CONVENTION NUMBER

T. & R. Bulletin

THE JOURNAL OF

The Inc. Radio Society of Great Britain

AND THE

British Empire Radio Union

Vol. 6. No. 3. SEPTEMBER, 1930 (Copyright) Price 1/6

Varley

FAMOUS SINCE BROADCASTING BEGAN

Long before Broadcasting became what it is to-day, Varley had won fame for their coil winding. On this experience is founded Varley's latest achievement in radio. Varley Impedance Matching Output Transformer —a new component of advanced design— gives six different ratios. Accurately and without difficulty you can match loud-speaker and output valves. Remember that Varley Components are descendants of a long line. Since radio came Varley ideal has been quality. The Varley Impedance Transformer is the only adequate answer to the modern radio problem.

IMPEDANCE MATCHING OUTPUT TRANSFORMER

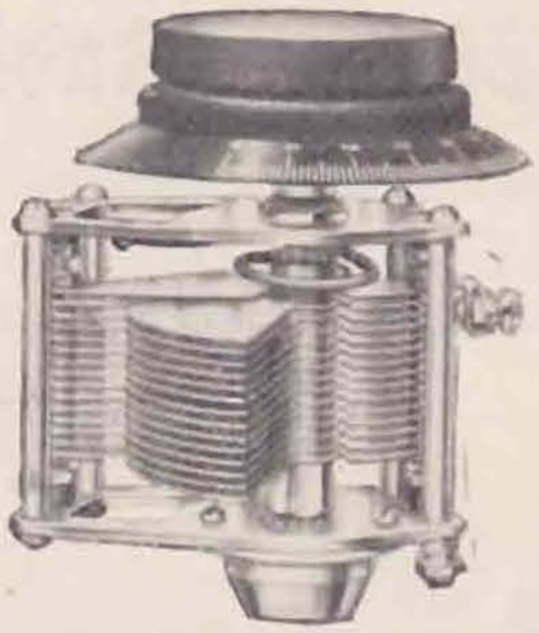
£1-2-6

6 ratios :
8-1, 10-1, 12-1,
15-1, 20-1, 25-1.

For RADIO
OLIVER PELL MANUFACTURE
Varley

Advt. of Oliver Pell Control Ltd., Kingsway House, 193 Kingsway, London, W.C.2. Tel.: Holborn 5303.

Required for your 3v. A.C., S.G. SHORT WAVE RECEIVER

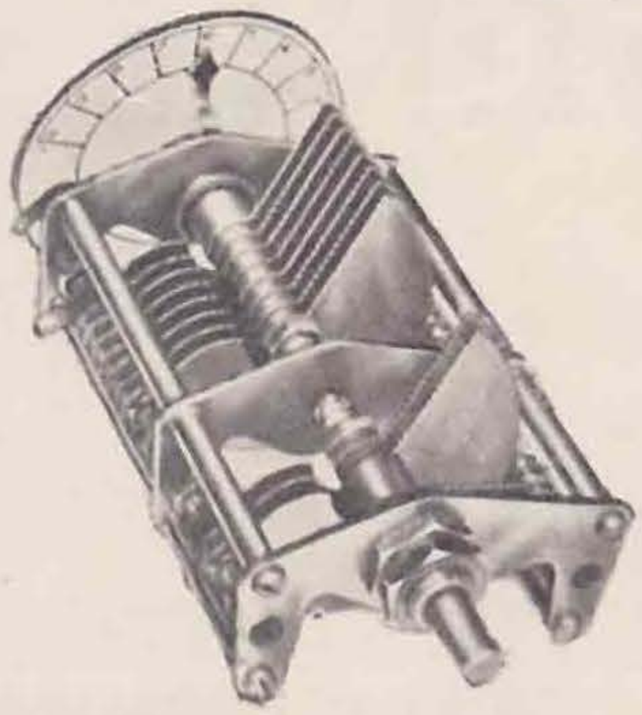


THE POLAR "IDEAL."

This condenser has both Fast and Slow Motion control. Accurate tuning is easily obtained by reason of the design, construction and smooth yet firm action. Its wide tuning range alone gives it definite superiority over other condensers. Sturdily built and constructed throughout of chemically-cleaned hard brass. One-hole panel fixing. Fitted with Phosphor-Bronze balls for Short Wave working if desired.

·0001 - 12s. **·00025 - 12s. 6d.**

Other Capacities: ·0005 - **12/6** ·00035 - **12 3** ·0003 - **12 -**



TYPE "A" SHORT WAVE CONDENSER.

An entirely new type of Short Wave Condensers, which is specially designed to cover the band from 15 to 40 metres. It enables a number of Stations to be spread over a large arc of the dial. The larger portion is variable in 10 steps; control is by knob at back. The smaller portion is variable; control by knob on panel. Noiseless in operation.

Price: **15s.**

POLAR

POLAR

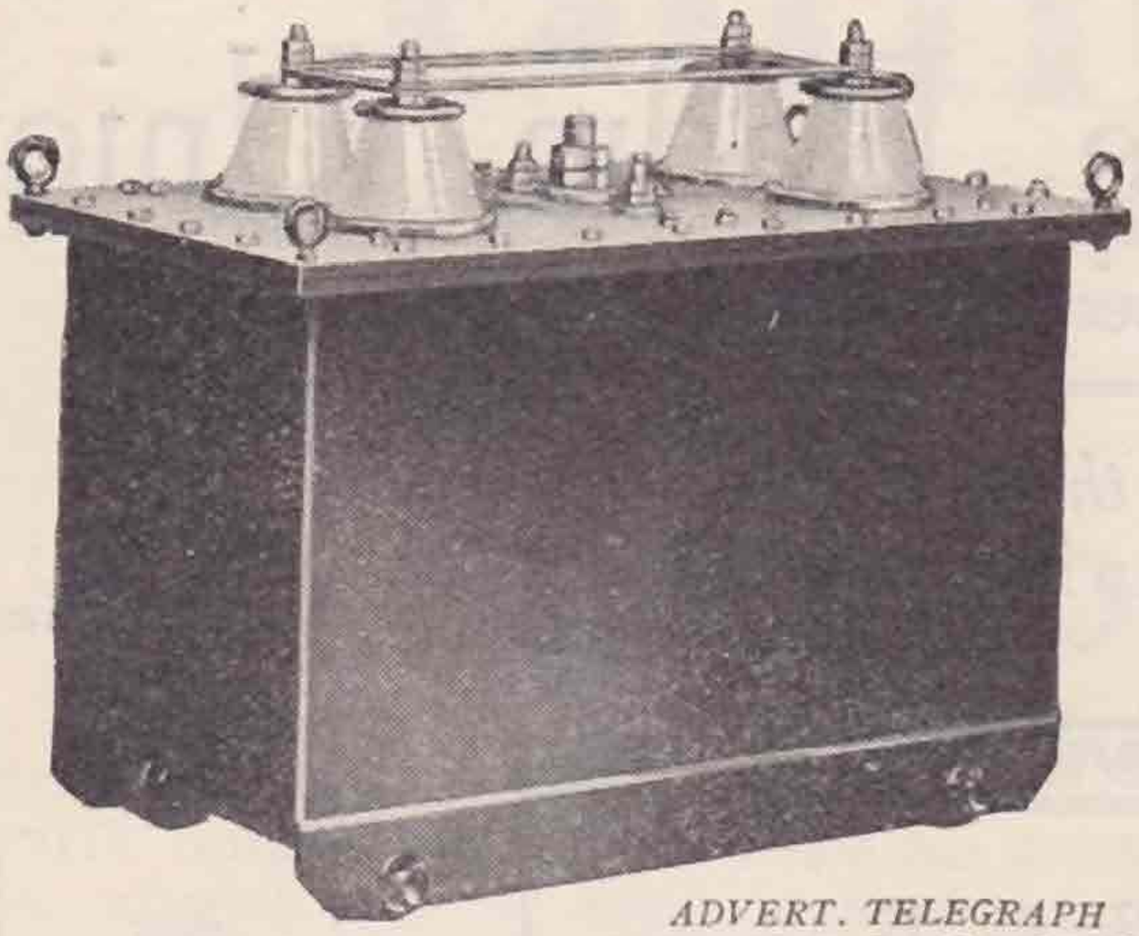
SEE THE POLAR RANGE ON STAND 118, OLYMPIA.

Also write for complete illustrated list.

WINGROVE & ROGERS, LTD., 188-9, Strand, London, W.C.2.

POLAR WORKS, MILL LANE, OLD SWAN, LIVERPOOL.

Transmitting Condensers . .



The T.C.C. range of Condensers comprises High Frequency Types for all needs. No Condenser problem is too big—or too small for T.C.C.

The H.F. Condenser illustrated has a capacity of .008 mfd. and is required to pass 200 amperes at 600 metres.

T.C.C. CONDENSERS

ADVERT. TELEGRAPH CONDENSER Co., N. ACTON.

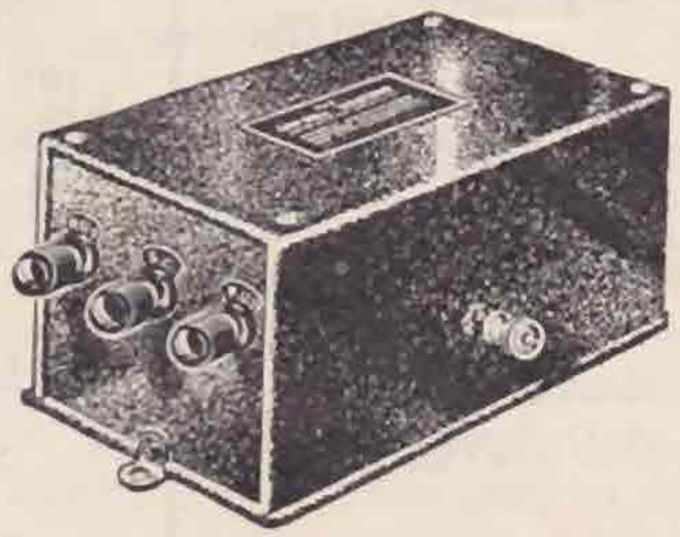
Realism from Records

when using electrical pick-ups, is only obtainable by fitting the

GAM-BRELL NOVOTONE

The "Novotone" is the *only* device designed to compensate perfectly for the serious losses in the reproduction of records. Connected in your pick-up circuit, it imparts to your records:

Full-bodied and true reproduction of the bass notes.
Appreciable brilliance of the higher notes.
A large increase in general amplification.



Type S for Standard and Type H for High Resistance Pick-ups **£5**

The "Voluvernia"

Scientifically designed volume control which *does* give perfect control from zero to maximum volume with one turn of the knob. No moving metal parts in contact with the resistance, movement therefore being silent, firm, and smooth. The perfect volume control for Radio or Radio-Gramophone. May be fitted to any panel. **6s. 9d.**

Free. 16-Page Booklet T.R. "REALISM FROM RECORDS"

GAM-BRELL WILL BE ON STAND 106 AT OLYMPIA

GAMBRELL RADIO LTD., 6, BUCKINGHAM ST., STRAND, LONDON, W.C.2

THE INCORPORATED

Radio Society of Great Britain

AND THE

British Empire Radio Union

53, Victoria Street, London, S.W.1.

Officers for the year 1930.

President: GERALD MARCUSE (G2NM).

Acting Vice-President: H. BEVAN SWIFT (G2TI).
Honorary Secretary: J. CLARRICOATS (G6CL).
Honorary Treasurer: E. DAWSON OSTERMEYER (G5AR).
Honorary Editor: G. W. THOMAS (G5YK).

COUNCIL:

K. Alford (G2DX).
D. P. Baker (G2OQ).
A. D. Gay (G6NF).
Capt. K. Hartridge (G5CB).
T. A. St. Johnston (G6UT).
R. L. Royle (G2WJ).
A. E. Watts (G6UN)

Committee Representatives:
J. D. Chisholm (G2CX).
J. W. Mathews (G6LL).
H. B. Old (G2VQ).

R. S. G. B. CALENDAR.

ANNUAL CONVENTION.

September 26.—At the Institute of Electrical Engineers, W.C.2. 5.30 p.m., Tea. 6 p.m., Presidential Greetings. 6.15 p.m., Lecture.

September 27.—At the I.E.E. Morning: Delegates' Meeting. Afternoon: Photograph, followed by Business Meeting. Evening: Convention Dinner at Pinoli's.

October 24.—Meeting at the I.E.E.

November 21.—Meeting at the I.E.E.

December 19.—Annual General Meeting at the I.E.E.

COMMITTEE:

J. D. Chisholm (G2CX).
J. Clarricoats (G6CL).
G. Marcuse (G2NM).
M. W. Pilpel (G6PP).
H. J. Powditch (G5VL).
G. W. Thomas (G5YK).
A. E. Watts (G6UN).

DISTRICT REPRESENTATIVES:

1. I. D. J. Beattie (G6BJ).
2. T. Woodcock (G6OO).
3. J. Noden (G6TW).
4. A. C. Simons (G5BD).
5. D. P. Baker (G2OQ).
6. R. C. Horsnall (2ABK).
7. H. C. Page (G6PA).
8. C. S. Roberts.
9. G. Courtenay Price (G2OP).
10. J. Clarricoats (G6CL).
11. L. H. Thomas (G6QB).
12. T. A. St. Johnston (G6UT).
13. H. V. Wilkins (G6WN).
14. J. Wyllie (G5YG).
15. H. Andrews (G5AS).
16. C. Morton (GI5MO).

PROVINCIAL DISTRICT REPRESENTATIVE: H. B. Old (G2VQ).

B. E. R. U. REPRESENTATIVES:

Canada: C. J. Dawes (VE2BB).
Irish Free State: Col. M. J. C. Dennis (EI2B).
S. Rhodesia: G. G. Livesey (VP3SRB).
Ceylon & S. India: G. H. Jolliffe (VS7GJ).
New Zealand: J. Johnson (ZL2GA).
Iraq: H. W. Hamblin (YI6HT).
Egypt: C. E. Runeckles (SU8RS).
South Africa: W. H. Heathcote (ZT6X).
East Africa: L. J. Hughes (VQ4MSA).

T&R

Bulletin

The only British Wireless Journal Published by Amateur Radio Experimenters

SEPTEMBER, 1930. Vol. 6. No. 3.

EDITORIAL.

Our Bulletin.

THE British Empire Radio Union has developed into a reality; its membership is fast growing, and our family is therefore becoming more scattered. The BULLETIN will continue to be the connecting link between one Section of the Union and another, and between the Sections and London, but it may need to be modified in order to meet new requirements.

The history of the BULLETIN, so ably written by our acting Vice-President in last month's issue, shows that the BULLETIN, at the beginning of its career, catered almost entirely for an English membership, and the only features that have been developed during recent years are "Contact Bureau" and "Empire News." The other pages are filled with the same *type* of articles and notes as those which made up the first copies, the former being, in general, short and of interest primarily to the English members. We feel that the BULLETIN could be considerably improved and made of much greater interest to Colonial members by the means outlined below. We are referring here more especially to the Colonial members living in the wilds, many miles from the nearest amateur or town.

From correspondence reaching London we have formed the opinion that Contact Bureau News is not of great interest to Colonial members. It is hoped, however, that some scheme whereby Colonial members may be able to participate in the Group system will soon be instituted. We are further convinced that the type of article which may find favour among members in the British Isles is not the kind that is most helpful to Colonial members. The latter require, primarily, constructive articles dealing with up-to-date transmitters and receivers, and such articles need careful composition if they are to assist amateurs in remote parts of the Empire, where personal meetings between amateurs are not of everyday occurrence, and where specified apparatus may take weeks or months to obtain. Where help from neighbouring amateurs would be forthcoming at home, the Colonial amateur has frequently only himself to consult in cases of difficulty, and it will be a serious drawback if poor results are obtained due to insufficient details in the article concerned or to lack of experience in using a new circuit.

Perhaps the foregoing may be largely supposition on our part, but we definitely aim at attempting to find out the type of article of most use to members at home and abroad. We shall then endeavour to make up the BULLETIN accordingly, base requests for articles upon information we receive, and possibly reject articles that we consider as unsuitable. We cannot do this without the co-operation of our scattered membership in the first instance, and, at a later date, from the experts in our own ranks both at home and abroad.

May we, therefore, ask for criticism on the above remarks, for it must be realised that we cannot anticipate your desires. Further, we are but an amateur Society, and can only say that we will do our best to follow up your suggestions.

The R.S.G.B. 1931 Short Wave Three.

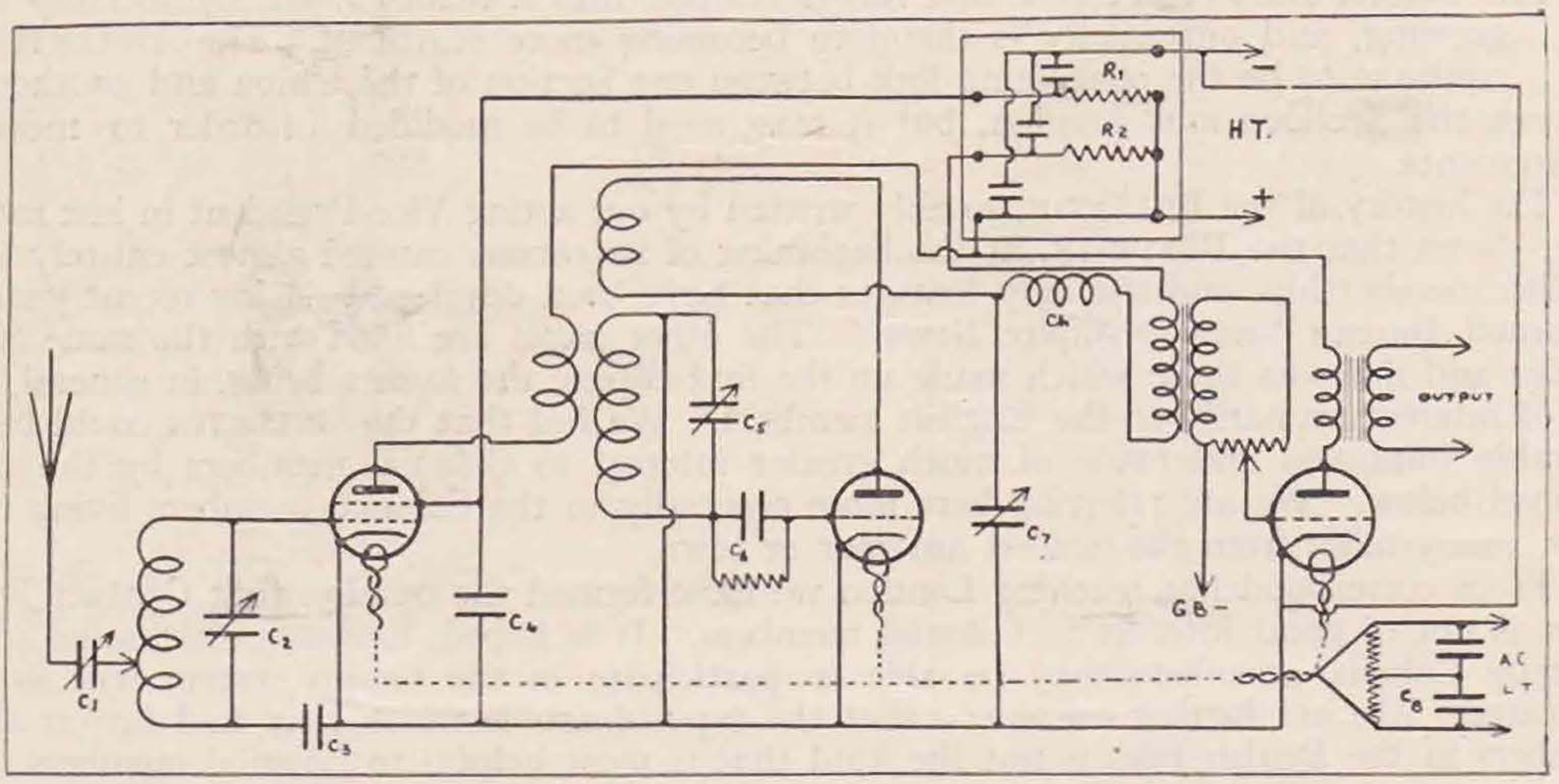
A Short Wave Receiver Employing Screened Grid H.F. Amplification and Indirectly Heated Valves.

THE design and construction of a short wave receiver employing screened grid H.F. amplification and intended for operation from A.C. mains departs in few respects from standard short wave receiver design. The following description of such a receiver will be found easy to follow as the design was made as simple as possible and standard components used whenever available.

The Theoretical Circuit.

A glance at the theoretical circuit will show this receiver to consist of 3 valves, the first as an unneutralised screened grid H.F. amplifier, the second as a leaky-grid detector and the third as an L.F. amplifier, being transformer coupled to the detector. It will be seen that the grid circuit of the S.G. valve is tuned to the incoming signal and the aerial connected to a point on this tuned circuit through a small condenser. The anode current to the S.G. valve is fed through the primary winding of the transformer designed for coupling the S.G. to the detector valve. The design and use of transformers in this position has not received as much attention as could be desired, and there is probably still much to be learnt regarding the construction of H.F. coupling transformers suitable for operation on frequencies around 5-30 megacycles. From the point of view of construction and operation, the use of a transformer is greatly to be preferred in place of the tuned-anode system, whether of the conventional form or of the Ultraudion type. The greatest drawback to the usual form of tuned-anode coupling system is certainly the bad interlocking that exists between the aerial and detector circuits, and this interlocking is at times so bad as to make the receiver almost uncontrollable. The Ultraudion type of circuit for tuning the grid circuit of the detector is a means of overcoming this interlocking nearly completely but introduces constructional drawbacks centering round the impossibility of earthing either sets of plates of the tuning or reaction control condensers. The use of a transformer here, built of lines to be described later, gives as good signal strength as with any other arrangement, produces very slight interlocking of the controls and allows one set of plates of both condensers (grid tuning and reaction) to be at earth potential.

It will be seen that an output transformer is fitted for connection to headphones or loud-speaker. A usual output filter circuit could have been employed, though the reason for the transformer will be apparent later. An anode feed system is used to obtain the lower voltages necessary on the screen of the S.G. valve and on the anode of the detector. The full H.T. voltage is used on the anode of the screened grid and on the L.F. valve.



C_1 .0001 mfd. preset condenser (Polar).
C_2 .0001 mfd. (Polar).
C_3 1 mfd. (T.C.C.).
C_4 1 mfd. (T.C.C.).
C_5 .00012 mfd. S.W. "A" (Polar).
C_6 .0001 mfd. (T.C.C.).
C_7 .00025 mfd. (Polar).
C_8 2 mfds., centre-tapped (T.C.C.).

