is troubled with threshold bowl. How about joining the CB?

G6AX has now a transmitter on 1750KC, using low power and an indoor antenna. He is running schedules with G5VN and G2AWH, and is getting good reports.

G5DC has nothing to report, but has the strength to lift a pen and lick a stamp to say so.

G2AWH is running a schedule with G6AX and is rebuilding his receiver for 28MC.

BRS195 has been grinding quartz and finds it not quite so easy as it sounds. His receiver is working well on 28MC, and he has heard 12 W stations and G5MQ. He has constructed a sliding "Rotor Condenser" which he finds very satisfactory.

G6QA is on the 7MC and worked G5XD on 0.16 watt and ET-TPW1 on 3 watts.

G5MS has had a fine few months on 14MC and has managed to work pretty well the whole world using his new Western Electric 250. He was reported easily the loudest G station in USA. G5MS did not tell me this, however, it was direct from W.

G5XY is busy organising trials for the Burnley Motor Club and making BC sets, though he has just got a Western Electric 250 which will not stop oscillating!

### DISTRICT No. 5.

Representative: D. P. BAKER (G2OQ).

I am pleased to say that a Midland Conventionette will take place at the "Hope and Anchor," Birmingham, on Saturday, February 9, 1929, at 6.30.

A good meal will be provided, and I am looking forward to a real good time and a record attendance.

A good attendance is assured as the Wolverhampton and District Radio Transmitters' Society are turning up in force, and it is expected that the Coventry Transmitters' Association will be well represented.

Will all members interested apply to me as soon as possible for tickets, price 3s 6d. inclusive. All will be welcome.

I have no reports for this month; this, I fear, is caused by Christmas festivities, which, after all, is a very good excuse, and I hope you have all had a really good time.

### DISTRICT No. 6.

Representative: G. W. THOMAS (G5YK), 169, Hills Road, Cambridge.

This is the first district report that it has fallen to my lot to write, and I am sorry to say it is a small one. The only active county in my district appears to be my own, but then we know

that can't be. We have in all about 60 stations in the district, and that without counting the AA men and the BRS stations. Now I want all of them to report regularly to me by the 20th of the month, and we'll soon show the rest of the country that this district, though small in numbers, is certainly composed of active stations.

Perhaps the fact that only Cambridgeshire is mentioned this month is due to the very good organisation work put in by G2XV in his office as sub-manager during the past few years. Until I see exactly the distribution of stations about the district, I do not propose appointing any sub-representatives. G2XV and G6CR have promised to act in the capacity of Assistant District Representatives: one of their duties will be to arrange anything to do with the social side of districts, as I myself have very little time in Cambridge, or in the whole district for that much, to see to such matters.

I think that all members of No. 6 District who were in the old Mid-Britain (East) Area will feel sorry that our old friend G6JV has been unable to find time to carry on the work of District Representative in the future. He was indeed a good friend, and we shall miss him. He and his colleagues did more for the general good of the district than most of us imagine; and to those, I am sure, every one of us extends his thanks, wishing them every success in the New Year.

### CAMBRIDGE.

G5YX has been busy, as usual, splitting up frequencies and getting "Freq." meter calibrated to exactly fine limits.

G5YX has not made any official report, but has been heard operating on the 20 band—early morning work has not been so prevalent at this station recently—(mornings are cold now, OM!)

G6CR still very secretly conducts mysterious researches on crystal control, and there is little information leaking out as to the activities inside the little "den" on the first floor at Parkside.

G2DB patiently awaits the arrival of a long belated LS5D—hence no activities here.

G5JO has been heard pushing out a nice clear-cut D.C. signal on the 20 band recently, he is a comparatively new convert to this frequency.

G2XV is still in the process of converting to crystal control, and every effort is being made to turn out a really solid and robust outfit, which will stay put when once it is put. A few QSO's have been effected with local "Yanks" on 20 and 5YK has been heard on 10, but nothing else.

It may be as well to mention here that I shall be relinquishing my office as Sub-Area Manager as from December 31, and it has given me great pleasure to be privileged to collect and write up the reports of the Cambridge "gang" for the past two or three years. Mr. Thomas, of G5YK, will, I believe, carry on with the good work from this date, and I sincerely hope you will all give him the excellent support which you have bestowed upon myself in the past.

73 es best DX to you all.

GERALD A. JEAPES (2XV).

### ESSEX.

G5OK busy on 164.88 C.C., but most of his spare time occupied by the radio trade.

G2ABK also busy as above, but will be rebuilding G5QK after it has been on show at the Southend Radio Society's Exhibition in January.

### DISTRICT No. 8.

Representative: H. C. PAGE, New Gardens, Teynsham, Kent.

