

THE T. &amp; R.

## BULLETIN

THE INC.  
RADIO SOCIETY  
OF GT. BRITAINAND THE  
BRITISH EMPIRE  
RADIO UNION

Vol. 7 No. 8

FEBRUARY, 1932 (Copyright)

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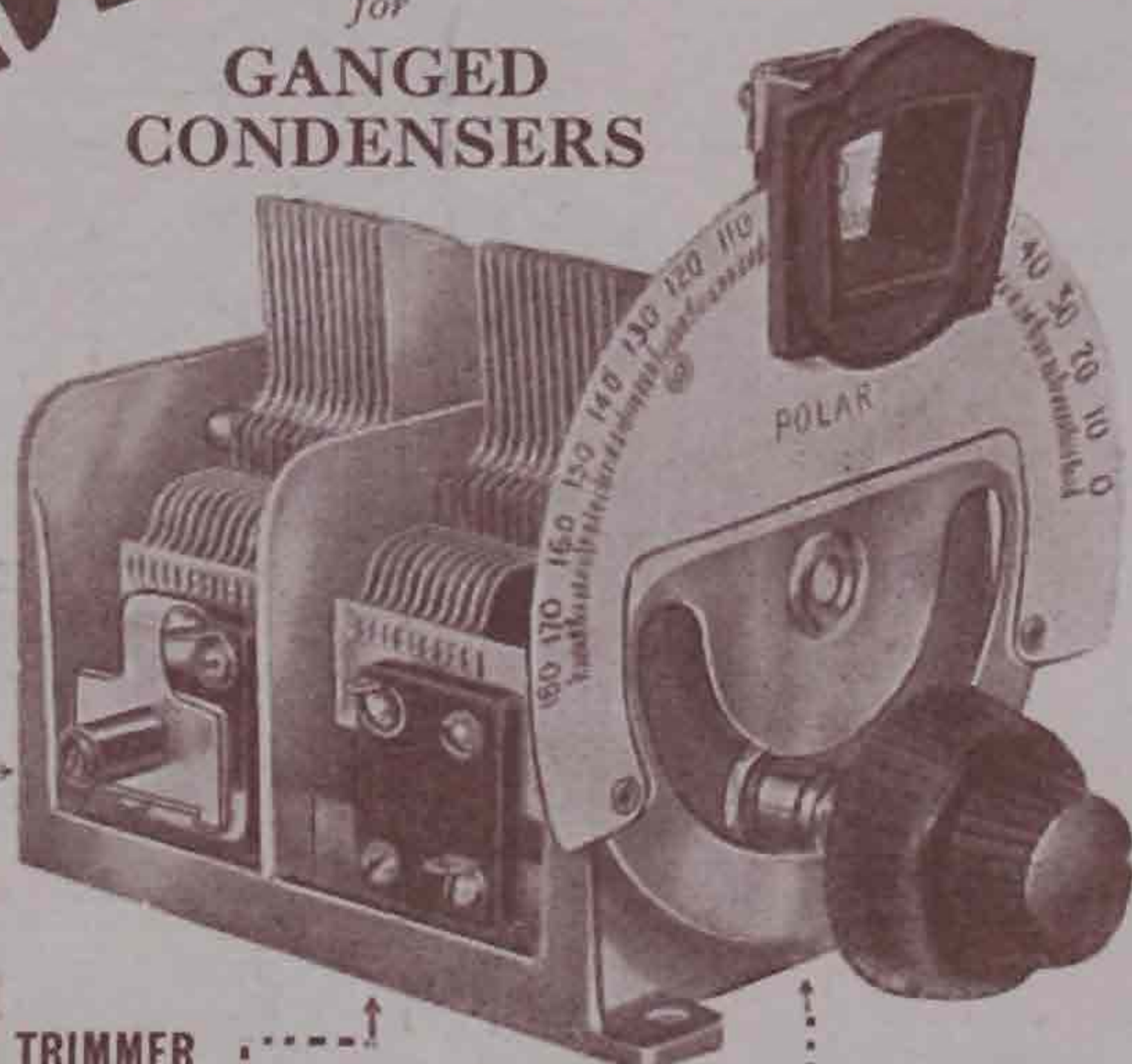
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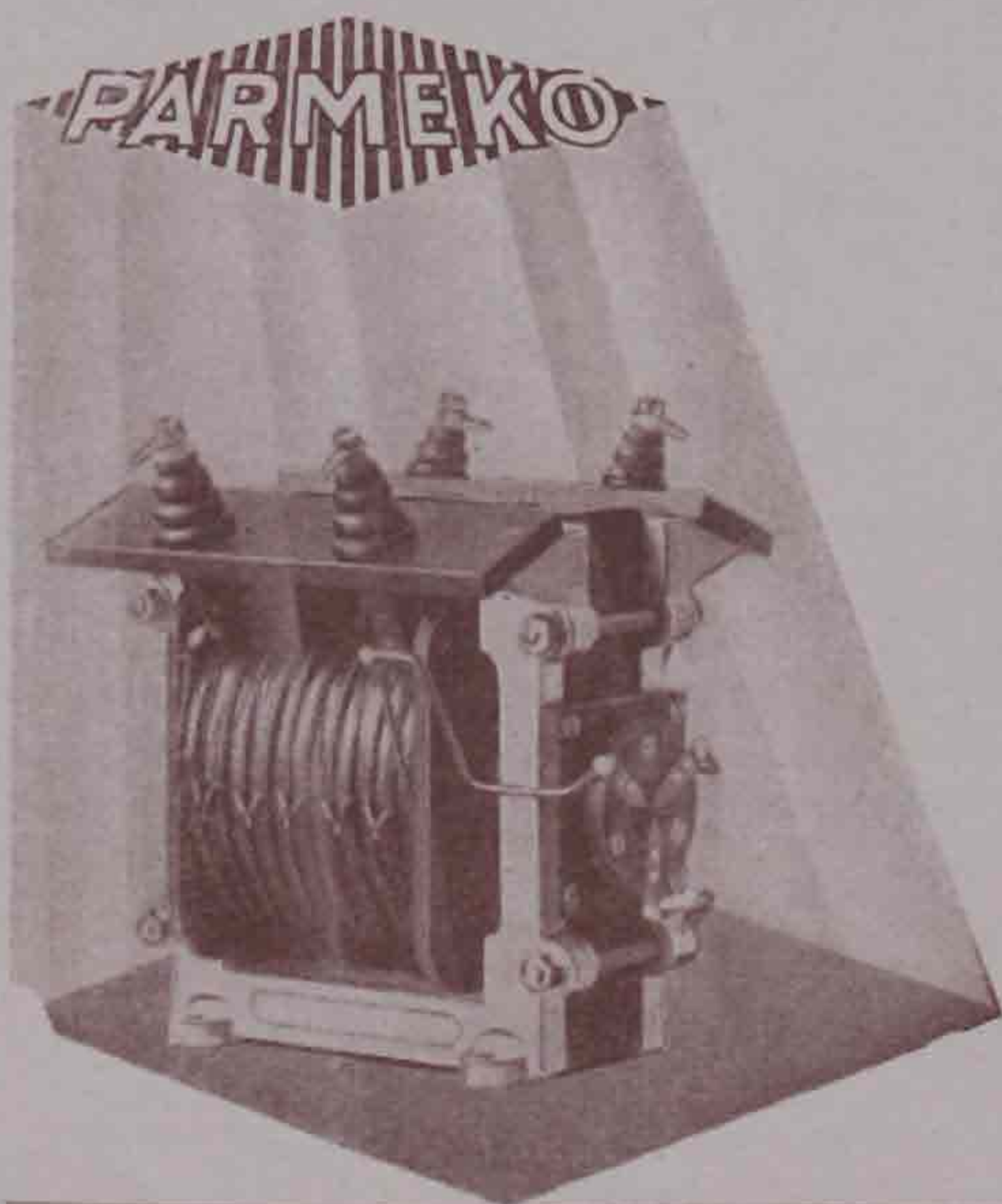
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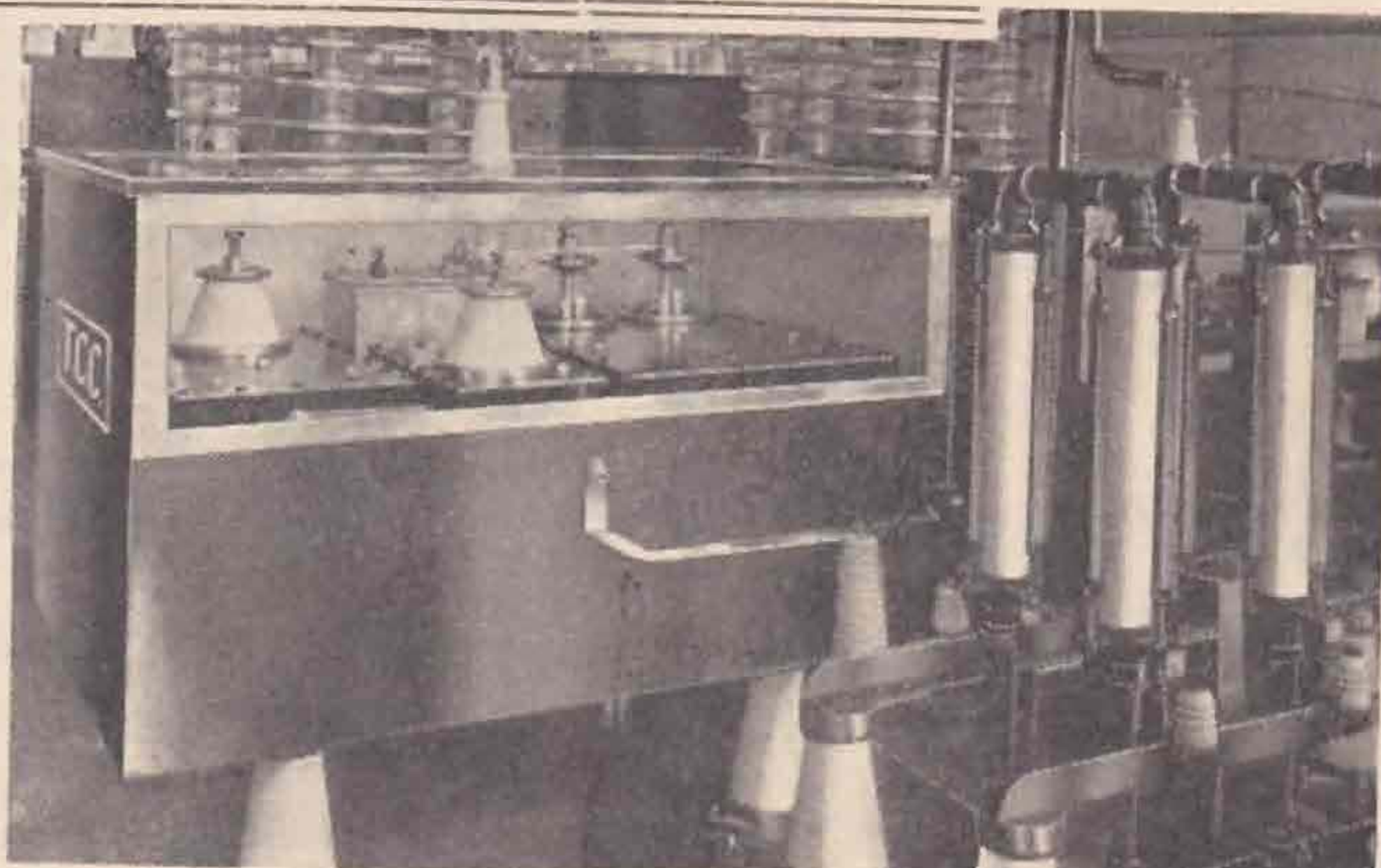
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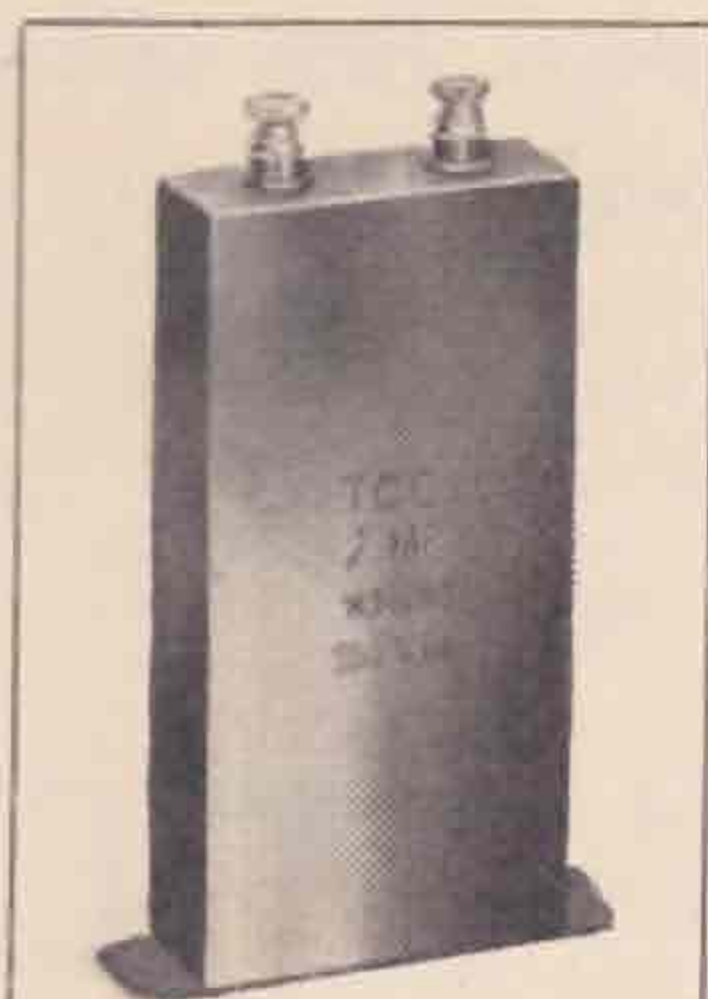
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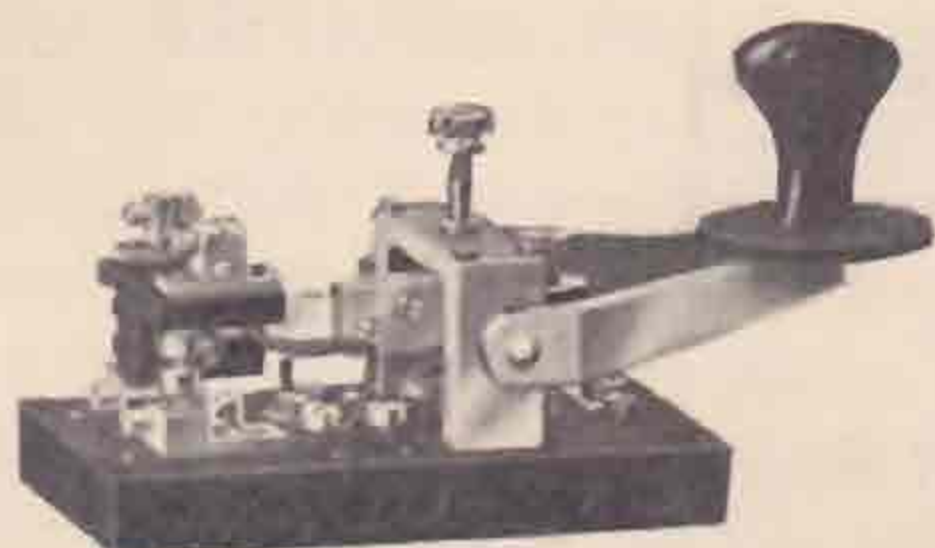
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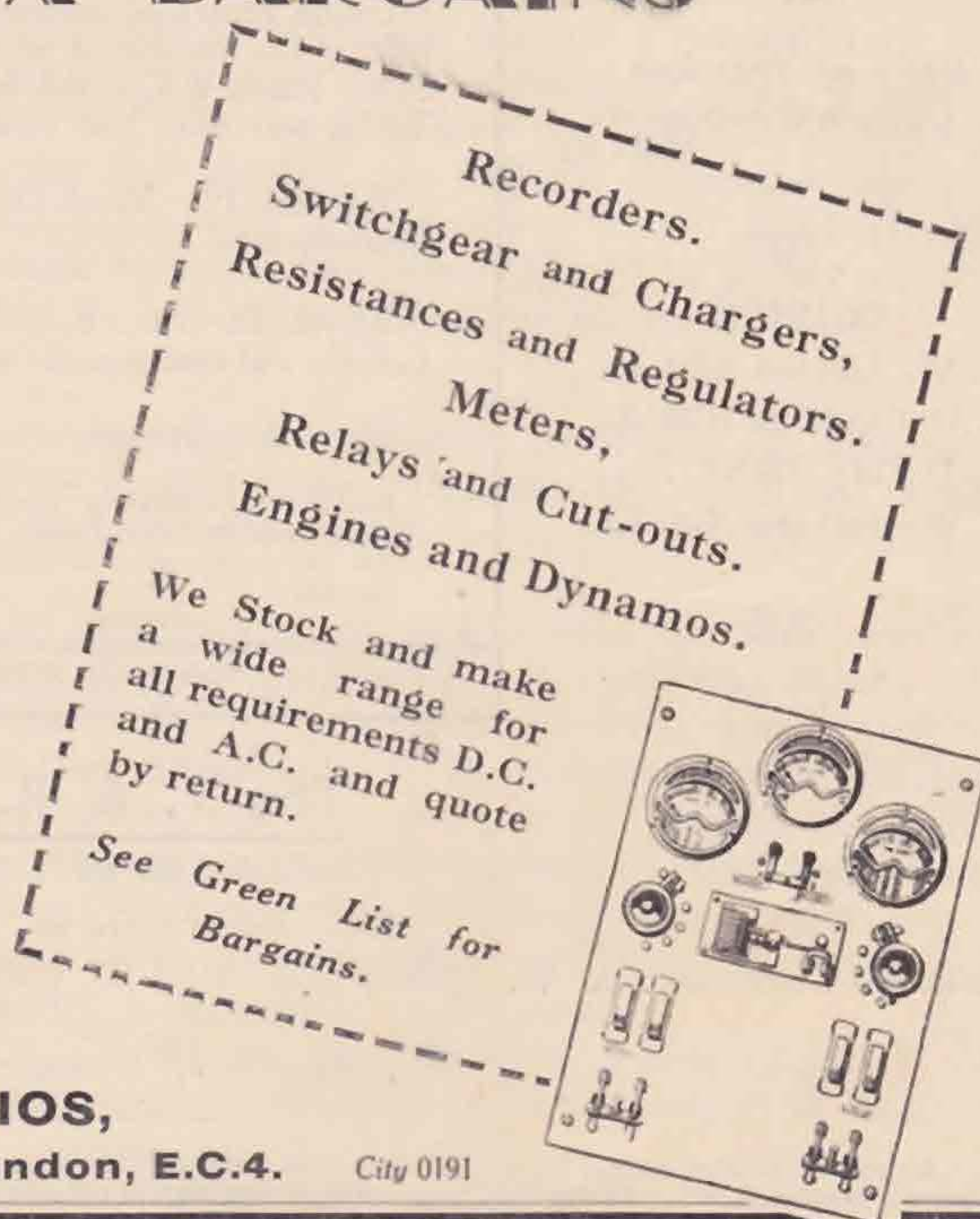
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**CALENDAR**



Unless otherwise announced all meetings are held at the Institution of Electrical Engineers, Savoy Place, W.C.2, commencing at 6.15 p.m. Tea is served at 5.30 p.m.

*February 19.*—Mr. A. D. Gay, on "Frequency Measurement."

*March 30.*—Mr. F. E. Henderson, of the G.E.C., will read a paper on "The Thyatron."

*April 22.*—Subject to be announced later.

*Details of forthcoming Local Conventionettes will be found under the District Notes Section as they become due. The full list appeared in the Convention Report, October BULLETIN.*



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*Provincial District Representative on Council:*  
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**The T. & R. Bulletin.**

*(Published on the 14th of the month.)*

*Hon. Editor:* G. W. Thomas (G5YK).

*Editorial Committee:* A. W. Alliston (G5LA), J. D. Chisholm (G2CX), A. D. Gay (G6NF), J. W. Mathews (G6LL), A. O. Milne (G2MI).

*Advertising Manager:* H. Freeman.



# Bulletin

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

FEBRUARY, 1932

Vol. 7. No. 8

## CLIMBING UP THE LADDER.

**T**HIS ladder has but five steps. The man on the lower rung has a Broadcast Receiver within reach, capable of listening to the B.B.C. programmes and, with luck, some foreign stations. The man on the second step can hang an R.S.G.B. Membership Certificate on its appointed hook on the wall and, with a two-valve Short Wave Receiver, can listen to amateurs conversing with one another in all parts of the world; he is BRS1001, and enjoys all the privileges of membership of the Society. On the third step he can just see into a room belonging to a transmitting amateur; the microphone is on its stand, the walls are covered with QSL cards, and in the corner stands the transmitter, while the operator at that very moment is talking to a friend of his in the Sudan. The happy man on the fourth rung has had his licence 48 hours now; he learnt the Morse code with the aid of the R.S.G.B. Morse practices, plus assistance from another transmitting member a couple of miles away, who helped him to attain the required speed and showed him how to build and operate a transmitter. He is in London and has just heard a Glasgow station calling; being a born optimist he replies, and he is now enjoying the thrill of his first QSO. On the fifth step our operator is serenely happy—he has held his transmitting licence for ten months, his W.B.E. Certificate has just arrived from Society Headquarters, and his application for a high power permit has been sent to his District Representative. His original single valve set has been replaced by a very efficient low power crystal control set, and he feels that he has known Amateur Radio all his life.

\* \* \* \* \*

Our Society can take a very active part in assisting its members to obtain the necessary transmitting licence and special permits and in giving advice through the medium of the BULLETIN in the construction of apparatus. Just how this assistance is given is dealt with in the following paragraphs.

First, for the benefit of non- (or very new) members, it should be said that all members who do not possess a transmitting call sign are allotted a BRS (British Receiving Station) or BERS (British Empire Receiving Station) number for identification purposes, which number is given up when they obtain a call sign, should their interests lie in the direction of transmitting. Such a number identifies them as keen experimenters, and transmitters are pleased to receive reports from such members as they know they can rely upon the information contained in the report. It is also of considerable use in clearing QSL cards rapidly through the Society's Free QSL Bureau. It is obviously much easier to file cards in a numerical sequence than by name. BRS1001 is far more readily recognised than Mr. J. B. Smith, of Clapham.

R.S.G.B. Morse Practices take place every Sunday morning, and are found of much use by our new members. The times of these practices can be obtained from the County or District Representatives.

Unless a BR Station is living out in the wilds he is practically certain to have a transmitting



member within reach in these days of easy and fast travel, and these members may always be relied upon to give such assistance as is in their power, or their time permits. In this way many BRS members have increased their Morse speed to the required twelve words per minute and learnt how to build and operate transmitting sets.

Before a licence is granted, the applicant has to take an examination in Morse Code at a suitable Post Office, and be able to send and receive at a minimum speed of 12 words per minute (both letters and numerals) for a period of five minutes. No further examination as to technical knowledge and capabilities is required in Great Britain, but sufficient information has to be given in the licence application to satisfy the Postmaster-General that the applicant is a *bona-fide* experimenter. Here, again, the neighbouring transmitter or the Society's official local representative can give useful advice to suit individual cases. (Forms of application for transmitting licences are obtainable from the Secretary, General Post Office, London, E.C.1, and, in this country, these licences are *only* given on the grounds of experimenting.)

Every English county has a duly appointed R.S.G.B. representative, and counties situated together geographically are bonded together under a District Representative. These representatives are the direct liaisons between Headquarters and the provincial membership, and are able to give the newcomer all the necessary information he requires, besides being in a position to put him in touch with the nearest active amateur.