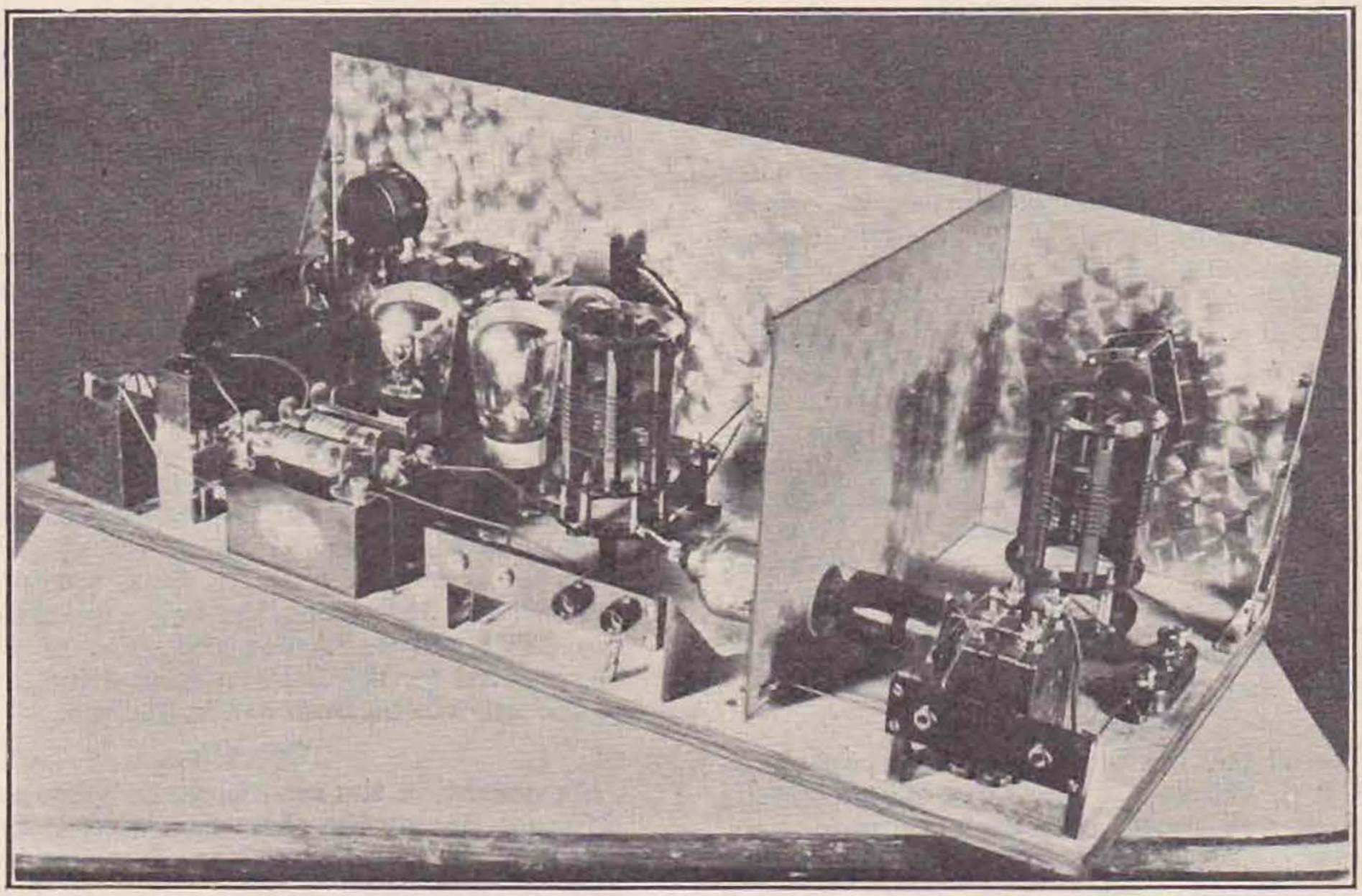
Construction.

The general layout of apparatus can be seen from the photograph. On the right of the screen is situated the first tuned circuit consisting of a coil and the variable condenser C_2, a ·0001 mfd. Polar "Ideal" (the type with slow-motion). The two

fixed condensers C_3 and C_4 are seen in front of the coil and the Polar "preset" condenser C_1 to the right of the coil. An Aermonic 5-pin horizontal valve holder is used here. The wiring of this part of the set needs little comment. Only one wire is taken from the variable condenser and this is the one going to the coil and thence to the grid of the valve. The other connection from the condenser to the tuned circuit is obtained through the metal screening. The two earth potential sides of the fixed condensers are linked to the cathode connection of the valve holder and taken direct to a convenient point on the screen. Both H.T. + (for screen) and G.B. — connections from these two condensers are taken beneath the wooden baseboard to the proper points.

will be found very simple: the use of the 80/1 reduction dial is exceedingly helpful.

To the left of the coil can be seen the detector valve and behind the coil is the T.C.C. ·0001 mfd. grid condenser carrying a Dubilier 2 megohm leak. The choke connected between the reaction circuit and the L.F. transformer primary is out of view but is placed below the reaction condenser. The McMichael Binocular choke used here is very compact with, of course, a small field. Being connected to the low potential side of the reaction coil there is no need to use a special "Short-Wave" choke as all available chokes of the latter variety exhibit bad "dead-spots" at a number of places on the band which cause much trouble in use. This is one reason for using series feed to the anode of the



Turning now to the centre part of the photograph, and the detector circuit, the reaction control condenser, a ·00025 mfds. Polar "Ideal," is in full view, but the S.W. "A" Polar tuning condenser, C_5, is largely hidden by the screen. This condenser, which is a non-slow-motion type, has been fitted with a Utility Micro-Dial with 80/1 reduction ratio and has given very good results. Though most readers are probably familiar with the Polar S.W. "A" condenser it may be as well to mention briefly the salient points in a condenser of this type. Two variable capacities are provided, one of 100 mmfds., and the other of 20 mmfds. (both are maximum capacities). The former is controlled from a small knob from the inside of the set and is fitted with a celluloid dial engraved 0-10. The latter capacity is controlled in the usual way from the slow-motion dial on the front of the panel. The larger capacity is first set to some required value, fine tuning then being accomplished on the smaller capacity. By this means stations are considerably spread out over the dial and tuning

screened grid valve, as had parallel feed been employed it would have been essential to use a "Short-Wave" choke in the anode feed: home-made plug-in chokes would have been found hard to beat here.

The L.F. valve can be seen to the left of the detector and behind is the A.F.6 Ferranti L.F. transformer: a very good gain is obtained here by the use of the 1/7 transformer. Mounted on the aluminium panel can be seen the Gambrell Voluvernier. This has proved excellent in operation. The second transformer on the extreme left of the set is the OPM.I Ferranti Output transformer, giving three ratios, 1-1, 1-1·6 and 1-2.7. The 9 volt grid bias battery (Pertrix) and the Ferranti Anode Feed Unit can easily be identified. A Bulgin 'phone jack is secured to the panel below the volume control. Lotus 5-pin holders are used for the detector and L.F. valves. The machine finish aluminium panel and screen were supplied to specification by Ready Radio.

There is nothing to be said regarding the wiring

of the L.F. circuits, though some connections on the detector circuit call for comment. It is, of course, important that this wiring shall be done carefully and that all wires be kept straight and, as far as possible, be taken from point to point. The cathodes of both detector and L.F. valves are connected together and taken in one direction to the H.T. — terminal of the anode feed unit and in the other direction to the low potential end of the detector grid coil. From here a connection is taken to the stators of the S.W. "A" condenser. By this means a short connection is obtained on both paths between tuning condenser and coil, and even if the cathodes are connected by an alternative route to the panel or screen, the direct connection between the low potential points of coil and tuning condenser should not be omitted.

The heater connections to all the valves are carried out by means of flex which is run under the wooden baseboard. These wires are brought out to a pair of Clix power sockets, being the right pair on the left terminal strip. The other pair of sockets on the same strip are for H.T. + and —, and the pair of sockets on the other terminal strip for aerial and earth, the earth connection, of course, going to the screen or panel. All the various plugs and sockets are supplied by Clix and the terminal strips and brackets by B. & J. Wireless. On the extreme left of the baseboard is seen a 2 mfd. T.C.C. condenser provided with a centre tap. A Varley 300 ohm potentiometer, not visible, is connected across this condenser and a further connection made between the arm of the potentiometer and the centre tap of the condenser. This is shown in the circuit, the condenser being C_8. It is, of course, a means of providing an exact centre tap on the heater supply, the centre point being connected to H.T. — and cathodes, whereas the heater sockets are connected to the outer terminals of the potentiometer and condenser.

The Coils.

The coils and coil bases are supplied to specification by B. & J. Wireless. The short wave coils are made on their well-known skeleton ebonite formers, 2½" diameter. Connections to the coil bases will first be considered. These coil bases have a maximum of 6 sockets set round a 2" diam. circle, though, to make the transformer-coil non-reversible, and hence guard against short circuits, one socket in this base is replaced by a pin and the necessary alteration made to the coil. Still viewing the receiver from the back, this base is so secured to the baseboard that this single pin is nearest to the main panel carrying the tuning controls. When viewed from above it is therefore in the 12 o'clock position, and is the grid end of the secondary coil. Advancing round the coil base in a *clockwise* manner the remaining sockets are connected as follows :— 2 o'clock to cathode, 4 o'clock to anode of S.G. valve, 6 o'clock to H.T. for anode of S.G. valve, 8 o'clock to plate of detector valve and 10 o'clock to reaction condenser and choke. By this means it will be seen that the three circuits (*i.e.*, secondary, primary and reaction) and connected to adjacent pairs of sockets and that the sockets have alternatively high and low potential connections. Connections to the coil base as indicated will be found to give short direct connections. The coil base for the aerial coil contains only 4 sockets, of which one of these is dead. Using similar nomenclature, the 12 o'clock socket is connected to the aerial preset condenser, 2 o'clock is missing, 4 o'clock to grid bias (and through a condenser to screen), 6 o'clock is dead, 8 o'clock to grid and 10 o'clock is missing.

Two pairs of coils covering from 17-32·5 ms. and from 31·5-53 ms. (these measurements have been made from the transformer coil) are constructed as follows on B. & J. Wireless formers. No. 1 aerial coil 4 turns of No. 20 S.W.G. wire, wound 8 turns per inch and tapped at 1½ turns from the low potential end ; No. 2 aerial coil 9 turns of similar spacing and tapped at 3 turns from the low potential end. No. 1 transformer coil : Primary 4 turns of No. 32 S.W.G. D.W.S. and secondary 5 turns of No. 22 S.W.G. each spaced 8 turns per inch and interwound. The reaction contains only 2 turns of No. 32 S.W.G. wound in a slot as near as possible to the secondary wire and at the low potential end. No. 2 transformer coil : Primary 9 turns, secondary 10 turns, reaction 3 turns, the whole being constructed in a similar manner. Details of coils for the other wave bands will be given in next issue.

The Valves, Etc.

Mullard Indirectly Heated Cathode Valves are used in the set and the following types are required : S4VA for screened grid, 354V for detector and 164V for L.F. amplifier. With a maximum H.T. voltage of between 150 and 200 volts the resistances in the anode feed unit should have the following values :— R_1 (for feeding the screen of the S.G. valve), 100,000 ohms ; R_2 (for the detector) 50,000 ohms. With a negative bias of 1½ volts on the control grid of the S.G. valve, the current to the screen will be about ·5 milliamp and to the anode about 1·5. Thus it will be seen that a fairly high screen voltage is allowed for, this being the best method of working the S4VA valve. A negative bias of 9 volts will be required for the L.F. valve and the total current to the set will be from 6-7 milliamps.

Operation.

In operation the set has given very good results, although during the short time that tests have been possible the conditions for short wave reception have been generally poor. However, the American 'phone stations have been received at good strength on occasions. Due to the very small interlocking between the two tuning circuits it will not be found that the H.F. tuning control offers any difficulty at all to even the most careful searching.

The use of a valve such as the 164V in the L.F stage allows of considerable amplification here, though it is not suitable as an output valve where great volume is required for loud-speaker work. A P.M. 254 output valve may be used where the signal strength is sufficient to enable one to dispense with the extra magnification obtained from the 164V. Alternatively a P.M. 24A Pentode can be used with a suitably increased H.T. supply for this valve alone. The use of a second L.F. stage can be used where greater volume is required. In this case a resistance coupling unit of the type designed for second stage work is recommended with an anode resistance of the order of 30,000 ohms. A super power output valve can then be used, but should be de-coupled through about 10,000 ohms to prevent instability. If any of the three suggested alterations to the L.F. stage is made, it must be remem-

(*Continued on opposite page.*)

Grid Current Modulation.

By J. CROYSDALE (G5US).

ONE hears very little in the BULLETIN of that simple system of grid current modulation in which the filament-anode impedance of a valve is used as grid leak; this impedance being varied by modulating across its grid and filament.

The system is extensively used in Germany, I know, both in broadcasting and amateur stations, and is due to Schäffer.

On rebuilding G5US to conform to "1929" standards, the old choke-control Hartley had to be scrapped and a C.C. outfit built on lines suggested by G6BR, G5YK, and others in these pages.

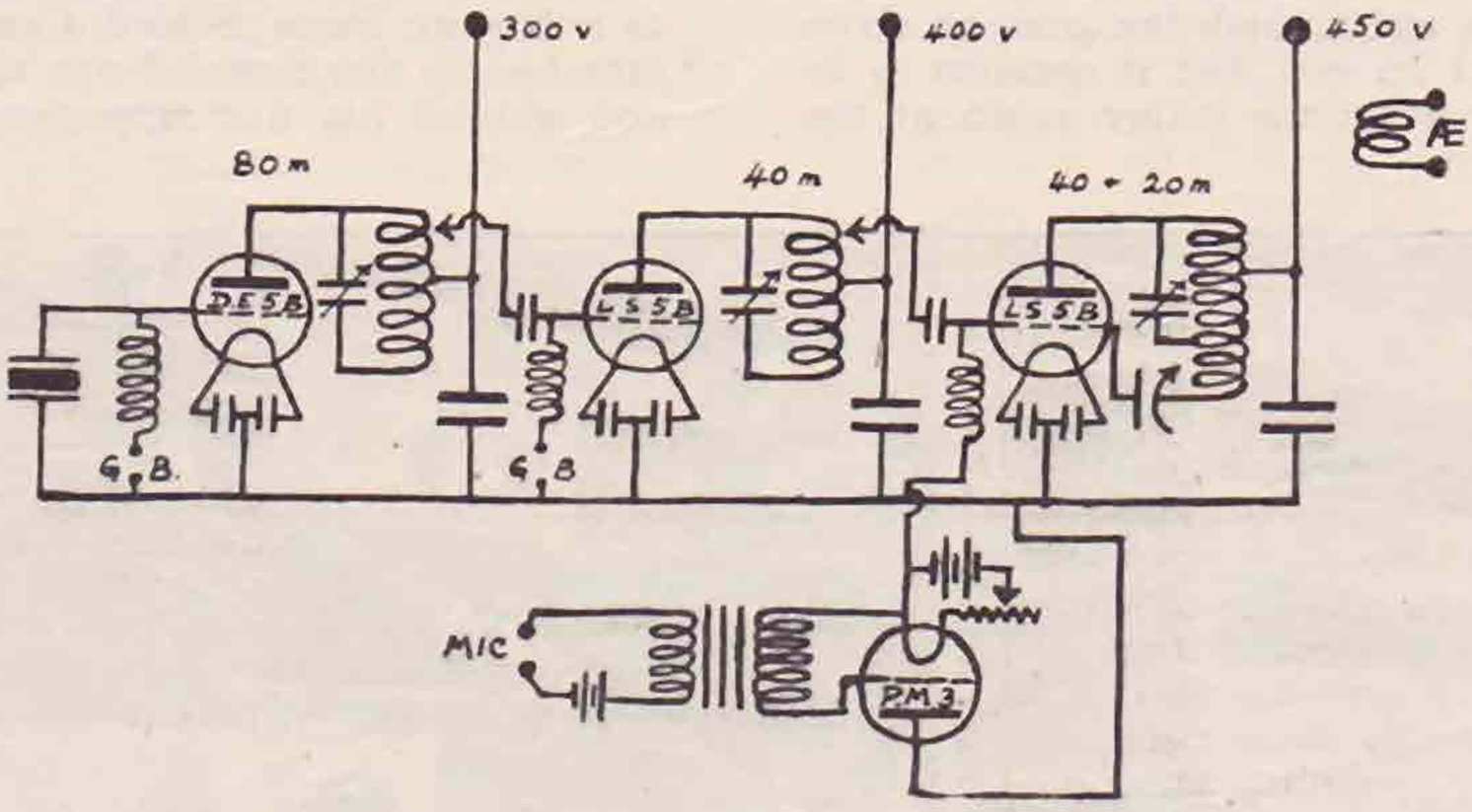
For some time the use of 'phone was dropped, but the fever coming on again, some simple system of modulation was required. Choke-control, although the ideal perhaps, is expensive in the extra H.T. and power valve necessary; and meant, moreover, in this case, considerable circuit rearrangement.

So grid modulation, by the usual transformer in grid lead, was tried, but not very satisfactory results were obtained either in the F.D. or P.A. stage.

Finally, the method of grid current modulation was experimented with, and it worked excellently. It is cheap and simple to operate, as will be seen from the data and circuit. In fact, in every way it seems just the modulation for a C.C. outfit.

The P.A. is modulated in its grid leak lead. The modulator valve can be kept running and thus used as a variable grid leak by varying the filament emission. If at any time during a C.W. QSO one finds "fone" possible, it is a simple matter to switch on the microphone battery, hold the key down, and speak.

The extra valve, being of the .06 variety, takes but little "juice" from a dry cell. If more than 10 watts on the P.A., then use a valve with more suitable characteristics, of course. Here, when



using 10 watts to an LS5b as P.A., a Mullard P.M.3 has about the right impedance controlled by a 30-ohm rheostat. Minor adjustments, such as grid bias and voltage of the microphone battery, can be made to suit individual cases. It should be quite a simple matter for those who want it, to apply a gramophone pick-up, with perhaps a stage or so of amplification.

The method described should, of course, be applicable to any circuit using grid leak and condenser.

(*Continued from previous page.*)

bered that the grid bias will need suitably increasing. The reason for the use of a multi-ratio output transformer will now be obvious, as the ratio can be adjusted, within limits, to suit different valves.

Experiments were conducted replacing the tuned aerial circuit (coil and tuning condenser) with a Short-Wave H.F. choke of low-loss design, the aerial in this case being connected through the preset condenser direct to the grid. Very good results were obtained—in fact nearly as good as when using the tuned circuit—but local broadcasting caused a loud and very unpleasant background which made the system unworkable at some times of the day.

The use of A.C. on the heaters causes a negligible background hum even on headphones if the precautions for correctly centre tapping the heaters are followed. The use of an eliminator as a means of H.T. supply is quite permissible though the results obtained will vary. Provided a good eliminator is used, and the A.C. mains are not notoriously bad, the hum should not be too objectionable. If, however, the receiver is to be used for general amateur work of headphones, a 150 v. battery will be found most suitable, and, as has been pointed out earlier, the current consumption will only be 6 milliamps.

In conclusion it may be said that the screened grid stage is certainly contributing its fair share of amplification and this is in no small way due to excellence of the Mullard valve. Anyone constructing a similar receiver will find that for general short-wave reception on headphones it is hard to beat and that, under favourable conditions, some of the more powerful short-wave broadcasting stations of the world will work a small loud-speaker.

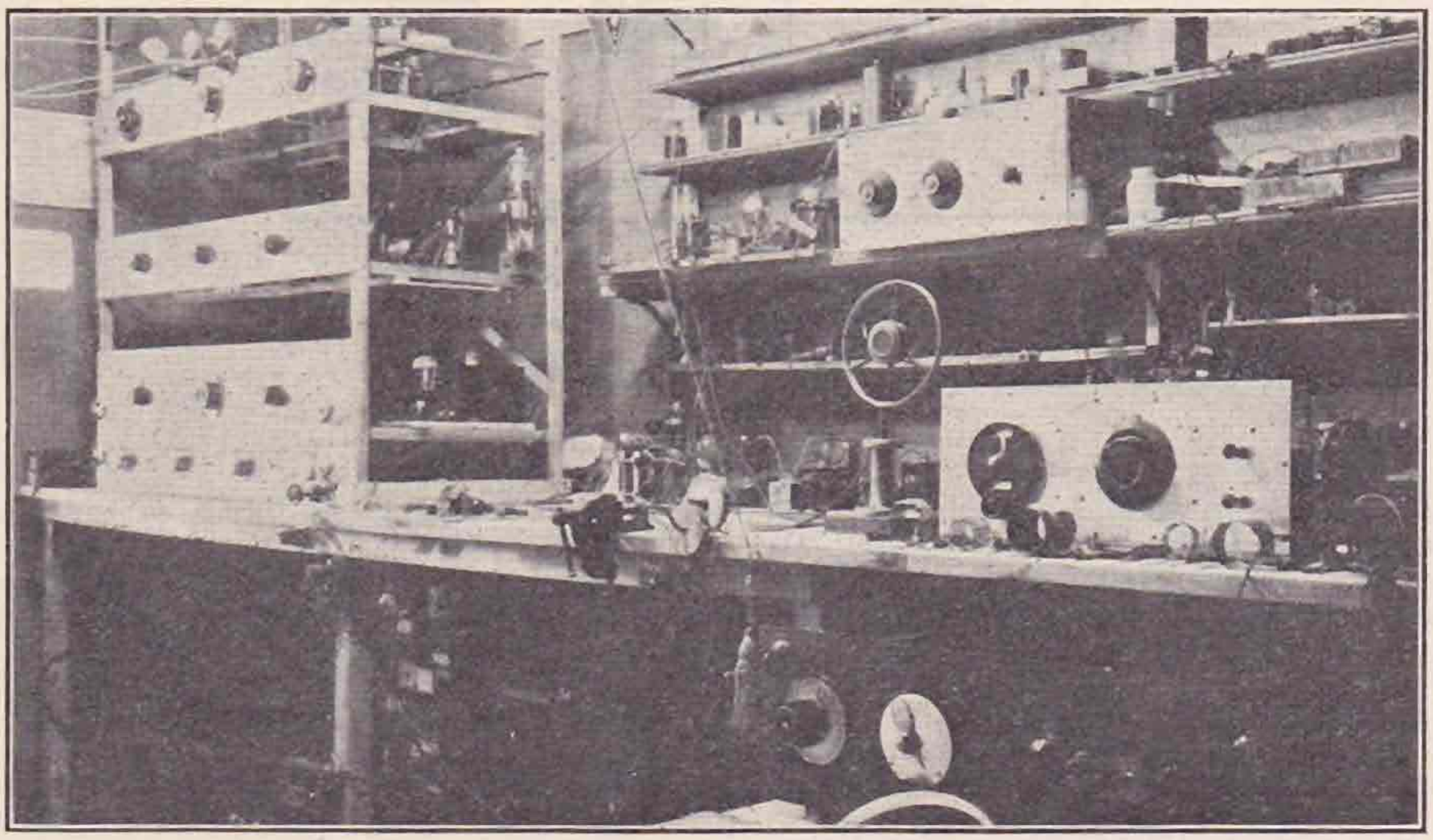
Station Description No. 9.
G5YK.

By "WANDERLUST."

AT Convention, 1929, you will remember, it was suggested by our Hon. Editor that a series of station description articles would prove of interest to our members, especially to those in the provinces who may not have the same opportunities of meeting fellow transmitters and visiting stations as their more fortunate brethren in London, and a decision was made there and then to inaugurate a series of articles on these lines. Convention is here again, and the present series of descriptions is at an end, but it remains to be seen in September when we gather again at the Institute of Electrical Engineers whether it has been of sufficient interest to merit a further series next year. The Editorial Committee is anxious to receive any suggestions or criticisms that you may have to offer concerning the BULLETIN, and will be very grateful if readers will come to Convention with the idea that the BULLETIN is their paper and that the only desire of the Editorial Committee is to carry out instructions to the best of its ability.

It is fitting that this first series of station descriptions should come to an end with the Radio history of G5YK, our worthy editor, to whom the BULLETIN owes a great deal of its present attractiveness. So often the Editor of a technical paper like ours has to be chosen for his literary ability, as it seems to be a melancholy fact that many of the world's cleverest intelligences are often inarticulate and have to leave it to those with humbler qualifications to do the talking for them. Not so, however, with our Editor, who combines a definite flair for writing with a sound knowledge of what he is talking about, and the Council and Committee of R.S.G.B. regard themselves as being extremely fortunate in having him at hand when the choice of the Editor is made.

Like many of our members, Mr. G. W. Thomas has grown up with Amateur Radio from the very beginning and has passed with it through the downward stages to the very low wavelengths. His first introduction to transmitting came, when as a boy at Perse School, Cambridge, he became attached to the Signal Corps of the school O.T.C. and gained his first experience of operating a



receiver and portable field transmitter (KÄD and KÄE). A receiver for all wavelengths from 30,000 to 200 metres was soon constructed, and it was whilst listening on this receiver, weird though the design was, that the first amateur transmitter was received. A local radio enthusiast of pre-war vintage, Mr. Jeapes, now G2XV, helped him to "break into the game" as the Americans would say, and with this able assistance he soon progressed. Finally, in 1924, the call sign 2AQK was obtained, and preliminary tests on "Artificial Aerial" transmitters were made. Early in the next year this permit was converted to the usual 10-watt open aerial type, and work was commenced right away on the then popular 160-metre band. The power used was very small and was derived from home-made H.T. accumulators. G5IS in South London was one of the first stations worked on this wavelength, but although power was increased to 4 watts it was not possible to get outside the British Isles.