G6LK, although only granted a full ticket last month (November), has done some excellent fone work. He has worked eight countries using an input of 9 watts, the best report being from CTICK, who gave him R8 and F.B. modulation. The above fone work is carried out on the 7,000 K.C. band, and all reports will be welcomed, and answered. He also hopes to be trying out fone on the 14,000 K.C. using C.C. before long.

G5WP sends in his first report! This station is working exclusively on 14,000 K.C. band. After three years of trying he has at last worked W Districts 1, 2, 3, 8. Also worked NC 1 and 2, using QST 1929 transmitter.

G6GS also sends his first report. Another QST 1929 transmitter here. W also worked at this station. Best report from here being R5, using 6.6 watts. All reports received give C.C.! This station also works on the 160 meters on Sundays, using C.C., and is anxious for contacts and reports.

G5RS is now using D.C. mains for supply. He is working mostly on the 7,000 K.C. band. Best DX on this frequency being AV, who reported R4. Some fone work is done on 160-meter band on Sundays.

G6FZ will only be heard working occasionally.

G2BUW failed to pass P.O. morse test in receiving so is still "A.A." Is now swatting the code very hard and hopes to get through test next month. Now also busy building 7,000 K.C. transmitter in readiness for full ticket. At the time of writing (December) has not much time for ham work owing to Christmas rush in the radio trade.

NOTE.—I should like to take this opportunity of thanking all the above "hams" who have been good enough to send in reports, and I hope that they will continue sending same every month. I trust that the Surrey Notes will continue to grow bigger and bigger, and please let me have them by the 17th.—G2BUW.



**DISTRICT No. 8.**

Representative: C. W. TITHERINGTON (G5MU), West Lodge, Moigne Combe, near Dorchester.

May I take this opportunity of wishing all No. 8 District members a Happy New Year.

**Berkshire.**

County representative. Offers, please.  
BRS149 has rebuilt his receiver, has several schedules going, and is willing to report on any fone station.

**Dorsetshire.**

County Representative: G5MU, address as above.  
G2BFA is busy grinding quartz, also forming a CB group to study quartz problems. He has made a picture receiving set; converted an old phonograph into a recorder; results are very good.  
G5MU is grinding quartz and has harmonic CC on 14 MC.

**Wiltshire.**

County Representative: Col. W. PALMER (G2BI), "Elm Field," Colne, Wilts.  
No reports received.  
I shall be glad to hear from all active stations in Hampshire, Berkshire and Wiltshire.

**DISTRICT No. 10.**

Representative: J. CLARRICOATS (G6CL), "Ciel," Hartland Road, Friern Barnet, N.

Happy New Year to all, and may we enjoy many good contacts with old friends, and make new friends by the same means.

North London amateurs, you are now a separate district—help to make it the keenest in the country; numerically we are second only to our Southern neighbours, but actively we are—I venture to suggest—far behind; let us change this during 1929.

For the information of all, the following is a list of stations known to be active; if I have omitted anyone, let me know. I'll apologise next month.

On 1,750 K.C.—G2AX, G6DP, G6FI, G6KW, G5UM, G5CD.  
On 7,500 K.C.—G6CL, G5QF, G6PP, G5HJ, G6UN.

On 14,000 K.C.—G6XN.

Several of the above stations are working on more than one band, but I have quoted the one on which most work is done. Now, do you think twelve active stations out of 130 odd licences is encouraging? I don't. Where are the stations of yester-year—G2SH, G2WJ, G5GU, G5UP, G5XO, G6PN, G6SC, G6TV, G2BZ, G2LJ, G2ON, G2SZ, G5AD, G5HS, G5KU, G6KJ, G6NR. Are you all out of the game? We want you back. HW cum OMS?

Just a postcard by the 25th telling me what's doing is sufficient or, if you wish, call me on radio or land line. Thank you.

Reports are scarce again.

G6PP keeps pegging away in his endeavours to WAC on 5 watts. His crystal-controlled signals are reaching out well when conditions are good. GI6YW, G6UN and G6CL visited him. Allen expressed his surprise at the excellent results obtained with such low power, and under so many difficulties.

G6DP sends his first report. He is experimenting with chemical rectifiers and finds jam-jars with aluminium and lead electrodes most suitable. He, like G6CL, has had excellent results with a Clearon 25 and obtains T8 reports consistently. He uses the rectified supply on his three-valve receiver, and obtains a dead silent background. Using eight cells arranged as voltage doublers, he can get 400 volts at 50 mils, without undue heating.

G2AX, G6UN, and G5QF have been rather inactive, the latter has been experimenting with moving coil speakers, whilst G6UN on the occasions he has been working, has been continuing his tests with low power.