The Society do not intercede on the applicant's behalf to obtain his "first licence," but will be of assistance in obtaining special permits for him as will be seen later.

There is a form of transmitting licence granted in this country known as the "Artificial Aerial" licence. This allows the licensee to use transmitting apparatus, but the signals must not be allowed to radiate outside the building; to prevent this an artificial aerial may be used consisting of inductance, capacity and resistance (to be equivalent, electrically, to an aerial) and all the usual experiments with regard to efficiency, tuning and modulation may be carried out. This licence may be regarded as the half-way house between a receiving and a full transmitting licence, and is frequently given to applicants for full licences who have not been able to satisfy the Postmaster-General as to their necessary technical knowledge or the need for the use of a radiating aerial to conduct the experiments outlined in their original application. In a case such as this a further application in six months' time will frequently procure a full licence: some applicants definitely ask for an artificial aerial licence first and then apply for the full one at a later date. There is no charge for this class of licence, providing a receiving licence has been obtained.

The first radiating licence granted to an experimenter will allow a maximum power of ten watts to the anode of the valve feeding power to the aerial, and permission will be granted for transmissions on 14, 7 and 1.7 megacycles (20, 40 and 160 metres)

if such frequencies are requested. There are also certain restrictions as to the times and duration of transmissions and information regarding the method of calling. The use of the bands of frequencies known as 28 and 56 megacycles (10 and 5 metres) can usually be obtained without difficulty on special application direct to the Post Office, providing good and sufficient reasons, such as work with a Contact Bureau Group, are given.

The fee for a "10-watt" transmitting and receiving licence is 20s. per annum, but in addition, a licensing registration charge of 10s. is payable on initial application. A further 5s. is charged for the Morse test, which is payable to the officer conducting the test. An extra 20s. per annum is required from all holders of high power permits.

Permission to work on the 3.5 megacycle (80 metre) band is given *only* to persons recommended by the Society, as this band is shared with other services, and the Postmaster-General requires to be satisfied that amateurs using the band have genuine experiments to conduct and will not cause unnecessary interference with the other services. *All applications for the use of this band must be sent in through the District Representative*; the Society then advises the Post Office direct.

Powers of over 10 watts input (usually in multiples of 50 watts) are granted by the Postmaster-General on the recommendation of the Society, *and here again the applications must be sent in through the District Representative*. In order to prevent excessive interference from poorly equipped stations using high power, the Council of the Society will not, as a rule, recommend a member for high power unless he is using crystal control or some other form of frequency stabilisation. They also prefer members to have been using a controlled set for a period prior to their application. *Some definite reason for requiring the use of the higher power should be given*. The Postmaster-General will not grant high power permits for use on the 1.7 megacycle band.

All requests for special facilities are approved by Council at their meeting on the third Wednesday in each month; it is essential therefore that all applications be in the hands of the District Representative not later than the 10th of the month.

During Society Transoceanic tests, permission can usually be obtained for members, who make the necessary application, to operate their stations for a 24-hour period, assuming the other conditions of the licence are not violated.

The construction and operation of a member's station must be left largely to himself. Much assistance can be obtained from the pages of the T. & R. BULLETIN, and our transmitting members will be only too pleased to assist a newcomer to build his station and operate it as efficiently and effectively as possible.

These comments have been given with the object of assisting our home membership with some of the licensing problems which may have concerned them in the past or will concern them in the future. We are confident that much time will be saved if the suggestions mentioned are used on every occasion when a knotty point arises.



## R.S.G.B. AND N.P.L. CALIBRATION SERVICES.

(1) *From G5YK (Cambridge) on the first Sunday in each month.*

The Service takes place in the 3,500 K.C. amateur band on the following nominal frequencies at the times stated (G.M.T. or B.S.T. as in force) :—

09.30 on 3,525 K.C.  
09.40 on 3,585 K.C.  
09.50 on 3,630 K.C.  
10.00 on 3,720 K.C.

The Service is given in Morse, but is preceded by a short telephonic announcement at 09.25 at the first frequency. Each separate transmission lasts about eight minutes and is divided up as follows :—

(Say) 09.30-09.34 Call R.S.G.B. de G5YK and announcement of the service.  
09.34-09.36 Two minute dash.  
09.36-09.38 Announcement of measured frequency and close.

The frequencies may be relied upon as being accurate to plus or minus 2 K.C.

(2) *From G2NM (Sonning-on-Thames, Berkshire).*  
The Service is given at 3,583.13 K.C. according

to the following schedule (times are G.M.T. or B.S.T. as in force) :—

11.00 every Sunday (telephony).  
23.00 every Sunday and Thursday (Morse).

The crystal used for this transmission is worked in a constant temperature chamber, and the frequency of the complete oscillator has been checked and approved by the Post Office.

(3) *From G5HW (Teddington) on the first Tuesday in March, June, September, and December, commencing at 21.00 G.M.T.*

The Service is given at 1,785 K.C., and the standard transmission is preceded by the announcement CQ de G5HW, repeated several times, followed by the standard wave transmission on the above frequency. The announcement is followed by a continuous dash, the whole lasting 10 minutes.

This procedure is repeated six times, i.e., at 21.00, 21.10, 21.20, 21.30, 21.40 and 21.50 G.M.T.

Full details for the reception of this service were given on page 126 of the October, 1931, issue.

## STRAYS

ZL2CF used 5 watts on 7 M.C. for two days only, but was received by BRS497 at QSA5 R5 on August 25, 1931. Vive le QRP!

\* \* \*

In the B.E.R.U. Contest taking place this month Nigeria is being included in the Sudan and Egypt Group.

\* \* \*

During the International Goodwill Tests organised by the A.R.R.L. in February and March, W9GV proposes to transmit continuously during the transmitting periods on both 7 and 14 M.C., using separate transmitters keyed automatically with "TEST DE W9GV." The object of W9GV's experiment is to get some idea of the variations of signal strengths on these two bands during 24-hour periods. They therefore enlist the help of amateurs throughout the world, who are asked to report on the major variations of signal strength during each day. They will appreciate it if listeners will note the signal strength at periodic intervals during the test and report to Dr. Charles E. Scelesh, Edgewater Beach Hotel, Chicago, Ill., U.S.A. The results will be circulated to all participants in due course.

\* \* \*

Our cartoonist, who lives in constant fear of assassination, asks us to assure members that in the series "Society Celebrities" he does not pretend to draw a speaking likeness, but merely a caricature. The pictures are not being published in any pre-

arranged order, and are mostly drawn from memory. In the words of our worthy President, "it is the privilege of the great to be caricatured"; if this fact is borne in mind by his victims, it will allay the terror which is keeping our poor artist awake o' nights, and enable him once more to proceed on his lawful occasions unarmed.

\* \* \*

ESSEX!—

Whiskers No. 1, of Wickle Wood, to ditto No. 2, of Steeple Bumpstead, who was examining the aerial embellishments of G5QV (slowly): "Don't ee stan' out thair a garp'n Dairv'd, d'yar cum an hev a luk in hair, booe; enuff stuff ter bloo up ther hool o' ther town. Wots that affair? (pointing to a corked test tube with two wires of different lengths and water with green sediment, officiating as a liquid grid leak.) Wot'r yar er larfern at?"

Whiskers No. 2: "Ha! Dunn'r wot that is, yar iggorant fule, Ha! Whoi, that's 'r AUTO-WAC."

\* \* \*

VU2JP, of Travancore, S. India, will be working every evening from 18.00 to 20.00 I.S.T. on 7 and 14 M.C., and will appreciate reports, especially from near his home town, Edinburgh.

\* \* \*

Mr. Slater (ex-YI2GQ, YI6KR, VU2LK) has arrived home and will endeavour to visit all friends.

\* \* \*

G6GG, of 5 Elm Road, Shoeburyness, Essex, is testing on 7,112 K.C. and will welcome reports.



# SIX-VALVE SHORT-WAVE SUPERHETERODYNE

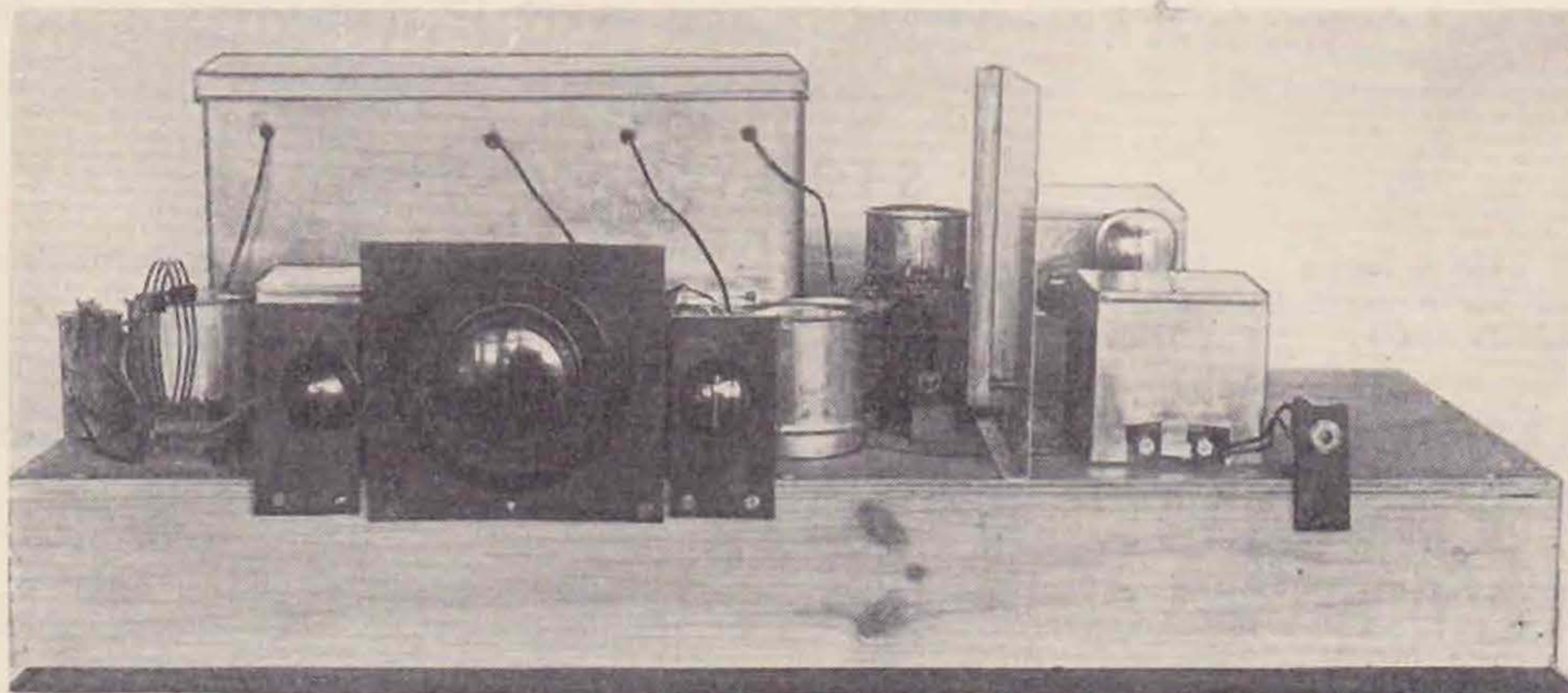
## For Cw and Telephony for Wavelengths from 16 Metres to 56 Metres.

By DR. WORTLEY-TALBOT (G6WT), A.M.I.R.E.

THE subject of superheterodyne receivers has always interested the writer since 1923, and many broadcast receivers were built incorporating this circuit during 1923-1927. But with the falling into disrepute of the circuit about 1926, interest in supers flagged until the screen-grid valve in its vertical form made its appearance, and interest again was revived, not in the broadcast, but in the short-wave field, and during the past two years about three experimental models have been built. Two of them were not much good, the third one fair, and since August last, two better ones have been built, and this article will endeavour to show a few of the difficulties experienced in the latest set built, and means adopted to try and overcome these obstacles in the most fascinating field of all radio receivers. After many trials and tribulations, and with nothing more than ordinary amateur knowledge of radio, a six-valve circuit was decided on, simply to eliminate phones altogether and to put every signal that got to the grid of the

then the super is dead also, and one can definitely pack up. But just one instance of what this super can do—a four-valve set was installed—one untuned R.F. stage detector and two L.F. to test it against the super, and on several occasions when three or four R3 signals came in on 20 metres on the speaker of the straight set, a quick antenna change-over was made to the superhet, and these signals were R5-R6 on the het. speaker, and one or two other signals that were not audible on the four-valver. The four-valver is a standard set used for the past two and a half years, and was quite satisfactory as a receiver, both for phones when DX was bad and speaker use when DX was good, and here it may be said that since last August conditions on 20 metres at this station have been well below average strength.

Now, as regards the circuit itself. The antenna coil (three turns for 20 metre band) is tuned by an .00015 variable condenser (any good make) and the signal after rectification goes through the



first detector on to the loud-speaker, as it was found that wearing phones for hours on other receivers was tiring. The circuit comprises S.G. first detector, Triode oscillator, two stages of S.G. intermediate frequency amplification, a S.G. second detector and a pentode output to the speaker. This requires a good 2-volt L.T. battery and high capacity high tension batteries, although wet high tension (10-ampere capacity) is available and the need for watching dry H.T. batteries is obviated at this station.

It is here desired to explain that, from the number of valves used, signals at all times ought to be wonderful. Nothing is further from the truth—the signals, when conditions are good, are very good, but when conditions on the amateur band of 20 metres are very bad, then the super is no better than any other receiver. When the band is dead

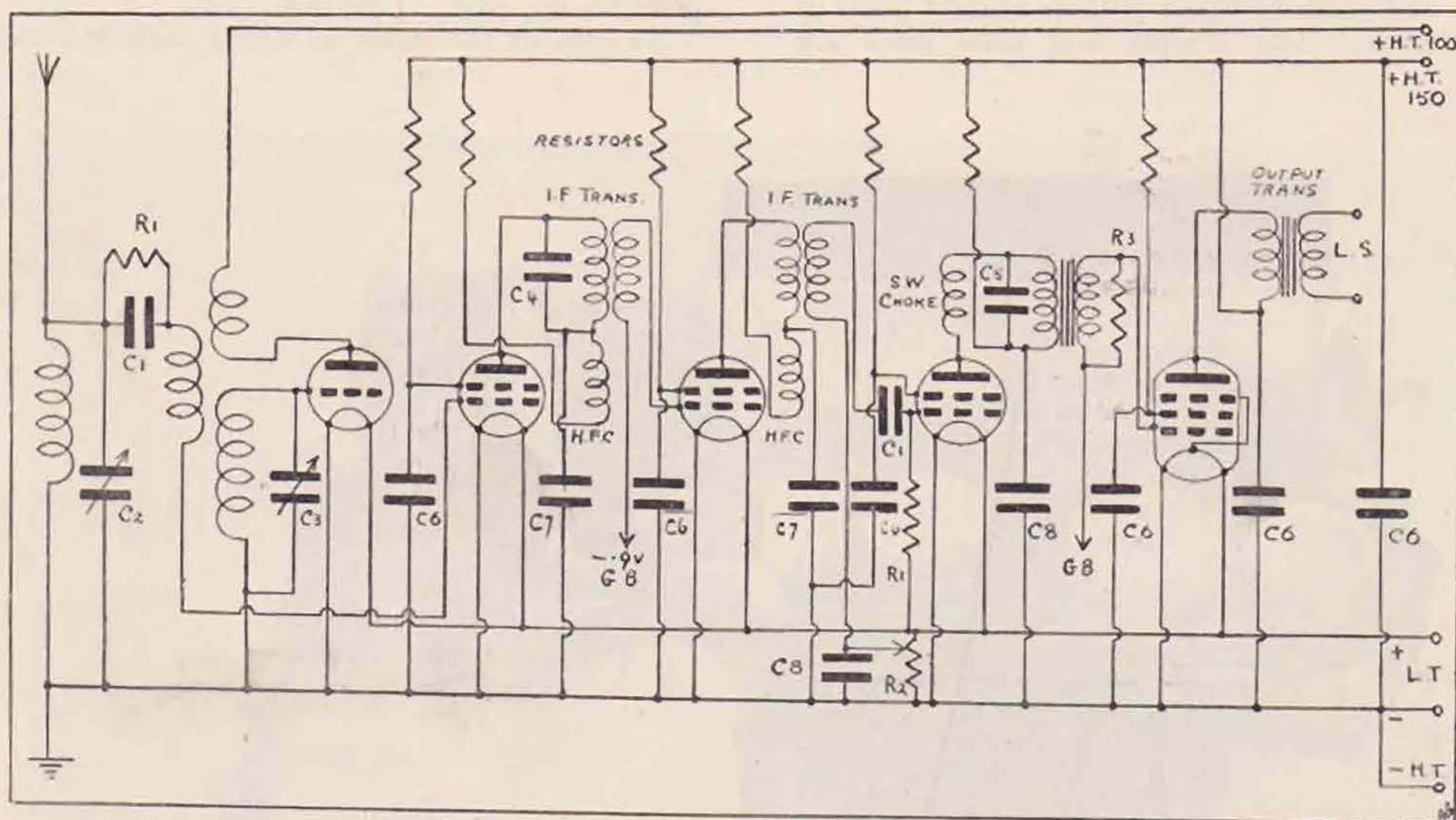
oscillator pick-up coil to the grid of the second valve in the diagram, which is a Mazda SG215, the first detector. The first valve in the diagram is the triode oscillator, an H.L.210, and the beat frequency of the oscillator, being tuned, is mixed with the incoming signal frequency and the combination of the two frequencies—a new frequency—is passed to the long-wave intermediate frequency amplifier where this frequency is amplified. The fixed condenser, .0005 mfd., across the primary of the first intermediate frequency transformer is a filter condenser and only allows a certain band of frequencies to pass through the I.F. amplifiers, which in this case are tuned to 6,000 metres. The object of having a long-wave amplifier and changing the original wave-length is because it is much easier to amplify a signal at, say, 6,000 metres than to endeavour to amplify it at, say, 200 metres. This



signal going through the I.F. amplifier is at radio frequency, and has to be rectified by a second detector and the output of this second detector, a S.G.215, is amplified at low frequency by the L.F. stage, a Mazda PEN220, and through a necessary output transformer to the speaker.

There are three controls in the set. One variable condenser, the knob on the left, tunes the antenna coil, and the large dial, the most important control, tunes the grid circuit of the oscillator. From the

Now, as regards CW reception, the usual method is to make the second detector oscillate to give beat reception, and is no doubt the best method, but is not always the easiest to design if one is using commercially-made intermediate frequency transformers, as a reaction winding is required from the plate of the detector valve. No doubt this can easily be used if home-made coils are used, or if one is using the new band-pass intermediate frequency coils now made for broadcast and



6-Valve Superheterodyne Receiver.

(Note: The second S.G. I.F. Stage is not shown above as it is only a repetition of the first.)

**Condensers:**

$C_1$ —.0001 mfd.	$C_5$ —.001 mfd.
$C_2$ —.00015 mfd.	$C_6$ —2 mfd.
$C_3$ —.00005 mfd.	$C_7$ —1 mfd.
$C_4$ —.0005 mfd.	$C_8$ —.2 mfd.

Grid Leaks ( $R_1$ )—4 megohms

Potentiometer ( $R_2$ )—300 ohms

$R_3$ —50,000 ohms

The Oscillator Coil Former is Silver Marshall, 6-pin contact, 2 in. diameter, No. 24 D.W.S. wire.

20 metres: 4 turns grid, 3 turns plate, 2 turns pick-up.

40 metres: 8 turns grid, 5 turns plate, 3 turns pick-up.

The Aerial Tuning Coils are Eddystone, 3 turns for 20 metres and 8 turns for 40 metres.

writer's point of view it has been found inadvisable to endeavour to spread the amateur band across the dial of the tuning condenser, and as it was also desired to listen to anything from 16 metres to 56 metres, their band spreading was not designed for in the final circuit, although in an experimental set this was done and was quite satisfactory. Naturally, the tuning range of the oscillator is determined by the size of the coil and the capacity of the tuning condenser. It was found that the most satisfactory size for the tuning variable condenser was 50 mmfd., or .00005 mfd., and a general radio midget condenser is in use tuning the grid coil. It was found that .0001 mfd. was too big and the smaller condenser was better, although the writer is aware that in America High C circuits in receivers are sometimes preferred, just as the Americans are keen on High C transmitters.

amplifying at 110 to 120 K.C., as with these it would not be difficult to introduce a reaction winding. So in the circuit in which we are interested, the S.G. intermediate frequency valves are made to oscillate by two of their grid returns going to the centre tap of a 300-ohm potentiometer, which is very satisfactory and gives smooth control both on C.W. and telephony. The centre tap is by-passed by a .25 mfd. condenser to earth. This potentiometer control completes the three controls, and as the A.T.C. is flat, almost all the controlling required is done by the oscillator condenser with a good non-backlash slow-motion dial (Karas micrometer is used in this set) and with the potentiometer.

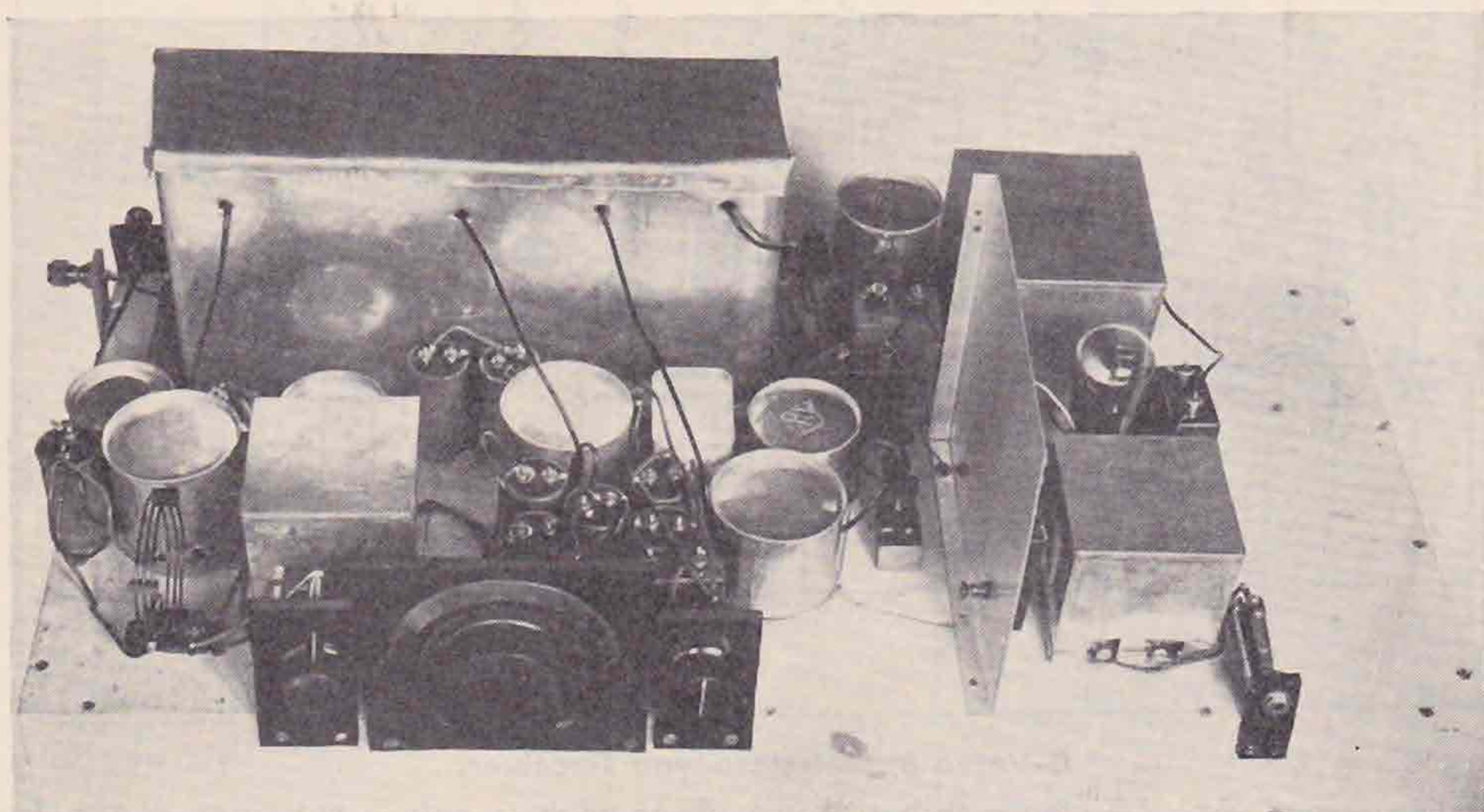
Everything that is possible has been done to "tame" the circuit and everywhere, except in oscillator valve circuit, by-pass condensers and resistors are used. Although not always necessary



in battery sets, in a super, with lots of H.F. about and the valves taking a fair number of milliamperes from the H.T. battery, nothing would stop the set motor-boating if the battery got run down unevenly, due to tappings and its resistance increased. By taking off a main H.T. of 150 volts and dropping down through resistors to the necessary voltage for the oscillator plate, detectors, screens, etc., and by-passing everything, then the motor-boating is reduced, but one still has to shield all components carrying H.F. currents in separate shields or cans, and earthing them to their nearest point of low potential. The shields and cans used are

and beyond the capabilities of amateurs in most cases. The first S.G. valve was tried as a space-charge detector, *à la* Hatry, that is, modulating the grid of the valve by imposing on it the output of the oscillator, but difficulties presented themselves immediately, which were not surmounted and ordinary rectification resorted to. The above method was invented by R. E. Lacault in his original Ultradyne Broadcast Super Het about 1926, and elaborated by Robert Kruse. The method is easy on B.C. super hets, but a very difficult proposition on, say, 20 metres.