In September, 1925, when 45 metres first came

into prominence, a new transmitter was made after the design of Mr. Royle (G2WJ) who was one of the pioneer stations on that band. This proved to be a great advance on previous transmitters, and in December G5YK made his first contact with U.S.A., and by July, 1926, all continents of the world had been worked. 23 metres followed in due course, and G5YK had the good fortune to make the first contacts with Singapore and Grenada as well as working all continents again in the course of a few months. The valve used was a rather ancient 0/40 Mullard which, although it had done yeoman service on the higher wavelengths, soon felt the strain of 20 metres, a wave on which it had never been intended to work, and departed this life through the seals giving way.

A Master Oscillator-Power Amplifier set with frequency doublers from 80 to 20 metres was then constructed, and for six months this outfit proved itself an advance on the old self-oscillator. Then crystal control came, and by grinding several spectacle lenses to 80 meters some quite useful crystals were made, much to the detriment of finger tips!

When 10 metres first came to the notice of amateurs, G5YK again showed himself in the front ranks of the pioneers. A receiver was coaxed into working order, and after many hours of fruitless listening to schedule for W2JN, G5YK was at last rewarded by being the first British Amateur to receive signals from across the Atlantic on 10 metres. In 1928 two-way contact was made with W2JN in Upper Montclair, N.J., on this band, and extensive experiments were carried out with this station at week-ends. Later, the first contact on 10 metres (or 28 M.C. as it had now begun to be called) between Europe and Asia was made when Lieut. Rodman (VU2KT) at Jubbulpore, India was worked one Sunday morning. Another first contact, that between England and Germany, also fell to G5YK, whilst QSO was also effected with Egypt, South Africa and Rhodesia.

The present transmitter which is used for all frequencies up to 28 M.C. is shown (on the extreme left) in the accompanying photograph. The whole transmitter is self-contained except for the power supply, of which mention will be made later, and is constructed in three layers, on which the various portions of the set are mounted. There is a separate power amplifier unit for each frequency band, so that a quick change over from one band to another is possible with practically no adjustment, the amplifiers being left tuned and merely connected to their respective doublers when required for use. The crystal oscillator incorporates a special switching device, so that a choice can be made from a series of six crystals without any great alterations to the set. LS5B valves are used throughout the crystal and frequency-doubling stages, whilst D.E.T.1 S/W valves are used in the power amplifiers. The power supplies for all the foregoing are kept under the bench on which the transmitter stands, and are as follows :— For the power amplifiers a 1200—1200 home-made transformer is used in conjunction with two Marconi U6 rectifiers and 8 mfds of T.C.C. high voltage smoothing condensers. The power supply for the other stages is derived from other home wound transformers which give separate supplies to the crystal doublers. 250 volts is applied to the former, whilst the doublers are usually worked with 400 volts on the anodes. Keying is done by breaking the primary winding of the power amplifier supply circuit, and whilst the result is not quite as clear-cut as that obtained by other methods, it has the advantage that little or no interference is caused to neighbouring sets, even when powers of the order of 50 watts are used.

The receiver at present in use is that seen in the bottom right-hand corner of the photograph, and comprises a screened grid H.F. amplifier stage as well as a peaked L.F. transformer coupled amplifier and one resistance capacity coupled stage of audio amplification. The set is built on a sliding shelf under the bench, and when not in use can be stowed well out of the way of dust and clumsy hands.

The station monitor and frequency meter is seen standing on the bench above the receiver and has proved itself to be a useful adjunct to the station. It is of the quartz controlled type, calibrated from N.P.L. sub-standards, and combines a great degree of accuracy with general utility. It is with this frequency meter that the calibration signals for which station G5YK is noted, are checked.

Telephony has been used with success on both the 3.5, 7 and 14 M.C. bands, and some good music and speech is often heard from G5YK.

It is easy to see that the station is not exactly a model of neatness when compared with some others recently described in the BULLETIN, but this is due in the main to the fact that G. W. Thomas is essentially an experimenter before anything else, and constant alterations, additions and improvements are being made to the gear in use, resulting in a somewhat untidy appearance which is due more to enthusiasm than slovenliness.

In conclusion, G5YK is always pleased to see visitors at his station in Cambridge, and although, unfortunately, he is able to be at home only during week-ends, if any foreign or British amateur goes to see the station he can be certain of a warm welcome and a very interesting evening.

Strays.

The present address of Mr. C. W. F. Wavell is required. Official letters containing his certificate have been returned by the G.P.O. from his last known address at the Surveyor's General Office, Colombo, Ceylon.

G2QW has been trying out all bands and reports conditions generally bad, except on 2 M.C. Has made a start on 14 M.C. G6LL is still working hard on his new transmitter, which he intends completing before the Convention.

F8EF, of 128, Avenue de Neuilly, Neuilly-sur-Seine, is coming to London (Heston Park) in his "Moth" plane, FAJOI. He will be very glad to see English hams, and hopes to arrive on September 13. We are indebted to G2KO for this information.

Correction.

Under new members in May, 1930, BULLETIN, Mr. C. Harrison, of Hobart, Tasmania, was erroneously described as a new member. This should have read "Tasmanian Division, W.I.A." Mr. Harrison has been a member for many years.

Around the Midlands and Beyond.

By J. Clarricoats

AT the request of Mr. Simons, District 4 representative, and with the agreement of Council, it was decided that I should represent the London Headquarters Executive at the recent Conventionette held in Mablethorpe, Lincolnshire.

Through the kindness of Mr. H. B. Old (G2VQ) he arranged that I should make for his station at Mapperley, Nottingham, and carry out from there as many station visits as possible during the days preceding the actual conventionette.

By good fortune I arrived at G2VQ immediately following the conclusion of his successful work in connection with VMZAB (the Southern Cross), and I was thus able to see at first hand the actual gear used by him on that occasion, and described in some 80 odd London and provincial newspapers who had obtained minute by minute news of the plane's progress from his station. That his activities during the flight were considered of paramount importance is borne out by a remarkable letter of appreciation from the G.E. Co., whilst the fact that Mr. and Mrs. Stannage (father and mother of the operator of VMZAB) were actually present at G2VQ for a good proportion of the night's vigil, brought Mr. Old's station into deserved prominence. During the flight and for normal receiving work a peaked audio-frequency receiver is used in which good use is made of an old Ford secondary coil. During my visit signals were received at good average strength, but the absence of background was the most noticeable feature. This advantage has been well amplified recently by the fact that Mr. Old's station was responsible for receiving the long-awaited loyal greeting from South Africa when all hopes of success seemed lost.

The transmitter is operated from a Newton generator delivering to the output valve approximately 150 watts. Crystal control is used on all frequencies, whilst a well designed Zepp feed aerial situated as it is many hundreds of feet above sea-level is responsible undoubtedly for the efficient reception of G2VQ at DX. An interesting feature of this station is to be found in a corner of the shack where carefully stored away are relics of radio days long past. These early efforts will, we hope, be on view at Olympia in September, as they show more clearly than words can describe the progress we, as amateurs, have made since G2VQ and his contemporaries took the air way back in 1920.

Prior to a concentrated drive of station visits an enjoyable afternoon was spent viewing the main features of Nottingham. The new Town Hall (locally called the Council House) and the War Memorial are excellent examples of present-day architecture, whilst the old Castle (of Players trade mark fame) serves to show clearly the trend of advance which the city has made, as it houses the exhibits of the Nottingham Museum authorities.

The new University buildings (donated by Sir Jesse Boot), situated in perfect surroundings, make one long for the opportunity of being educated there under 1930 conditions.

Two visits of extreme educational interest were made, the first to the Brick Yard of the Nottingham Patent Brick Company, and the second to the works and offices of the "Nottingham Post." Two of the oldest trades, each using modern machinery, delivering bricks and newspapers as quickly as the occasion demands, truly interesting places for an amateur to visit.

The first "out" station viewed was that owned by Mr. J. Lees (G2IO), and although he is a comparative newcomer to the great amateur fraternity, I venture to prophesy that in a short while his station will be world known.

For neatness of layout and overall efficiency he is easily placed first in the list of stations visited on this trip, in fact until then I had only seen one station during 1930 which could be truthfully classed as neat *and* efficient, that of Mr. H. C. Page (G6PA), of Teynham, Kent.

Mr. Lees' station is situated on rather low ground, but with this disadvantage and the fact that his power is at present derived from dry batteries giving barely 5 watts input, his list of DX worked is highly satisfactory and augurs well for the time when a motor generator set is installed and higher inputs used.

In company with G2VQ and G2IO a visit was paid to Aslockton, a tiny village some 20 miles east of Nottingham; within this hamlet has come into being yet another new call-sign which we hope will soon link up with other remote parts of the country and the world. Mr. Blake (G6VB) is the owner of this truly rural station situated in a shack surrounded by fruit trees. Small the station is as yet, and rather hay wire in construction, but within a few months a sure starter for a W.B.E.

With the coming of sun-down our tracks were turned towards Ratcliffe-on-Trent, wherein we hoped to locate Phil Allen, of G6LN. To be sure he was in, but *in bed*. Against our wishes, however, he insisted on attending to his nocturnal visitors, and in spite of the cooling breezes from the river, elected (after welcome refreshments!) to lead the way through his father's magnificent garden to the home of G6LN, a specially made shack some 200 yards from the house. Mr. Allen has been inactive for some months, but an early return to life is predicted judging by the alterations going on in and *around* the shack! No prize is to be awarded to the person describing Phil's "get up" when he got up!

From Nottingham on July 20 a party set out to visit the Worksop stations owned by Messrs. Martin (G6MN) and Sadler (G2XS). Mr. Martin is another owner of a shack which is piled high with experimental receivers and transmitters for almost every wave-band in amateur use.

A Zepp aerial, a crystal controlled master oscillator, and an excellent gramophone pick-up equipment are outstanding features of the station situated just above the printing works in which so many British QSL cards have been printed. A visit to the factory was arranged and a demonstration of some modern printing machinery given by Mr. Martin.

Tea was taken at G2XS as guests of Mr. and Mrs.

Sadler. Mr. Sadler's station is remarkable, inasmuch that it is completely self-contained in one large oak gramophone cabinet which is arranged to house the short-wave receiver and transmitter, the broadcast receiver, loud-speaker, batteries, switches and the gramophone itself. An interesting evening was spent converting his Hartley circuit to tuned plate, tuned grid. We who were responsible trust that our efforts have been successful and have compensated for the muddle we left him in on our departure.

Sunday, July 27, was the day fixed for the Mablethorpe gathering, and for the second time in two weeks King Sol had decided to smile kindly upon a District Conventionette. From Nottingham, Worksop was the first stop, where G2XS and G6MN joined the Lee Francis. At Lincoln the other Nottingham party joined us, driven by G2IO and consisting of G2HD, G6LN and G6VB. Horncastle was made the luncheon rendezvous and the occasion for photographs and menu signings! We would recommend all who travel in Lincoln to visit Mrs. Eyres' " Home from Home " and sample her excellent roast duck.

An hour's run through the Lincoln fen district, with its quaint windmills strangely reminiscent of another age, brought the cars together in Mablethorpe at 2.30 p.m. Amid much hooting the hundred mile travellers were welcomed by Mr. Simons (G5BD), and a host of local amateurs. The shack from which signals, sent by G5BD, have traversed the world, was viewed, and much interest shown in his contrivances designed to overcome the difficulties of keying and operating a hand generator with but one arm. The first W.B.E. certificate outside London was well on view, as were countless QSL cards from almost every corner of the globe. An A.O.G. aerial was in vogue during July, but a return to the Zepp is anticipated before autumn.

From the home of G5BD the party (now 19 strong) embarked by motor coach for G.K.Z., the Humber Radio Station, and enjoyed a pleasant hour with the two officials who had been appointed by the G.P.O. authorities to explain the operation of the various sets used for dealing with the heavy traffic encountered from North Sea shipping. The direction finding receiver employing V24 valves and its associated aerial evoked considerable interest, as did the ½ k.w. telephony transmitter.

The station is housed in a single-storey bungalow type building, and is a few yards from the foreshore and at the southern end of Mablethorpe.

From G.K.Z. the party returned to the town (packed with many holiday makers) for tea.

The main business of the Conventionette followed, and many interesting discussions arose regarding the points raised by the several speakers. (A report on the meeting appears elsewhere, written by Mr. A. C. Simons).

Before departing a visit was made to G2AT, owned by Mr. Marlow. Here again a shack is in use, whilst a single wire untuned aerial was in favour.

From Mablethorpe the car parties proceeded along the coast road to Skegness, sampling the rock and ales of this popular resort.

The return journey was made *via* Lincoln and Worksop, Nottingham being reached well after midnight.

After the pleasurable personal QSO's in and around the Midlands it was decided to continue the holiday in the Isle of Man at the invitation of Dr. Brian Christian G5XD.

On arrival at Douglas, after a somewhat choppy sea passage, early endeavours were made to get in touch with Mr. Colebourne (G6IA), who from previous radio contacts had indicated his desire to welcome all who visit the Island. Efforts in this direction were successful, and an interesting tour of the Island, including a major portion of the Tourist Trophy Course was arranged, following which (in company with G5XD and G6GZ, who was " discovered " on holiday at Peel) a visit was made to his station. Situated high up above Douglas Bay, and with the advantage of a " top of the house " radio room, it is not to be wondered that his signals have been heard all over the world with powers around 10 watts. The station has been out of action for some months owing to the fact that Mr. Colebourne's business has extended greatly recently but an early return is promised. Mr. Colebourne's associations with radio go back to pre-war days and his position in the Isle of Man offers unique opportunities for interesting the layman in the wonders of amateur radio. Many new Manx enthusiasts are expected to join the society during the coming winter.

Owing to the fact that G5XD is now professionally engaged in Liverpool, his station has been closed down in the Island and re-erected in Lower Bebington, Cheshire, but sufficient evidence remains to indicate the excellent location which he possessed in Victoria Road. The aerial is erected on the high land overlooking Douglas Bay and explains probably why his signals were so well received with low inputs, many hundreds of miles distant.

In concluding this brief descriptive article of my holiday travels in the Midlands and beyond, I cannot but feel glad that I am associated with such excellent fellows who have for their main hobby the study of radio phenomena. Throughout my wanderings I have met evidence a hundred times over of real ham spirit, and as a result of its expression am confident that the future of both national and international amateur radio is assured for all time.

To H. B. Old (G2VQ) and B. C. Christian (G5XD) I extend cordial thanks for the hospitality of their homes, and to all old friends and new I tender my appreciations for your kindnesses.

Strays.

C. J. Mumford (CT1BL) has gone to Ceara, Brazil, and is taking all his gear with him. He expects to be on the air by about the end of August, and hopes to get in touch with all his friends in England.

Mr. F. W. Hudson, of Lower Topa, Murree Hills, India, in a recent letter, offers to listen in for British stations between the hours of 19.00 and 21.00 G.M.T. He would be glad to hear from anyone interested in arranging schedules. His observations will be made on 14 M.C.'s.

STAND 229.

Barometric Pressure and 28 M.C.

By W. B. Sydenham, B.Sc. (G5SY).

NO experimenter who has had any real experience of the band can deny that 28 M.C. is full of absorbing interest, and no less so because of the peculiar and comparatively rapid changes in conditions which occur. It is important that one realises something of the numerous variables covered by the term "conditions," especially as some people have considered that what is good for 14 M.C. is good for twice that frequency. Though the purpose of this article is to deal with only one of these, it is as well to have a very brief summary of what we may consider to be the more important ones.

It would seem fairly conclusive that long distance signals are affected by (*a*) the distance; (*b*) the time, that is to say the time of the day and also the period of the year; (*c*) the geographical conditions, especially screening hills, etc., at or near the stations; (*d*) barometric conditions between the stations. Nothing has been said regarding aerials, as we will assume that apparatus of equal efficiency is in use at the various stations. The time, both of day and year, is evidently of great importance and will provide much food for thought. Again, we all have our troubles as regards screening and other local effects, so we will say no more on that point.

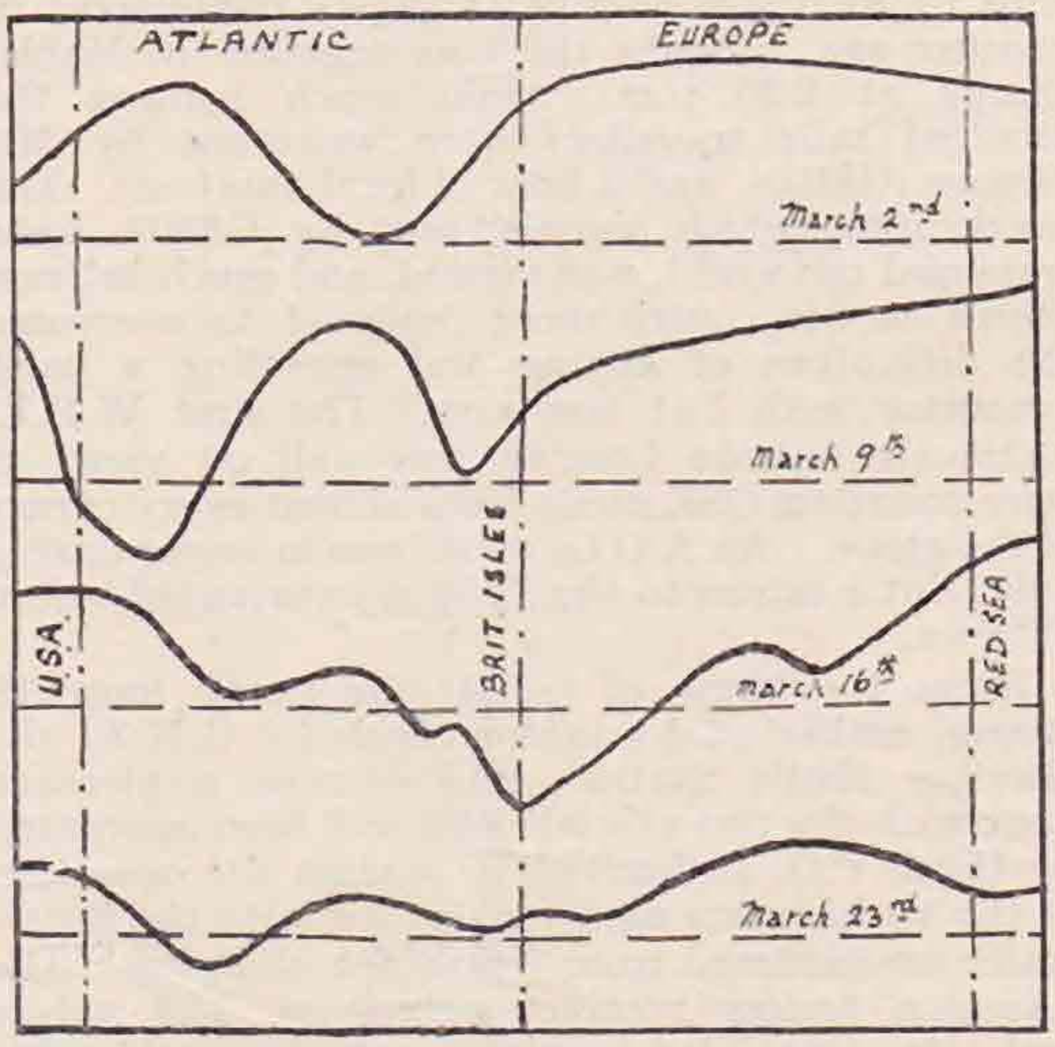
We now come to the last point, that of barometric pressure conditions. There is no doubt in the writer's mind that in our all too short 28 M.C. "season" pressure distribution is the chief cause of the changes which occur from day to day. No doubt there are many who will say that variations in the Heaviside layer form the primary cause, but if such a layer really exists and if it affects our 28 M.C. signals it is chiefly concerned with *regular* variations such as time of day and year.

It is well known that Group 1B has for some considerable time been keeping a record of weather conditions over Western Europe, but it will be of more general interest if we take as examples the four Sundays of the March tests. Let us briefly summarise the results for the British Isles.

On March 2 were heard VQ2, SU, FM, EU5, ZS, but practically no W's. On March 9 many W's, VQ2, SU and ZS; altogether an excellent day. On March 16, very little except to the south. On March 23 reception conditions were rather poor in the British Isles but better over the rest of N.W. Europe, chiefly for south-easterly directions.

On the first of these days pressure was high over most of Europe but lower over the British Isles; low over the Atlantic and higher again off the E. coast of America. On the 9th, the best day, a high pressure area covered most of the N. Atlantic, with other high pressure areas over S.E. Europe and the Sahara. Pressure was low over the E. coast of U.S.A. and fairly low over western Britain. On the 16th, U.S.A. had high pressure, low pressure extending across the Atlantic and most of Europe, while it was higher over Asia Minor and North Africa. The formation on the 23rd was rather complicated. Most of Eastern U.S.A. and Canada was high but there was a depression over Labrador, a ridge of higher pressure up the Atlantic to Greenland, a depression over Ireland and high pressure over Central Europe and the Mediterranean. Pressure was lower over N. Africa and Iraq.

All this is necessarily a little vague, so we will consider things from a slightly different point of view. Suppose, instead of considering the distribution of isobars horizontally, we think of the layers of air at equal pressure in a vertical plane. It is evident that where we have high pressure areas we must ascend to higher levels in order to reach regions with the same pressure as that to be found perhaps at sea level elsewhere. We could therefore construct isobars in a vertical plane, the lines over high and low pressure areas being represented respectively by "hills" and "valleys." For our purpose it is not necessary to draw more than one such line, but it is



extremely instructive to compare such a line for March 9 with those for the other Sundays. Above is shown one line for each Sunday, very roughly drawn and certainly not to scale. These give a rough idea of the shape of the equal pressure lines in a vertical plane along a line, not quite a great circle, from U.S.A. to the British Isles and thence to the Red Sea. The average 1,000 millibar level is shown by a dotted line in each case.

It will be noted that only on the 9th have we a well defined "hill" between two deep valleys on the Atlantic, though on the 23rd we have something similar, though to a much milder degree, between the British Isles and U.S.A. and also between us and the Red Sea. This condition of affairs has been noted for some time past, and the writer considers, now that we are approaching another 28 M.C. season, that the attention of experimenters should be drawn to it.

One or two points stand out clearly. First of

all it seems that a high pressure belt is required between the stations, with the stations themselves comparatively low. There is, however, insufficient data at present to give any idea of the importance to be attached to the low pressure areas shown on the 9th. We must not lose sight of the fact that although we have been using the word " pressure," it would be more correct to use the word " density " in the sense that where we have higher pressures we shall have greater densities, and all æther radiations are refracted or deviated by variations in the densities of the media through which they pass. This leads one to consider the possibility of the waves attempting to follow the general course of the lines of equal densities through the atmosphere. It is well known that a sufficiently strong beam of light sent up into the air at an elevation of, say, 45°, would tend, through the decreasing density of successive layers, to become more horizontal. Does something like this happen on 28 M.C., and if the wave requires the use of the Heaviside layer does it mean that it must approach the latter at such a well-defined angle that the form of the equal density layers in the atmosphere must be particularly suitable for the distance between the stations ?

There is certainly a possiblity that the answer to these two questions is in the affirmative. We may hope for more evidence during the coming winter and the writer hopes that he has made the article sufficiently interesting to persuade others to take up 28 M.C., not just with the idea of adding to their " wallpaper," but for the purpose of adding to our store of knowledge of what will prove to be a very useful band. In conclusion, he would be glad to hear from any experimenter who finds out any point of note regarding 28 M.C. and weather conditions.

A Visit to HAF7A.

By G5FC.

At the end of May my father and I spent a holiday in Austria and Hungary, and as Szombathely (HAF7A's QRA) is but a few hours' journey in the train from Budapest, we decided to call on him. My acquaintance with Captain Neu over the air dates back well into 1928, and on this account we were already firm friends.