G6CL had some 30 European and North African contacts, all over 1,000 miles, with an input of 5 to 7 watts, but no American contacts were established. It was noticed that, on the whole, very few British-American QSO's were effected, especially on occasions when the American stations were strong.

One of the most pleasant week-ends since "Ciel" started was spent with T. P. Allen on the occasion of his visit to receive the Rotab Cup. My appreciations are offered to Mr. Watts (G6UN), and Mr. J. W. Mathews (G6LL) for their share in the entertainment of our Contact Bureau Manager.

G5HJ is converting to crystal control, and is taking my advice and joins C.B. this month.

**DISTRICT No. 12.**

Representative: L. J. FULLER (G6LB), 13, Seagry Road, E.11.

G6LL is about the only active station in the area at the time of writing. He is still busy on 28,000 k.c., doing most of his work with W2JN. He uses 14,000 k.c. for arranging 28,000 k.c. schedules with American stations, and also runs a Sunday morning CC 'phone schedule with G5YK on 7,000 k.c.

G6FY finds 14,000 k.c. dud, but is now receiving on 28,000 k.c.  
G6UT also finds 14,000 k.c. dud.

G6LB is still QRT, but really hopes to be on the air again by the time these notes appear. He is evolving a receiver which will be the result of several months' work, and hopes it will be "the goods."

G6LB and G6FY wish to heartily endorse GI6YW's last month's CB note about Triotron valves. They have both been using the 2-volt dark-emitter type (TD2) for the last 18 months, and have yet to find a valve to give better results.

**DISTRICT No. 13.**

Representative: H. V. WILKINS (G6WN), 81, Studland Rd., W.7.  
Permit me to start these few notes by wishing all members of District No. 13 all the best of luck for 1929. It is hoped, with your co-operation, to regain our lost prestige as an area. Next month it is hoped that these notes will at least be doubled, so remember this, and let me have your reports at 81, Studland Road, W.7, by the 25th of the month.

G6JY, using new series-fed TPTG, raised EW on first call R6 on 0.8 watts on 7,000 k.c. band. Also trying hand generator.

G6VP attributes his fine DX to studying one wave only. He can use three aerials in one night if necessary. Reports conditions bad, but has managed to raise FO (six times), SA (twice), the usual W's, and heard in W five and six. Receiver working well on 28,000 k.c., but no licence for this band yet. Claims to have been first G to QSO FK.

G2ARV is very busy with apprenticeship as an electrical engineer. Reports 28,000 k.c. disappointing and has abandoned it temporarily.

G6WN has spent most of the month rebuilding for CC ready for 1929, so little to report. A few European QSO's have been made.

**DISTRICT No. 14.**

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

November has produced nothing very much worthy of comment. Conditions on all bands have been uniformly bad, with a tendency to get worse towards the end of the month. The writer has been "at the game" for a good number of years now, and cannot recollect a period comparable with the past two months for wretched radio conditions.

In future, in order to avoid confusion with the new general method of district numbering, I propose to designate Nos. 1, 2, 3 and 4 Scottish Sub-Districts "A," "B," "C" and "D" respectively, which please note.

I am sorry to record the departure of G6QF from "D" District. Mr. Robertson left at the end of the month for Manchester to take up employment with the Metro-Vic. people. He was very enthusiastic, and "D" can ill spare him.

The first monthly "rag-chew" took place at 5YG on November 28, when 2MA, 2WL, 5XQ, 6NX, 6WL, 6WZ and Miss Burns were present, and a very enjoyable evening was spent trying to make 5YG's C.C.T.X. "do its stuff."

"B" District gives no indication of life, and "C" District can only produce regrets from its officer that he has received no reports. Now 2AP, 6VO, 6IZ, 2SR, 5GK, 5NW and 5WT, whatever is the matter with you?

I understand that 5JK, of "B," who has been at sea for a number of years, has received an appointment with the B.B.C., and is at present located at 2BD.

6MS, who is also a sea-going operator, and is at present on a sister ship of the ill-starred "Vestris," which runs between New York and Brazil; he expects to be home for a spell in a month or two, and will put his amateur TX in commission immediately on his return.

Does anyone know the correct QRA of G6OW, as all letters to him come back via the D.L. Office?

I am sorry to report the definite loss of our "GC" intermediate. It was hoped that we might retain this under the new conditions, but negotiations with the G.P.O. have proved its retention impracticable, and we must now fall into line with other "G" stations.

**"A" DISTRICT.**

Representative: A. T. WILSON (G2WL), 206, Newlands Road, Cathcart, Glasgow.