As regards the noise to signal ratio in supers, a



cream tins, tea tins, etc., and the rude remarks made by friends about "Fittings by Cadbury," "Screens by Fry," etc., have been hard to bear! Just one warning. Do not keep the can over the oscillator coil too close to it or alteration of inductance and H.F. losses will result. Let the can be at least  $1\frac{1}{2}$  ins. from the coil.

The L.F. side is also completely shielded from the H.F. side. All the valves except the pentode are in one shield, with partitions between each valve. It was not found necessary to shield either aerial coil, aerial condenser or oscillator condenser. (It is a Midget, and its field very small.)

A sheet of tinned copper is fixed to the under-board and all shielding is earthed to it. This idea was used in 1924, 1926, in broadcast super to eliminate hand capacity and has often been found useful at this station.

As it is well known concerning supers that each signal comes in at two points on the dial of the oscillator condenser, this leads to confusion sometimes in the working of a super when handled by one unaccustomed to them, and is present in this set also. But the difficulty has been overcome by Hatry, of Hartford, in his six-valve super by designing his oscillator tuning and intermediate frequency so that at no time is more than one point of tuning on the dial. This is expert designing

long antenna has always been used, as it is believed that it is better to have as big a signal as possible to impress itself on the grid of the first valve, than to use a very short antenna and make the set amplify the weak signal and increase valve and circuit noises more than necessary. Of course, this set radiates as there is no H.F. buffer between the detector and oscillator product and the world, but it certainly should not interfere with broadcast. Many harmonics of commercial stations will be heard on our band, but they will rarely interfere with a signal being received.

Another important item was noticed in the building of this super. When it was completed it was set up for trial and everything appeared to be in order, but there was dead silence in the speaker and nothing would get the set going. It was eventually found that the grid and plate windings of the oscillator coil were in opposite directions. This was rectified and the set "perked" immediately.

The voltages on the various valves are most important and the resistors to drop the main voltage must be chosen very carefully. The first detector plate requires about 106 volts and the screen only about 40, as the valve is not being worked at the proper place on its curve when detecting. The

(Continued on page 265.)



# S.W. AERIALS AND FEEDERS.

By F. CHARMAN (G6CJ).

(Continued.)

It is not possible to give a prescription, as the writer has not used one, and nobody has yet given one complete with SWG; however, there are several in the BULLETIN which will probably work with 7/22 wire. As an example, we have the "Windom" described by 6FO, which up to the moment defies explanation. For the purpose of working on any band, it would appear most satisfactory if one could match the impedance of the end of the wire. The Zeppelin aerial (see later) makes some attempt at this. A single wire feeder cannot be made fine enough to have the requisite impedance, or, alternatively, it is not possible to make the top so fat that its L/C is reduced to the required extent. It occurs, however, to the writer that one might make a high impedance feeder by coiling it up like an enormously long solenoid. I haven't time to try it myself, but I should be interested to hear from anybody who would care to investigate it more fully. Such a coiled feeder could be about one or two inches in diameter, fine wire, and coiled close at the top, and then gradually opened towards the bottom, so that by the time it arrived in the shack it would represent a comparatively low impedance.

## The Open Aerial and A.O.G.

We now come to the various types of open aerial, although, historically, they should have come first. It should have been realised from the previous sections that the fundamental requisite of an aerial is one or more complete standing waves, and in all systems that is what we have to achieve.

Taking first the aerial, which is short compared with the wavelength, such as the long-wave aerial, we realise that it is not possible to get a complete standing wave on the wire itself; the remainder has to be made up by tuned circuits between the bottom and earth. The coupling circuit is either series or shunt tuned, according to what part of a standing wave has to be completed. If there is nearly, or just more than one standing wave, it is very difficult to get the coupling coil big enough to collect any energy. This sometimes occurs in S.W. open aerials, and it is then found possible to make the coupling coil bigger if the "earthy" side is left free, the small capacity to earth providing the high reactance necessary to match up the circuit, and there is, of course, a best L/C ratio, C often being merely the distributed capacity of the coil. This constitutes A.O.G. No. 1, and is called the "tank aerial."

As the aerial gets bigger, or the wavelength less, we approach the class where there are two half waves on the aerial. In this type two loops of radiation are thrown off in opposite phase, and tend to cancel at a distance, but as one is near the ground and often partly indoors, the top one gets better radiation, so that there is generally some. But the system is very inefficient, even worse than the first one with only a bit of a wave on it, and is seldom used.

## The Harmonic Aerial.

With the aerial adjusted to have between  $2\frac{1}{2}$  and 3 loops on it, a very efficient system results, known as the "third harmonic" aerial. Here the two bottom loops, which are in the region of poor radiation, tend to cancel, and most of the radiation goes on upstairs, where it has the best chance.

The size of aerial possible at an amateur station comes to about this type for the 7 M.C. band, and 5 loops can usually be fitted in for the 14 M.C. band. This aerial has been very popular in the past, and is still to be recommended for the beginner, as it is fairly simple to get going. For working on both bands it needs to be just under  $1\frac{1}{4}$  of the longer waves, say about  $1\frac{1}{8}$ , as there will then be a fair section of loop to fill in with coupling coils and condensers on each band, with an easy impedance, giving 3 loops for 7 M.C. and 5 for 14 M.C. If it is to be worked on one band only, however, it is better to go to nearly 3 or 5 loops, so that A.O.G. No. 1 termination has to be employed. Table I. gives some idea of the natural wavelength of an open aerial.

H	$\lambda$			
	L=30	L=60	L=70	L=100
20	60	95	110	140
30	70	100	120	150
40	80	110	130	160
60	100	140	160	185

H is the height of the aerial above ground in feet.

L is the length of the top in feet.

$\lambda$  is the natural wavelength in metres.

TABLE I.

Those beginners who wish to start with one of these systems will naturally want to know how they can tell what the conditions are. The length of the wire is not much of a guide, because the standing waves tend to occupy a good deal less than half a wavelength each, especially if the aerial is bent about, and has a counterpoise, and one has to get what indications one can off an ammeter near the transmitter and the transmitter feed.

## Adjustment of the Open Aerial.

The aerial should be a fairly large B.C.L. inverted L type, and a counterpoise of two or three wires will be necessary for the 3.5 M.C. and 1.7 M.C. bands, where there is often less than one loop, in order to reduce the series resistance of the earth connection, which may be high compared with the resistance represented by radiation, and so steal away juice.

On all bands it should be possible, by tuning the couplings, to increase the feed to the output stage considerably; this indicates that something is



taking a lot of juice. If the tuning of the coupling is loose and very sharp, then the aerial isn't getting much of it and another arrangement must be tried. On 1.7 M.C. parallel tuning will be required and a current of at least .5 amp. should be obtained in the aerial with 10 watts. On 3.5 M.C. one is near the natural wavelength of the aerial, and series tuning will probably be required. The aerial current may be anything.

For 7, 14 and 28 M.C. one of the other systems will be used, including the A.O.G. type, and it will be necessary to experiment to find which one works. The current near the transmitter should be low, and it may be difficult to get much movement on a  $\frac{1}{2}$  amp. meter with 10 watts. If the current is large at resonance, then there is an even number of waves on the system, the radiation resistance is low, and the system poor.

### The Zepp.

One other system requires comment, the type known as the "Zeppelin." This falls into the A.O.G. class, and consists of an inverted L with a twin feeder for the lead-in, the top being one half wave, and one of the feeders being free. The idea is that the free wire suppresses radiation from the other feeder, but it is doubtful if it does, as no two people seem to get the same results, and the system is often very directional.

The top is usually trimmed up to  $\lambda/2$  with a lamp or meter in the centre, but the feeders have raised a good deal of controversy. As they are not only unmatched, but also unbalanced, they must radiate. Some advise that they be  $\lambda/4$  so as to make an harmonic aerial, and this is probably the best arrangement, as there is some possibility of the two feeders balancing under these circumstances\*. The tuning at the base should be series or shunt, according to their length. The coupling must, of course, load up the output stage, but the best indication of what is happening is in the centre of the top.

There are many other systems which may be tried, but it is outside the scope of this article, which is supposed to be general. For example, the vertical Hertz or doublet is a good aerial if one can get it fairly high; the vertical aerial with earth is not usual as it is not easy to get a high one, and when it is operated at harmonics, the radiation is mostly directed at a high angle, where it is not much use.

### The "Voltage" Fed Hertz.†

Another popular method of feeding a Hertz is by a single wire, tapped in at a suitable point, and works by virtue of its capacity to earth. The impedance of the feeder is greater than that of a twin, owing to the higher L/C ratio. It depends on the S.W.G. of the wire and the proximity of earth. Fortunately, it falls in value between the 80 ohms at the centre and the high, or "dynamic" impedance (of the order of 10,000 ohms) seen at the end, and so there is a point on the aerial where the impedances match. All sorts of values are given, and have been given in the past, for this tapping point, but it depends not on mythology,

as one would suppose from reading these attempts, but simply on the diameters of the feeder and aerial wires.

To get the aerial going, erect a top section just a little less than half a wavelength long and connect a feeder wire about a quarter the way along it, with an ammeter or lamp at the same point in the top. The feeder is now coupled, either direct or through a variable condenser, into an oscillator, to determine the wavelength, which loads it up best. An ammeter in the feeder may be helpful. The aerial is chopped in proportion to the wavelength, as before, after which attempts may be made to match the feeder.

### Single-Wire Feeders.

There are several ways of adjusting the feeder. The top may be tried in various positions, which means a lot of clipping and joining up again, and

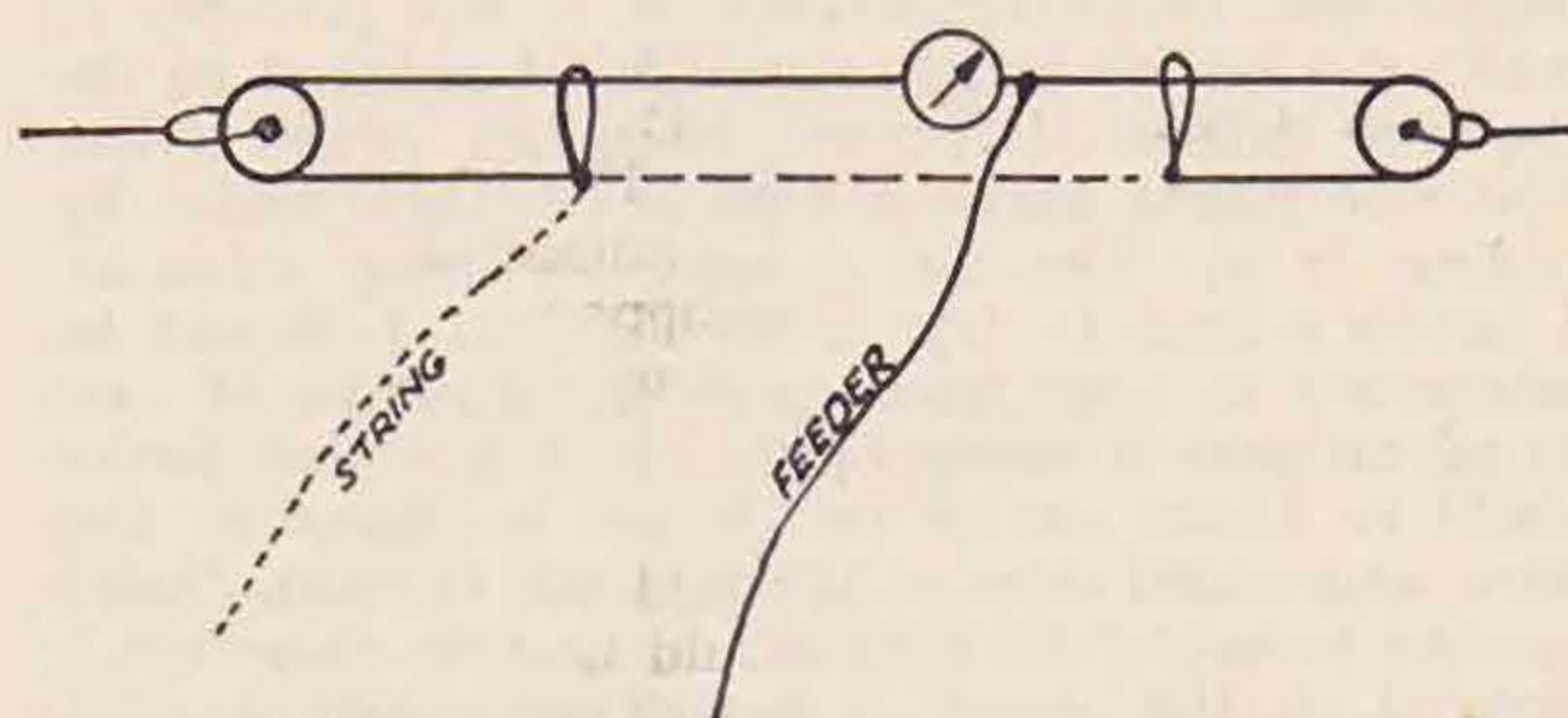


FIG. 7.

much adjustment at the bottom. The best coupling (at both ends) will give the greatest current in the aerial at the junction. Perhaps the scheme of Fig. 7 is helpful. The aerial wire is passed round a pulley at each end and brought back for a yard or two, the ends being tied back to each other with string, and also shorted with a loop to the adjacent aerial. The whole can then be slid backwards and forwards, and the tapping point, with ammeter, etc., will go with it. Another scheme is to make a trolley which will slide up and down the aerial wire, consisting of two meccano pulleys about a foot apart on a strip of wood, and connected by a lamp or meter. This, however, requires more watts than the other scheme. When both ends are correctly coupled, connection to the transmitter, if a simple oscillator, will cause least change of wavelength, and a neon lamp slid up and down the feeder on a stick will show that the voltage is the same everywhere. The current in the top is greatest at the junction in this type.

### Hertz Aerials—General.

One of the chief advantages of a Hertz of either type over the other types is that, when properly adjusted, it will give a much steadier wave when the wind is high and the wires swinging. The radiation from a Hertz is fairly good in all directions, except the way the wire points, though it may become highly directional if the feeders start to radiate.

### The Full Wave.

Before passing to other types, the full wave is worth mention because it enables one to do things

\* See G6FO's article.

† "Voltage" and "Current" feeds are misnomers, because one must have both to feed energy.



on two bands. This is a type of Hertz which is tuned for, say, 7 M.C., and is used with two half-waves on 14 M.C. It is not possible to predict its performance, and it may be highly directional, as the feeder (single wire) is always unmatched on one band at least, but it is always worth trying.

### Beam Aerials.

Before concluding, a short description of the principles of Beam and Multiple tuned aerials may be interesting, as one can begin to think of them for 28 and 56 M.C. amateur stations. The general principle is a collection of half-wave sections, some fed, and maybe some just re-radiating, arranged so that the radiations cancel out in all but one direction. For example, the Marconi Beams have a row of vertical wires up to 16 in number spaced  $\lambda/2$  apart, in a line facing the receiver. These wires are several half-waves long, and are fed in the bottom section. At the junction of each half-wave there is a small tuned circuit which takes up half a wavelength, reversing the phase. Half a wavelength behind each wire is another similar one. This is free, and it re-radiates in the opposite phase to that which it receives, thus balancing out the radiation which is trying to go backwards, and doubling that the other way.

A simple Beam system could have one radiator and one reflector, but it would not be very sharp. It would radiate one unit to each side, two forwards, and none backwards. As the number of radiators in a row increases, so the radiation sideways lessens, until with an array of, say, 16, it is all confined to about one degree. In a similar way, as the number of units is increased vertically, so the radiation is more and more sharply confined to the horizontal plane.

The gain of a one-wire reflector system is 6 decibels, two to one. That of a well-adjusted modern beam array is about 40 decibels—about 100 over the ordinary aerial, whilst the use of a similar system at the receiving end doubles this. In this way the ratio of signal to mush, etc., is made enormous, and transatlantic phone becomes possible when normal amateur signals would be blanketed out.

Hundreds of systems have been evolved in the past few years; it is not possible to detail them here. In some the phasing is very ingenious, the wires wandering in all directions and landing up finally in the correct phases and positions. They will mostly be found in the abstracts of *Experimental Wireless*, or in the *I.R.E. Journal*. Some funny tricks may be achieved with some of these systems, especially if the rear array is also fed in the correct phase. One may, for example, by adjusting the phase direct the signal in any desired direction. It ought to be very thrilling to turn one knob over the transmitter and swing your beam round from Brooklyn to Buenos Aires.

### Conclusion.

This article has been an attempt to explain the action of certain types of aerial along modern lines. It is a very difficult subject for the beginner, as the theory is not a little complicated, and I remember when I started how difficult it was to puzzle out what the aerial was doing and when it was working. The text-books are not much help, as they are all written by people steeped in the older type of aerial, which is enough to puzzle anybody. I have outlined what I consider sufficient theory, and have attempted to show how to get the various systems to work. If I have done this, then I have succeeded; if not, I invite discussion.

### Six-Valve S.W. Superheterodyne.

(Continued from page 262.)

oscillator plate requires 120. The two intermediate plates 130, screens 80. The second detector plate 90 to 106, screen 40. Pentode plate 150 and screen 125.

In conclusion, the short-wave super-het. circuit offers an enormous field for experimentation, and although it is not easy to build or to get going, it is extraordinarily interesting, and countless experiments can be done with it.

The very best of components are necessary, and all the by-pass condensers and resistors must be the best. The condensers used are the Dubilier type 9,200, specially made for the job of by-passing H.F. currents, and they are indeed beautifully efficient and work especially well in supers. The resistors are all Bulgin and are very satisfactory. A final word. Do not think that a short-wave super is infallible and can get everything on the air. It does—when conditions are good—but no better than a single-valver when the band is "dead." If the writer can help anyone by his small stock of knowledge of this circuit, a line through the courtesy of the Editor will ensure response.

### Frequency Measurement and Control.

(Continued from page 268.)

The crystal oscillator in the transmitters drives amplifier stages symmetrically arranged with regard to earth potential and housed in screened compartments, i.e., push-pull stages and symmetrical lay-out with respect to the centre line of the framework.

In concluding his address, the Chairman drew attention to a valve which has been developed by the P.O. for simplification of high-frequency amplification. It incorporates the advantages of push-pull and minimum reaction from output to input circuits. The valve consists of two similar electrode systems arranged symmetrically about a single cathode, and so arranged that "feed-back" on one half of the valve is counterbalanced by equal and opposite "feed-back" from the output of the other half of the valve. In its simplest form the valve consists of a loop filament, two control grids, two anodes, and two stabilising grids in the form of flat electrodes symmetrically placed with regard to the control grids on the opposite sides of the anodes. Each control grid is cross-connected to the stabilising grid outside the anode on the opposite side of the valve.

T. P. A.



# STATION DESCRIPTIONS Nos. 21 and 22.

By C. BROOKES (G2CB).

**BERS25.** BERS25, owned by Mr. G. Seymour, is situated in Aden, and has been the means of putting British Arabia on the B.E.R.U. map.

Mr. Seymour first became interested in amateur radio in 1926, through the medium of the short-wave notes in one of the wireless periodicals, but no attempt was made to build and operate a short-wave receiver until after his arrival at Helwar in Egypt, in the latter part of that year.

With the first receiver constructed many amateur signals were logged on the 7 and 14 M.C. bands, and through this medium Mr. Seymour came to hear of SU8RS, of Cairo, the B.E.R.U. representative in Egypt. Desiring to meet SU8RS and to join the B.E.R.U., Mr. Seymour flew from Helwar to Cairo, and before returning filled in the necessary application form for B.E.R.U. membership.

This example of enthusiasm is typical of the keenness shown by Empire amateurs for the B.E.R.U.

Unfortunately at this period Mr. Seymour encountered domestic troubles which necessitated a transfer to Aden, and so his radio activities were curtailed for some months.

Soon after arrival in Aden the call of BERS25 was received, and the construction of a new receiver commenced. When completed this gave very satisfactory results, and was used by BERS25 in the B.E.R.W. contest. Mr. Seymour was successful in this contest, sending in a fine log of stations heard, and thus winning one of the zone certificates awarded to receiving stations.

The receiver in use is just a straight two-valve affair, i.e., a detector followed by a single stage of amplification.

The circuit is a modified Reinartz, with the aerial loosely coupled to the grid coil.

The aerial, which is indoors, is 33ft. in length. This length appears to give the best results, besides reducing background noises in relation to signal strength.

Many G stations have been logged and reported on by BERS25, particularly low-powered stations, and some interesting schedules have been arranged.

An attempt was made in conjunction with two other R.A.F. operators, to get a short-wave transmitter on the air, but, unfortunately, illness intervened, and nothing further was carried out.

By the time these notes appear BERS25 will have returned to England, where he hopes to obtain a full amateur licence and continue with the good work.

A final word as to radio conditions in Arabia. Aden is wonderfully situated for the reception of short wave signals, as observations show that amateur signals are received well from every part of the world, with the exception of Alaska and Iceland, but the absence of signals from these areas may be due to a lack of stations.

The monsoon season during the summer is, of

course, troublesome, and signals are scarce during this period, although amateur signals have been received at fair strength during a severe sand-storm, in which the height of the sand cloud rose to 1,500 feet.



In conclusion, BERS25 would like to thank the many fellow amateurs at home who have written him appreciative and encouraging letters, and hopes to meet many of them personally upon his return to England.

**VK3HM.** Station VK3HM is owned and operated by Mrs. E. L. Hutchings, and is situated at Callawadda, Victoria, Australia.

VK3HM has been in operation now for the past two years, but Mrs. Hutchings' interest in radio dates back to 1925, when she became deeply interested in the activities of her son's station, VK3HL.

The interest remained after VK3HL had taken unto himself a wife, so much so, in fact, that Mrs. Hutchings applied for, and was successful in obtaining, a licence of her own, and thus VK3HM came into existence.

