

THE T. & R. BULLETIN

OFFICIAL ORGAN OF THE INCORPORATED

RADIO SOCIETY OF GREAT BRITAIN

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CONTEST TIME

TO an accompaniment of Test B.E.R.U. calls, our Sixth Annual Empire Contest will break upon the world of amateur radio at 1900 G.M.T., Saturday, February 6.

Since the last Contest, which, incidentally, went off without a hitch, we have received numerous letters from overseas competitors, giving their views and offering suggestions. This seems an appropriate occasion, therefore, to comment upon one or two of the points which have been raised.

First, here's one from Merve of Australia, who tells us that when he first began to consume watts in a B.E.R.U. Contest he had no difficulty in recognising a signal from Great Britain—it was clean and thoroughly well behaved. But to-day apparently because we have been copying certain stations from across the Atlantic, many of our signals have little character of their own. A heavily modulated carrier may break through QRM, but before *accidentally* introducing that little bit of A.C., just ask yourself the question, "Am I acting in the right spirit of the Contest?"

Then there is a long screed from Bob, out in New Zealand, who bemoans the fact that a DX operator gets bored stiff listening to an RST 589 station sending Test B.E.R.U. a dozen times before signing his call. As he says, "Why waste time, it's his call sign we want to hear." Last year we remember that a certain station which was putting a hefty signal into G, persisted in giving a five-minute CQ B.E.R.U. call after every contact. The naughty words said about him after the Contest would have shocked our "cad comedians."

Here's another snorter from Frank out East, his complaint is against the man who sends Test B.E.R.U. on 14,020 kc., and without giving any indication, begins to search for replies from the H.F. end of the band. At heart we abhor the principle which has gathered moss in recent years of restricting our listening to the end of the band we are using for transmitting; but with the U.S. phone band on 14 Mc., where it is, we realise that the present arrangement is about the only one possible. Let us, then, follow common practice, and in searching for replies, commence at the right end of the band, or alternatively, make use of the now recognised Q signals if the search is to commence at a point other than the edge of the band in which our crystal or E.C.O. frequency falls.

Good luck to all who enter for this, the greatest event of our year, and remember, if you are a British competitor, that by the terms of your licence you are required to select frequencies which are at least 5 kc. *inside* the International Bands on 7 and 14 Mc.

THE YEAR IN REVIEW.*

By JOHN CLARRICOATS (*Secretary*).

Introduction.

THE year under review has witnessed an unprecedented increase of interest in short-wave radio, which has resulted in a very considerable advance in our own membership and a gratifying addition of advertising support from the radio trade.

Throughout the year the Council of the Society have kept before the membership the experimental aspect of our hobby, and every endeavour has been made to impress on all full licence holders the necessity of justifying their existence as transmitting amateurs, by submitting the conclusions drawn from their experiments for publication in the Society's Journal.

It is generally recognised that the majority of British transmitting amateurs are interested in experimental work, and it is the considered view of the Council that if further frequency allocations are to be obtained, we must be able to show to the licensing authorities that our work is contributing to the progress of the art of radio.

Membership.

As practical evidence of the Society's development we have to record with pleasure that the nett membership passed the 3,000 mark in November last.

For the purposes of historical reference the membership as at December 1 for the past six years was:—

1931	...	1,537	1934	...	2,245
1932	...	1,800	1935	...	2,587
1933	...	1,980	1936	...	3,046

Of our present membership some 2,500 are resident within the British Isles.

Publicity.

Without question the Society's publication, "A Guide to Amateur Radio," has been responsible for the very considerable increase in membership. This project, started as recently as three years ago, has grown from a 48-page pamphlet to a recognised handbook of 128 pages. The current (4th) Edition was placed on sale on August 26 last, and within 10 days over 8,200 copies had been sold. A reprint became necessary at this stage, and to date over 12,000 copies have been sold or distributed.

The popularity of the Guide is attributed to the fact that we have endeavoured to present at a popular price a very complete explanation of the theory and practice of amateur radio. This has been made possible through the whole-hearted co-operation of a small group of technical members whose names appear as a preface to the 4th Edition.

The Society's especial thanks are due to Messrs. H. A. M. Clark, F. Charman, and D. N. Corfield who, with the Secretary, formed the Managing Committee for this publication. Work on the 5th Edition will commence early in 1937.

Exhibitions.

The interest shown in the R.S.G.B. stand at Olympia was definitely greater than in previous years, due to the renewed public interest in short-

wave radio. Several members contributed apparatus for display, the high degree of workmanship attained receiving commendation from many quarters.

In addition to the publicity given to our work at Olympia, highly successful exhibition stands were organised by the Scottish Section at Glasgow, the Western District at Bristol, and the East Midland District at Nottingham. Many other Districts and Groups (notably the R.A.F. School at Cranwell) arranged for the Guide to be distributed locally.

Licence Matters.

The cordial relationships between the Society and the G.P.O. have continued, and during the year several important improvements in operating conditions have been obtained.

Possibly the decision to grant members a 25-watt permit after being licenced for six months for an additional fee of 10s. per annum, has been the most appreciated. Since its introduction in June, well over 100 members have taken advantage of this concession.

The arrangement whereby members interested in 56 Mc. experiments could obtain a portable permit free of charge was also welcomed. This concession will continue to operate annually from Good Friday to the end of September.

During Convention the President was able to announce an important change in frequency allocations. From September last, British amateurs were authorised to operate up to within 5 kc. of the Madrid band limits on 1.7, 3.5, 7 and 14 Mc., and within 10 kc. of the Madrid limits on 28 and 56 Mc. This improvement in operating conditions was made possible as a result of evidence supplied by the Band Monitoring Group, who during the preceding two years had taken a large number of frequency checks with a view to proving that British stations were capable of working closely to the former specified limits.

As a result of discussions with the G.P.O., the Society was successful in obtaining permission for British amateurs to use aerials up to 150 ft. in length instead of 100 ft. This decision has enabled at least one overseas Group to obtain a similar concession from their own Posts and Telegraphs Department.

During the year the first Group of the new G8 calls were issued, an outward sign of the increase in interest in transmitting work. Artificial aerial calls in the series 2CAA have recently been issued.

The number of licences at present in operation taken as at November 1, 1936, was: Full Calls, 1,836; A.A. Calls, 1,230.

These figures represent a nett increase since January 1, 1936, of 224 in the case of the former, and 263 in the case of the latter.

A request was made to the G.P.O. during the year that experimental calls used by commercial companies should be changed to a separate numerical group, but this was found to be impracticable in so far as existing calls were concerned. We can report, however, that all future experimental commercial calls will be assigned to the group G8YA-G8ZZ.

* Being the Report read by the Secretary to the members present at the Annual General Meeting, December 18, 1936.

Unlicensed operation has been traced on several occasions and prosecutions have followed.

Licence Facilities.

In addition to the 25-watt permits which have been granted on the recommendation of the Society, some 50 members have applied for and have been recommended for powers in excess of 25 watts. In the majority of cases the G.P.O. have granted the facility requested, but in isolated cases applicants have failed to satisfy the examining inspectors that the request for increased power is justified.

Numerous members have been recommended for permission to use the 3.5 Mc. band.

As a result of overtures from the Society, arrangements have been made with the G.P.O. to authorise experiments in the 112 and 224 Mc. bands, but as neither of these bands is an international amateur allocation, it will be appreciated that the arrangement is only of a temporary nature.

International Convention

Most members are by now aware that the next International Telecommunications Convention is due to take place in Cairo early in 1938. In preparation for this meeting, the G.P.O. set up a Committee to study all phases of telecommunication. Shortly after the formation of this Committee, a Technical

Union shall be represented at this meeting by an A.R.R.L. officer and a Canadian.

At the Cairo Convention it is anticipated that our past President, Mr. A. E. Watts, will be a delegate.

During the year close contacts with the Wireless Telegraphy Board and the Colonial Office have been maintained.

Technical Developments.

The outstanding technical advances made during the year concern the design of receivers for amateur bands operation and frequency stability experiments with frequencies of the order of 56 Mc.

Several types of single-signal super-heterodyne receivers have been developed by members and descriptions have appeared in the Society's Journal. At least one commercial British amateur bands receiver of this type is now on the market, and others are likely to follow.

Several manufacturers, in collaboration with the Society, have produced special valves and components for amateur use, and as a result of the support given by members, prices have in many cases been reduced.

The T. & R. BULLETIN.

The eleventh volume of the Society's Journal ended with the June issue. It is of interest to record that the number of pages has shown a steady increase with each succeeding volume, the volume under review containing 518 pages compared with 484 pages the previous year. The first six numbers of the current volume have averaged 48 pages per issue, and it is the Council's policy to endeavour to raise the average gradually each year. The publication of large issues followed by small issues is deprecated.

During the year every endeavour has been made to publish articles of general interest to all grades of members. An outstanding series of contributions stand to the credit of Mr. G. McLean Wilford.

Constructional articles sponsored by the Society have been well received, and in this connection we desire to thank the several manufacturers who have co-operated with the editorial staff.

The regular features have, we believe, been much appreciated. Our especial thanks are due to "Uncle Tom," author of "Soliloquies from the Shack," Miss Nelly Corry and Mr. L. Blundell, the compilers of the 28 and 56 Mc. Notes; Mr. Hunter, author of "The Month on the Air," and Mr. T. P. Allen, our official book reviewer. Mr. Milne has again acted as BULLETIN draughtsman, for which services we record our appreciation.

Advertising.

In no previous year has the revenue from advertising been so large. This is attributed to the fact that all manufacturers of apparatus likely to interest amateurs have realised the pulling power of the T. & R. BULLETIN. The task of obtaining the advertisements has fallen largely upon the shoulders of our Advertising Manager, Mr. H. Freeman, of Parrs, who receives the Society's thanks for his share of the success achieved. Mr. Freeman was also responsible for obtaining the advertisements for the 4th edition of "A Guide to Amateur Radio." His work in this connection is one of the outstanding achievements of the year.

Headquarters Visits.

The policy of making annual visits to the membership resident outside London has been con-

LONDON MEETING,

January 29, 1937

at

I.E.E., SAVOY PLACE.

TEA 5.30. COMMENCE 6.15.

Discussion :

"Straight Receivers."

Opened by Mr. H. C. Page (G6PA).

sub-committee was appointed to discuss matters mainly affecting frequency allocations.

At the invitation of the Chairman of the Sub-committee, the R.S.G.B. Council was requested to present its case for the amateurs of Great Britain, setting out reasons for the retention of existing bands, and making proposals for extension. A carefully prepared report was submitted and proposals put forward for extending our bands, indicating how this could be achieved without detriment to any of the fixed, mobile, broadcast, services, etc.

The Sub-committee has now reported to the main Committee, and it is anticipated that at an early date we shall be in a position to inform members what proposals are being made by the British Administration in so far as they affect amateurs.

We would mention that the data provided by our Band Occupancy and Commercial Activity Groups proved of very great value to the Council in presenting its case.

Prior to the Cairo Convention, a meeting of technical experts will be held in Bucharest. It is planned that the International Amateur Radio

tinued, and considerably extended. During the year the Secretary addressed nearly 800 members present at Provincial District meetings, Conventionettes and other gatherings.

For the first time official visits were paid to Scotland and Northern Ireland.

The following centres were visited: Birmingham, York, Newport, Exeter, Nottingham, Cambridge, Cranwell, Tunbridge Wells, Liverpool, Belfast, Barnet, Newcastle, Folkestone, Edinburgh and Glasgow. At all meetings an address was delivered by the Secretary.

The visit to Belfast was arranged to coincide with the 10th anniversary celebrations of the Radio Transmitter's Union of North Ireland. During this visit the opportunity was taken to meet several officials of the Irish Radio Transmitters' Society of the Irish Free State.

The Northern tour was made in company with our Past President, as were the visits to several other English districts.

Every opportunity has been given for the membership out of London to ask questions concerning the Society's work. Numerous visits have been made by Headquarter's representatives to local stations in order to obtain first-hand knowledge of operating conditions and technical progress.

The T.R. Scheme.

The outstanding success of the year from an organisation point of view, was the introduction of the Town Representative scheme in place of the County Representative scheme. On every hand evidence was forthcoming that the new method of local representation was welcomed.

It is anticipated that at an early date, every town with five or more members resident within a few miles of its centre will be represented by its own town representative. The opportunity is here taken of thanking the 1936 T.R.'s for their work, which in many cases has been extremely onerous. The success of the T.R. scheme can be best judged by a reference to the District Notes and News published each month, from which it can be seen that social activities have increased considerably since the beginning of the year.

District Representatives.

The Council desire to record their thanks to the District Representatives who have continued to render invaluable aid as their liaison officers. In many cases the D.R.'s have been assisted in their work by District Scribes, and to these members also, a cordial vote of thanks is accorded.

No important changes in the division of the English districts has taken place except that the Northern portion of District 2 has within the last few weeks been formed into a new District under Mr. H. Hornsby. It is expected that this re-division of territory will produce a better working arrangement than was possible hitherto.

Scotland.

Due to the large increase in our Scottish membership it was decided in June to form three new Scottish Districts. The wisdom of this change was apparent to the President and Secretary during their recent visit.

As reported last year, a Scottish Record Office has been established under Mr. J. Hunter. This office has rendered invaluable service to Headquarters and to the Scottish membership in general.

Our Resident Vice-President, Mr. J. Wyllie, of Glasgow, has continued to act as a link between Council and the Scottish District officers. The value and importance of this contact cannot be too strongly emphasised.

Sectional Activities.

The various sections of the Society have again rendered a great service. The most important from a general membership point of view is undoubtedly the QSL Section. This section has been managed by Mr. J. D. Chisholm, and during the year the number of cards handled has increased very considerably. A close liaison has been maintained with other National QSL Bureaux and a regular exchange of cards has been conducted.

During recent months an endeavour has been made to overcome the growing menace of unclaimed cards, and already evidence is forthcoming that the methods adopted are proving successful.

Due to a change of address, our Calibration Service was out of operation for a few weeks, but we are glad to report that the very high precision gear used by Mr. Gay is now in full working order and the calibration of members' crystals and frequency meters is being continued as before. The importance of the work carried out by this Section cannot be overestimated.

Our QRA Section has again been controlled by Mr. M. Williams, and the same close contact maintained with the publishers of the *Radio Amateur Call Book*.

The Tests and Awards Committee has continued its work under the Chairmanship of Mr. T. A. St. Johnston. This Committee has met on several occasions during the year, and as a result of their deliberations all contests have been staged in a highly satisfactory manner. Their most important contribution was the preparation of the rules for the 1936 and 1937 B.E.R.U. Contests. It is believed that we are now reaching a method of scoring for these contests which can be regarded as fair for all.

Mr. St. Johnston has also continued to organise the Slow Morse Practices which have proved of great benefit to new members.

R.E.S.

The Society's Research and Experimental Sections have again been conducted by Mr. H. C. Page, who has been assisted in his work by Mr. J. C. Elmer. Due to the important function of these Sections, the Council are at present considering a scheme for revision which will enable the Society to offer even greater facilities than are at present available to all members interested in Research and Experimental problems.

During the year the Sections have recorded a considerable increase in membership, and in pursuance of the policy adopted last year many important full-length technical and theoretical contributions have been published in the Society's Journal.

Certificates.

During the year the Council decided to issue a new certificate of merit to those members who have been successful in receiving amateur transmissions from at least 25 parts of the British Empire. This certificate is known as the H.B.E. To recognise the importance of long-distance communication on the 28 Mc. band the Council approved the preparation of a special 28 Mc. W.B.E. certificate. Both

certificates have been claimed by a number of Home and Overseas members.

The I.A.R.U.

The R.S.G.B. Council have continued to work in close harmony with the I.A.R.U., and in particular with the Headquarters' Society, better known as the A.R.R.L. Many important matters of policy have been decided during the year and several suggestions or proposals submitted by the R.S.G.B. have received attention.

The B.E.R.U. of Societies.

Our Society, as Headquarters of the B.E.R.U. of Societies, has maintained close contact with other organisations and Groups in the British Empire, and has been able to render assistance in many directions.

Details of our arrangements for handling licence matters with the G.P.O. were communicated to the New Zealand Amateur Radio Transmitters and our suggestions have, we understand, been adopted by them. Similar suggestions have been sent to our Representatives in Australia.

Assistance has been given to the amateurs in St. Lucia, who have until recently been unable to obtain transmitting licences. The approval of call-signs for the various islands in the Windward and Leeward groups has done much to clarify the position.

Helpful advice has been given to the Rhodesian B.E.R.U. Group who have experienced some difficulties in connection with licences.

The Malayan B.E.R.U. Group, acting on our suggestions, approached their Posts and Telegraphs Department and obtained permission to use longer aerials and the 3.5 Mc. band.

Suggestions concerning policy and licence matters in general have been communicated to our Egyptian B.E.R.U. Group, and advice given to our Representatives in Newfoundland, India, and elsewhere, on various matters of interest.

The B.E.R.U. Section.

The membership of the B.E.R.U. Section has continued to make progress, and our thanks are due to the overseas Representatives who have helped to make known our work in their Dominion or Colony.

National Field Day.

This event proved an unqualified success in spite of inclement weather. The Tests and Awards Committee are at present giving consideration to several important suggestions put forward by members after the last N.F.D. It is anticipated that the hours of operation for the 1937 Contest will be reduced to 24 in pursuance of the policy being adopted in other contests.

The B.E.R.U. Contests.

The 5th series of B.E.R.U. Contests were supported by 50 per cent. more entrants than in the previous year. The 1937 event will, it is expected, receive even greater support in view of the reduction of operating hours and improvements in the method of scoring.

Local Contests.

With the exception of the 1.7 Mc. Contest other local contests, including one for receiving members, were not well supported; in consequence, the Council, acting on advice from the Tests and Awards Committee, decided that for 1937 only one local

contest, viz., 1.7 Mc. Transmitting, should be arranged.

An endeavour was made to organise a 10-watt contest, but as only 20 members promised their support it was decided not to proceed with the plans.

28 Mc. Contest.

For the second year in succession, the Council arranged an International 28 Mc. Contest with a view to encouraging operation in this band. That they have been successful can be judged by the increase in the number of stations active throughout the world on this band of frequencies.

The Contest concluded on December 31. A good entry from amateurs in all countries is expected.

Band Occupancy.

The work of organising the band occupancy Group has again been enthusiastically undertaken by Mr. L. Hill. As mentioned earlier, their checks have proved of considerable assistance to the Council.

Individual stations heard active during checks taken over the past few years are as follows:—

September, 1934	...	...	...	745
April, 1935	...	...	...	815
September, 1935	...	...	...	905
April, 1936	...	...	...	928
November, 1936	...	...	...	1169

Band Monitoring Group.

The organisation of this group has recently been taken over by Mr. A. O. Milne, in succession to Mr. G. C. Allen. The work carried out by the members forming the Group has been of very great importance, for besides providing the Council with evidence of the accuracy of the frequencies used by members it has also been able to give helpful advice to isolated members who have been heard operating off frequency.

Commercial Activity Checks.

The Commercial activity checks in preparation for the Cairo discussions were conducted by Mr. Milne and a group of keen observers located in many countries. The value of these checks will be apparent to all who have studied the frequency allocations assigned at the Madrid Convention.

Appreciations.

Before concluding this, my seventh annual report, I wish to place on record my thanks to Mr. Arthur Watts, whose advice has proved of immense value to me during this and preceding years. On numerous occasions it has been necessary to ask him to personally handle matters of policy; you as members are the best judges as to the wisdom of the course he has taken in these instances. From my own knowledge of the tasks he has so ably undertaken, I can say with certainty that no President before him has possessed such a grip of every aspect of our work. These views, I feel sure, are shared by the Council and by every member who has had the opportunity of working with him. As our Ambassador in Chief to the G.P.O., Colonial Office and Wireless Telegraphy Board, Mr. Watts has by his personality and keen discrimination between that which is important and otherwise, obtained for our members and, incidentally, for non-members as well, many concessions which others may have felt it would be impossible to obtain.

We hope that he will be able to still further help us when the time for the Cairo Conference arrives.

I need say little about the work he has done in

connection with the B.E.R.U. Section because most of our members are already aware of his yeoman services in that direction; suffice it is to mention that the foundations of this important Section were well and truly laid by our retiring President.

I desire also to record my thanks to our President-elect, Mr. E. Dawson Ostermeyer, for his unfailing help and guidance. For more than 10 years he has held executive office and throughout that period he has been acquiring the attributes which will be so urgently needed next year when he becomes our President.

His valuable services as Hon. Treasurer are well known, but few members will remember that when

Mr. Ostermeyer succeeded to that office, the Society's financial position was far from sound. For nearly a year he carried on the dual task of Treasurer and Secretary, attending at Headquarters every day.

To all my other colleagues on Council I extend an expression of thanks for the assistance they have rendered to me. In particular I wish to record my appreciations to Mr. Arthur Milne, who has on many occasions acted as my deputy when Society's business has taken me from London.

In conclusion, I thank Miss Gadsden and the other members of my staff for their loyalty and keen devotion to the job in hand.

MINUTES OF THE ANNUAL GENERAL MEETING

Held at the Institution of Electrical Engineers, London,
on Friday, December 18th, 1936

Mr. E. Dawson Ostermeyer (G5AR), Executive Vice-President, presided in the absence of Mr. A. E. Watts.

Present: Messrs. H. Bevan Swift, J. D. Chisholm, A. D. Gay, A. O. Milne, H. C. Page, T. A. St. Johnston, H. A. M. Whyte, and John Clarricoats (Secretary), together with about 50 members.

The Chairman opened the meeting by apologising for the absence of Mr. Watts, who was confined to his bed with illness.

The chairman moved that the minutes of the previous annual general meeting be taken as read. The proposal was carried.

Mr. E. D. Ostermeyer proposed, and Mr. A. D. Gay seconded, the adoption of the Treasurer's report and financial balance sheet. Carried unanimously.

The Secretary read his annual report. (The report appears elsewhere in this issue.—EDITOR.) Mr. Bevan Swift, in moving the adoption of the report, spoke warmly of the enthusiasm shown by headquarters' staff, and congratulated the Society on its progress. Mr. H. A. M. Whyte seconded the motion, which was carried with acclamation.

The Chairman announced that Messrs. A. O. Milne, H. C. Page, H. A. M. Clark, T. A. St. Johnston, Viscount Carlow, Messrs. H. A. M. Whyte and E. A. Dedman had been elected to serve on the 1937 Council. Messrs. J. W. Mathews, R. H. Hammans and V. M. Desmond were unsuccessful candidates for election.

The Chairman moved that a cordial vote of thanks be accorded to the scrutineers, Messrs. Kershaw, Haberer, Allen and Sadler. Carried.

The Chairman moved, and Mr. G. W. Thomas seconded, that Mr. Ockleshaw be appointed honorary auditor for 1937. Carried.

Mr. Bevan Swift moved a formal vote of thanks to the President and Council of the I.E.E. for again permitting the Society to hold meetings in their building. Carried.

This concluded the formal business.

The Secretary then announced that Mr. D. W. Heightman (G6DH) had been awarded the Powditch Transmitting Trophy for his outstanding

work on the 28 Mc. band. Before inviting the Chairman to make the presentation, he asked all members present to rise in memory of the donor of this trophy who had recently passed away.

The Chairman then made the presentation, amid applause.

It was announced that the presentation to Mr. Arthur Watts would take place at the January meeting to be held on the 29th inst.

* * *

Mr. Angier, B.Sc., of the Decca Gramophone Co., then delivered his lecture on gramophone recording. At the conclusion the Secretary moved that a very hearty vote of thanks be accorded to the lecturer and to the Decca Company. The motion was carried with acclamation.

It was announced that a visit to the Decca recording studios had been arranged to take place on the evening of February 5.

A Six-Way Six-Continent Telephony Contact

A remarkable six-way telephony contact was set up on December 30 between the following stations: W4DLH (Florida, U.S.A.), VU2CQ (Bombay, India), SU1CH (Cairo, Egypt), HK1Z (Colombia, South America), G5ML (Kenilworth, England), and VK4LO (Brisbane, Australia).

The first round, which was completed in 21 minutes from 12.37 G.M.T., established a record time for W.A.C., whilst the achievement itself was a record, for never before to our knowledge have six continents been linked simultaneously by telephony.

It should be mentioned that each one of the six stations could hear the other five and that the approximate distance covered in each round was 50,000 miles.

The frequencies used were: W4DLH, 14210; VU2CQ, 14368; SU1CH, 14304; HK1Z, 14090; G5ML, 14088; VK4LO, 14085 kc.

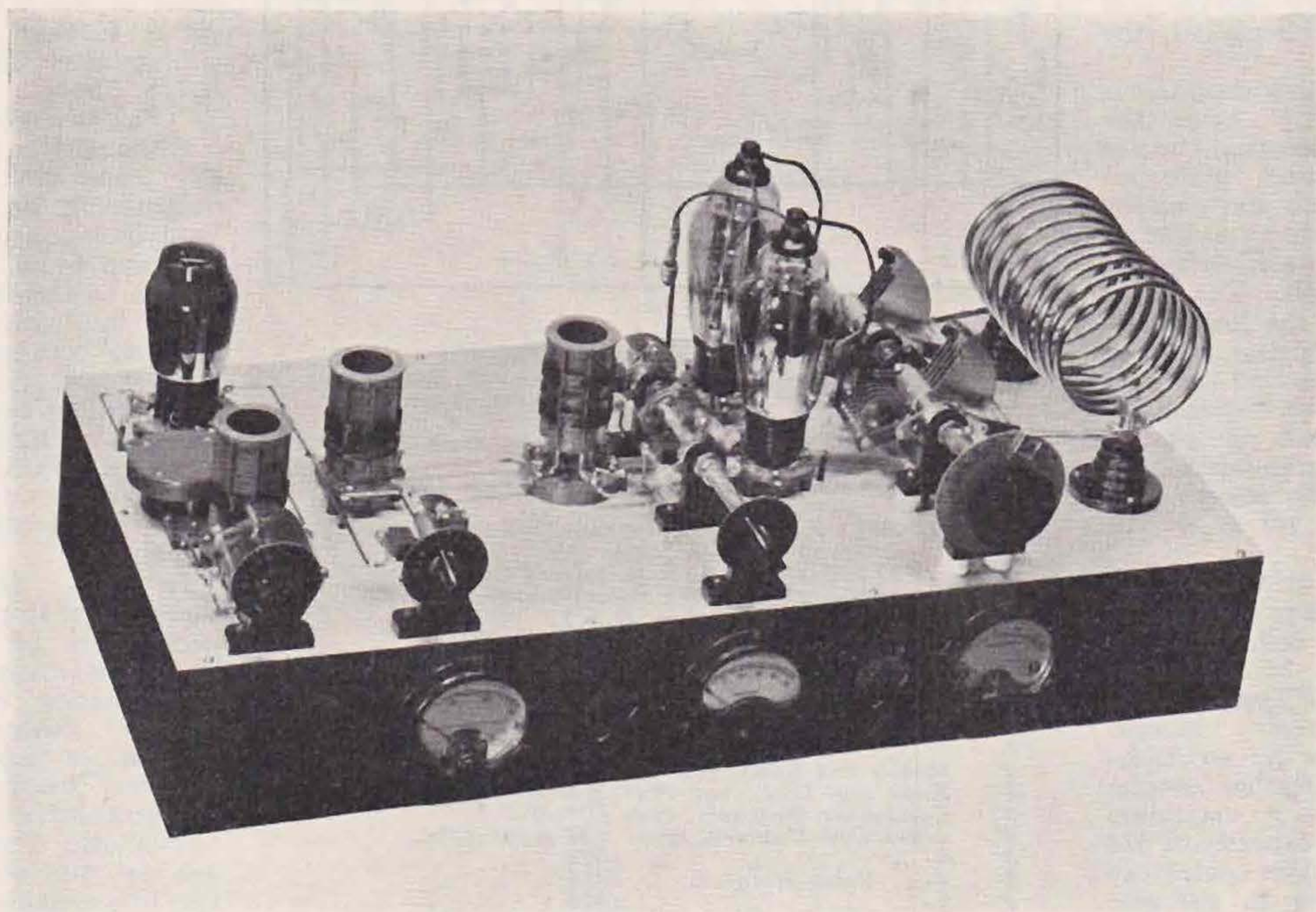
Congratulations are offered to the operators taking part in this historical achievement.

THE DX THREE

IN designing the DX Two described in the June 1936, issue of this Journal, we had in mind the production of a transmitter which could be used for field day, as well as fixed station work, consequently the employment of any valve other than a simple triode in the final amplifier stage would have presented difficulties.

The unexpected interest shown in our earlier transmitter has prompted us to produce an

the DX 2 has again been employed with certain minor differences. As in the previous model a *Tungsram* APP4C has been chosen in this circuit. This valve possesses very marked characteristics for tri-tet operation, although it has been developed primarily as an audio power pentode. A pair of 362 *Company's* RFP 15's have been used in the final stage, first because they are British, second, because they are reasonably cheap, and third, because they



A view of the completed Transmitter fully equipped for 14 Mc. operation. The specially designed neutralising condensers are clearly visible.

elaboration which we confidently believe will produce even more satisfactory results than its predecessor, for the reason that a pair of screened R.F. pentodes have been used in the output stage. As this is a mains operated transmitter the increased filament consumption and valve current drain can be ignored.

The completed transmitter has been operated with input powers up to 75 watts but for normal work an input around 50 watts is recommended.

Circuit Arrangements.

As will be seen from the circuit diagram Fig. 1 the very successful tri-tet exciter arrangement used in

require very little R.F. excitation in order to produce a good output.

The crystal circuit is conventional, and includes either a 3.5 or a 7 Mc. AT cut Q.C.C. crystal in enclosed holder. The cathode coil is in the low potential lead between crystal and earth and is tuned by a .0002 μ F *Eddystone* Type 957 condenser. Coil data is given later.

The screen voltage for the APP4C is obtained via a 30,000 ohm *Varley* Power Potentiometer, which also controls the final output. A value of between 10,000 and 15,000 ohms has been found satisfactory for an input power of 50 watts to the last stage. All by-pass

Constructed by :—

S. Buckingham, G5QF.

Described by :—

J. Clarricoats, G6CL.

Tested by :—

A. E. Watts, G6UN.

condensers are .001 μ F Dubilier Type 620, 250 v. working.

The anode circuit is tuned by an Eddystone 45 μ F Type 900/4 Condenser.

The anode voltage applied to this circuit should be of the order of 350 volts, and under normal conditions the anode current should be about 25 mA.

Link coupling is employed between the output of the tri-tet oscillator and the grid input circuit of the P.A.

The link coupling is wound $\frac{1}{4}$ " below the low potential end of the tri-tet plate inductance and consists of two turns wound in the same direction as that coil. The other end of the link coupling consists of two turns wound in the centre and spaced $\frac{1}{4}$ " from each side of the main grid input winding, the whole being wound on a 6 pin former.

The grid input circuit comprises a centre tapped coil, tuned by a pair of Eddystone 103 μ F Type 900/100 condensers ganged together by an Eddystone flexible coupler to give a maximum tuning capacity of 51 $\frac{1}{2}$ μ F. The centre tap is taken to the grid current meter via a B.T.S. R.F. choke, the other side of the meter being connected to the negative side of the grid-bias battery.

The anodes of the RFP 15's are connected to the fixed plates of a pair of Eddystone 100 μ F Type 979 transmitting condensers which are ganged by a B.T.S. flexible coupler Type UG, and are taken to a pair of Q.C.C. Type A stand-off insulators upon which the plate inductance is mounted.

Screen voltage is obtained by connecting a Varley 30,000 ohm power potentiometer across the P.A. plate supply; the lead from the potentiometer being taken to the screen through a B.T.S. short-wave choke. A by-pass condenser is connected to the screen tag on the valve holder and taken to earth.

The importance of connecting screen and sup-

pressor electrodes to earth by the shortest possible route cannot be too strongly emphasised.

Suppressor voltage is obtained from a 60-volt Exide battery, a value of between 15 and 45 volts positive being generally suitable for C.W. operation. An R.F. choke is connected in series with the suppressor battery in order to prevent feed back via the battery to the input circuit.

High tension is applied to the centre point of the P.A. coil via a Ferranti 0-150 milliammeter and a B.T.S. Choke.

Neutralisation.

Although it is generally considered that neutralising an R.F. Pentode is unnecessary we have found it desirable to introduce a very low value of capacity between the anodes and grids. It is recognised that the need for neutralisation may not be necessary if an elaborate arrangement of screening is employed.