2MA has put in a pretty strenuous month, and with considerable success. He has been experimenting with raw A.C. as applied to a crystal-controlled TX, and has had surprisingly good results, with an input of about 3 watts. He is increasing his power shortly, and hopes to use his full 10 watts, making use of the A.C. mains and a chemical rectifier. He finds 5YK's method of earthing the coil centres considerably improves his efficiency; also that an air dielectric grid condenser further improves results.

2WL is still very QRL, and cannot find much time for his amateur work. He is trying to get a permit for the 28 MC band.

2FV also QRL, but has done little building for C.C.

5YG temporarily QRT owing to motor and generator troubles. Has abandoned A.C. filament supply to the TX, as it has been found absolutely impossible to get a carrier free from modulation when using 25 cycle A.C. for the filaments (even with C.C.).

5XQ has not reported, but is known to be rebuilding his RX and TX, and was heard once or twice "testing out."

6NX has succeeded in getting a nice C.C. signal, and appears to be getting out well.

6WL has done a fair amount of C.C. experimental work, and is also putting out a very good signal.

**"C" DISTRICT.**

Representative: J. B. STURROCK (G6KO), Kirkbuddo, Forfarshire.

5WT has applied for his licence under the new conditions, but does not seem able to work up any further enthusiasm at the moment.

5NW and 5GK are known to be active on "fone," but neither has reported.



6KO has got his generator back, and has done a little C.C. work. He is very QRL with matters not connected with radio, but hopes shortly to have a transmitter going on the 14 MC and 28 MC bands.

#### "D" DISTRICT.

Representative: J. S. BAMFORD (G5JB), 44, Findhorn Place, Edinburgh.

5JB has just finished building a new C.C. TX for the 7 MC band, and will shortly be on the air again working QRP tests.

6QF has not done very much apart from a little "fone" work. He leaves for Manchester in December.

6UU has found very little time for experimenting this month, business having occupied most of his time.

#### DISTRICT No. 16.

Representative: C. MORTON (GI5MO), "Simla," Glastonbury Avenue, Belfast.

The past month has been one of reconstruction and crystal grinding, and there has been little activity "on the air" among the GI's. Here are the reports:—

2WK is crystal grinding and hopes to be transmitting in the 14 MC band soon. He has done some interesting work recently in the way of picture reception, which has been more or less successful.

5WD is very much occupied with business and has little time for radio. He has nothing to report.

6SQ is now settled at his new address—7, Parkmount Road, Belfast. He is getting his gear fixed up gradually, and hopes to be "on the air" again soon.

6YW reports "cobwebs on the key" due to QRM from C.B. and other work. He is very busy making a BCL set with complete AC elimination, including a moving coil speaker.

6WG has been endeavouring to get on to crystal control, but has only had partial success so far. He has worked a fair number of Europeans on 7 MC during the month.

6TB has nothing to report.

5OT had his first contacts with a number of European stations this month, using an input of 8 to 10 watts. His aerial is in a very exposed position, and the recent stormy weather has been upsetting things badly.

5MO.—A valve rectifier is now installed and is a vast improvement over the old chemical "box of tricks." A small amount of 28 MC reception work has been done.

6HI has nothing to report owing to pressure of business.

## Notes and News from British Dominions.

### Channel Islands.

Representative: A. M. HOUSTON FERGUS (G2ZC),  
La Cotte, St. Brelades, Jersey, C.I.

Very little work has been done in this district of late, though all seem busy getting ready for the new conditions.

It is with deep regret that I have to record that G5WZ has given up his transmitting licence, as he is specialising in receivers and M.C. loud speakers. He is our oldest transmitting licence holder.

G6PU, G6HZ, and G2ZC are all preparing for crystal control, while G6OX has also applied for his new licence, but I do not know if his station is to be C.C. or not, and I have not yet heard from G5GW, who will not be home on leave for another year or more.

The only station that has been on the air has been G2ZC, who has two new transmitters built to test out the merits of High C as against High L, and so far the results have been reported as exactly the same in every way. Both are C.C. one being TPTG, series, L.C. to a harmonic aerial, and the other the same circuit, but D.C. to an "end-on" Hertz aerial, the frequency used being 7,100 KC.

### Irish Free State.

Representative: COL. DENNIS (GW11B).

There has been considerable activity amongst GW's during the past month, and I am glad to be able to report that all three stations working on the 28 M.C. band have now got over the pond, 13D with 10 watts to an L.S.5 valve having worked W2AER (R3). Conditions on 7 M.C. have generally been reported good, although at the writer's station they have only been so on a very few occasions, whilst 14 M.C. has been bad everywhere. I hear that all GW calls are shortly to be changed in accordance with the new regulations. I have again to thank 17C for his assistance in collecting reports.

14B has not had much time for the key, and has nothing of interest to report. He is awaiting delivery of the crystal which he has on order, and meanwhile contemplates MO on 7 M.C.