Precisely at 2.30 Captain Neu arrived at our hotel with his friend, Captain Bokor, who speaks English well. A visit to the museum and the Cathedral were made and after a cup of chocolate in an adjoining café we repaired to HAF3RK'S QRA, where we were made very welcome indeed by all at home. Everyone drank toasts and we parted about an hour later firm friends, and made off for No. 10, Szell Street, wherein lies the QRP station of HAF7A.

Here we found a typical lay-out of an enthusiastic ham. Two separate transmitters employing the Hartley circuit are in use in the 7 and 14 M.C. bands. Three hundred volts into a Telefunken valve feeds pure D.C. into the Fuchs aerial, and has given a bag of five continents, the best DX being Chile. The receiver is a Weagent 0—V—1 and is very pleasant to handle.

It was good to feel a key again, although we had only been away from home a week ! Also I had the privilege of sending out a CQ ! Hi ! A QSO with Mr. Moxon of G6XN on 14 M.C. gave us the thrill of being in touch with the home country, and I was loth to leave this fine shack, which, like so many others, is situated in Captain Neu's bedroom. However, all good things come to an end, and at 10 o'clock we dropped into a café for a coffee and to listen to the gipsy music. Shortly afterwards we parted from our friends and, although we wanted to thank them from the bottom of our hearts, all we could say was " Danke schön."

The wonderful welcome afforded us by HAF7A and his friends gave us an example of the true ham spirit and showed us that it is very much in evidence in Hungary. I can only hope that they come to England some time for a holiday, and then we can give them something in return.

Danke schön, OM's !

Round the World Flight.

Amateurs Asked to Assist.

At the moment of going to press we have been asked to assist in a round-the-world-flight scheduled to start on Friday, 19th, from Croydon Aerodrome. The airplane is a Gipsy Bluebird, and carries a wireless transmitting set working on a wave of 35 metres with an input of 60 watts.

The transmitter is worked automatically, and airplane's call, GABDS, will precede every transmission made. The following code will be used :—

GABDS-OK indicates " in normal flight."

GABDS-LG indicates " making normal landing."

GABDS-MP indicates " flying, but engine or aircraft poor."

GABDS-FA indicates " is making a forced landing ashore."

GABDS-SOS indicates " is making a dangerous descent (possibly in water) and requires immediate assistance."

At the Graham Amplion works, at Slough, Bucks, a 50-watt S/W transmitter is installed working in the 40-metre amateur band and using the call G5GL. The set is a standard Graham Aircraft Type G.A.3, and will work any station. Any important messages are required direct by radio to G5GL, or may be 'phoned to Slough 672 during the hours 9 a.m. to 6 p.m., or to Maidenhead 1203 during the hours 6 p.m. to 9 a.m. The aircraft transmitter will be working once every hour, and normal transmissions will take place half hourly. Any changes of programme or important events in connection with the flight will be sent from G5GL at 11 a.m. in the form of a test message to all stations.

The following schedule will be adhered to as far as possible : Croydon, 19th ; Baghdad, 22nd ; Karachi, 24th ; Calcutta, 25th ; Hongkong, 28th ; Shanghai, 30th ; Tokyo, 3rd. There are, of course, intermediate landing places and these are not non-stop flights. The schedule for the continuation of the flight will depend on the success of the earlier stages.

" In the Course of Conversation."

By INCONNU.

THREE amateurs were having the usual rag-chew which always results when two or more of the fraternity meet face to face; discussion meandered from cabbages to kings, and the writer found in it an idea for the article—if such it may be called—which follows. Why not, said he to himself, offer the BULLETIN readers an hors d'œuvre composed of the various little subjects raised by these three amateurs.

If the dish be acceptable, you can copy the example of Oliver Twist. If it be otherwise, you will at least know that three fairly representative hams found pleasure in yarning about the items to another who had the advantage of a little scientific training. Anyhow, this chat is intended to interest mainly those who have just taken up the greatest hobby in the world, and if it appears that the answers are too " pat " and complete, please remember that it would be impossible to reproduce the entire conversation, and the information therein is probably all that would be of interest. The yarns will be briefly summarised under the headings of questions.

Which TX Circuit is Best for a Self-Oscillator?

Theoretically, there is no such thing as a best circuit. There are really only two main groups of circuits. Firstly, those which employ inductive feed-back, and secondly, those which employ capacitive feed-back. In practice both effects occur to some extent, especially at very high frequencies, but we will not go far wrong by considering only one at a time. The Hartly, Reversed Feed-Back, and such, depend upon inductive coupling between grid and plate circuits. The Colpitts and T.P.T.G. depend upon the coupling of a condenser between the plate and grid circuits; in the T.P.T.G. the condenser is often only the inter-electrode capacity of the valve.

Though all properly designed circuits should, in theory, give the same results with regard to efficiency there are practical snags. One circuit is much easier to handle and adjust than another, and may allow a much more stable note at high frequencies. These are points for the individual transmitter; one ham swears by the T.P.T.G. and another swears at it. The circuit which suits you, as I believe someone said before, is the best circuit. Try them all. You will gain valuable experience which will benefit you later. However, for the beginner the Hartley or the T.P.T.G. will provide enough thrills to keep you awake at night for some weeks to come. When you can honestly say that you have exhausted the adjustments on these two you will be well qualified to choose for yourself. It would be interesting to know the percentage of transmitters who are using these two circuits and who, by a little experiment, could obtain higher efficiency without losing quality. And efficiency is not to be gauged by the DX alone.

What is Radiation Resistance?

The power which is supplied to an aerial is spent in various ways. Some induces eddy currents in stay wires, and other metal objects near the aerial, some is lost in the dielectric of the insulators, some is used in heating the aerial wire itself. Some power is radiated out into space. The radiation resistance of an aerial is an imaginary resistance which is consuming the radiated power; in other words, it is the resistance which would have to be inserted in the aerial to account for the input power if none were being radiated. The square of the current multiplied by the resistance in a circuit represents the power spent, therefore the power radiated divided by the square of the aerial current will give the radiation resistance. The radiation resistance of any half-wave aerial is about 90 ohms.

Why are Most Transformers for Power Supply Rated in " Kilo-Volt-Amperes " (K.V.A.) or " Volt-Amperes "?

The output power from a transformer to a load is obtained from the product of three factors: current, voltage, and a quantity known as the " power-factor." The power-factor is a factor which must be used to account for the current being out of step (" out of phase ") with the pulses of voltage. It is obvious that 100 milliamps at 1,000 volts may represent any power from 100 watts down to zero—it all depends upon this power-factor thing. That is, it depends upon how much the current is out of phase with the voltage; if it is badly out of phase and the value of the power-factor is low, there will be little power represented by the readings given above. Now the output current from a transformer is limited by the size of the wire used on the secondary, and the output voltage is fixed by the number of turns. We may use the maximum output current at the rated voltage and be obtaining only a fraction of the possible output power because of the current being out of phase with the voltage. Nevertheless, we cannot exceed the permissible current, and the power output of the transformer is a quantity which is determined by the power-factor of the circuit to which it is connected. It would be wrong to rate a transformer as having an output of 1 kilowatt maximum; but correct to say it had a possible output of 1 kilo-volt-ampere.

Can an Aerial Have Any Effect on Quality of Telephony Transmitted?

Yes. Broadcast stations have the same little difficulty with aerials that listeners have with selective stages.

An aerial is a tuned circuit, and if it be made too sharply resonant the side bands will be cut and poor quality will result. However, that would appear to be one of the least likely causes of the poor fone on the 7000 K.C. band.

What is the Objection to Connecting Two TX Valves in Parallel?

Well, if we allow that you have been lucky enough to obtain two valves with similar characteristics and which will share the load equally, and that you have reduced the grid-leak value, there still remains the fact that you have just doubled the valve capacity which is connected across the tuned circuit. When the valves warm up the electrodes will expand and the internal capacity

(*Continued at foot of next page, col.* 1.)

British Arctic Air Route Expedition.

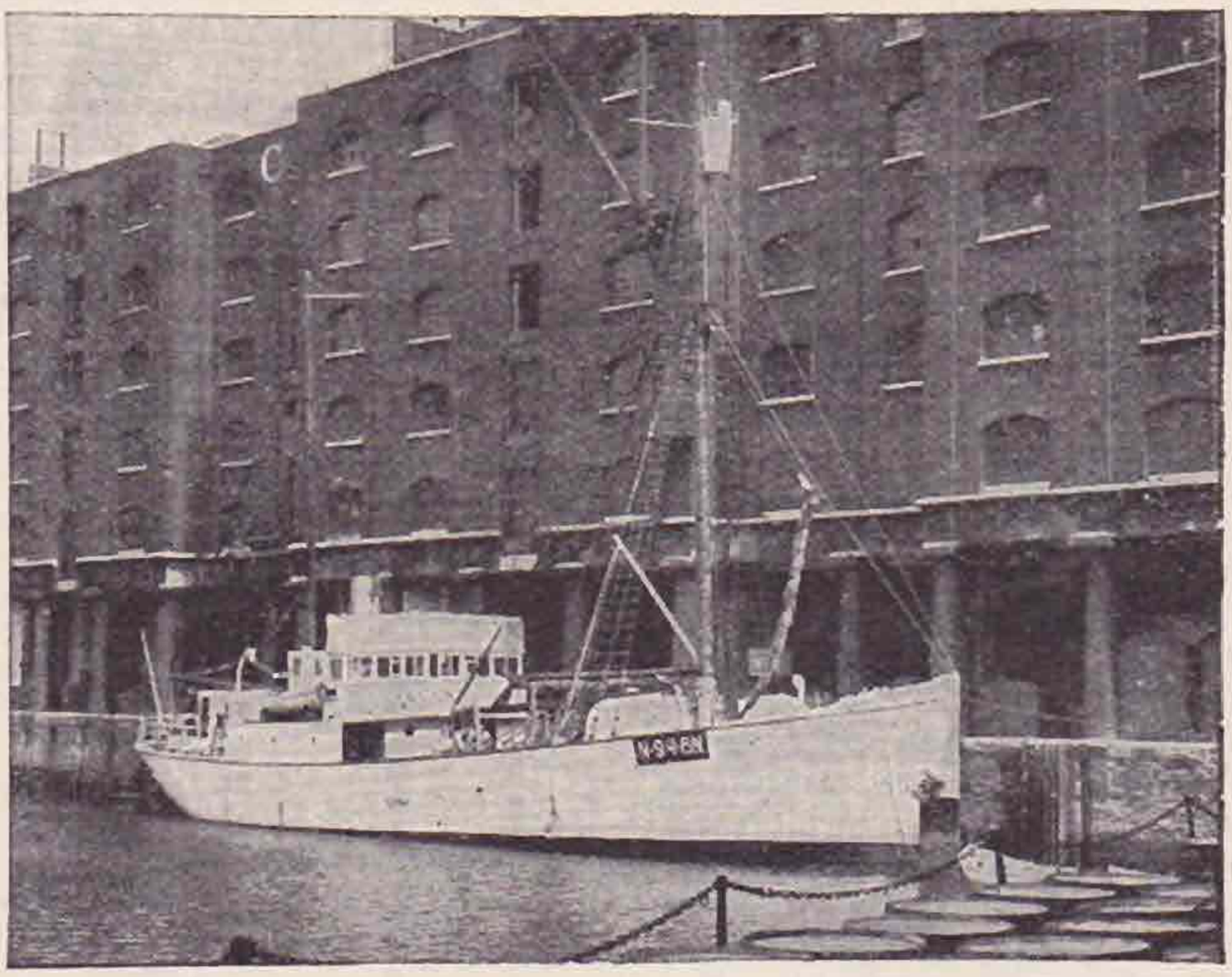
Keeping in Touch by Radio.

ON Sunday, July 6, 1930, Shackleton's historic ship *Quest*, specially chartered from her Norwegian owners, sailed from St. Katherine's Dock, London, on the British Arctic Air Route Expedition, which has, for its object, the investigation of an all-British Air Route across the Arctic regions to Canada.

Mr. H. G. Watkins, himself an experienced explorer, heads the little band of fourteen men who include among their number, surveyors, aeroplane pilots, wireless operators, geologists, meteorologists and other experts. The Expedition is thoroughly well found, the equipment comprising aeroplanes, fast motor boats, and sledges for locomotion, the most perfect of scientific instruments for surveying and the very latest types of radio transmitting and receiving equipment for maintaining communication not only between the various sub-expeditions and their base camps, but also with the outside world.

The transmitting equipment is designed to operate on the short waves and will be erected at base camps, one of which it is intended to establish on the South-eastern coast of Greenland and another, which will serve as a main base, 150 miles inland on the highest part of the plateau.

The receiving equipment taken with the expedition consists of two Eddystone three-valve receivers manufactured by Stratton & Co., Ltd., of Birmingham, and two Eddystone four-valve receivers. The smaller sets will accompany the sledging parties while the four valve equipments will be installed at the head bases. Both the transmitting and receiving equipment are fitted with Mullard valves.



[Reproduced by permission of *The Times*.

Crystal controlled transmitters are being used on both the main set and the portable sledge sets. These will work on various waves from 20-60 ms., depending upon the distance to be covered. The low power sets use 40 m. fundamental crystals. The crystals and wavemeter were supplied by Carter Bros., who also gave considerable help in making the actual transmitters.

The vital importance of the radio equipment to the Expedition will be understood when it is stated that the meteorological section of the Expedition will remain at the main base on the top of the Greenland ice cap for a whole year and that this is the first occasion that an expedition has spent a winter at such a high altitude in the Arctic.

"In the Course of Conversation."

(*Continued from previous page.*)

will change. This affects the frequency of the oscillations and we get creep, or drift.

If you have two similar valves it is much better to connect them in a Mesny circuit where the inter-electrode capacities are in series across the tuned circuit and where any changes will not cause appreciable drift.

At What Angle do Waves Leave Aerials of Various Types?

It is extremely difficult to obtain figures for any aerials other than simple symmetrical ones. Calculations can be made for the vertical aerial which gives an equal horizontal radiation in all directions, but which has aften a maximum radiation upwards at some angle to the horizontal depending upon the relation between the length of the aerial and the wavelength. The aerial in the following cases is assumed to be grounded to a perfectly conducting earth.

If the aerial is one-quarter wave long, it will radiate best horizontally. A half-wave aerial will shoot the signals up at an angle of 49° to the horizontal, and a three-quarter wave aerial will produce best radiation at an angle of 39°. A full-wave will give 33.3° and a 1½-wave will give 63°.

Is there any Advantage in Using a Low Impedance TX Valve?

Apart from any considerations of power there is an advantage in using a low impedance valve. With a high impedance valve on high frequencies it may not be possible to increase the anode inductance sufficiently without decreasing the frequency below the desired value—sufficiently, that is, to produce oscillations.

With the larger anode impedance the inter-electrode capacity of the valve may become the main closed circuit condenser and have large RF currents passing through it. These will cause dielectric losses in the anode and grid seals of the valve, and these losses will increase as the glass becomes warm, and eventually may damage the valve.

By using a lower impedance valve the anode inductance may be reduced and the closed circuit condenser will have a greater capacity than the valve, and will pass the main portion of the current.

Television.

PART III.

By P. D. Walters (BRS273).

IN the two preceding parts of this series on "Television" a brief general outline has been given of the actual apparatus used for reception, and so for the benefit of those readers who contemplate building a "Televisor" for themselves, it is proposed to deal first with the necessary gear to work it.

Since a standard "Televisor" can be constructed from a kit of parts which is on the market, the radio set and amplifier deserve primary attention.

The high-frequency side of the radio set will depend upon local conditions and the distance from Brookman's Park at which it is intended to operate the "Televisor," and therefore will be left entirely to the reader's discretion. Unless a band-pass filter is incorporated in the grid circuit, it is inadvisable to have too selective tuning, as the whole of the 10 K.C. sidebands must be covered.

Before discussing the detector stage, one must decide upon the type of L.F. amplifier which will be adopted. The two most popular methods are transformer and resistance-capacity coupling, and each, if well designed, can give extremely good results on speech and music. But an amplifier which gives very good quality reproduction of music may quite possibly give a poor television picture, owing to the fact that vision signals occupy a much more extensive frequency range than is covered by audible sounds, and probably the amplifier does not function satisfactorily outside the audible frequency range.

Whereas about 10,000 cycles per second represents the upper limit of audible-frequency range (except in the case of children, who can often recognise frequencies as high as 18,000 cycles per second), the quality of a television picture is certainly affected by frequencies of about 25 K.C. or more. In fact, sharpness of detail and good reproduction of half-tones depend to a large extent upon the higher frequency component of the vision signals. Similarly it is necessary to preserve frequencies below 16 cycles per second, which is the lower limit of audible-frequency range.

The obvious conclusion to be drawn from this is that the television amplifier must be so designed as to give as nearly as possible a straight line frequency-amplification curve over this extended frequency range.

Although transformers produce a marked cut-off of the higher frequencies, the writer has obtained very good results using them in a television amplifier in which the last stage consisted of two LS5A's in push-pull, but it is generally accepted, and subsequent experiments have convinced him, that, provided certain precautions are taken, R.C. coupling is superior to the former method for vision work.

Let us assume therefore, that it has been decided to use R.C. coupling, and then the next point to consider is the number of stages. This is important, for, as it has already been mentioned in Part I, each time a stage is added or cut out a phase change of 180 degrees takes place. But as the same effect occurs when changing from leaky-grid to bottom-bend detection, it would be better at this juncture to decide which to use.

Owing to its inability to deal with large inputs, the leaky-grid detector is unsuitable. An exception to this, however, is the power grid method, which is becoming increasingly popular now.

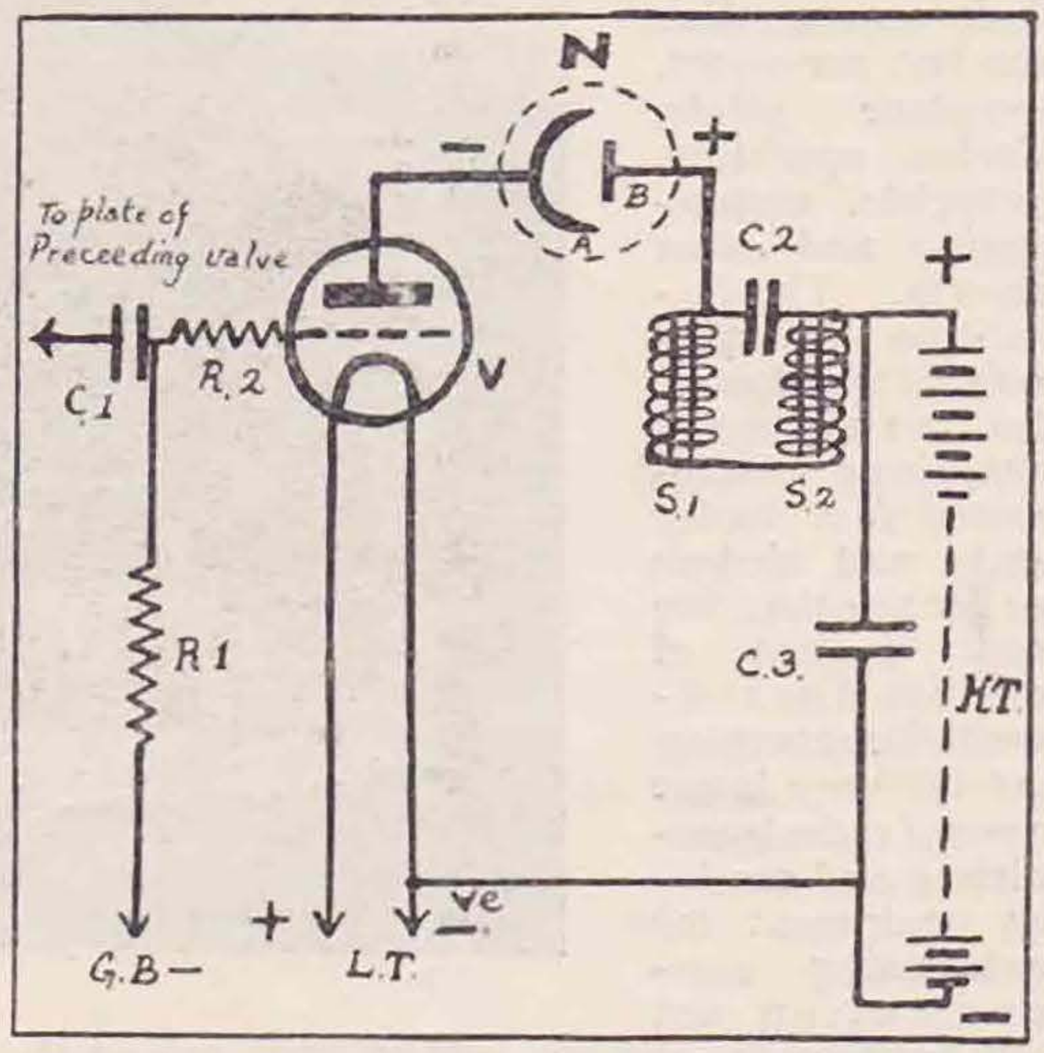


Fig. 5.

V=Output Valve.
C_1, C_2=0.1mfd.
R_1=Grid leak 0.5. meg.
R_2=H.F. stopper resistance, 150,000 ohms.
N=Neon lamp ("a" is the flat plate and cathode, "b" is the short rod electrode and anode).
S_1S_2=Synchronising coils.
C_3=2mfd.

Although the writer has not yet fully tested this method for television work, he has heard reports of its satisfactory use in this connection. On the other hand, anode bend detection in conjunction with R.C. coupling, when properly adjusted, can give very good results. The adoption of this method necessitates the use of either one or three stages of R.C. in order to give a positive picture.

The ordinary flat plate television type of neon lamp requires for successful operation at least 30 m.a. and a minimum voltage of 200. Its "critical voltage" varies between about 170 and 185, below which no glow is visible.

There is a choice of several methods of connecting the neon to the L.F. output, and it is doubtful whether any one particular way is better than the others. The simplest method is to wire the neon lamp and synchronising coils all in series with the anode circuit of the output valve or valves (Fig. 5). This is only possible if the anode current with this arrangement is 30 m.a. or more. Owing to the high resistance of the neon, a considerable voltage drop will take place and the H.T. must

(*Continued foot of column 2, next page.*)

A Radio Reverie.

If we look back to 1918 or 1919 there rise up visions varying with the age, sex (I link in here sex-appeal or the equivalent susceptibility in the case of the plus four-ed fraternity), and various other matters which can be studied in a very " sun-bathing " costume from so-called war books. These notes, however, started off to look at radio from a decidedly non-war viewpoint. One point always marks the original pre-war and close-to-war amateur receiver. Next time you attend a ham gathering and foregather with the " Grandpas " of the science, just brush aside the greyish yellow side whisker from any of the ancients, and it will be odds on that a sort of cabbage ear will be disclosed. Doctors call such a formation " crystalitis " and tell us it was caused by hanging on too long to spark signals from three doors up the road in 19-umpty. Often the peculiarity mentioned is associated with a permanent hardening of the skin on first finger and thumb of right hand—due, it is said, either to banging a small tube called a coherer, because it lived up to its title and tried to cohere permanently, or, in the case of slightly more juvenile specimens, from tickling a crystal with a small rod held between the affected finger and thumb. To the present readers the idea of tickling a crystal for hours when up-to-date dances offer such possibilities—but I digress.

A very similar aural deformity marks the generation of listeners who followed the " old contemptibles " mentioned above. In this case the ear is marked with a circular ridge the exact size of a G.P.O. ear-piece cap of the brand then found in (and lost from) public call boxes. Need I say more ? It is wiser not to ask anyone bearing this ear mark for details regarding the local police.