It was decided, therefore, that as compactness is of more importance than strict interpretation of accepted theory, a method of achieving this very small degree of neutralisation should be evolved. The losses due to the introduction of neutralising are so small that they can be ignored.

The method finally adopted is clearly illustrated in the sketch (Fig. 2) and also in the accompanying photograph. It will be appreciated that ordinary types of neutralising condenser are

much too bulky for a compact design, even assuming that a capacity sufficiently low could have been obtained.

The material used for the neutralising device consists of a small $\frac{1}{8}$ " glass tube $1\frac{1}{2}$ " long (obtained at any chemist), a piece of systoflex $1\frac{1}{4}$ " long, which fits fairly snugly into the tube, a length of rubber-covered flex about 5" long, and a length of No. 18 s.w.g. tinned copper wire suitably covered where it is exposed. One end of the rubber-covered wire is connected to the anode terminal and the other is inserted into the systoflex and held firmly in

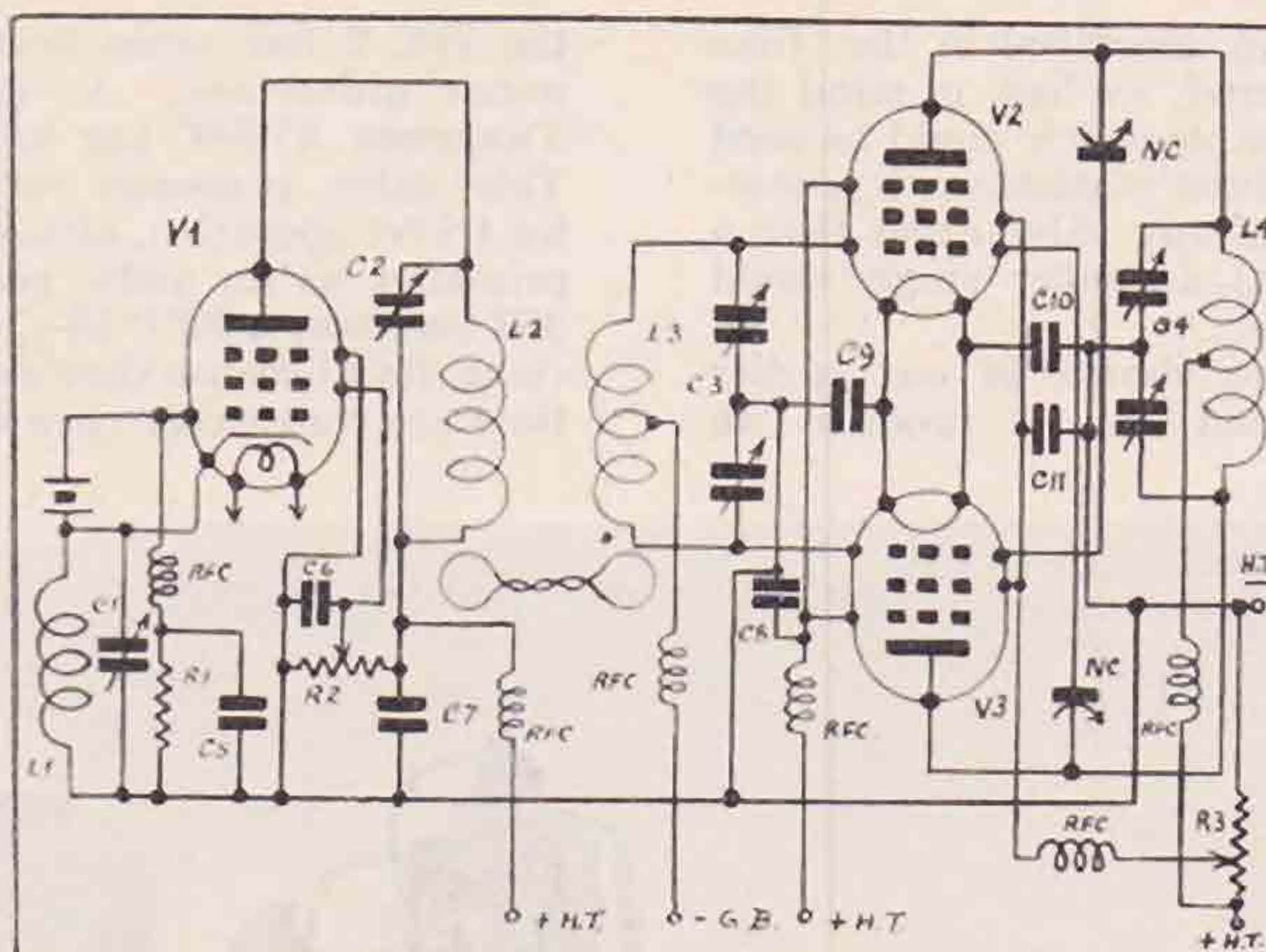


Fig. 1.

Circuit Diagram of the DX Three.

- C1 .0002 Variable Condenser, type 957, Eddystone.
- C2 45.5 μ F. Variable Condenser, type 900/4, Eddystone.
- C3 103 μ F. Variable Condenser, type 900/100, Eddystone.
- C4 100 μ F. Variable Condenser, type 979, Eddystone.
- C5-C11 .001 μ F. Fixed Condensers, 250 volts working, type 620, Dubilier.
- R1 25,000-ohm 1-watt Metalised Dubilier.
- R2, R3 30,000-ohm Power Potentiometers, Varley.
- RFC Short-wave Chokes, B.T.S.
- V1 APP4C, Tungram
- V2, V3 RFP15, 362.
- L4 Tubular Coils, Q.C.C.

Other Components:

- 1 Flexible Coupler, type 1009, Eddystone.
- 1 " " " " UG, B.T.S.
- 2 Knobs and Dials, type 1044, Eddystone.
- 1 Knob and Dial, type 1026, Eddystone.
- 8 Condenser Brackets, type UB, B.T.S.
- 4 4-pin Coil Holders, type 937 Eddystone.
- 3 6- " " " " 1002 "
- 2 4- " Valve Holders, " 1015 "
- 2 5- " " " " 1016 "
- 1 7- " " " " 1024 "
- 1 6- " " " " 969 "
- 1 7 Mc. Crystal, Q.C.C.
- 1 3.5 Mc. Crystal, Q.C.C.
- 1 Enclosed type Crystal Holder, Q.C.C.
- 2 Extension Handles, type 1008, Eddystone.
- 1 Aluminium Panel, 24" x 12", 16 S.W.G., Paroussi.
- 2 0-50-milliamps. Moving-coil Meters, Ferranti.
- 1 0-150
- 2 Beehive Stand-off Insulators, type A, Q.C.C.
- 1 Stand-off Insulator, type C, Q.C.C.
- Terminals: 2 LT+, 2LT-, 2 GB+, 2 GB-, HT-, HT+1, HT+2, Belling Lee.
- NC See text.

position by a dab of Chatterton's compound. The length of No. 18 s.w.g. is connected to the grid of the adjacent valve holder, and its free end is spirally wound six times around the lower portion of the

locked in position by a nut. The remaining portion of the rod must then be sawn off $\frac{1}{4}$ " from the nut to allow for ganging.

It will be noticed that all variable condensers

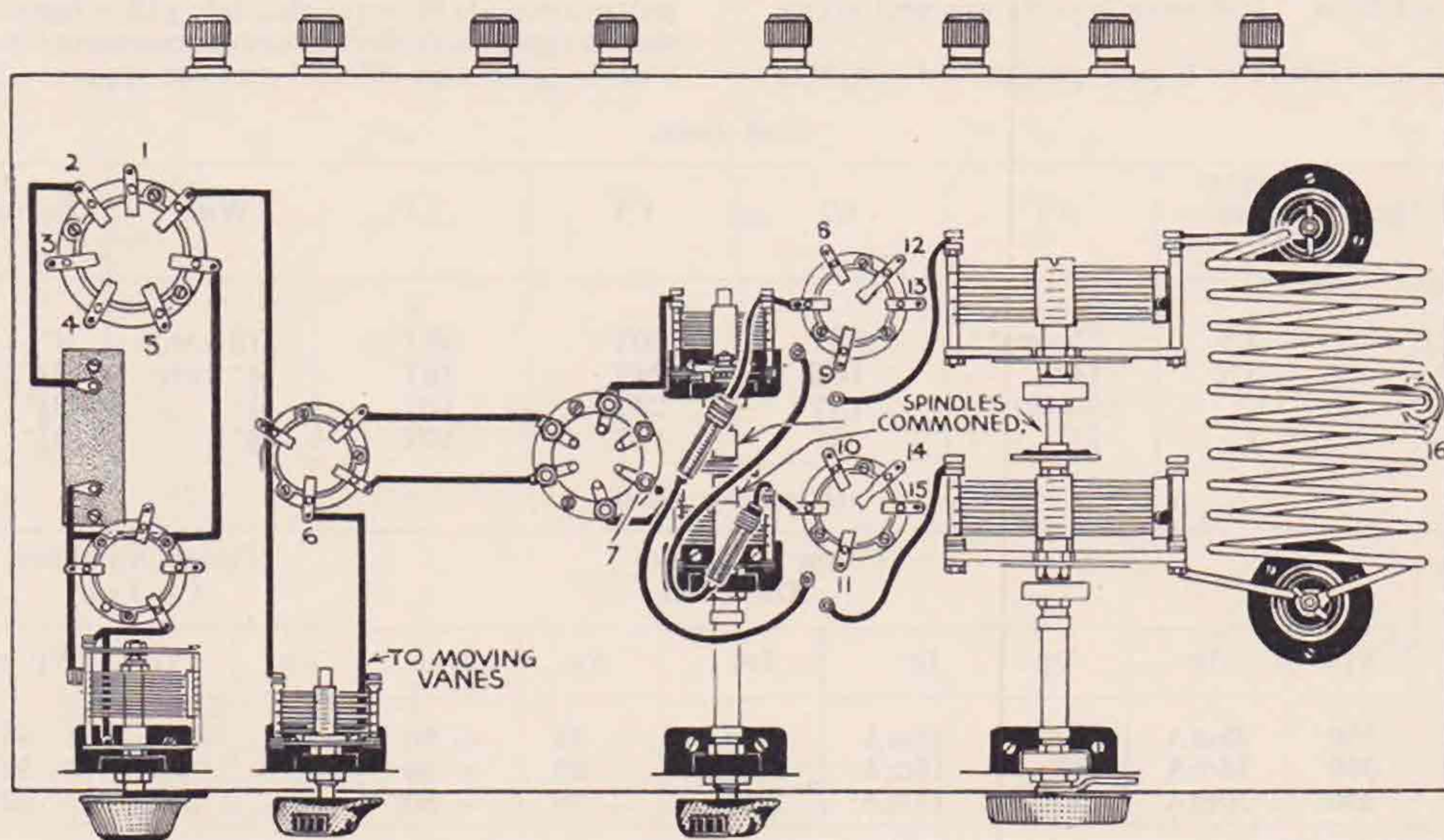


Fig. 3.

A diagrammatic plan of the Chassis Top showing position of all exposed wiring.

glass tube, the turns of wire being soldered together to form in effect one plate of the neutralising condenser.

Neutralisation is achieved by moving the systoflex ended wire up or down within the glass tube.

Construction.

Little need be written concerning layout and construction because the photograph and diagrams, Figs. 3 and 4, make these points quite clear. The metal chassis is No. 16 s.w.g. aluminium sheet, 24" x 12", which can be purchased from Paroussi. The framework is of 9 ply wood 4" deep, with vertical sides; this will facilitate assembly of the completed transmitter into a rack if desired.

The only two features which can be considered as non-standard are the neutralising device and the method of ganging the P.A. plate condensers, the former has already been described.

It will be remembered that a B.T.S. Flexible coupling has been specified for ganging the plate condensers; this was selected because it has a $\frac{1}{4}$ " hole in one end of the coupler and a 2BA hole in the other. To effect ganging, the locking screw should be removed from the end of the rotor shaft of the front condenser and a short length of 2BA threaded brass rod inserted in its place and

are mounted on B.T.S. Type UB brackets, this gives increased rigidity and improves the appearance.

The plate tuning condensers, besides being mounted on brackets, are also raised from the metal chassis on $\frac{1}{2}$ " insulated spacers.

Each P.A. plate coil has a short length of No. 14 s.w.g. copper wire soldered to its centre to permit an easy and rigid connection to the stand-off insulator which carries the plate supply.

The terminal arrangements are illustrated in the diagram, Fig. 4.

Operation.

The transmitter has been designed primarily for 3, 5, 7 and 14 Mc. operation, using a 3.5 Mc. crystal for fundamental and 7 Mc. working, and a 7 Mc. crystal for fundamental and 14 Mc. working.

The adjustment of the tri-tet oscillator is precisely similar to that described in the previous article. The output from this circuit when working on the harmonic is ample to excite the grids of the RFP.15's operating at 500 volts, in fact, experience leads us to the conclusion that a pair of RFP.60's could possibly be driven to about 80 watts input on the harmonic without employing a buffer amplifier, provided the anode voltage on the tri-tet stage is 400 volts.

During tests grid current was maintained at a constant value of 15 mA, using between 35 and 70 volts negative grid bias.

Coil and operating data are given in the tables on next page.

Substituting a pair of RFP 60's, an input of 45 watts (500 v. at 90 mA) gave a slightly higher R.F. aerial current reading the comparative figures on 14 Mc. being .66 A and .85 A.

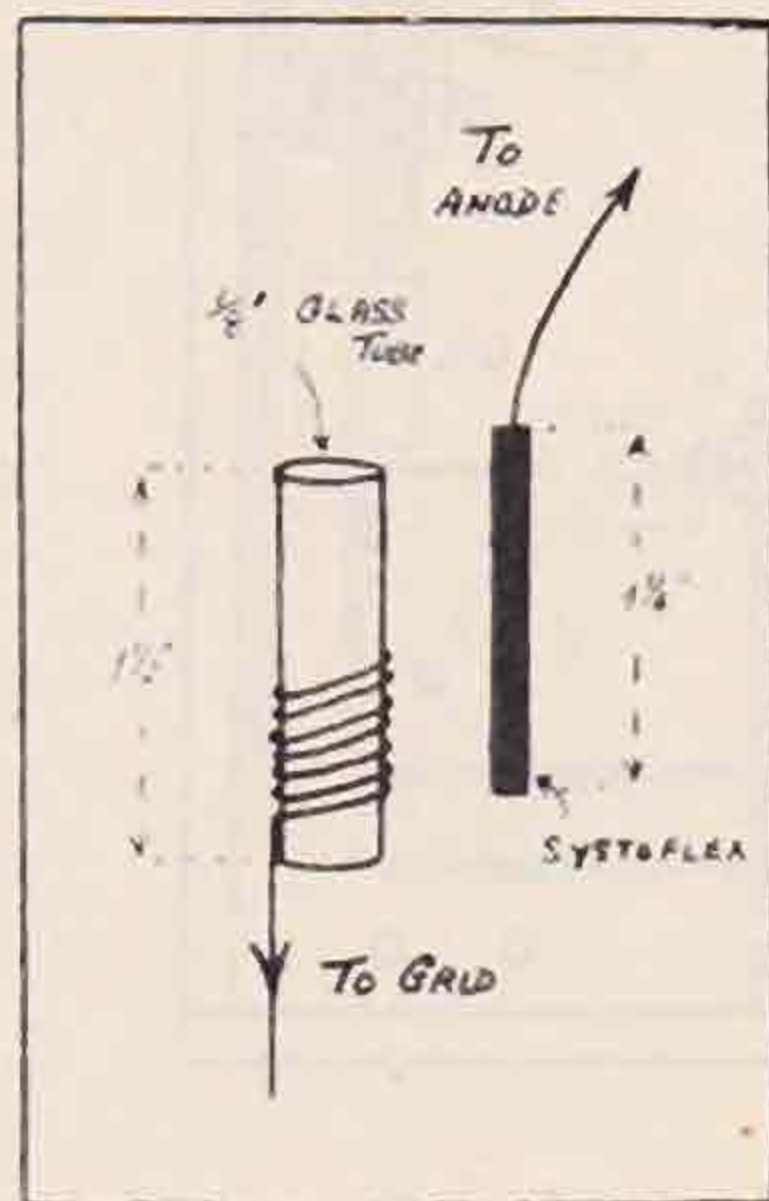


Fig. 2.
Constructional details of
Neutralising Condenser.

Results.

Initial tests show that this transmitter is capable of giving exceptionally good results with an input of 40 watts. With this power VK was worked under poor conditions. European reports are well above average.

In the near future we hope to produce a description

of a speech amplifier for use in conjunction with the DX3.

Cost.

The retail price of the parts used in this transmitter amounts to approximately £12, a figure which should appeal to those desirous of possessing a modern, well-designed and efficient piece of apparatus.

Coil Data.

Band Mc.	Crystal in use. Mc.	L1	L2	L3	L4	Wire.	Former.
3.5	3.5	Shorted	38T	50T	32T	18 s.w.g.	4" dia.
7	3.5	14T	18T	24T	16T	$\frac{3}{8}$ " tube	3 $\frac{1}{2}$ " "
7	7	Shorted	18T	24T	16T	$\frac{3}{8}$ " "	3 $\frac{1}{2}$ " "
14	7	7T	9T	12T	10T	$\frac{3}{8}$ " "	3 $\frac{1}{2}$ " "

Operating Data.

Band Mc.	C. O.		Power Amplifier Off Load.					Power Amplifier On Load.		
	Vp.	Ip.	Vp.	Ig.	Ip.	Vg.	Vsup.	Vp.	Ip.	Vp. x Ip.
3.5	350	25mA	500	15mA	10mA	- 35	+ 50	500	110mA	55W
7	350	18mA	500	15mA	20mA	- 35	+ 50	500	104mA	52W
14	350	20mA	500	15mA	20mA	- 70	+ 50	500	84mA	42W

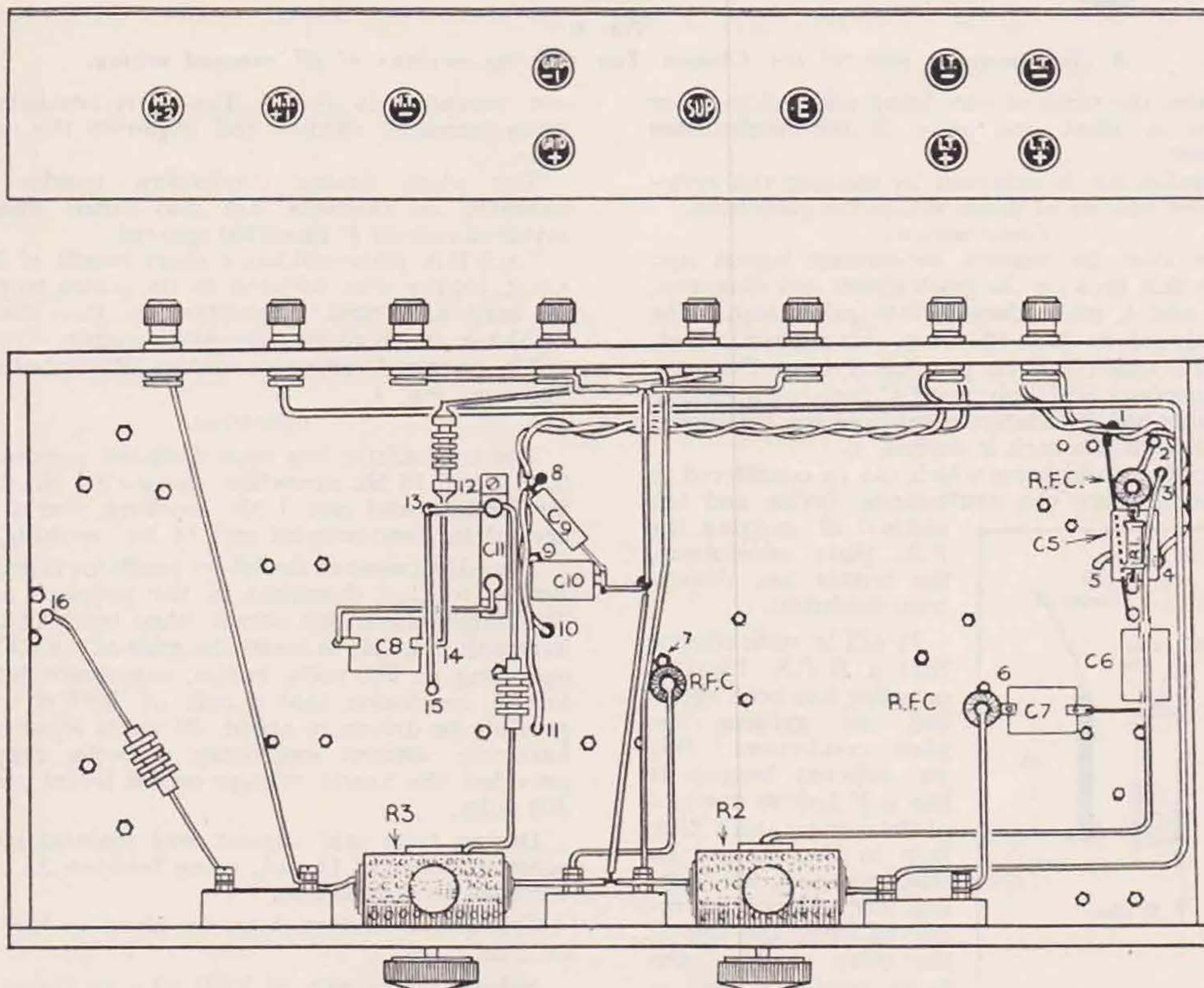


Fig. 4.

An under panel diagrammatic plan showing wiring, and terminals, and location of components.

DX TO ORDER

By F. CHARMAN (G6CJ.)*

It is the purpose of this article to show how a Great Circle map used in conjunction with known polar diagrams, can be employed to determine the direction in which signals can be transmitted. No attempt will be made at completion, but the suggestions made should prove of use to members, especially those living in the British Isles.

To obtain full benefit from the information given, overseas readers should endeavour to obtain a Great Circle Map centred on their own country.

Finding True Direction.

Our first problem is to find the true direction of those places we wish to reach; having done this, we must choose an aerial system which will transmit in the desired direction. We may, perhaps, be limited in this choice owing to the difficulty of erecting the most effective system, but a compromise may in such circumstances give results superior to the hit and miss methods adopted by many amateurs.

Finding the true direction of a point on the earth's surface cannot be achieved by means of an ordinary atlas because such maps (usually drawn on Mercator's parallel projection) show the world as a flat surface, whereas we know it to be spherical.

By using a Great Circle map we can calculate the distance and true direction of any point from its centre.

Distances for places close to the centre point of the map will be approximately the same as those obtained on a "flat" map, but, as will be seen, the further afield we go the more peculiar things appear to become. For example, if we look at Fig. 1, we see that the Antipodes appear around the outside rim of the map, and any land in this region becomes spread out round the edge. It is, therefore, clear that the distance scale only works from the centre, and radial distances are the only ones we can use.

Great Circle Maps.

Fig. 1 shows a Great Circle map centred on London. It is suggested, however, that British Isles members should obtain a copy of the new Great Circle map published by Messrs. Iliffe, of London; this is considerably larger and, as a consequence, calculations can be made with greater accuracy.

However, the diagram reproduced will serve to explain certain features about these maps. Right in the centre is a little triangular formation which is intended to represent Great Britain. Directions from that spot are marked off in tens of degrees around the edge of the map. The little circle to the north is Lat. 80, with the North Pole in the centre. The ellipse at the bottom represents the Antarctic. For the sake of clarity, other latitudes and longitudes have been omitted.

It will be noticed that the North and South Islands forming New Zealand (which are actually about the same size as the British Isles) are spread around the North-East edge of the chart. If our centre were moved a few hundred miles to the south-west of London, then New Zealand would encircle the whole outer rim. Thus, as far as this

map is concerned, it would be impossible to measure a distance between, say ZL 1 and 4. The map is, however, quite suitable for measuring up to a radius of a few hundred miles from London, and will give little error anywhere in Great Britain.

Africa is easily recognisable, as are the Americas, although they appear a little out of shape. Asia spreads itself round to the North-East, and Australia appears to stand on end just below ZL3 and 4. It will be noted that VK6 is at the bottom, and VK4 at the top. VK7 is shown as a blob on the east side of the continent.

General Observations.

Before considering aerial designs, a few general observations should be recorded. The most important is the fact that with the exception of New Zealand and South Africa, the whole of the British Empire lies, broadly speaking, within an East-West band. As a result, it is possible to design an aerial which covers the majority of the Empire, and at the same time radiates a lobe in the direction of South Africa.

A line due West goes through Newfoundland, along the East coast of Canada, and the U.S.A., and down through the Gulf of Mexico into the Pacific.

The Eastern route to Australia and New Zealand is mainly over land, and the Western route mainly over water.

The route to South Africa is over the rocky and sandy parts of North Africa, therefore, any wave requiring more than one "hop" to reach South Africa from Great Britain will be affected by this rock or sand belt. Such soils have a very high dielectric constant, and no appreciable conductivity, so that waves arriving at the surface are mostly refracted into the earth and lost. This fact explains why we can hear South African stations more consistently on the higher frequencies, for such frequencies have longer skips and a smaller number of "hops."

Let us now consider some of the other places G stations find difficulty in working.

The 1st New Zealand district, the West Coast of U.S.A. and Canada, the Hawaii Islands and Japan (apart from the sandy deserts of VK6 and Mexico) all fall into this category, and it is of interest to observe that the tracks of signals to all of these places go near to the Magnetic North or South Poles. This is, indeed, food for thought. Let us, in particular, consider the case of K6 and K7 (Hawaii and Alaska); to reach these places, signals from Great Britain must go right over the North Magnetic Pole, which is located somewhere to the North of Canada, and we note that the only period in the year when contacts become possible is when conditions of light and shade are at their best, viz., springtime in Great Britain.

Light and shade cannot be delineated on a Great Circle map, but they can be fairly easily represented on Mercator's Projection (e.g., a flat map). Ladner and Stoner give useful advice on this subject in their standard book, "Short Wave Communication."

* R.E.S. Aerials Group Manager.

Although we cannot study seasonal changes on a Great Circle map, we may see that the South-West Great Circle route to VK and ZL is not much greater than the North-East route; therefore, it is likely that our signals will travel either way according to light conditions and frequency employed. It has now been well established that morning signals from G, and evening signals from VK and ZL travel by the long route, whilst evening signals from G reach VK and ZL by the shorter route across Asia. In each case the transmissions follow a darkness route. Frequencies around 14 Mc. appear to work better when there is a little daylight at both

ends; 28 Mc. appears to operate in the opposite direction, by daylight.

Although it is generally agreed that signals follow Great Circle routes, there has been evidence that under certain conditions, signals reach us "round the corner," especially those which would normally go near to the Poles. It is hoped to deal with this subject at a later date, when additional experience has been obtained. We can, nevertheless, say with some certainty that if a very directive system 70° E. of N. is erected, then for most of the time excellent signals will be received in VK2, which is on this line from London.

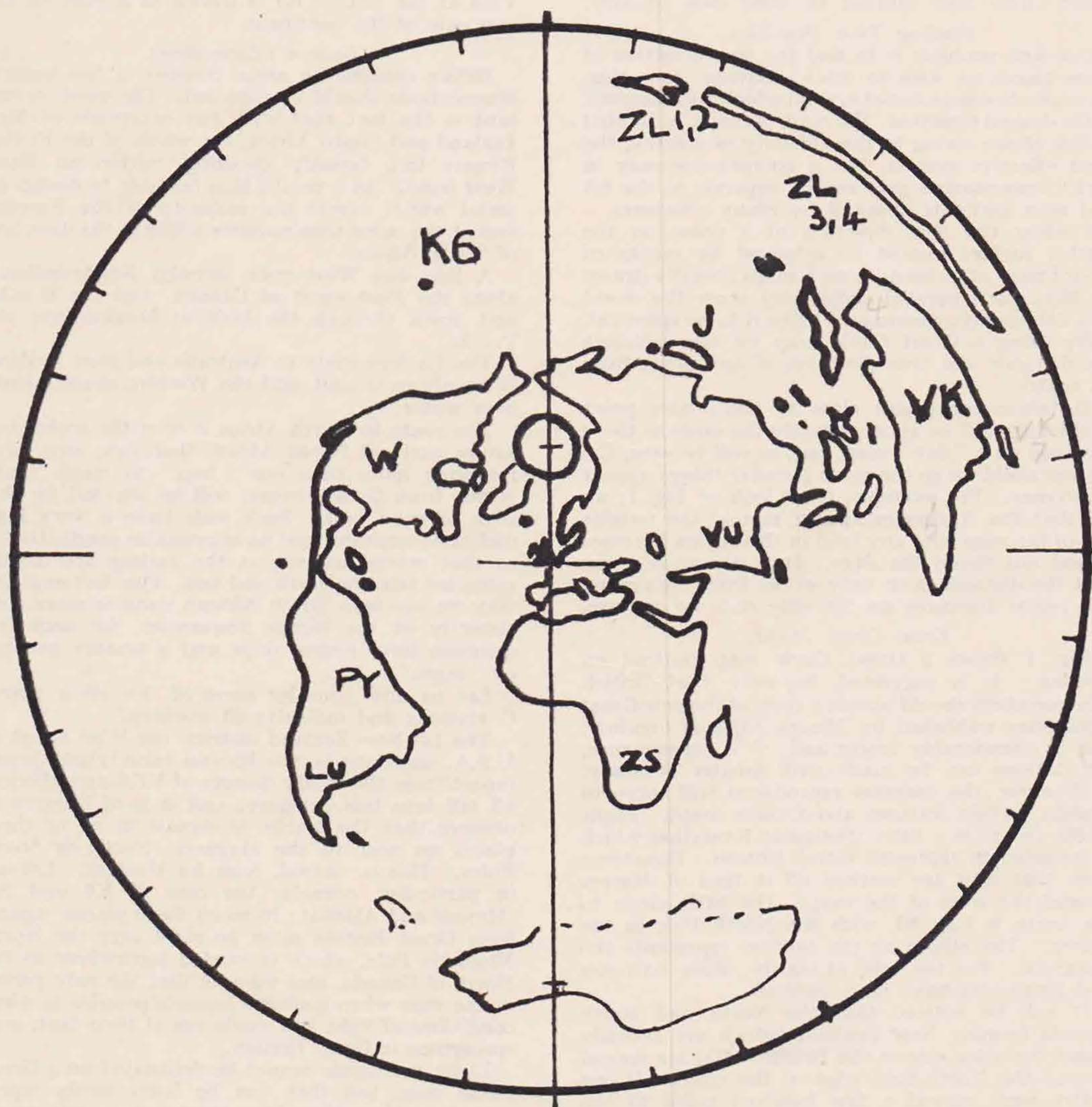
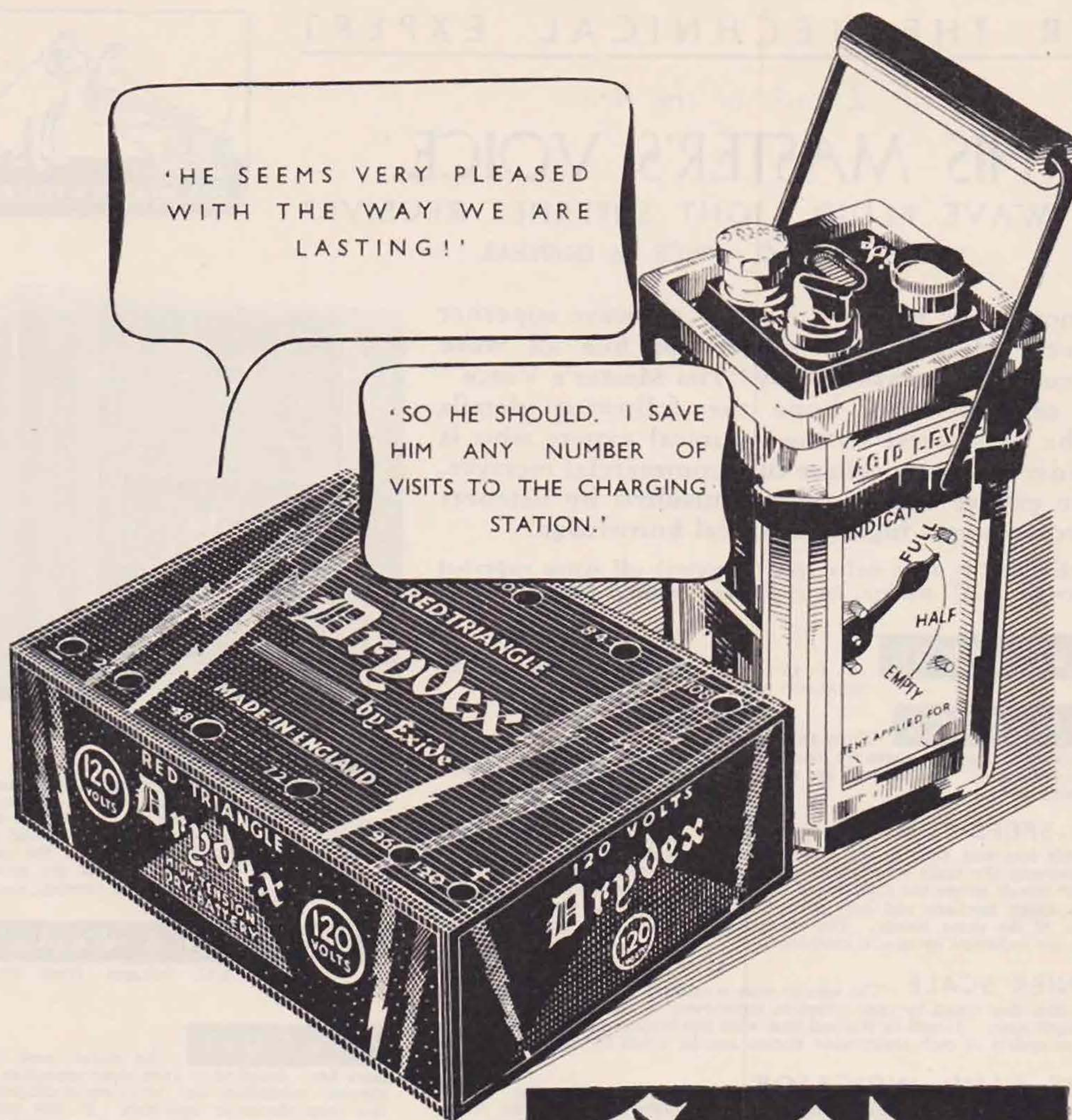


Fig. 1
Great Circle Map for London & Great Britain.