16B has been building a completely screened receiver, and remains to be convinced of the advantages of screening! He has consequently been little at the key.

17B is inactive at present.

18B, using MO on 7 M.C., has worked W 1, 2, and 3 dists., as well

as FM's 8RIT and 8GKC and sundry Europeans. On 28 M.C. he was called by W2TP, but fading prevented a QSO.

19B has not been heard for a long time. (Where are you, OM?)

15C has been doing some listening on 28 M.C., and is experimenting with CC on 7 M.C., using 2SZ's circuit. He has had some trouble, but hopes to be definitely CC very soon.

16C has been little at the key, having been building a transformer for 450v. full wave rect. A.C.

17C still testing CC on 7 M.C., and has kept a daily sked with OGRA, a Danish ship, during its voyage from Dover to Malta. He reports DX on 7 M.C. as being very good, and has worked AG seven times, several FM's and EU's, and has reports from AT, AP, AS and FE amongst others. On 14 M.C., with the exception of a QSO with AQILM, conditions have been almost "dud." On 28 M.C., W2JN has been worked twice, R4, and reports have been received from W2ACN and W2BVG. He was also called on the 16th inst. by W1CMF, who replied to his test call, but fading prevented a QSO.

18C on 7 M.C. has been working 'phone to Europe, and getting good reports. He has worked FM, this being his fourth continent.

11D reports only European work on 7 M.C. Has worked TP on 14 MC. 12D has not been very active.

13D on 7 M.C. has worked only European stations, and on 28 N.C. W2AER, R3, as mentioned above.

11B has nothing of interest to report. He is CC using the fundamental of the crystals at the lower end of the 7 M.C. band, but is at present quite swamped by a "spreading" German commercial station working almost continuously on a wave-length just below him.

## Change of Calls of Amateurs in Irish Free State:

AS FROM JANUARY 1, 1929.

Old Call.	New Call.
GW11B	EI2B
" 12B	" 3B
" 13B	" 4B
" 14B	" 5B
" 16B	" 6B
" 17B	" 7B
" 18B	" 8B
" 19B	" 9B
" 12C	" 2C
" 13C	" 3C
" 14C	" 4C
" 15C	" 5C
" 16C	" 6C
" 17C	" 7C
" 18C	" 8C
" 19C	" 9C
" 11D	" 2D
" 12D	" 3D
" 13D	" 4D

## Notes and News from Europe.

### Germany.

By E. REIFFEN.

The DX people say that conditions did not improve appreciably during the past month. DX work on 7 and 10½ mc. was fair. On 14 mc., as during the previous month, it was very variable. According to the new German regulations no "D" is allowed to use raw AC from January 1, 1929, onwards. A similar action on the part of all other countries is desirable.

German hams are greatly disturbed by the long hours of working of broadcasting stations. A solution to this problem has been found by some DX hams in the use of a QRP transmitter using at the most 5 watts, and which causes no interference to BCL's. Even with this power it is possible to have a good number of QSO's during the daytime.



The great majority of D's are still unlicensed, but the licensing question is in the process of development so that a satisfactory conclusion will probably be reached early in 1929.

The DX hams have rebuilt their transmitters in readiness for the new conditions. Some are concerned with tests on 28 mc. A prize of two transmitting valves will be awarded by the D.A.S.D. to the station accomplishing the first Germany-U.S.A. QSO on this frequency.

The year 1928 is over. We wish all hams a happy New Year and best DX on all bands. May the "ham spirit" long continue. 73 to all.

## Czecho-Slovakia.

By L. VYDRA (EC2YD).

DX conditions during October and November seemed to be very bad in Czecho-Slovakia.

A series of QRP tests were organised by the 2nd District (Moravia). These were from December 25, 1928, to January 1, 1929, when all amateur transmitting stations situated in EC2 used a maximum input of 5 watts.

A transmitting station occupied by Elektra Lamp Works is working on 70.3 metres every Friday from 18.00 G.M.T. This station transmits regular lectures or Morse code for shortwave beginners. We want reports about these tests concerning QSA, QRH, QSS, modulation, etc. Input of this station is 500 watts and will shortly increase to 1 kw. probably.

Most of our stations are rebuilding for 1929.

The Editor regrets that owing to the late arrival of these notes he was unable to publish them in the December issue, when our members would have been able to co-operate in their low-power tests.

## Holland.

By J. H. KOEN (M.Sc.).

Well, fellow members, let me start my monthly talk by wishing you a happy New Year. I hope that the 1929 "narrowed conditions" will give us the same good chances in radio experiments as we had in the years that now have passed away. Perhaps January, 1929, will bring us the end of our "pirate" life. At the time when these few words are written all transmitting amateurs in Holland are eagerly looking for that one splendid Christmas gift—transmitting licence.