Concurrent with—or slightly before—the time of this outbreak was a series of outrages upon the ether. From these outrages it is thought many of the present broadcast programmes have their inspiration. On wave bands between 1,000 and 300 metres the voice of the gramophone was never silent. Amateur experimenters upon the violin, cornet, penny whistle, and other instruments of non-precision joined with amateur experimenters in voice production to further the evil done by still other amateur experimenters in modulation of semi-constant radio waves. One experimenter announced his arrival by means of the entrails from a cuckoo clock. Another, still more steeped in scientific research, retaliated by making his announcement after a similarly eviscerated bird whose vital parts had received such attention that they now " oo-d before they cook-d." One brave soul comes to mind. He actually called up the London Station of the British Broadcasting Co. and wished the mighty ones a " Happy Christmas." And the London Station of etc., etc., replied to him ! No, kiddies, this is *not* a fairy story. Policies, at adequate rates considering the risk, will be issued upon the life of any of you who would care to repeat the experiment. And before venturing consider, too, the shock which might be caused to that " little friend of everyone "—the Chancellor of the Exchequer *via* Mrs. Chancellor. Have you paid your licence ?

In those dark times a voice was heard from Essex. It usually sounded something like " Two Em-er-em-er-em-er Tock, Wr-r-r-r-r-ittle, calling." Followed some experiments upon the human voice which often sounded a cross between a yodelling chorus and a steam whistle. Heaven save me from the just-wrath of P.P.E. should he read this, which is unlikely. At the time we sympathised with his natural pride in breaking new ground by broadcasting a Shakespearean play. Knowing now, as we do, that this was the best and cheapest way of dodging authors' fees, we curse the beginning and inspiration of the years and years of Shakespearean excerpts foisted upon us. A celebrated attempt (on the farewell night from 2MT) to put out the sound of a battery of champagne corks leaving their parent bottles is supposed to have given some European amateurs the idea for their 25 cycle notes a little later.

We now approach the times of amateur achievement upon the " officially discarded so you can play there " waves. Contacts were made with U.S.A. and the American language became firmly attached to all radio conversations.

An English station talked to Australia—and broke off the conversation because business duties called. . . . .No, I did not think you would ! !

Lower wave lengths (I use the old version) came into use. The aerials of yesterday (which looked for all the world like a skeleton sausage without the skin) had disappeared, and no longer did every parrot feel at home in an amateur experimenter's back yard.

Many nations joined in, mostly without official sanction, and the motif " please QSL card " was heard as freely as Tosti's " Good-bye " had been a few years before. Usually, however, only resembling the earlier efforts as regards tremulo passages and shakes.

What times are the present ones. And how we have progressed. Every one is now keen only upon scientific achievements for the benefit of his fellow experimenters. No one wants QSL cards. The voice of the gramophone is rarely heard. Even broadcast programmes are good and musical, and the officials are only thinking of what the listeners would like to hear. And, too . . . Sorry. As I went to sleep it's obviously time for bed.

Television—(*Continued from previous page*).

accordingly be increased by 100 volts or more to compensate for this. This means that a total H.T. of 300 volts or more is necessary, depending upon the output valve used.

Next month circuits will be given showing how the neon can be operated without employing such high H.T. voltages, also a circuit of the complete R.C. amplifier.

With reference to Figs. 4B and 4C on page 8 of last month's issue, due to a slight error the magnets M and N are shown engaging with the cogged wheel C. Actually, of course, there is a very small clearance between the two, otherwise the wheel could not revolve.

14 M.C. Reception in British Somaliland.

By J. Drudge-Coates (Ex-Y-DCR and AI2KX).

BRITISH Somaliland is, perhaps, totally unknown to many radio amateurs at home. In recent years the development of short-wave radio has done much to make known many of our lonely outposts throughout the British Empire and to strengthen the existing bond of friendship with the Mother Country. In this respect, I am afraid that Somaliland still remains outside the circle created by amateur radio enthusiasts. Here in this country radio goes back to the "dark ages," only Government stations exist, these are few in number and are equipped with very old 1½ K.W. spark transmitter and crystal receivers! These stations are manned by Indians and a Britisher supervises the whole group.

Wireless licences for either transmission or reception are not granted, but I am glad to say that a movement is at present on foot to permit receiving sets to be used. Here I might add that the total European inhabitants number approximately 50, and perhaps the greatest number to be found in any one station throughout the whole of British Somaliland would be about 10. The reader will see, therefore, that this country is indeed cut off from the rest of the world as regards radio, and very little is known of conditions prevailing in various parts of this British possession for radio reception or transmission.

In view of the above, I decided to make observations on amateur transmissions on short wave and to study in particular those emitted from British stations. The results of these observations follow.

The Expedition with whom I am working is engaged in demarcating the Anglo-Italian boundary of Somaliland, as this boundary extends for the whole length of British Somaliland from north to south on the eastern side and to approximately one-third of the total breadth from east to west, it will be seen by a glance at a map that the results shown hereafter are applicable to the greater part of the whole country as the observations were carried out during the demarcation of the above.

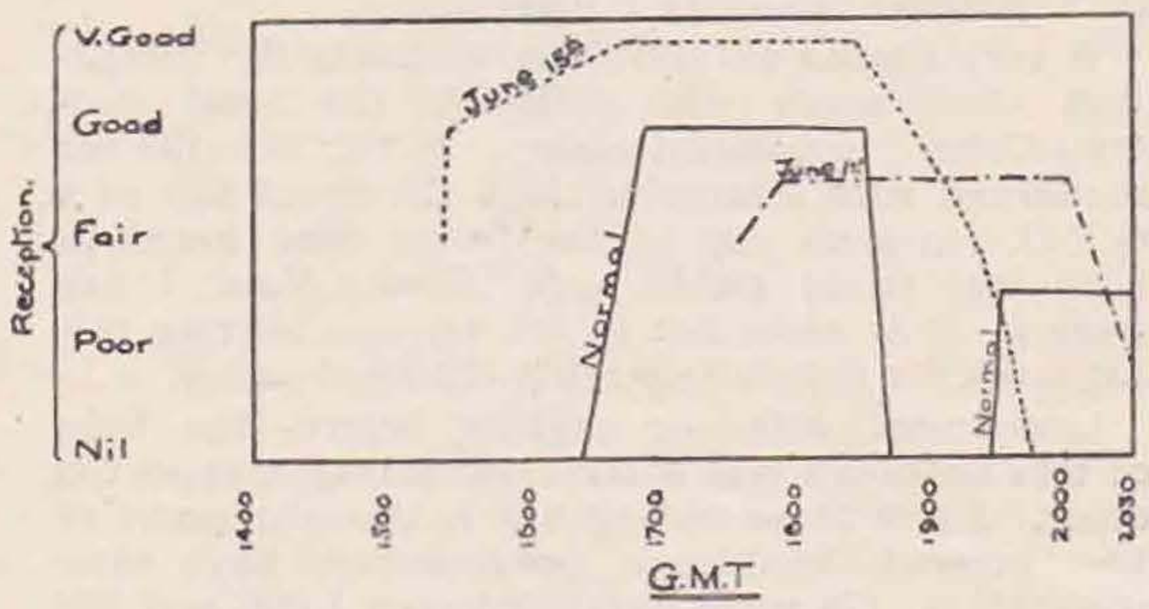
The period covered by the observations is from March 2, 1930, till June 30, 1930, during the hours from 14.00 to 20.30 G.M.T. (17.30-00.00 L.S.T.), and the total number of days upon which observations were made is 32.

The apparatus used needs no special description, being an 0—V—2 capacity-controlled receiver. The aerial was an insulated wire 10 metres in length and slung between tents at a height of about four metres, direction of aerial was always from East to West.

The 14 M.C. band was chosen for several reasons, some being that the time at my disposal would probably give very little results indeed on the 28 M.C. band, atmospherics on the 7 M.C. band during the summer months in the tropics are always very bad.

The first amateur signal was received at 17.52 G.M.T. on March 2; it was G6WT. He was quickly followed by G's 5YG, 5TZ and 6OU (I believe that this is the first time that amateur signals have been heard in this country, if this is not so I would like to hear from anyone having a prior claim to G6WT as being the first amateur station to be heard in British Somaliland.

April 13 found the Expedition camped among the Al Hills (11° N., 49° E.), at approximately 6,000 ft. above sea-level, here the reader might say "some hills," and I agree with him after having to tramp over them. However, I am straying from our subject. Here, weather conditions were very cloudy and a strong wind blowing from the S.W. No G stations were logged until 17.15 G.M.T. when G6XB was heard calling "Test" at strength 5/6. From now on signals came in very well and G's 2GM, 2GF, 2LP, 2IP, 2BM, 5BY, 5BH, 5BJ, 5HJ, 5YK, 5NJ, 6HP, 6WT, 6QB, 6VP, 6XJ and 6QX were all logged between 17.15 and 18.30 G.M.T. After this time all European signals seemed to fade out quickly, I might say suddenly. Signals from G stations reappeared about 19.30 G.M.T., but at a much weaker strength, and the number of stations heard was greatly reduced. These signals remained steady, although weak, and were so, at the close of the observation period at 20.30 G.M.T.



* Graph, showing the conditions prevailing on:—1, Normal days; 2, June 1; 3, June 15.

The mean results of the observations made during March and April showed that G signals would first become audible about 16.30 G.M.T. reach maximum strength about 17.00 G.M.T., and remain constant until about 18.30 G.M.T., after which there would be a rather sudden fade-out. The signals would reappear about 19.30 G.M.T., but greatly reduced in strength and numbers. Although the signal strength is much lower during this latter period, there is no sign of bad fading or swinging up to the time the observations ceased, at 20.00 G.M.T.

June 1, however, gave a decidedly different result from the normal. Signals were not heard until 17.30 G.M.T. and then at fair strength only. Instead of the usual rapid fade-out of signals at 18.30 G.M.T., the above-mentioned strength was maintained to about 20.00 G.M.T., after which rapid fading set in and in a very short time stations that had previously been 100 per cent. readable could not be copied at all.

June 15 again proved a somewhat phenomenal day for 14 M.C. reception. Our position was

now 8° N. 49° 30′ E., approximately 300 and 400 miles from VQ4 and VQ3, respectively. G stations were in at fair strength as early as 15.30 G.M.T., gradually increasing in strength until by 16.40 G.M.T. the signal strength was louder than ever obtained before. G's 2VQ, 6DH, 6HP and 6VP were all logged with the "fones" on the table. These conditions prevailed up to 18.30, after which there was, instead of the usual somewhat sudden fade-out experienced at this time, a more gradual one. Here I would like to say that the D.C. CC stations seemed to be effected more than others, the peculiar echo to their note being very pronounced (see later). By 19.40 G.M.T. all stations had faded right out and were not heard again during the period.

During 15.30-18.30 G.M.T. several G-VQ contacts took place overhead without a sound being heard from the VQ stations by me. The G stations in contact were heard at remarkable strength; it was also noted that both G2VQ and G6HP failed to raise VQ3MSN during 17.00-17.30 G.M.T., after which the former was heard in contact with the latter. VQ3MSN was approximately 400 miles from me at the time, his signals were not audible here, but were apparently being received in England, and where I was receiving the G stations at excellent strength, he apparently could not hear them until 17.30, when he made contact with G2VQ. Of course, I have experienced the short-distance skip on the 14 M.C. band before, but not that of the longer. VQ3 signals have been heard here between 15.00 and 17.30 G.M.T. on other days, but never after this time.

To summarise the results of the observations it would appear that the 14 M.C. signal from British amateur stations are heard at their best in British Somaliland between 17.00 and 18.30 G.M.T. (during a period between 14.00 and 20.30 G.M.T.) during the months of March to June. There appears to be a total disappearance of signals between 18.30 and 19.30 G.M.T., after which time stations are heard again, but at weaker strength.

Between 17.30 and 20.30 G.M.T. signals emitted from stations within a radius of approximately 400 miles from the receiver are not audible.

D.C. CC signals on 14 M.C. are subject to a peculiar echo to their note, which at times makes the reading of the morse difficult (G's: 2VQ, 5ML, 5YK, 6HP, 6DH are particularly mentioned in this respect).

Other countries favourably received during the whole or parts of the above "favourable" period for the reception of G stations are: F, ON, OZ, PA, SU, YI, FM, CT, D, PK and VS.

Countries never heard during the above period, but have been heard at other times are: W1 and 2, VK and VE.

In conclusion, let me say that although these observations, covering as they do only a few hours of the day, are therefore very incomplete, the results of same as set down above may be of interest to those making a special study of the 14 M.C. frequency.

What is Happening to DX?

By G. A. Jeapes (G2XV).

Time rolls on, valves improve in sensitivity, screened grid valves are introduced, noiseless condensers, slow-motion dials—still more time rolls on—crystal control, pukka aerials, better design, better operation, better signals, but where are we now, as compared with 1926, 1927, and thereabouts? Have we got anywhere?

The writer discusses present conditions with all "hams" with whom he comes into contact, and all are agreed upon the one definite fact, that conditions for DX are growing steadily worse, even in spite of the steady march forward of progress in design of our stations. What is the reason for this state of affairs? I am not attempting to answer this question, but it seems that there is some conducting medium upon which we rely for transporting our signals which is gradually becoming "used up."

I have memories of the time when—with one detector of the old 6-volt Bright emitter type with "swinging coil" reaction, and one stage of L.F. with hand capacity at 6 ft., and any old aerial—the most "hay wire" outfit imaginable—one could sit down any time between 9 p.m. and 9 a.m. (according to time of year) and hear enough "Yanks" to sink a battleship, one on top of the other, and in between them, Australians, New Zealanders, Brazilians—in fact, almost every country in the world used to come through at their particular time of the day; in fact, one could say almost to an hour what time it was possible to hear any particular part of the globe. Then, having heard what was doing with the old "hay wire" receiver, one switched on a "hay wire" transmitter, probably consisting of an LS5 (or similar) valve, with a note like a "hacksaw," and a signal, probably as steady as your aerial on a windy day, which kept climbing out of audibility. You called "test," with the result that, when you switched over, probably finding anything from three to six stations answering.

As another example, take the present signals we receive from the American side of the transatlantic telephone. Their carriers are little, if any, stronger than the signals of some of our U.S.A. "ham" pals whom we used to hear a year or two ago with regularity, and who were using possibly a one hundredth part of that consumed by the 'phone stations referred to.

What is the use of better receivers and better transmitters to us, if the connecting medium has "gone west"?

Although the foregoing remarks are directed at the 14 M.C. (20 metre) band, it is believed that the 7 M.C. (40 metre) band is also in a bad state.

OUR PRESIDENT.

There is still time to send in your appreciation of Mr. Marcuse's effort on behalf of British Amateur Radio, so get out your QSL cards now and send one along to H.Q. All you need to say is TNX OM!

Contact Bureau Notes.

By H. J. Powditch (G5VL).

THESE notes will be in your hands just before Convention. They are really the wind-up of a year's work, both for you and me. Its up to everyone at Convention to say if they are satisfied with the way CB has gone along. I know I am stating the obvious, but it's only meant for a reminder and not an item of information.

As this copy of the Bulletin may reach more outside our own members than is usually the case, let me explain that " Contact Bureau " is essentially a means of pooling results, ideas, theories—what you will—so long as it keeps its members from being shut up in a small box, working each on his own lines without reference to or knowledge of what the other men are doing. It's for the interchange of all radio experience, and tries to achieve its results by introducing its members into small groups, each group working upon one subject and pooling the results by a monthly report to its Centre. These reports are again summarised for publication on this page. We range from G2DT and G2OL leading their groups in the ultra-high frequencies round 56 M.C. to G5UM and his group on 2 M.C. G2ZC looks after that much-discussed fading question, four groups are interested in QRP work, and so on.

As to the past year, I've had it whispered in my off-side ear that CB is all 28 M.C., or nearly all. Well, what about it? CB is what the members choose to take up, and if they are mostly interested in 28 M.C. that's not my fault. There's more room for experiment there, and new facts and ideas are to be found in that band more readily than in the better explored ones. Still, there are profitable openings for many other subjects. Wave propagation, beam and reflector work, easier methods of crystal control; if you have read these notes you will find them all familiar texts. We have had several suggestions for running a research group. However, our research stations don't bite. To get a rather different line before the tests in January, I want all 28 M.C. groups to collaborate in an experiment. Will ALL 28 M.C. GROUPS please devote their energies this month to sending to their G.C.'s an account of the type of receiver they find best for the band, their special likes and dislikes, snags, points to be watched in construction and lay-out, and, wherever possible, " why." In short, let's get out a " best possible " receiver for 28 M.C. founded on the results and experience of the 28 M.C. groups. If this idea proves of use, we can tackle other gear later. It's a pure experiment, and I ask all those who can to support it—and afterwards criticise the results. Please don't forget that the snags and difficulties overcome are the points that will help others along.

As to the general items of interest for the month. First, BRS250 writes that he heard W6DDY (who was QSO G6RB at midnight in July) state he was using a new beam system. I don't think, however, that G6RB uses a directional radiating system, so it can't have been all beam. Next a note from VK3WL, who states that about 14.30 G.M.T. on March 9 this year, during the 28 M.C. tests, he heard YI1LM calling " CQ ten " on 14 M.C. band. VK3AG also heard the " ten " call on 14 M.C. Further, VK3WL actually heard U0ZZ answer YI1LM's CQ, and the contact is reported in the test reports in the April " Bull." Perhaps YI1LM will confirm if the above-mentioned time is correct. The fact that both he and U0ZZ were heard on 14 M.C. wants a good deal of thought before a satisfactory explanation can be arrived at. VK3WL is not a newcomer to 28 M.C., and as both he and VK3AG are fully agreed that the lower-frequency band was the one used for reception, that side of the matter seems beyond doubt. The other point is that the time signals were heard is between 14 and 16 hours G.M.T. Graphs of times published in the May " Bull " showed this to be the peak reception period here for SU, ZS, VQ and W2. Generally speaking, it seems that one time may be found the best for all signals either originating in or received in this country. I am not forgetting G5ML's reports from VK shown in last month's issue, but these were in June, three months later, and it seems feasible that the period will change with the part of the year. The actual time in Australia for the YI/UO affair was 00.35, local time. There's only one thing that makes me a wee bit doubtful about the affair, and that is that YI1LM was having some trouble with a C.C. set in the early part of the tests. Against this, UO and OK both worked him on (supposedly) 28 M.C. on the date mentioned. SU8RS joins in the discussion as to skip. His analysis of results shows that (taking districts) out of 15 in which his signals were regularly heard on 28 M.C., nine were at a distance of from 2,000 to 2,500 miles, three at 1,550 to 1,700 miles, one each at 830, 3,280 and 4,250 miles. From these figures he agrees the average skip at the approximate figure of 2,000 miles mentioned in July notes. His aerial is as previously described, 21.2 metres horizontal with a 13.25 metres vertical lead up and a .00025 condenser inserted at the junction of the vertical and horizontal. This gives apparently best radiation (judging from reports) over an arc of from 29 to 48 degrees from the line of the aerial itself and extending away from the lead-in end towards free end.

Still higher on the frequency bands, Dr. Stoye (D4AFJ) says he is now on 150 M.C. He wants skeds on the (comparatively) low bands round 56 M.C.. Group work has, as was to be expected, suffered from holiday interference. As there is little to report I am cutting rather drastically.

28 M.C. Work

Group 1B.—G.C. G5SY and G6LL are both pulling down and rebuilding. G5SY wants any advice as to valve for last stage of TPTG with " Lock " control. (Power is, I think, 50 watts, G5VL.) Weather article completed and discussion invited after its publication. G5ML's reports of 28 M.C. harmonics from VK and W9 are already known. His transmitter was, of course, working

on 14 M.C. at the time. The fact that G5ML has himself logged harmonics of 14 M.C., W stations appears to point to favourable conditions for the harmonics.

Group 1*C*.—G.C. G6VP will have the help of YI6HT in this group. This station will be remembered for some very good work during tests. G5YK has heard nothing further. G6WN is still on C.C. G6DH has a new M.G. G6VP is redesigning PA. With new QRA in view, work is held up.

Group 1*H*.—G.C. G6OO has been laid up, and others do not report.

Fading, Blanketing and Blindspotting.

Group 2*B*.—G.C. G2ZC reports that G2ZN takes the vacant place in the group. BRS250 sends in a criticism of G6PP's theories, and I hope G2ZC will give his reply to this. The scheme I mentioned last month (of asking stations to log and graph results) meets with G2ZC's approval. Unfortunately so far no one has offered any help with the work. It's not too late yet.

56 M.C. Work.

Group 7*A*.—G2DT as group centre, bristles at the lack of work and reports. I give his remarks in full.

Owing to the total lack of dope that is forthcoming from members of this Group, these notes are naturally dwindling to such a state that they hardly warrant acceptance by the Editor.

G6XN has had a couple of QSO's with G2OL, six miles away, and maximum strength was R5. G6TW has been busy doing a spot of glass blowing and thus making special insulators for his debut on the next amateur band for which he must blame the GC, who really suggested a move to the next band as a means of keeping Old England's tail up in view of all these activities below 1 metre in foreign countries. G2DT has been QRT pending the building of a receiver for exhibition at Olympia just after the appearance of these notes.

Group 7*B*.—G.C. G2OL and other members have been again out with the portable sets. Their aim is to chart the contour of maximum signal strength round the transmitter, and on the day in question they worked a 90 degree section from West to South. Soaking wet made results of a doubtful nature as absorption by buildings, etc., was suspected under the conditions. I am leaving out details this month as I hope G2OL will supply a complete account when the job is completed. Some notes, however of his are reproduced in full as they give a summary of his views.

"I am of the opinion that on a dry day signals would have been audible all round, but the absorption and/or screening was too great from buildings which were soaking wet, especially when on the previous field day, under much the same conditions as regards country, but drier, sigs were heard up to 20 miles with ease. It is all boiling down to the horizon theory as expounded in the *Wireless World* a short time ago by Professor Noack.

"During the last field day it was noticed, as always before, that the receiving aerial must be in a certain position relating to the transmitting aerial, but not necessarily pointing to it, and there are two minimum positions where all sign of signals vanish. Especially is this effect curious in relation to 2OW and 2OL, as these stations have their respective transmitting aerials at right angles to each other, and are only one-third of a mile apart. Yet when receiving both at a distance of anything up to 15 or 20 miles, each station requires the receiving aerial in a position of its own, irrespective of the position of the receiver.

"After much thought, I am of the opinion that the ground wave behaves in much the same fashion as any other band, but the absorption and screening directional and reflectional effects are *very* much more marked."

G6CO had a blocking condenser go phut, and the dry cell HT suffered from overload. G2BY and G2OW, holidays. BRS310, change of QRA. A new member, BRS327, is going in for reflector work with G2OL. G6WN's hope to use 50 watts and a new mains receiver. They find great difficulty in getting an all mains set to work quietly on 56 M.C. G2OL tried putting a thermometer in the field of his transmitter inductance and reading rose from 65 degrees to 123 degrees F. Input 12 watts.

QRP Work.

Group 8*A*.—It is with great regret that I note the transfer of G2ZN from QRP work. With greater facilities at new QRA, he goes to higher power and will work with Group 2B. G2ZN was the first member of the first QRP group in CB, and his group pulled off the QRP trophy last year. 2AZR also has to fall out. G5RV will carry on the group centre. This station also complains of bad conditions, but QRO got VO8MC. G6LF, bad conditions and Europe only. G2WP has done a bit better of late, EU9, YL, HAF on 4 watts. He notices unusual skip on 7 M.C., G's from London only being heard. G2ZN has CRAC and has at last hooked I. He also notices abnormal day skip. BRS317 finds W's still scarce, but the South Americans improving.

Group 8*B*.—Reports range from "amazingly bad conditions" to "worse than awful." G6SO and G5CM seem to have best results from 2 M.C. G2OA has conquered all bands except 56 M.C. and higher, and is after these. BRS309 sends in a log of 500 stations heard and dope on QRP transmitters. GC notes as "red-hot about QRP." G.C. G2VV has a 2,000 miles QSO on 5 watts. He finds present conditions to be (for 7 M.C.): Most Europe after 21.00 G's only after 21.00. Local stations after dark and DX in day time. All group stations report the same freak conditions.

Group 8*C*.—G.C. G5PH still does not get his reports. If some of you chaps in 8C read these notes, you will know that he has been asking you to keep him advised of your doings for some months past. Please back up. G2AV has to get new Xtal down to wave and rebuilding. G5AQ has a COPA set, but conditions bad. G6PS has been heard on 7 M.C., but does not report. Same regarding G5QA. G2AT, bad conditions G.C. G5PH is the only one who seems satisfied and skeds with D4QB give him R9. A Xtal has been found to stand 15 watts at 600 volts when QRO work is required. Mains feed also successful.