EXIDE 'HYCAP'—the L.T. battery
for modern sets.

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*Still keep going when
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FOR THE TECHNICAL EXPERT

Details of the new

"HIS MASTER'S VOICE"

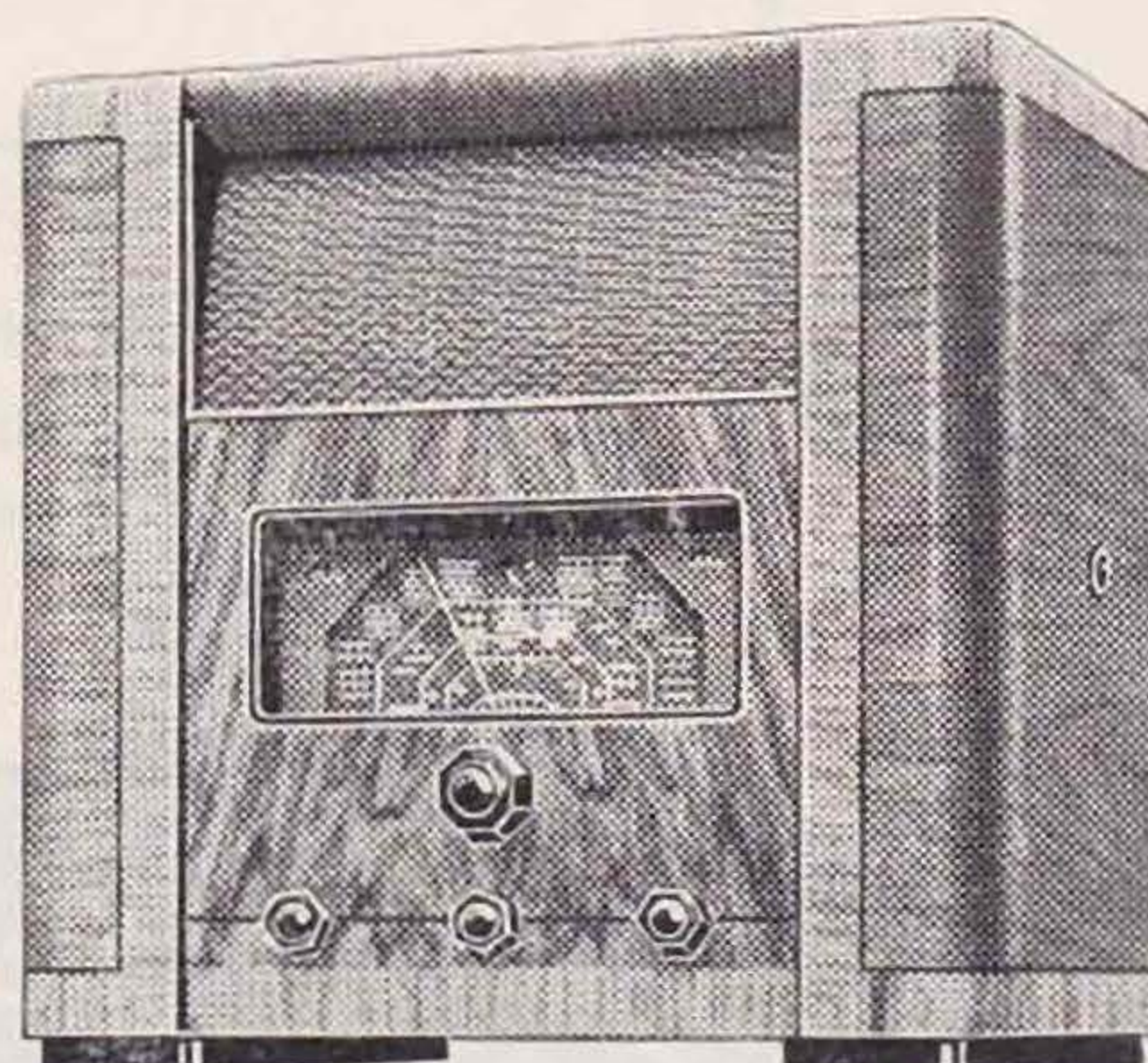
ALL WAVE FLUID LIGHT SUPERHET RECEIVER

MODEL 482 A.C. PRICE 16 GUINEAS.



The new "His Master's Voice" all wave superhet receiver, Model 482, is one of five all wave receivers being marketed by "His Master's Voice" this season. We hope the following details will be of interest to the technical expert who is considering the purchase of a commercial receiver, or the expert who is often consulted by listeners not possessing a highly technical knowledge.

MODEL 482 is a six valve (plus detector) all wave superhet receiver for A.C. mains, in a figured walnut table cabinet.



WAVE RANGE

16.5 to 51.5 metres. 200 - 580 metres.
725-2,000 metres.

CONTROLS

Apart from the Mains Switch, which is mounted at the side of the cabinet, there are four operating controls—Volume, Waveband, Tone and Tuning. The controls are situated on the front of the cabinet below the Tuning scale.

TWO-SPEED TUNING

The Tuning control is of the two-speed type with fast and slow knobs arranged concentrically. These knobs drive simultaneously the main wavelength indicator and a vernier scale. The main indicator travels across the illuminated wavelength scale, which bears the names of over eighty medium and long wave stations, besides the wavelength calibrations of the three bands. The wave bands of the principal short wave stations are indicated by special markings.

VERNIER SCALE

The vernier scale is calibrated in degrees of 0 to 100, and rotates five times to one complete movement of the pointer across the wavelength scale. It will be realised that with this arrangement the exact point of the reception of each short wave station can be noted for future reference.

WAVE BAND INDICATOR

An ingenious lighting scheme illuminates the station names and wavelength calibrations, leaving the rest of the scale dim. A wave band indicator is situated at the top corner of the scale, and shows which wave band is in use. It is actuated by a control knob on the front of the receiver.

CATHODE RAY FLUID-LIGHT

The fluid-light tuning device is of the electronic cathode ray type and is extremely sensitive. The device is semi-circular in shape, and when the receiver is not tuned to a station two arcs of light are apart. As the receiver is correctly tuned the arcs converge.

VOLUME CONTROL

The volume control is wired in the grid circuit of the L.F. amplifier, and is operative on both radio and gramophone pick-up.

5-POINT TONE CONTROL

The five-point tone control which operates both on bass and treble, will be found extremely useful as the best setting can be obtained for each station. It operates on radio and gramophone pick-up, which may be connected to two sockets.

AERIAL

Sockets are provided for either "His Master's Voice" all-wave anti-static aerial, or a doublet aerial.

SPEAKER

Energised field moving-coil speaker incorporating a special cone to give a good response on both high and low notes. The flux density is 7,500 lines. A "Sound transparent" metal grille is mounted on the cabinet in front of the speaker. Sockets are provided for the connection of additional external speakers.

CONSUMPTION & VOLTAGES

85 watts on A.C. voltages from 95-260 50-100 cycles.

CIRCUIT

The circuit and chassis have been designed to keep stray capacities to an absolute minimum, and the valves employed have low inter-electrode capacities. In this way the absolute maximum degree of sensitivity and selectivity has been obtained on all wave ranges, particularly on the short wave range. The valve complement is as follows:

- W42 H.F. amplifier.
- X42 Mixer.
- W42 I.F. amplifier.
- D41 Speech and AVC double diode.
- H42 L.F. amplifier.
- N42 Pentode output.
- U14 H.T. rectifier.

It will be noticed that the employment of valve D41 looks after speech rectification and the production of AVC voltages, and as the latter are applied to the three previous valves, the AVC control is very efficient. The speech output from valve D41 is via resistance capacity coupling through the H42 valve to the high efficiency pentode N42 which has an output of three watts undistorted.

If you would like to receive a copy of the "H.M.V." illustrated catalogue of RADIO receivers and Radio-gramophones write to "HIS MASTER'S VOICE" 98-108 Clerkenwell Road, E.C.1.

Practical Aerials.

A vertical aerial should, of course, radiate equally well in all directions, although, if the station is screened by a hill, then signals may fall off in the direction of the obstruction. The chart will show where a reduction in signal strength is likely to occur. The effect of a hill is to cause signals to bounce off it into the sky at a high angle.

Let us consider a simple horizontal di-pole, one half wave-length high. This system by the way, is ideal for long distance as opposed to local work.

The polar diagram in any plane containing the wire is usually illustrated as a pair of touching circles, with the wire tangent at the common point, but when considering the effect of the earth's reflection, the diagram will be different, for we now have a little end-on radiation, although this is rather high angle, and, therefore, only suitable for local work. The effective polar diagram for a horizontal dipole is shown in Fig. 2. There may be some divergence of opinion about the diagrams illustrating this article, but they are considered to be good estimates based on both theory and practice.

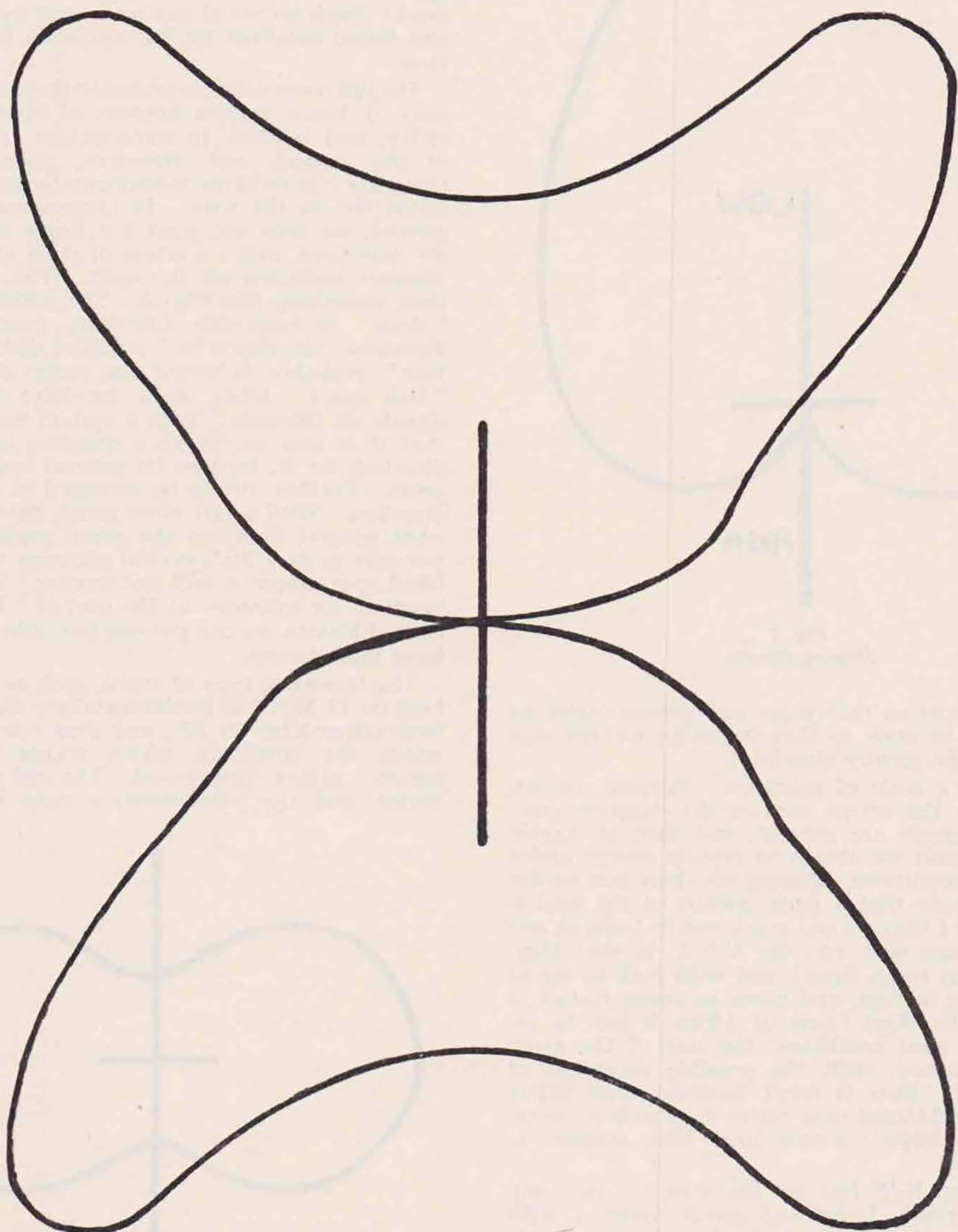


Fig. 2
Effective Polar Diagram of Horizontal Dipole.

This diagram has been drawn to a scale to fit the chart, and is an attempt to represent the distance one might expect to reach under fair conditions with a 25 to 50 watt transmitter. It is impossible here to give an exact picture, as this depends on so many other considerations, but great help can undoubtedly be obtained by this method. If this polar

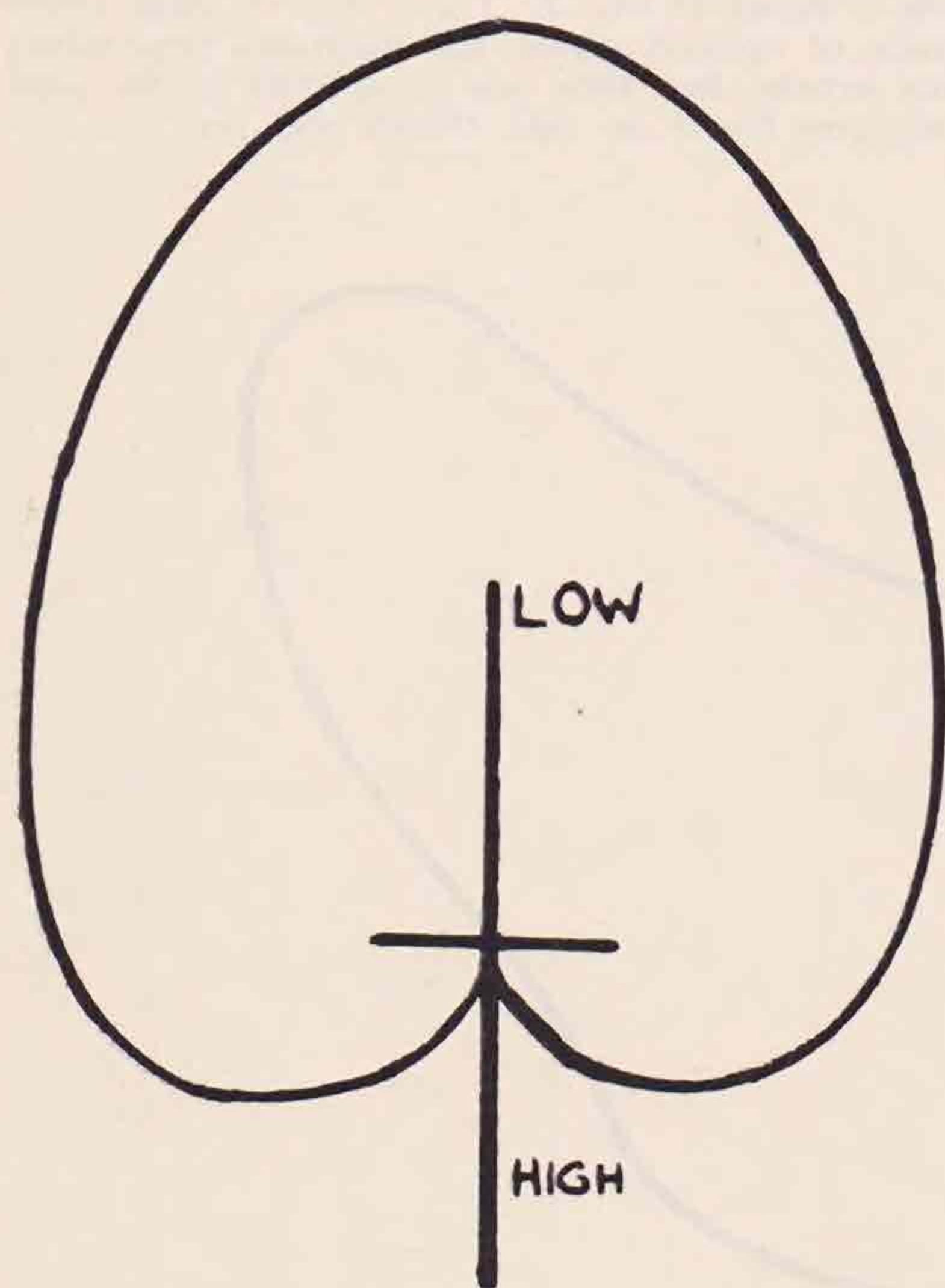


Fig. 3
Sloping Dipole.

chart is traced on thin paper and pinned centre to centre on the map, so that it can be rotated, our study will be greatly simplified.

Now for a scale of reference. Suppose we say that inside the active area of the diagram good readable signals are general, and that at double the outer limit we obtain S4 reports except under very good conditions. Placing the chart first on the N-S axis, note that a large portion of the land is covered, and that we can reach out to India in one direction, and well into the U.S.A. in the other. We can also reach Brazil, and with luck as far as Hong Kong in Asia, and down to about Kenya in Africa. The West Coast of Africa is lost to us, but under good conditions the rest of the globe can be reached, with the possible exception of ZL1 and 2. Bear in mind, however, that better results are obtained over water than over a course involving "hops" across large land masses, as noted earlier.

Taking an E-W line for the wire, we can only expect to reach Africa and South America, with perhaps Japan and New Zealand, under favourable conditions. Europe will probably drown everything on the receiver! We will now try a little simple directivity.

Fig. 3 represents the same di-pole, but with one end high, the slope being, say, 30° . This cuts off all radiation from the high end, as the wire is end-on to all useful angles. Furthermore, by placing it end-on to the disturbing earth reflection, permits very low angle radiation in the other direction. For the same reason, however, it also produces strong local signals. A little trial will soon show that if we can set this aerial up on an E-W line, with the high end West, then we should be able to sit down in the evenings on 7 Mc., or in the afternoons on 14 Mc., and take our pick of practically everything heard working to the East or South. Further, our receiver will be clear of American QRM, but for Westward reception it will be stone dead! Such an aerial has been used by the writer and found excellent for its somewhat limited purpose.

The full wave aerial is probably the most popular, since it has a certain amount of inherent directivity, and is thus, to some extent, independent of the ground, and, therefore, gives low-angle radiation. It radiates fundamentally four lobes at about 60° to the wire. In conjunction with the ground, we thus get good low angle radiation in 60° directions, and a mixture of short and medium distance radiation off the ends. The diagram is thus something like Fig. 4. The aerial is always "dead" in broadside directions, even for short distances; the region of "no short distance radiation" probably following the outer sides of the "free space" lobes, since we have high angle signals off the ends. Such a system looks so good that it is now no longer a question of finding a direction for it, because its general coverage is so great. Further, it can be arranged in almost any direction. With a full wave aerial, having decided what general direction the aerial *could* take, one has only to do a little careful planning to place the blind spot where it will not matter. In an E-W location, for example, at the cost of "losing" the Gulf of Mexico, we can put one lobe into each of the large land masses.

The two-wave type of aerial, such as one 132 ft. long on 14 Mc., has fundamentally a diagram with four major lobes at 37° , and four minor ones towards the broadside, which makes the "DX-agram" rather complicated. The end radiation is better, and the lobe direction very good. The

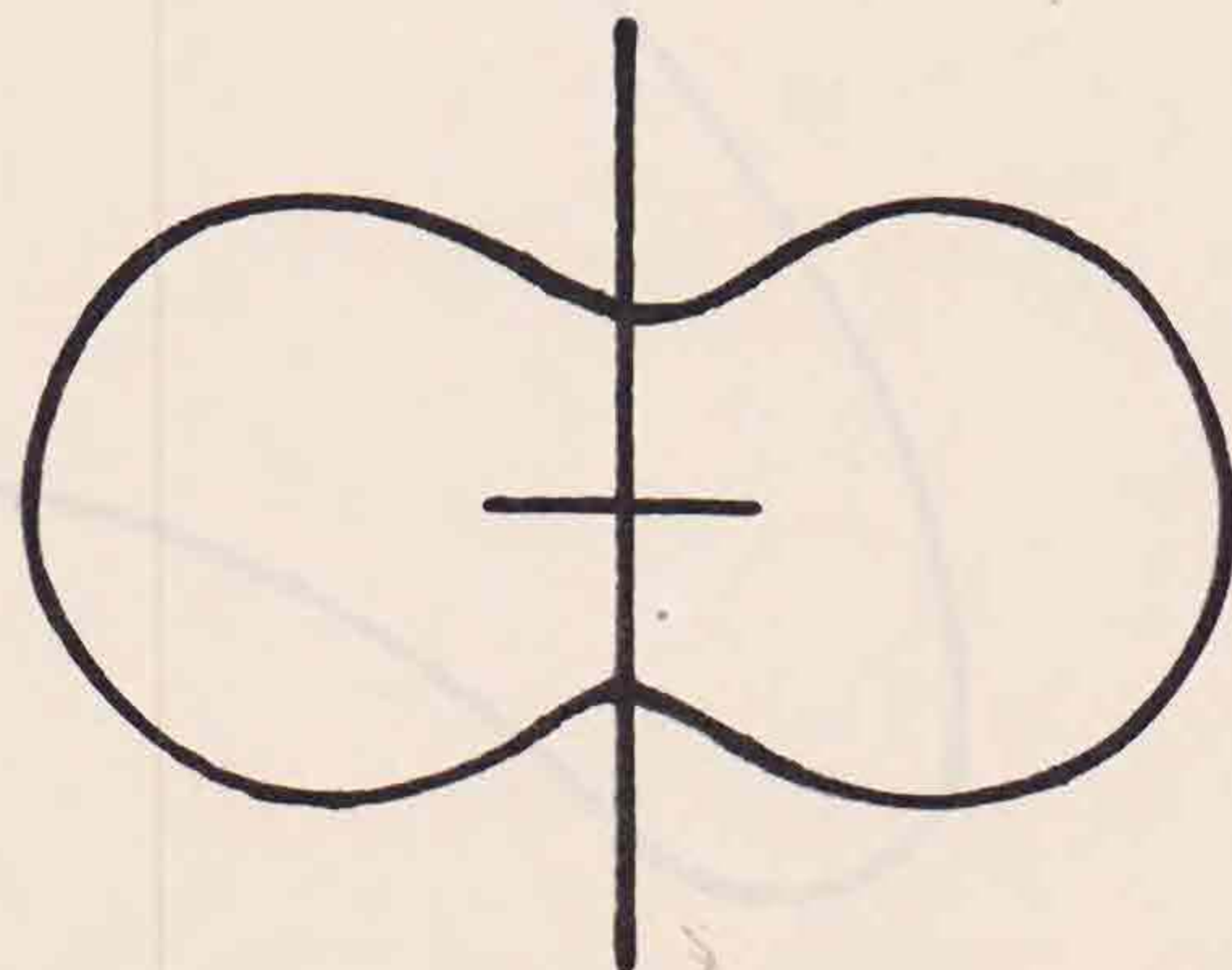


Fig. 5
Two-full-wave Aerials.

minor lobes are good for medium distances, and their secondary crevasses are not visible at awkward angles, so that they simply serve to broaden the major ones. The result is excellent, and a N-S

will be necessary to remember that the "DX-agram" will vary from band to band, and the problem may be more difficult, especially if space and direction are limited.

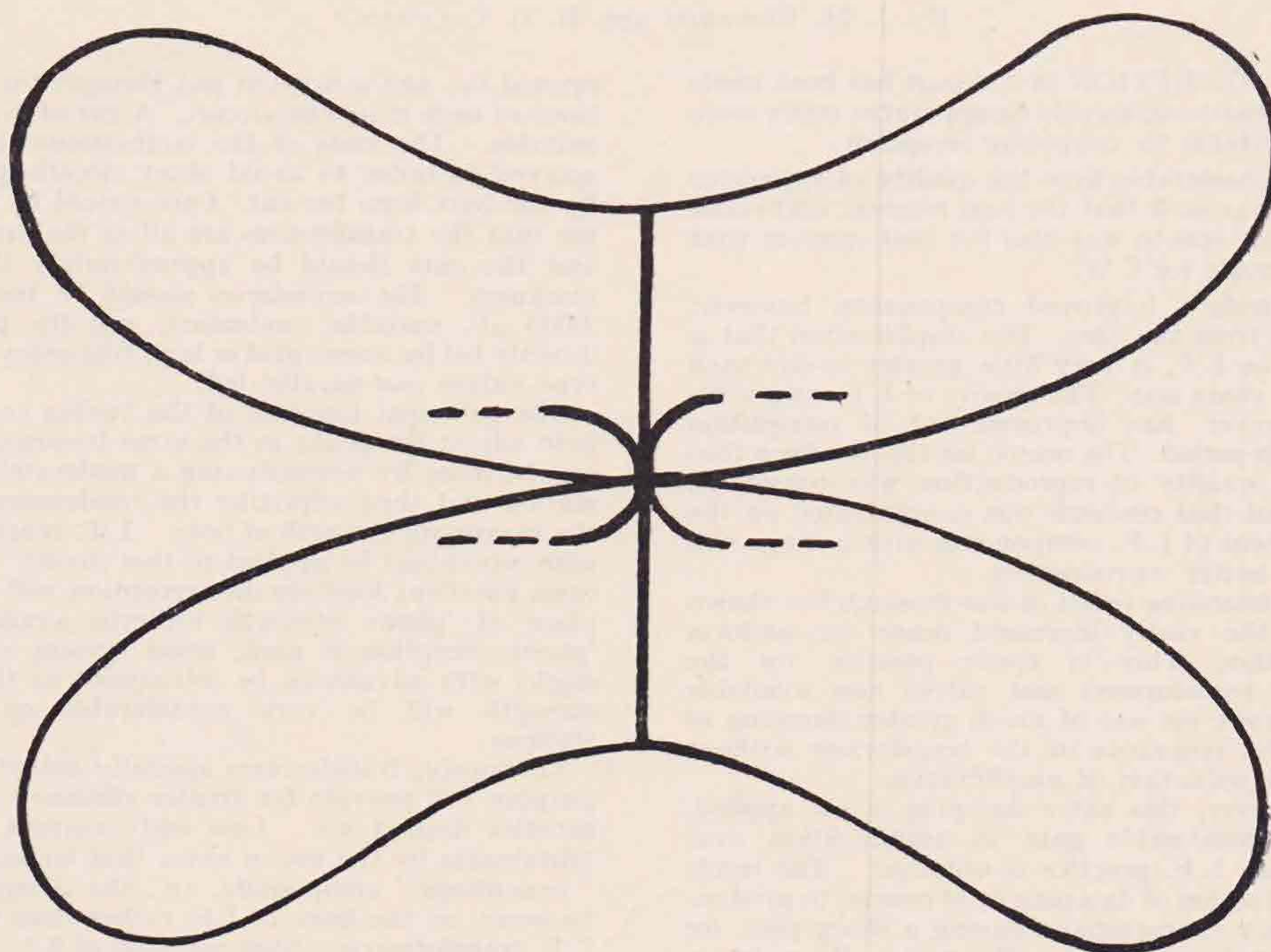


Fig. 4
Full-wave Aerial.

aerial of this type should enable one to work the Antipodes in both directions, and reach most of the "difficult" places. There is certainly no doubt about its popularity.

In selecting an aerial to work on two bands, it

There are many other aerals, but we have mentioned enough examples to enable the interested reader to select an aerial to fit his location. It should be remembered that for long distances horizontal directivity pays compound interest.

Another Good Deed Well Done

Just as we go to press, we are advised by Mr. Hill, ZE1JB, that Mr. L. Madgwick, ZE1JG, recently performed a very useful service by intercepting signals concerning a French mail plane which had been forced down in the bush north of Beira. The plane was operating on the Madagascar-Broken Hill service. Mr. Madgwick was listening in at about 09.00 G.M.T. on December 20 when he heard very weak signals from a station signing FB8AF, the call of an amateur in Madagascar. Before the signals became unreadable ZE1JG was able to elicit the information that the plane was down in position 30 deg. E. and 19 deg. S. At the time of writing, the plane had not been located, but thanks to Mr. Madgwick's timely reception steps were being taken by the authorities to institute a search.

Mr. Hill has not yet been able to establish whether the plane was using the call of the amateur to whom it is issued or whether the operator himself having heard of the crash was calling for assistance to be sent. The transmissions were sent in French.

Strays

VK4EL is testing out a new aerial system on 14,072 kc. and is looking for British stations between 13.30 and 16.30 G.M.T. on Fridays. He uses an input of 30 watts to a 45 in the final.

* * *

Mr. N. van Perlstein, G5MI, of Ipswich, who is transmitting at indefinite times on 57 Mc., is anxious to arrange schedules with transmitting and receiving stations. His aerial is vertically polarised on the top of a 65 ft. mast, while the station site itself is in an elevated position.

SUGGESTIONS FOR IMPROVEMENTS IN C.W. RECEPTION

By J. H. EDWARDS and H. G. COLEMAN.*

C. W. RECEPTION in the past has been made almost exclusively on apparatus really more suitable for telephony reception.

For a considerable time the quality of apparatus available was such that the best receiver that could be made for speech was also the best receiver that could be made for C.W.

With modern improved components, however, this is far from the case. The amplification that is obtained on L.F. is very little greater to-day than it was 15 years ago. The *quality* of L.F. amplification, however, has improved out of recognition during this period. The reason for this has been that improved quality of reproduction was considered so essential that research was concentrated on the improvement of L.F. components with but one aim in view—better reproduction.

One outstanding result of this research has shown itself in the vastly increased range for uniform amplification. This is made possible by the improved transformers and valves now available which permit the use of much greater damping of the natural resonance of the transformer without noticeable reduction of amplification.

If, however, this extra damping is *not* applied, a very considerable gain in amplification over present-day L.F. practice is obtained. The result of this reduction of damping is, of course, to produce a frequency characteristic having a sharp peak for every transformer used. By *tuning* these transformers so that the peaks come on the same frequency, an amplifier is produced having an enormous L.F. gain at this particular frequency, but, of course, useless as a normal L.F. amplifier in view of the fact that a very sharp attenuation occurs either side of this tuned frequency. This condition is, however, *ideal for C.W. reception* as, if the difference in frequencies of the heterodyning valve and the carrier is set at the frequency of the tuned transformers, the resultant note will be amplified enormously, whereas other notes produced by interfering signals will hardly be amplified at all. With only one frequency to be considered, stabilisation is much easier, and the resultant gain is definitely additional, and available for full use, no sacrifice of either H.F. or L.F. gain having to be made to ensure stability.