The month of November was a very bad one for DX. After dark all signals faded out, only early morning hours being good for long-distance work. Interest in 28 mega. cycles is growing. Only three stations are known to be testing. They are  $\phi$ VN,  $\phi$ CX and  $\phi$ CM. All three have heard each other's signals, but contacts have not yet been established. The power of  $\phi$ VN is something about 80 watts.

## Denmark.

By H. PETERSEN (OZ7SP).

We have the pleasure to inform our foreign friends that the new regulations for this country have at last appeared from our General Directory for Post and Telegraph Service. The regulations, which, of course, are based upon the regulations carried by the Washington Convention of 1927, are as follows:—

WAVELENGTHS.—The wavelengths or bands permitted for amateur work are:—

Kilocycles.	Metres.
1,730	173.4
1,830	163.9
1,930	155.4
3,830—3,990	78.3—75.2
7,010—7,290	42.8—41.15
14,120—14,380	21.4—20.86
28,030—29,970	10.7—10.01
56,100—59,900	5.34—5.01

FREQUENCY.—The waves sent out must be as free from harmonics and as constant as technical development makes it possible. Use of raw or insufficiently rectified A.C. for plate supply and keying by spacing wave is prohibited.

CALLS.—In future Danish calls will consist of the prefix OZ, followed by one figure and not more than three letters. Present calls may be kept unaltered, except that the intermediate ED is replaced by the prefix OZ. If, however, a shorter call is wanted it may be changed upon application for a call only consisting of OZ, one figure and one letter (like f.inst.OZ2C).

All general regulations covered by the International Radio Convention must be maintained.

Conditions in Denmark are not good at present. Owing to very heavy "skip" it is almost impossible to make QSO's with near-by countries during the time in which our hams are permitted to transmit. Only Spain, Italy, and USSR, and now and then a single British station are heard. 00.00 to 01.00 G.M.T. seems to be the best hour for W-QSO's.

The year 1928 has gone. We wish all our foreign friends a happy 1929. May the New Year bring to you the best DX you ever had, and may we have opportunity to show you what is meant by real ham-friendship and ham-spirit.

## Correspondence

### "CRYSTAL SNAGS."

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

DEAR SIR,—The writer does not pretend in any way to be an authority on Quartz crystals, but the following experiences may help those hams whose one ambition is to get on the air using "crystal control." There seems to be quite a revival in the Quartz lens or pebble industry, and let it be whispered that it is known that the manufacturing opticians are wondering why! Most of us have either purchased or borrowed some quartz pebbles and having tested same for piezo electric effect, found with satisfaction that one or two of them have possessed good oscillating properties. We at once proceed with care to grind them down in most cases to about 1.75 mc. or so, in order that we may utilise the various harmonics in our bands. As a rule all goes well, and we get our crystals operating quite well on or about 1.75 mc. Not being satisfied, we think that taking great care to keep the two faces as near parallel as possible we can go on grinding our crystals to about 3.5 mc.; this, in the writer's experience, is just where the heading of this letter emphasises itself and where most of us begin to court trouble. After experimenting with many crystals which have been ground down to approximately 3 mc., and which have shown quite good oscillating properties on a lower frequency, they have ceased to oscillate when the frequency is raised. I then made it my business to investigate. These imperfect crystals were re-polished on one side only, and by means of some reflected light obtained from a paraffin lamp I was able to look for any twinned portions that might be present. (A paraffin lamp is better for the purpose than electric). The mystery was solved, for to my great astonishment those lenses that showed no signs of any twins growing within before grinding were literally full of them and apparently manifest themselves only as the lens gets thinner. These twinned portions in the writer's experience do not appear to have quite the same crystalline structure as those which can be seen in a thicker crystal, but seem spear-pointed and have no geometrical appearance. This peculiarity is very misleading unless one is fortunate enough to be the possessor of some Iceland spar, when the twinned portions can readily be seen at the commencement. However, as the price of Iceland spar is just as expensive as a 3.5 mc. crystal obtained from many firms ready calibrated, it is not worth while purchasing same unless much time is to be devoted to crystal research. The writer's advice to those who contemplate grinding their own crystals is to get it down to about 1.75 mc. and not to attempt to exceed that frequency.

G. E. JONES,

G6XB.

## QRA Section.

By M. W. PILPEL G6PP.

A few additional QSL agents' QRA's and changes of address came to hand just too late to be included in the list last month, so they are appearing below. It should be specially noted that cards for some countries, where unlicensed transmitters exist, must be sent strictly under cover, and no mention of "Radio" must be made on the envelope. Care should also be taken to make the packets of cards as light as possible, so that the suspicions of the authorities are not aroused, otherwise disastrous consequences for the unfortunate recipients will almost certainly result. Please make a note of these "under cover" countries, they are: China, Czecho-Slovakia, Egypt, Estonia, and Rumania.

