THE T. & R.

BULLETIN

THE INC. RADIO SOCIETY OF GT. BRITAIN

AND THE BRITISH EMPIRE RADIO UNION

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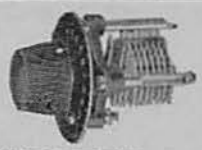

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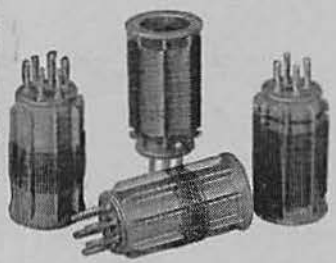

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THE T. & R. BULLETIN

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No. 7

MEGACYCLES AND MICROFARADS

THERE are usually two ways of doing a job, and because most of us have been doing certain jobs in the wrong way, these words have been penned. Stated briefly, we have for years been using incorrect abbreviations throughout the pages of this journal. Habit grows upon us all, and it comes as a shock when practices we have learned ages ago have to be discarded, but the extended use of electrical abbreviations, and the introduction of numerous new terms are responsible for the changes which we shall briefly comment upon.

The most commonly used of all abbreviations in this journal is the one which refers to the various frequency bands upon which we conduct our experiments, *viz.*, the abbreviation for "megacycle." Far and wide this term has been contracted to "mc.," but a glance at the article on page 135 of the October, 1935 BULLETIN will show that a small "m" means "milli-," therefore, when we write "mc." we are, strictly speaking, defining "megacycles" as "millicycles"! A small point, perhaps, but one which has already caused some confusion in official quarters. In future, therefore, let us use the correct abbreviation "Mc.," or, if we write in the plural, "Mc/s." Curiously enough, the small brother of the "Mc." is written as "kc.," not "Kc."

Many years ago we were brought up on the Ohms Law diet of "C equals E over R, R equals E over C, E equals C times R," but an examination of the current list of electrical terms shows that our old friend "C" now stands for "Coulomb," whilst "I" is the correct abbreviation for "Current."

Again, when referring to the capacity of condensers, most of us in bygone days used the expression "mfd," but to-day the correct abbreviation for microfarad is "μF," whilst micro-microfarads, almost unknown a decade ago, should be described as "$\mu\mu$F."

There are numerous other instances of changed practice, and we would recommend all those who have occasion to write for this journal to make a closer examination of the article previously mentioned, or better still, study the British Standards Specification No. 423, which deals fully with the subject.

In drawing attention to these matters, we feel sure that all members will agree that as a scientific body, the R.S.G.B. should endeavour to set an example to all who use electrical abbreviations.

J. C.

THE YEAR IN REVIEW*

By John Clarricoats, Secretary.

It is my privilege to again present a summary of the year's work, together with comments on matters of importance.

Membership.

Membership has increased in a most satisfactory manner, the nett gain over the year amounting to 342. The present total of 2,587 comprises 2,091 Corporates, 13 Associates and 483 overseas members.

For comparison purposes the figures for the past four years, taken on December 1, are given :—

1931	...	1,537
1932	...	1,770
1933	...	1,978
1934	...	2,245

To the many new members who have joined us during the year we extend a cordial welcome and an invitation to enter into every sphere of our activities.

Licence Matters.

An important new licence facility was obtained in June when the G.P.O. authorised 3.5 Mc. experiments to be carried out at all times of the year, with the exception of September. Week-end operation is still permitted during this month.

Permission was also given for the use of the suffix " P " when stations are operated as portables.

During the year the first batch of the new 25 watt permits was issued. An effort was made to have these issued at no extra charge, but the Administrative Department of the G.P.O. could not agree.

Notification was received in July that as from January 1, 1936, all transmitting amateurs would be required to obtain a broadcasting licence if programmes are received for entertainment. The Council, whilst regarding the decision with disfavour, had no option but to agree for the reason that for some years all new licencees have been paying the extra fee. The new regulation, therefore, only affects a comparatively small number of present licence-holders.

Band Monitoring.

Very useful work has been carried out by the members of this Group under the direction of Mr. A. D. Gay. During the year over 5,000 checks have been conducted, and in only a very few instances has off-frequency operation been reported. When this has occurred, in nearly all cases the station heard was not using crystal control.

Band Occupancy.

Mr. L. Hill, G5WI, has, with the assistance of some twenty members, carried out two further Band Occupancy checks. These took place in April and September.

No less than 906 individual British stations were heard active during the September checks. Individual activity figures for the whole series of checks are as follows :—

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

The high total of stations heard active on 7 Mc. (viz. 716) during the September checks is a further indication of the cramped conditions on this band.

Commercial Activity Checks.

Acting on an R.S.G.B. suggestion, the I.A.R.U. have put into operation a world-wide check of commercial activity in the bands around our 7 Mc. allocation, Mr. A. O. Milne, G2MI, is in charge of the R.S.G.B. check.

The purpose of the check is to obtain accurate data of commercial activity in preparation for the Cairo Conference when it is anticipated that some steps will be taken to ask for a wider frequency assignment at the H.F. end of our 7 Mc. band.

I.A.R.U.

The R.S.G.B. continues to work in close co-operation with the Headquarters of the I.A.R.U. Numerous suggestions of International importance have been made during the year, including a recommendation that similar boundaries for basing W.A.C. and W.B.E. claims be assigned.

A proposal aimed at expediting I.A.R.U. business has been tabled, and is at the moment being voted upon by the member societies.

Co-operation with European Societies.

The closest possible co-operation exists between the R.S.G.B. and the active European Societies. In preparation for the Cairo Conference a circular outlining our views has been issued to these organisations, and it is anticipated that a meeting of European delegates may be held in Brussels next year. The opinion has been expressed that a European representative should be invited to join the I.A.R.U. Delegation to the Cairo Conference.

The membership may rest assured that the Council will continue to safeguard the interests of British amateurs on all matters affecting their welfare. To this end a Cairo Committee has been appointed to study international matters.

Co-operation with the G.P.O.

The cordial relations which have been established between the Society and the G.P.O. continue to prove of great value on all occasions when licencing matters are discussed.

It is considered highly desirable to record that the R.S.G.B. are at all times in close touch with the G.P.O. engineers, and that every application for improved facilities receives their most careful consideration.

Numerous recommendations for high power and 3.5 Mc. permits have been made by the Council, and with but very few exceptions these have been granted.

* The Secretary's Annual Report, as read at the Annual General Meeting, December 20, 1935.

The attention of members is drawn to the fact that all applications for increased facilities must be based on technical grounds and should be handed to the member's District Representative.

District Activities.

All British Districts report an increase in membership. This is very largely due to the fact that local meetings are held at regular intervals in most of the important centres.

As from January 1, 1936, a new scheme of representation will be put into operation. By appointing Town Representatives, it is confidently expected that the social aspect of the Society's work will become of even greater value than is the case at present.