Most of the work at this station has been done on the 14 M.C. band, but occasionally a move is made up to 7 M.C.

On 14 M.C. the transmitter is crystal controlled, with an input of 25 watts, to the output valve. A 210A valve, controlled by a 3.5 M.C. crystal, forms the C.O., followed by two further 210A's as frequency doublers for 14 M.C. operation, but on 7 M.C. the second 210A is operated as a neutralised power amplifier.

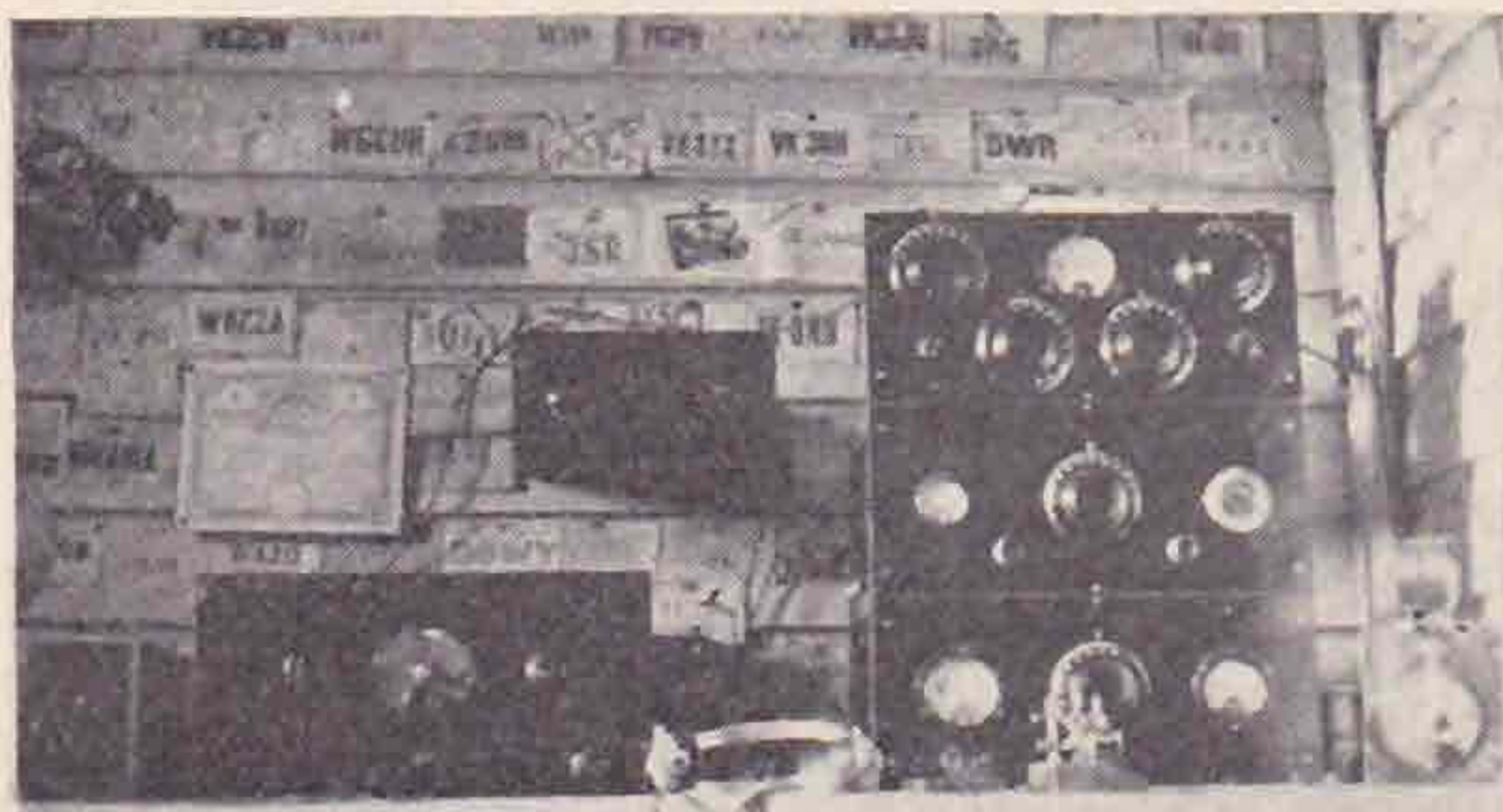
Power for the transmitter is derived from a 500 volt dynamoto, operated from the 32 volt house lighting supply. The voltage to the C.O. is dropped through a suitable resistance.

The filaments of the transmitting valves are also fed from the house lighting batteries, through suitable resistances.



A monitor is found indispensable and all transmissions are checked. The monitor is also used as a frequency meter and is checked periodically against the standard frequency transmissions from W6XK.

The receiver is a four-valve affair consisting of screened grid H.F., followed by a detector, and two stages of L.F. amplification. The S.G. stage is tuned, this giving far superior results to an untuned stage.



The transmitting aerial is a half-wave Hertz for 7 M.C. band, with quarter-wave feeders. On 14 M.C. this aerial gives very good results, with the feeder condenser across the coupling coil. The same aerial is used on the receiver, changing over being effected on a S.P.D.T. switch.

A word as to the results obtained. Mrs. Hutchings has a fine DX record to her credit, and has obtained both the W.B.E. and W.A.C. certificates. Most of the DX has been accomplished on the 14 M.C. band, although when conditions are favourable good work has been done on 7 M.C.

Phone is sometimes used on this band and the Telefunken system of modulation is employed. This method is found to be very satisfactory, but

owing to the critical value of bias required by the modulated valve is rather difficult to adjust.

In conclusion, VK3HM is always pleased to work



MRS. HUTCHINGS, VK3HM.

Empire stations, and is usually on the air daily (household duties permitting) from 15.00 to 17.00 G.M.T.

#### Book Review—(Continued from page 269).

trouble and authors do not always deal with it as fully as its importance demands. The same applies to electrostatics, but here again we find generous treatment.

The chapter covering the underlying principle of the valve and its application as a detector and amplifier lays a sound foundation for the interesting chapters on battery and mains receivers which follow.

The authors often pause in their description of apparatus, or the principles underlying its operation, to explain very clearly some fundamental electrical principle which arises in the subject in hand. This rather unorthodox method is very effective, as the student has the application before him as he studies the theory.

Rectifiers and filters, the oscillatory circuit, wavemeters and tuning receive simple and direct treatment.

Commercial broadcast and telegraph transmitters are treated with a wealth of detail which adds immensely to the value of the instruction. The chapter on "Commercial Tube Transmitters"

must be invaluable to practical men who have to work with the various types of American gear shown, but others will benefit by a careful study of the circuits and maintenance instructions.

A chapter on short-wave work leads the reader from the simplest Hartley circuit up to the high-power commercial transmitter. Spark and arc transmitters receive a chapter each.

D.F. work and radio in aviation form two up-to-date chapters describing much ingenious and interesting apparatus.

The chapter on broadcast transmitter equipment describes in detail various makes of American apparatus.

The book concludes with a number of very useful tables.

The whole treatment is practical and caters for the practical man; it is non-mathematical, extraordinarily well illustrated, fluent and of vital interest. Though much of the book is concerned with American gear, it is sure to appeal to British technicians.

T. P. A.



# FREQUENCY MEASUREMENT AND CONTROL.

*A summary of the Chairman's Address to the Wireless Section, I.E.E., given by Col. A. S. Angwin, D.S.O., M.C., B.Sc.(Eng.), M.I.E.E., and published by kind permission of the I.E.E.*

THE Chairman's opening remarks emphasised the need for smaller frequency separation between channels and the smallest possible band of frequencies for any channel. The required width for any communication depends upon the modulation and a "tolerance" to allow for imperfect frequency control. On short waves the "tolerance" may exceed the modulation.

The Post Office, in pursuance of its statutory obligations as the licensing authority in this country, has equipped a frequency observation station at St. Albans (Colney Heath), and this station works in conjunction with the Radio Laboratory at Dollis Hill. Such a station must be equipped to take accurate and rapid measurements over the complete frequency range in commercial use.

The sub-standard at Dollis Hill is an electrically-driven, temperature-controlled tuning fork. The fork frequency is 1,000 cycles per second, and frequency changes on account of temperature are estimated at less than five parts in 100 million. The fork frequency can be compared with unit time by means of an amplifier driving a phonic motor, which in turn operates a contact every second. A double-coiled siphon recorder allows a comparison between Greenwich time signals and the fork output. Tests in co-operation with the N.P.L. indicate an order of accuracy of better than one part in one million.

Measurements of the low and medium radio frequencies are made by using multivibrator equipment, and, by using special oscillators operating up to the 300th harmonic of the fork, the range is extended to the medium-high and high radio frequencies.

The secondary standard at St. Albans is a valve-maintained fork with multivibrator equipment similar to and frequently checked against that at Dollis Hill, but not temperature-controlled. The St. Albans fork, of 1,000 cycles per second, controls precisely a multivibrator of the same fundamental frequency from which harmonics between 10th and 115th are selected, giving a range up to 115 KC/sec. at intervals of 1,000 cycles. For higher harmonics the 20th harmonic is selected and operates a second multivibrator from which the 6th to 72nd harmonics are selected, giving a range up to 1,440 KC/sec. at intervals of 20 KC/sec.

For short-wave measurements, 1,440-24,000 KC/sec., a highly selective super-heterodyne receiver with an intermediate frequency of 240 KC/sec. is used. The multivibrator output is switched to the input of a synchronising amplifier. The harmonic output of this amplifier is coupled to the "reference oscillator" so that as the fundamental frequency of the latter is varied its frequency is pulled into step with each harmonic in turn. The reference oscillator's output is rich in harmonics which are used for short-wave measurements. A special interpolating condenser is used in parallel with the tuned circuit of the first beating oscillator as, in practice, this valve serves as the comparison oscillator. This condenser can be read accurately to  $0.0006 \mu\text{F}$ .

A number of charts showing frequency variation of different types of stations over long and short periods were shown and compared with the recommended limits of tolerance of the C.C.I.R.

The deviation from the allotted frequency of a short-wave C.C. telephone station has not, since recent modifications, been observed to be greater than 65 parts in one million.

A high-grade master-controlled broadcasting station on the medium waves did not vary during a day's run by more than 50 cycles.

Observations on the performance of short-wave telephone transmitters in use on the P.O. services have established that, with thermostatically regulated C.C., the maximum variation is of the order of 125 parts in one million, and can be maintained within these limits. Further, a C.O. can be initially adjusted to within 50 parts in one million of the allotted frequency and the maximum variation from this frequency should always be within 115 parts in one million. The C.C.I.R. recommendation for the future is .02 per cent.

All short-wave point-to-point telegraph and trans-oceanic telephone transmitters at present operated by the P.O. are C.C. The Y cut crystal (contact planes parallel to electric axis) was used in the earliest transmitters and had no temperature control. Now the X cut is used, as the temperature coefficient is less (20 parts compared with 70-80 parts in one million) and unwanted modes of oscillation are less frequent. Thermostatically-controlled ovens keep the crystal to within  $\pm \frac{1}{4}^{\circ}\text{C}$ ., representing a frequency change of about  $\pm 5$  parts in one million.

The quartz oscillators, one inch square, have rounded edges to reduce unwanted oscillations. The air-gap of about .003 in. is adjusted by a micrometer screw to bring the frequency within a few cycles of the required value.

A resistance shunts the crystal which controls a P625 valve with 120 plate volts and a tuned plate circuit. The oven temperature is maintained at  $50^{\circ}\text{C}$ .

The frequency characteristics of crystals are explored by an elaboration of the "crevasse" method. The crystal in its holder and oven is connected across a tuned circuit which in turn is loosely coupled to an oscillator. The tuned circuit condenser of the oscillator has a specially constructed small-capacity condenser of total capacitance  $12 \mu\text{F}$  in parallel. A micrometer drive allows very small variations to be made in the oscillator frequency. A valve voltmeter is connected across the condenser of the first tuned circuit. This circuit is adjusted approximately to the frequency of oscillation of the crystal and then the readings of the voltmeter are recorded for various values of the condenser of the oscillator. A good crystal shows a major response curve with a sharp crevasse, but curves with rounded bottoms or complex responses indicate undesirable crystals.

(Continued on page 265.)



## HIC ET UBIQUE

## New Vice-President.

COUNCIL have much pleasure in announcing that Dr. E. H. Reyner, of the National Physical Laboratory, and one of the leading radio engineers in the country, has been appointed an honorary vice-president of the Society.

\* \* \*

Mr. S. Townsend, G2CJ, has been appointed D.R. for East Anglia in place of Mr. C. E. Runeckles, who has resigned. Mr. Townsend will temporarily carry on as C.R. for Norfolk until a successor has been selected.

\* \* \*

Mr. D. Low, 2BRF, has been appointed C.R. for Glamorgan. His full address is: "Nantissa," Westbourne Road, Penarth.

\* \* \*

In connection with the B.R.S. test announced in this issue, Council have decided to present a challenge trophy to the winner providing the number of entrants exceeds 10 per cent. of the total B.R.S. members registered on the closing date.

A special consolation prize of £2 2s. (which is to take the form of goods purchased from BULLETIN advertisers) has been offered by Mr. Livesey, G6LI, which also becomes effective on the condition mentioned above.

## Visit to Ediswan Electric Co.

Arrangements have been made for a party of 36 members to visit the valve works of the above company at Hillmarsh Lane, Brimsdown, Middlesex, on Saturday, April 2.

Members desirous of joining the party must apply for a special form supplied by the Ediswan Co., in which they must sign an undertaking to the effect that they are not engaged in the manufacture of radio valves or connected with any radio valve manufacturing or merchandising company.

These forms may be obtained on application from the Hon. Secretary, R.S.G.B., 53, Victoria Street, S.W.1, or may be called for during office hours.

The visit will commence at 10 a.m.

## QRA Section.

Manager: M. W. PILPEL (G6PP).

## New QRA'S

- G2GS.—J. G. MAITLAND EDWARDS, 127, Ashley Gardens, London, S.W.1.  
 G2MI.—A. O. MILNE, "Southcot," Larkfield, Kent (on and after March 1).  
 G5AZ.—H. HAZELDEN, 40, Keston Road, London, S.E.15.  
 G5QL.—L. HERRINGTON, 54, New Street, Ashford, Kent.  
 G5SG.—E. A. SPRINGETT, 12, Princess Road, Regent's Park, London, N.W.1.  
 G5VW.—VISCOUNT CARLOW, 37, Chesham Place, London, S.W.1.  
 G5XM.—J. ARMSTRONG, Bolton Y.M.C.A., 125, Deansgate, Bolton.  
 G6KI.—R. W. KIDNER, 200, Beaumont Road, Bournville, Birmingham.  
 G6RS.—R. K. SHEARGOLD, "Glenmore," Manygate Lane, Shepperton, Mddx.  
 2ATV.—C. SMITH, 31, New Road, Whittlesey, near Peterborough.

2AVR.—R. H. ROLINGS, 25, Dawes Street, Gillingham, Kent.

2BRA.—F. R. CANNING, Crindau, Newport, Mon.

The following are cancelled: G5AA, 2AKN, 2AOX.

QRA's wanted: AU8KAL, K5AB, XXIYJ.

## QSL Section.

The office has been handicapped of late owing to attacks of the prevalent influenza, but as the work is well up to date no serious dislocation has been caused, and all cards are being dealt with in the usual way.

The Wireless Institute of Australia ask me to notify members that their society headquarters is the *only* official QSL bureau for all Australia. Some sections of W.I.A., of course, continue to run their own agencies in conjunction with W.I.A., but apart from these local sections of the official bureau there is no other official agency.

J. D. C.

## BOOK REVIEW

RADIO TELEGRAPHY AND TELEPHONY. By R. L. Duncan and C. E. Drew. 1,046 pages, 528 illustrations and numerous tables. Price 45s. net. Published by Messrs. Chapman and Hall, London.

This is a second edition of the well-known book enlarged and revised to bring it up to date.

The authors in the preface to this edition pay a tribute to the "persevering amateur" for his pioneer work in the short-wave field.

The elementary principles of electricity are capably explained in the first four chapters, and then their application to practical work in motors,

generators, automatic starters, etc., is shown at some length in Chapter 5. This almost immediate introduction to practical machinery and circuit diagrams seems likely to be popular and successful, and the authors include, throughout the book, instructions on the maintenance and operation of apparatus.

After a brief treatment of curve diagrams, the lead cell and practical information about charging plant leads on to an all-too-short chapter on meters.

The authors very wisely go carefully and at some considerable length into the fundamentals of A.C. circuits. This subject often gives the student most

(Continued on page 267.)



# CONTACT BUREAU NOTES.

By H. C. PAGE (G6PA).

**B**Y the time you read this, the first two week-end periods of the 28 M.C. tests will have been concluded. May I hope that you have all been successful. It is hoped that as many of you as possible will send in a brief report on the results obtained during the first two week-ends. This report should be forwarded as soon as possible so that a *precis* may be made and published in the Notes.

I have had a request from W9GV asking G stations to keep an eye open for their transmissions during the ARRL International Goodwill Tests. They would be very grateful for reports on the signal strength variations of their transmissions. There will be two transmitters working, one on 7 M.C. and another on 14 M.C. Will those of you

who may be listening to these transmissions report to W9GV, Edgewater Beach Hotel, Chicago, Ill., U.S.A., after each period of reception.

G5CV tells me that the Television group not is getting along very fast. In fact, he feels that it is practically useless to continue it in its present form. May I make one more appeal for new members for this group. Surely there are some of us who are interested in this branch of radio.

Elsewhere in this issue you will find a copy of the rules for the 3.5 M.C. tests. Please read these very *carefully*. There may be points in them that you do not expect. I would draw your attention most especially to rule No. 9. A postcard will do. Just let me know that you are taking part.

## Group Reports

### 28 M.C. Work.

G6VP, Group Manager.

As was to be expected, there has been relatively great activity on the band, the tests are on us as I write, and the first half will have taken place as you read these notes. Will the fates be kind to us? I feel sure that if conditions would mend, we should find that real progress had been made since the inception of 28 M.C. tests. When conditions started to fall off, I think that everyone who worked on the band strived, as never before, to perfect both his transmitter and aerial system, and from what I gather, there are now some really very efficient and reliable stations on the air.

It is worthy of notice that the only DX, that is, ex British Isles, contacts have been made with three stations only, representing two countries, viz., Hungary and Algeria. There seems no reason why amateurs of other countries should have failed when we consider both the direction and mileage of these successful people, and one can only infer that there has been no real sustained effort.

Here are individual Group reports:—

*Group 1B.*—G5SY did not report last month on account of eye trouble. We are all glad to hear that this is now better, and we accord him our sympathy. G6LL has been QSO HAF4D, and has also received the Italian phone as R8. BRS588 reports poor conditions. G5MP has been rebuilding for the tests, and generally occupied with his station. He has a very good suggestion which will be elaborated in next month's report. It deals with each group member obtaining the definite co-operation of no less than three foreign stations for the tests. G2XH is making every effort in preparation for the tests. He has just made a push-pull transmitter on the lines of the one recently described in the BULLETIN. G2XH states that G5LT, G6YC, G6LF, and G5NP will also probably be taking part in the tests. BRS77 is new to the group, and frequency. He is having difficulty with his receiver, which is a mains SG detector, and choke coupled L.F., used with batteries. He states that as soon as the second phone lead is connected the set oscillates at about 1,000 cycles, and no system of chokes or anything

else has cured matters. He asks for assistance. He does not wish to change the circuit. G6LK has been much away from home, and as he sees no prospects of any change, reluctantly drops out.

*Group 1C.*—G6WN have not been working as much as usual owing to conditions; nevertheless, they worked HAF4D on December 20 at 15.52-16.27 G.M.T. HAF4D was QSA5 R7, with a wobbly, chirpy D.C. Note.—He reported G6WN QSA3 R4 T9. On this day both the phone stations were audible. The top one (Rome?) R4 transmitting music. G5VB is suffering from a power leak, and so has been off the air. Nothing but local stations have been heard. G2PF is a new station to the group, and sends his first report. He states that Chichester is badly screened, and no amateur signals have been heard up till now. At present he is using a 3.5 M.C. crystal and the usual F.D. stages. The aerial, a 66 ft. voltage-fed, being clipped on to the plate coil of the last F.D. This latter is an LS6A, and he states that a considerable amount of R.F. energy is obtained, contrary to what one might expect with this valve as a doubler. He has heard some telephony on the band. A station was calling S.S. *Olympic*. Can anyone suggest who it was? He also wants QRA of RKD, PAX, GBA, WQA, DFJ, WDS, and ORL. G6VP has been getting ready, like the others, but has not been on the band at week-ends owing to B.E.R.U. work, and other reasons. He is trying another method of locking the PA, viz., by the use of both a coupling twin and also a condenser strapping the plate of the 28 M.C. F.D. and the grid of the P.A. He comes to the conclusion that the greatest cause of creeping out of lock of the P.A. is simply heating occasioned by the filament, and the cure is fairly obvious.

*Group 1F.*—BRS25 writes that only three members, viz., G2DZ, G2OA, and BRS615 have sent reports, although he has written the members individually, asking for these. Some effort should be made. You owe it to the person who takes the time and trouble. G2DZ has been very active. He is using a locked amplifier with 25 to 30 watts. He has had a sked with W2JN, which, however, was abortive. He has also run skeds with local stations, and had some very encouraging reports.



G2OA has rebuilt, although no radical change has been made, except to his receiver; this is now all A.C., and totally free from hum on all bands. BRS615 has been on a lot. He heard HAF4D CQ ten, and later heard him QSO G6WN. He is still trying out different aerals, but reverts to his usual 16 ft. 6 in. long inverted L. BRS25 has kept watch week-ends, but the only genuine 28 M.C.'s DX heard has been HAF4D. He heard his CQ ten also, and later his QSO with G6WN. At 12.05 G.M.T. a weak station was calling CQ, and later on calling G4BJ. G5BJ?, but owing to complete fade-out each time he signed his call was not obtained.

This completes the G reports. ST2D sends a very interesting list of stations heard and work done. He states that no fundamentals, except SUC and SUZ have been heard, but numerous

The G.C. thanks the G.C. of 2A for copies of the French reports, which will be studied by the members of 2B as an extra budget.

We enclose our Earthquake report for December, 1931, which is a short one, but it is interesting to note that following on the full report of quakes that the Hon. Editor of the T. & R. BULLETIN was courteous enough to print in full, we have received many confirmation reports as to bad conditions prevailing at the time of the earthquakes, and, therefore, we feel justified in going into the subject as thoroughly as we can.

As I write this, a report from a foreign district has come in, not only reporting two shocks, but with the confirmation that radio conditions fell off immediately after the shocks, and so far we have not had anything to prove that conditions are otherwise than what we have always found.

### Earthquake Report.

DATE (1931).	TIME, G.M.T.	SITUATION.	REMARKS.
Dec. 14	Between 03.00 and 04.45	Several shocks, some rather severe, in Tuscany, at Romagna and Palazzuolo	—
Dec. 18	About 05.00	Two distinct tremors, a quarter of an hour apart, felt on Western side of Nottingham	Not recorded at West Brom- wich. But Mr. Shaw says it is not unusual for local, mild shocks to pass un- recorded.
Dec. 19	?	Light shocks in Tuscany and Romagna	—
Dec. 26	12.41 G.M.T. ?	Slight shocks at Venice.	—

harmonics are continually audible, including YI2DC. He states that push-pull transmitters and those employing three-phase A.C. direct to the anodes arranged to rectify and oscillate at the same time, produce some fh. harmonics. He also refers to SU8RS's trouble with severe threshold howl, but states that he has never been able to produce it, so does not think that it had any definite bearing to the country. He will be very QRX during the tests.

### Fading, Blindspotting, and Skip.

G2ZC, Group Manager.