2 M.C. Work.

Group 10*A*.—G6FO adds his weight to this group. He has already been heard everywhere with fone and CW. Power is from 5 to 9 watts. Reports from BRS are particularly asked for by

(*Continued on next page, column* 1.)

BULLETIN ADVERTISERS ARE YOUR HELPERS.

HIC et UBIQUE.

Result of District Representative Elections.

District No. 1.—J. Browne, G2XB.
District No. 4.—J. Lees, G2IO.
District No. 8.—R. C. Neale, G6GZ.
District No. 10.—S. J. Buckingham, G5QF.

With the exception of Districts 15 and 16, where the result has yet to be announced, the Representatives for Nos. 2, 12 and 13 are the same for those of last year. The Representatives for the remaining Districts were announced in last month's BULLETIN.

* * *

Society Gossip.

All good wishes are extended to Mr. Scott (G2SC), who has accepted an accountancy position in Uganda. Mr. Scott hopes to be on the air early in January, 1931, and wishes to take this opportunity of sending 73 to all who have met him on and off the air!

* * *

Welcome back, Ted Cook (G6UO) from your journey to South Africa. Your work in District 1 of S.A.R.R.L. has been appreciated by all, and we look forward to your continued help in the future, both with R.S.G.B. and B.E.R.U. activities.

* * *

The Council, at its meeting held on July 16, accorded votes of thanks to Harold Old (G2VQ) and Arthur Watts (G6UN). Mr. Old represented the Society at the International Congress in Antwerp, whilst Mr. Watts was responsible for the very successful Loyal Relay. We feel sure the membership at large will unite in extending thanks to these two well-known amateurs.

To all District Representatives.

The Honorary Secretary's attention has been drawn to the fact that certain D.R.'s have not in their possession copies of the pamphlet explaining our aims and objects. In view of this he invites all who are interested in the work of placing the Society prominently before new radio amateurs to apply to him for supplies of this pamphlet, and also copies of the membership application form.

The new edition of "What is Amateur Radio" will be available to D.R.'s immediately after Convention.

The Society's Trophies.

Council have pleasure in announcing that the Society's trophies will be presented at Convention during the afternoon meeting on September 27.

The winners are as listed below:—

The Rotab Cup: Mr. Frank Miles (G5ML).

The Worthley Talbot Cup: Mr. Cecil Runeckles (SU8RS).

The Powditch Transmitting Trophy: Mr. J. W. Matthews (G6LL).

The Powditch Receiving Cup: Mr. J. W. Hamilton (BRS310).

The 1930 Committee Cup: Mr. W. H. Winchcomber (G6ZH).

The Somerset Cup: Miss B. M. Dunn (G6YL).

Manchester Conventionette.

This will take place on October 18, 1930.

Details have not yet been definitely arranged, but there will be included a business meeting and discussion in the afternoon, a visit to the Manchester Radio Show in the evening, and probably a

(*Continued on page* 71, *column* 1.)

(*Continued from previous page.*)

G6FO. His ideas are that weather has no effect on conditions, and remarks particularly on the fact (already referred to some time ago) that signals appear to travel better in one direction at different times so that at one time a distant station's signals will be weak although he is receiving well, and another time this process will be reversed and weak reception will be at the original transmitter's end. Why? G2RX has been watching conditions on 7 M.C. and 2 M.C., and concludes there is no connection between the two bands. He is also on sked with G6FO for observation of conditions on fixed input. 2AZQ notes a good month, and comments upon the small amount of QRN for the time of year. Two best days observed were July 27 and August 10 when both temperature and barometer readings were similar. No report from G6QC. Hw? Both BRS164 and G5UM also found the two days mentioned before to be the best. G.C. G5UM thinks conditions have not been so good for this band since 1925-6. He has logged 51 different stations in 21 days. G2ZN has suggested that many sun spots mean bad conditions on high frequencies and good conditions on 2 M.C. "At present there is only one sun spot and the good DX heard on 2 M.C. and bad conditions on the higher frequencies seem to point to one condition—that sun spots are the factor affecting radio conditions." A sked with BRS164 has been worked for the past year through every conceivable type of weather conditions, and this, plus G2ZN's theory, have wrecked G.C.'s pre-conceived theories about WX and moon effects. All members of Group are working regular skeds (with the possible exception of G2AX). They are G5UM, G6FO, 2AZQ, G6QC, BRS164.

R.S.G.B. Sales Department

The following can be obtained from Headquarters on application:—

A.R.R.L. Handbook, by Handy ...	**4/-**
Citizens' Radio Amateur Call Book (4/- to Members)	**4/6**
Enamelled Coat Badges of Emblem	**2/6**
Members' Headed Notepaper (per 100 sheets)	**2/-**
Enamelled Car Plaques of Emblem	**3/6**
Call Sign Brooches...	**2/6**
Rubber Stamps of Emblem ...	**1/6**
K.C. Metre Charts	**6d.**

Fifth Annual Convention.

September, 1930.

Programme.

Friday, September 26, 1930 :—

5 p.m.—Informal gathering at the Institution of Electrical Engineers, London.

5.55 p.m.—Reception by the President and Acting Vice-President.

6 p.m.—Presidential greetings.

6.10 p.m.—Announcement of the election of new District Representatives.

6.15 p.m.—Paper entitled "The Progress of 28 M.C. Transmission and Reception," read by Messrs. J. W. Mathews and G. W. Thomas.

8 p.m.—Charabanc parties for provincial members to the stations of Messrs. Clarricoats and Mathews.

Saturday, September 27, 1930. Morning free, except for delegates :—

10 a.m.—Delegates' meeting.

1.50 p.m.—Convention photograph.

2 p.m.—Presentation of trophies.

2.15 p.m.—Business meeting.

4.30 p.m.—Tea.

6.30 p.m.—Annual dinner at Pinoli's Restaurant, Wardour Street, London.

Important Notices.

Council have agreed to the suggestion put forward by Mr. J. W. Mathews and Mr. J. Clarricoats that provincial members attending the opening meeting on Friday, September 26, shall be taken by charabanc to one or the other of the above stations. Charabancs will pick up parties outside the I.E.E. just after 8 p.m. and will return to London at 11 p.m. It is felt that this arrangement will give our provincial members an excellent opportunity for discussion. All expenses will be paid for by the Society.

Immediately you read this announcement, please send a postcard to H.Q., if you wish to be included in one of the parties. We can accommodate sixty members, so please book at once.

The Dinner will, as previously announced, be held after the Business Meeting concludes on Saturday, September 27. Tickets are now available, and space is limited to 200, so please make your application at once with a postal order for five shillings.

Money is not actually wanted before the night, but considerable time will be saved if everyone will assist the Honorary Secretary as much as possible prior to the dinner.

All district delegates should be present at 10 a.m. on Saturday, September 27, in order that the delegates' meeting may commence promptly.

Olympia Exhibition.

Our stand will be found in the Empire Gallery, No. 229.

Please call and sign our visitors' book.

The Society stand is the official rendezvous for all Society members.

SEE YOU AT STAND 229 AT OLYMPIA.

Trade Notices.

The DO/25.

The new Mullard Super-power valve should be very useful where great output is required, such as for use in public address amplifiers. With an anode impedance of 1,150 ohms and an amplification factor of 3, it has a slope of 2.6 ma/volt. Maximum H.T. is 400 volts, and the filament is rated at 6 volts, 1.8 amps. (Price 30s.)

* * *

Messrs. Lectro Linx, Ltd., whose products are familiar to every reader, have drawn attention to some new features concerning Clix plugs and sockets. The additional price of ½d. per unit which has hitherto been applicable to Clix specialities with engraved insulators will be discontinued, and engraved insulators will be priced at the same rates as the plain.

New principles of resilience in plug and socket design are being incorporated in all of their specialities for 1931, which include new types of 4 and 5 pin valve holders and terminals for screen grid valves.

The All-in terminal, which has been described before in these columns, will be once again in the market, and will doubtless prove as popular as in the past.

* * *

We have received from Messrs. Gambrell Radio, Ltd., a list of apparatus that they intend to market in the coming season, and amongst many good things in the catalogue we find one or two that will be of especial interest to our readers.

In the first place there is the well-known Novotone which was so ably demonstrated before the society last December. This is made in two models, Type S for standard pick-ups and Type H for high resistance pick-up, such as Marconiphone ; both are priced at £5.

Then there is the Volurernia, a volume control which is smoothly variable between 0-500,000 ohms, and is a real delight to work with, as well as being moderately priced at 6s. 9d.

The Multitest metre should also make an appeal to those who are real experimenters, as it can be used as milliammeter, ammeter or voltmeter, and the following ranges are covered : 5 milliamp., 50 milliamp., 5 amp., 5 volt, 50 volt, 250 volt. Price £3.

FERRANTI
TRANSFORMERS

TYPE AF 3.
PRICE 25/-

The necessity for a good Transformer was never greater than it is to-day.

The improvements in broadcasting, the improvements in the construction of Sets and the greater knowledge of their correct operation, and the introduction of the Dynamic Speaker with its amazing response to all audible frequencies, makes the Transformer question to-day more vital than ever.

However carefully you build your Set, whatever valves and output stage you employ, the reproduction is definitely inferior unless you use a good Transformer. The Moving Coil Speaker is positively wasted following a cheap Transformer with a poor response curve.

If you desire a reproduction that will give you lasting satisfaction, see that you incorporate an output stage of adequate power, a Moving Coil Speaker and FERRANTI Transformers.

FERRANTI LTD. HOLLINWOOD LANCASHIRE

Manchester Conventionette (*Contd. from page* 68). further visit to some works or other during the morning.

Tickets will be issued at a small charge, to cover tea and other incidental expenses.

Applications for tickets and details should be made to G6BJ, or your new District Representative, Area No. 1, to whom all letters to G6BJ will immediately be passed on.

We want to make this Conventionette worthy of the North of England, and to beat last year's meeting, so write immediately. A POSTCARD WILL DO.—G6BJ, 14, Rosehill Mount, Manchester Road, Burnley.

QSL Section.

An Explanation of its Function and use.

The full use of the section is reserved exclusively for members of R.S.G.B. and B.E.R.U., but non-members may, however, collect cards forwarded by foreign societies to R.S.G.B. which are intended for them.

The section gives to members a two-fold service. In the first place it collects and forwards to British amateurs cards which are received from the various Radio Societies of the world, and secondly, it receives from members their cards for free distribution at home and abroad.

The methods of the section are best dealt with under separate headings, and are as follows :—

Cards For You.

These should be collected from the section by means of stamped addressed envelopes, and the following points should be noted :—

(1) Envelopes must be stamped by the sender and clearly addressed.

(2) The sender's call sign *must* be printed in block letters in the top left hand corner of the envelope.

(3) Envelopes must be of a standard size (6 in. by 4½ in.) or as near to these dimensions as possible. (Envelopes of the "paper bag" type and the commercial size cause the section much needless trouble and waste of time.)

(4) If special instructions as to the number of cards to be sent in each envelope are to be given, they should be written immediately under the call sign in the top left-hand corner, and should be in the form "Wait for —— cards." Envelopes are despatched where possible when there are three cards in the files for one call sign, and the above applies only if this arrangement is not convenient.

If it is not desired to go to the trouble of preparing envelopes for this purpose, it is possible to procure them from the section, already addressed and stamped, to the value of 1½d. at a price of 2d. each envelope.

Your cards will be kept for three months if you have no envelopes at H.Q., and after this time they will be disposed of at the discretion of Council.

Cards From You.

The section is in a position to accept for distribution cards addressed to any amateur in the world, and a rapid exchange of QSL cards is maintained with foreign societies. These cards are sent in bulk at periods of a week or so, and it is, therefore, unnecessary to place each card in a separate envelope. The section would be grateful if the following points are borne in mind when cards are sent for distribution :—

(1) Do not put any cards in envelopes (except if letters or photographs are enclosed) but sort the cards together in countries.

(2) Write the call sign of the station to whom the card is addressed clearly and in large letters, so that it may be seen at a glance. If the space on the face of the card is insufficient or obscure, write it plainly on the back.

(3) Weigh the packet carefully before despatch and make certain that the Society does not have to shoulder the all too common burden of excess postage.

(4) Address the packet to QSL Section, R.S.G.B., 53, Victoria Street, London, S.W.1, which is the only address of the Section.

Enclose no stamps as the service is entirely free to members.

For the benefit of new members (and some older ones, too) I am having the leaflet containing the rules of the section printed below so that we may start the new season well.

With reference to the sale of envelopes, which has been a feature of the section in the past year, I should like it to be known that orders will be gladly received at Convention or at the Society's stand at Olympia for these. Price 2d. each.

QRA Section.

NEW QRA'S.

G2QF.—J. L. Roberts, "Mon Abri," Kylemore Avenue, Mossley Hill, Liverpool.

G2QW.—F. H. Walters, 5, Whitehorse Street, London, E.1.

G2QX.—A. E. Groom, 13, William Street, Luton, Beds.

G5MD.—R. W. Hardisty, 15, Green Lane, Oxhey, Watford, Herts.

G5XI.—H. R. Birtill, "Dunloe," King's Gap, Hoylake, Birkenhead.

G6HO.—H. L. Holt, 73, Barricroft Road, Didsbury, Manchester.

G6LU.—A. Woodmansey, 51, St. Catherine's Road, Harrogate.

G6NU.—W. E. Nutton, 42, Richmond Road, Gillingham, Kent.

G6SJ.—J. Jones, 42, Eford Estyn, Garden Village, Wrexham.

G6XD.—J. J. G. Taylor, "Willowby," Radford Road, Plymstock, Plymouth.

2AAL.—F. L. Postlethwaite, 41, Kinfauns Road, Goodmayes, Essex.

2ACO.—I. A. G. Cole, 33, Grosvenor Road, Wallington, Surrey.

2BGM.—J. H. Cant, 89, Royal Parade, Eastbourne.

VP3SRB.—G. G. Livesey, Linslade, Post Bag, Gwelo, Southern Rhodesia.

The following are cancelled :—G2SC, G6TZ, 2BJG.

Please send all new QRA's, changes of address, etc., to G6PP, 54, Purley Avenue, London, N.W.2. Telephone : Hampstead 2590.

M. W. P.

NEW MEMBERS.

W. A. V. Watson (BERS10), Caixe Postal 30, Fortaleza-Ceara, Brazil.

E. J. Wilton (BRS363), 8, Orbel Street, Battersea, S.W.11.

YOUR SUBSCRIPTION MAY BE DUE—IS IT?

Quartz Crystals for Amateur Transmitters

THE CLEANEST AND BEST FINISHED CRYSTALS OBTAINABLE.

STANDARD CRYSTALS - 20/-

HEAVY DUTY CRYSTALS - 30/-

OPEN TYPE HOLDERS - 4/6

SEALED TYPE HOLDERS - 7/6

Crystal Oscillators COMPLETE WITH VALVE, Crystal in Sealed Holder, Certificate of Frequency, Mounted in Oak Cabinet with Lid, including Marconi Royalties **£3 5 0**

WRITE US FOR FURTHER PARTICULARS.

CARTER BROS., 1, NEWMARKET ROAD, CAMBRIDGE.

'Phone: CAMBRIDGE 429.

Mention the "Bulletin."

Workshops: PARSONAGE STREET.

B&J

SPECIFIED

For Two New Sets.

THE

"A.C. SHORT WAVE THREE"

Described in this Issue.

AERIAL COILS ... **8/6** each.
TRANSFORMERS ... **9/6** ,,
BASES ... ... **1/6** ,,

THE

"NEW UNIVERSAL THREE"

Described in the R.S.G.B. Book, "What is Amateur Radio?"

COILS for 20, 30 and 40 metre Bands
COILS, **8/6** each. BASES, **1 6** each.
BROADCAST BAND COIL with special loading condenser.
COIL **12/6**. BASES **1/6** each.
FILAMENT SWITCH **1/6**.

B. & J. WIRELESS CO.,

ATHELSTANE MEWS——LONDON, N.4

WRITTEN WITH THE FULL AUTHORIZATION OF THE INVENTOR OF THE BAIRD PROCESS.

TELEVISION

TO-DAY AND TO-MORROW

By Sydney A. Moseley and H. J. Barton Chapple, Wh.Sch., B.Sc. (Hons.), A.C.G.I., D.I.C., A.M.I.E.E.

Foreword by John L. Baird.

FULL technical details of the Baird Television Transmitter, the Baird "Televisor" Receiver, Synchronism, Photo-Electric Cells, etc., the Tele-Cinema and Tele-Talkies, Noctovision, Daylight Television, Colour and Stereoscopic Television, and the developments of the invention in other countries, will be found in this remarkable work. Opening with the vivid story of the discovery of Television, the book is a complete guide to the subject.

Illustrated. **7s. 6d.** net. 154 pp.

"The users of all television apparatus, and particularly amateur constructors, would be wise to have this book ready to their hand; it is well worth perusal by anyone interested in this entertaining subject."
—"ELECTRICAL REVIEW."

Of a Bookseller, or
PITMAN'S, Parker Street, Kingsway
LONDON, W.C.2

NIELS JACOBSEN (OZ1A), 29, Bredgade, Copenhagen, Denmark.

G. VAN RHYN JACZ (PA0VR), Lange Nieustraat 37, Schiedam, Holland.

W. E. NAILOR (BRS364), 23, West Street, Sittingbourne.

A. W. HAYDEN, 2, Myrtle Cotts, Heath Road, Lake, Sandown, I.W.

T. STEPHENS (VK3GO), 21A, Hoddle Street, Essendon W.5, Victoria, Australia.

A. T. HUTCHINGS (VK3HL), Callawadda, Victoria, Australia.

W. G. F. WEDDERSPOON (VU2JB), Government High School, Akyab, Burma.

E. A. BELLAMY (BRS365), 10, Mapperley Hall Drive, Nottingham.

W. A. READ (G5AA), Westmead, Ashurst Road, N. Finchley, N.12.

R. C. B. BARNES (BRS366), 16, Orlando Drive, Carlton, Nottingham.

ENRIQUE NIELSEN J., Casilla C, Magallanes, Chile.

R. H. FARRINGTON (BRS367), 15, West Street, Sittingbourne, Kent.

H. J. AHIER (BRS368), Lansdowne, 45, Colomberie, Jersey, C.I.

R. W. WRIGHT (BRS369) 42, Cedar Road, Aintree, Liverpool.

JOHN NORRIS (2AVF), 16, Gorse Street, Stretford, Manchester.

CALLS HEARD.

By J. HUM (G5UM), 17, Eastwood Road, London, N.10, on 2 M.C., August 3 to 10. Receiver O-v-2 :—f8zaz, g2au, g2bl, g2gg, g2hh, g2ho, g2hp, g2ip, g2ju, g2kt, g2lz, g2nu, g2ob, g2qi, g2qv, g2qw, g2xo, g2zn, g5aa, g5bc, g5cm, g5ib, g5nc, g5nr, g5oa, g5rs, g5ug, g5vg, g6dr, g6fi, g6fm, g6fo, g6fy, g6gl, g6nw, g6pa, g6qc, g6qo, g6rb, g6rc, g6rh, g6so, g6yq, g6zr.

* * *

By E. NIELSON (CE7AA), Casilla C, Magallanes, Chile, on 28 M.C., March 9 to April 6, 1930, all between 1400 and 1600 G.M.T. :—w2jn, w2bg, vq2bh, nkf.

* * *

By OK2LO, July 1 to August 14, 7 M.C. :—G : 2cj, 2fs, 2gm, 21x, 2pf, 2rm, 5aq, 5cm, 51w, 5ph, 5pj, 5rx, 5uj, 5wb, 5zn, 6bt, 6cs, 6io, 6pp, 6rb, 6sj, 6qb, 6wy, 6yl. 14 M.C.—G : 2ao, 2by, 2dz, 2gm, 2ma, 2nm, 2oa, 2ol, 2vp, 2vq, 2yu, 2zp, 5bj, 5ib, 5mu, 5rv, 5sy, 6dh, 6gd, 6gs, 6fy, 6ps, 6yk, 6wn, 6wt.

* * *

By VU2ZX, August 10, 1930, Murree Hills, India.—G : 2gm, 2nm, 2ux, 2vq, 5ma, 5tz, 6gd, 6li, 6ot, 6yk, gi5nj, ei2d, ct1cw, i1fg, f8cs, 8fk, 8gdb, 8esm, 8fem, on4aa, 4eu, py1ah, pa0hp, 0zf, uo1jh.

* * *

By ST6HL, Khartoum, Sudan, August 31, 1930.—G : 2cx, 2ol, 6qb, 6wt.

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.

Madrid, 1932.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—As everybody should know, a Convention is held every five years to fix, *inter alia*, the allocation of wavelengths. The last was held at Washington in 1927, and the next will be at Madrid in 1932. If we amateurs are to hope for any sort of treatment from this Convention, we must be well represented. The A.R.R.L. will be there, and I think that as many European delegates as possible should be there as well.

We want at least the bands we have now; in fact, we *must* have them. To send a delegate from R.S.G.B. a fighting fund is necessary, the bigger the better. If this is collected in small sums at frequent intervals, no one will miss his mite, but that mite collected several times can make a large sum. Anyhow, I enclose 5s. as my first sub. to the Madrid Fighting Fund—2s. 6d. for myself and 2s. 6d. for one of the members whose ideas differ from mine.

Yours faithfully,
A. W. ALLISTON (2BMB).

(The Madrid Fighting Fund is now open. This must be regarded as a general Fighting Fund, however, as the next meeting of the C.C.I.R. is to take place in Copenhagen next year, and we should, if possible, send a delegate there.—ED.)

An Appeal.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—May I make an appeal to all those hams who possess licences for operating in the 3.5 M.C. band to make a little more use of them?

When the new licensing conditions became operative early in 1929 numerous hams at once sent up a "grouse" because we were not allowed the use of the band in question, and wanted to know why the Society did not do something about it. Early this year, mainly through the efforts of our President (Mr. Marcuse), we obtained a concession from the P.M.G. allowing us the use of the 3.5 M.C. band at week-ends only.

Yet, after four months, one has only to listen on either Saturday or Sunday to realise that apparently most of us neither wanted nor appreciated this concession.

A large number of hams are apparently labouring under the impression that the band is absolutely no good when compared with either the 7 or 14 M.C. bands. Let me say at once that this idea is entirely wrong. Not only was good work done in the old days on this band, but it can be done *now*. As an example of what can be done, the writer was QSO with the following stations last Saturday night after 23.00 B.S.T. :—UO1CM (R8), OH2NM (R8), OH6NL (R4), and G6PA. Signal strength was infinitely greater than that to be obtained on

7 M.C. at this time of year, and QRM is practically nil.

Now, OM's, what about it? The writer has been working on this band since May and can assure everyone that it is much preferable to chasing phantom DX on 7 M.C.

Surely it is up to us to show the Society and G2NM in particular, that we do appreciate their efforts.

73's and CU on 3.5 M.C. next Saturday night.

R. A. BARTLETT (G6RB).

A Criticism.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—There are two small points in Mr. Spottiswoode's article in the August issue which, I think, call for comment.

He defines an alternating current by stating that at any point in an A.C. circuit when the current is at minimum, the voltage is maximum, and *vice versa*. While this may be true in a few particular circumstances, would it not be better to regard the general case when defining alternating current?

In the case of a purely resistive circuit, the current will be maximum when the voltage is maximum. The case mentioned by BRS324 can occur, of course, but only in a purely reactive circuit, *i.e.*, when either inductance or capacity, but *no* resistance is present.

I think, also, that there is an inaccuracy in the explanation of an R.M.S. value. If we take it as "the root of the average of the squares of the maximum and minimum voltages attained" we get a meaningless result. As long as the wave is purely sinusoidal this gives the right value, but one advantage of an R.M.S. value is that it gives a useful working value for any waveform. To obtain a true R.M.S. value the following procedure is more correct:—Take a large number of values of the voltage distributed throughout the complete cycle. Square all these and then take an average of them. The square root of this will be the R.M.S. value. The greater the number of points chosen, the more accurate will be the result.