Provincial District Meetings, which were a new experiment, proved highly satisfactory. These meetings took place in Birmingham, Bristol, Manchester, Leeds, and Torquay. Five fresh venues have been selected for 1936, and it is hoped that good attendances will be recorded.

Local Conventionettes were held in several districts and a most satisfactory London and Home Counties outing, arranged by Mr. G. Featherby, took place at Ongar in July.

As the result of views obtained from a questionnaire published in the Society's Journal, it was decided to continue District Notes in their present form. The District Calendar of forthcoming events, whilst being used regularly by certain groups, is still far from comprehensive.

Several changes in connection with District representation have taken place during the year. In the East Midlands, Mr. J. J. Curnow (G6CW) succeeded Mr. H. B. Old (G2VQ); in the West, Mr. R. A. Bartlett (G6RB) succeeded Mr. W. B. Weber (G6QW); in South Wales and Monmouth, Capt. G. C. Price (G2OP) replaced Mr. D. Low (G5WU); in North Wales Mr. D. Mitchell (G2II) succeeded Mr. Vaughan Williams (G6IW); whilst in the Mid-East District the Rev. L. C. Hodge (G6LH) has taken over from Mr. A. E. Livesey (G6LI).

The thanks of the Society as a whole are due to all the D.R.'s, past and present, for their very whole-hearted support and assistance.

A similar mark of appreciation must be accorded to our retiring County Representatives, many of whom will continue to assist us either as T.R.'s or as District Scribes.

Scotland.

During the year, Mr. Wyllie (G5YG), who had acted as Honorary Scottish Manager for more than ten years, was compelled to relinquish that position for health reasons. We take this opportunity of placing on record our thanks to Mr. Wyllie for his past services, which have been recognised in material form by conferring upon him a Vice-Presidency.

Consequent upon Mr. Wyllie's resignation, and acting upon his suggestion, Council were pleased to appoint Mr. James Hunter (G6ZV), of Glasgow, Honorary Scottish Records Officer. Mr. Hunter has already made his presence felt, and with the co-operation of his District Officers the future progress of amateur radio over the border seems assured.

National Field Day.

National Field Day was again an unqualified success. All Districts had stations in action, and it is expected that when the time arrives for the fourth contest to take place greater enthusiasm than ever will be shown. The co-operation of several overseas stations was most highly appreciated.

R.S.G.B. Contests.

These were supported in general by the usual group of devotees, but the total entries was small when compared with the number of stations who are known to be regularly operating on the 1.7 and 3.5 Mc. bands.

It was with reluctance that the Council decided not to organise a Reception Contest for 1935. Their decision was based on the fact that previous contests have been very poorly supported. A contest in conjunction with the 1.7 Mc. Transmitting Contest has been arranged for January 1936.

B.E.R.U. Contests.

The hours and periods for the Fifth Annual B.E.R.U. Contest were arranged on somewhat different lines to those in vogue in previous years, and as a result of the experience gained it has been decided to revert to the older methods for the next contest. The scoring method has been extensively modified and it is hoped that it will prove popular. It should be mentioned that a considerable amount of time and thought was devoted by the Tests and Awards Committee to the preparation of the rules for this and other contests.

Publicity.

The third edition of *A Guide to Amateur Radio* was placed on sale on the opening day of the R.M.A. Exhibition and, as has been reported earlier, all previous sales records were broken during the Exhibition period. Without question the Guide has provided excellent publicity for the Society, a fact which has given great satisfaction to those who assisted in its production.

The question whether or not future editions shall follow at yearly intervals is one which the new Council have to consider at an early date.

The Society's stand at Olympia again focussed attention on amateur radio, and allowed the general public to attain first-hand information regarding our work. The assistance so freely given by several members during the ten days of the Exhibition was of inestimable value to Headquarters.

Tenth Convention.

The Tenth Convention surpassed all earlier events of this type, both from the point of view of enthusiasm and attendance. The decision to arrange visits to places of interest proved an unqualified success. The film show, the Convention Lecture, and the dinner were possibly the most appreciated items in a very full week-end.

Sectional Activities.

The QSL Section has again had a busy year under the direction of Mr. Chisholm, handling well over a quarter of a million cards. It became necessary in June to engage a junior clerk to assist with the work of this section. The decision to cease the exchange of listeners' report cards with European countries becomes effective as from January 1, 1936. This action was reached because of the enormous increase which had taken place in the number of cards of doubtful value received from European countries. The decision applies only to reports on 3.5, 7 and 14 Mc. transmissions.

Mr. M. Williams (G6PP) has again handled the QRA Section in an efficient manner. By co-operating with the Radio Call Book Company he has been able to keep the British list of amateur calls up to date.

The Calibration Section, under Mr. A. D. Gay, has rendered invaluable service to all members, for not only have standard frequency transmissions been made from time to time but a large number of crystals and frequency meters have been calibrated and certificates issued.

The Tests and Awards Committee, under Mr. St. Johnston's chairmanship, have met on several occasions, and have given careful consideration to the numerous suggestions received from members.

A Technical Committee was formed during the year under the chairmanship of Mr. Gay, and as a result much useful assistance has been given to Headquarters, especially in connection with the new Guide.

Research and Experimental Sections.

Considerable progress has been made in connection with the R.E.S. Towards the end of 1935 a decision was reached concerning the future of this section, which should enable it to make good progress in the years to come. Besides catering for individual and group members, it has been decided to form Research groups, which will, in effect, provide the ideas from which new developments will spring. It is our pleasure to record that Mr. J. C. Elmer (G2GD) has offered his services as assistant to Mr. H. C. Page (G6PA), Manager of R.E.S.

The membership of the Section continues to increase and several valuable contributions from its members have appeared in the T. & R. Bulletin during the past year.

The T. & R. Bulletin.

The Society's Journal completed its tenth year of publication during the year, an event marked by the receipt of many letters of well wishes from members.

The T. & R. Bulletin has provided readers with the latest information on all matters of general interest, and many useful contributions of a technical nature have appeared.

An especial word of thanks is due to the many regular contributors, including Uncle Tom, who seems to be either the best-loved or most-hated of them all! Revenue received from advertising was slightly higher than in 1934, due in no small measure to the efforts of our Advertising Manager, Mr. H. Freeman, of Parrs Advertising.

Our grateful thanks are offered to all advertisers who have supported our Journal.

The B.E.R.U.

Our overseas British Empire section continues to make steady progress. In Australia and New Zealand sub-representatives have been appointed to assist the official representatives, and as a result a closer contact between individual members is being maintained. In Australia Mr. Ray Carter (VK2HC), who had acted as representative for several years, was compelled to resign for personal reasons, and Mr. Ivan Miller (VK3EG) was appointed as his successor. A letter budget is now in circulation amongst our Australian members.

In India, Messrs. McIntosh (VU2LJ) and Nicholson (VU2FP) have rendered great service, the latter organising and publishing a very comprehensive monthly Bulletin.

In Egypt, Mr. Pettitt (SU1SG) has succeeded Lt. Cole (SU1EC) as Representative, and attempts are being made to issue regular Bulletins to members.