This system is not affected by existing I.F. stages, and can be used to obtain additional efficiency in such circuits.

Consequently, a receiver can be produced, which, whilst only suitable for C.W. reception, fully justifies and encourages its construction as a special C.W. receiver having such high amplification that many places now considered blind spots for certain transmitters come well within its range of reception with enormous increase in reliability on low-power long-distance transmission.

A suitable circuit for a receiver of this nature is as follows:—

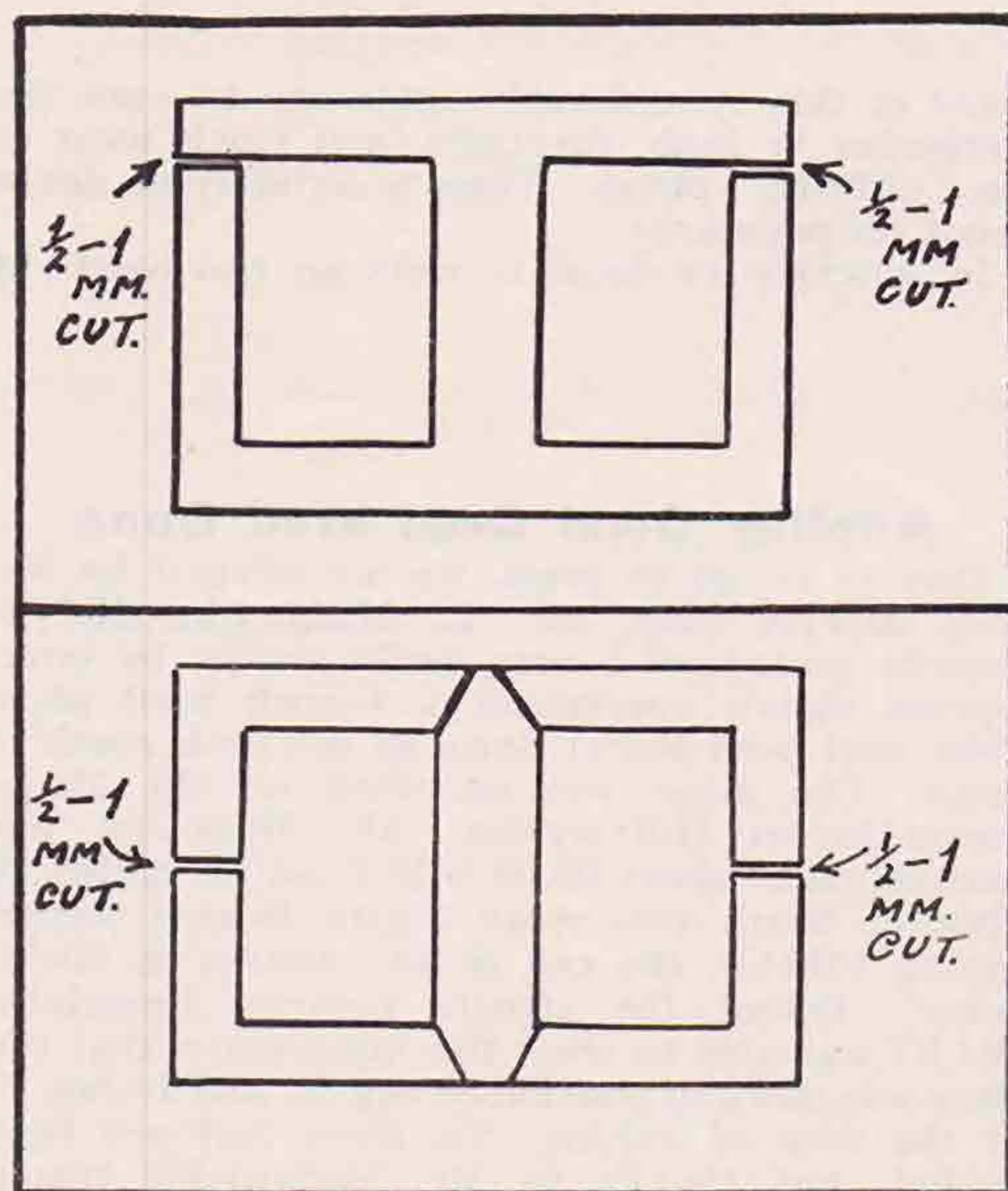
The transformers used can be of the ordinary L.F. type, preferably shrouded; they should be

opened up, and a saw-cut put through the laminations of each magnetic circuit. A cut of $\frac{1}{2}$ -1 mm. is suitable. The ends of the laminations should be splayed in order to avoid short circuits produced by the burr from the cut. Care should be taken to see that the transformers are all of the same type, and the cuts should be approximately the same thickness. The *secondaries* should be tuned with .0005 μ F. variable condensers, and the primaries directly fed by screen grid or high-frequency pentode type valves (*not* parallel fed).

The principal function of the tuning condensers is to adjust the peaks to the same frequency. This can be done by heterodyning a moderately strong station and then adjusting the condensers to give the maximum strength of note. L.F. reaction may with advantage be applied to this circuit. In most cases excellent loud-speaker reception will take the place of 'phone strength hitherto available. If 'phone reception is used, some system of A.V.C. might with advantage be introduced as the signal strength will be very considerable on nearby stations.

Obviously, transformers specially suited for this purpose will provide far greater efficiency—characteristics desired are: Low eddy current losses—(obtainable by the use of extra thin laminations or "iron-filings" compounds, i.e., the design should be more on the lines of I.F. rather than standard L.F. transformers); Step-up ratio of 3-1; Secondary inductance of 50-100 Henrys.

(Continued on page 336.)



Laminations should be interleaved with strips of paper where saw cuts are made to prevent burrs causing magnetic short circuits.

* The 362 Valve Co., London.

AROUND THE EMPIRE No. 4

ZT6AQ.

ZT6AQ came into being as the result of a temporary pause in the wanderings of G6UO.

In 1929 G6UO's activity was brought to an end by a trip to South Africa, where for a time the call ZU1J was held, and in the following seven years G6UO appeared on the air only two or three times, due to constant travelling. Apparently the DX was insufficient by radio, for some 35 countries were visited in person and W.A.C. and W.B.E. (the first letter standing for WALKED!) are only lacking because Australia and South America have not yet been visited!

During this period of travel, contact with amateur radio was made by personal visits to other stations and by pounding the brass at such stations as VE2EE, KAILY, VS6AH, W2ELK, etc., because the carrying of one's own apparatus is not an easy matter, due to customs and licence difficulties. The obtaining of a licence in the Empire is of course quite simple, but up to now the only trips which have not called for long stop-overs in foreign countries have been those to Africa, so only in this country has the necessary gear been taken along.

On the first trip to Africa normal "Haywire" gear was used but this proved no joke where transport was concerned, so when the present trip was planned it was decided to build suitable apparatus in the light of previous experience, with a view to a compact, high-efficiency job capable of being carried easily yet having power enough to obtain DX with a minimum of effort.

The original design did not come fully up to expectations, so the transmitter was modified later, and it is the present equipment which is the subject of this article. Though the design has been changed, the appearance of the gear is virtually unchanged, so the photographs still bear a strong resemblance to the actual apparatus.

Comments from DX stations express surprise at the signal radiated from a 35-watt input; comments from local amateurs express surprise that a signal goes out at all when the locality of the station is considered. The secret lies in making every component work at peak efficiency rather than relying on Brute Force.

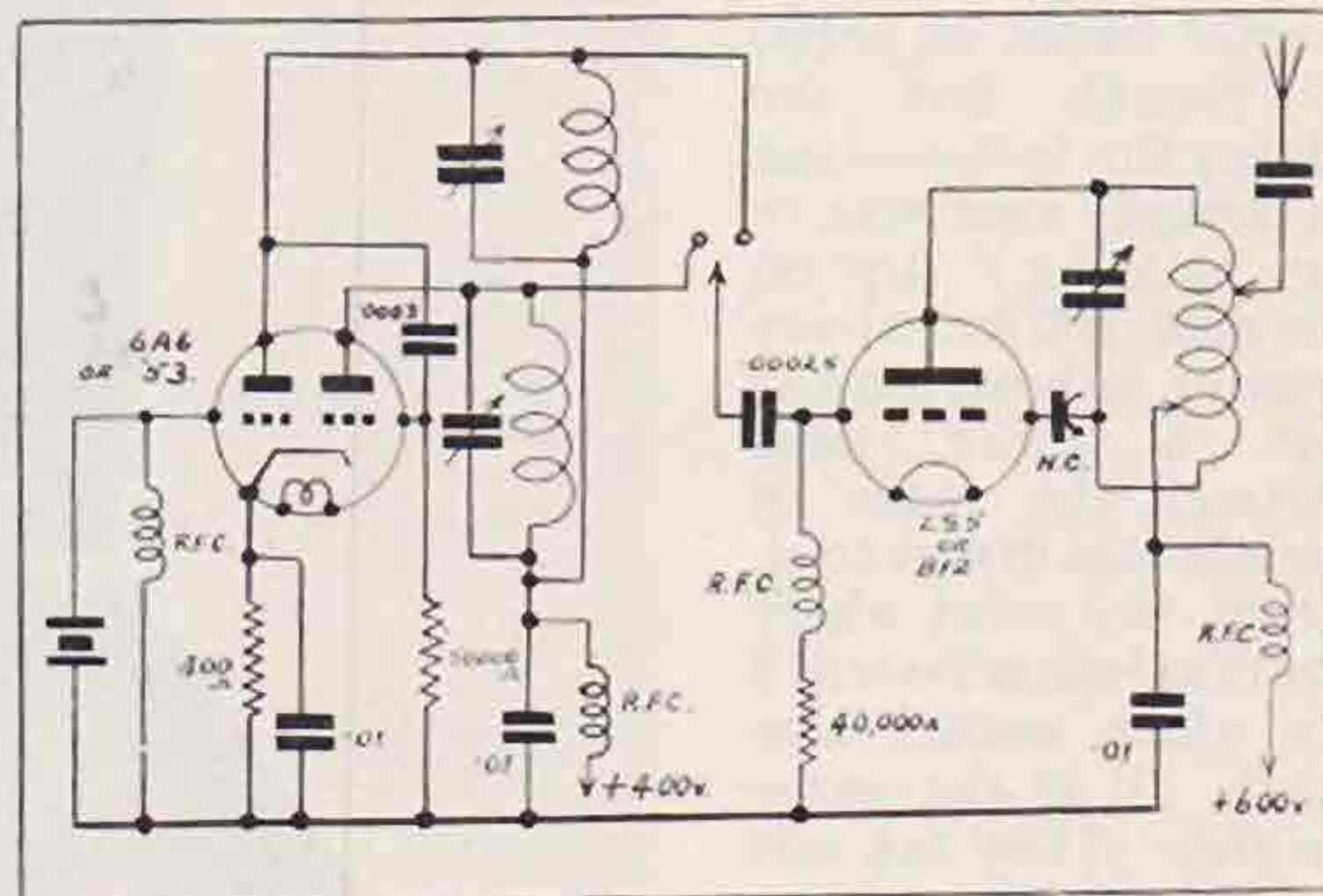
The first requirement being "Transportability," old *Burndep* portable cases were obtained to house the gear. As will be seen from the photos, one case contains the transmitter and the other takes care of all valves as well as the receiver, when on the move. The receiver has also suffered alteration, but needs no description. Suffice to say that it was originally an O-V-Pen, using 30-33 arrangement; was altered to O-V-2 (30-30-33) for a time, and is still O-V-2 but uses an SG detector, the final arrangement being 34-30-33. The tuning range is 500 to 10 metres.

To get the transmitter into the space available presented a problem. Crystal control was considered essential, so not less than two tubes were needed. The photo shows how this was done. An input of not less than 20 watts was required, so power supply was a difficulty with only 18" x 18" x 4" available, but *Messrs. Davenset, Ltd.*, solved the problem with one of their neat little transformers, and with a pack capable of delivering 600 volts

at 120 mA there was room enough for a 40 henry choke and the necessary smoothing equipment and switches, etc.

The original transmitter was a CO/PA using a 201 as oscillator into an LS5 as amplifier. The advent of the 53 and 6A6 double-triode tubes made easy revision possible. The present arrangement is a 6A6 working as oscillator/doubler, feeding a B.12 as amplifier. The 6A6 takes 40 mills at 400 volts and drives the B12 to 50/60 mA at 600 volts, so 30/35 watts input is the normal power. The circuit used is given in full detail for those who are interested, and all values have been checked and re-checked by substitution until every ounce of power (output, not input) has been obtained.

The aerial used is the Windom. The location will be dealt with later as it is of interest, but the top is 65 feet long, the feeder is tapped on at 22 feet



Circuit diagram of the very efficient and compact transmitter used by ZT6AQ.

from one end, and the feeder is 100 feet long. Other aerials have been tried, but the Windom has always proved the best.

The QRA is a small flat, and as space is valuable, the whole station stands on a table only 3 feet by 2 feet and the total space occupied, including operator, is 4 feet by 5 feet. For those who want a two-acre field and a 15 by 20 foot shack for their station, these details may be an eye-opener—especially to those who are crying for higher power because they cannot get DX on 100 watts.

Johannesburg is a miniature New York, with most of the buildings rising from six to twenty-one storeys in height. ZT6AQ is located in the city itself, on the first floor of a seven-storey block of flats. There are 70 flats in the building, and at least forty have radio! Further, on the 250-foot city block on which the building stands there are four other residential buildings, so the total number of radio sets on the block is about 150 at least. Further, it is estimated that within a radius of 1,000 feet there are at least 400 receivers in use. Not a bad spot for a murder if one causes key clicks or other interference!

To return to the "Home" building, however; there are 70 flats, and therefore 70 frigidaires, 70 electric stoves, 70 electric fires, the usual number

of electric irons, toasters, hair-dryers, etc.—all well-known interference-makers if a switch or wall-plug goes faulty. 50 feet away is a dry-cleaning establishment and 100 feet away is a hairdressing saloon. A well-known "G," when told of this, said it his idea of where Hams went to after death!

That is not the whole story, however. The whole block is built up to a height of 100 feet, leaving a sort of courtyard in the middle and, as aials are not allowed on the street side of the building all aials are at the back, and most people use outdoor aials. To stand in the courtyard and look up is an education. Forty aials hang at various heights in the restricted space, running in directions and at all angles. Right in the middle hangs the good old Windom!!

Screening is bad no matter where an aerial is placed, but the higher the better—and so thought everyone in the building! Up on the roof, 100 feet above ground is best, and at last a clear path through the maze of aials was discovered. From the point where the Windom is fastened six other aials also start, all at the same height. They fan out a little, and some drop a little, but all six terminate within ten feet in width and six feet in height of each other!

The feeder drops down straight for 80 feet, past other aials or leads-in, and finally runs horizontally *inside* the flat for 20 feet!! No attempt at insulation other than covered wire has been made and the feeder is first nipped in the fan-light over the door and then passes through a ventilator.

With all this, both WAC and WBE awards have been obtained, and 34 countries have been contacted in one year of operation. Reports of R6 are common, and R8/9 is often received from almost all parts of U.S.A., Asia and South America.

Greetings

The following message was received on December 28 by G6NF from ZE1JV:—

B.E.R.U. members in Australia send season's greetings and good wishes to their cousins in Great Britain and Ireland. (Signed) VK4GK.

Regarding interference to others; careful checks have been made on other receivers in the locality and no sign of a click is noticed and never has there been a complaint of any description. The station works at all hours, day and night, and an old 1-V-1 BCL. set used for B.C. reception in the same room shows no signs of clicks. The secret of this absence of interference lies in the use of a *Belling-Lee* line suppressor, a good keying filter, the earthing of all transformer cores, and the *leaving off of any earth to the transmitter negative*.

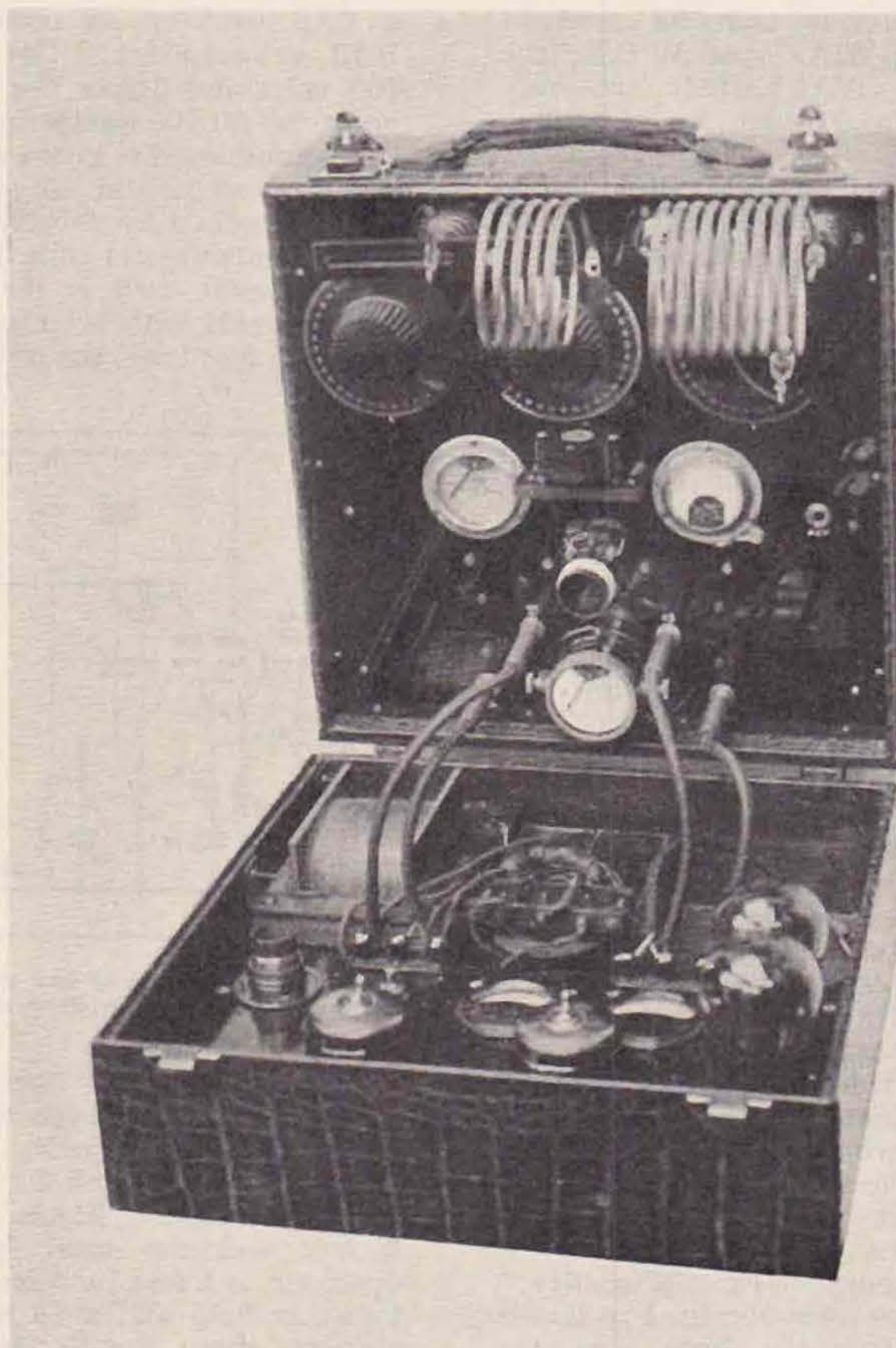
No one device will prevent clicks and the combination of the whole is necessary, but the most important point is that concerned with earthing the transmitter. All the other suppression devices are useless if the transmitter is earthed.

One or two points of interference have been over-looked, but should be included for full weight. There are two high-speed lifts within 50 feet of the transmitter, a trackless trolley-bus service 100 feet away, and a tram service 300 feet away!

The station is operated on the 7, 14 and 28 Mc. bands, but up to now only local contacts have been made on "Ten." At the moment two crystals are in use, on 7140 and 7193 kc., and these are doubled in the 6A6 for 14 Mc. whilst the B12 acts as a second doubler to "Ten" with the harmonic output put straight into the aerial.

The demand for high power is deprecated and the Editorial in the September, 1936, BULLETIN is

fully endorsed. In line with this, and to keep up with the times, another revision of the transmitter is planned, to use the new 6L6 SG tube in place of the B12 as amplifier with the object of obtaining a higher output to input ratio, with the input still well below the authorised 50 watts.



The complete transmitter showing the neat arrangement of components, including power choke and switches.

Norwich Radio and Transmitting Society

Members interested in joining the above recently formed society are invited to communicate with the Secretary, Mr. W. A. Dix (G5IX), 18, Harvey Lane, Norwich.

REDUCING QRM BY INTELLIGENT OPERATING

By A. G. HAM.

THERE appears to be a certain feeling in this country that since licences are granted for experimental reasons, it is *infra dig* to possess any proficiency as an operator. This is a very mistaken idea, as we are judged by the world in general as much on account of our operating as by the strength and quality of our transmissions. It is not difficult to become a good operator, because the greatest necessity is nothing more than common sense.

Some Suggestions for Improvement.

First, when you come on the air, *listen*; don't dash blindly into a test call without first obtaining some idea of the number, strength and distance of the signals coming through. For example, if you wish to work the States, listen first to see how signals are coming over. Assuming conditions are satisfactory, it would be pointless to wait for an American CQ, as there would probably be many others answering it, but this listening will have served the purpose of gauging the optimum speed and length of one's own test call. There are many well-known DX workers who still call "test DX" during American periods at 12 wpm for five minutes at a stretch, only to have some 30 or 40 stations come back to them, only one of which they can work at a time. This is sheer waste of the other man's time and power, and is nothing but rank selfishness.

On the average evening, when the 14 Mc. band is full of American signals, a one-minute test call at 20 wpm or more is ample. Further, if you have a choice of crystals, choose one away from the edges of the band when calling "test," as there will then be less chance of the QSO being spoiled by QRM.

When signing off at the end of the call, tell the world the way you are going to listen, by making use of the appropriate abbreviations:—

QLM—I am listening from the low frequency end to the middle.

QHM—I am listening from the high frequency end to the middle.

QLH—I am listening from the low frequency end to the high frequency end.

QHL—I am listening from the high frequency end to the low frequency end.

QMH—I am listening from the middle to the high frequency end.

QML—I am listening from the middle to the low frequency end.

Correct use of these abbreviations will save endless QRM, as stations operating near the frequency at which you propose starting to listen, need only call for 15 seconds or less.

Use common sense also when calling other stations. Choose your frequency intelligently, and never call for more than one minute, frequently interspersing your own call-sign.

When you have raised your man, cut the preliminaries as short as possible and *always* send single, using only recognised abbreviations; after all, the man at the other end knows invariably exactly what you are saying without listening carefully to it, so the shorter it is, the less needless

QRM is caused. Send your report twice, as there is a greater possibility of error in copying numbers than there is with plain language. Keep the report as concise as possible; e.g., "Ur 579x" conveys the same information as "Ur fb pdc xtal sigs QSA5 R7 tone T9 vy fb," and life is too short to listen to all that!

After giving your report sign over without further ado, get his report, and then carry on with tests, ragchew or what you will, regulating your speed to the report given, sending single and using "break-in" if possible.

When you have finished sign off quickly; don't take another five minutes over it as if you were saying goodbye to your sweetheart, and you weren't going to see her for years. Then listen around before starting another test call: someone else may be calling you, after having heard you sign off the last QSO.

Don't's.

1. Don't send double except under exceptional circumstances such as when fading and interference are bad. Even when handling E.L.S. reports, send the report single and then check it again, rather than send it double first time.

2. Don't carry out local "ragchews" on 14 Mc. when DX is coming through.

3. Don't use duplex phone unless it is equipped for carrier suppression or employs a "push to talk" arrangement.

4. Don't use high power for local QSO's. A tapped transformer and a D.P.D.T. switch will enable a quick reduction in power to be made.

5. Don't use a watt more than is necessary for reliable DX operation. On "good" evenings an input of 10 to 20 watts will put quite as good a signal into the States and elsewhere as 50 to 100 watts. Try cutting down your power after contact has been established—you will be surprised at the result.

6. Don't over-modulate phone or modulate c.w. Avoid the use of any form of signal that takes up more than its fair share of the band.

7. Don't deliberately operate just off frequency. This is the worst offence of all, as the Commercials may use it as evidence against us at Cairo.

We all complain about the amount of QRM in the bands nowadays and we all want it reduced. The remedy lies largely in our own hands. Make your operating snappier, use common sense, and everyone will benefit.

Fact is Stranger than Fiction

The first QSO effected by G5XW, of Croydon, was with G6OD, who said during the contact that he would be shifted from Bow to some other district during the next few months. G5XW thought no more of it.

Time passed until one day G5XW's small boy, aged 4½, went to meet his sister from school. On arrival the policeman on duty asked him who he wanted. Further enquiries elucidated the information that "My daddy is G5XW."

Needless to say, the policeman was G6OD!

THE 56 Mc. BAND

By L. G. BLUNDELL (G5LB).*

THE latest news from "down under" indicates that 56 Mc. DX work is getting a good deal of attention in VK2 and 3, and information received through G2YL and W9FM shows that inter-state working on this band is anticipated during the next year or two.

VK3BQ and 3BD have heard harmonics of lower frequency stations located a good distance away, and VK2OD and 2EH are reported to have heard VK4DE.

In North Africa conditions continue to provide CN8MQ with numerous signals from Europe. In recent QSO's (on 28 Mc.) with G6DH and G2XC he gave the following details of signals heard in December:—

December 3, 14.30, H of LY1KK.

December 14, 10.35, G5CM, R3/0.

December 24, F8OL heard CN8MQ at 11.00.

December 27, H's of PA0KW and PA0UN (R7 and R4 respectively).

So it seems that skip is about right during the daylight hours, and active CW stations are urged to be on at very frequent intervals so that there may be every chance of getting a medium DX contact while conditions are favourable.

G6DH passes along the information that VK3YP has received a report from D4 on his 56 Mc. CW harmonic when working on 28 Mc. G2HG reports hearing CN8MQ on December 27 at about 10.30, but no QSO was forthcoming.

Those with 28 Mc. gear please note that CN8MQ is in the habit of putting out "warning" calls on 28 Mc. when he finds conditions are good on 56 Mc. These calls are usually as follows:—"CQ 56 Mc. de CN8MQ: Condx on 56 FB for DX: Pse reply 56 Mc.": SK.

It is sincerely hoped that by the time these notes appear in print someone will have made history with a real DX QSO! but if not, well, let it be soon.

Now a few remarks apropos the CW tests, etc., suggested by G5JU in the December BULLETIN.

The writer heartily endorses and supports this idea and sincerely hopes that there will be a large number of stations who normally modulate their transmitters, putting out plain CW calls during the period mentioned. Also, it must be remembered, the hours mentioned by 5JU are, in view of recent events, apparently the most suitable and promising for DX work. With the increasing use of CW gear throughout the world, and improving conditions, the outlook is distinctly hopeful, so it is again urged that all who can will co-operate in this renewed effort to "get there."

As regards scheduled activity in this country, nothing in the way of amended or additional times has been received, but it is known that several stations are active outside the periods given in past issues, and individual activity is altogether on a larger scale. There is, therefore, definite encouragement for those interested in the receiving side only, so BRS and AA stations are asked to get busy and render useful assistance.

Looking ahead to days when the "portable" season starts, the writer suggests that some earnest thought be given to the use of CW on these occasions. Remember that some considerable saving in weight of gear can be effected by leaving out the modulation equipment—not to mention the consequent reduction in power consumption!

Battery-driven self-excited gear *can* be made to give a note suitable for keying, and suitable receivers are not at all difficult to get going. It would be interesting to see how a portable station using CW could make itself heard as compared with a 'phone rig with the same input and same QRA. So G portables, what about it?

As things are shaping, 1937 promises well for 56 Mc., and the writer takes this opportunity of wishing everyone the best of luck—in radio and otherwise.

* 45, Monivea Road, Beckenham, Kent.

THE 28 Mc. BAND

By NELLY CORRY (G2YL).

CONGRATULATIONS to G6DH on being awarded the Powditch 28 Mc. Transmitting Trophy. Everyone who has been active on the band during the last twelve months will agree that he thoroughly deserves it for the enormous amount of work he has done. Apart from anything else, his regular and comprehensive reports have been the mainstay of the 28 Mc. Propagation Groups of R.E.S. and of these Notes. Hearty congrats, OM!

Conditions during December, though slightly inferior to those of November, were more reliable than a year ago, and there was no really poor day throughout the month.

The summer weather in the Antipodes probably accounted more than anything else for the decrease in the number of Oceanic stations heard, but the fact that G6DH had contacts with eight different VK's and seven ZL's shows that they are still workable. Even G6WN has been successful in

making a hitherto unobtainable VK QSO. VK2GU, whose signals have been the most consistent from "down under," reported, in the course of a 45-minute QSO with G2XC, that Finnish stations were generally much louder than other Europeans. G2PL was easily the loudest G heard, with G6DH, G2XC and several others usually taking second place.

The increase in Asiatic activity reported last month has unfortunately not been maintained, and though JNJ has continued to come through most mornings between 08.00 and 09.00 G.M.T., J2CE and VS6AH were the only amateurs reported heard. Another region where activity has declined considerably is South and Central America, and apart from an occasional LU station and XE1AY, the "regulars" appear to have deserted 28 Mc. However, stations in Martinique and the Dominican Republic have been heard for the first time, viz., FM8AA, reported by G2XC audible around mid-day, and HI7G, whose 'phone signals have sometimes reached R8.

(Continued on page 336.)

THE MONTH ON THE AIR

BY JOHN HUNTER (G2ZQ).

CHRISTMAS, or the omission of my address * from last month's article is responsible for diminishing the number of reports received. Those received, however, are just what is wanted.

Queer calls take up much space this month. G6KP hears UN2A of QST fame, agrees with me that he is no Liberian. He works I5AA, of Caligari, Sardinia, for his 118th country. G6PJ asks about SNT1, heard continually QSO SNT4 on 14 Mc.—these are Spanish "Red" stations, probably ham rigs taken over by the authorities. Some British amateurs have worked such war stations recently, but the practice is not to be recommended, as amateur radio must keep clear of politics.

GSCI worked by G6ZO stated that he was a British ship off the Azores, QRD England from South America. QRM lost ZO the ship's name, but it ended in "-ic." Sounds doubtful owing to the strict prohibition of amateur operation on board British ships.

EI8G reports EI5F QSO HS4T, who explains that he borrows the transmitter of HSP or HSJ and QSY's it into the ham band. However, a QSL sent *via* HS1PJ was returned "No such station in Siam," and as HS1PJ is the Chief Engineer of HSP, etc., HS4T's story sounds a bit thin. VE2CID, heard frequently on 3.5 and 14 Mc. appears to be in Canada, but no more is known of him. G5HH reports NX1AP, but gives no theory as to his QRA. Maybe he's just an old-fashioned Greenlander. And maybe not. K6BKN heard recently is not the real one, who told 2AUB that he had been QRT for two years. 2AUB also hears TA1BJ, FK8AA, FK3AA, FB9AW, and knows nothing of any of them. FK8AA seems plausible, and 2AIJ's theory is that he is F7CGV, FK8CVG with a newly licenced call: he was heard on sked with FA8BG. G6YR has heard FS5AZ, but also cannot help with a QRA. Too many bootleg calls are on the air: if you know of any unlicensed stations in your district who use foreign calls, let me know; this form of bootlegging is particularly unpleasant, and offenders must be pilloried.

G6KJ breaks National Press headlines by announcing himself on 3.5 Mc. phone as "6 King John." A local reporter with an unselective BCL set and more enthusiasm than accuracy scented a second constitutional crisis and wrote up a highly imaginative story about "radio gate-crashers."

G2MI reports that DJC, German BC station is giving "ham hours" on a frequency just outside the 3.5 Mc. band. He calls various national radio societies in their own languages, and discusses ham topics generally.

7 Mc. at last finds its feet after many months of no DX. G6WY raises XE1AX on a test call, while G6NX works HH5PA, PZ1AB, asks if the latter is a first 7 Mc. contact. Ten watt stations work U.S.A. and CM easily, and G6ZO hears XU6SW, VP2GA, KAIUS among others on this band. G2SO hears K6NOJ S7 at 0840.

14 Mc. activity falls off slightly with the improvement of 7 Mc. conditions, but G6YR works CR7MB;

G5HH has QSO with W7MB at 1130 G.M.T.; G5OQ works the world, and G2YB hears FB8AF, as well as working most of the world. All these stations use QRP.