Group 2A are now discussing the points of a list of phenomena that may affect fading, and it is a curious thing that in the two groups not one member had a word to say as to Aurora Display and its effect on wireless signals. Can any member of the R.S.G.B. give us any information on the subject? Group 2A also discussed Changing Earth Potentials, but very little information was forthcoming on this subject. The group is in touch with the French Meteorological Bureau, and are undertaking observation work, from which it is anticipated that some interesting information will be obtained. There are two call sign changes in the group, BRS504 now being 2ATK, and BRS473 now being 2AWJ.

Group 2B, having exhausted their list for discussion, are at the moment determining on the future policy of the group, and though some interesting points have been mentioned individually, they are not as yet the findings of the whole group, and, therefore, cannot be included in our C.B. report.

### 3.5 M.C. Work.

G6RB, Group Manager.

Group 4A.—Most reports again show very little activity, most of which can be put down to the very poor conditions still prevailing on the 3.5 M.C. band. These conditions seem more or less in keeping with conditions generally, which may be summed up as being very bad. Apparently all stations are still experiencing an abnormal "skip" effect, and a total absence of DX. G6WY reports very little doing, and has become very disappointed with the total absence of DX in any shape or form. Complaints of the nonchalant attitude adopted by group members in the forwarding of budgets. G2XT has done very little this month, and when he has been on has found QSO's very difficult to get. G6OM, whom we welcome into the group, sends a description of the apparatus he uses on 3.5 M.C. Is using a Standard C.O.P.A. transmitter with an input of 13.5 watts in conjunction with a 66 ft. Hertz antenna coupled direct to plate coil. Has only worked the usual Continentals so far, but is hoping for DX when conditions improve. BRS408 also reports conditions very poor, but inclined to improve, in his opinion. Gives interesting report on the signals of group members heard during the month.

G6RB has little of interest to report, and has found conditions the same as everyone else. Has now erected a new antenna, a Zepp, as described in the December BULLETIN, but so far has had very little chance to try it out. Is very puzzled as to how it will function on 3.5 M.C., as, according to



theory, such an antenna is useless for this band, yet we are told it works very well.

G.C. has again to complain of the apparent indifference of some group members in both contributing to and forwarding the budget. If you are really interested in 3.5 M.C., please show some enthusiasm by at least contributing *monthly* to the budget, and when it is in circulation, by forwarding promptly, and not keeping it more than three days.

*Group 4B.*—G6FO gives useful information on the G6JV type of aerial for 3.5 M.C. work. He states that this method is highly efficient on this band, even with short aeriels. He recommends all stations to try this.

G2WP, after a year of working on the band, finds reports give R8 to R9 up to a distance of ten miles at all times. At distances from 25 to 40 miles, very variable reports are received. At distances above 50 miles, the reports are fairly consistent at R6 over England.

BRS552 gives useful reports on comparative strengths of G stations. He finds this band the most useful for amateur work at the present time.

G2KB has not done much work this month owing to holiday. Grid control phone is now working well on this band. Bad interference from the local Hillmorton transmitters is being experienced, making it impossible to work at times. Experiments are being made on a super-heterodyne receiver, with a view to overcoming this form of interference.

## QRP Work.

G2VV, Group Manager.

I should be pleased to hear from any QRP enthusiasts willing to fill vacancies in various groups. When writing, please state which group you prefer to join. Another group has been formed by G2TK which will be known as 8G. They will report next month, and are working on weather effects on 10 and 20 metres, and as they are all situated near one another, some interesting data should be obtained, especially regarding 10 metre effects. It is hoped to announce the winning group in the 3-watt QRP annual contest in next month's notes. Now for reports.

*Group 8B, Aerials and WX.*—G.C. G2VV has at last taken down the 33 ft. Windom and is now using a 66 ft. Windom with feeder tapped 9 ft. 4 ins. from the centre. It is rather difficult to say at present if results are definitely better on 7 M.C., as conditions are so variable, but on 14 M.C. conditions have been too erratic to get a respectable contact. Regarding WX he notes that when a very thick "soupy" fog prevails over most of the country, it seems a guarantee that conditions will be good during that period, especially for DX on 7 M.C. Even a local fog seems to buck things up considerably. What do other WX enthusiasts think about "fog effects"? G6SO is working mainly on 3.5 M.C., but is on 1.75 M.C. when conditions are good. He says that on 3.5 M.C. signals (especially G's) fade out from 11.00 until 13.00, fading again at 19.00, when G's seem to completely disappear. On 1.75 M.C. signals seem to fade out at about 09.00 until 13.00, returning again until 15.00, when little is heard again until 21.00, and at this time most signals are very weak. All signals are received at good QSA when the WX is good at his QRA, but

rainy at the other station's QRA! G5OQ, who has been studying weather effects for several years, finds that almost without exception conditions are at their best when it is damp and squally at his QRA. He is using two aeriels and comparing results. These are a 67 ft. AOG and the "noted" 33 ft. Windom. Finds that with C.C., it is impossible to keep the TX in resonance on 7 M.C. Is applying for an 80 metre permit. Says the best time for good QSO's on 7 M.C. is 07.00 until 08.30, and 13.00 to 17.30 at the present moment. G5RX and G5CM promise interesting reports later, whilst we regret to lose G6PV, who finds it necessary to resign owing to business. One keen QRP man interested in weather effects and aeriels required to fill his place!

*Group 8C, Lunar Effects.*—G.C. G5PH regrets that the group have not had sufficient time yet to prepare reports regarding the moon, but hope to send interesting data later. He has been running a successful schedule with CT2AN, using 4 watts C.C. G2WS reports conditions bad, and spending most of his time trying to get a QSO on 14 M.C. G5LQ and G5LC also report conditions bad, but are active on 7 M.C. BRS587 reports fading bad on all waves, and cannot find any reliable time for reception.

*Group 8D, 28 M.C. Work.*—G.C. G5QU (ex 2AGN) is busy getting his gear to work on 28 M.C. after the first thrills of 7 M.C. Q.S.O.'s! Is using 4 watts to a T.P.T.G. with harmonic C.C. and P625A or LS5. Aerial is the much-used AOG system. G5RX is wondering when he will receive something on 28 M.C. Is constructing new receiver for this band. Is now also on 3.5 M.C., using only 2 watts. He tried the C.C. TX described in the BULL. by G2TK, but can't get it going nicely on 28 M.C. yet. 2APR apparently has a good 28 M.C. receiver, and sends full data for budget. Suggests Ultraudion might be a good circuit for 28 M.C. (It is! I'm using Ultraudion on all frequencies from 28 M.C. downwards.—G.M.) A QRP 28 M.C. enthusiast is required for this group to fill G6BU's place.

*Group 8E* has now been taken over by G5JU, who promises good activity again shortly.

*Group 8F, 1.75 M.C. Work.*—G.C. G2TJ is getting out well on 1.75 M.C. locally, but has not yet worked any DX on this band, and says conditions do not seem as good as usual. Is getting gear ready for new A.C. mains shortly to be installed. G2PF resigns as he has applied for a 100 watt permit for 28 M.C. work. He wishes to join the 28 M.C. Section. (Suggest you write G.M. of 28 M.C. Work, G6VP.—G.M.) G2QX seems to have been getting out, although he reports bad 1.75 M.C. conditions. He has worked Italian IAS (FB, OM, G.M.). Input was 4 watts. He is now busy reconstructing his transmitter. G5OJ has not been very active, as he has been building a new job, C.C., F.D., and P.A., and hopes to get some good Q.S.O.'s on 1.75 M.C. soon. G5LN is having trouble with his "repaired transformer" for H.T. supply, and has been trying a generator using motor drive, but this seems worse, so he has chosen the lesser evil and reverted to mains! The whole trouble seems to be that he cannot eliminate A.C. ripple. Is working on 1.75 M.C. and has worked D this month with 4 watts. He, unlike G2QX, finds 1.75 M.C. very good, but all other bands very



bad! Will some keen 1.75 M.C. QRP ham fill the vacancy open by G2PF?

## 2 MC. Work.

G5UM, Group Manager.

In *Group 10A*, G5FP has scrapped his C.O.P.A., and is now using a plain CO. He forwards some interesting material regarding keying experiments, and says that, at present, he is using the absorption method described by G6LI last year. A 25-turn coil is coupled to the plate coil, and is tuned by a .0005 mfd. condenser in series with the key. This condenser is shunted with a neon lamp. The system gives a clickless and thumpless transmission, and eliminates sparking. On the receiving side, G5FP has built a 1-V-2, with S.G. Conditions have been found reasonably good, and on January 10 OZ7EH was worked. January 5, too, was a good evening, and G2AX, Bexhill, was R8.

Preparations for removal have militated against much work by G5RX. However, by the time these lines are in print, the voice of his well-known bug-key will be heard in the land again—and from a QRA having exceptional facilities for aerial erection.

Valve experiments that led to the demise of his only pair of matched feeder lamps are described by G6FO. One of the Mazda public address valves, type PP5/400, has been tried out during the month, but with the standard 2 M.C. Hartley, the "bottle" would not oscillate unless the load (aerial-counterpoise) were reduced to a very low value. With the P650, which has electrode construction identical with the PP5/400, excellent results were forthcoming. The latter valve was ultimately tested in a T.P.T.G. circuit, and with only 230 volts on its plate, gave enough R.F. output to abolish the aforementioned lamps in the Zepp feeders! G6FO comments that it seems as though the T.P.T.G. were the only circuit in which the PP5/400 will oscillate. He adds that it is very critical as regards grid bias, and that with the 230 volts he used, a grid-leak of 2,000 ohms proved most satisfactory.

G5UM has also been making valve tests, with a view to ascertaining the best type for a P.A. with 240 volts available. The P625 has so far been found to be the best, with the PM256 second. Strange to say, the ubiquitous CT25X was a long way down the list. A fixed input of 10 watts was used, and the tank R.F. output measured for each valve. As regards communications, December 20 was found to be especially good, and G5UM wishes to know if other groups noted anything outstanding on this day.

## Antenna Group.

G2OP, Group Manager.

Group centres report that stations are not reporting to them each month. Every station in the group should send a report to his G.C. to reach him not later than the 15th of each month. I know conditions are still bad, but if you have nothing to report you should still send a card saying so, otherwise you will be looked on as a dead station. I have given instructions to G.C.'s to strike the name of any man out of the group who does not report regularly. Owing to business QRM, G2CJ has had to relinquish G.C. of 12A, and the new G.C.

(Continued on page 285.)

## THE SIGN OF THE BLACK DIAMOND



R.S.G.B. or  
B.E.R.U.  
BADGES.

*See last Bulletin,  
p. 253, for full details.*

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## "T. & R. Bulletin."

JAN.  
1932

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**PARRS ADVERTISING, LTD.,**

Craven House, Kingsway, W.C.2.

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## Notes and News—(Continued from page 282.)

Schools, 17, Fitzroy Terrace, Glasgow (a concern of which the proprietors are R.S.G.B. members), have made arrangements to give Morse tuition to amateurs, such as they. The terms for tuition are very reasonable, and further information may be found in the "small adverts" column on the back page of this issue. When making arrangements with this College, please mention the T. & R. BULLETIN advertisement.

\* \* \*

District 4 notes were received too late for insertion in this issue; will members note that the Leicester meeting will be held on March 12, at the Victoria Hotel, London Road; tea at 5 p.m.



## B.R.S. LISTENING CONTEST.

**D**URING the past two years our B.R.S. membership has increased from about 150 to well over 600. To cater for this new interest a special B.R.S. Listening Contest has been arranged to take place during March. The contest will be open to registered B.R.S. members only.

Listening will be confined to the 1.75 and 3.5 M.C. amateur bands, and the contest will extend from 00.00 G.M.T., March 1, to 24.00 G.M.T., March 31. Points will be awarded for every contact heard between a British station and any

The winner of the contest will be the member who is judged by Council to have scored the most points in accordance with the conditions laid down above, and the decision of the President in any dispute shall be final.

All reports must be sent in on ruled log sheets drawn up on the lines shown below, and must reach Headquarters not later than April 7, 1932.

This test, if supported properly, will bring to light many interesting facts. It will show who are the active British stations on our low-frequency

### FORM OF LOG.

Name.....  
 Address .....

B.R.S. No. ....

Points claimed.....

Receiver used .....

Date.	Time.	Call sign and Report given by Station A.	Call Sign and Report given by Station B.	Band.	Points Claimed.
1.3.32	00.05 to 00.22	G6CL, R6, T8, W5, QRM, QRN. Wx windy.	G6LI, R5, T9, W5. No QRM. Wx fine.	3.5 M.C.	1
1.3.32	17.26 to 17.48	G2VQ, R7, T9, W5. Wx cold and wet.	SU1CH, R6, T6, W5. Wx hot and windy. QRN bad.	3.5 M.C.	4

other station, providing that the listener can receive both ends of the contact, and can log the report which each station gives to the other. No points will be counted for the reception of only one station taking part in a QSO.

The leading logs will be checked for accuracy against the British stations reported upon, and any inaccurate returns will be deleted from the score.

To insure fairness in the operating of this test a graduated scale of points has been prepared. This is as follows:—

	Points.
Great Britain with Great Britain ...	1
Great Britain with France, Holland, Belgium, Denmark and Germany...	2
Great Britain with the rest of Europe, the Azores, Madeira, Canary Islands and Northern Africa ...	3
Great Britain with America (Districts 1, 2, 3 and 8), Canada (District 1), Newfoundland and Egypt...	4
Great Britain with the rest of the world ...	5

Contacts count the same score whether they are carried out with C.W. or telephony, whilst contacts between Great Britain and ships at sea count the score of the country to which they were nearest at time of contact.

A maximum of five different contacts may be logged from any British call sign on each of the two bands. Only one contact between any pair of stations may be counted.

bands; furthermore, it will give everyone an idea of the operating ability of our B.R.S. membership.

Providing this test is successful, a further series will be organised for those primarily interested in 7 and 14 M.C. work.

Come, now, ye B.R. Stations, get set for this, the first test organised especially for you, and whether your log be large or small, see that it reaches Headquarters before closing date.

### Reception Tests.—(Cont. from next page.)

Date.	Period G.M.T.	Band.
Feb. 20 ...	15.30—16.30 ...	14 M.C.
" 21 ...	16.30—17.30 ...	14 "
Mar. 6 ...	07.30—09.00 ...	14 "
Feb. 21 ...	At any time during day	28 "
" 28 ...	" " " "	28 "
Mar. 6 ...	" " " "	28 "

### STRAY.

A BCL recently called on a local ham and stated that he had heard that we used crystals in our transmitters. He was under the impression that if he could only obtain a specimen of the crystal for use in his crystal receiver he would get results on broadcasting comparable with those from the local hams working on 1.7 M.C. about 500 yards away!



## 3.5 MEGACYCLE TESTS

### RULES.

1. The Tests will take place in the first two week-ends in March, during the following hours:—

March 5, 12.00 G.M.T. to March 6, 24.00 G.M.T.

March 12, 12.00 G.M.T. to March 13, 24.00 G.M.T.

2. The Tests will be open to all R.S.G.B. members resident in the British Isles, both transmitting and receiving.

3. Contacts may be made with stations in any part of the world, outside the British Isles, and BRS stations may log any station heard, outside the British Isles. No station may be worked or logged twice within a period of twenty-four hours.

4. Schedules may be arranged, providing Rule 3 is adhered to, and the above-mentioned hours are kept. Contacts made on schedule should be as short as possible, so that other stations wishing to work the distant station may not be unduly hindered.

5. Points will be allotted according to the list published herewith. No points will be allowed for contacts made during other than the specified hours.

6. Full logs from all entrants must reach Contact Bureau by March 31. Even if your score is small, please let us have your log, so that records of these Tests may be complete. Please be careful to state whether your input is *over or under* ten watts.

7. Judgment of the Tests will be made by C.B., but in the event of a dispute, the matter will be referred to the President of the R.S.G.B., and his decision will be final.

8. The terms of any licence issued by H.M. Postmaster-General must be strictly adhered to in all cases.

9. All entries for the Tests must reach G6PA by February 27, 1932.

Whether you are taking part in the Tests or not, please send your logs to Contact Bureau, as a full record of the Tests is desired.

All reports should be sent to G6PA, Plumford Farm, Ospringe, Faversham, Kent.

### METHOD OF SCORING.

Country.	10 watts or under.	Over 10 watts	BRS Stations.
France ... ..	1	1	1
Belgium... ..			
Denmark ... ..			
Germany ... ..			
Switzerland ... ..			
Austria ... ..	2	2	2
Czechoslovakia ... ..			
Hungary ... ..			
Italy ... ..			
Jugoslavia ... ..			
Latvia ... ..			
Lithuania ... ..			
Norway ... ..			
Poland ... ..			
Portugal ... ..			
Spain ... ..	4	3	3
Sweden ... ..			
Esthonia ... ..			
Finland ... ..			
Morocco & N. Africa ... ..			
Roumania ... ..	6	4	4
Russia ... ..			
Azores ... ..			
Egypt ... ..			
Asia, Western ... ..			
Asia, Eastern ... ..	12	7	7
Africa, Central and South ... ..	12	7	7
South America ... ..	12	7	7
North America, Eastern W-12348. VE 12	9	5	4
North America, Western W-5679 VE-345	12	8	8
Australasia ... ..	13	8	

## RECEPTION TESTS.

Concerning the Reception Tests as published in December and January issues of BULLETIN (to which please refer for details), further tests have now been arranged as detailed below. All classes of membership will find these logs an excellent means of comparing reception conditions in the various Districts, and it is hoped that logs are received from several members from each of our 15 Districts, and from Scotland and Northern Ireland. It is interesting to note that the Dutch amateurs are arranging somewhat similar reception tests, and it may be possible for some co-operation to be arranged in this direction. All logs should

be sent to T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4, by March 9.

### RECEPTION PERIODS AND BANDS.

Date.	Period G.M.T.	Band.
Feb. 20 ...	23.00—24.00	1.7 M.C.
" 21 ...	18.30—19.30	1.7 "
" 24 ...	23.00—24.00	1.7 "
" 19 ...	22.00—23.00	3.5 "
" 29 ...	21.30—22.30	3.5 "
Mar. 3 ...	20.30—21.30	3.5 "
Feb. 20 ...	22.30—23.00	7 "
" 21 ...	07.30—09.00	7 "
" 26 ...	22.00—23.00	7 "

(Continued at foot of col. 2, previous page.)



# NOTES and NEWS



# BRITISH ISLES

## DISTRICT REPRESENTATIVES.

### DISTRICT 1 (North-Western).

(Cumberland, Westmorland, Cheshire, Lancashire.)

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

### DISTRICT 2 (North-Eastern).

(Yorkshire, Durham, Northumberland.)

MR. L. W. PARRY (G6PY), 13, Huddersfield Road, Barnsley, Yorks.

### DISTRICT 3 (West Midlands).

(Warwick, Worcester, Staffordshire, Shropshire.)

MR. V. M. DESMOND (G5VM), 199, Russell Road, Moseley, Birmingham.

### DISTRICT 4 (East Midlands).

(Derby, Leicester, Northants, Notts, Rutland, Lincoln.)

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

### DISTRICT 5 (Western).

(Hereford, Oxford, Wiltshire, Gloucester.)

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

### DISTRICT 6 (South-Western).

(Cornwall, Devon, Dorset, Somerset.)

MR. H. A. BARTLETT (G5QA), 95, Old Tiverton Road, Exeter, Devon.

### DISTRICT 7 (South-Eastern).

(Berkshire, Hampshire, Kent, Surrey, Sussex.)

MR. J. DRUDGE COATES (G2DC), "Burleigh," Farnborough Park, Hants.

### DISTRICT 8 (Eastern).

(Cambridge, Huntingdon, Norfolk, Suffolk.)

MR. S. TOWNSEND, 115, Earlham Road, Norwich.

### DISTRICT 9 (Home Counties).

(Bedfordshire, Hertfordshire, Essex, Buckinghamshire.)

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

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

(Monmouth, Glamorgan, Breconshire, Carmarthen, Cardigan, Pembroke.)

MR. A. J. E. FORSYTH (G6FO), "St. Aubyns," Gold Tops, Newport Mon.

### DISTRICT 11 (North Wales).

(Anglesey, Carnarvon, Denbighshire, Flintshire, Merioneth, Montgomery, Radnorshire.)

[To be appointed.]

### DISTRICT 12 (London North).

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

### DISTRICT 13 (London South).

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

### DISTRICT 14 (London East).

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

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

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

### SCOTLAND.

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

### NORTHERN IRELAND.

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

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

### DISTRICT 1 (North-Western).

THE Manchester Area meeting, held on January 4, was a great success, some 24 hams being present, five of whom went over from Liverpool Area, including myself. This is very encouraging, and I hope more of the local hams will attend at the future meetings. The Liverpool Area meeting held on January 16 was preceded by a visit to the G.P.O., where we spent a very enjoyable hour and a half having the details of the numerous instruments explained. An amusing incident occurred when one of our members sent a test message on one of the teletype machines. One of the words sent was "Service," and when we asked the operator at the other end if he had got it O.K. he came back and said "Yes, but you spell 'Service' as 'Servuce.'" Hi! The meeting was not very well attended; only nine members turned up, so that the debate we had arranged turned out to be a discussion on the relative merits of "Self-excited v. C.C." What happened to all

those fellows who were going to tell us so much about self-excited? At all events, it was very enjoyable and instructive. On January 10, G2OA and myself paid a visit to G6TW, where we were introduced to a new S/W super-het. This is an F.B. piece of work and certainly functions very well. It brings in all sorts of DX signals that one does not hear on an ordinary straight Rx, but it brings up the unwanted background as well. The one particular thing that strikes one is the absence of A.C. hum. It is all run off the mains, and considering the amount of A.C. wiring in the set, it has made great strides, and the phones are not the least uncomfortable. Since a full write-up is appearing in the "BULL" very soon, I must not say too much about it. All counties report dud conditions on the higher frequencies, and it seems that most stations are going on the higher waves. To mention but a few, G2QB, G6OM, G5XD, G2WP, G2RV, and others are working on 3.5 M.C. with quite good results. I don't know whether any



other stations have noticed it, but G6OM says that as the barometer rises the 80 metre DX comes in well; the higher the better, and as it drops the DX fades off with it. A.C. valves have become a craze in the Liverpool area; everyone is having a try at them. G5WG would like to know if anyone has succeeded in getting a monitor to work with an A.C. valve, and he would like to hear from any ham on the subject. The Lancashire report seems to get smaller each month, and the C.R. says, "Where's that dope for the Letter Budget; it looks like falling through completely if some improvement doesn't happen." Now, what about it, boys! Keep it going! G2WP has got a 7 M.C. Zepp. with 15ft. feeders, and gets very high currents with parallel tuning, and asks if any others in the gang have had similar experiences. 2ARY has not been very well and is unable to wear headphones, but he finds things generally dud with a L.S. Now, pull yourselves together, lads, and let's have a better report next month!

#### DISTRICT 2 (North-Eastern).

There is very little to report this month. I think it must be the very variable and peculiar conditions we appear to be having. Certainly the reports are very variable.

2ARM seems to be doing very well with his reception, especially during daylight, both on 7 M.C. and 14 M.C. G2TK during the past six weeks has had QSO with SU1CH no less than 15 times on the 7 M.C. band, while on the 14 M.C. band had contact with XZN2A, a ship 200 miles east of Algiers. Has also worked ST2D on 7 M.C. with 2.5 watts. At the moment testing on 28 M.C. G5FV is also on 28 M.C. trying out tests with G2TK. G6SK is on the air again after eight months. G5IA testing on 2 M.C. with the Leeds gang. G5TQ has built a new transmitter for the 2 M.C. band, and is getting FB results.

The Sheffield gang are getting busy on 28 M.C., and the following stations would like reports: G2XH, G5NP, G5LT, G6LF, G6YC.