Mr. McIntosh (VS1AA) has, with assistance from Mr. Bee, reorganised the B.E.R.U. Group in Malaya and good progress is being made.

Canada still presents some difficulties, due to the fact that no National Society exists other than the Canadian Section I.A.R.U., but we are hopeful of increasing our membership in the Dominion during the coming year.

In South Africa Mr. Heathcote has been successful in increasing our membership, whilst in the Rhodesias Mr. Hill, who succeeded Mr. Mavis, successfully negotiated with local government officials when certain licence difficulties arose.

In other parts of the Empire our representatives are actively assisting in the work of making the B.E.R.U. known.

Technical Developments.

The outstanding developments concern the stabilisation of ultra high frequency transmitters. Several members are engaged on this important work. Attention is also being paid to improvements in ultra high frequency receivers; when these experiments have been concluded, it is anticipated that long distant communication on 56 Mc. will become possible at certain periods of time.

More and more members are using stabilised transmitters for general work, due in no small measure to the useful constructional articles published in our Journal.

Improvements in receivers are also taking place, but the inability of British manufacturers to provide a kit of parts for a single signal superheterodyne receiver has resulted in many members purchasing expensive receivers from the U.S.A.

The valve situation which was commented upon in a recent editorial seems to be improving, and already one company has produced an R.F. pentode which appears to compare very favourably with an American equivalent. We hope to see other companies following suit during 1936, for only by using modern valves and components can the British amateur hope to keep pace with ultra high frequency development.

The 28 Mc. Band.

The universal interest which was shown during the period of the 28 Mc. Contest sponsored by the R.S.G.B. paved the way for a succession of outstanding achievements in October last.

In this connection we would mention in particular the work of Miss Corry (G2YL), Messrs. Laker (G6LK), Swain (G2HG), Shoyer (ZS1H), McMath (VK3JJ), Belstead (VK4EI), Beatson (VK4BB), Bischoff (VK2LZ), and Shiba (J2HJ), all of whom are members of the Society.

It is expected that conditions on this band will continue to remain good for long distant work during the next two years.

Empire Link Stations.

Invaluable assistance has been rendered to Headquarters by Mr. H. A. M. Whyte (G6WY), Mr. F. Charman (G6CJ), and Mr. H. Chorley (G5YH), in connection with E.L.S. work. Monthly reports, results and advice of tests and information of general interest have been received through these stations and others. Two of the most efficient of

the 1934 overseas E.L.S. are now in England; we refer to Lt. Cole (SU1EC) and Mr. G. G. Samson (ZL4AI). To these gentlemen and to all others who have assisted in this work we offer our thanks.

Headquarters.

Owing to the pressure of Society work, Council considered it desirable to request members, where possible, to make an appointment in advance if they wish to discuss Society business with the Secretary. It is realised that this is not always convenient, but members will assist Headquarters if they will co-operate in this matter to the best of their ability.

Before concluding, I wish to pay a tribute to the loyalty and efficiency of my assistants, and to record my most grateful thanks to Mr. Arthur Watts, Mr. Ostermeyer, Mr. Bevan Swift, and their colleagues on Council, for without their guidance and assistance the progress which it is my privilege to report would not have been accomplished.

Finally, I wish to thank all D.R.'s and members for their help during the year, and I trust that the cordial relationships which have always existed between themselves and Headquarters will continue.

ANNUAL GENERAL MEETING

Minutes of the Annual General Meeting, held at the Institution of Electrical Engineers, on Friday, December 20, 1935. Present: Mr. A. E. Watts (President), Mr. E. D. Ostermeyer (Executive Vice-President), Mr. H. Bevan Swift (Past President), Mr. G. Marcuse (Past President), Mr. J. Clarricoats (Secretary), and about sixty members.

The Secretary read the notice convening the meeting.

The President moved that the minutes of the previous Annual General Meeting be taken as read. The motion was carried.

Mr. Ostermeyer, before proposing that the Hon. Treasurer's report and balance-sheet be approved, explained that the Council had given very careful consideration to the suggestion that the amount on deposit should be invested, but it had been decided to make no change at present.

Mr. A. W. Alliston seconded the Treasurer's motion, which was adopted unanimously.

The Secretary read his annual report. (*The report appears elsewhere in this issue.*—EDITOR.) Mr. H. Bevan Swift, in moving its adoption, spoke of the work which has been done during the year, and paid a tribute to Headquarter's Staff. Mr. G. Marcuse seconded the motion, which was carried with acclamation.

The President announced that Messrs. A. D. Gay, H. C. Page, J. D. Chisholm, A. O. Milne, T. A. St. Johnston, V. M. Desmond and H. A. M. Whyte, had been elected to serve on the Council for the coming year, together with the following officers: Mr. A. E. Watts (President), Mr. E. D. Ostermeyer (Executive Vice-President and Hon. Treasurer) and Mr. H. Bevan Swift (Hon. Editor).

The President, in moving a vote of thanks to the retiring Council, mentioned that Mr. G. W. Thomas was retiring from executive office after a very long period of duty; both Mr. Thomas and Mr. Dedman (who had just completed three years of service) had been most valuable members of Council, and their past services were very much appreciated.

The President moved that a vote of thanks be accorded to the President and Council of the Institution of Electrical Engineers, for their kindness in permitting meetings to be held on their premises. The motion was carried.

Mr. W. W. S. Wallace proposed, and Mr. A. N. Le Cheminant seconded, that Mr. Ockleshaw be appointed Hon. Auditor for the coming year. Carried.

Mr. Watts, after thanking the Council, staff and members for their support and help during the year, said that whilst the Secretary had mentioned by name a considerable number of members who had given their services during the year, it was not possible for him to give a complete list. He desired, therefore, to thank the following: Mr. A. E. Dyson (G6NJ) for preparing THE T. & R. BULLETIN index and checking B.E.R.U. contest entries; Mr. G. McLean Wilford (G2WD) for his numerous technical contributions to THE BULLETIN; Messrs. G. C. Allen, T. C. Clark, J. J. Paine and A. M. Houston Fergus for their assistance with band monitoring work; Mr. A. O. Milne (G2MI) for continuing his work as BULLETIN draughtsman; Messrs. H. A. M. Clark, F. Charman, D. N. Corfield, J. W. Mathews and G. W. Thomas for their work on the Technical Committee; Messrs. G. A. Chapman, H. W. Stacey, C. A. Sharp, for acting as District Scribes; Messrs. W. H. Matthews and C. J. Greenaway for their assistance on the Awards Committee; Mr. T. P. Allen, who had again acted as official book reviewer. Finally he thanked all members who have assisted in connection with band occupancy and commercial activity checking. Mr. Watts also paid a tribute to those who had contributed articles to the third edition of "*A Guide to Amateur Radio.*"

Mr. Watts concluded by saying "There are many others whose names I should like to mention, but a full and complete list would be extremely lengthy. I must therefore offer on behalf of the Council a cordial word of thanks to all who have rendered service in any shape or form."