These points are minor, but, I believe, of fundamental importance, and for this reason I have taken advantage of the remark in the last sentence of Mr. Spottiswoode's otherwise excellent article on rectifiers.

Yours faithfully,

G6OT.

(We are also indebted to G6RH, who wrote pointing out the above.—ED.)

Amateur Radio and International Goodwill.

To the Editor of T. & R. BULLETIN.

SIR,—I wonder if amateur transmitters fully realise how they are helping to create a spirit of friendship and goodwill between the nations of the world. Truly, here is an instrument with which the friendship of nations can be firmly cemented.

After having had a QSO with a "Foreign Ham," I inevitably feel that a bond of friendship will always exist between us, and I am sure I am quite right in saying we all get similar impressions. In our own particular sphere we can be a League of Nations in a small way, and by fostering the "Ham Spirit," we shall surely be helping forward the claims of international peace and good fellowship.

Not only can we bring about this state by genial, friendly, and helpful operating procedure when on the "air," but also by giving foreign and Colonial "Hams" a jolly good time when they come to England. Unfortunately, we do not get a large number of visitors to Birmingham, but any chap who does look us up is assured of a good time with the Birmingham "Bhoys," and all visitors we have had to date invariably promise similar fare if we pay a reciprocal visit.

Wishing the heartiest success to the "Ham Spirit."

Believe, me,

Yours faithfully,

A. C. EDWARDS (G6XJ).

Thanks.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—I should like, through the columns of the BULLETIN to thank G5SN and G2KT for their able tuition in wireless theory and the handling of a transmitter, as a result of which I have now a three-letter call sign. I feel that without their valuable assistance I should never have been able to obtain this. I am greatly indebted to them, and hope one day to be able to help others in the same way.

Yours truly,

VICTOR A. SIMS (2ACK).

29, Rochford Avenue,
Westcliff-on-Sea, Essex.
August 26, 1930.

CALIBRATION SERVICE.

The R.S.G.B. Calibration Service (Standard Frequency Transmission) will be transmitted from station G5BR on the first and third Sundays in each month and by station G5YK on the second and fourth Sundays according to the following schedule:

9.55 a.m. Series of X's, followed by a telephonic announcement that the calibration service is about to be transmitted.

10 a.m. Transmission on 7,050 K.C. (nominal).

10.5 a.m. Transmission on 7,250 K.C. (nominal).

The actual transmission will consist of the call (in Morse) "RSGB DE G——" (repeated), followed by a two-minute dash and the frequency used. The frequency of the preliminary announcement will be the same as that used for the first transmission: at the close of the second transmission a further short telephonic announcement will be made. Times are G.M.T. or B.S.T. as in force at the time.

QUARTZ CRYSTALS

Crystal Control for All!

Behind our organisation we have 20 years' experience in manufacture of Standards-of-Length, representing the highest accuracy in the world.

Based upon this experience, two years' research with the piezo-electric property of Quartz Crystals has enabled us to produce Crystal Plates of very high mechanical and electrical accuracy; and, as it is generally acknowledged that the "output" from quartz plates, their freedom from subsidiary frequencies, and consequent ability to control full power at the fundamental frequency, and to withstand high voltage, are all dependent upon intrinsic accuracy of the plates, we can offer exceptional value in this branch of our work.

We manufacture from the natural crystals to the finished plates; cutting the "blanks" from our large stock of selected crystals; and by our **new methods** we are able to produce in quantities; and we have had **no failure** in the range we have worked, viz., from 30 to 150 metres wavelength.

GUARANTEE.—Every Oscillator is sent out accompanied by our guarantee that it will control 10 Watts at its fundamental frequency, and will oscillate without reaction other than is supplied by valve capacities; also we furnish a certificate stating calibration conditions and the fundamental frequency within an accuracy of 0.1 per cent.

EXPERIMENTAL BAND CRYSTALS.

Experimental Band.	Frequency.	Wavelgth.	PRICE (Unmntd.)
British (G.P.O. Assignment) Washington Convention	3530 to 3960 Kc. 3500 to 4000 Kc.	75.71 to 84.94 74.96 to 85.66	**15/-** each
British (G.P.O. Assignment) Washington Convention	7050 to 7250 Kc. 7000 to 7300 Kc.	41.35 to 42.53 41.07 to 42.83	**25/-** each
Special 3525 to 3625 Kc/sec., for doubling to British "40-metre" Band			**20/-** each
Special 7030 to 7170 Kc/sec. for doubling to British "20-metre" Band			**32/-** each
Standard Holders, for Transmitting Crystals			17/6 each

TRADE SUPPLIED. Enquiries invited for Frequency-Standards, Crystals, Holders, Temperature Controlled Containers, etc.

Brookes Measuring Tools Co.

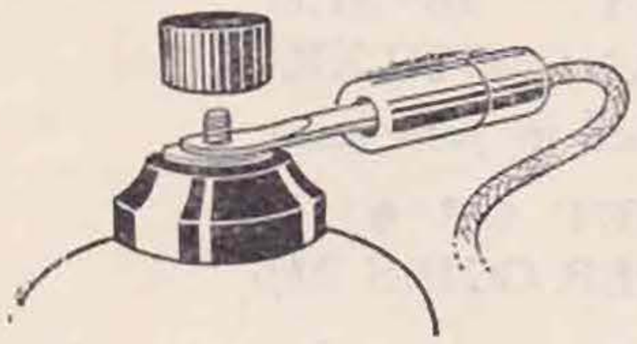
51-53, CHURCH STREET, GREENWICH, LONDON, S.E.10.

TEL.: GREENWICH 1828.

CLIX NEW LINES for reliable contact.

Your make-and-break connections are the most important in the whole of your radio outfit and unless they are reliable you will have trouble, difficult to trace. Fit Clix and avoid all trouble.

No. 6. CLIX ANODE CONNECTOR.

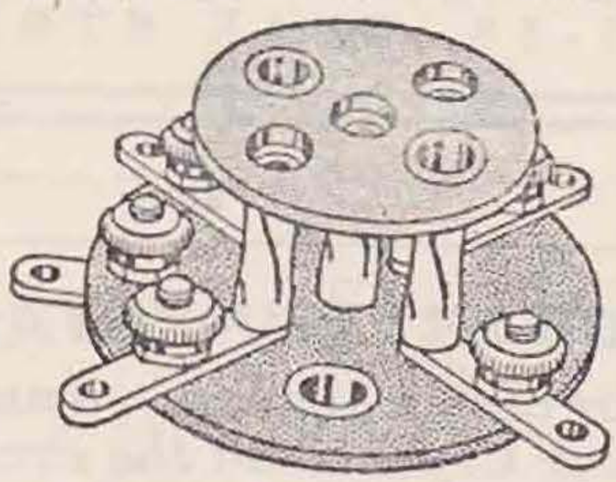


No. 6. Pro. Pat. Regd.

For use with Screened Grid valves. Provides a certain and safe push-pull contact. Impossible to short anywhere. Solid Pin Tag is permanently fixed to valve terminal. Black insulator. Engraved S.G., P.

PRICE 3d.

No. 27. CLIX 4/5 PIN VALVE HOLDER.

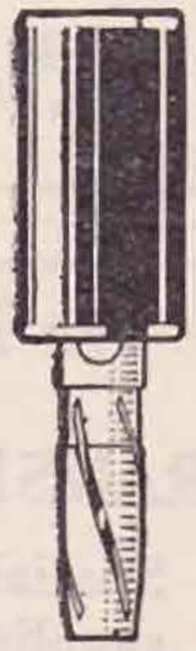


No. 27. Prov. Pat. Reg. Des.

Incorporating the new Resilient Sockets, Perfect contact with solid or any other type of valve pin. Sockets air-dielectrically insulated and self-aligning. Impossible to blow valves.

Type B for Baseboard Mounting:

With Screw Terminals ... 10d.
Without Screw Terminals... 8d.



Required for the 3-V. A.C., S.G. Short Wave Set.

2 Power Plugs (No. 11) 2½d. each.
2 Power Sockets (No. 12) ... 2d. each.
2 All-in Terminals (No. 15) ... 8d. each.
2 Parallel Plugs (No. 9) ... ... 2d. each.
2 Rigid Sockets (No. 19) ... 1½d. each.
2 Springscrew Wander Plugs (No. 8) 2d. ea.

No. 15. Pat. Pro. Pat. Reg. Des.

No. 11. Pat. Pro. Pat.

Write for New Illustrated List.

LECTRO LINX LTD.,

254, VAUXHALL BRIDGE ROAD, S.W.1

—H. & B.— —H. & B.—

SPECIALISTS
IN SHORT WAVE WORK

COILS
For Transmitting and Reception.

FOR THE
"Q.S.T." 28 M.C. TRANSMITTER
described in June issue.

SET OF 6
COPPER COILS 21/-

FORMERS
Supplied for Ultra Short Wave Coils and U.V. Bases.

ELIMINATOR Safety Boxes
10" x 6" x 7" 15/-
18" x 10" x 9" 21/-
Impossible to release lid until you switch off.

SCREENS
For Valves, Coils and Condensers.

BOXES
Screening Boxes
Copper and Aluminium made to order.

KITS OF PARTS AND COMPONENTS OF ANY MAKE SUPPLIED TO ORDER

We pay carriage on all Cash Orders. C.O.D. charges paid on all orders over £1

H. & B. RADIO CO.
34-36-38, BEAK STREET, REGENT STREET, LONDON, W.1

THE QUARTZ CRYSTAL Co.
have for disposal a limited number of Power Crystals in the exclusive part of the new 3.5 m.c. band. To encourage the use of this band these crystals are being offered at a special price of £1. This price applies to R.S.G.B. members only.

THE QUARTZ CRYSTAL CO. (G2NH & G5MA),
63a, Kingston Road, NEW MALDEN, SURREY.
Telephone: Malden 0671.

SLIDE RULES
From **5/9** each.
ALL TYPES AND MAKES.
RULERS - - PENCILS
STATIONERY, SUNDRIES.
FULL PARTICULARS ON APPLICATION.
Quotations by return.

R. A. HARRIS,
(MEM. R.S.G.B.)
146a, QUEEN VICTORIA ST., LONDON, E.C.4.
Phone: CITY 8021-8022.

We Invite Your Enquiries
for all types of
TRANSFORMERS & CHOKES
Special heavy duty eliminators supplied to meet any requirements.
TRANSFORMERS FOR TRANSMITTING.

Please write to:
CHESTER BROS.,
495, Cambridge Road, London, E.2.

"T. & R. Bulletin."
ADVERTISEMENT RATES.

	Per insertion.		Per insertion.
Full Page	£5 0 0	Half Page	£2 10 0
Quarter Page	1 5 0	Eighth Page	0 12 6

Series Discounts—5% for 6 or 10% for 12 consecutive insertions.
Advertisements specified for *Facing Matter Positions* are *not* subject to series discounts.
The T. & R. BULLETIN is published on the 14th of each month.
Orders, Copy and Blocks should be received by us on the 30th of each month preceding month of issue.
All applications for space or specimen copies should, please, be sent to Advertisement Manager,
PARRS ADVERTISING, LTD.,
Craven House, Kingsway, W.C.2.
Telephone: Holborn 2494.

IS YOUR BOOKSHELF MINUS

NOTES & NEWS FROM THE BRITISH ISLES.

DISTRICT No. 1.

Representative: D. J. BEATTIE (G6BJ), 14, Rose hill Mount, Manchester Road, Burnley. (Tel.: 3659).

G2DH stars once more with four continents worked twice over, but heard no Asiatic stations and so was unable to equal last month's record. G2OI worked W1, 2 and 9 on the morning of July 24 on 7 M.C. with 7 watts and a ¼ wave AOG. Was this a star night? G2WP has rebuilt, and finds an AOG aerial unreliable. (What isn't in these conditions?—G6BJ). G2WP and G5RX have been observing conditions in relation to weather, sunspots, etc., which problem is being dealt with in the letter budget. G5CI still finds 07.30-09.00 B.S.T. best for local Europe. He is building a 1.75 M.C. transmitter. G5ZN is going strongly on 1.75 M.C. and also on 3.5 M.C. on Saturday nights from 23.00 B.S.T. and would appreciate any reports. G6RH has been on 1.75 M.C.—best DX London. G6BJ is now working on 1.75 M.C. in addition to the other bands. He has worked some duplex telephony with G5ZN—G5ZN, being on 1.75 M.C., G6BJ on 7 M.C.

These will be the last area notes to be written by G6BJ, who has, unfortunately, multitudes of exams. in the near future, and so will be unable to carry on, even if anyone was so rash as to nominate him. I must, however, thank all the members of the district for the support which you have given me during the past year, and hope that you will support your new D.R. as well.

DISTRICT No. 2.

Representative: T. WOODCOCK (G6OO), 8, George Street, Bridlington, Yorks.

G6LF has had no luck with QRP owing poor conditions on 7 M.C. during daylight and QRM after 18.00 B.S.T., so has gone QRO with 7½ watts, obtaining good reports from Europe, although unable keep sked with G2WP, Manchester, due to skip. The 14 M.C. transmitter is ready and a 3.5 M.C. transmitter is under construction. He heard VMZAB on the trans-Atlantic flight from 14.30 B.S.T. to 06.30 B.S.T. the following day. 2BYB, of Hull, reports poor conditions. Visited G5LW and heard the first G signals for months; they worked G6SK three miles away. BRS290, on holiday in Nottingham, hopes to visit local stations. Reports conditions to be very poor. G6SK rebuilt his receiver as S.G. Det. 2LF, with pleasing results. A new 14 M.C. current fed Hertz aerial has been erected. He is rebuilding the TX using Hartley MO. PA. BRS270 has given up the Ultraudion in favour of the Hartley circuit for TX. G5QY has kept "skeds" with VOQH during the first half of month, but due to bad conditions lost him. He has worked CN8MOP on 7 M.C. at last and raised SV1AN, Salonika, on 7 M.C. using 4 watts. No 14 M.C. work has been done. Testing Marconi and Hertz antennæ systems, and he may soon be going as "shipboard op.," so he hopes that other local "hams" will keep "Tyneside" on the radio map. G6DR (after holiday spent at G6OO) has erected a new aerial system and worked most of Europe using hand generator and harmonic C.C. control, which gives very good results. Quite a lot of work done on 1.7 M.C. with British stations and reports show high efficiency. G6UJ has done most work on 1.7 M.C. lately and has been assisting G2KO. Using M.L. converter and fundamental C.C. he puts out a very good signal. Fone, using the above and absorption modulation has proved very successful, the C.C. holding quite well. Skeds with G2KO, G6DR, G6OO arranged for 11.00, 14.00, 22.30 each Sunday on 1.7 M.C. G6OO, unfortunately, has had ten days on the "sick list," which put him out of the local regatta. However, the yacht was sailed by other willing hands and managed to pull a third prize. The "Beam" for 28 M.C. work has been temporarily dismantled and a 67 foot inverted L takes its place, enabling more bands to be used. Conditions greatly improved during the last week and look like continuing. Sked kept with G6DR and G6UJ on 1.7 M.C. fone and C.W. using 4 watts. Visited by GI6YW (N. Ireland), who is staying in York on holiday. He expects three or four No. 2 District hams will be with him at Convention this year.

G2KO (ex BRS264) is now on the air, and reports working with G6YL from SM6UA. G6YL is staying at Gothenburg, and says that she has been made welcome by all the Swedish amateurs.

DISTRICT No. 3.

Area Representative: JOSEPH NODEN (G6TW), Coppice Road, Willaston, Nantwich. Cheshire.

If any member in my area wishes me to bring anything forward at the Convention, will they please drop me a line early. Thanks! The reports this month are a very poor show for the area.

G5FC finds the new receiver very FB, but conditions have been very poor, and local QSO's have been the rule. G2VP: Nothing extra has been added to this station's success, but the usual 7 and 14 M.C. working has been carried out. G2CG: This station has now succeeded in being heard in U.S.A. The new mast is now in position. G2OA: The new receiver is going well and down to 28 M.C., also transmitter. He is now licensed for 28 and 56 M.C. work. Tests on 28 M.C. will take place each Sunday at 15.00 B.S.T. He still finds that the 7 and 14 M.C. very poor, although he has been heard in India and W9. G6TW: Very little work has been done on the 7 and 14 M.C. band, but some 56 M.C. work undertaken; 300 to 200 M.C. tests have taken place with success, and I am very pleased with the transmitter.

DISTRICT No. 4.

Representative: A. C. SIMONS (G5BD), Lynwood, Mablethorpe, Lincs.

These may be my last notes, so to all who have contributed during the past year my best thanks, OM's. I hope that all who attended have pleasant memories of our Conventionette. I shall be at Convention and hope to meet you all again there.

Please remember that to carry out his job properly the D.R. must have your support, so do not hesitate to let your new D.R. have your news,

AN UP-TO-DATE CALL BOOK?

grouses or applications to HQ so that he is in touch with you.

An occasional DX signal heard in the afternoons recently point to an improvement in 14 M.C. conditions, which are very blank still, 7 M.C. being about normal. QRN rather bad and very few G stations audible. G6VP's theory *re* narrow spots in band being workable, whilst other parts are dead is shared here.

G2AT has been too busy most of the month, but his QRP C.C. is still FB. G5CY also busy, but is building new peaked audio receiver. Hopes to visit several Belgian amateurs during his holiday in September. G5BD had no DX at all, but will shortly have the 65 ft. by 40 ft. Zepp up again. It's a sure DX getter. G5FA has been very active, but is disappointed at the very bad conditions. He notes that local stations, including G's, are numerous on 14 M.C. G6MN reports conditions dud on all bands. Visits from G2VQ, G5XU, G2IO, and G2HD. G6LI busy erecting station at home QRA. G6HK trying CO.PA, but cannot get depth of control compared with harmonic single tube method.

DISTRICT No. 5.

Representative: D. P. Baker (G2OQ), Crescent House, Newbridge Crescent, Wolverhampton.

G5BJ spent his annual holiday doing DX; can regularly work five continents each day despite bad conditions. Cannot W.A.C., though, as W's cannot be heard. New and much higher aerial just erected. Now W.B.E. G6CC now on the air with crystal-controlled outfit on 14 M.C. band. G6XJ says conditions are still very indifferent on 14 M.C. Has worked LU, CE, VQ, FM, etc., but DX, generally speaking, poor. Working week-ends on 7 M.C., including choke control 'phone tests.

DISTRICT No. 6.

Representative: R. C. Horsnell (2ABK), Hepani, Wickford, Essex.

It seems from reports that there is a general renovation going on at all stations, so we will hope for an active winter.

2BJG is now on the air as G2QX, of Luton. He wants the co-operation of BRS and AA men on 7 M.C. from 07.00-10.00 B.S.T. G5RV is now C.C. on all bands and is putting up a new Zepp. He is going to France for holidays. 2BVR reports poor conditions, but has been busy with his receiver. G6FX is busy on 7 and 14 M.C. and reports bad magnetic storms. G2SA has been on 14 M.C. with fair results. He has paid a visit to G5SW, where G6FX is engineer. G6QX has been on holiday. BRS342 sends a good log of stations heard on 7 and 14 M.C. BRS261 has heard all continents in five minutes. He awaits his full licence now, and is ready with 10 watts C.C. T.P.T.G. for all bands. 2ABK and BRS191 had an interesting visit from G6FX and G5RV, and an FB evening was spent; 2ABK also had two visits from G6QX on holiday at Leigh. 2ABK has only usual dud conditions to report for this month, but has roped in three new members as an alternative to listening.

DISTRICT No. 9.

District Representative: G. Courtenay Price (G2OP), 2, St. Annes Villas, Hewlett Road, Cheltenham.

I am pleased to see that I have again been elected to represent you during the coming season, and as heretofore I will endeavour to serve the Society, the committee and yourselves to the best of my ability. May I thank those several gentlemen who sent in my nominations.

I have decided to make the city of Bristol a sub-district, and Mr. R. A. Bartlett (G6RB) has kindly accepted my invitation to be the local representative.

Please send me your reports on September work to reach me during the first week in October, when they will be circulated as a budget to those who subscribe.

I shall be away from District H.Q. during the whole of September on holidays.

DISTRICT No. 10.

Representative: J. Clarricoats (G6CL), "Ciel," Hartland Road, N.11. Finchley 3512.

So far no one has come forward with an offer to take over No. 10 District. I am quite sure there must be one amongst the 40 odd society members in North London who could—if they felt so disposed—make a good job as D.R. I, personally, have not time to do the work properly now, owing to headquarter's duties, so please have a good "think" between now and Convention so that we may start the new year with a keen and active D.R.

Messrs. Pilpel, Kershaw and Buckingham report, but none have news of general importance. G6PP considers conditions "looked up" during August on 7 M.C., but then went off again; he has built a midget 14 M.C. outfit. G6CL has a new balanced Colpitts, but has had no opportunity to test it against the old T.P.T.G. On Thursday, September 4 the D.R. entertained a very large gathering of amateurs; details next month, if of interest! Convention Sunday will, as in previous years, see an invasion of "Ciel." About 50 provincials are expected—not all at one time I hope—but I also want you North Londoners to feel that my house is open to you as well that day. Last year we asked you to bring your own beer—this year we substitute "gallons" for "beer," for is not this the wooden anniversary of Convention?

BRS36 spent a very interesting holiday abroad, and was present at the International Congress at Antwerp. Many hams were visited, including HB9G at Lausanne.

Very little receiving work has been doing lately, as BRS36 has been very busy qualifying for a transmitting licence—his papers have now been sent in, and he awaits results impatiently. His grateful thanks are due to the various "hams" who have given him so much assistance.

DISTRICT No. 11.

Representative: L. H. Thomas (G6QB), "Conway," 66, Ingram Road, Thornton Heath, Surrey.

G2CX has been on the air when possible with the rebuilt Goyder Lock C.C. outfit. ST6HL was worked, but otherwise nothing exciting to report.

DISTRICT No. 12.

Representative: T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4. Telephone: Chingford 118.

G2ZN reports bands during past month as hopeless, except on 2 M.C. He is still obtaining data on connection between sunspots and conditions, and

(*Continued on page* 81.)

TECHNICAL ARTICLES ARE WANTED

MICROPHONES

You will get the best and cheapest selection of Microphones for all purposes at 218, Upper Thames Street, E.C. Electradix Mikes are used everywhere. Broadcast Mikes, £12, £6 and £2, for public address. Announcers' Hand or Stand Mikes, 15/-. Wrist Speech Microphones, 10/6. Solo Hand Mikes 107B in brass case, 3/6. Microphone Units for making multiple mikes, 4/6. Skinderviken Buttons, 3/6. W.E. Service Speech Buttons, 10d. Booklet "Wonders of the Microphone," 6d. Add postage on above.

New Aug.-Sept. Sale List just issued. Free for stamped addressed envelope.

Microphone Specialists

ELECTRADIX RADIOS

218, Upper Thames St., E.C.4

FOR A SAFE EXAM-PASS ENROL WITH THE T.I.G.B.