G2BH has had bad trouble with scraping noises in the receiver, and has found the trouble to be due to the guy wires not being insulated. G6PY has had first QSO with VK and FM. EAR stations are the loudest received here at any time.

The following stations are active: G5IZ, G6UF, G5HB, BRS588.

Now, arrangements are being made for regular meetings in Leeds and Sheffield, and by the time you read these notes one meeting in each city will have taken place. I want all who can to be present at the next and really make these gatherings a success. If possible, the meetings will be monthly.

G5CX is now on 3.5 M.C. and getting good results. G2SW has just changed to "Zepp" aerial, and finds it far superior to single wire voltage-fed system. Finds combined series and parallel tuning best on 14 M.C., using 15-ft. feeders. G6DB is carrying on with Morse tests, but does not receive reports. G5DD will soon be starting on 80 M. band. Worked a W station with 10 watts on 7 M.C. band recently at 1.30 a.m.

#### DISTRICT 3 (West Midlands).

Please note that Mr. S. C. Parish (G2ZW), of 72, Lordswood Road, Harborne, Birmingham, at the request of H.Q., is acting as No. D.R. 3 *pro tem*. The sympathy of members is extended to G5VM

on the severe illness of his wife. Best wishes for her speedy restoration to health, and congratulations to them both on the birth of their daughter are also tendered.

Congratulations on his marriage and best wishes are given to G6CC, whose QRA, by the way, is changed.

We welcome from Scotland G2MA, whose arrival adds another Empire Link Station to those in our District of whom we are so proud.

In Warwickshire and Worcestershire G5ML (C.R.) reports that the 7 M.C. band seems to be receiving the most attention lately. G5VM, prior to his domestic anxieties, worked South Africa, Australia, India, Egypt, Hong Kong and Canada on that band. G5BJ, G6XQ, G6XJ and G5NI have all been active, the two last now working from A.C. mains, the recent conversion to which has formed the basis of interesting experiments by G6XQ, particularly with regard to obtaining grid bias from the mains for the P.A. stage. G5BJ has been working VIYB and VO8MC and sundry W stations. He is building a 40-metre set for the B.E.R.U. tests. The rumour that he is taking to a seafaring life has been traced to his penchant for working ships. G2ZW is practically off the air pending conversion to A.C. mains, and G2WW pending completion of xtal control, following the custom of the District. G6XQ recently worked a VK under conditions of considerable difficulty, and was successful in relaying to London a message from a high official of the Australian Government when calls to other G stations had failed to do the trick. (FB, OM.) G5ML, from his new QRA, has WAC several times recently on 40-metre band between 19.00 and 23.00 G.M.T., and runs a regular sked with PY1FF (Brazil), using push-pull with his two Zepps. BRS427 has been listening on 7 and 3.5 M.C., and reports phone conditions very f.b. on the latter band. He advocates, as a cure for fading, the use of two aerials of exactly equal length, set up in directions 90° apart. Where they approach each is connected to one end (the same end) of one coil of a double-wound coil, the other end of both windings being joined together and earthed. This double wound aerial coil is then loosely coupled to the tuning circuit of the receiver.

The meetings of "Mars" (Midland Amateur Radio Society, affiliated to R.S.G.B.) have been well attended. The wireless junk sale at Christmas, apart from realising well over £12 for a local charity, thanks partly to G5NI's efforts as auctioneer, sent many members and potential members of R.S.G.B. away with useful apparatus. Will the former please notify the latter that No. 3 D.R. *pro tem*. has plenty of R.S.G.B. application for membership forms, and will be glad to send one to anyone who requires it?

G2NV, the C.R. for Staffs and Salop, reports that members, though asked to do so, have not sent him a single report. This, however, has not prevented complaints that local reports are not seen in the BULL. There being no direct supply, "Nuts Vic" has had to do some intensive listening-in (and detective work?) to meet the demand, and with the following result: G6WF is very active on 1.7 M.C. (CW and phone), and is taking part in 28 M.C. tests with practical co-operation and assistance from BRS587. G6PC, though on the air again on 1.7 M.C. (mostly phone tests) from his



new QRA, has not yet settled down to the new A.C. supply. BRS488 is "swotting" Morse, and hopes to receive his ticket soon. (Good luck, OM.) G6OI and G6OJ (King Edward VI Grammar School, Stourbridge) are very active at week-ends on 1.7 M.C., and have co-operated with G6WF, G6PC and G2NV in very interesting phone experiments. G2NV is delighted with DX conditions at his new QRA (which please note, OM's, the P.M.G. says is now "Radiohm," Bridgnorth Road, Stourton, Stourbridge), and its freedom from QRM from trams, X-ray plant, etc. At present he is operating on 1.7, 7 and 28 M.C. with three separate transmitters.

Will all R.S.G.B. members and their friends, and particularly the members of the four counties of No. 3 District, please note that the Midland Conventionette will take place in Birmingham on Sunday, March 20 next. Detailed arrangements will be published later. A hearty welcome will be extended not only to those in Districts adjacent to our own in the Midlands, but to those members and their friends who can more easily "go down to the sea in ships."

#### DISTRICT 5 (Western).

A Hamfest was held at Bristol on January 23, at which the D.R. was the guest of the evening. He was presented with a Society plaque of emblem mounted between two stand-off insulators on a polished base. We were lucky enough to have the P.D.R. (Mr. H. B. Old) present, and the evening, as well as being thoroughly enjoyable, showed very clearly the progress which has been made under the new county arrangements. The excellent County magazine deals with all points of local interest.

Wiltshire is still served with an excellent Letter Budget. Will members please report to their respective C.R.'s if they are making use of and deriving any benefit from the National Morse practices which are now running. The provisional date for the District Conventionette is May 1.

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

Reports this month from Hants, Kent, Surrey and Sussex. All counties report very bad conditions prevailing on the 14 and 7 M.C. bands. It is an ill wind that blows nobody good, though, owing to the existing bad period many stations are carrying out purely experimental work, while there is also a general all-round activity on the 1.75 M.C. band. BRS members are earnestly urged to report regularly to their C.R. and to contribute to the Letter Budgets organised by G6WY for Kent and by G6GZ for the remainder of the District.

The Surrey report from G6NK shows that interest is not waning in spite of bad conditions. G2DZ continues to work VK regularly on 14 M.C., and yet finds time to try out 28 M.C. tests with G5LA and G6HP. The monthly meeting held at G6GS was again well attended, 25 hams being present, including seven members of the W.S.A.R.S., one of whom has now been granted his A.A. ticket (F.B., OM—C.R.). The talk on this occasion was most interesting, "A 5 Metre Receiver," given by G5BY.

The Kent report from G6WY shows that all stations are as keen as ever and that bad conditions

are causing a much greater activity on the 1.75 M.C. band. G6BA and 2AOX are to be congratulated on obtaining first place for transmitters and receivers respectively in the recent "All Kent 1.75 M.C. QSO." G2IG and G6XO are experimenting on 5 metres and report good "fone" work already accomplished. G5FN and 2BZW are hard at it with "Rice" mikes, with great success, and 2AFX finds that Noden valves for accumulator charging interesting. G5OQ is in possession of a "dancing crystal," and G2RJ is endeavouring to find out in which direction his aerial radiates best. (I hope you are all members of C.B.—D.R.).

The Hants report from G6GZ deals chiefly with the Letter Budget, which is still growing; 13 letters this month (F.B., OM). Contributors are requested to send in their letters so that they reach G6GZ on or before the 15th each month. The Budget preparation means quite a lot of work, and it is essential to start it off by the morning of the 16th. An increased activity is reported on the 3.5 and 1.75 M.C. band. Aerials, a pet subject in No. 7, are receiving the usual attention; it is reported that one well-known station tried out five in one week. We welcome G5RS back to the active fold. The following contributed to Letter Budget this month:—G2DC, G5RS, G2GG, G2BI, G5UY, G5JZ, G2PF, G6NZ, G6BU, G5OU, G6GZ, 2BXT, and BRS343.

The Surrey report from G2AX shows that nearly all active stations in Eastern Sussex are working on 1.75 M.C. On this band G2AX has been QSO G5RS at Aberdeen with a few watts. Many stations are known to be active, but fail to report to the C.R. (Please, OM's, just drop your C.R. a card once a month—D.R.). G5QM will shortly be on the air with a full wave Hertz operating on the 1.75 M.C. band; he is borrowing a field to put up the aerial in. Hi! Hi!

#### DISTRICT 8 (Eastern).

Mr. Runeckles, BRS163 (ex SU8RS) has resigned from the position of D.R. for personal reasons, and the writer (G2CJ) has been asked to carry on. He thanks Council for this honour and hopes to receive the support of the District. We hope BRS163 will not cease all activity. What about a two-letter call, OM? We all know your fist.

Will each member of No. 8 District do his best to increase our numbers? At present we are the weakest district and at least half our members are inactive. There's room on the air for all the inactive ones and plenty more. Shake the dust off that transmitter, OM, and let's hear from you. The D.R., who lives near G6JV, would willingly suffer QRM from this quarter.

NORFOLK.—G5UF and 2AAK are active, and thanks are due to the latter for publicity obtained in the local Press. He should apply for a full ticket soon. G2CJ is QRL with business and thinks BCL's should be painlessly destroyed.

SUFFOLK AND HUNTINGDON.—G6BT is one of the few active members. Why? Not from lack of effort on his part!

CAMBRIDGE.—Our most active county, G5YK, is on 3.5 M.C. and has now a frequency meter accurate to about fifty decimal places! (Steady on, OM—Ed.). G6BS is on 7 and 3.5 M.C., getting F.B. results with 5 watts. G5YN is also on 3.5 M.C. and is modulating his CO! G6CR is going



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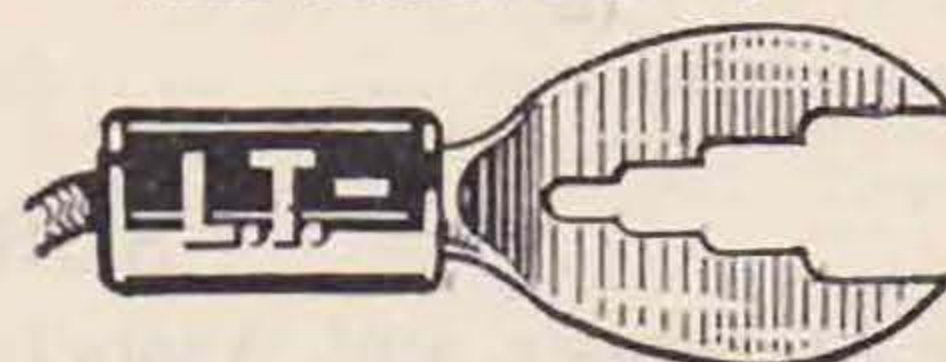
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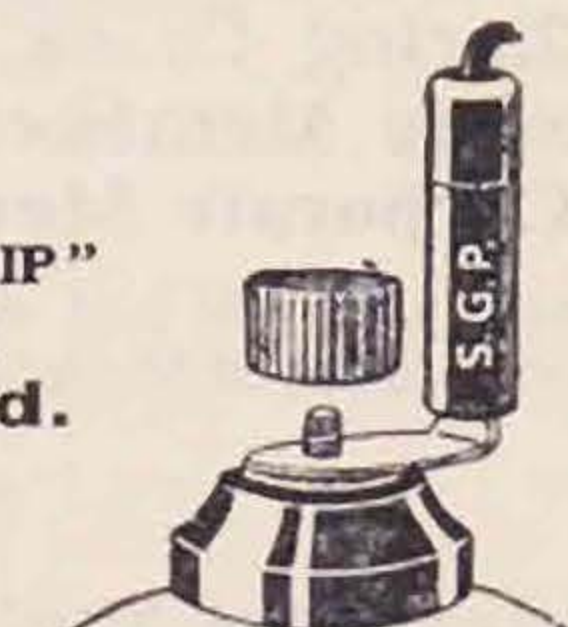
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Headquarters Society:—BRITISH EMPIRE RADIO UNION,

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## APPLICATION FORM.

The Hon. Secretary,

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

Signature.....

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

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

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

Call Sign.....

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

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

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

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

### UNDERTAKING TO BE SIGNED BY APPLICANT.

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

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

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Charing Cross ... ..	0	15	0	„ „
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Non-Corporate Members—Associates ... ..	0	10	0	„ „

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

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

### NO ENTRANCE FEE.

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

### FOR OFFICE USE ONLY.

Approved by Council.....

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



strong with "fone" on 7 M.C., while G2XV and G5JO are faithful to 14 M.C. The D.R. confirms all language used about this band and could even add some.

Will members please report regularly to their C.R.? Even a "nil" report tells him you are still interested. Has G5OF seen the D.R.'s hat which was lost on a visit to Cambridge?

#### DISTRICT 9 (Home Counties).

What a holiday! Sunshine, Clacton air and radio. The great point to bear in mind is, 8 and 9 District Conventionette is to be held at Clacton-on-Sea at Easter. We have three very active stations in the town, viz., G6QO, G6DH and G5QV, and conjointly they are arranging for the reception of a fairly large party, as numerous London and Midland members have signified their intention to be present. As the daily sessions will no doubt be of short duration, your YF, YL, friends or family



SOCIETY CELEBRITIES—No. 5.

could also share a very pleasant time with you. Make it Clacton this Easter, and bring your friends.

Reports are right up to the average. G5FB and G5MR in Herts write fully, as usual. G2WJ is busy on 3.5 M.C. G2HJ is still in town, but keeping in touch with his District as usual. BRS490 comments favourably on phone from G5RD, and BRS669 at present in Wales, wrote in. G5LY is off at present, expecting A.C. mains shortly. G2QJ is delving into the intricacies of C.C. oscillations without H.T. In Essex there is much doing, particularly on 1.7 M.C. G2LZ still maintains his sked with ZL4AO. G2YI has rebuilt for A.C. mains, and works on 3.5 and 1.7 M.C. BRS191 is concentrating on DX phone reception. Has 64 W stations logged, several on 14 M.C. BRS706 sends an interesting letter. G2WG is operating on 1.7 and 3.5 M.C. vertical aerial, C.C., and phone of excellent quality. G2SA, G6WI and G6GG are active, and G2DQ, G2AF, G6DH, G5YS have all

reported. Yes, we are all very busy in Essex. Thanks and greetings to all. Expecting to see you at Easter.

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

I am glad to be able to record an influx of new members in this Area, particularly in Monmouthshire, where there has been an increase of over 80 per cent. since the last notes were written. We welcome G5KK, G5TW, G5WH, 2AIS, BRS570, BRS659, BRS669, BRS727, and Mr. Gray, of Newport, whose BRS number is yet to come through. The R.S.G.B. membership in Newport is now five, while BRS493 has become 2BRA. We understand that a super-station is in course of construction.

I am also pleased to say that the new C.R. for the county of Glamorgan has been appointed. Will Glamorgan members please note the QRA and also that they should write to Mr. Douglas Low (2BRF), "Nantissa," Westbourne Road, Penarth, Glamorgan, in the first instance.

The work of the Area is still about equally divided between the 1.75 and 7 M.C. bands, the recent P.M.G. restrictions having done much to improve operating conditions on 170 metres in this District.

The whole Area is now completely organised, and it rests with members to make full use of this organisation and so benefit to the maximum extent from the work of the Society. Each member should let his C.R. have a short report on his activities by the 14th of each month, and attention is again drawn to the Letter Budget. Though we have a good muster there is room for many more, as by no means all those who could do so are contributing. The 30th of the month (February 29 this year!) is the closing date for the L.B., and all contributions should be sent to me.

My only regret this month is to have to record that G5FI, of Cefn Coed, the C.R. for Brecon, is again in hospital as a result of his recent motor smash. He has been laid up for many weeks, and it is feared that he may never fully recover the use of one leg, which is a serious blow to a good rugger player, apart from anything else.

Finally, I should be glad to hear from anyone into whose hands this may fall who is not yet fully informed as to the operations of the R.S.G.B. in this part of the world.

The following stations are known to be active:—G2PA, G5KK, G5LP, G5NS, G5OC, G5PH, G5TW, G5WH, G6FO, G6GW, 2AIS, 2BPI, 2BPM, 2BRA, 2BRF, BRS245, BRS518, BRS570, BRS573, BRS669, BRS727.

#### DISTRICT 12 (London North).

The Letter Budget has grown to 23 contributors, and it has been necessary to run one every three weeks. I shall be pleased to hear from anyone who would like to contribute.

The last monthly meeting held at G6CW on January 9 was attended by eleven. A general discussion took place, including the improvement of the Letter Budget.

The next meeting will be held on Saturday, February 27, at G2IM. Anyone who is coming please drop him a line; time, 8 p.m.

Activity in the district is increasing and the BRS stations are getting some fine logs.



**DISTRICT 13 (London South).**

With 20 really active stations in this Area, surely more than five have something interesting to report? G2AI has joined the "Windom" brigade, but results not too good. G2YG has been away again, but will be on 1.75 M.C. shortly. G5PL has worked more DX on 7 M.C. and finds that solid feeders make little difference against stranded ones. W.B.E. claim has been turned down, as ZC6JM does not count as Asia. G5YH finds a T61D a useful valve and he is now WAC. G2ZQ is down with 'flu. G6BB has changed to E. fed Hertz and says that this type of antenna acts as a Marconi type (sorry cannot agree, OM). He has calibrated a frequency meter which is capable of measuring to 0.05 per cent. accuracy. G6NF has been active on 3.5 M.C. every Sunday morning with phone. Very little key-work done as calibration matters have taken up most of time. Conditions at night on 3.5 M.C. are good. Several W stations are heard after 23.00 G.M.T.

How many stations in this Area possess an accurate frequency meter? G6NF will put out several different frequencies on February 21 at 11.00 G.M.T. on the 14 M.C. band. Send me a P.C. of your measurements and I will tell you your degree of accuracy within 0.02 per cent.

**DISTRICT 14 (London East)**

The monthly meetings show no evidence of waning popularity, as is evidenced by the goodly January gathering at G6FY's. The next one will be held on February 23, at Chingford as usual, G6UT, we are pleased to say, now being back on the key after his recent illness. Weekly Morse test schedules are still in progress, but as there seems some considerable doubt as to the demand for these, learners are requested to communicate with the D.R. on this point; otherwise they will probably be discontinued owing to lack of support.

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

Twelve members were present at the January meeting, when each spoke for five minutes and gave us some very interesting discourses.

G5CV has offered his QRA (45, Fairfax Road, Chiswick) for the next meeting on Monday, February 22. There is to be a discussion on low frequency couplings for use in amateur receivers.

The March meeting has also been arranged and will take place on Saturday, the 12th, at G6VP, 12, Ferrers Avenue, West Drayton.

Both are fixed for 7.30 p.m., and as this is the only notification, please make a note of the dates, etc.

Nothing has as yet been fixed for the March meeting, so suggestions will be welcomed.

Very few reports have come to hand and those that have show conditions as rather poor.

I should like to thank the anonymous donor of the notepaper and should like to thank him personally.

We have ex VE2AE with us in the Area, and I should like you all to meet him at the February meeting.

**SCOTLAND.**

January has brought us no alleviation of the extraordinary poor conditions on all bands; indeed, the reverse has been the case, and one begins to

wonder just what is happening to short wave radio. The gales of January have been responsible for much damage to aerial systems, the writer being one of the victims, having had his aerial system and 50 foot masts completely destroyed by hurricane. He was consequently QRT during the latter part of the month.

At a well-attended "A" District meeting at G5YG it was decided to adopt the system recently put into force by "D" District relative to the election of District Officer, namely, that the post be held for 12 months only and be filled by the transmitting members in rotation. Acting upon this decision, Mr. J. Cyril Adams (G5XQ) was appointed for 1932, and entered into his duties as from January 1. I should like very much if "B" and "C" District officers would arrange to discuss this with their districts, and let me know the result.

Mr. R. E. Thomson, of Broughty Ferry, having received the call G6RT, will shortly be on the air with a C.O.P.A., and I wish him good luck.

The Scottish Crystal Register was issued to all Scottish members in January, and as the preparation of it entailed a good deal of work, I trust that members will make an effort to keep it up to date. Here is the first addition to it. G6RT has purchased a 7 M.C. crystal, the fundamental frequency of which is 7,030 K.C.

It will interest members, and particularly "A" District, to learn that Mr. John Batty, who for years has held the post of Chief Post Office Radio Inspector for Scotland, retired at the end of 1931, and has been succeeded by Mr. John Kilgour, recently in charge of the South of Scotland Area. Mr. Kilgour is just as well disposed towards our members as Mr. Batty was, and if they show their usual consideration in the operation of their stations, I see no reason why our existing pleasant relations with the G.P.O. in Scotland should not continue indefinitely.

I am sorry to record another departure south. This time it is G2QO, A. C. F. Dearlove, who recently left Glasgow for Hull to take up a post with the Marconi Company there. I am sorry to lose him, but as the change is to his advantage financially, I wish him the very best of luck. I am pleased to note that G2MG is now consistently on the air with a beautiful C.C. note, and hope that his recently renewed interest on amateur radio may be long sustained. Mr. J. Hamilton, 10, Airlie Terrace, Dundee, has been allotted the call sign of 2BLJ, and I trust ere long will go forward for his full ticket. 2BTT and 2AUV are presently attending Morse classes, and are going forward for full licence very shortly. "D" District continues to hold its fortnightly meetings, and at the most recent meeting a general discussion was held on aerial systems. G6SR and G6FN continue the Morse class schedules, but so far as I know are still reportless. The 3.5 M.C. Morse transmission will be commenced from the writer's station some time in February. I note with pleasure that G2FV has returned to Glasgow, and consequently comes once again on to the strength of "A" District. His crystal, therefore, the frequency of which is 3,562.4 K.C., falls to be added to the Crystal Register.