At the conclusion of the business meeting the President presented the Powditch Transmitting Trophy to Miss Nelly Corry.

* * *

The meeting was followed by a most interesting lantern lecture, entitled "British Radio Services," delivered by Mr. F. Addey, B.Sc., Assistant Inspector of Wireless Telegraphy, G.P.O.

Strays.

Mr. R. P. Walker-Alexander (G5RA/VS7RA) thanks all British amateurs who assisted him during his leave in England. He is returning to Ceylon this month, and hopes to make schedules with many of those he also worked whilst at home.

* * *

Mr. E. J. Gleeson (EI5D), who has been inactive for some months, asks us to mention that his station is on the air once again. It may be remembered that Mr. Gleeson's call was "pirated" recently.

THE TRANSMISSION AND RECEPTION OF MICRO-WAVES*

By C. G. Lemon, F.Ph.Soc., A.M.I.R.E. (G2GL).

IF we study the whole range of electromagnetic waves on a logarithmic scale as is shown in Fig. 1, we observe that the range of the so-called quasi-optical waves lies between 10 metres and 0.0008 millimetre. This is bounded by commercial waves on the one side and visible light on the other. However, only the two shaded parts can be used for communication purposes. These two parts have the ranges 10 m. to 5 cms. and 0.7 to 2.0 μ.

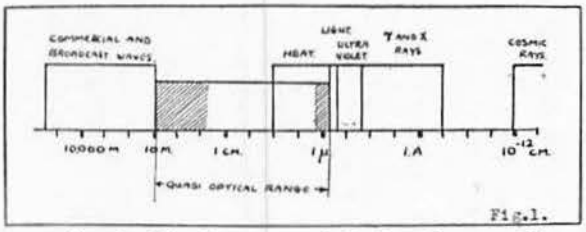

Fig. 1.—The Spectrum of Radiant Energy. The Quasi-Optical Range for Communication is shown Shaded.

A characteristic of the quasi-optical waves is their straight line propagation. Between the transmitter and the receiver there is only line of propagation and therefore the phenomenon of fading is unknown. The possibility of concentrating the radiated energy is another important feature. Concentration can, of course, be carried out by reflecting systems. However, comparing the gain of 30-50 times for a 20-metre commercial station to that of 10^4 to 10^5 for an optical reflector, we see that reflectors on fairly long "short wave" transmitters are very inefficient. In the lower part of the quasi-optical range we can use systems similar to the optical ones, but even at 50 cms. we get into trouble, because, to be effective, reflector systems should be some order of magnitude larger than the wavelength.

A further characteristic is that the noise level at quasi-optical frequencies is extremely low compared to the lower frequencies. They do not appear in man-made devices as in the broadcast range. In fact even Dame Nature seems to have difficulty in starting these high frequencies.

Wavelengths above 5 cms. do not appear to be influenced by atmospheric conditions. Below 5 cms., however, the humidity of the air, and especially the CO_2 content of the atmosphere, absorbs the radiations. Below 3 cms. there is no appreciable radiation in the atmosphere, this being absorbed and scattered in the vicinity of the generator. As we progress lower still in wavelengths, we find that radiation starts again only at the shorter heat waves, infra red and visible light.

Generation of Quasi-optical Waves

Fig. 2 indicates the various ways of producing quasi-optical waves.

Using special types of valves and connected in the Colpitts fashion, oscillations have been produced down to 0.5 metre. The negative resistance circuit (dynatron, etc.) cannot be made to oscillate much below 10 metres owing to the difficulty of building resonating circuits with a sufficiently high impedance. It can easily be understood that the usual reaction circuit cannot produce waves much shorter than 1 metre owing to the time taken by an electron to get from one electrode to the other.

A solution to the difficulty was first found by H. Barkhausen, and he actually uses the time taken by the electron in its movements within the valve to produce the ultra-high-frequency oscillations. A cloud of electrons travels around the electrodes inside the valve, charging and discharging them, and so producing varying voltages that can be applied to outside circuits and radiators. By this method it is possible to produce oscillations down to 3 cms.

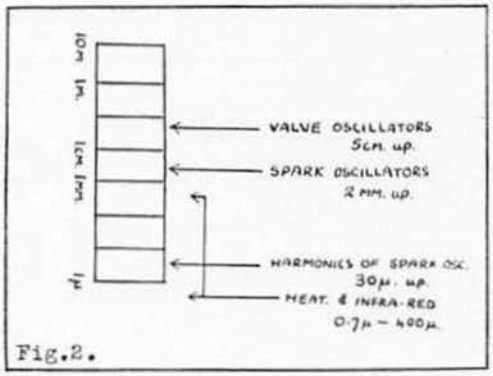

Fig. 2.—Methods of producing Quasi-Optical Waves.

Wavelengths down to 3 metres can fairly easily be produced by the use of ordinary valves, provided small valves are used and the required power is low. As soon as it is desired to use higher frequencies or obtain a larger output, many difficulties arise, the most serious being insufficient protection from overheating at the points where the electrodes are sealed into the bulb. Another point is the alteration of frequency as the valve warms up.

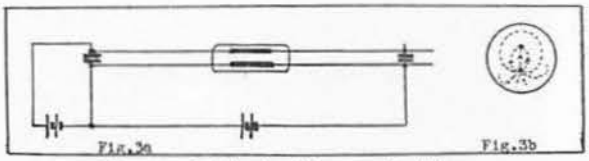

Fig. 3.—A Simple Electron Oscillator.

*A Lecture delivered at the I.E.E., London, on September 27, 1935.

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Below one metre the Barkhausen method of producing oscillations has to be utilised. The simplest form of electron oscillator is shown in Fig. 3a. This consists of two filaments in an evacuated container, one filament being able to emit electrons when heated. Applying a suitable potential, the electrostatic field is as shown in Fig. 3b. Most of the electrons will hit the other filament (anode), but some of them will not hit the anode at all, passing completely around. As the distance of these latter electrons on their periodic path around the anode varies, a change of voltage will be periodically produced and in this manner gives rise to what we call electron oscillations. The frequency of these electron oscillations is mainly controlled by the applied voltages. The lecher wire system being so tuned and adjusted to have a high impedance at the frequency generated, in this way the varying voltages produced on the anode are communicated to the external circuit.

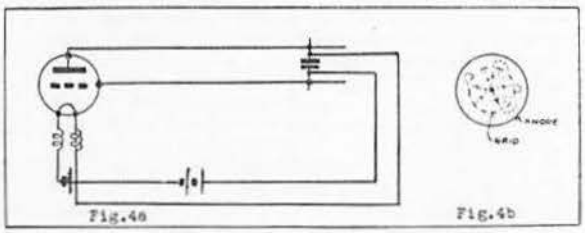


Fig. 4.—The Barkhausen Electron Oscillator.