3.5 Mc. is exceptionally good, and ZL1DI was heard for an hour one morning calling HB9Y without success, but apparently not listening for all the other stations calling him. G6WY works several W9's. G6FO reports some amazing work by his next door neighbour G6GM, located 20 miles away. GM, using less than ten watts to an all-battery MOPA, has worked W2BGO on 3.5 Mc. for 20 successive mornings, and there seems no reason why he should not go on all winter. G5FI tried to raise U.S.A. with his QRP on both 14 and 7 Mc. with no luck, so FO advised him to try 3.5; FI now works W's in strings. In G6FO's opinion 1.7 Mc. will be opening up for DX at about the



XU3FK, operated by Dr. Robert, in Chefoo, has provided a first contact with China for many British Stations. He QSL's too!

end of January for a few weeks. U.S.A. should then be easily worked on less than ten watts between 0600 and 0800 G.M.T. To raise American stations on this band, G's should keep below 1800 kc., the lower edge of the U.S.A. 'phone band.

Ex-VS6AX, laterly of the British Field Force at Haifa, Palestine, and also BERS311 of Ambala, India, complain of the high power G stations who unnecessarily modulate their notes, giving no chance to the QRP man with but one crystal. BERS311 also notices much off-frequency operation during contests, and criticizes those stations who fail to give their calls during quickfire contest QSO's, thereby losing points to receiving stations.

There are as yet no licences in Greece, according to G2MI, but active in Athens are SV1AZ, 1RX, 1SM on 7 Mc., and 1KE, 1RX on 14 Mc. QSL's should go *via* SV1KE, 17a, Bucharest Street, Athens.

W8DOD's YL breaks new ground by sending DX stations, in each country worked, a diamond shaped piece of material, asking them to sign it with name and call; when enough are returned to her, she will sew over the signatures, and fix them together into a quilt, or should it be qslt? G6CL and G6KP represent England.

(Continued on page 336)

BOOK REVIEWS

The Radio Amateur's Handbook. Fourteenth (1937) Edition. By the A.R.R.L. Headquarters Staff. 544 pages, 564 illustrations, 74 charts and tables. Published by the A.R.R.L., West Hartford, Conn., U.S.A. Price \$1.00 in U.S.A., \$1.25 elsewhere. Obtainable from R.S.G.B. Sales Dept., 5s. to members, 5s. 6d. to non-members.

If there is an amateur who has not heard of this Handbook he is probably using a coherer, so it doesn't matter to him; those who possess one or more of the 400,000 copies which have already been issued will want to know in what way the present edition differs from previous ones.

A considerable amount of rewriting has been done, and 200 new illustrations have been included. As would be expected, the new valves necessitate new treatment in the CW and phone designs. Noise silencers are treated more fully and brought up-to-date. Aerials receive more space, especially with regard to directional systems and coupling methods. The most advanced designs in ultra-high frequency equipment are supplied, and this must prove an increasingly attractive section. The charts and tables are even more comprehensive than before, and the seventeen pages of valve data is claimed to be the most complete and detailed tabulation of valve data ever published.

In every way the new Handbook is "bigger and better than ever," and is easily the best value in radio literature that it would be possible to find. The growth and success of the Handbook since its inception has been one of the most marvellous events in the history of amateur radio; not only is it to be found in the shacks of amateurs all over the world, which is natural, but it is used in many schools and technical classes as a text-book, and a first-rate book it is. The writer has found it lurking in unexpected places; the operating room on an American warship, and the control room of a B.B.C. station, to mention only two.

The amateur who is without a recent copy of this grand book is lacking in something more than money, for its price compared with its value is merely nominal.

The A.R.R.L. deserve our heartiest congratulations, but as amateurs we ought to take a pride in the quality of this book, which is so often the ambassador of amateur radio in the courts of the professional. The trouble is that, to read each edition thoroughly as it comes out, one would find little time left for amateur radio.

T. P. A.

* * *

Television Optics. An introduction. By L. M. Myers. 338 pages and 214 illustrations. Published by Sir Isaac Pitman & Sons, Ltd., London. Price 30s. net.

The student or engineer interested in television has had, until recently, to go to original papers in

technical journals for such information as he could glean there of the modern technique. Recently, books on television subjects have been appearing, many of the popular type, but an increasing number of them sound scientific works dealing with different aspects of the subject. The present book is such, and the importance of this branch of the technique needs no stressing.

The author considers that television may be divided into three branches: purely optical, electron-optical, and purely electrical or radio. The book concerns itself with the first two.

Chapter 1 deals in considerable detail with image formation by lenses and the aberrations which arise. The second chapter is concerned with photometry, giving a very clear outline of the various definitions, laws, and modes of measurement. Chapter 3 deals with the Kerr effect very fully; perhaps readers will consider the 65 pages so devoted rather out of proportion to the 55 pages given to the theory of image formation. However, this is probably the fullest and most up-to-date treatment of this subject which has appeared between covers.

The next chapter describes mechanical optical scanning systems; the lens drum, the prism drum, the Nipkow disc, the mirror drum, the mirror screw, etc. Each is treated analytically, and a most interesting section dealing with various types of film transmitter is included.

The last chapter covers the very important subject of electron optical scanning systems, and much information of all kinds is given regarding cathode ray tubes, time bases, the Farnsworth transmitter with its multiplier, the iconoscope, and the intermediate film receiver. The chapter ends with a useful introduction to electron-optics.

Two appendices deal with picture frequencies, and the technical details of the Alexandra Palace transmissions, respectively.

It might reasonably be considered that the human eye as the last optical instrument in the chain, and one with very definite peculiarities, would receive much more attention.

The subject must, of necessity, and to a considerable extent, be treated mathematically; but the mathematics employed have been kept comparatively simple.

This is a sound technical work which should interest all students of the subject. It is well illustrated with helpful diagrams and photographs.

T. P. A.

* * *

"India to China." By The Buzzards. Published by Messrs. Eyre & Spottiswoode.

Mr. A. H. Campbell, G6HC, has sent us for review a copy of a very unique little booklet which has been prepared for the benefit of Scouts and others who are desirous of learning the Morse Code.

The whole book is written in Morse, including a map of the world which has its place names in the code.

The book is beautifully produced, and is written in the form of a story entitled "India to China." The price is 2d. (post free 3d.), available from the Scout Shop, Buckingham Palace Road, London, S.W.1.

RESEARCH AND EXPERIMENTAL SECTIONS

MANAGER :

H. C. PAGE (G6PA), "Warren House," Warren Road, Bexleyheath, Kent.

ASSISTANT MANAGER :

J. C. ELMER (G2GD), "Aethelmar," Seabrook Road, Hythe, Kent.

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G.M. : 7 and 14 Mc.

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G.M. : 28 Mc.
(To be appointed)

G.M. : 56 Mc.

J. N. WALKER (G5JU), 4, Frenchay Road, Downend, Bristol, Glos.

G.M. : Artificial Aerials

A. W. LISTER (G5LG), Royal Military Academy, Woolwich, S.E.

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G.M. : General

J. MAWBEY (BRS. 1300)

G.M. : 56 Mc.

J. N. WALKER (G5JU)

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F. WILSON (G2XX), 85, Risca Road, Newport, Mon.

G.M. : 28 Mc.

L. O. ROGERS (G2HX), "Audwen," Estcourt Road, Gloucester.

G.M. : Joint Group with Propagation

G. A. H. ECKLES (G5GC), 57, Sutton Road, Beverley High Road, Hull.

No. 4 : PROPAGATION

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G.M. : 56 Mc.

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MISS N. CORRY (G2YL), "Redholm," Walton-on-the-Hill, Tadworth, Surrey.

G.M. : Conditions

J. HAIGH (G6HA), 2, Greenock Terrace, Leeds, 12.

G.M. : Literature

A. T. MATHEWS (G5AM), 24, Woodside Park Road, North Finchley N.12.

G.M. : Joint Group with Aerial Design

G. A. H. ECKLES (G5GC).

No. 5 : VALVES AND INSTRUMENTS

S.M. : D. N. CORFIELD (G5CD), 10, Holders Hill Gardens, Hendon, N.W.4.

No. 6 : AUXILIARY APPARATUS

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No. 9 : TELEVISION

S.M. : E. L. GARDINER (G6GR), The Nyth, Norwich Road, Northwood, Middlesex.

G.M. : Contemporary Literature

E. J. SCUDDER (BRS. 981), 32, Queen Street, Folkestone, Kent.

NEWS OF THE MONTH

Design of a 56 Mc. Superheterodyne.

This month we have much pleasure in publishing an introductory article from the pen of Mr. Chambers (G5NO) on the subject of superheterodyne receivers for 56 Mc. The subject is not an easy one to deal with, and in consequence the cost of such a receiver must be somewhat considerable. However, it is felt that members will be interested in the writer's experimental work on this subject.

A Stabilised Oscillator for 56 Mc.

We have often emphasised the need for stable transmitters on 56 Mc., and we make no excuse for introducing the subject again. Until we have steady transmissions on these frequencies we shall not make real progress. While crystal control is without doubt most desirable, it is certainly possible to attain a good measure of stability by other means; the article from Mr. Clark (2B1B) shows another method of achieving this condition.

Measurement of Power Output.

We are indebted to Mr. D. N. Corfield (G5CD) for a timely contribution on the subject of power output measurement, for this is a subject which arouses interest whenever the question of efficiency of transmitter stages is discussed.

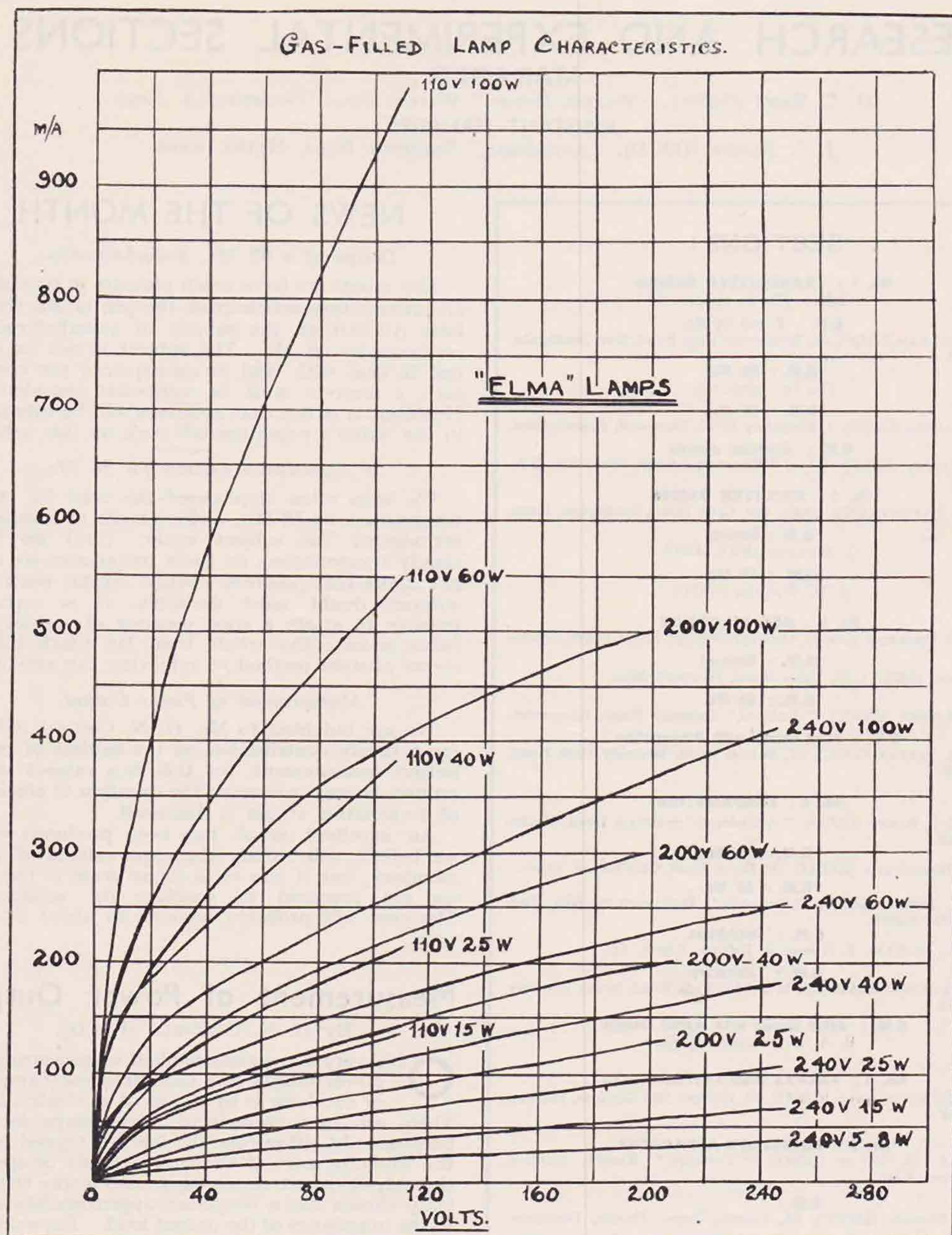
An excellent graph has been produced which we believe will satisfy the requirements of most members, but if one on a larger scale is required we are prepared to consider its production. The cost will probably amount to about 6d. per copy.

Measurement of Power Output

By D. N. CORFIELD (G5CD).

ONE very convenient method of measuring the power output of a radio frequency amplifier or oscillator is by means of an electric lamp. There are two methods of using lamps for this purpose. In either case the lamp is tapped across the whole or part of the tuned circuit comprising the output circuit, arranged in such a way that the lamp chosen has a resistance approximately equal to the impedance of the output load. For example, a transmitter is designed to give an output of, say, 40 watts into 600-ohm untuned feeder line; therefore a lamp of, say, 60 watts rating is required, and a 240-volt 60-watt lamp when lit with 40 watts has a resistance equal to 800 ohms, which is near enough correct.

The graph shows a series of curves for most standard sizes of lamps plotting voltage against current. These curves apply to gas-filled lamps made by a member of the Electric Lamp Manufacturers' Association (E.L.M.A.), and do not apply to cheap foreign lamps. These curves show that



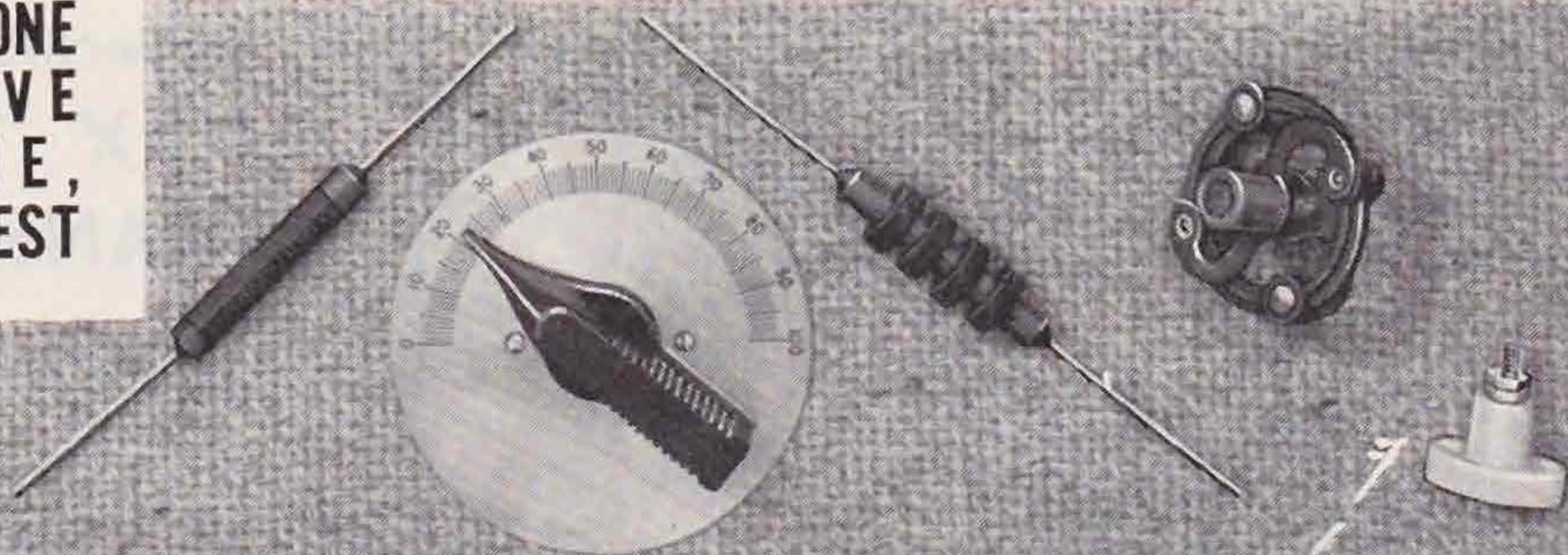
the resistance of a lamp does not follow a straight line law, but from these curves the resistance and watts dissipated for any voltage or current can be obtained.

The writer has no facilities to produce curves suitable for low-power work, but no doubt many readers are in a position to take curves of such lamps for themselves.

When a lamp is used for the measurement of R.F. output, there are two ways of measuring the power: the current through the lamp may be

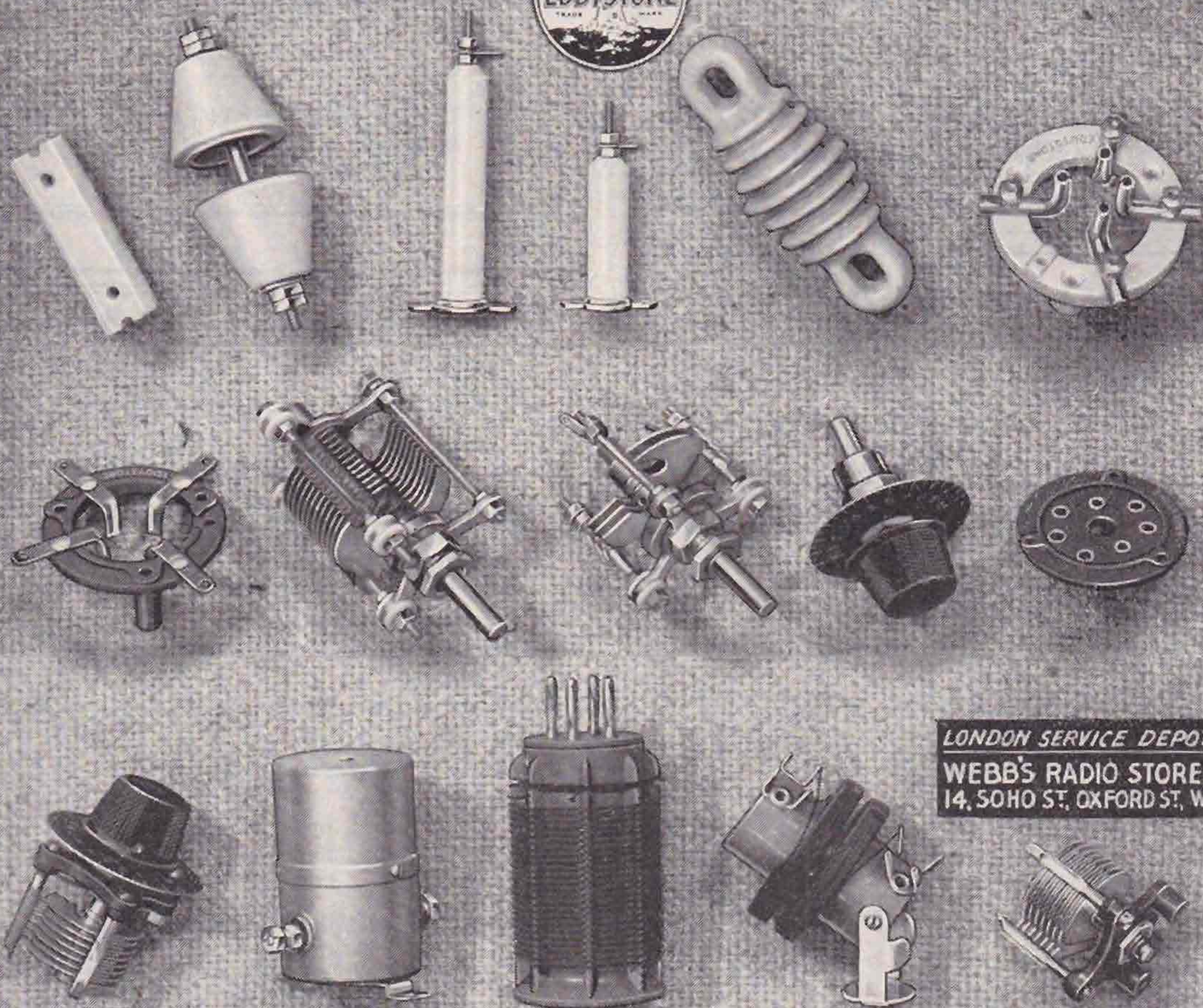
measured by a suitable hot wire or thermocouple meter, or the voltage across it may be measured with a valve voltmeter, and by referring to the curves the watts may be calculated. If it happens that no R.F. measuring instruments are available, the measurement may still be made by photometric methods. The simplest of these is to set up a similar lamp about 2 to 3 ft. away supplied with D.C. or A.C., whose voltage or current can be adjusted and measured with ordinary meters. Exactly half way in between the lamps is a sheet of

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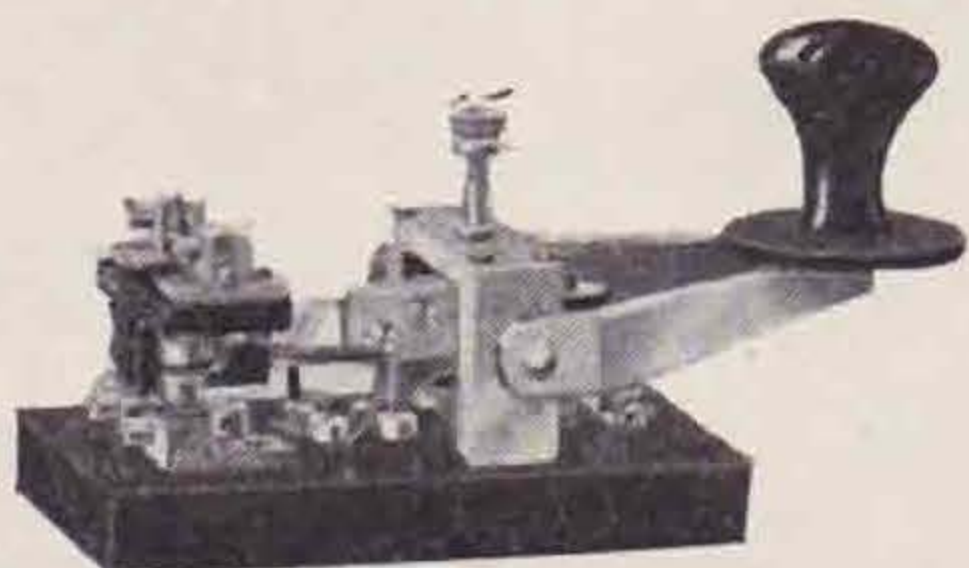


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paper with a grease spot in the centre (grease spot photometer). If the second lamp is adjusted in brightness until the grease spot is not visible, and the current or voltage read off on the meter, reference to the curve will give the power in either lamp, the two being equal.

For measurement at ultra high frequency (56 Mc.) it is advisable to dispense with a lamp holder and

solder directly on to the cap. No advantage has been found by removing the cap, as the capacity in the cap is very small compared with that in the pinch of the lamp.

Measurements of the above type may be accurate to about 10 per cent., except at ultra high frequency, but in any case they give a very easy and cheap method of measuring the comparative output of one piece of apparatus against another.

A FREQUENCY STABILISED OSCILLATOR

By I. B. CLARK (2BIB).

THIS design for oscillatory circuits, although not new, is, perhaps, not so well known among amateurs, as by its merits it should be. Study of the diagrams appended shows that the design requires no expensive components; in fact it would be difficult to have anything more simple. In Germany the circuit has been tested down to

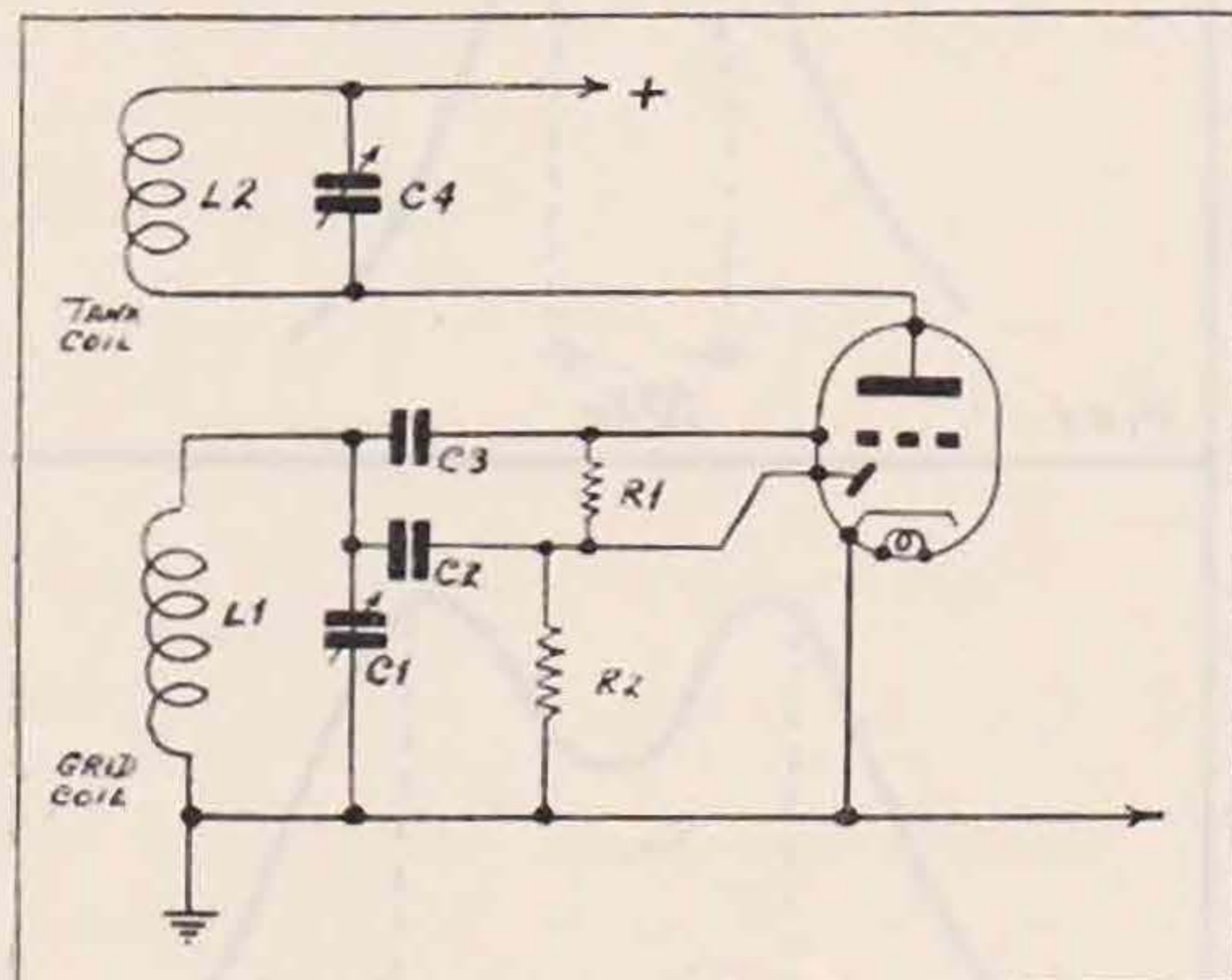


Fig. 1.

Bias Fed direct to Grid.

- L.1. L.2. C.1. C.2. *Dependent of Frequency.*
 C.3. 10 $\mu\mu\text{F}$. Mica.
 C.2. 200 $\mu\mu\text{F}$ do.
 R.1. .5 to 1. Megohm.
 R.2. 50,000 ohms to 1. Megohm.

well below five metres, and has been found to give a very stable output even on these high frequencies. Therefore, the design should appeal greatly to those who are trying to find something a little better than the self-excited oscillator for the ultra-high frequencies. Those who are working on Super Hetrodynes will also find that the method lends itself very well to the second detector stage for obvious reasons.

It is not necessary to say much about the principle upon which the circuit operates, beyond the fact that any change of H.F. output is rectified by the diode and fed back to the grid as bias. In this way the ratio of the grid and anode currents is held constant.

There are two ways of feeding back the current. In Fig. 1 is shown the method by which the bias is fed directly on to the grid. The use of R_1 is to keep the H.F. potential on the diode higher than the potential on the grid. This method of feedback lends itself also to directly heated valves. In Fig. 2

is shown the cathode feed back method. This second circuit lends itself very well to T.P.T.G. construction for five metre operation.

Fig. 3 gives one application of the design in the form of a stabilised Electron Coupled Oscillator. Other uses will be obvious and so no space need be given to them here.

Modulation of the oscillator is effected in series with the bias resistance. Very little input is required for modulation; in fact in practice it was found that a pick-up and a 4:1 ratio transformer were all that were necessary, but a great deal depends upon the type of valve used.

Temperature does not affect the system once the transmitter has been allowed a short while to warm up.

To "start up" the oscillator it is necessary to disconnect the diode plate of the oscillator by means of a switch. The oscillator is then adjusted as a normal self-excited oscillator until anode current is at a minimum. The diode is then re-connected when the anode current will drop to a still lower value, but the valve remains in an oscillating condition with the frequency stabilised.

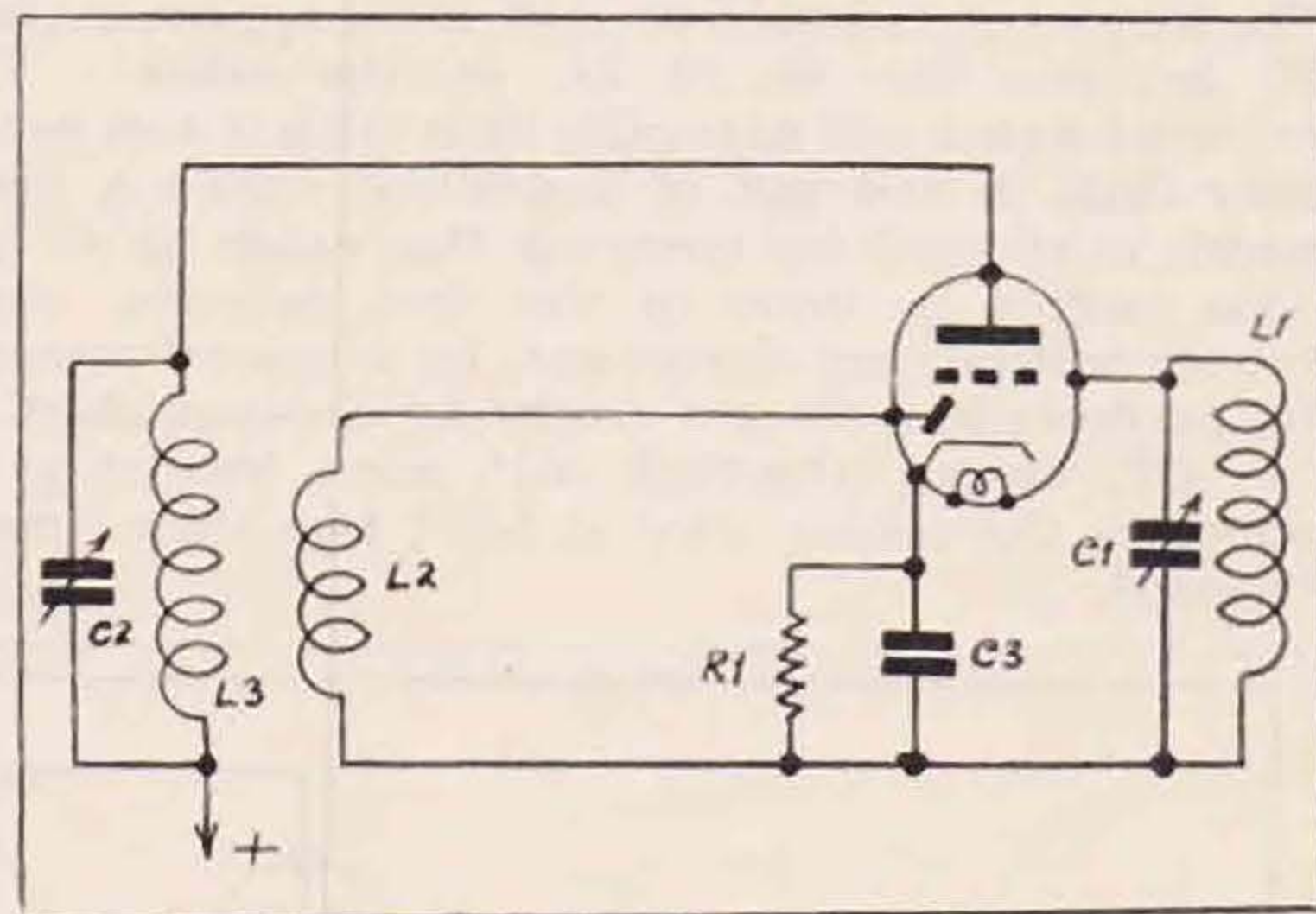


Fig. 2.