It may be of interest to "A" District BRS and AA members to learn that the Scottish Wireless

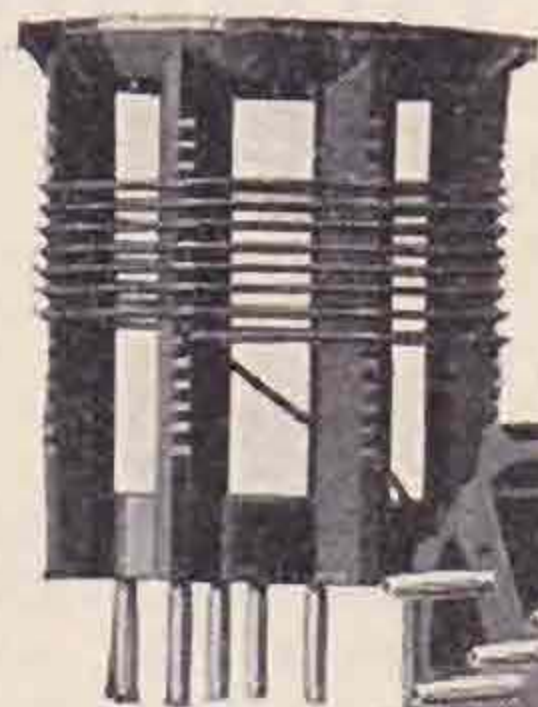
*(Continued on page 273, foot of col. 2.)*





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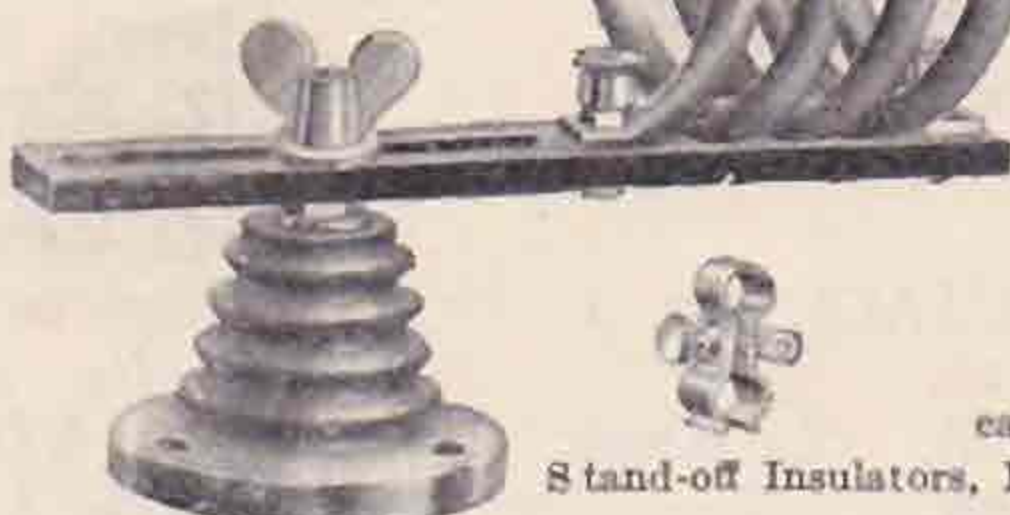
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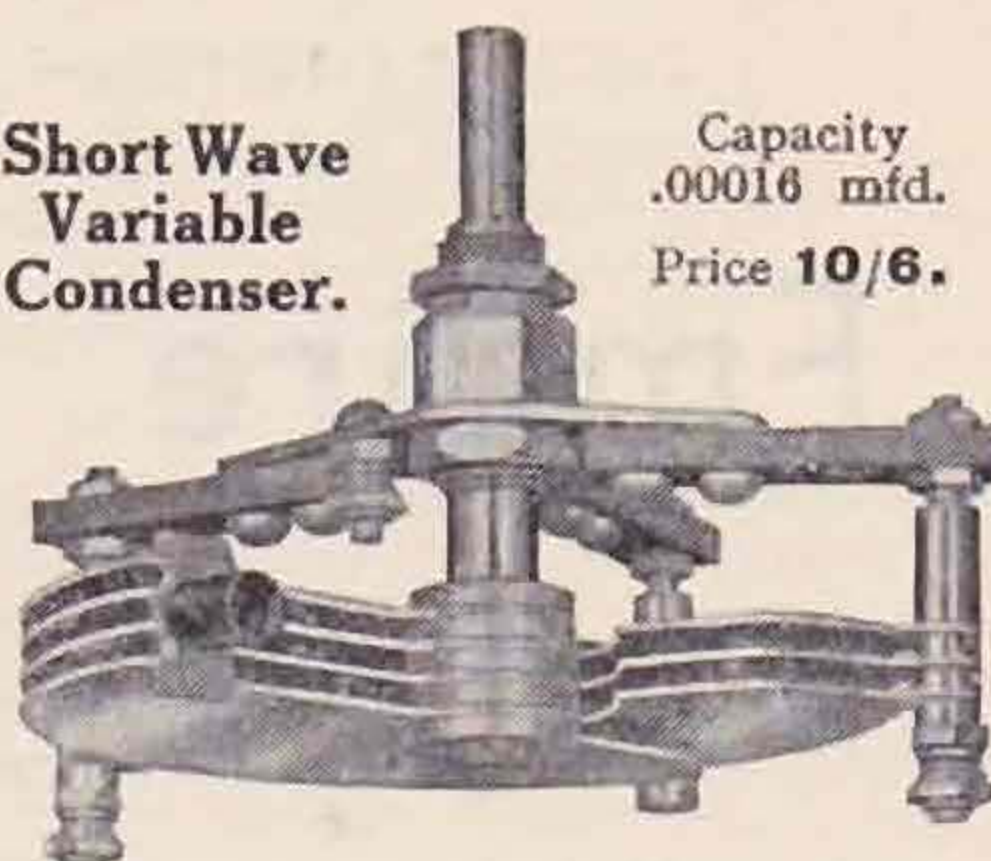
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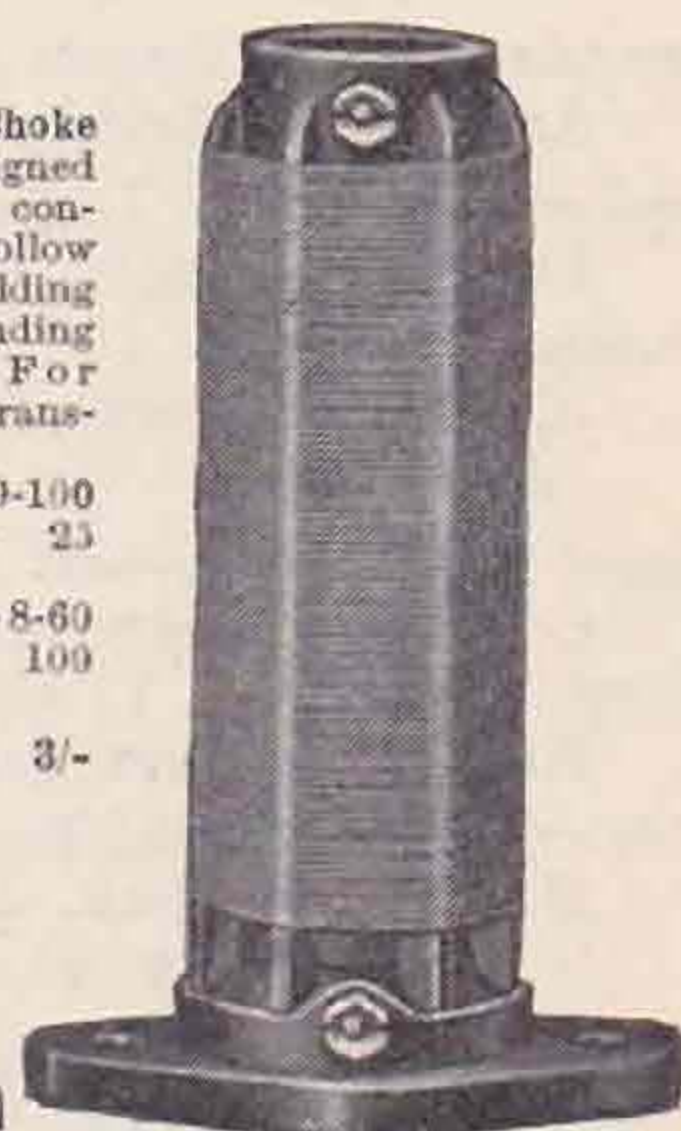
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# Empire



# News.

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

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

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

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

*Ceylon and South India.*—G. H. Jolliffe (VS7GJ), Frocester Estate, Govinna, Ceylon.

*Channel Islands.*—Captain A. M. Houston Fergus (G2ZC), La Cotte, St. Brelades, Jersey, Channel Islands.

*Egypt and Sudan.*—H. Mohrstadt (SU1AQ), No. 1 Co. Egypt Signals, Polygon, Cairo.

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

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

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

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

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

*Malaya.*—G. W. Salt (VS2AF), Glenmarie Estate, Batu Tiga, Selangor, Malay States.

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

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

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

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

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

## Australia.

By VK2HC.

**NOVEMBER-DECEMBER:** Considering conditions on 28 M.C. from every angle, the work done on this frequency during the last month or so is the best for some time. Numerous contacts have been established between VK3, VK4, VK5, and, most outstanding, VK7, when VK7CH made a short contact with VK3KY. Some other notable stations on this band are VK3BQ, 3JJ, 3WL, 3BZ, 3HK, 4GK, 4XN, 5HG, 7CH, 7RB.

Very poor conditions exist on 14 M.C. All DX signals are rather weak and unreliable. The best time for European contacts is at about 13.00 G.M.T., with Asia a little later. The South Africans are seldom heard except by VK6 stations.

On 7 M.C. static has had a say, the result that DX in the evenings is rather restricted. In the early mornings, about 20.00 G.M.T., QRN is slight, and some good DX has been worked.

Operation on 3.5 is rather hopeless, and very few are on this frequency at present.

The Maclurcan Cup contest, organised by the N.S.W. Division of the W.I.A., is to be held in February between 13th and 29th, 14 M.C. only, and points are granted somewhat after the B.E.R.U. C.T. scheme.

There is also a QRP All-Australian test to be conducted on a miles-per-watt basis, commencing January 4 and concluding January 31.

Enthusiasm is running high in connection with the forthcoming B.E.R.U. contest, and all can rest assured that the VK's will do their best to retain the trophy!

## Canada.

By VE2BB.

*December:* DX conditions still very poor, and but few contacts are made. Local conditions are quite good. We are hoping that matters will improve considerably for the tests.

## Ceylon and South India.

By VS7GJ.

*December:* VU2JP, South India, reports conditions have been more or less the same since September last, with occasional bright spots.

The 7 M.C. band has been very consistent, and though many DX stations have been worked, conditions are not what they usually are at this time of the year.

14 M.C. is practically dead, and exceptional nights are but very few.

VS7GT says that the 14 M.C. band has shown a slight improvement, although it is completely dead for long periods. The 7 M.C. band began the month well, and was very lively, but has latterly been subject to heavy blanketing and skip, in which local stations were inaudible.

## Iraq.

By YI2DC.

*December and January:* With the absence of regular reports from Iraq it would seem we are relaxing after the heat of the summer. That is not so, however, as a number of keen amateurs are now unable to continue with the transmitting side of the business.

YIIEJ, YIIRM and YI2BT are now inactive for this reason, and the last mentioned is hoping to join YI2DC at Basrah soon. YI2GM has been



moved to India for some time, and that call is not likely to be heard again. YI6HT has not been heard for months, the owner being away on flying duties most of his time. Incidentally, we should all be glad to hear from him on the air again to show that we have at least one crystal in Iraq.

At the time of writing the only active stations appear to be YI6KR and YI2DC. YI6KR has been heard at YI2DC several times during the last three months, and is not on CC yet. YI2DC made his appearance in September, and is using a PP transmitter of 30 watts or less on 14 M.C. and 7 M.C. most afternoons and evenings, respectively.



RADIO IN THE TROPICS!

Conditions at that station have been fairly good on 14 M.C. and poor on 7 M.C. during the period mentioned. 14 M.C. has been best about 11.00 to 15.00 G.M.T., when the fade-out occurs. On 7 M.C. nothing but R9RAC from Russia is heard about 15.00 G.M.T., after which they rapidly decline in strength, when a few European and VK stations

are heard. About 19.00 G.M.T. conditions improve and the RAC is substituted by the sweet strains of CC and DC notes. W stations have only just made their appearance on 14 M.C. about 15.00 G.M.T., and VK and ZL were first heard in October, since which a number of good QSO's have been made. YI2DC has been informed by ST2D that his 28 M.C. was recently heard at that station. Further tests were made at a later date, but nothing was heard by ST2D. The active stations hope to take part in the B.E.R.U. contest if time allows.

### New Zealand.

By ZL3AR (via G6VP).

*December:* A most successful Ham Convention was held in Christchurch during the Christmas week-end, and was attended by members of all sections, over 50 being present.

Saturday morning was spent in station visits, but after lunch the Secretary's report was read, and it was gratifying to learn that a credit balance of £247 was to be carried forward.

A general discussion ensued as to the future conduct of the Society. Greetings were sent to the B.E.R.U.

### Sudan.

By ST2D.

*December:* ST2C and ST2D were both active on 14 M.C. during early November, but were then called away from Khartoum. ST2D also spent some time on 28 M.C. and 7 M.C., and managed to return in time to spend Christmas on the air.

After an absence of many months, VK's and ZL's have returned to the 14 and 7 M.C. bands, and can easily be worked. The Americans have disappeared from 14 M.C., but have reappeared on 7 M.C. after 21.00 G.M.T. 14 M.C. is limited to a period between 11.00 and 17.00 G.M.T. for any useful work, while 7 M.C. is good from 16.00 to 06.00 G.M.T. for both local (always over 1,000 miles) and DX work. During early November 28 M.C. showed signs of renewed life, but is now dead.

### A New Station Log Book.

We have recently received from Richard Martin and Co., Ltd., of Worksop, a new design of log book which we feel is worthy of recommendation to all amateurs desirous of maintaining a neat and accurate record of their work.

For some years we have pressed for the compilation of a log sheet containing sufficient space beneath each heading to allow the entry to be read clearly whether written in pen or pencil. This desirable requirement has been admirably fulfilled.

Mr. E. R. Martin (G6MN), who has designed this sheet, has learnt from experience that the average amateur wants something "good" when he purchases a log book. We believe he will get it in this latest contribution to our very limited supply of amateur radio aids.

The new book should prove of very much value to B.R.S. members who have only recently started serious station logging. The log will enable them to maintain an accurate record in a uniform binding.

The book contains 100 large sheets each ruled with 25 horizontal lines and divided into 11

essential columns. The paper is of very good quality and the whole is bound in stiff blue covers. The price is 1s. 9d. per 200 pages, 2s. 6d. per 400 pages, postage 6d. extra.

J. C.

### Contact Bureau Notes.

(Continued from page 273.)

is G6GV (G. H. Vickers, Barnfield, Prestwich, Lancs.). An interesting report comes from ST2D, who, when he was out in the desert, has been getting excellent results out of a small Marconi type aerial on 7 M.C. Since his return he has pulled down his old C.F. Hertz and AOG aerials, and put back his Zepp. Results exactly the same as before. ST2D therefore suggests that a properly adjusted Hertz with good height, clear of local obstruction, can be fed anyhow with equal results. He has tried them all, and the only difference is the adaptability of some types of feeds to the particular situation. For multi-band working he prefers the Zepp. There are still vacancies in the self-excited and B.E.R.U. antenna groups.



## CORRESPONDENCE.

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

### Clearing up the "Zepp" Question.

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

DEAR SIR,—May I ask a little of your valuable space to comment on the controversy between Messrs. Forsyth and Charman in your last issue? On reading both articles and letters there seems to be much sound sense on both sides in spite of the apparent disagreement on certain points.

Mr. Charman's stipulation that there must be no impedance mismatch at each end of the line if radiation is to be prevented is undoubtedly correct. And yet he says that the ordinary Zeppelin feeder with one wire attached to the end of a half-wave aerial does not match, while Mr. Forsyth says that this is exactly what it is intended to do, and refers to Mr. Livesey's article which gives an explanation of how the Zepp fed aerial is supposed to work. This is excellent in itself, but (and does not G6LI himself warn us that the theory is not strictly accurate?) its theoretical nature seems to be the cause of the dissension.

Mr. Forsyth claims to present the practical point of view rather than the academic. May I humbly suggest that the usual presentation of the theory of the Zepp feeder as given by Mr. Livesey in the December issue is purely academic and the real cause of the trouble is that he is assuming certain academic (and practically impossible) conditions to hold for the purpose of his explanation.

If the aerial and feeders were entirely without loss, then the diagrams given on page 186 would be perfectly correct and the open end of the aerial would present an infinite impedance to the line, which would cause no unbalance to a quarter wavelength of perfect line. Now not only is it impossible to make these losses zero in the line, but we have in the aerial itself a comparatively large "loss" due to the radiation of energy from it which gives it the appearance of having more resistance than its purely electrical resistance. (See page 224.) Thus the purely hypothetical conditions assumed by Mr. Livesey (although correct for his purposes of explanation) cannot be used by Mr. Forsyth to prove his case. Mr. Charman undoubtedly refers to a practicable aerial and feeder, the former with a considerable radiation efficiency and the latter with a small but not negligible loss.

What is the effect of this resistance? It has the effect of preventing the presence of a complete current and voltage node in the wire, and of thus rounding off the sharp dips in the current curves of Figs. 7 and 8 of Mr. Livesey's article. There is thus not an infinite impedance at the end of the aerial, and we are forced to Mr. Charman's conclusion that the ordinary Zepp feeder *must* be working unbalanced. Reference may be made to an article by Roosenstein in *Experimental Wireless*, June, 1931, for further details.

This brings us to another point, however. There is no doubt that when any form of feeder is operating correctly there must be no impedance mismatch at the ends, no radiation from it, and a uniform current and voltage throughout its length. Now,

the important point which, I think, has not been sufficiently emphasised in all the recent BULLETIN articles is that with a feeder working in this manner its length has *no significance whatever*, and that any length of feeder may be used to feed any form of aerial suitable for it. The only effect of a long feeder is the power lost in it, which is proportional to its length. With the lengths and wire diameters in common use, the power lost will generally only be a few per cent. of the power transmitted.

I am in agreement with Mr. Forsyth that in the usual practical circumstances the wire gauge is not of vital importance. For example, with a spacing of 8 ins., a change of wire from 14 s.w.g. to 18 s.w.g. gives a change in feeder impedance of little over 15 per cent., which is well within Mr. Charman's own tolerance! In any case, it is the writer's experience that irregularities in the line and proximity to earthed objects cause a greater change from the calculated value, as given in Fig. 4 of Mr. Charman's article, than this.

In support of this may I quote some actual measurements made on a feeder at G6OT, consisting of two 7/22's spaced at 8 ins. apart. This was calculated to give a characteristic impedance of 627 ohms, which agrees with the value obtained from Fig. 4. A number of measurements made at the working frequency of 14 M.C. gave a mean value of 460 ohms. The feeder was 68ft. long and was measured in a horizontal position about 15ft. above the ground. This agrees with Mr. Charman's opinion that the impedance of the feeder is reduced by the proximity of the earth and indicates the order of the divergence from the theoretical value which may be obtained in practice.

I am afraid that Mr. Charman's description of the characteristic impedance of a transmission line on page 223 is apt to lead readers astray. He considers a pair of wires which stretch from A to B, and are thus of finite length, and states that they look like a pure resistance load. In the general case this is definitely not so. The manner in which the impedance of a pair of wires, open at the far end, varies with their length can only be completely shown by means of diagrams and an explanation too long to give here, but may in general be inductive or capacitive, and its resistance may vary between very wide limits. The only cases where the line presents its characteristic impedance to a source are:—

1. When it is infinitely long.
2. When it is of a finite length and closed by a resistance equal in value to its characteristic impedance.

We see, therefore, that a matched feeder may be of any length. If the line is closed by a resistance not equal to the characteristic impedance, e.g., an aerial tuned to resonance but not matched to the line, it will appear to have an impedance higher than the characteristic impedance at odd quarter wavelengths and lower at even quarter wavelengths. This explains why an end-fed Hertz aerial (Zeppelin) is always recommended to be fed



with a quarter-wave feeder and a centre-fed aerial with a half-wave feeder. These are the best conditions for the unmatched feeder, but represent a loss of efficiency at the junction of the aerial and feeder and also considerable radiation from the feeder.

The use of a feeder line matched into the aerial at one end and to the transmitter at the other obviates both these strong disadvantages, and also presents the great convenience of a feeder which may be of any required length.

In conclusion, may I apologise for trespassing on so much space and add my congratulations to those of several others who have recently noted the steady improvement of the BULLETIN.—Yours truly,  
H. A. M. CLARK (G6OT).

### Phone or Key?

To the Editor of T. & R. BULLETIN.

DEAR SIR,—I feel I must reply to G2MI's letter in the January issue of the BULLETIN. He says that he disagrees with me in that he thinks fone is the ideal form of QSO.

I think if he reads my letter carefully he will find that I actually expressed the same view, so I fail to see how he disagrees with me. In fact, my exact words were: "Fone would really be the *ultima thule*."

The whole trouble is bound up in the fact that such an ideal is unattainable.

G2MI only needs to listen on the 7 M.C. band on a Sunday morning to hear the utterly disgraceful chaos caused by a few dozen or so QRO fone stations. What would things be like if we all used "fone"? How could any ham hope for an ideal QSO?

We must remember that amateur radio is intended for all sections of the community and recognises no distinctions whatever. A ham with low-power gear should be allowed a chance, and he certainly won't get it if we all decide to use fone.

Under such circumstances I'm quite confident ham radio would come to an end! We'd all "pack up" because of QRM.

I shall look forward to the day when the U.S.A. regulations regarding telephony and C.W. on the amateur frequency bands will be adopted, and enforced, the whole world over.

To return to the subject of Esperanto. G2MI says he does not understand what I mean by referring to Esperanto as "a code." Well, I cannot see that any further explanation is necessary. Surely he realises that a language worthy of the name cannot be built up artificially like Esperanto. No, a language is something that, of necessity, must have a natural and slow growth.

Another point G2MI raises is that we are a lazy nation. Well, I'm afraid there is, perhaps, some truth in that.

However, I think the real reason for it is that so many foreigners speak our tongue so well that we do not find it necessary to learn their language.

And surely this very fact in itself is a strong argument for English as an international language?

May I conclude by reminding G2MI that although we may have differences of opinion, we are "all out" for making lasting international friendships and furtherance of world peace. Wishing him very 73.—I am, yours sincerely,

HARRY C. D. HORNSBY (G5QY).

### The Language of Peace and Goodwill.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—To reply briefly to G5QY's letter which appeared in the December BULLETIN is going to be difficult; there are so many different points which he has overlooked.

The subject is "World Peace and Amateur Radio." In setting out for "W.P." we are breaking tradition—G5QY is going to break tradition by keeping tradition in language; the very thing which has made wars! Would a non-English "ham" find "Peace" in our traditions? Esperanto has a tradition, and it is "World Peace"; it has been passed on by word of mouth from age to age.

G5QY states that "Esperanto is an international code"—so any language is code for that matter—but is he aware that the P.O. calls it "plain language" by international agreement, whereas some national tongues, Welsh, for instance, are not. Esperanto is traceable back to the common Aryan stock of European tongues, and so far I have discovered only one artificial root in it—don't forget that it is phonetic. It has far more roots than most "hams" will need.

Several years ago G5QY learnt some Esperanto, but found it of no use in "Amateur Radio." I admit it requires something of the "detached mind," the pioneer spirit, but if we left "OM" to the radio side (for DX must have its place) and used "Amiko" for the ham side of our movement, we should be living for the future and not in the past—the past of which we feel so ashamed as humans.

The December issue of the BULLETIN gave at least three instances which show that the "ham" ideal is not here yet. G2UV, for example, feels very much as I do over the foreign (French, OM—an ugly word—can you better it with an English word?) QSO's. How many English "hams" call the other fellow in his own tongue or even attempt to return the compliment paid them?

Has G5QY ever tried to explain "Old Man" to a Continental "ham"?

Mistakes, some serious, have occurred and will continue to trouble our international relations while we try to use national tongues for purposes for which they are not, by their nature, fitted. Every "ham" has many ready analogies for this scientific problem.

M. W. P., in his review of "Kurzwellentechnik," the book which is to be the A.R.R.L. book for the Germans, regrets that it is written in German. So the "common or garden" "Liebhaber" has had to wait till now for his book, and now because it is so good, we wish it to be in English. The members of smaller countries, well, "let them learn English if they want S.W. Ham Radio," does not seem to be ideal; can we really fraternise under those conditions?

No, OM, I can't feel that I am very far wrong in backing a language which is a mixture of most, easy and a half-way meeting place for all. The task is a big one, but one might as well make some real scientific effort to found World Peace on friendship and unity as to amble along in non-directive ham radio.

G5QY is as good a "ham" as I shall ever be, and I shall be as proud a "G" as he, if we British can



also lead in winning this World Peace issue—the international mind is only just becoming apparent; it is the product of the war, Esperanto, and "Ham Radio," too, surely, OM?—Vy 73, sincerely yours,  
W. H. MATTHEWS (BRS591).