The circuit used by Barkhausen for generating electron oscillations is shown in Fig. 4. The types of valves recommended are preferably of the 1925 variety, consisting of a straight wire filament (tungsten or thoriated tungsten), a cylindrical grid having a supporting wire welded to each grid and a cylindrical anode. Fig. 4b shows the paths taken by the electrons and, as will be observed, periodic paths are taken by most of the electrons. The grid is connected to a high positive potential and the anode to zero or a negative potential. Electrons emitted by the filament go in straight lines to the positive grid, but a fairly large number pass through the interstices of the grid, find themselves in a negative region due to the anode, and thence reverse their direction and return to the grid. Again, a number of these returning electrons miss the grid and pass through into the positive region between filament and grid, are caught up in the primary stream, and repeat the periodic path. This cloud of electrons approaching and receding from the anode varies the potential of the anode in accordance with the frequency of the periodic path. A lecher wire system coupled to the anode and grid enables the electron oscillations to appear external to the valve. Again, the frequency of the electron oscillations is mainly determined by the applied voltages.

From the foregoing, it is easy to see that an ordinary vacuum type lamp operating on D.C. can give rise to electron oscillations and as a matter of fact can be picked up on a suitable receiver.

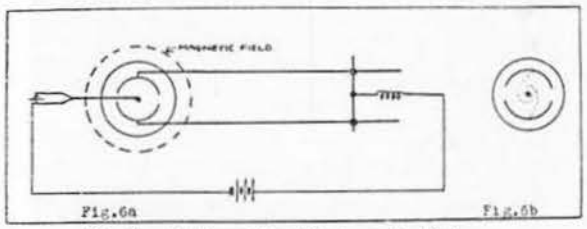


Fig. 6.—A Magnetron Electron Oscillator.

The output from a valve connected in the Barkhausen fashion cannot be made to exceed 0.1 watt, owing to the amount of heat that can be dissipated by the anode.

Another type of electron oscillator is that shown in Fig. 5. In this case the lecher wire system is connected between the grid and filament. This enables the power output to be slightly increased. An improvement upon this method, and one which is capable of generating electron oscillations having a value approaching several amperes, was described in the October, 1934, issue of this journal.

We now come to the magnetron oscillator, which is capable of producing a larger power output than that given by the conventional Barkhausen circuit. The circuit diagram is shown in Fig. 6. The magnetron consists of a straight filament surrounded by two halves of a cylindrical anode. A powerful magnetic field is arranged in line with the filament. The electrons are twisted from their straight paths to the anodes by the application of the magnetic field and so this causes the electrons to take periodic paths, thus giving rise to the electron oscillations (Fig. 6b).

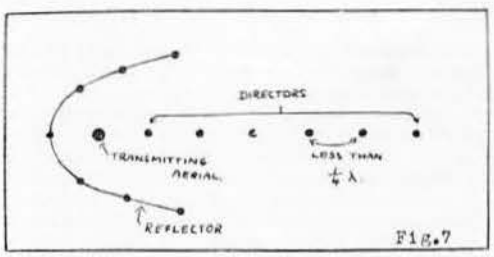


Fig. 7.—The Transmitting Aerial Array used in Micro Wave Transmission.

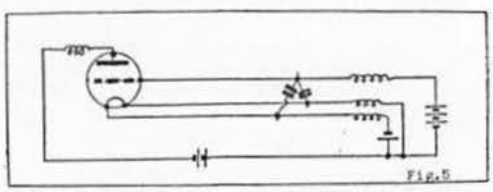


Fig. 5.—A Grid-Filament Electron Oscillator.

An Amateur Transmitter

From the foregoing information on the various methods of generating electron oscillations, it will be seen that the easiest and cheapest method for the amateur is that shown in Fig. 4. It was therefore decided to work on this circuit to produce a really stable and easily operated micro-wave transmitter which any amateur can construct at a minimum cost and so carry out his own particular experiments.

(*Continued on page* 292.)

A PRACTICAL METHOD OF CUTTING THE "TOP"

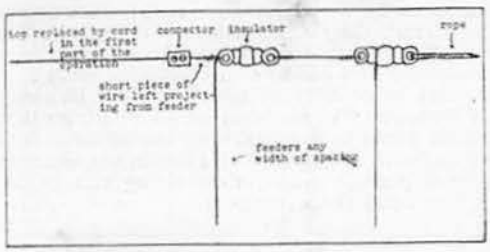
By G. W. Slack (G5KG).

EVERYONE will agree that it is a different problem to be sure that the radiating portion of a Zepp is matched to the operating frequency at which it is desired to transmit, and it will be generally agreed that this is a very important feature when it is desired to work DX with the low inputs in general use.

Various methods have been put forward for getting the top "right"; one method is to calculate it by the usual formulæ, which in practice often proves very unsatisfactory because of the unknown factors which come into play, such as the proximity of trees and buildings, the varying properties of the earth and the different heights of the radiating system above the ground.

Others suggest inserting a hot-wire meter or lamp in the centre of the wire, but unless the device is left in position the resistance of the radiating system is altered, and therefore the aerial is no longer "matched."

The practical method used by the writer will now be described; first of all, a set of feeders are constructed, the spacing of which is not at all important, any of the usual sizes can be used. These are pulled up into the operating or working position, but the "top" is replaced by a piece of string or strong cord. This puts the feeders into their operating position, but without the "top."



The transmitter is then started up on the frequency at which it is desired to match the top, and the feeders are very loosely coupled to the P.A. tank coil in the usual way. It should be mentioned here that great care must be taken when doing this, otherwise the hot wire-meter may be burnt out. The feeders are then carefully tuned to resonance, i.e., maximum current, and the dial reading or readings noted (depending upon whether series or parallel tuning is being used).

The theoretical length of the top is calculated by the usual formula, namely:—

$$\text{Length (feet)} = \frac{468{,}000}{\text{Freq. (kc.)}}$$

This formula is based on a 2.1/1 ratio of natural wavelength to actual length.

About two feet are added to the result purposely, so that the top will be too long to start with, bearing in mind that it is a simple matter to cut a piece off and a very difficult one to put a piece on. A piece of wire is now cut to approximately this length, and attached to the feeders in the manner shown in the diagram. When constructing the feeders the wire is twisted round the insulator as shown, leaving about one inch of wire projecting so that the usual electrical connector (also shown in the diagram) can be attached.

The feeders and top are now pulled up into the operating position and the feeders again tuned for maximum current reading. No notice should be taken of the actual amount of current, the system being tuned for maximum reading under each set of conditions. The dial reading of the feeder-tuning condenser or condensers is again noted. If more capacity is required to restore resonance the "top" is too short, if less capacity is required it is too long. In the writer's particular case he made sure that it *would* be too long to start with. All that has to be done now is to "prune" the top bit by bit, carefully retuning the feeders for resonance each time a piece of wire is cut off, and noting the change in dial reading. This is continued until the dial reading is exactly the same with the top attached as with the feeders connected alone.