I should like to thank all those members who have kept me informed about new QRA's during the past year. I appreciate their help and trust that I can rely on them to carry on with the good work during 1929.

Swedish amateurs have just had their calls altered to conform with the Washington regulations, and they now consist of the old call signs with a numeral inserted between the second and third letters. The stations are divided into districts, ranging from "1" in the far North to "7" in the South. Thus old SMVE becomes SM7VE, old SMTIC now SM5TC, etc., etc.

## QSL Section.

By A. HINDERLICH, G2QY.

That's better. I've only got 6 lbs. weight of undelivered cards on hand, and the weight has stopped increasing. Will every active station



that has not, within the last two months, received a notification of the number of envelopes at QSL Bureau, treat this as a reminder that there are none, and send in a fresh supply to lighten the work here, and save being mulcted in the sum of sixpence? Thank you.

I have been able to make arrangements whereby cards for every active licensed station (including the "hush-hush" ones) will be sent to them once, together with a notification that further batches must be claimed from the R.S.G.B. By the time this appears I shall have started sending undeliverable cards back to the senders. If any of your cards come back you may be pretty sure that the intended recipient does not want them, as he will have had at least one, and probably more, opportunities of claiming them.

With regard to foreign countries, additions to the list of QSL agencies abroad appear under QRA Section notes, but if you prefer to send cards to them, please be very careful about two things. The first is to put enough stamps on the envelope, and the second is to use proper covers. "Under cover" does not mean a cheap envelope addressed to "Radio WX 1/2, YZ."

Judging by the response to my remarks last month, the change-over to the new nationality letters is going to be quite easy, and by the time these notes appear I shall be sending cards to the legal owners of the nationality letters, for them to have first pick and pass the remainder along to the other country if they wish.

I would like to take this opportunity of thanking you for re-electing me to this job, and of showing my appreciation by asking for help in forming a strong sub-committee to provide the ginger. G2CX has consented to serve, though knowing he will have to come all the way to Hampstead occasionally, but more volunteers are wanted. Please don't be shy!

#### QSL AGENCIES.

Supplementing or correcting the list which appeared last month.  
 Egypt.—A. NAHMIS, 5, Rue Emad-el-Dine, Cairo. (Under cover.)  
 Norway.—"N.R.R.L.," QSL Section, Norsk Radio, Karljohansg. 5, Oslo.  
 Rumania.—SUBLT. C. BRATESCU, Str. Sf. Elefterie 45, Bucarest 6. (Under cover.)  
 Russia, Azerbaidjan, Turkestan, etc.—QSL BUREAU, CSKW ODR, Moscow, Ipatievsky per 14.  
 Sweden.—S.S.A., Stockholm 8, or DR. B. ROLF, Alsten-Stockholm.

## EXCHANGE & MART.

Rates 1d. per word, minimum 1s. 6d. Front line in capitals if desired. 2d. per word where all capitals are required. Minimum 3/-.

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

**G16JA** selling up. 1,000-v. 80MA B.T.H. Generator, L.T., 14-18-v., £4; little used DET 1, £2 10s.; 2 1/4 h.-p. Petrol Engine, £1 10s.; 80-v. 2.5 amp. Exide H.T., 10s.—Write G16JA, 60, Clifton Road, Bangor, Co. Down, Ireland.

**FOR SALE.**—"MACKIE" MOTOR GENERATOR, No. 27240, input 24 volts 5 amps., output 1,000/700 volts .04/.086 amps. Above has been fitted to bedplate by Messrs. Mackie, Ltd., and coupled to 200-volt 5,000 r.p.m. 1/4 h.-p. Motor No. 28583. May therefore be used as at present coupled on 200-volt D.C. mains, or unmounted from car batteries.—Offers to 6TH, Newport.

**WIRELESS WORLD,** Vols. 1-13 inclusive, bound, take Vols. 4 and 5 *Experimentlz Wireless*, bound or unbound, in part exchange.—Offers to NOEL, "Clevedon," Finchley Avenue, Chelmsford, Essex.

**FOR SALE.**—60-ft. Oregon Pine Wood Lattice-work Mast; triangular; 6-ft. base with pulley, 11 thrice insulated 7/18 Guy wires and double-ended straining screws; cost £10, accept £5 or best offer for quick sale; owner removing.—Reply to H. FLINTHAM, A.I.R.E., M.R.S.G.B., 50, Burton Avenue, Doncaster.