Expressly designed for the benefit of prospective candidates for the leading Professional examinations including—

The Institution of Electrical Engineers
The Institution of Mechanical Engineers
The Lond. Univ. B.Sc. (Eng.) Degree
The Radio Association, etc.

the T.I.G.B. correspondence courses furnish training of the highest standard; they present the knowledge and experience of a most highly qualified tutorial staff and practically assure a safe exam.-pass at the first attempt. *The T.I.G.B. Guarantees Training until Successful*

FREE—THIS 124 PAGE GUIDE

Get "The Engineer's Guide to Success," containing the widest selection of engineering and allied-technical courses in the world (including a specially advanced course "Radio and High Frequency Engineering," p. 59), and investigate the remarkably successful Tuition methods of The T.I.G.B. Write to-day for copy and state your tuition requirements, to

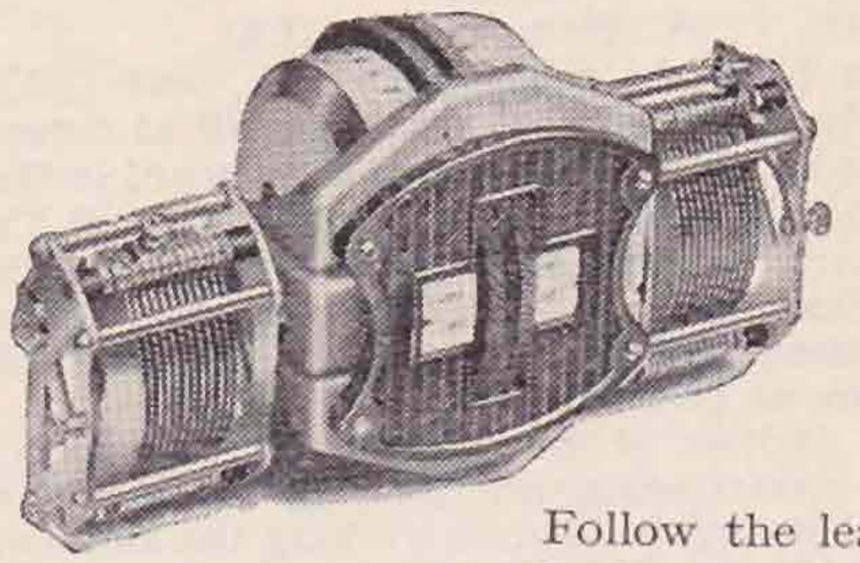
The Technological Institute of Great Britain

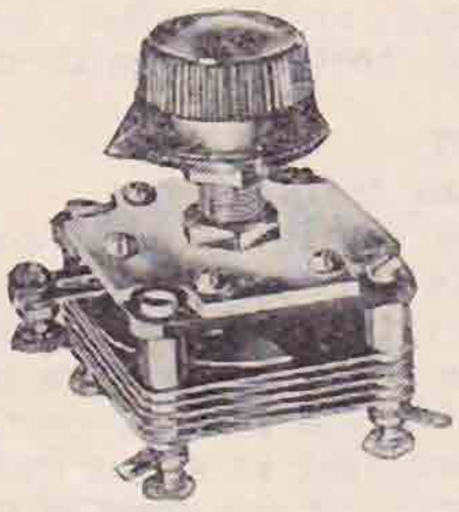
(*Established* 1917.)

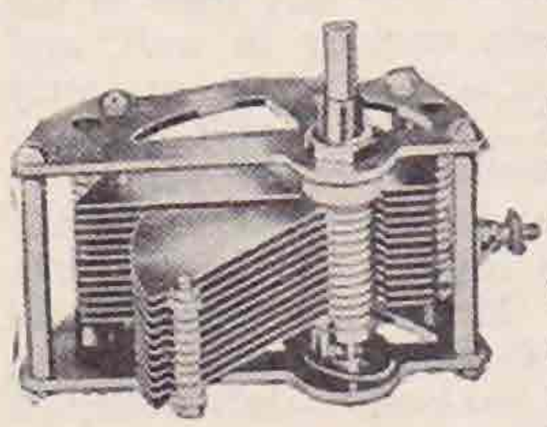
42, TEMPLE BAR HOUSE, LONDON, E.C.4.

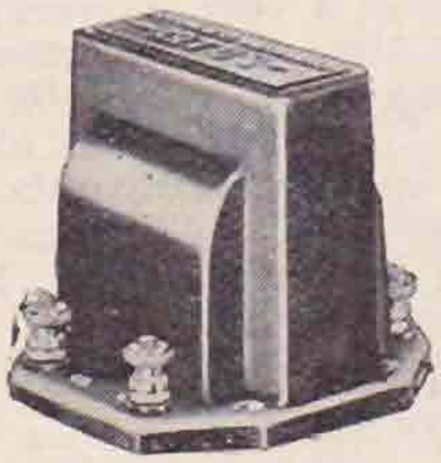
LOTUS

Components make the best set.









Follow the lead of the leading technical designers—use Lotus Components and ensure a successful and efficient set. Neat in appearance, accurate in finish and efficient in use, Lotus Components are British made and the height of mechanical perfection. The Lotus range includes every necessary component—from simple switches to condensers and all-mains units. Ask your dealer for Catalogue or write for a copy to address below.

See the Lotus Stand No. 30 at Olympia.

LOTUS COMPONENTS

Garnett, Whiteley & Co., Ltd.,
Dept. T.R. Lotus Works,
Mill Lane, Liverpool.

YOU CAN SUPPLY THEM.

Empire B.E.R.U. News.

INDIA.

By T. W. Hudson (VU2ZX).

July has been the monsoon month, and QRN is extremely prevalent, being almost R9 at times. No stations in VK ZL or ZS have been heard in the hills, but it is believed that in plains W VE and PY were received in the early mornings. There is no doubt that the only real DX signals heard here are CC stations, and VU2ZX is striving to make his note as pure as possible.

VU2EV (Editor of the Indian Radio Society) has been investigating interference caused by a commercial station in Madras working the amateur portion of the 14 M.C. band, and together with VU2ZX he has taken the matter up with the authorities.

EGYPT.

By C. Runeckles (SU8RS).

Last month has given a return of good conditions on both the 7 and 14 M.C. bands, although on the latter band DX is rather patchy. South American stations have been coming in well on the 14 M.C. band at about 20.00 G.M.T., and on the 7 M.C. band in the early morning at about 04.00 G.M.T. No signs of VK or ZL at any time of the day. G stations have been coming in well, and the difference between their notes and the majority of others is most marked. QRN is still troublesome about sunset here, but not so bad as it was a month ago. SU8WY and 8RS seem to be the only active stations this month. SU8WY has been doing well on 7 M.C. He ran a very successful sked with XW1M on 7 M.C. whilst he was crossing the herring pond. SU8RS has been mainly occupied chatting to G stations. He had a very interesting QSO with SX5M, a ship off Cuba. SU8RS intends spending every Sunday during October from 08.00 till 18.00 G.M.T. on 28 M.C., as he has an idea that things will be looking up on that wave about that time. SU6HL is working on 14 M.C. using a T.P.T.G. push pull with 50 watts input. He hopes G stations will give him a few calls.

CEYLON.

By G. H. Jolliffe (VS7GJ).

July, as far as Ceylon is concerned, has been a bad month for receiving and transmission, except at odd times, so very little is doing on both the 42 and 21 metre bands.

VS7AL from up-country, has moved to another bungalow on the same estate, and is now in the throes of making another set from the ruins of the T.P.T.G. circuit. He reports nothing doing on the 14 M.C. band, and QRN bad after 6 p.m. on 7 M.C. band, thus making work impossible.

VS7GJ is QRT for the time being, owing to generator trouble necessitating transport to England for repair. In the meantime he has been working on 7 M.C. with a small 5-watt set, and getting excellent results locally.

Except for a few KA stations, VS7GJ in the low country meets with the same experience as VS7AL.

VS7AP (Colombo) is really our only active amateur, other than VS7TD.

The usual long list of stations worked have not come forward from VS7AP, but he is to be congratulated on the work done during July; earlier in the month he found G stations coming over well on the 14 M.C. band.

IRAQ.

By H. W. Hamblin (YI6HT).

Activities in Iraq have been somewhat curtailed this month due to the heat, which has broken all previous records.

YI1CD has been the most active station, but reports conditions generally poor. YI6KR is on the air once more with a T.G.T.P. and A.O.G. aerial, but so far with poor results. At Baghdad intense fan QRM has caused even the most hardened hams to QRT. In the South, YI6HT is suffering from service QRM, a record-breaking heat-wave and malaria. He has rebuilt the RX and is rebuilding TX for QRO and CC. He hopes to be doing local fone with this rig on 7 M.C., in addition to DX on the higher frequencies.

IRISH FREE STATE.

By Col. Dennis (EI2B).

I have very little to report this month, as there seems to be little activity amongst EI stations. Conditions continue to be bad on 7 M.C., and still worse on 14 M.C., which probably accounts largely for the present lack of activity.

EI8B has been rebuilding, and is also carrying out some experimental work in another direction, which I am not at the moment at liberty to disclose. They will be in London shortly, where they hope to meet many of their G friends. They had a welcome visit from CT2AA when he was in Dublin recently. EI7C has now got his transmitter working CC on 2, 7 and 14 M.C., with power from the A.C. mains, and will shortly be on 28 M.C. also. They have been on a visit to GI6YW for the motor races in Northern Ireland. EI2B has nothing of any interest to report on either 7 or 14 M.C. He is also CC on 2.M.C.

SOUTHERN RHODESIA.

By G. G. Livesey (VP3SRB).

The main item of interest during period July 15 and August 15 has been our 80-metre competition. At a rough guess, about 38 stations have been working. VP3SR and the writer have been the only S. Rhodesian entrants. We should like to put our Colony somewhere on the list. Why didn't you chaps have a shot at it?

The Cape Province has proved rather difficult for us to touch, but we got through several times. VP3SR with 16 watts, VP3SRB with 6 watts.

The 14 M.C. band is completely empty. Wipe-out is now lessening on 7 M.C., and local contracts seem possible up to 19.30 S.A.S.T. The 7 M.C. W6, and Far-East stations no longer come through between 16.00 and 17.30 S.A.S.T.

3SR and 3SRB have experienced wipe-out on 80 metres at nights when we have been working together. This is strangely disconcerting, as the distance is about 150 miles. From approximately May until October no work can be effected on 14 M.C. to any DX countries. There is a complete "wipe-out," and I understand that no S. African stations are being heard in England.

VP9SR is on 7 M.C.; likewise VP6SR. VP4SRB, VP7SRB and VP5SRA are at present overburdened with work. VP2SRA is active with low-power T.P.T.G., and a pleasing note. He should get easy contact with England next 14 M.C. DX season. VP3SR is redesigning for a medium-power C.C. 14 M.C. set.

Districts—(*Continued from page* 78.)

will in due course publish his findings when definitely confirmed. 2AZR has been trying out chemical rectification, using ammonia phosphate with improved results; has visited stations G6TX and G2HO. G6FY has been trying out new generator; has been to Monmouth District visiting various hams. During his recent visit to Belgium he visited the following ON stations: 4MB, 4AA, 4GW, and 4UU. G6TX is working on 2 M.C. band and finds all others bad. During the recent "air war" he took part on the W/T side as a volunteer with the R.A.F.

DISTRICT No. 13.

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

Although this month has been one of holidays rather than radio, it is gratifying to have several new reports, and it seems as if the letter budget idea (sent to over twenty active stations) was not entirely unsuccessful.

All new reports are welcome and help to swell the letter budget.

G2IY sends an interesting account of his visit to Antwerp Congress and the splendid time he had with our Belgian friends. G6RC is testing harmonic C.C. on 14 M.C. and finds extraordinary conditions on this band. He is testing telephony on 1760 K.C. G6CO has been on 14 M.C. and is still testing A.O.G. aerial. G2OW has changed his QRA and is now in the Essex area. Has receivers going on both 7 and 56 M.C. Hopes to keep in touch with District No. 13 as he will often be at his usual QRA at week-ends. G2OL finds a thermometer in the plate coil of a 14 M.C. transmitter rises in the space of five minutes from 65F to 71F, whilst in the coil on 56 M.C. it rises from the same air temperature to 123 F in a period of half an hour. He has rebuilt entire station. G2BY has been doing some DX on 14 M.C. after rebuilding transmitter. Reports LS5 valve better than D.E.T.1 and B12 in his case. G6VP found signals very erratic and prone to QSB. Is changing his QRA to 12, Ferrers Avenue, West Drayton. BRS338 has had a short wave receiver on holiday in camp. Finds Formodenser aerial coupling better than direct or loose coupling. BRS197 also has had receiver on holiday in Cumberland and has heard some DX there. BRS273 is off the air after the untimely death of four good valves. He is thinking of building a receiver for 112 M.C. G6WN worked four continents and two new countries, Uganda and CM He is still testing an all A.C. receiver and building a new 56 M.C. transmitter and receiver.

DISTRICT No. 14.

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

As I have been on holiday during the past few weeks, I am sorry to say I am rather out of touch with my district, and, indeed, with radio in general. To date I have only received "B" district reports, and I assume that the holiday season accounts for the absence of the others.

Mr. Ingram, of "B" District, gives quite an interesting account of the state of radio in his district at the moment, and I am very pleased indeed to note a considerable revival of interest. Together with G5JK a visit was recently paid to G6KO, who, owing to pressure of business, has been compelled to give up radio work for the moment. G6IZ suggests the formation of a Scottish 80 metre group to foster local research work on that wave, and I shall make enquiries to ascertain if there is sufficient enthusiasm to justify such a formation. G5JK has been putting in quite a lot of work with his new DO40, but is having a little trouble with his keying arrangements. (Write me and give details of the bother, OM, and I shall endeavour to assist.—G5YG). G5JK has also been doing well with his portable TX (G2ZV), and has succeeded in making contact with Spain with an input of one watt. He has at present the assistance of his brother AC8JK, who returns to China early in October and who intends to attempt some schedules with Scotland, when he gets started again. An interesting "ragchew" was recently held in "B" District, when the Scottish transmitters had the pleasure of meeting G2MR and AC8JK, both of whom were on holiday in Aberdeen. The following were present: G6IZ, G6VO, G5JK, G2MR, and AC8JK, and an enjoyable time was spent. G6VO is still concentrating on crystals, and has turned out some very fine specimens. Naturally his signals are C.C. and good DX has been done, although conditions have not been good. G6IZ has been experimenting with aerials on the 7 M.C., 14 M.C., and 28 M.C. bands, and has communicated the results of his work direct to the Editor. 6IZ has also the good fortune to be able to announce the arrival of a brand new op. at his station. (Heartiest congrats. to you and Mrs. 6IZ, OM.—G5YG).

On closing these notes permit me to thank all Scottish members for the honour they have done me in nominating me for another period. Needless to say, I shall do my utmost to further their interests with the Society.

DISTRICT No. 16.

Representative: C. Morton, GI5MO, "Simla," Glastonbury Avenue, Belfast.

G6YW wishes to express his appreciation of the courtesy of G2YU and G6OO duriug his visit to their stations while he was on holiday in Yorkshire. EI7C brothers were in G1 for the T.T race, and were very welcome in this area.

HELP US TO GET THEM.

European Notes.

The following are the only reports received this month from European countries :—

NORWAY.

During the summer months there has been a general improvement in the rather bad conditions which seem to have prevailed over Europe during the spring, and there has been much activity in Norway and also many newcomers. The negotiations with the Norwegian Government regarding the licence conditions have been terminated, and the result is very favourable for the amateurs, conditions remaining practically as before the Hague Conference. The most important points are that the 3,500 K.C. band is still open for special licences, that a good monitor may be accepted as a wavemeter, and that the power remains at 50 watts maximum. Some questions regarding message handling have been cleared, correspondence regarding personal and club activity being permissible, and the NRRL has been granted a certain controlling and qualification testing power, which is probably unique and a proof of the fine " ham spirit " of the Government.

The general meeting and Convention will be held at Oslo on the 9th and 10th of August this year.

SWEDEN.

In order to get a closer co-operation between the members and headquarters, and also between members in the same locality, Swedish amateurs have started an organisation with a sort of Section Communication Managers called District Leaders (DL's), elected for a period of two years. The organisation has already been helpful and much is expected of it during the coming season, when it is hoped to arrange some interesting contests between the districts, etc. Members of the S.S.A. are still mostly working relatively low-powered outfits with a medium input of about 20 watts. One of the few more high-powered stations is the " Grand Old Man," SM6UA, who by this time is probably known to most hams in the world for his unfailing enthusiasm and skill in spite of his age being over 60. At his home on Orust there always used to be some hams during the summer enjoying his hospitality, and G6YL is going to visit old " UA " during August.

When 28 M.C. conditions were good in February and March, several SM's were active on that band. The most successful station was SM6WL, who worked EAR and FM with 10 watts input. No W stations have as far as is known yet been heard in Sweden on 28 M.C., but FM, SU, YI and ZS are coming in very strongly when Father Heaviside permits ! SM6WL is also a good QRP station, having obtained WAC with 10 watts input. For some time the abbreviation " RDI " has been used in Sweden as a substitute for the old " QRV." Meaning " ready," it is built up like " SRI " and it would be interesting to hear the opinions of other amateurs on this matter. Since 1927 the SSA has been transmitting a weekly radio-news-bulletin in Swedish. This broadcast still continues and takes place at 0900 G.M.T. every Sunday. The general call for SSA members is SM9SA, and reports of reception of this broadcast are very welcome.

PORTUGAL.

It has been the hottest month of the year in Portugal, no rain at all having fallen. Most of the Portuguese amateurs have been spending their time trying to keep cool, and this is not conducive to much active radio. Observations made on the short-wave broadcasting stations show that conditions on the higher frequencies, although still very bad, are improving slightly. The medium broadcast band shows distinct improvement as compared with last year at this time, although this may be due to the increased power of many broadcasting stations.

EXCHANGE & MART.

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

TANTALUM AND LIONIUM.—Make your own Battery Chargers for alternating current. Simple, reliable. Lionium Rectifying Electrodes, 2-4 amps., 10s., 5-10 amps., 15s. Also Transformers, Blue Prints, 1s. each, and complete Chargers.—BLACKWELL'S METALLURGICAL WORKS LD., Liverpool.

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.

TELEVISION.—Scanning Discs, Phonic Wheels Experimental Apparatus made to drawings.—JOHN SALTER, (Est'd 1896), 13, Featherstone Buildings, High Holborn, W.C.

G6MN for good QSLS. Overprint of R.S.G.B. and A.R.R.L. emblems can now be had, no extra charge.

SALE.—Complete Transmitter, 1 K.W. Foster Transformer, 230/2,500/2,500 volts, Filament Transformer, 230/15 volts, 10 amps. 2 T. 100, A.T. 40, L.S.5 Valves, 2 Osram 150-watt Rectifiers, Smoothing Chokes, Oil-filled Condensers, Weston Milliameters, Resistances, Low-loss Condensers. Crystal 129.5 metres. Wavemeter with Weston thermo galvo. Cambridge Instrument Co.'s Micro-ammeter, Weston 2,500 voltmeter, 5,000 volt condensers. Must clear. Best cash offer accepted. —G5PZ, 3, Castle View Gardens, Ilford.

VARIABLE CONDENSERS.—.0001 double spaced 100:1 gearing ; silent and mechanically perfect ; complete with dials. Also 0003 same type. Limited number only. Seven days approval against cash 8s. 6. each, post free ; two for 15s.—F. HALDEN, 5, Frinton Road, N.15.

MOVING COIL SPEAKER, New 220 Volt D.C. £2 5s. below.

MEMO POSTCARDS—A new line, 250 6/-. Send for sample. QSL CARDS printed with modern type, your own design from G6MN.

SUPPORT THE SOCIETY AND TRADE ONLY WITH YOUR SUPPORTERS.

Radio's Red-Letter Week

If you would know the new wonders that have been added to Radio, come straight to **Radiolympia.**

Radio-Gramophones are here that look and sound too marvellous to be true! Valve sets, Crystal Sets, Home Construction Sets, Components. All are here to meet every need and to suit every pocket. And whatever your ambitions you will find that the keynote of modern radio is simplicity. To-day Radio is as much part of the home as Gas or Electric light and just as easy to operate.

Come to the

NATIONAL

RADIO EXHIBITION

and marvel

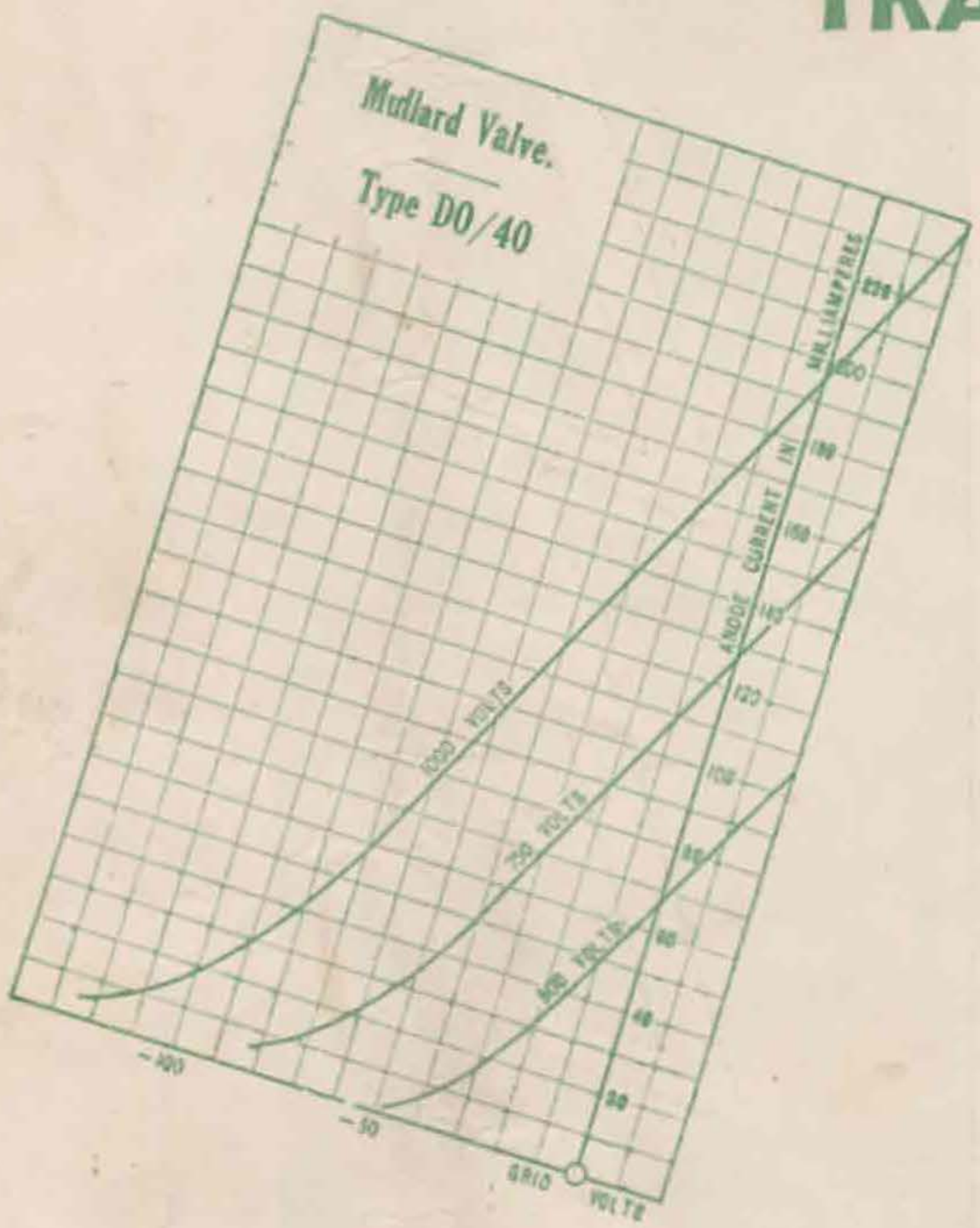
SEPT. 19-27

NEW HALL OLYMPIA

11 a.m. to 10 p.m. DANCING

PROMOTED BY THE RADIO MANUFACTURERS' ASSOCIATION

LOW TEMPERATURE FILAMENT TRANSMITTING VALVES.



The Mullard D.O/40 is a dull emitter transmitting valve capable of working on anode voltages up to 1,000 volts and tested dissipating 40 watts at the anode.

The D.O/40 has a low impedance, and is suitable for use as a modulator in choke control transmitters. It is also suitable for short wave transmission (down to 40 metres).

Max. Filament Voltage	6.0 volts.
Filament Amps.	2.0 amps.
Max. Anode Voltage	1,000 volts.
Total Emission	300 mA.
Impedance	4,000 ohms.
Mutual Conductance	2 mA/Volt.
Amplification Factor	8

PRICE £5-5-0

Mullard

THE · MASTER · VALVE

The Mullard Wireless Service Co., Ltd., Mullard House, Charing Cross Road, London, W.C.2.

Printed for the Inc. Radio Society of Great Britain, 53, Victoria Street, London, S.W.1, by Loxley Brothers Ltd., 50, Southwark Bridge Road, London, S.E.1.