The "top" is now matched and will remain matched so long as the particular frequency is used and the effective height of the aerial is not changed.

This method may sound rather complicated, but it is very easy to accomplish in practice. It will be seen that theory is not taken into account except to obtain the length of the top roughly, while all the unknown factors are taken into account, because the matching is accomplished with the aerial in the operating position. It will also be noticed that no steel tapes or other accurate measuring instruments are required.

This method has always been used at G5KG for Zepp aerials, whether one-half, one or two wavelengths long, and has always given perfect satisfaction. It certainly does away with that disconcerting thought: "I wonder if that 'top' is just the right length."

(Editorial Note.—The proof of the pudding is in the eating—during the 3.5 Mc. Contest last November Mr. Slack contacted Australia using this system. His input was 10 watts.)

B.E.R.U. CONTEST

Remember that under the new rules, it will not be policy to ignore a "one point" QSO, for it may be the vital deciding point. As the score total increases so the fight will become harder. No multiplier this year! May we appeal to non-contestants to exercise their spirit of good fellowship by not causing telephony QRM during the contest. It will be very much appreciated if those stations not directly interested in the contest would confine their experiments during the four week-ends in February to the 1.7, 3.5 and 56 Mc. bands. Most important, though, please give "fone" a rest. Thanks O.M.'s.

Awards Committee.

HIGH FREQUENCY WORK IN INDIA.

By D. L. Martin (VU2BL).

THE 56 and 28 Mc. bands provide a welcome field for experiment in India during the monsoon season, when atmospherics and fan interference obliterate the lower frequencies. Unfortunately, many amateurs seem content to battle through it or close down altogether, and co-operation is therefore rare. During 1934, however, VU2BL was very fortunate in having the assistance of VU2BN and BERS231 in his tests, for which he was more than grateful. 2BN was situated 12 miles distant and a schedule was kept almost every night on 56 Mc. using CW.

An introduction to 56 Mc. was made by erecting, about half-mile from the receiver, a midget push-pull transmitter on a tripode with a ½-wave dipole. The receiver was the normal "Ham-band" type using valve-base coils. No difficulty was found in getting it down to below 56 Mc., providing the coil was made self-supporting on a sawn-off valve-base. Various positions were tried with the dipole, and maximum signal strength resulted when it was horizontal and at 90° to the plane of the receiving aerial, which was the common inverted "L" type of no particular length.

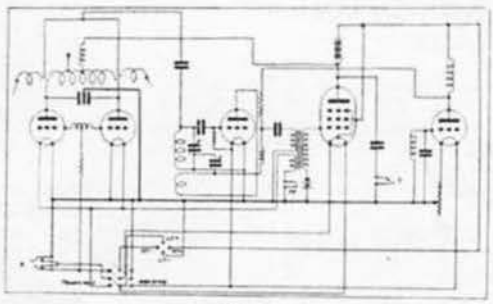


Fig. 1
Outline of transceiver used by VU2BL for 56 mc. work in India.

It was not long before 2BN and 2BL carried out their first 56 Mc. QSO. Both stations used similar transmitters of the P.P.R.G. type, ½-wave (28 mc.) Windoms and straight receivers. Although these aerials were fed by a single wire, no trouble was experienced in using them clipped onto one side of the centre-tap of the tank coil. This did not appear to upset the P.P. arrangement and T8, or, even, T9 notes were quite common on 56 and 28 Mc. It was necessary, however, to protect the transmitter from vibration due to keying, by mounting it on sponge-rubber. The average report either way was QSA5 R6 and with the power available (6-10 watts), 'phone was never possible using super-regeneration owing to the excessive background noise. At all times 56 and 28 Mc. were most reliable during the day or night. During the latter half of the year 2BN used two LP2's and an old 45-volt H.T. battery, with an input of about ½-watt. At 2BL, reduction in power to as low as 60 milliwatts still provided a workable signal! It was very necessary to have the transmitting aerials in the vertical, and a further advantage was found by using the same aerial on the receiver.

Portable gear was soon found desirable, and so a transmitter-receiver (TRX) combination was constructed at 2BL. It was thought that the normal method, using one valve for detector or transmitter would not be as efficient as a midget P-P. transmitter working independently. Accordingly the circuit shown in the diagram was evolved and proved most satisfactory. The TX portion, including valves, was boiled down to 5 in. x 3 ins. x 3 ins. and two old PM252's were used. An "*Ormond*" differential airspaced condenser, .0001/.0001 mfd., was used for the tank circuit with the coil mounted directly across it; this proved

Fig. 2.
The transceiver ready for action.

invaluable in view of the restricted space. Provision was made for a coupled aerial by two single-turn loops and a suitable direct tapping point on the tank coil found for either a single wire fed aerial or a ¼-wave rod. The latter, mostly used in the vertical position, was finally proved to be the most effective. A pentode did double duty as modulator and output valve. A useful check on side-tone could always be made, as the 'phones were automatically in circuit. It was, however,

advisable to remove them during a 'phone transmission in order to improve the depth of modulation.

Ordinary valve-base coils were used in the receiver so that the other bands could be covered. The super-regenerative valve could be brought into operation by the use of the filament rheostat, which incidentally provided adjustment of the applied oscillation. The whole was enclosed in a box 10 ins. x 11 ins. x 4½ ins., which happened to be available, although one specially designed would have been more suitable. The power supply was obtained from a 2-volt accumulator and a 90-volt H.T. battery housed in a similar box.

Tests were carried out with 2BN and results compared favourably with the normal transmitter, but the TRX had to be mounted on a 5-ft. wooden tripod, the ¼-wave vertical rod being used. Without the tripod no contact was made with 2BN, the TRX being in the vicinity of 2BL's station. Another test took place from a mound about 50 ft. high and contact was made with 2BN using the same aerial and tripod. With a ¼-wave dipole fitted direct to the coupling coils, it was noted that although 2BN reported no change in QRK, 2BL at three miles reported a marked decrease. This occurred with the dipole in the horizontal.

Further opportunities for practical tests were presented during the Christmas holidays. Accordingly, the TRX was taken by BERS231 to his quarters in Karachi, 2BL residing with 2BN. The working distance was now reduced to about 5 miles. Tests from a 100-ft. church tower, using the ¼-wave vertical rod, were not at first satisfactory. However, it was discovered that 2BN's aerial was horizontal (used for TX and RX); a change to the vertical pushed 2BN's signals through to the TRX and increased the QRK of the latter from R2 to R7. This discovery was not made until a later test was carried out from a second-storey closed room.

Although the TRX was badly screened in this case, results proved excellent once 2BN's aerial was corrected.

Later the TRX was removed to 2BN's house and his gear altered to form a similar arrangement. The TRX was then taken out in a boat by BERS231 and continuous two-way 'phone communication was carried out up to a distance of 2½ miles. This appeared to be the useful range for 'phone using the vertical ¼-wave rod at sea-level.

THE TEN METRE BAND.

By Nelly Corry (G2YL).