Cathode Feed-Back Method.

- L.1. L.3. C.1. C.2. *Dependent on Frequency.*
 L.2. Approx. 50 per cent. of L.1.
 R.1. 20,000 to 100,000 ohms.
 C.3. .001 μF . mica.

It is inadvisable to use either high feedback coupling or a valve with a very high amplification factor. Should this be done very little output will result in the normal way.

In conclusion, the writer would like to express his thanks to D4BUF, 2BUC, and Herr W. Schramm for their co-operation.

THE DESIGN OF A 56 Mc. SUPERHETERODYNE

By G. CHAMBERS (G5NO).

THE design of a superheterodyne receiver for the ultra-high frequencies, which include the amateur 56 Mc. band, differs a good deal from that for use on lower frequencies, but is not so difficult as may first appear. The experience and abilities of the average amateur must be taken into account and also the question of expense.

Obtaining suitable valves is the first consideration, particularly that of finding an efficient frequency-changer. A Triode-Hexode appears to be the most suitable type and the *Osram* X41 works well. The oscillator section possesses an unusually high mutual conductance and oscillates readily in a Colpitts circuit up to 75 megacycles.

It is extremely difficult to obtain a worth-while gain from a radio frequency stage with normal valves and the use of an "Acorn" would be essential. This would add considerably to the cost and entail extra complication in the lining up of the receiver, and will not therefore be considered. It is advisable to start off with the frequency changer and, if required, an R.F. stage can be added later.

Two intermediate frequency stages are used, and since transformers wound for 465 kc. are commercially available at a reasonable price, this frequency is used. It must be pointed out that normally a band width of 9 kc. is passed by these transformers, and therefore the receiver we have in mind will be quite unsuitable for the reception of vision signals, for which a band width of 2 megacycles would be necessary. At the same time, a band width of 9 kc. will not be satisfactory. One of the troubles encountered is that of frequency drift, which may be more or less serious, so that the frequency is liable to shift from approximately 20 kc. one side to 20 kc. on the other. The received signal will naturally drift with it and hence may drift in and out of audibility, unless a band width is allowed for covering this range of 40 kc. This cannot be done in the first detector, since tuning will be very sharp, but, by a special method to be described, it can easily be accomplished in the I.F. stages, although with some loss of gain, which is the reason why at least two stages must be used.

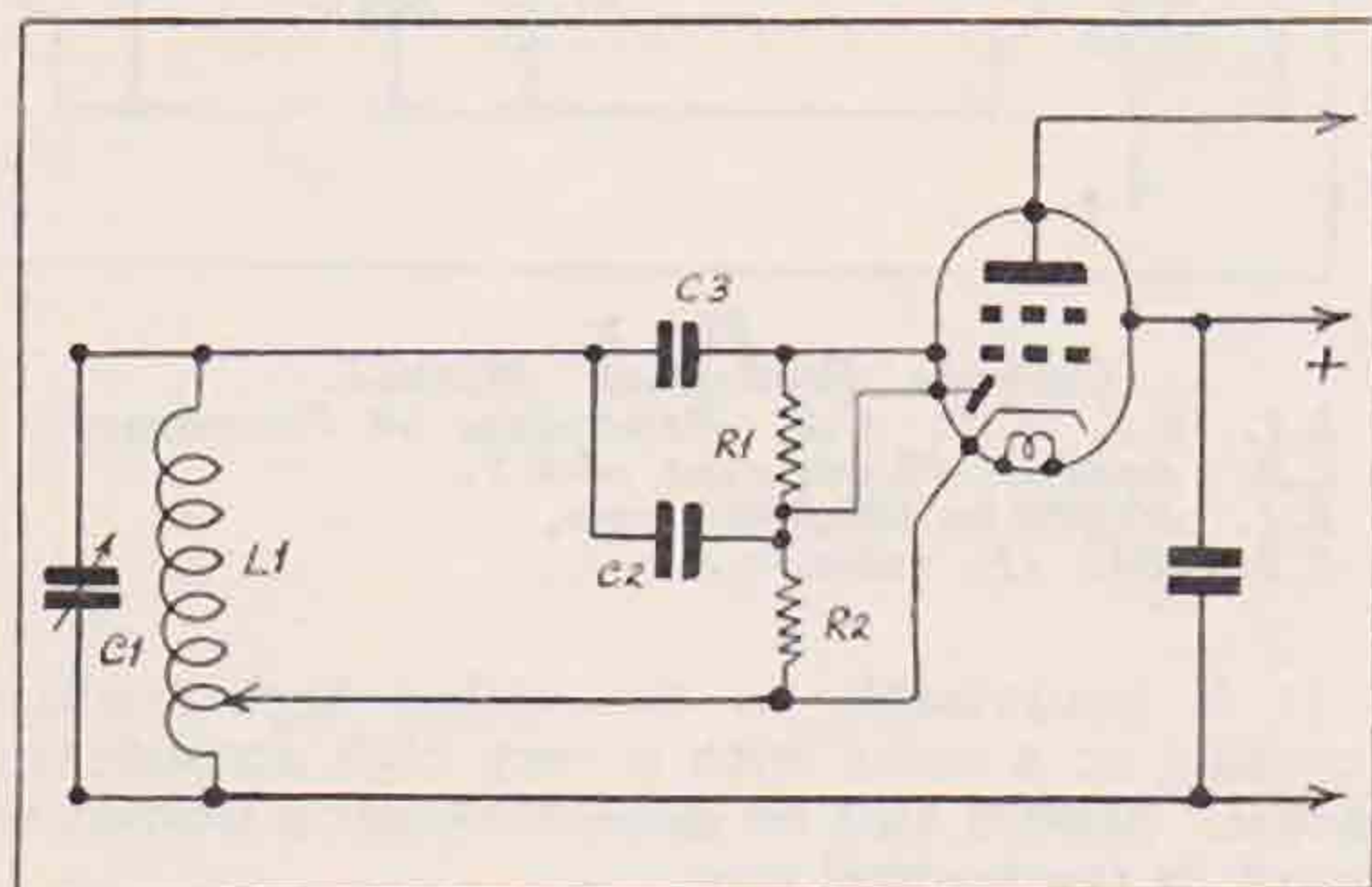


Fig. 3.
Electron Coupled Oscillator.
Values as for Fig. 1.

To illustrate this method:—Fig. 1 shows the curve of the usual type of transformer with both primary and secondary tuned to, say, 450 kc. If now we tune the primary to 430 kc. and the secondary to 470 kc., we shall obtain a curve similar to Fig. 2. It will be seen we have our desired band width of 40 kc., but the top is not flat. The curve may be flattened to give a linear response (Fig. 3) by putting resistances, of equal value, in series with the primary and secondary circuits. Since the value required is of a low order,

(Continued on page 336.)

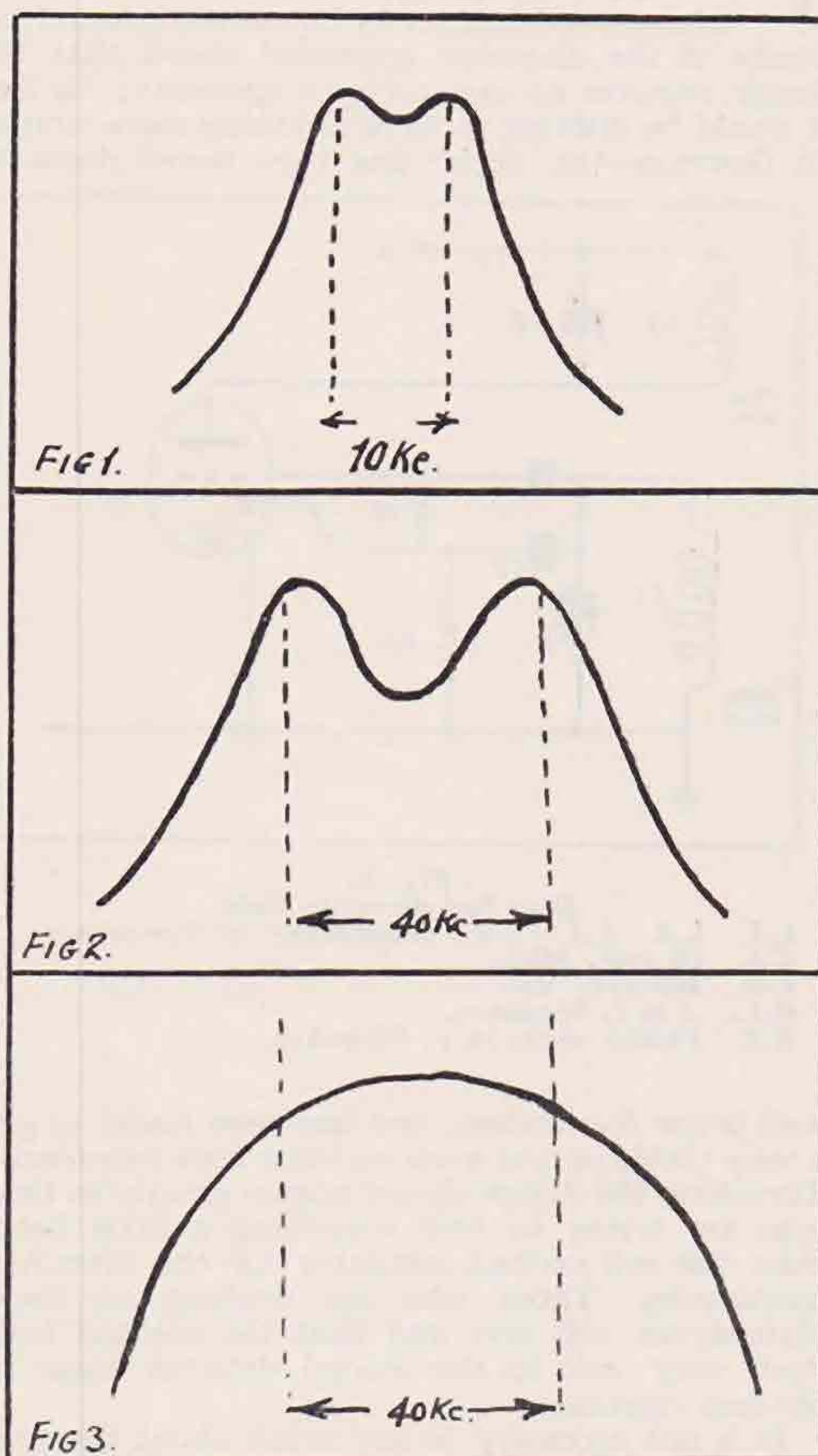


Fig. 1 (top).

Curve of usual I.F. transformer with primary and secondary tuned to say 450 kc.

Fig. 2 (centre).

Curve obtained with primary tuned to 430 and secondary to 470 kc.

Fig. 3 (bottom).

Curve obtained by inserting resistances of equal value in series with primary and secondary circuits.

BETWEEN



OURSELVES

Appreciations

The Secretary wishes to thank all members at home and abroad who sent seasonal greetings to himself and his staff. These expressions of goodwill were very much appreciated.

Presentation to Mr. A. E. Watts

Owing to illness our Past President, Mr. Arthur Watts, was unable to be present at the annual general meeting held last month. Arrangements have been made for the presentation to take place at the I.E.E. meeting to be held on Friday, January 29.

At this meeting Mr. E. Dawson Ostermeyer will read his Presidential address, after which Mr. H. C. Page (G6PA) will open a discussion on the design of straight receivers. It is hoped that all London members will make an endeavour to attend, as the subject is one which should interest everyone.

I.E.E. Meetings commence at 6.15 p.m., and are preceded by tea served free of charge, from 5.30 p.m. New members resident in the London Area are cordially invited to these meetings, and it is requested that they should make themselves known to the Secretary and other Officers of the Society. Topics for future discussions should be forwarded to the Secretary.

Congratulations

Our congratulations are offered to Viscount Carlaw (G6XX), on the occasion of his recent marriage to Miss Peggy Cambie.

Visit to Decca Gramophone Company

We are pleased to announce that arrangements have been made for a party of members to visit the Recording Studios of the *Decca Gramophone Co.*, London, at 6 p.m. on Friday, February 5. Members desiring to be included in the party must send a card to Headquarters prior to February 1, in order that they may receive full details of the visit.

New D.R.s Appointed

We have pleasure in announcing that Council have appointed Mr. J. N. Walker (G5JU), District Representative for Western England in succession to Mr. R. A. Bartlett (G6RB), who has resigned owing to pressure of private business.

Mr. Walker, who is one of our best-known Bristol members, has made many valuable contributions to R.E.S., in which organisation he holds the position of Group Manager.

Mr. W. H. Allen (G2UJ), of Tunbridge Wells, has been appointed District Representative for South-East England in succession to Mr. A. O. Milne (G2MI).

Mr. Milne, besides being a member of Council, is the newly appointed Manager of the Band Monitoring Group. He is also BULLETIN draughtsman. In order to be relieved of District Representative duties, Mr. Milne offered his resignation to Council.

Mr. Allen is an active member of the Tunbridge Wells Society, and a regular visitor to meetings held throughout Kent.

The Council desire to record their thanks to Messrs. Bartlett and Milne for their past services, and tender their best wishes to the new District Representatives.

The re-appointment of all other District Representatives was confirmed by Council at their December meeting.

Town Representatives 1937

The following additional Town Representatives have been appointed since the publication of the list in our last issue :—

District 1.

Blackpool : Mr. H. M. Fenton (G8GG).

District 3.

Birmingham : Mr. G. Brown (G5BJ).

District 4.

Derby : Mr. H. Street (G25D).

Leicester : Mr. H. Vendy (G5VD).

Nottingham : Mr. J. Lees (G2IO).

District 10.

Swansea : Mr. E. Dell (G2UL).

District 11.

Colwyn and Llandudno : Mr. A. Ogden (G5OD).

District 16.

Ashford : Mr. R. W. Wratten (G2JV).

District 19.

South Shields : Mr. W. Smith (G5WZ).

G6DH Wins Powditch Trophy

Members at home and abroad will join us in congratulating Mr. D. Heightman (G6DH), of Clacton, Essex, who has been awarded the 28 Mc. Transmitting Trophy (presented by the late Mr. H. J. Powditch) for the year 1937 in recognition of his outstanding experimental work on that band.

Band Occupancy Check

Details of the 10th Band Occupancy Check carried out last November are just to hand from Mr. L. Hill, G5WI, the Manager of the Group.

All previous records have been left far behind, and for the first time over 1,000 individual British stations have been logged during a check period.

The details of the check occupy a book of over 30 pages, a fact which will give members some idea of the colossal task undertaken by the Group, and Mr. Hill in particular.

The following summary shows the activity on each band checked:—

1.7 Mc.	3.5 Mc.	7 Mc.	14 Mc.	Total.
148	123	907	487	1,665

Many of the stations logged were heard on more than one band; therefore, the table of Individual Stations active provides an even more accurate index of stations in operation.

We give below the I.S.A. figures from Series 1 to date:—

Series.	Date.	Totals.
1	July, 1932	211
2	November, 1932	355
3	March, 1933	526
4	September, 1933	706
5	March, 1934	751
6	September, 1934	745
7	April, 1935	815
8	September, 1935	905
9	April, 1936	928
10	November, 1936	1,169

In addition, it should be remembered that a number of stations work exclusively on 28 and 56 Mc., whilst others are inactive on Sundays when the checks are conducted. If this fact is taken into consideration, it is safe to assume that the total activity to-day is approximately 1,300, which represents 75 per cent. of the total calls issued, a figure which we believe is higher than in any other country.

The stations taking part in the November checks were:—

Bristol: G6RB, 5KT, 6ZR, 5WI, 2BMK, BRS689.

London: G6ZO, BRS565, 1729.

Burton: G5JF.

Glasgow: G6JD, 5ZX, 2BQL, BRS1295, 1705.

Mobberly: BRS2402.

Liverpool: BRS2298.

Belfast: GI6TK.

Penryn: G6LV, BRS2654.

Members desirous of joining the B.O. Group should communicate with Mr. L. Hill, 56, Ravenhill Road, Lower Knowle, Bristol.

Piracy

Although it is not our policy to publish information concerning the illegal use of members' call signs, we feel that attention must again be directed to this despicable practice.

In examining cards for G8 stations we have observed that a large number are addressed to unlicensed stations. The call G8WW provided a good example of persistent piracy, and we are pleased to report that the person using this call has been located and prosecuted.

Up to the end of December calls up to G8IZ had been issued. The only exceptions to the straightforward series of allocations are mentioned in the December issue of the Call Book.

We are asked by Mr. Budden, G6BP, to state that he has not been on the air since receiving his call some months ago. The batch of cards which recently accumulated at Headquarters addressed to G6BP have been sent to the G.P.O.

We consider it is the duty of every licensed amateur to report a pirate to the Society without warning.

Piracy must cease.

Questions and Answers

The Council have given consideration to a suggestion made by members in District 8 that a Questions and Answers page be run in this Journal.

Before the matter can proceed it is essential that we should have the names of at least three members who would be willing to reply to technical queries.

Members in a position to undertake this work are requested to communicate with the Secretary. It is suggested that a small fee be charged for this service, half of which would be retained by the Society and half by the person answering the query.

The questions would be answered direct to the person instituting them, and selected questions and answers would be published monthly.

CALIBRATION SERVICE

Crystals should be sent direct to the Calibration Manager enclosed in a small tin, and securely packed to avoid loss in transit. The Society cannot be responsible for any loss that might occur in sending crystals through the post.

Return postage must be enclosed as postage stamps, and not attached to the Postal Order.

Calibration fees: 1.7, 3.5 and 7 Mc. crystals, 1s. 6d.; 100 kc. crystals, 2s. 6d.

All communications should be addressed to:—

Mr. A. D. Gay (G6NF),

"Oak Dene,"

156, Devonshire Way,

Shirley,

Croydon,

Surrey.

See page 117 *A Guide to Amateur Radio* for particulars of frequency meters, etc.

Technical Articles

The Editorial staff are now planning their programme for the period March to September, and to assist them in this task members are invited to make suggestions for future technical articles.

The Editor will also be pleased to consider for publication articles submitted by members. Such articles should, if convenient, be typed, using double spacing and should invariably be written in the impersonal or third person. Diagrams should be sent on separate sheets, whilst photographs must be sharp and clearly defined.

District Articles

Members may remember it was decided at Convention that each District should undertake to prepare a technical article. The response to date has been *nil*, except from the District making the suggestion, viz., South-Western. Mr. Sydenham (G5SY) advises us that his District are preparing an article dealing with Aerial Experiments on 56 Mc.

We shall be glad to hear that other Districts have not forgotten the suggestion.

Bulletin Features Competition

In order to ascertain the views of members concerning articles and features published in this Journal, the Editor has decided to organise a competition based on the articles published during the year 1936.

Members are invited to submit a list of the 12 articles or features which have appealed to them most. A copy of Ladner and Stoner will be presented to the member submitting a list which most closely agrees with the total votes cast for each feature.

The following simple rules must be adhered to:—

1. Entries must be submitted on a single sheet of paper containing the name and address of the sender, together with a list of the 12 features placed in order of interest.

2. No correspondence can be entered into regarding the competition, and no communication may be sent with the entry, which must be addressed to the Hon. Editor, T. & R. BULLETIN, 53, Victoria Street, S.W.1, and marked on the envelope "Competition."

3. Entries must reach Headquarters not later than February 15, 1937.

4. The decision of the Editor is final.

Here now is *your* chance to tell us what appeals to you. Get out the last 12 issues of the BULLETIN and make your choice *to-day*.

Foreign Periodicals

In order to make the best possible use of the numerous foreign radio journals which reach Headquarters weekly and monthly, we invite members with a knowledge of languages to apply for those in which they are interested.

A list of the periodicals available follows:—

<i>Name of Journal.</i>	<i>Issued by</i>	<i>Language.</i>
QSO (Belgium) ...	Reseau Belge	French
Old Man (Switzerland)	U.S.K.A. ...	French and German
Radio (Colombia) ...	L.C.R.	Spanish
Radio OH (Finland)	S.R.A.L. ...	Finnish
U.R.E. (Spain) ...	U.R.E. ...	Spanish
CQ (Germany) ...	D.A.S.D. ...	German
OZ (Denmark) ...	E.D.R. ...	Danish
Texmka Xponira (Russia)...	—	Russian
Helios (Germany) ...	(Trade) ...	German
Funk (Germany) ...	—	German
QSL (Portugal) ...	R.E.P. ...	Portuguese
FAR (Spain) ...	—	Spanish
LA (Norway) ...	N.R.R.L. ...	Norwegian
Krotkofalowiec (Poland) ...	P.Z.K. ...	Polish
OTC (Sweden) ...	S.S. ...	Swedish
Kratkeveny ...	C.A.Z. ...	Slovak
Onda Corta (Mexico)	L.M.R.E. ...	Spanish
OEM (Austria) ...	O.E.V.S.V. ...	German
Radio Centrum (Holland) ...	N.V.V.R. ...	Dutch
Intercine ...	League of Nations	Various languages including English
Club Paulisia (Brazil)	—	Spanish

Members applying for Journals are requested to furnish R.E.S. with a précis of any interesting article appearing therein.

If a member can be found who is willing to undertake the task, the Editor is prepared to publish in this Journal monthly abstracts from foreign journals. Offers should be addressed to the Secretary.

QSL Section

Manager: J. D. CHISHOLM (G2CX).

With the beginning of the New Year it is once again our pleasant duty to offer the season's compliments to all who make use of the Section and to thank them for their past co-operation. Comment and constructive criticism is always welcomed, and it is hoped that the service given by the Section will become more useful as time goes on.

As from January 1, H.Q. will take over all dispatching of cards to home and overseas destinations, and routine matters connected with the working of the Bureau will be dealt with at 53, Victoria Street. A revision of the system of filing cards is being experimented with and a diminution in the number of unclaimed cards is expected to result. If the trial proves satisfactory, the institution of postcard reminder cards to those whose envelope supply is exhausted will be made permanent, to our mutual advantage, we hope.

One further acknowledgment before closing. My personal thanks are due to the members of the QSL Sub-Committee, Messrs. Dedman (G2NH), Kershaw (G2WV) and Weale (G6DZ) for their help and advice during 1936. I would particularly thank G2WV for giving up a considerable amount of his time to the monotonous duty of sorting through the unclaimed files during the year.

R.S.G.B. Slow Morse Practices.

Details will be found below of the slow Morse practices organised by the Society for those members wishing to learn or improve their code. As usual, test matter will be taken from recent issues of the T. & R. BULLETIN. The page number and month of issue will be given at the end of each test—by telephony. A telephony announcement will also be given at the commencement of each test to assist those interested in tuning in the sending station. It is emphasised that reports will be appreciated and are desired, in order to ascertain useful range of transmission and numbers utilising the service. If, however, a reply is desired, a stamp should be sent. Will stations in areas at present not served offer their services to Mr. T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4. (telephone, Silverthorn 2285). Future transmissions from G5SU will be on 1825 kc. and not on 1930 kc. as heretofore. New stations included in the following schedule are:—G2YV, Mr. G. H. Whitehouse, 93, High Green, Cannock, Staffs; GI6XS, Mr. M. Sullivan, "Gillhall," Groomsport Road, Bangor, N. Ireland; GI5QX, Mr. J. N. Smith, "Ben-Venuto," Hawthornden Drive, Belmont, Belfast, N. Ireland; GI5UR, Mr. R. Barr (jun.), 4, Dunkeld Gardens, Old Park, Belfast, N. Ireland. The latter two stations are sending under the auspices of the Radio Society of Northern Ireland and the City of Belfast Y.M.C.A. Radio Club. No tests have been arranged on B.E.R.U. contest dates.

Schedule of Slow Morse Transmissions

			G.M.T.	Kc	Stations
Jan.	22	Friday	2300	1785	G6QI
"	22	Friday	2315	1852	G5DY
"	23	Saturday	2300	7145	GI5QX
"	24	Sunday	0915	1775	G6ZQ
"	24	Sunday	0945	7155	GI5UR
"	24	Sunday	1000	7260	G5JL
"	24	Sunday	1015	1825	G5SU
"	24	Sunday	1030	7180	G2YV
"	24	Sunday	1345	7180	G2YV
"	25	Monday	2300	1741	GI6XS
"	27	Wednesday	2300	1775	G6ZQ
"	27	Wednesday	2315	1741	GI6XS
"	29	Friday	2300	1785	G6QI
"	29	Friday	2315	1852	G5DY
"	30	Saturday	2300	7145	GI5QX
"	31	Sunday	0915	1775	G6ZQ
"	31	Sunday	0945	7155	GI5UR
"	31	Sunday	1000	7260	G5JL
"	31	Sunday	1015	1825	G5SU
"	31	Sunday	1030	7180	G2YV
"	31	Sunday	1345	7180	G2YV
Feb.	1	Monday	2300	1741	GI6XS
"	3	Wednesday	2300	1775	G6ZQ
"	3	Wednesday	2315	1741	GI6XS
"	5	Friday	2300	1785	G6QI
"	5	Friday	2315	1852	G5DY
"	6	Saturday	Senior	B.E.R.U. Contest	
"	7	Sunday	Senior	B.E.R.U. Contest	
"	8	Monday	2300	1741	GI6XS
"	10	Wednesday	2300	1775	G6ZQ
"	10	Wednesday	2315	1741	GI6XS
"	12	Friday	2300	1785	G6QI
"	12	Friday	2315	1852	G5DY
"	13	Saturday	Senior	B.E.R.U. Contest	
"	14	Sunday	Senior	B.E.R.U. Contest	
"	15	Monday	2300	1741	GI6XS
"	17	Wednesday	2300	1775	G6ZQ
"	17	Wednesday	2315	1741	GI6XS
"	19	Friday	2300	1785	G6QI
"	19	Friday	2315	1852	G5DY
"	20	Saturday	Junior	B.E.R.U. Contest	
"	21	Sunday	Junior	B.E.R.U. Contest	
"	22	Monday	2300	1741	GI6XS

QRA Section.

Manager: M. WILLIAMS (G6PP).

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INTRODUCING THE INTERNATIONAL BROADCAST & SOUND ENGINEER YEAR-BOOK, 1937

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Recognising the difficulty of keeping abreast of developments in the field of Broadcast and Sound Engineering, and being aware of the amount of useful information scattered throughout numerous publications, we have decided to publish this Year-Book. Its purpose is to provide a digest of contemporary progress accompanied by authoritative articles of great practical value, and followed by some independent technical reviews of typical equipment and apparatus.

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THE EDITOR.

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 N. GILL (BRS2733), 13, Petrie Road, Thornbury, Bradford.
 R. STURMAN (BRS2734), 153, Sutherland Avenue, Maida Vale, W.9.
 J. STEVENSON (BRS2735), 13, Walmer Crescent, Ibrox, Glasgow.

NEW MEMBERS.

DOMINION AND FOREIGN.

- A. H. HEATH (VK5ZX), 7, Clifford Street, Prospect Park, South Australia.
 E. KENTISH BARNES (VQ4KTC), Middle Ridge Estate, Kitale, Kenya Colony.
 CAPT. M. S. W. BISDEE (VS7MB), Military Hospital, Colombo, Ceylon.
 SU LEONG KONG (VS4JS), Posts and Telegraph Dept., Jesselton, British North Borneo.
 R. E. MACOMBER (W3CZE), 7327, 14th Street, N.W., Washington, D.C., U.S.A.
 I. E. ROWLANDS (ZL3JX), "Ruthin," R.M.D., Kaiapoi, New Zealand.
 P. C. RANDELL (BERS384), c/o Forestry Department, Sapoba, Benin Province, S. Nigeria.
 J. SCRIMGEOUR (BERS385), 197, Donnelly Street, Kenilworth, Johannesburg, South Africa.
 L. F. STEEL (BERS386), Jodhpur, Rajputana, India.

Stray.

We have been advised that the QRA of SU5NK, J. P. Thomas, has been changed to 8, Sharia Falaki, Cairo.

(Continued from 2nd column).

chassis may be used as a buffer stage to excite a final stage running at 500 watts C.W. and 250 watts telephony. The valve line up comprises a 47 as C.O., a 46 as doubler/buffer, and two 46's as straight amplifier.

Trade Notes

We recently tested one of the new ZT (Zero Temperature) crystals marketed by N. E. Read, 37, Willow Street, Oswestry, Shropshire. The sample submitted had a stated frequency of 7069.6 kc. which should have quadrupled to 28,278.4 kc. On test in an open type holder the frequency was checked by two independent observers as being 28,283 kc. The normal frequency variation for a 7 Mc. band ZT crystal is given as ± 2.5 kc., but unless the crystal is used in a fixed dust-proof holder, we do not think this figure can be guaranteed, although, as will be seen from the above, the calibration accuracy was within 4.6 kc. (on 28 Mc.) of the stated frequency, which is equivalent to an accuracy of 1.15 kc. on its fundamental. This accuracy is a good deal better than that guaranteed.

These crystals are guaranteed to have one frequency only, provided they are worked between perfectly flat unpolished electrodes in normal circuits, and with anode voltages not exceeding the stated values.

There are two other types available, the NT cut for normal transmitter control with a guaranteed accuracy of ± 3.5 kc. on 7 Mc., ± 1.75 kc. on 3.5 Mc. and ± 0.08 kc. on 1.7 Mc., and the PT cut when voltages up to 500 volts are used. The accuracy of PT crystals is given as ± 3.5 kc. on 7 Mc., ± 1.75 kc. on 3.5 Mc. and ± 0.08 kc. on 1.7 Mc.

The prices are: NT cut 15s., PT cut 20s., ZT cut 24s.

A small extra charge is made if selection at a given point at either end of the band is required.

Radiomart, of Birmingham, announce a new transmitter chassis which will be marketed in kit form as the RF60. The chassis is made from 16 gauge steel, cadmium-plated to Admiralty specification. The panel is finished with heavy crackle and machine pierced. Arrangements have been made for metering all plate circuits and final amplifier grid circuit by closed circuit jacks. Ceramic is used for all valve holders, coil holders, etc. Wiring is carried out with 14 gauge bus-bar for all R.F. circuits, and coloured, glazed corona-proof cable for H.T. supply leads. The complete kit with coils for one band less valves and crystals retails at five guineas. Additional sets of coils (three per band) are listed at 17s. 6d. per set, whilst a kit of matched Raytheon or Sylvania first grade valves is available at 22s. A labour charge of 30s. is made if the purchaser requires the kit to be wired and tested.

The chassis can be used with a 10-watt input with one 46 in the final stage and suitable aerial coupling, or can be taken to a full 60-watt input, without overloading when an additional 46 is used. The

(Continued in previous column.)

NOTES and NEWS



BRITISH ISLES

DISTRICT REPRESENTATIVES.

DISTRICT 1 (North-Western).

(Cumberland, Westmorland, Cheshire, Lancashire.)
Mr. J. NODEN (G6TW), Fern Villa, Coppice Road, Willaston,
near Nantwich, Cheshire.

DISTRICT 2 (North-Eastern).

Yorkshire (West Riding, and part of North Riding).
Mr. L. W. PARRY (G6PY), 13, Huddersfield Road, Barnsley,
Yorks.

DISTRICT 3 (West Midlands).

(Warwick, Worcester, Staffordshire, Shropshire.)
Mr. V. M. DESMOND (G5VM), 199, Russell Road, Moseley,
Birmingham.

DISTRICT 4 (East Midlands).

(Derby, Leicester, Northants, Notts.)
Mr. J. J. CURNOW (G6CW), "St. Anns," Bramcote Lane, Wollaton
Notts.

DISTRICT 5 (Western).