**FOR SALE.**—Mullard 0/20 Valve, debased, brand new, £1; Anode Dissipation, 20 watts at 400-v.; also Weston Moving Coil Relay, 5s.; also Silvertown Buzzer, 7s. 6d.; also Microphone Transformer, 2s. 6d., and Keystone S.G. Valve Holder, 1s. 6d.—Apply G6XC, 337, Anlaby Road, Hull.

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**GENUINE QUARTZ LENSES.**—Limited supply at 1s. each and postage. Also Selected Lenses with harmonics, 40-50 metre band, 3s. 6d. each; also one ready-ground will Control Transmitter with reaction, at present in use at G6XC, price 10s. Terms, C.W.O.—Apply G6XC, 337, Anlaby Road, Hull, Yorks, England.



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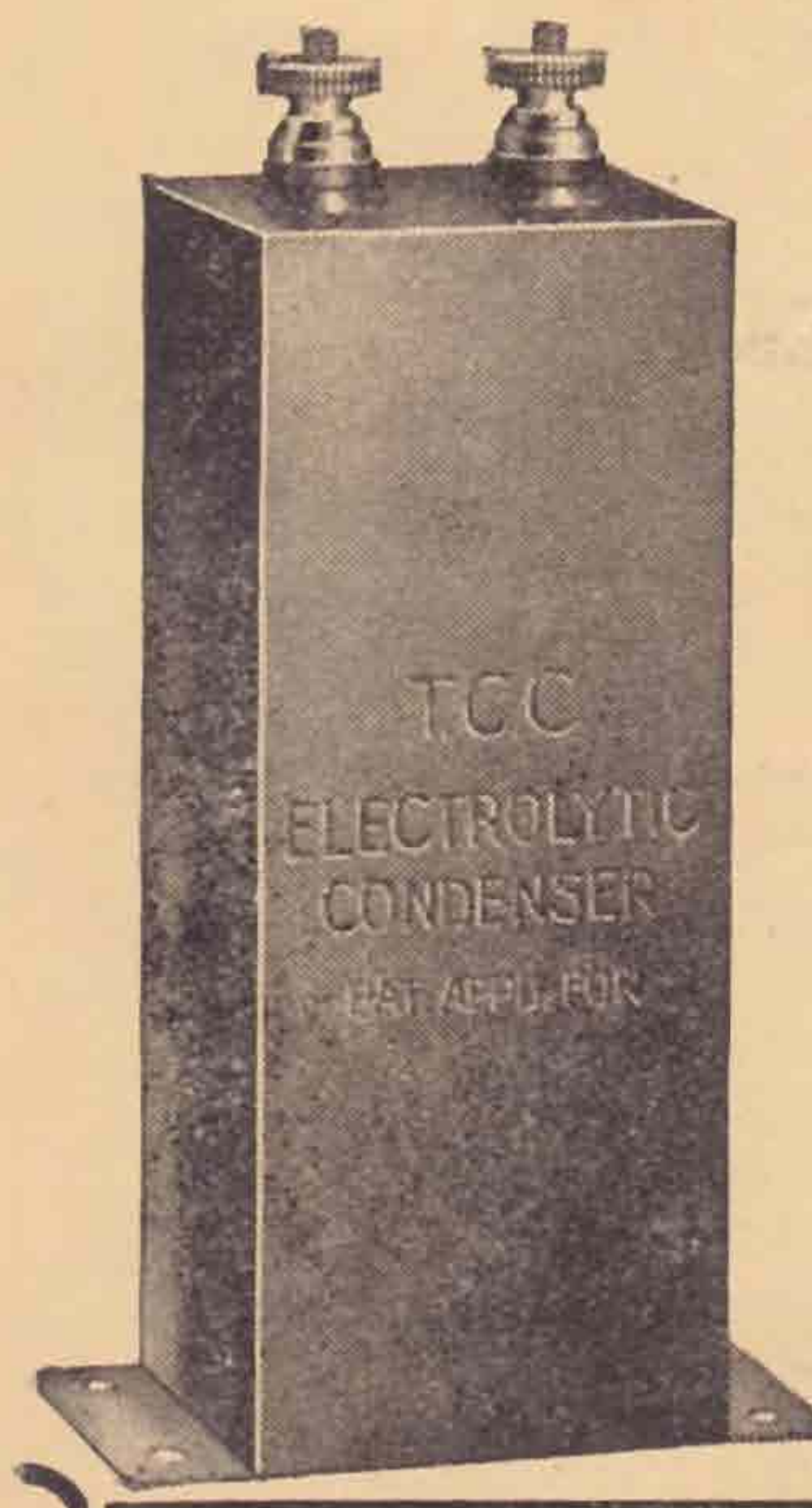
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