CONDITIONS during December, though showing a slight falling-off compared with November, were still exceptionally good, and signals from every continent except Asia were plentiful. The band was, as a rule, rather quiet on weekdays, but a few VK's were audible most mornings, and no afternoon passed without some W's coming through.

Hearty congratulations to G6LK who worked ZL3AJ at 10.32 G.M.T. on December 22, and to G6WN who worked ZE1JU at 08.49 G.M.T. on the 12th. These are both believed to be first contacts.

In addition to stations in all U.S.A. districts and VE2, 3, and 5, other consistent signals were ZT6K, ZU6P, LU1EP, LU9AX, VP5PZ, ZE1JU, ZE1JN, and several SU's. FF8MQ now uses the call CN8MQ, but his QTH is still the same, viz. 30N. and 8W. Quite a number of European stations have been heard in the South of England this month, and on several days OH7NC, OH7ND and OH3NG were very loud signals.

DX heard by G2HG includes a ZL, believed to be ZL4BQ, on the 8th, and HJ3AJH calling CQ Ten at 17.00 G.M.T. on the 26th. G6WT heard YN1R calling SP1CS at 09.34 G.M.T. on the 13th, and BRS1847 reports FB8C on the 6th, and K5AC on the 14th; these are all believed to be harmonics.

G6LK heard ZL3AJ again on the 29th, and also VU2BV working D4OON. On the 26th and several other days he heard YI6GF, but thinks this is another 14 Mc. station.

The increase in the number of British stations active on 28 Mc. is shown by a report from BERS25, of Malta, who heard 29 different G's in three days. Conditions in Malta seem to be much the same as in England, and BERS25 has recently heard VK, LU, ZT, ZE1, W2, W3, W6, FF8 and SU. He also remarks on the fact that conditions seem good nearly every day, but it is only at week-ends that many stations are active.

The first VK-HJ 28 Mc. QSO was made between VK3HK and HJ3AJH on December 26, at 12.50 G.M.T. VK3BQ also worked HJ3AJH, making the first VK WAC on ten. VK3BD has worked LU9AX.

VK4EI has worked OE1ER, OH7NC, YM4AA, VS6AH, SU1SG and SM6WL.

Several real Old Timers are now active, including G2NM, G6WT, W1ZE (who claims to be the first American amateur to be licensed), and W2JN, the first W to work G on Ten in 1928.

* * *

Information is still required about first G contacts on 28 Mc., particularly claims for the first VE, SU, YI, and CX contacts. The following list is believed to be correct, but details of previous QSO's will be welcomed:—

G6LL	worked	W2JN	on 21/10/28.
G2FN	,,	W6UF	,, 28/10/28.
G5YK	,,	VT2KT	,, 10/2/29.
G5YK	,,	D4UE	,, 23/6/29.
G5WK	,,	ZS5C	,, 22/12/29.
G6DH	,,	VQ2BH	,, 9/3/30.
G6DH	,,	UODX	,, 19/10/30.
G6DH	,,	FM8MOP	,, 9/11/30.
G5OJ	,,	FF8MQ	,, 10/5/35.
G5LA	,,	LU1EP	,, 16/6/35.
G5FV	,,	ZB1I	,, 28/6/35.
G6LK	,,	VK2LZ	,, 13/10/35.
G6DH	,,	X1AY	,, 13/10/35.
G5OJ	,,	VP5PZ	,, 20/11/35.
G6WN	,,	ZE1JU	,, 12/12/35.
G6LK	,,	ZL3AJ	,, 22/12/35.

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SAFETY PRECAUTIONS AT G6QX

By Robert Jardine, A.M.Inst.N.A.

FOLLOWING upon the article appearing in the January, 1935, Bulletin on "High Voltage Dangers," the writer considered that it might interest members generally to have a description of the layout of station G6QX.

Many of the arrangements may appear over-elaborate, but no apologies are offered, the writer not aiming to duplicate his prior experience. The subject is dealt with under four headings, viz. :—

1. Mains Entry to Power Cabinet.
2. Power Cabinet and Equipment.
3. Control at Operating position.
4. The Transmitter.

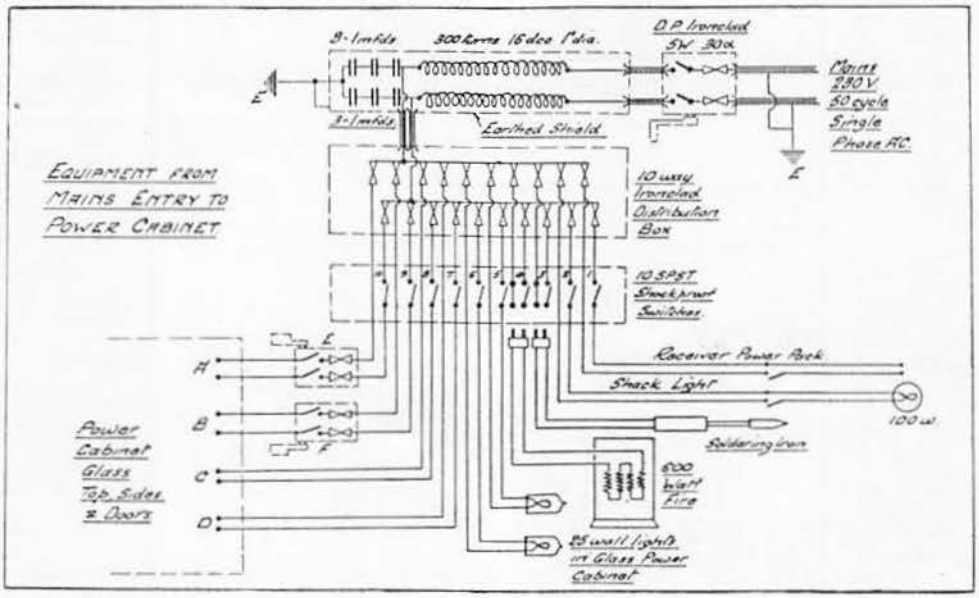

Fig. 1.
Schematic diagram of equipment from mains entry into the power cabinet.

A Power to all filaments. The 590-volt transformer is controlled by the local shockproof D.P. switch marked "E."
B Power to 1,500-volt transformer primary through key. Controlled by D.P. switch F.
C Power to high-voltage rectifier filament transformer 2.1 volts.
D Power to high-voltage rectifier, pre-heater oven.
Switches E and F are painted cellulose red and appropriately designated.

1. *Mains Entry to Power Cabinet.*

Fig. 1 is a diagrammatic layout of the actual leads, and applies more or less to any transmitting room, but more particularly to the outside shack.

The 230-volt 50-cycle single-phase A.C. mains enter through 7/.064, 22.5 amp. single-core lead-covered cables, 2,500 megohm grade, supported on porcelain cleats at 15-in. centres up to the 30-amp. double-pole ironclad switch with fuses controlling the whole of the power supply to the shack. The lead covering is earthed by positive bolted brass clips with 12-gauge copper wire to an outside galvanised tube earth driven 3 ft. vertically into the ground.