(Hereford, Oxford, Wiltshire, Gloucester.)
Mr. J. N. WALKER (G5JU), 4, Frenchay Road, Downend, Bristol.

DISTRICT 6 (South-Western).

(Cornwall, Devon, Dorset, Somerset.)
Mr. W. B. SYDENHAM (G5SY), "Sherrington," Cleveland Road,
Torquay.

DISTRICT 7 (Southern).

(Berkshire, Hampshire, Surrey.)
Mr. E. A. DEDMAN (G2NH), 75, Woodlands Avenue, Coombe,
New Malden, Surrey.

DISTRICT 8 (Home Counties).

(Beds., Cambs., Hunts., Rutland and the town of Peterborough.)
Mr. G. JEAPE (G2XV), 89, Perne Road, Cambridge.

DISTRICT 9 (East Anglia).

(Norfolk and Suffolk.)
Mr. H. W. SADLER (G2XS), "The Warren Farm," South Wootton,
King's Lynn, Norfolk.

DISTRICT 10 (South Wales and Monmouth).

Capt. G. C. PRICE (G2OP), The Mount, Pembroke Dock.

DISTRICT 11 (North Wales).

(Anglesey, Carnarvon, Denbighshire, Flintshire, Merioneth,
Montgomery, Radnorshire.)
Mr. D. S. MITCHELL (G6AA), "The Flagstaff," Colwyn Bay,
Denbighshire.

DISTRICT 12 (London North and Hertford).

(North London Postal Districts and Hertford, together with the
area known as North Middlesex.)
Mr. S. BUCKINGHAM (G5QF), 41, Brunswick Park Road, New
Southgate, N.11.

DISTRICT 13 (London South).

Mr. J. B. KERSHAW (G2WV), 13, Montpelier Row, Blackheath
S.E.3.

DISTRICT 14 (Eastern).

(East London and Essex.)
Mr. T. A. ST. JOHNSTON (G6UT), 28, Douglas Road, Chingford, E.4.

DISTRICT 15 (London West).

(West London Postal Districts, Bucks, and that part of Middlesex
not included in District 12.)
Mr. H. V. WILKINS (G6WN), 81, Studland Road, Hanwell, W.7.

DISTRICT 16 (South-Eastern).

(Kent and Sussex.)
Mr. W. H. ALLEN (G2UJ), 32, Earls Road, Tunbridge Wells.

DISTRICT 17 (Mid-East).

(Lincolnshire and Rutland.)
REV. L. C. HODGE (G6LH), The Bungalow, Skirbeck Road, Boston,
Lincs.

DISTRICT 18 (East Yorkshire).

(East Riding and part of North Riding.)
Mr. W. A. CLARK (G5FV), "Lynton," Hull Road, Keyingham,
E. Yorks.

DISTRICT 19 (Northern).

(Northumberland, Durham, and North Yorks.)
Mr. H. C. D. HORNSBY (G5QY), "Newlands," 105, Kenton Lane
Newcastle-on-Tyne, 3.

SCOTLAND.

MR. JAMES HUNTER (G6ZV), Records Office, 51, Camphill Avenue,
Langside, Glasgow.

NORTHERN IRELAND.

MR. W. GRAHAM (G15GV), 5 Ratcliffe Street, Donegal Pass, Belfast.

NEW MEMBERS ARE CORDIALLY INVITED TO WRITE TO THEIR LOCAL DISTRICT REPRESENTATIVE.

DISTRICT 1 (North-Western).

BIRKENHEAD.—The November meeting of the Wirral Amateur Transmitting and Short Wave Club was held as usual on the last Wednesday in the month at King's Square Café, Birkenhead. A junk sale and raffle were the high-spots of the evening. G6GL has been appointed T.R., and will welcome reports each month from members in Wirral. 6HQ is having trouble with BCLs. 2FZ, 6GL and 6CX are rebuilding, and both 2FZ and 6GL are using new "single-signal supers" with enjoyment. 2BXO is testing crystal oscillators. 2AHG, 2BON and 2BDT are also active. Piracy is very prevalent in this area, and it must cease at once, or else —!

Liverpool.—As the District Scribe was away from home at the time of the December Meeting, he was unable to report the proceedings, and no particulars have since been received, which is no doubt due to the change-over in TR.

Manchester.—For some unknown reason, last month's report went astray—probably got lost in the post. The only item of special interest in this

report, however, was the remarkable DX work being done by G2DH on the 28 Mc. band.

Twenty members attended the last meeting of the year, which took the form of a social evening, and made a pleasant ending to the year's activities.

G2DH has WAC on 28 Mc. 2WQ has contacted VK on 28 Mc. G2LK, 2OI, 2HW, 2JC, 2ARC, 2ATZ, 2BDA, 2OOI, 5PX, 5CH, 5OZ, 5YD, 6TL, 2BJT, BRS2327 and 2674 are active, the latter is a new member, whom we welcome. Best of luck to BRS2OOI, who is applying for full ticket.

The following stations are still working schedules on 56 Mc.: G5YD, 2OI, 2RA, 2AXH, 2ARC, 2WQ, 5CH. They would welcome reports, and all are willing to stand by for stations. 2OI and 5YD are busy rebuilding for all other bands.

G2OI, as TR for the Manchester Section, wishes all members the compliments of the season and good DX in the coming year.

Blackpool and District.—The usual weekly meetings have been held, and G6MI has demonstrated his 56-Mc. gear on several occasions. G5MS has been off the air for a few weeks, but has now

returned to seek DX. 6MI is busy on 56 Mc., and on the air every week-day at 22.00, except Monday and every Sunday at 14.00 and 16.00. He would appreciate co-operation outside the district. 6VQ, 8AK, 8GG are active on 7 Mc., while 2ARL is swotting code.

DISTRICT 2 (North-Eastern)

Leeds.—The Leeds Radio Society is active, and members are constructing a club receiver. The only report is from BRS2310, who is active on 3.5 Mc., and receives good Transatlantic signals which peak about 00.10 G.M.T.

Morse; BRS2598 now 2CFA; BRS2606 awaits A.A. licence; 2BGM and 2BCQ busy preparing gear; BRS2293 listening on 7 and 14 Mc. and building a 56 Mc. receiver; G5HK almost ready with his new transmitter. Other active stations are 2BKM, 2AFW and 5UJ. Best wishes are sent to our new member BRS2688. Those who are unable to attend the Sheffield meetings are asked to report to the TR.

Huddersfield.—The November meeting, held at G5VD, was attended by G6RO, 8CW, 8KY, 2ARN, 2ALU and BRS2551. A local 56 Mc. network was discussed. A further meeting was held at 8KY,

FORTHCOMING EVENTS

JAN. 16.—Scotland, H District. Annual Dinner, in Station Hotel, Kirkcaldy, at 7.30 for 8 p.m. Tickets 6s. 6d. each from A. W. Lawson, 2ANL, "Makora," Kinghorn, Fife.

JAN. 17.—District 13 (Blackheath Area), 8.30 p.m. at G2ZQ, 63, Hervey Road, Blackheath, S.E.3.

JAN. 19.—District 12, 7.30 p.m., at The Café, Waterfall Parade, Landers Corner, N.11.

JAN. 20.—District 14 (East Essex Section), 8 p.m. at G6CT, 23, Eastwood Boulevard, Westcliff-on-Sea.

JAN. 20.*—District 15, 7.30 p.m., at G6WN, 81, Studland Road, Hanwell, W.7. "Television" by G5OG.

JAN. 21.—Annual Dinner of the S.L.D.R.T.S. 8 p.m. at Half Moon Hotel.

JAN. 24.—District 11, 3 p.m. at G5YP, "Deepdale," Marine Road, Prestatyn.

JAN. 25.—District 13 (Anerley, Kennington, Brixton & Tooting Areas) 8 p.m. at Brotherhood Hall, West Norwood.

JAN. 26.—District 14 (East London Section), 7.30 p.m., at G6UT, 28, Douglas Road, Chingford, E.4.

JAN. 27.—Scotland "A" and "E" Districts, 7.30 p.m. at Room "A," Institution of Engineers and Shipbuilders, 39, Elmbank Crescent, Glasgow. A lecture will be delivered by Mullard Wireless Service Co., Ltd., Transmitting Division on "The Design and

Application of Transmitting Valves." Illustrated by lantern slides.

JAN. 27.—Scotland "D" District, 7.30 p.m., in the R.S.A. Rooms, 16, Royal Terrace, Edinburgh.

JAN. 29.—C.A.R.S. Annual Dinner, 8 p.m. at The Craven Arms Hotel, High Street, Coventry.

JAN. 29.—London Meeting at I.E.E. Tea at 5.30 p.m. Discussion at 6.15 p.m. on "Straight Receivers," by Mr. H. C. Page, G6PA.

JAN. 30.—District 15. Annual Dinner at "The Bell," The Mall, Ealing Broadway. 6.30 p.m. for 7 p.m. Tickets 4s. each.

JAN. 31.—District 7. 2.30 p.m. at "The Tumble Down Dick Hotel," Farnborough, Hants.

FEB. 3.—District 1 (Manchester Section). 7.30 p.m. at Brookes Café, 1, Hilton Street, Oldham Street, Manchester. Discussion by G2DH.

FEB. 3.—S.L.D.R.T.S. 8 p.m. at Brotherhood Hall, West Norwood.

FEB. 4.—District 10. Cardiff and District S.W. Club "Hamfest," 7.30 p.m. at Barry's Hotel, St. Mary Street, Cardiff.

FEB. 4.—District 5. 7.30 p.m. at the B.A.R.C. Clubroom, 23, Bridge Street, Bristol. Discussion on the "N.F.D. Transmitter."

FEB. 5.—Visit to the Decca Gramophone Co. Works, at 6 p.m.

FEB. 10.—Scotland "D" District, details as above.

*Sale of disused apparatus at this meeting.

Sheffield.—The next meeting at the Angel Hotel will be held on January 21. At the first December meeting, BRS2282 gave a talk on 56 Mc. receivers, whilst on December 17 a talk on modulation was given by G6LF. A Hamfest is arranged for January 16, and a good attendance is expected. General activities are: G5TO on 14 and 28 Mc.; 6LF on 28 Mc., and making 56 Mc. transmitter; 6PJ on 14 Mc., and making 56 Mc. transmitter; 2DJ testing 'phone; 2AWQ applying for full ticket; 2ASF awaiting his call; 2BXA practising

and it is hoped that members who have been unable to support the meetings in the past will endeavour to do so in the New Year. All new members are asked to communicate with the TR, so that their names may be put on the mailing list.

Doncaster.—G6SH still active; 2ANA awaits full call, and testing transmitter. At Thorne, 2BWF now G5CJ, is working Europe with 7 watts input; 2AUO now G8GA, and has had some success, but is also meeting with some trouble with universal valves.

Barnsley.—G5IV has been appointed TR, and reports should be sent to him. 2AHT is active, and awaits reports from DX stations to claim his HBE certificate. G5UA has rebuilt a rack and panel transmitter; 6LZ, who is rebuilding his SS super, gave an interesting talk at the local meeting on "Break-in." 2AOF has passed Morse test, and awaits call. BRS2408 has applied for call. G6PY, 6AJ, 2BH, 5KM and 5IV are more or less inactive at present. The next meeting of the Barnsley and District Wireless Society will be held on January 20.

Bradford.—The area is fairly active, considering the stations individually, and fair attendances are recorded at the Radio Society meetings, but no inter-station visits are taking place, as there appears to be no demand. The TR (G6KU) wishes to know whether members are finding the present arrangements satisfactory, he also reminds them that the time is now overdue for sending in nominations for the post of TR for this area.

DISTRICT 3 (West Midlands).

Coventry.—The annual dinner of the Coventry Amateur Radio Society will be held on January 29 at the Craven Arms Hotel, High Street, Coventry. An invitation is extended to all amateurs in Coventry, as well as to visitors from any of the near-by towns or cities. Tickets are 5s., but we would ask that an early application be made so that we may make the final arrangements as soon as is possible.

During December we had a visit from the Birmingham Group, and early in January we are returning the visit.

At the moment Coventry seems to be suffering from a 6A6 cum 6L6 complex, several stations are either using or are building this type of exciter.

On December 14 G5PP took part in an interesting five-way QSO, embracing four continents, the other four stations being W4DLH, SU1KG, SU1GP, and HK1Z.

We have to say "Farewell" to G5VG, who has left Coventry for London.

Staffs.—Only one report is to hand, and that from 2BDO, who has been logging some interesting DX phone around 7 Mc. These include WIXAO and W2XEM, Boston and Newark police stations. He also submits a log of stations heard on 28 Mc. (Send interesting items direct to G2ZQ.—Ed.)

DISTRICT 4 (East Midlands)

At the monthly meeting held at Nottingham on December 20, 1936, 30 members were present, and owing to the unavoidable absence of the D.R. (6CW), 2IO presided. The chief item discussed was the final arrangements with reference to the forthcoming dinner and dance to be held at the Trent Bridge Hotel, Nottingham, on January 23, 1937. The time was fixed at 7.30 p.m., tickets at 5s. each, evening dress optional. Tickets are obtainable from 6CW or 2IO.

Other items of note are the election of 6VD as T.R. for the coming year, and congratulations to 5ZP on winning the local transmitting contest at Leicester. The Leicester Section are to be envied owing to the fact that they are now in possession of a permanent club room, situate in Cedar Road, Leicester, thanks being due to Mr. and Mrs. Ridge-way (2BLR and BRS2497). Meetings are to be held there, in the shack, monthly, every Thursday

(January 14, February 11, and March 11, 1937). Code practice is being held Friday evenings, consisting of two groups, fast and slow.

DISTRICT 5 (Western).

It is with great regret that we learn of the resignation, due to pressure of private business, of Arthur Bartlett as D.R., but we know he will continue to be a big asset in keeping No. 5 on the map.

The new D.R. takes this opportunity of extending his best wishes for the New Year to all the members of the District, and will be glad to hear from them at any time, either directly or through their T.R.

The success of a district depends upon what the members put into it, so let us make sure that a good year lies ahead.

At the usual Bristol meeting held in December, Mr. G. Hellin, 2BYU, was again elected T.R. There was some discussion on the way Bristol meetings should be run, but no change is being made.

Activity on all bands is good. The D.R. appeals to all those who have been active during the year on 28 Mc. to send in an entry for the contest, which closed on December 31.

DISTRICT 6 (South-Western)

The D.R. begins the notes this month by wishing all members, and those of District 6 especially, a very happy and prosperous New Year. The sincere wish is expressed that the year will be a particularly happy one for amateur radio, and that by the time it draws to a close much will have been done to justify and consolidate our position in the radio world.

Members have been rather lax regarding the nomination of T.R.'s, in spite of the fact that the D.R. has in many cases pointed out the necessity of taking these T.R. nominations seriously. It is hoped that arrangements will soon be made in the various centres so that the list may be completed.

Torquay.—A very successful meeting was held on Tuesday, December 15, when there was an attendance of fifteen. Many points of interest were discussed, and the D.R. had once more to get out his capacity and inductance bridge, and demonstrate a few measurements. It was announced that BRS1821 is now 2AUI. G5GD and 5SY are engaged on 56 Mc. experiments, and are directing their work chiefly towards stabilisation in transmitters and superhets as receivers. 28 Mc. is still doing very well, and some good contacts have been obtained, especially on phone. The D.R. thanks 2CAA for agreeing to take on as T.R. for Torquay. He will be able to help the D.R. a great deal.

Exeter.—Though no official report has been received, it is known that this centre is very active. It is understood that 5QA has agreed to act as T.R. for the coming year in succession to 5WY. We would like to take this opportunity of thanking 5WY for the really great work he has done for Exeter during the past few years. He has had a difficult task, and he has done his job with characteristic thoroughness. We are all very grateful to you, OM.

Taunton.—The usual monthly meeting and junk sale was held at Bridgwater on December 13. Present were G2JM, 5AK, 6LQ, 2ANN, 2BAM,

2BJC, 2BMX, 2CFG, BRS2445, and 2651. The next meeting is on January 14, when 56 Mc. transmitters and receivers will be discussed.

Plymouth.—The D.R., thanks to 6RF, had the opportunity of paying a quick visit to several of the members in this town, and he was very pleased to learn that things are going well. We are sorry to lose 5AQ, who has left the district. We wish him luck and hope to see him again in the near future. G2ZP is with us for a while, and, no doubt, he will make the acquaintance of most of the local members. We also welcome to the district BRS1751.

Penryn.—No report has been received this month, but it is known that several of the members are active on 7 Mc. phone. The D.R. would be glad if information could be sent to him as to the wishes of the members in this locality regarding the position of T.R. for the coming year.

DISTRICT 7 (Southern).

The December meeting held at G2YL attracted our record attendance to date, over 60 members and friends being present. The Junk Sale was a huge success and we propose continuing the feature at intervals throughout the season. Incidentally, in the excitement, an umbrella was left at G2YL's, and if it is not claimed by the owner, we intend auctioning it at the next sale! Following our usual practice, in order to avoid interference with B.E.R.U. Tests, there will be no meeting in February, its place being taken by a meeting to be held at the Tumble Down Dick Hotel, Farnborough, Hants, on Sunday, January 31, at 2.30 p.m.

Portsmouth.—The South Hants R.T.S. held their December meeting at Fareham, with an attendance of over 40 members and friends. Mr. Stevens, assisted by Mr. Watkins, both of the *Westinghouse Company*, gave a most interesting lecture on "The Metal Rectifier." The construction and application of all classes of units, and circuits for their use, were explained and illustrated by slides and films. Our hearty thanks to both, especially in view of their foggy trip. Local activity continues at a high level. Reports to G6NZ, please.

Southampton.—G2IL is spending a holiday in South Africa and will in consequence not be on the air for about three months. Since erecting his centre-fed Hertz with 66-ft. top some two months ago, 5OB has worked two ZL's on 14 Mc., but has not succeeded in raising any other DX. 6YI is active again on 7 and 14 Mc. 5PT is experimenting with aerials on 56 Mc. and is trying both horizontal and vertical polarisation. 2ATT and BRS207 report active. Activities at 8DM have been confined to improving depth of modulation and increasing power on 57 Mc. transmissions to the full 10 watts. The aerial is being modified for horizontal polarisation and experiments are being conducted using the 40-metre aerial on its eighth harmonic.

Reading.—At the December meeting of the R.T. and R.S. there was a record attendance, some 20 amateurs being present. After the usual general discussion a talk was given by Mr. Marcuse (G2NM) on past experiences: this, together with many amusing recollections, made a very interesting evening. Many newcomers are now in the district, so the morse class will be introduced in the New

Year. Most local members report active; G2WK has left the town and we wish him the best of luck in his new district. We were pleased to welcome G5VI on his first appearance at local meetings. 2AOH, of Maidenhead, and BRS2662, of Newbury, are welcomed to the Berkshire group.

The next local meeting will be on Wednesday, January 20, 1937.

Reigate.—A hearty welcome to G8HH, who has just received his radiating permit and is already on 14 Mc. G2MV, who is on 28 Mc. 'phone, is receiving excellent DX reports. Other stations active are G5LK, 2KV, 2AIG, and 6JF, the latter rebuilding. G5XG is still maintaining his daily 'phone schedule with SU1KG, and is also active on 28 Mc. He is awaiting a VK for W.A.C. on 10. Members are again requested to report activities to the T.R. (G5XG) by the 25th of each month.

DISTRICT 8 (Home Counties)

At a meeting held on December 11 at the Fitzroy Arms, Cambridge, at which 16 members were present, a welcome was extended to a few newcomers. The minutes of the previous meeting were read, together with Headquarters' reports and replies to various correspondence arising out of previous meetings.

G2PL reports some very excellent contacts on 7 Mc., including K6 and VE5, also a contact with W7 at R9 is worthy of note for this band. 2PL achieved these results using a 66-ft. Windom, but finds that a 132-ft. "end on" is definitely the best for 28 Mc. 5JO has been active on 3.5 and 7 Mc., but does not report. 5DR has been plotting new aerials for his new QRA and has erected a half-wave Windom N.E. by S.W., also a half-wave vertical Windom; both of these are to be tested against each other on 14 Mc. 6HD has only been on the air for a few hours on 1.7 and 3.5 Mc., and continues to progress with the construction of his SS superhet. 8FF has been QRP on 7Mc. and had about 250 contacts with this, but finds DX difficult to raise, so has now erected a 66-ft. "end on" which he hopes will improve his range: he has had some very good results with his RX on 28 Mc.

2AZF has succeeded in keeping the radiations of his AA station "inside" the house by reducing H.T. to 60 volts. 2CDX is rebuilding and is the first member in the district to make use of the crystal register by perusing same to find a suitable "gap" in which to purchase his own.

2AHK is awkwardly placed for a location in which to work, and would be pleased to share his gear with somebody near at hand in order to keep active (QRA is Duxford; who will help?). 2XV continues with pleasing results on 14 Mc. 'phone and has found the VK 'phones on this band are coming through again.

Peterborough.—2NJ is back on 7 Mc. 'phone, using grid bias modulation. 2UQ prefers choke modulation, and proves his preference by putting R7 'phone into Mexico on 7 Mc. and also contacting China on CW. 5NX is still active on 7 Mc. 'phone. 6PD has obtained his permit for 28 and 56 Mc. BRS1540 has been co-operating with 2NJ concerning skip and ground wave effects. 2075 is building a 56 Mc. RX and he received a warm tribute to his efforts on behalf of the Peterborough S.W. and Television Society at their first dinner held recently.

The next district meeting will be held on February 12 and will be at the Bird in Hand Hotel, Peterborough, commencing at 8 p.m. sharp. Will members please notify the D.R. of any matters which they may wish to be included in the agenda?

The district frequency (crystal) register progresses slowly but is far from being complete. Those members who have not yet notified their crystal frequencies to the D.R. are asked to do so without further delay as it is intended to circulate a copy to each member upon completion.

Members who have any ideas for improving the district conventionette, to be held in April, should submit same to the D.R. at once; facilities for visiting some place of general interest are particularly welcomed.

DISTRICT 9 (East Anglia)

The Christmas season saw an increase in activity in the Norwich area, especially on the H.F. bands. G2MN is now all set for 28 Mc., having added a second doubler to his transmitter and improved his receiver. G2UT after a rebuild is on 14 Mc. G8DD has dropped phone for C.W. BRS2532 has applied for his A.A. G5IX and 6QZ visited G5QO at Christmas and carried out some "modifications"! These sections have also been on operating in local field strength experiments.

G6QZ is now transmitting on 56 Mc. daily. (Times to G5LB, please.—Ed.)

The Alexandra Palace transmissions are well received in Norwich, although the strength varies from day to day and from hour to hour.

On December 27, G6QZ heard a very strong telephony station on 56 Mc. which he believes emanated from Cambridge. The time was 11.30 G.M.T. Any claimants?

DISTRICT 10 (South Wales and Monmouth)

News is very scarce this month, this being undoubtedly due to the "ham spirit" and Christmas festivities combined. There are, however, two items of general interest to report. First, we must congratulate the Blackwood Radio Club on the successes of their members G6BK and 8CT, the former having worked all W districts except W5, 6, and 7 on 7 Mc., and the latter ZL and VK several times, also ZU and FB8. Both are using less than 20 watts input.

The second point is to remind members to keep an open date on February 4 for the "Hamfest" at Barry's Hotel, Cardiff, to which all will be heartily welcomed. Commencing at 7.30 p.m., the charge will be 1s. 9d., which sum includes either tea or coffee. Further details from G5BI. Please send all notes in by the 25th of each month. New Year greetings and best DX during 1937 from the D.R. and Scribe.

DISTRICT 11 (North Wales).

The last meeting at G5OD was well attended. The only topic of discussion worthy of note was that of N.F.D. The unanimous decision was that the district should not enter for the next contest, but should support the event by co-operating with at least three genuinely portable stations working on all bands. The district is in complete agreement with the sentiments expressed by G2VV in his article in the December issue of the BULLETIN.

The T.R. scheme is now in operation, and the first sectional reports are presented below.

Rhyl-Prestatyn.—G5YP, the new T.R., appreciates the honour bestowed upon him, and hopes that during his year of office he may have the pleasure of reporting great activity in his area. G6KY and 2AKD are active with receivers on 56 Mc., and will be willing to stand by and report on any signals. G5YP is active on 7 Mc., and wishes to make schedules with stations in South-East England. An informal meeting is held at the Savoy Café, Prestatyn, at 8 p.m., every Monday evening particularly for the benefit of those interested in 56 Mc. If anyone is passing through Prestatyn on a Monday evening, he will be made very welcome.

Llandudno-Colwyn Bay.—G6AA and 6OK are building 56 Mc. superhets and C.C. transmitters in preparation for the DX which is expected shortly. All members appear to be active, but there is no news of general interest to report.

DISTRICT 12 (London North and Hertford)

Owing to the festive season activity has fallen off and nothing of note has been reported.

For the benefit of those who desire an accurate frequency check the following frequencies used by G6CL are correct to ± 1 kc. :—

3507.5 *	7015	14030	28060
	7070.75 *	14141.5	28283
3585 *	7170	14340	28680
3589.25 *	7178.5	14357	28714

*Fundamental frequency.

DISTRICT 13 (London South).

The last of the district meetings under the old regime was held at Brotherhood Hall on December 17. It is felt that sufficient has been said during the last few months in these columns and at the meetings to ensure that everyone has a clear idea of the new scheme. A list of T.R.s is appended :—

G2ZQ.—Blackheath Area, covering Postal Districts S.E. 3, 6, 7, 9, 12, 13, 18.

G2JB.—Kennington Area, covering Postal Districts S.E. 1, 5, 11, 17.

2AZP.—Brixton Area, covering Postal Districts S.E. 21, 24 and S.W. 2, 9, 16.

G2LW.—Anerley Area, covering Postal Districts S.E. 19, 20, 25, 26, 27.

G2GZ.—New Cross Area, covering Postal Districts S.E. 8, 10, 14, 15, 16.

G2TH.—Wandsworth Area, covering Postal Districts S.W. 4, 8, 11, 18.

G2UX.—Tooting Area, covering Postal Districts S.W. 12, 17.

2BMH.—Wimbledon Area, covering Postal Districts S.W. 19, 20.

T.R.s are still required for Forest Hill, Chelsea, and Roehampton areas, and nominations will be gratefully received by the D.R.

Blackheath Area.—G2YG is preparing to return to the air on 14 Mc. Congratulations to G8IV (ex-BRS2100) on obtaining his licence. 5LG finished at the "Shop" at Christmas and is now unfortunately lost to the District. 5WN hopes to stage a come-back soon. G2TX, a prospective Blackheath member, has left for Felixstowe. We wish him luck. 2ZQ is starting a drive against broadcasting and advertisement by 1.7 Mc. amateurs, and hopes the District will co-operate in cleaning things up; 2WV is hard pressed organising District, but still finds time to be on the air at the

week-ends. The first informal area meeting will take place on January 17 at G2ZQ, 63, Hervey Road, Blackheath, S.E.3, 8.30 p.m. All are invited.

The above is the only T.R. report received this month and is probably due to the fact that the T.R.s have as yet not had time to round up their areas. With regard to this, we would offer our sincere thanks to G2ZQ for getting his area working in record time. We would remind all members of the District that they should now report direct to their T.R., who is responsible for forwarding an area report to the D.R. each month.

Anerley, Kennington, Brixton and Tooting areas have arranged to hold a joint meeting at Brotherhood Hall, West Norwood, at 8 p.m. on January 25. The next meeting of the S.L.D.R.T.S. will take place on February 3 and the annual dinner of that Society will be held on January 21 at the Half Moon Hotel.

The D.R. would like to take this opportunity of wishing everyone a very happy and prosperous New Year and sincerely hopes that the new scheme will be well supported. If you have any suggestions to offer do please write and let us have them.

DISTRICT 14 (Eastern).

East London.—As the date arranged for the meeting at G6UT, Chingford, was fixed before the December BULLETIN appeared, only three members attended! G6QK has left Wanstead, and is now residing at Manuden, four miles north of Bishops Stortford. Mr. F. Barrett (2BCF), of Grays, is now G8CO.

East Essex.—Although the last meeting was held prior to notification through the "BULL," there was a good attendance at G6IF's QRA—sixteen members being present. A discussion ensued on the part which will be played by R.S.G.B. members in the Southend Radio Society's Exhibition, which is being held on April 2 and 3.

Activity in this area on 7 and 14 Mc. is less—coinciding with the falling off of DX conditions, and most members are turning to 56 Mc. for their future tests. G5UK, 6CT, 2KT, 5QKP, and 6IF have been active on this band, and a number of interesting tests have been carried out between them.

G5UK, 6CT, 6IF, and 2LC were present at the wedding of G2YI on December 12. G2KT gave away the bride, and the rest "gave away" a plentiful supply of confetti. We all wish Mr. and Mrs. Horsnell the best of luck for the future, and continued happiness. G2YI is already on the air from his new QRA at Rayleigh.

BRS2708 is welcomed as a new member.

Your D.R. takes this opportunity of wishing all members of the District all the very best for 1937.

DISTRICT 15 (London West, Middlesex and Buckinghamshire)

The first meeting of the district to be held in Bucks was welcomed by those residing there. The attendance was sixteen, of whom seven had made the journey from West London and one from Aylesbury.

It is a pity that only two sections of the area have taken the trouble to nominate T.R.'s. The D.R. hopes that this state of affairs has or will soon

be remedied. 2BCN having moved, has resigned his position as T.R. for West Middlesex. It is understood that arrangements are being made to nominate a successor. We offer our thanks to 2BCN for his good work in the past.

There seems much controversy concerning district meetings as opposed to local meetings held by the T.R.'s. The D.R. favours district meetings once every three months and local meetings every month, these to be arranged by the T.R. Will members drop the D.R. a card on this subject to enable him to obtain a representative view.

Have you yet purchased your ticket for the district dinner? This event takes place on Saturday, January 30, at The Bell, The Mall, Ealing Broadway; 6.30 p.m. for 7 o'clock. It is an easy venue to reach and fairly late conveyances are available for the journey home. Tickets are 4s., obtainable from G6WN or G2IY, or members of the committee. We anticipate having Mr. Clarricoats with us and *also expect to see all district members there.* The support given will intimate to the committee whether another should be run next year.

London West.—G6CO has RFP15 going on phone and building new receiver. G6WN had forty-seven contacts on 28 Mc., including VK and XE. 2ASW reports. 2AUB experimenting with modulation and would prefer local meetings once a month and district meetings quarterly. BRS2239 would like local meetings; has been hearing W's on 7 and 3.5 Mc.

Middlesex.—G5JL on both 7 and 3.5 Mc. and would like reports on the latter band. G8FA on 7 Mc. 2BVX active. Congratulations to Mr. Guy, who has obtained his AA licence.

South Middlesex.—G2KI rebuilding for A.C. mains. 2LA rebuilding transmitter to rack form. 2NN built new sixty-foot mast. G2VV was married on December 27; we send our best wishes to Mr. and Mrs. Roe. 6GB built super-het receiver; has not yet tested it. 2BXC has abandoned using D.C. mains and resorted to batteries; finds he cannot receive the slow morse transmissions.

Bucks.—BRS2498 would prefer meetings to be held on Saturdays; has been on 1.7, 3.5, 7 and 14 Mc.

The T.V.A.R.T.S. dinner was very well attended and a good time was had by all. Visitors included G6CL, 2YL, 5LA and 6WN. The Society is to be congratulated for their efforts and particularly for introducing ladies to these gatherings.

DISTRICT 16 (South Eastern).

We are sure that all members of this district will be sorry to learn that G2MI ceased to be D.R. from the end of 1936. He has filled this position for over three years and has put in an enormous amount of work on District matters. During this period he has carried on the onerous task of BULLETIN draftsman, besides being identified with RES and other Society work, and it will be realised that with the ever-increasing growth of the District it is impossible for him to continue all this work in his very limited spare time.

All who know Mr. Milne will wish to accord him a very hearty vote of thanks for his never-failing interest in and enthusiasm for District 16, and we trust that the support that was given him will be vouchsafed to his successor, G2UJ, of Tunbridge Wells.

Gravesend.—A meeting was held on December 14 at which there was a good attendance. Among those present were G6CL and 2MI; the former gave a very interesting talk on the Amateur Movement—Past, Present and Future. The annual general meeting of the local society took place on the 28th, and all officers were re-elected for the coming year.

Our heartiest congratulations to 6VC, one of the most popular members in the district, who has taken unto himself a wife. All the best to both of you, OM.

Ashford reports some activity.

Heathfield G5JZ and BRS1173 are active on 28 Mc.

Eastbourne reports full activity. Will all members in the district please report to the T.R. 2BIU each month?