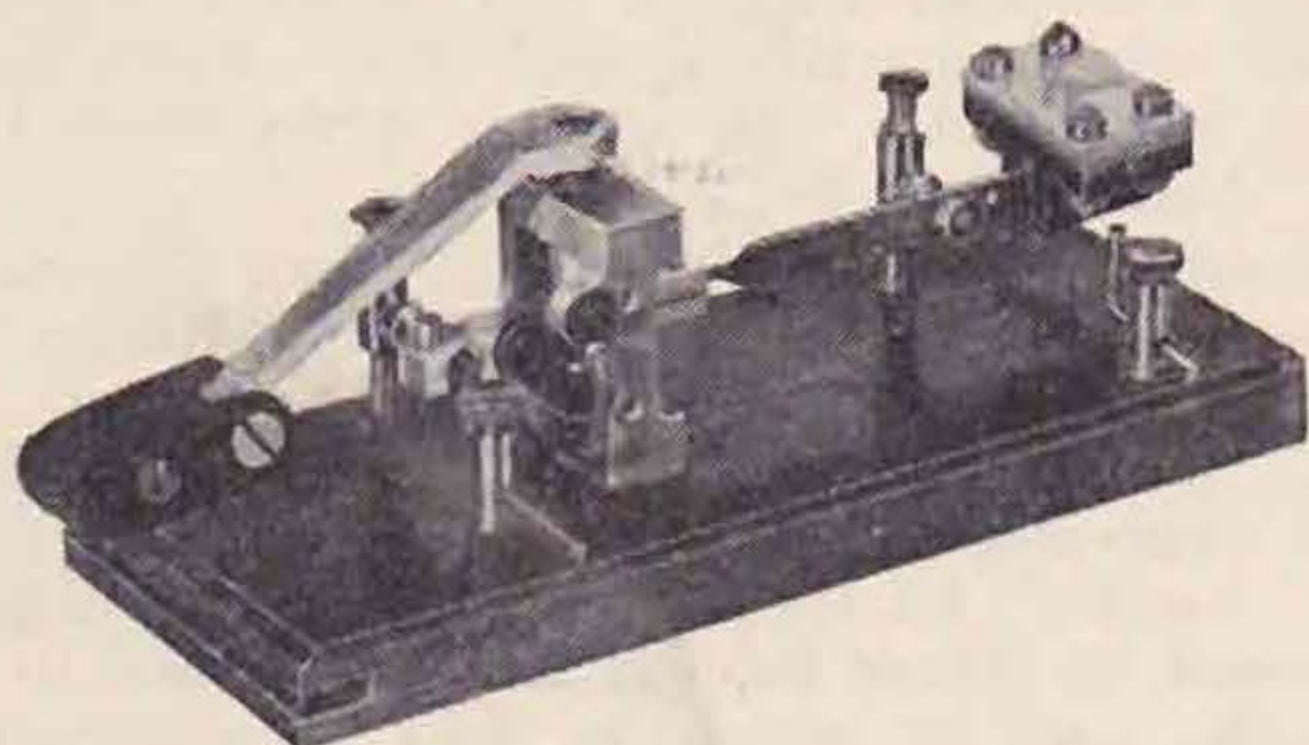
[This correspondence is now closed.—ED.]

### Semi-Automatic Morse Key.

To the Editor of T. & R. BULLETIN.

SIR,—With reference to the key you described in the January issue of the BULLETIN, I have had a helpful letter from EI2B, who has built and experimented with several keys of the type, and he has several modifications to suggest. As these undoubtedly might assist any who may be building the key, may I briefly state the alterations.

He finds phosphor bronze makes a good main spring, as well as a centring spring (*i.e.*, the two springs E E in Fig. 1 can be dispensed by fitting one under the arm).



A "Brown" Key converted.

His next suggestion, which I have tried, and find it to be good, is to mount a "U" spring on the dot contact extension piece (B), and have the dot contact mounting (F) a fixed mounting on the main spring. In other words, reverse the fixed and moving contact positions, and alter the shape of the dot contact spring. I have also discovered that Messrs. Leslie Dixon have some very fine keys, made by Messrs. Brown, which, with a little modification, might easily be utilised in making up the most difficult part of the key, namely, the pivot mounting. These keys are not "side swipers," but to anyone not having the facilities to make up the mounting, the work would not be difficult to modify a Brown. I understand that they are being sold at 7s. 6d., and apart from the mounting mentioned, they have some beautiful contacts. In the key I described, I tried to describe it as being made from the kind of scrap that all of us have, but if a little money be spent on the construction, a better key would probably result.—Yours faithfully,

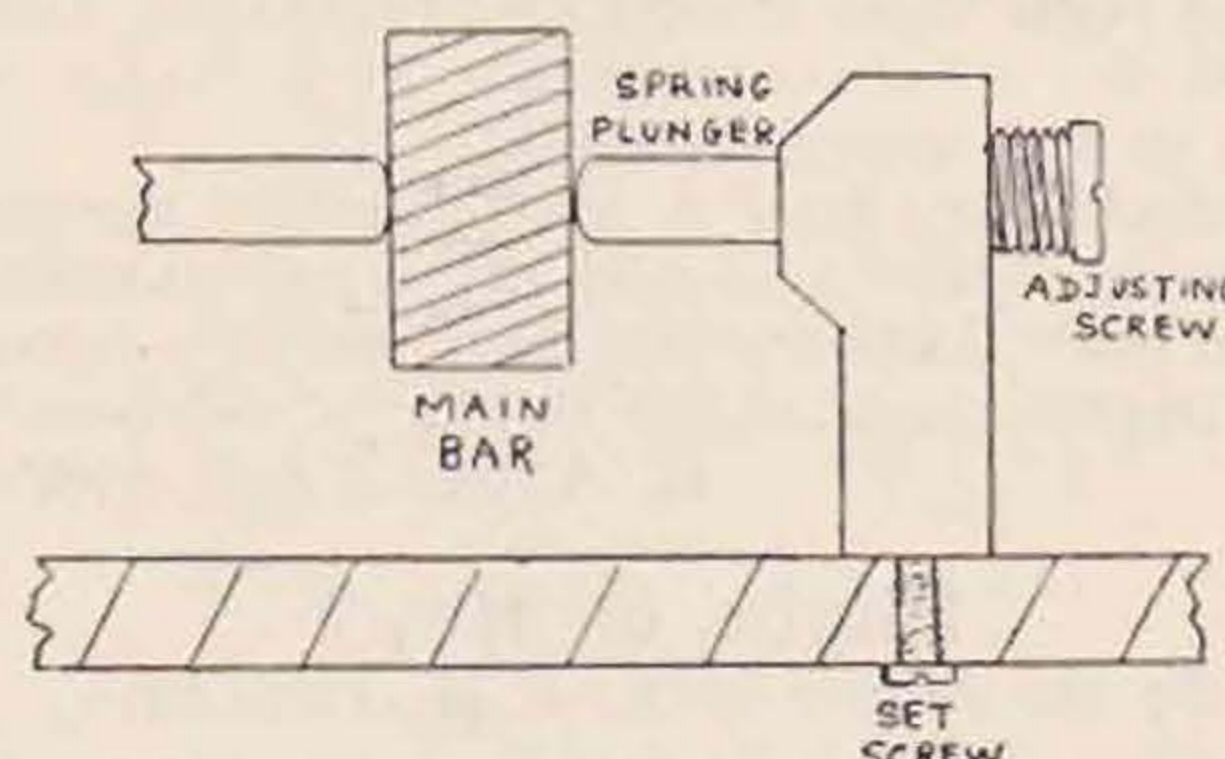
A. M. HOUSTON FERGUS (G2ZC).

To the Editor of T. & R. BULLETIN.

DEAR SIR,—Having constructed the semi-automatic Morse key described in the January BULLETIN by G2ZC, which, in my humble opinion, is one of the best constructive articles that has appeared, may I be permitted to suggest a slight modification to the original model, which I carried out and which might be of interest to other members.

Having made up the key, I found some difficulty

in getting even tension on the two springs, which are used to bring the arm to the centre position. After trying various springs, I hit on the idea of using two spring plungers that are used in the electric light holders to hold the bulb in good contact. One was mounted each side of the main bar, secured to the base plate by means of the small set screw—which are normally used to grip



the wire from the mains—and with the spring plungers pressing lightly on the main bar of the key. It will now be found that almost micro adjustment of the tension on the plungers can be obtained by means of the screw provided at the back of the plunger.

The sketch will explain the type of plunger I mean.—73's, etc., Yours faithfully,

H. J. LONG (2ALR).

### Calls Heard—(Cont. from next page).

VK5CR, South Road, St. Mary's, South Australia:—

14 M.C.: g2rv, g5ml, g5pj, gx2tm, st2c, ve3bm, ve5bi, ve5jm, vs3ac, vs7gj, vu2ah, vu2jp, yi6kr.

7 M.C.: g5mu, gmon, ve4dj, ve5dx, ve5ec, ve5fi, vp1fr, vp2br, vs6ae, vs6ag, vs6an, vs7ai, vs7ap, vs7gt, vs7ks, zs2a, zs2c, zt6t, zt6x.

\* \* \*

G5WQ, November 29 to December 14, between Capetown and Fremantle, W.A.:—

7 M.C.: g2by, g6yl.

14 M.C.: ear94, f8dl, f8eft, f8ex, f8fz, f8sx, f8wz, g2by, g2dh, g2dz, g2kb, g2oa, g2oi, g2ol, g5bd, g5cv, g5gq, g5pl, g5vb, g5yg, g6hp, g6qb, g6rb, g6rg, g6vp, g6wn, g6xn, g6xq, g6yk, g6yl, haf4d, haf8b, haf8c, ok1wk, ok2va, on4au, on4bz, on4fe, on4gn, on4jj, oz5a, sm6ua, sp3ar, vslab, vs3ac, vs6ae, vs7ap, vs7gt.

Between Fremantle and Adelaide, December 15 to 20, on 14 M.C.:—

f8pz, f8rj, f8wb, g2dz, g5vm, g6vp, g6xq, g6yl, on4uu.

\* \* \*

F. A. Robb (2AXW), 3, Worcester Terrace, Chamberlain Street, Belfast, Northern Ireland. January, 1932.

7 M.C.: au7ak, au7kah, au7cz, au8kal, cm2mm, ct2af, cv5bj, cv6cb, eu2kt, eu2nf, f8sj, fm8cr, fm8eg, fm4ab, frear149, ilii, ilid, pylff, sulch, wlenn, w2cxp, w3md, w3apn, w3bph, w4zh, zl4ba, zt1t.

14 M.C.: celai, cn8mi, fm8ih, k4rk, k5aa, oa4z, oa5p, oh7nc, oh7nf, un7pp, veldr, veldl, velbr, ve2co, ve5cp, vo8mc, vk7ch, wlcae, wlakv, wlbqr, wlazl, w2mb, w2ox, w2rr, w2akk, w3aho, w3cep, w3cdn, w3cdk, w4awo, w5bkb, w6ejc, w6eii, w7ax, w8blp, w8ccw, w8cte, w9adn, xzn2a.



## CALLS HEARD.

*In response to many requests we have decided to revert to the old system of listing "Calls Heard," and in future we will publish lists of "Calls" from all parts of the world.*

W. J. Magill, VS7AO, R.F.A., "Slavol," Trincomali, Ceylon. During December, 1931.

7 M.C.: ac3ma, ac8js, ar8mo, aulde, aulnz, au3ea, au7cz, au7de, au8ah, au8at, au8kal, ctltv, earl04, earl26, eu2mk, eu2ol, eu5kaa, eu6gh, f8pz, f8wy, fm4ab, j7cf, kalcm, kalco, kalcp, kaljm, kalne, kalrt, kalzc, kilhr, oklkd, ok2am, omlfr, on2tg, on4au, on4fm, pa0fp, pklab, pklac, pk1jr, pk3bq, pk3jj, pk3pr, pk4ab, pk4cr, pk4dg, pk4ja, sulch, vk2ba, vk2fo, vk2jz, vk2ns, vk2ou, vk3bw, vk3cw, vk3ek, vk3jr, vk3ka, vk3ml, vk3oc, vk3ou, vk3wl, vk3wx, vk3wz, vk3yo, vk4ah, vk5gr, vk5lx, vk5my, vk5ny, vk5rh, vk5xk, vk6bn, vk6cr, vk6dh, vk6fl, vk6hf, vk6jj, vk6lx, vk6ow, vk6rl, vk6rx, vk6ui, vk6wi, vk6wn, vs3ac, vs6ad, vs6ag, vs7ai, vs7ap, vs7gt, vs7mp, vu2ah, vu2jb, vu2jp, vu2kt, w3ang, w6uc, zllar, zl2ac, zl2bh, zl2go, zl3bj, zl3cs, zs2a, zs5u, zs6b.

14 M.C.: etlaa, f8pz, fm8cr, fm8eg, g6qc, g6rg, haf2g, haf9g, kalcm, kalja, kaljm, kalzc, ok2op, om2rc, on4au, on4oj, oz5a, pa0ld, pk1ci, pk1xl, pk3bm, pk5cg, vk2ax, vk2ba, vk2br, vk2dw, vk2hc, vk2hz, vk2lx, vk2lz, vk2xu, vk2xy, vk2zc, vk2zg, vk3bz, vk3dt, vk3go, vk3hm, vk3jt, vk3mp, vk3mr, vk3nm, vk3ow, vk3wl, vk4as, vk4gk, vk4po, vk4rv, vk4wo, vk5ju, vk5pk, vk6gf, vk6hf, vk6mu, vk6wi, vs1c, vs3ac, vs6ae, vs6ao, vs7gt, vu2ah, vu2df, vu2fx, vu2jb, w6ry, zg2c, zllce, zllgn, zl2bz, zl2du, zl2dw, zl2gw, zl2gq, zl3aq, zl4gq, zslc, zs4m, zs5u, zs6y, zule.

A. E. Livesey (G6LI), Stourton Hall, Horncastle, Lincolnshire. December, 1931, and part November.

7 M.C.: sulch, st2d, vk3bw, vk3ek, vk3tm, vk3xi, vk5gr, vk5yk, vk6wi, vk7ch, vo8mc, vs3ac, yi2dc, yi6kr, zl3az, zl4ao, zu2hg.

A. T. Mathews (BRS497), 24, Woodside Park Avenue, N. Finchley, London, N.12. December 19 to January 17.

14 M.C.: lu3dh, py1ff, py2aj, py2bq, ye2cr, vk2lz, vk2xu, vk4gk, vs5ss (QRA?), xf8nih, xzn2a, zl2bg, zl2ci, zl2cw, zl2gw, zl3ar.

7 M.C.: au7de, au8kal, cm2fn, cm2lc, k4acf, k4aop, k4es, k5ab (QRA?), kalcm, kalhr, kaljm, st2d, velbv, vk2bq, vk2ns, vk2oc, vk2ou, vk2pz, vk2xu, vk3bw, vk3cw, vk3ek, vk3gj, vk3hl, vk3jf, vk3rj, vk3tm, vk3wl, vk4hr, vk4ju, vk5hg, vk7ch, vk7ge, vs6an, w6cuh, xxlyj (QRA?), xzn2a (ship), zllak, zllgq, zl2ac, zl2ci, zl2es, zl2gn, zl2go, zl2jk, zl2jx, zl3aq, zl3aw, zl3az, zl3bj, zl3cc, zl3cs, zl4ao, zl4by, zl4cm, ztlt, zu6w.

3.5 M.C.: velae.

S. C. Hudson, Wingrove, Cliff Park Lane, Goodrington, Paignton, Devon. Telephony, loud-speaker strength.

g2vq, g5yn, g6rd, g6rv, pa0sn.

By VS7GT during November and December.

7 M.C.: ac8js, ar8mo, ctlah, cv5aa, earl0, f8pz, f8vp, f8wz, fm8bg, fm8da, g2vq, g6li, oklaa, ok2ag, ok2ak, on4au, on4fm, oz5a, spltz, sulch, vk2kl, vk2ns, vk2ou, vk2ps, vk2sg, vk2sm, vk2ux, vk3as, vk3cx, vk3ex, vk3gj, vk3pr, vk3tm, vk3wy, vk3zb, vk4ah, vk4gk, vk4wo, vk4yg, vk5gr, vk5hg, vk5ju, vk5ml, vk5my, vk5rh, vk5rw, vk5ux, vk5wj, vk5yk, vk6bo, vk6fl, vk6fo, vk6gf, vk6hf, vk6jk, vk6jt, vk6ls, vk6lx, vk6mu, vk6ol, vk6or, vk6rl, vk6wi, vk6wr, vs1ad, vs3ac, vs6ag, vs6ah, vs6ao, vu2ah, vu2df, vu2gd, vu2jb, vu2jp, vu2kh, vk2ux, w6cog, yi2dc, yi2fu, yi6kr, zllar, zl2fi, zl3cc, zs2a, zs2j, zs6aa, zt6x.

14 M.C.: pa0lo, pk1pk, pk1xl, vk2ax, vk2dw, vk2hz, vk2lz, vk2xu, vk2zg, vk3wz, vk4ah, vk4gk, vk4rj, vk5gr, vk6gf, vs6ae, vu2ah, vu2kt, zslc, zs2n, zs5l, zs5u, zs6y, zt1q, zt5v, zt6k.

J. R. Witty, G5WQ, from Las Palmas to Capetown, November 13-26, 1931:—

14 M.C.: g2dz, g5bd, g5bj, g5qc, g6gs, g6lm, g6vp, g6wn, g6xq, g6yl, st2c, veldq, vs3ac.

7 M.C.: g6yl, vu2ah.

CT2AN (via G2TK), December, 1931:—

7 M.C.: g2ga, g2tk, g2wq, g5pj, g5pl, g5rd, g6cl, g6db, g6lm, g6pk, g6wy, gi6ym.

(Continued at foot of column 2, previous page.)

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W. C. HINLEY (G5WH), 17, Bethel Avenue, Tredegar, Mon.

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 L. E. LEVINE (ZS5Z), Box 2775, Capetown, S. Africa.  
 R. I. GARDEN (ZT1S), Kelvinbrae, Avenue le Hermit, Sea Point, Capetown.  
 H. R. DAY (ZU1F), Brockley Common, Antrim Road, Greenpoint, Capetown.  
 A. N. SLATER (BERS96), No. 3 (Ind.) Wing, R.A.F., Quetta, Baluchistan, India.  
 C. S. HOWARD (BERS97), Room 49, Balfour House, 13, St. George's Street, Capetown, S. Africa.  
 R. T. A. WATERS (BERS98), Kentdale, 15, Arthur Avenue, Cronulla, N.S.W., Australia.  
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#### PATENTS AND TRADE MARKS.

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



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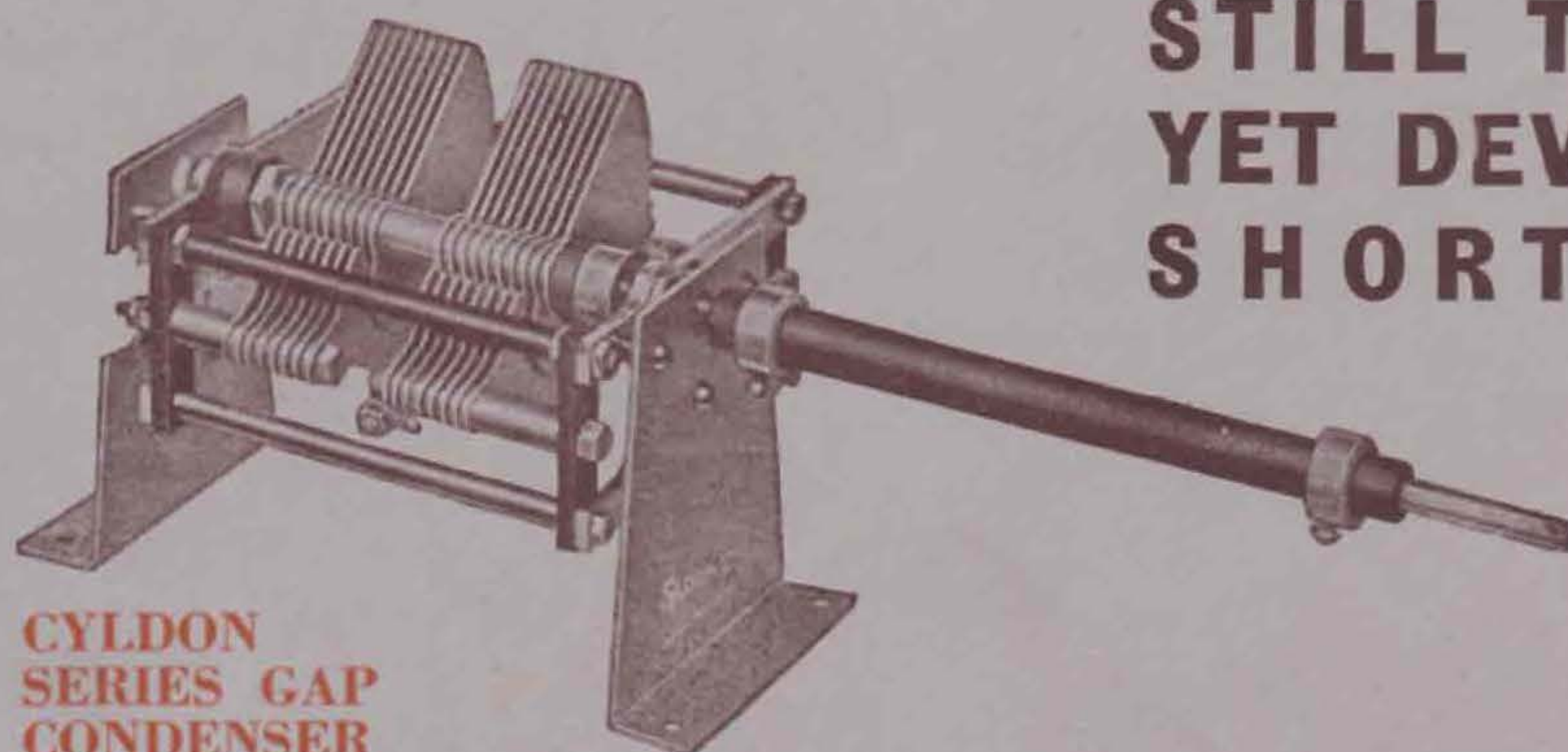
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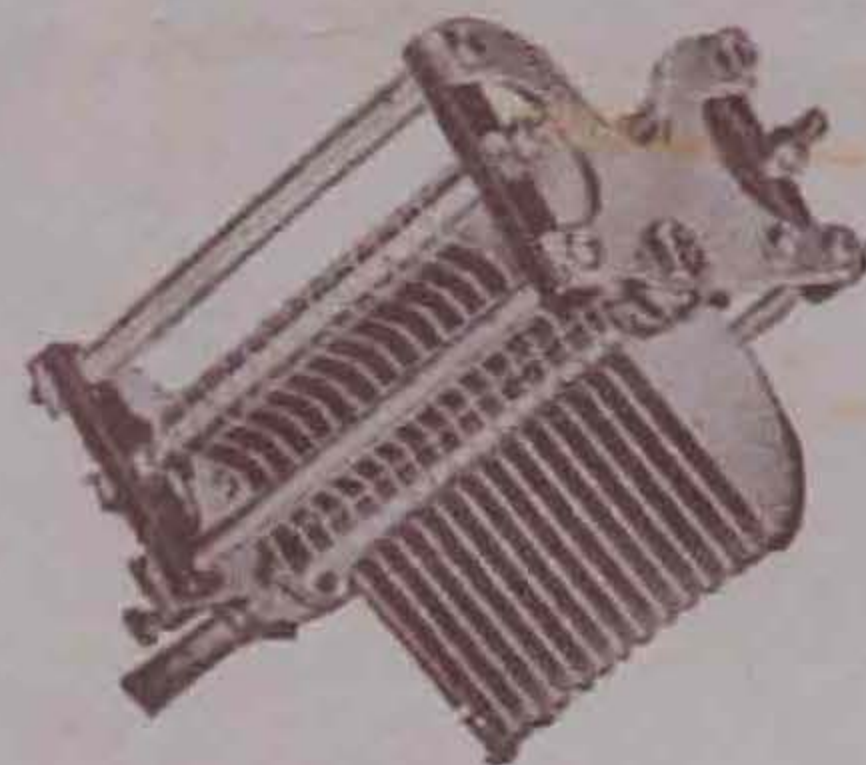
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