Brighton and Hove.—The Brighton and District Amateur Radio Society has been formed with a membership of 17, and G8AC is Hon. Secretary. Best of luck to the new venture, OM's.

Tunbridge Wells.—Eleven members of the T.W.D.A.T.S. attended a demonstration of television given by Mr. Powell recently in Tunbridge Wells. The receiver was a G.E.C. and a vertical half-wave aerial with reflector was used. Results were excellent, despite the distance of 37 miles from Alexandra Palace.

Nearly all stations are active, although there is nothing special to report.

Bromley and District and *Folkestone* promise to come to life in the New Year, but have nothing to report at present.

The D.R. would like to take this opportunity of wishing all a happy and prosperous New Year.

DISTRICT 17 (Mid-East).

The scarcity of reports this month would seem to indicate that even enthusiastic members can sometimes be persuaded to leave the shack for intensive experiments with plum puddings! However, herewith are reports from those who managed to get off a note in spite of seasonal distractions.

The outstanding report this month comes from G8BQ who has worked his first W on 14 Mc. on a genuine 8 watts, using a CO-FD with dry battery H.T. Congratulations, OM! G8AP has added VK4 to his list of DX as well as a few W's. G2HU is using a 6A6 oscillator link coupled to a 210, which has been the means of securing welcome contacts with ZL4 and VK3. He is awaiting cards for W.A.C. BRS2609 is now 2CGT, while BRS2523 is now 2CFT. 2AAS has his rig completed. The D.R. is planning to give a lecture on "Adventures with a Short Wave Transmitter" to members of his congregation! It is hoped that this will foster some interest locally.

A Happy New Year to all members and please do not forget your reports.

DISTRICT 18 (North Eastern)

Hull.—The T.R. is at a loss to understand what happened to last month's report, as it was despatched to the District Scribe by November 24, but it was apparently lost in transit, which is very much regretted.

Incidentally, the Scribe held up the Scarborough

notes waiting for the arrival of the Hull notes, until it was too late for publication.

The main item of the news this month is that we have unfortunately to give up the meetings at the Y.P.I. for financial reasons, which really means due to the lack of enthusiasm on the part of various members. Secondly, due partly to this and pressure of work, the present T.R. is retiring from R.S.G.B. activity, but is, of course, retaining his membership, and will always be glad to see or hear from members. Perhaps the membership will at once submit their nominations for a successor to either 2QO or 5FV, making sure, of course, that their nominee is willing to accept the job. 2QO will continue to act as T.R. until his "relief" is appointed.

There are only two reports again this month. G5MN sent his last month and it was included in the notes which disappeared. He says he is noting increasing activity on 56 Mc., G5HA transmitting regularly on this band with about 5 watts input, using 53's doubling down from 7 Mc. 5MN is applying for his 56 Mc. permit for this band. He mentions hearing a mystery call, sending fast and appearing to be a Russian.

2CAQ, Mr. Mower, is a new A.A. man and is getting together a transmitter using a 47 with D.C. mains as CO, and hopes to add his PA shortly. 2ARB and 2AAX are busy practising morse.

Members will congratulate G8IM, Mr. Mathieson, of Marfleet, on getting his full ticket; we shall be glad to hear from him.

Finally, will all members let the T.R. have a p.c. giving their names and addresses, and crystal frequencies, in order that the succeeding T.R. shall start off in good order.

A happy and prosperous New Year to all.

Scarborough.—G6CP has now his 28 Mc. permit. BRS2359 is listening for DX on 28 Mc. 5MV is experimenting with E.C.O.'s. 2BMD is building new transmitter in panel rack form. BRS2216 is awaiting a "Sky Buddy" and busy with morse.

The Scarborough Short Wave Society (2BXX) is rebuilding transmitter and applying for full ticket. Others active: 6TG, 8BB, 2BGS, 2BGO and BRS1756.

No notes received from Bridlington.

DISTRICT 19 (Northern).

Activity has increased during the last month, especially on 28 Mc. G5QY paid a visit to Stockton and met most of the members there. Thanks for the hospitality, OM's! T.R.'s are still required for Newcastle and Sunderland. Will members in these cities please note? Also reports from Sunderland would be appreciated.

Stockton.—An enjoyable meeting, with G2FO, G6ZT, 2BQO, G8GL, 2CBA, and BRS2664 present, was held at the latter's QRA in Northallerton. Further regular meetings were arranged. G8GL is doing good work with half-watt phone; G5XT is on 7 Mc. phone; G2FO is getting nearer 28 Mc. activity; G6ZT busy with all A.C. receiver; G8CL is doing good phone DX on 14 Mc. Also active are G6DR, 2CBA, 2BQO.

Darlington.—2BHF is now G8HQ and active on 7 Mc.; 2BQA and 2BLG are studying morse; BRS1895 is experimenting with a Collins coupler on his receiver with considerable success.

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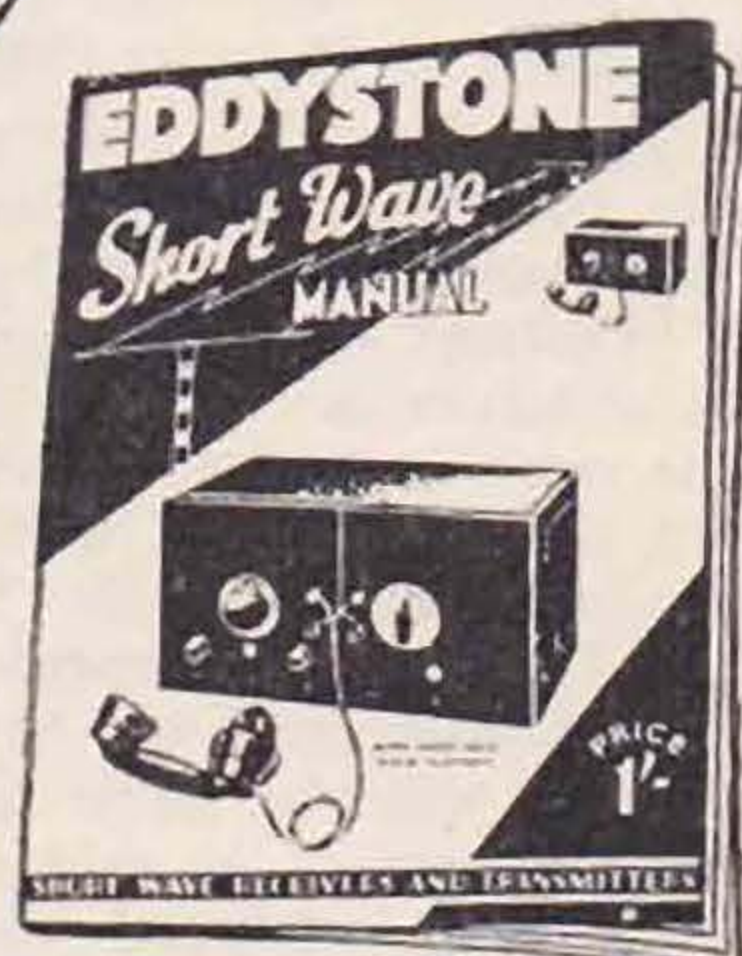
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**EDDYSTONE 1937
SHORT WAVE MANUAL**

South Shields.—Meetings are held fortnightly at G5WZ. Active members are G6XO, G5SD, G5WZ, G6VG.

Newcastle and District.—Monthly meetings are held at G2LD. Drop a card to 2BGG for dates. The following are active: G2LD, 5AY, 2PN, 5QY, 5RI, 6YL, 6MK, 2GC, 6IR, 2YY, 2OS, 2BGG. G2YY is working good 14 Mc. DX with QRP; G6IR, 5QY and 2GC are using new all A.C. receivers; G5RI is testing directional aerials on 14 Mc.; G2PN is trying out some unorthodox aerials on 28 Mc. with good results.

Scotland

The Wyllie Trophy has been won by Mr. S. W. Rowden, G6SR, for 1937, and the presentation took place on December 30, 1936, at the "A" District meeting in Glasgow. At this time the usual elections for District Officers takes place and the results are given under the various districts.

"A" District.—Again there is no news to hand of the activities of the members in this district. Mr. D. M. J. Tyre, G5TY, has been re-elected as District Officer for 1937. We wish to draw particular attention to the January meeting of the combined "A" and "E" districts, which takes place on January 27 in the usual location. At this meeting a lecture will be delivered by a member of the staff of the Transmitting Division of *Mullard Wireless Service Co., Ltd.*, London, on "The Design and Application of Transmitting Valves." The lecture will be illustrated by lantern slides. This is sure to be a good talk and we hope that members will turn out in force.

"B" District.—Mr. H. R. Taggart, G5TA, was re-elected by a huge majority as District Officer, at the December meeting. Mr. Taggart wishes to thank all members for their support during the past year and looks forward to having the same support or even more during 1937. G6IZ is on the air on 56 Mc., using a transmitter with P.P. TZO5/20 valves. Despite QRP at G6BM while rebuilding his P.P. power amplifier, he continues to work a fair number of VK's, etc. DX is also coming the way of G5YN. G5LF and G6LG are also active. G5TA is now licensed for all bands except 3.5 Mc.

"C" District.—Mr. W. Robertson, G6RI, has been re-elected as District Officer.

"D" District.—It was with regret that we heard the news that Mr. Jack Wilson, G6XI, had been forced to tender his resignation as District Officer of "D" District through reasons of ill-health and pressure of business. "D" District greatly appreciates the work done for them by Mr. Wilson during his short term of office, and wish him a speedy return to good health. Mr. W. Blyth, G5YX, of 17, Elgin Terrace, Edinburgh 7, has been elected as District Officer and we have no doubt that all the members will do their utmost to assist him. Great enthusiasm was raised by the news that G6SR had been awarded the "Wyllie Trophy." G6XI and G5YX suffered recently from the attention of a local pirate signing a DX call. The pirate was spotted and has now mended his ways. There are four new A.A. licences. Messrs. Batchen, Carslaw, McCusker and Muirhead having been issued the calls 2CFI, 2ACY, 2CFU and 2BIQ, respectively. Meetings were resumed for 1937 on January 13 in the R.S.A. Rooms, 16, Royal Terrace, Edinburgh, and will be held fortnightly thereafter.

"E" District.—Mr. J. R. Adams, G5KF, continues as District Officer for 1937. Mr. J. J. Allan, BRS2507, is now 2CFQ. G6KH and G5KF have converted their S.S. receivers to all mains operation and are delighted with the results, both as regards sensitivity and selectivity.

"F" District.—Mr. D. M. K. Harrower, G6NX, continues in office as District Officer. G2UD is using Ostar Ganz Pentode as a crystal oscillator. G6RV and G6NX are working a good deal of DX. Mr. Laing, BRS1653, has been offered a full licence and awaits his call. The latest addition to the fully licensed ranks, G8HP, is on the air with a CO.BA.PA. rig with a T25D in Power Amplifier.

"G" District.—Mr. J. P. Blair, G5FT, continues as District Officer for 1937. Meetings continue to be very successful and enthusiasm is at a high pitch in the district.

"H" District.—Mr. A. W. Lawson, 2ANL, was unanimously re-elected as District Officer for 1937. Meetings are being well supported. Mr. Proctor, BRS2590, has been issued the call 2APM. The first annual dinner, mentioned in these notes last month, will take place on Saturday, January 16, at 7.30 p.m. for 8 o'clock, tickets 6s. 6d. We hope that there will be a good attendance.

CORRESPONDENCE

DX SCORING

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

DEAR SIR,—I should like to be allowed to reply to Mr. Dyson's most interesting article dealing with a New Method of DX Scoring.

Firstly, I am glad Mr. Dyson considers that Scotland should count separate. I also agree now that the Isle of Man should count as a separate country, in view of certain information recently received.

I mentioned in my article that the case of the U.S.S.R. presented one of the biggest anomalies, and right away Mr. Dyson has fallen into the trap of presuming that the U.S.S.R. is similar to the U.S.A., and therefore should only count as one, or at the most two (Europe and Asia). I am glad he has brought up this point again, because I have received several letters on the subject. I do not think that I referred to any of the Republics, which should count separately, as being "autonomous." The U.S.S.R. is a *Federation of Republics*, not autonomous Republics. These are Russian Soviet Federal State Republic (Soviet Russia), White Russia, Ukraine, Georgia, Armenia, Azerbaijan, Turkomen, Uzbek and Tadzhik. All are separate individual Republics with their own Constitutions, and all except Russian S.F.S. Rep. are, in reality, Colonies of Soviet Russia. The fact that they are attached to Soviet Russia does not preclude them from being virtually Colonies.

Now the "parent" Russian Soviet Federal State Republic comprises about 85 per cent. of the total area of the U.S.S.R. and has 11 autonomous Republics and 15 autonomous areas. Here we have at once the similarity to the U.S.A. These eleven autonomous Republics are as follows:—Bashkir,

(Continued on page 336.)

Empire



News.

B.E.R.U. SECTION REPRESENTATIVES.

Australia: I. V. Miller (VK3EG), P.O. Box 41, Tallangatta, Victoria; Sub Representatives: J. B. Corbin (VK2YC), 39, Mitchell Street, McMahon's Point, Sydney, N.S.W.; R. Ohrbom (VK3OC), 22, Gordon Street, Coburg, N.13, Victoria; A. H. Mackenzie (VK4GK), Fire Station, Wynnum, Brisbane; G. Ragless (VK5GR), South Road P.O., St. Mary's, S.A.; J. C. Batchler (VK7JB), 21, Quarry Street, North Hobart, Tasmania.

Bahamas, Bermuda and the Eastern Part of the West Indies: P. H. B. Trasler (VP4TA), Point à Pierre, Trinidad, B.W.I.

Burma: W. G. F. Wedderspoon (VU2JB), Government High School, Maymyo, Burma.

Canada: Earle H. Turner (VE2CA), 267, Notre Dame Street, St. Lambert, P.Q.; W. P. Andrew (VE3WA), 1337, Dougall Avenue, Windsor, Ont.; F. Taylor (VE5GI), 4374, Locarno Crescent, Vancouver, B.C.;

Channel Islands: J. le Cornu (G2UR), 1, Les Vaux Villas, Valley Road, St. Helier, Jersey.

Egypt, Sudan and Transjordan: F. H. Pettitt (SUISG), Catholic Club, Mustapha Barracks, Alexandria.

Hong Kong: G. Merriman, (VS6AH), Box 414, Hong Kong.

Irish Free State: Captain G. Noblett, M.C. (EI9D), Barley Hill House, Westport, Co. Mayo.

Kenya, Uganda and Tanganyika: W. E. Lane (VQ4CRH), P.O. Box 570, Nairobi.

Malaya and Borneo: J. MacIntosh (VS1AA), Posts and Telegraphs, Penang, S.S.

Malta: L. Grech (ZB1C), 18, Constitution Street, Zeitun, Malta.

Newfoundland: E. S. Holden (VO1H), Box 650, St. John's, Newfoundland.

New Zealand: R. T. Stanton (ZL3AZ), 17, Martin Avenue, Beckenham, Christchurch.

North and South Rhodesia: R. A. Hill (ZE1JB), P.O. Box 612, Salisbury, S. Rhodesia.

North India: J. G. McIntosh (VU2LJ), Bukhia Tea Estate, Letekujan P.O., Assam.

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

South India: J. S. Nicholson (VU2JP), c/o Kanan Devan Hills Produce Co., Ltd., Munnar P.O., Travancore.

Australia

By VK3EG via G6CJ.

Recent weeks have produced concerted activity in all States on 56 Mc., with encouraging local results, but no definite inter-state contacts, although several doubtful reception reports are to hand. VK2 and 4 in the North, and VK3, 5 and 7 in the South, are co-ordinating their field-days and systematically attempting some DX.

28 Mc. periodically "does its stuff," and there is a great urge to get on "Ten." Enforcement of the P.D.C. regulations has been taken up by the P.M.G. and the W.I.A. Vigilance Committee, which, together with the six months probationary period on C.W. for all new licences, has worked wonders in cleaning up the 7 Mc. band. Prohibition of "muspitch" after 5 p.m. is also a greatly appreciated move, and all contacts are now being limited to half an hour's duration. We in VK can look back on 1936 as a landmark in respect to improved band conditions, for the change is definitely for the better.

14 Mc. seems to be the most popular band all round, and the freedom from QRN in the summer is a boon. At the moment activity is limited owing to vacations, but everyone is getting ready for the B.E.R.U. Contest. In VK4 a challenge cup has been donated for proficiency in that State during the Contest, and competition there will be very keen. We wish all members good luck and prosperity in the New Year.

Canada (Third District)

By VE3WA.

VE3WA is now operating from his new QRA and hopes to send future notes regularly by radio. His 60-ft. aerial tower was erected with the aid of nine local amateurs by means of block and tackle.

Conditions on 28 Mc. have been very good recently, and Europeans have been heard and worked from 1300 to 1900 G.M.T. ZS1H, ZT6AK and ZU6P have also been logged. ZE1JR was heard at 1700 G.M.T., whilst a few VK's and ZL's have been heard around 2300 G.M.T., but these stations are not consistent. J2IN has been logged at 2330 G.M.T. with a fine note.

VE3RO has worked VS1 on 14 Mc., his first Asian contact. He needs VK and ZS for his W.B.E.

Canada (Fifth District)

By VE5GI.

VE5HC is back from the North, and we expect to hear him on the air again soon. 5RT has a new C.C. rig almost ready, 5BI, 5NP and 5GI are all active on 28 Mc. VE5CL expects to have his 14 Mc. phone going soon from his new QRA, 5GS is over in G, 5EC is working DX on 14 Mc. VE5DT has worked his first G; 5EO is back on the air with a new rig.

Both the 7 and 14 Mc. bands are yielding plenty of DX these days; Europeans are coming in well on 14 Mc. around 18.00 G.M.T.; while on 7 Mc. Asians are heard around 15.00 G.M.T.

Irish Free State.

By EI9D.

The I.R.T.S. ran a very enjoyable social at the Moira Hotel, Dublin, on Saturday, December 19, when the Society's Cup was presented to GI5QX, winner of the I.R.T.S. Contest.

The undernoted new licences have been issued:—
EI5L, Mr. J. P. Comber (ex BRS2418), "Oldbawn,"
Foxrock, Co. Dublin.

EI7L, Mr. E. Kettle, 137, North Circular Road,
Dublin.

EI8L, Mr. Alan Jackson, Dublin.

Malaya and Borneo

By VS1AA.

Use of the 3.5 Mc. band has now been granted with revision in six months' time.

VS2AG reports yacht *Lattitude* in Manila working in 14 Mc. band, with call KZYL. 2AK forwards most interesting report. He is using phone on 14 Mc. with 28 watts input. Unfortunately, lack of space prohibits reproducing an account of his experiments. 2AK wishes to acknowledge reports received from G and would welcome further ones.

1AA is hotting up his broadcast superhet. He finds the triode hexode performs excellently when a Colpitt's oscillator is used. He is now experimenting with amplified AVC. 1AL has qualified for his WBE. Congratulations, OM.

Owing to the heavy delay which has ensued to a number of communications sent round for perusal, occasioned chiefly by one of the members having gone on leave, thus causing a hiatus in the circulation and consequent delay, 1AA would be greatly obliged if members would notify him regarding their intention to proceed on leave. It is only by such co-operation that we can hope to accelerate circulation, and your representative appeals for this co-operation.

Please note that monthly reports should reach 1AA not later than the 15th of each month.

Northern India.

By VU2LJ.

Details of the examination for radiating licences have now been issued by the authorities, and this test should not present any difficulties to the average amateur, the technical requirements being very elementary. Test centres at Bombay, Calcutta, Karachi, Madras, Lahore, Patna, Lucknow, Nagpur and Rangoon leave much to be desired, due to the size of the country. Efforts are being made to get other places established or a licence similar to the Class "C" which is issued in U.S.A. for those living more than 125 miles from examining city.

VU2DR has been experimenting with rotary directional aerials, but although the array works according to the book, only VK has been contacted.

BERS311 has rebuilt his receiver, using an all-metal chassis and American valves, resulting in a decided improvement in signals. Conditions have been very good on 14 Mc., but 7 Mc. has not showed much signs of life yet.

VU2LJ has settled down in his new QRA, and has set up the old transmitter with a temporary aerial, but QRM from the converter makes it impossible to hear anything less than R6 signals. This makes the B.E.R.U. contest appear less rosy!!!! But—

Rhodesia.

By ZE1JB.

Before proceeding with the notes for this month, we wish to make certain remarks concerning the future conduct of them. We have had several complaints that there have been inaccurate statements in the notes, whilst others have complained that the accomplishments of certain amateurs have been omitted. The writer pointed out in March, 1936, that he has to rely on the information supplied to him for the accuracy of notes. In so far as omissions are concerned, he regrets that he is not clairvoyant and unless he is advised of what is taking place, or happens to hear of it in some other manner, it obviously cannot be included. One or two amateurs in the past have sent notes regularly, and the information has always been printed, but those who complain of omission have only themselves to blame.

The Postmaster-General has decided, against the recommendation of the Experimental Radio Advisory Committee, to limit the number of licences to be issued in any one area, but we have no information as to the numbers he proposes to issue.

ZE1JB has been fairly active recently, and has worked many Americans on 14 Mc., as well as a few stations on 28 Mc. ZE1JV and ZE1JZ have been heard on 14 Mc. working DX; it is most unusual to hear 14 Mc. signals from such a close distance. Umtali is about 150 miles and Bulawayo about 250 miles from Salisbury.

ZE1JJ has been doing some work on 28 Mc., but finds it so quiet now that he is making a lot of preparations for 56 Mc. experiments. We are told that he is building a transceiver using a pair of 42 valves. We understand that ZE1JU is doing the same thing and has a pair of 801's in push-pull in his final, which put out a very fine signal on 56 Mc. He is using C.W., feeding a matched impedance 5-metre aerial, and sends out test calls nearly every day at 1600 G.M.T.

We have been informed that ZE1JL's licence has been cancelled.

ZE1JN has now returned from his holiday and is looking forward to getting on the air again. He and ZE1JS are conducting regular 56 Mc. schedules, usually at 1130, 1630 and 1800 G.M.T. The distance between the stations is about three miles, and the transmitter used by JN consists of a 53 oscillator modulated by another 53, using a 56 speech amplifier, while that at JS is a small transceiver using a type 19 tube. JN's receiver is a super-regenerative 3-valver. JN says that it took three days before contact was established between the stations because a wrong aerial and method of coupling was being used.

ZE1JO was recently married, which may keep him off the air for some time now.

ZE1JV has succeeded in working ZL1HY. As far as we are aware, this is the first ZE-ZL QSO on 14 Mc. The contact was made on November 21 at 1640 G.M.T. ZE1JV's transmitter consists of a 2A5 CO with a single 46 in the final, the latter being loaded to 50 watts. The aerial is a centre-fed Hertz of $1\frac{1}{2}$ waves each side of the centre. The aerial is link-coupled to the final, one section runs north to south, and the other north-west to south, giving an angle of 45 degrees between the wires, which would seem to result in a species of V beam. ZE1JV is waiting for a card from Brazil for his

W.A.C., and will then only need a VE for his W.B.E. (You should listen about 0400 or between 2000 and 2100 G.M.T. if you want VE's. —ZE1JB.) His score in the VK contest was 1800.

ZE1JY has not been heard, but we understand that he is travelling about the country at present.

ZE1JB takes this opportunity of wishing all B.E.R.U. members here and elsewhere everything of the best for 1937.

South Africa

Division One.—ZT1A says conditions on 7 Mc would be good if it were not for R8 static. This is probably due to the strong south-east winds which have been blowing at the Cape recently. He also complains of commercial stations operating in this band.

14 Mc. is still continuing good, although even on this frequency static is making itself felt.

ZS1AN requires VK to complete his W.A.C. on 14 Mc. ZS1H continues his good work on 28 Mc. By the time these notes appear he will be in the possession of a new receiver, a Super Sky rider imported especially for 56 Mc. When he gets going we can see more records being broken!

ZS1B is rebuilding his oscillator stage, inserting a 6L6 in place of the 53. ZS1A is rebuilding his final, using an RK20 instead of type 10's. ZU1V is on 14 Mc. again with new aerial masts 60 ft. high.

Further tests on 56 Mc. between plane and ground were carried out by ZS1B on Sunday, November 29. Results were excellent, as constant duplex communication with the plane was maintained during the whole of the flight. Various Government departments seem to be very interested in 56 Mc. ZS1B.

Division Five.—The 7 Mc. band seems to be practically deserted, except during week-ends; QRN is playing havoc with signals.

14 Mc. provides all the DX one could wish for.

28 Mc. signals are coming over with exceptional strength, some G and W stations being R7/8.

Congratulations to ZS5Z on obtaining his W.B.E. certificate. ZS5U has been very active on 14 and 28 Mc.

The following B.E.R.U. stations have also been active: ZS5Z, 5U, ZT5V, ZU5D and ZU5Q.

Division Six.—Activity on the 7 Mc. band has been rather restricted owing to the terrific storms experienced practically all over the Union, in consequence of which contact with the various Divisions has been interrupted.

The 14 Mc. band is a ham's paradise in the early hours of the morning, and a few members have been able to work all Districts of U.S.A. within a couple of hours.

On the 28 Mc. band numerous overseas stations have been heard and worked recently. ZS6C and ZT6Z have been conducting very interesting tests, the latter succeeding in doubling, redoubling, and redoubling again, from 80 to 10 metres.

Several new members have joined the 56 Mc. group, and as soon as possible the results of their experiments will be collaborated and analysed, so as to give us something definite to start off with.

ZT6AQ recently added six new countries to his DX list, namely, HS1, ZP, XU, D4, VK2 and 6,

and the coveted ZL. His DX is now 39 countries and 66 zones. He is active on ten, and has heard several W's. He is also testing bi-directional aeriels, and at the moment is using two half-waves in phase, with a phasing coil in the centre. On 14 Mc. the antenna is Windom fed.

The following members are active on 28 Mc.: ZU6P, ZT6M, ZS6T, ZT6AQ, ZS6C, ZT6X and ZU6V, whilst ZT6M, ZS6T, and ZT6X are active on 56 Mc.

ZT6X is now in possession of an oscilloscope. Future transmissions from this station should reach a high degree of perfection.

We wish all members the very best of luck and prosperity in the New Year. ZU6V.

CORRESPONDENCE

The New Detector Theory

To the Editor, T. & R. BULLETIN.

DEAR SIR,—With reference to the review of my little book in your issue of August last, I did not consider this a challenge, and so did not reply to it.

I note that your reviewer admits that the theory of detection is revolutionary, but some experts will not even admit that it is anything different from orthodox! However, as your reviewer admits that the theory is revolutionary, one cannot expect him to admit that he is in agreement with it—at least, not at present.

It may interest you to know that I have received several appreciative letters from readers, and that *Practical Wireless* gave the book a good review in its issue dated August 8. It has been noted in *Nature* and *Discovery*.

On the other hand, the experts who disagree with it only say in effect that they do not believe it, which seems strange, after it has been proved by practical experiments over a period of five years! For instance, if you take a set tuned to, say 300 metres, the loud-speaker output of that set can be passed through a radio-frequency transformer, and tuned again at 300 metres. The audio output can therefore be rendered inaudible when out of tune at radio-frequency!

In my humble judgment the New Theory should have a profound influence on the future design of wireless receiving apparatus—although perhaps I should not say so.

I should be pleased to receive any criticism of the book from your readers, whether destructive or constructive. As I am now a "hardened orthodox sinner," your readers can speak their minds freely!—Yours faithfully,

D'ARCY FORD

(BRS1879).

15, Gandy Street,
Exeter, Devon.

Reports Wanted

W4DNA (Florida) on his 7 Mc. transmissions. Confirmation will be acknowledged by card. BRS2427 passes us this information.

G8GI (Lincs.) on his 1.7, 7 and 14 Mc. transmissions.

THE 28 Mc. BAND—*(Continued from page 308.)*

From South Africa, ZS1H, ZT2B, ZU6P and others continued to come through, though their signals were generally weaker than in previous months. ZE1JJ reported on December 2 that DX conditions had been poor on all bands. He only needs a Canadian contact for W.B.E., but has not even heard one yet. North Americans were audible daily from about 13.00 G.M.T., and all districts except W7 and VE5 were heard consistently. G6DH worked 130 different W's during the month, but has not heard a W7 since the middle of November. When conditions were good for W's the U.S. Police transmitters were also heard well, and W2XEM and others were R8 on 9 metres.

Signals from Eastern Europe came through daily, though sometimes they were weaker and more prone to fading than before. YL2BB reports that Latvian stations are at present only licensed for this band, but they hope to be allowed to work on 14 Mc. soon.

THE MONTH ON THE AIR—*(Continued from page 309)*

G6YL beat G2TM to Turkey by three years, and even she is not at all sure that her's is first contact. In August, 1931, she worked a ship in port at Istanbul, and between that date and April, 1932, she had had eight QSO's with ships of various nationalities in that harbour, all of which were confirmed.

For next month, don't forget to send me accounts of any interesting happenings on the air; this column is not reserved entirely for DX, and thanks to your help, it is beginning to cover quite a wide field.

IMPROVEMENTS IN C.W. RECEPTION—*(Continued from page 302)*

The most obvious advantages of this system of C.W. reception are:—

- (a) Absence of background noise—(even "Schott" effect is reduced).
- (b) Enormous increase of amplification.
- (c) Elimination of blind spots.
- (d) Easy stabilisation for high stage gain obtained.

Reports from users of this circuit will be very welcome, and any further help we can give will gladly be extended.

56 Mc. SUPERHET *(Continued from page 316).*

less than 100 ohms, and a non-inductive resistance of this type is not commonly available, it is better to shunt the tuned circuits with a high resistance, and this will produce the same effect. The exact value of the resistance will depend on the intermediate frequency, the "Q" of the coils and on the coupling of the coils. With normal commercial transformers designed for 465 kc. and a 9 kc. band width, a value of 250,000 ohms will be suitable, but if the value is required exactly, it will be wise to write to the makers. The effect of inserting the resistance will be to reduce the mutual inductance of the coils and, if the construction allows of it being done, the two coils should be pushed slightly closer together to make up for this reduction.

Coming now to the oscillator section, this must be very completely screened from the input circuit. The writer advises the use of a copper box containing the valve and holder, oscillator coil and the oscillator section of the gang condenser, this box being mounted on the chassis by means of insulating pillars and connected to it at one point only. This will prevent coupling, other than that specifically arranged for, taking place.

In a receiver of this type, we must avoid background noise as much as possible. It is therefore advised that the valves used be of first-class manufacture and the bias adjusted to be slightly greater than normal. This will result in reduced anode current and reduced valve noise, but the actual sensitivity will be only very slightly less.

We are now concerned with A.V.C. so that the second detector can be any of the usual types, and this also applies to the low frequency stages, which can be arranged for either telephone or loud-speaker output.

As is usual with any type of ultra-high frequency circuit special attention must be paid to the layout, in order that all wires carrying high-frequency current shall be as short as possible. This also applies to the by-pass condensers, the size and position of these being chosen to obtain maximum effectiveness at the various frequencies involved.

In a later article, the writer intends giving a practical description of a 56 Mc. Superheterodyne constructed on these lines, when values of condensers, coils and resistances will be included.

CORRESPONDENCE—*(Continued from page 332)*

Tartar, Kirghiz, Dagestan, Crimea, Yakutsh, Karelia, Chuvash, German Volga, Buryat Mongol, Kazak. The autonomous areas are clearly marked on any modern map. Ural is one taken at random, because the writer knows of one amateur who counts it as a separate country.

It is hoped that the above explanation will convince those who were still in doubt. It should be emphasised that the 11 autonomous Republics do not count separately, but come under Soviet Russia or Russian S.F.S. Rep.

Thanks are due to Mr. Dyson for clarifying the position of the Saar, and we can therefore count this separately. It is interesting to note that the "210 DX Club" of America consider Wales and East Prussia as separate countries. Opinions on this point will be appreciated.

G6NJ's system has much to commend it, and I should like to congratulate him on a novel and well-thought-out scheme. I do feel, though, that the majority of interested amateurs prefer to try for new countries, as opposed to new zones, whether these zones are as outlined by G6NJ or by "Radio." There is something more interesting in knowing that one has contacted a new piece of territory which is constitutionally separate from any other rather than contacting a station on a piece of land with arbitrary boundaries.

Yours faithfully,

H. A. M. WHYTE

(G6WY).

9, The Mead,
Beckenham, Kent.
December 28, 1936.