From the main switch short leads of lead-covered cable pass into the mains filter box, which is of steel and earthed. Each lead connects to 300 turns 16 d.c.c. on a 1-in. form with a bank of condensers 6—1 μF. sections 1,000-volt A.C. test in series across the pair of leads, and the midpoint earthed. This condenser block happens to be available and is therefore used, being of course well above the required rating.

The output from the mains filter passes into a 10-way ironclad distribution fuse-box with a fuse link for each of the ten leads leaving the box, each fuse link being wired consistent with the load taken by the appliance in that line. The ten pairs of leads from the distribution box pass to a switch-board, one of each pair connecting up to shockproof single-pole quick-break switches, two with plugs from right to left, as follows :—

1. Receiver power pack.
2. 100-watt shack roof light.
3. Soldering iron (switch plug).
4. 600-watt fire (switch plug).
5. 25-watt candle lamp to top shelf, power cabinet, 590-volt equipment.
6. 25-watt candle lamp to bottom shelf, power cabinet, 1,500-volt equipment.
7. Power to 60-watt lamp in Philips 1062 (3,000-volt 300 mil) mercury vapour rectifier pre-heater oven.
8. Power to 1062 rectifier filament transformer.
9. Power to 1,500-volt transformer.
10. Power to 590-volt transformer, and all filament transformers.

Switches 8, 9, 10, all control high-voltage equipment, and the switch covers are cellulose enamelled a brilliant signal red colour and placed next to each other, and each switch has a small brass card-holder with a signwritten card identifying the switch. Before entering the power cabinet, lead pairs from 9 and 10 are further broken by double-pole shockproof fuse switches E & F (*Crabtree* 50-50, all insulated) cellulose enamelled a brilliant signal red colour with the handles signwritten "ON" or "OFF," and clearly visible in each condition, i.e., power on or power off. In addition, the following information is signwritten on the covers, viz., "590-volt transformer," and "1,500-volt transformer."

These two key switches are vitally important to the operator as they completely isolate the high-voltage equipment irrespective of any other control that may be described under Fig. 3, "Control at Operating Position."

We have now covered the supply from the company's mains to the power cabinet in a workmanlike manner, the various cables used being rated at 15 amp. well above the loading. Cheap tinsel-covered flexible cables should be barred for the wiring discussed so far, and porcelain cleats used for mounting pairs of leads on the walls, with porcelain buttons to take care of any heavy flexible cables used.

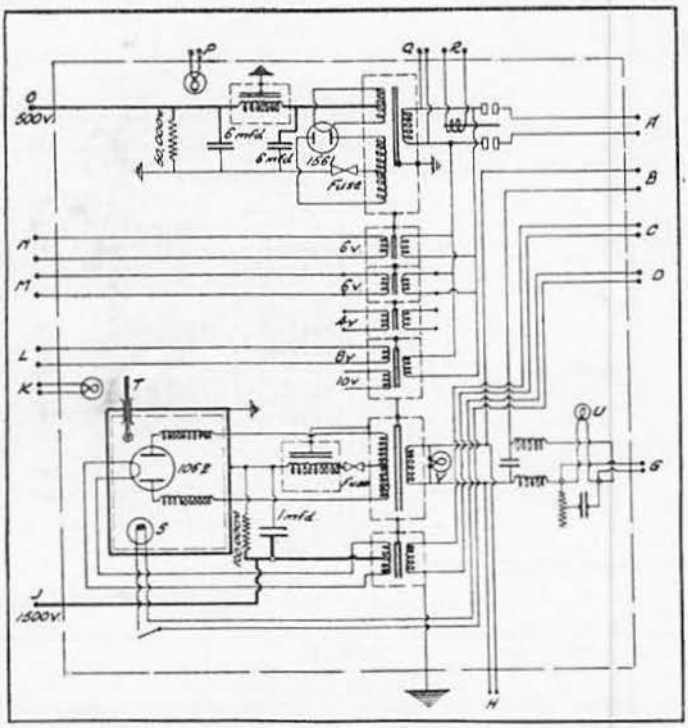

Fig. 2.
Arrangement of wiring in the power cabinet.

2. *Power Cabinet and Equipment.*

The cabinet proper has glass sides, doors, and a plate-glass top, and every unit of the power plant is visible and accessible.

The upper shelf houses the 590-volt equipment, also various filament transformers, etc. Each transformer and choke is completely enclosed in a square steel box, positively connected to the cores, and securely bolted to steel shelves which link up positively to an outside earth.

Input leads to transformers are porcelain cleated to the steel shelves, and output leads consist of ignition cable, with sweated ignition cable terminal tags. The power is applied to the equipment on the upper shelf by a relay operating from a 12-volt car battery, 6 volts only being used, the controlling switch plug being worked from the operating position. Recently this switch and relay has been superseded by a single-pole switch, breaking the primary inputs from the operating position, as there was a hazard if the relay contacts froze or failed to operate owing to low battery voltage with the controlling switch in the off position.

The centre tap fuse is set for 250 mils and enclosed in a regular porcelain fuse-box, and the 590-volt bleeder resistance is a *Zenite* 24, 180-watt, 50,000-ohm, rated at 50 mils and mounted vertically for air circulation.

The lower shelf houses the high-voltage equipment complete, i.e., 1,500, 1,000, 0, 1,000, 1,500 transformer, 1062 *Philips* rectifier, 5,000-volt working 1 μF. condenser, rectifier starting choke in the centretap, bleeder, and rectifier filament transformer. All of these units are cased in steel boxes and link up through the cores with the continuous earth.

The rectifier is contained in a specially devised oven, heated by a 60-watt lamp, the oven consisting of a small steel cupboard with a special screen built in for the rectifier anode, H.F. chokes, and is lined throughout with layers of cellotex, hard wood and asbestos, so that the heat insulating qualities are excellent. In fact, the temperature of the oven rises from 32° F. to 90° F. in just eight minutes, after which the lamp can be switched off and the rectifier will start and continue to run for two hours without further heating.

Some difficulty was experienced in starting the rectifier before this oven was installed, but this arrangement ensures that the rectifier will warm up whilst the operator is listening on the band prior to transmitting.

In Fig. 2, A, B, C, D are mains input pairs; R is 6 volts d.c.; Q and H are pairs for *Osglim* signal lights, across transformer primaries; P, K are inspection lights illuminating the power cabinet.

L, M, N are output pairs to filaments, L being for SW9 standby mounted alongside TV2-60 (T61D) 7 Mc. amplifier.

O and J are high-voltage output leads of ignition cable supported in porcelain standoffs.

T is a thermometer giving rectifier oven temperature, and there is an extra switch on the oven to break the heater lamp input.

It will be noticed in both Figs. 1 and 2 that a continuous earth system links up the various steel shelves, screens, cases, etc., and it is important that this be tested for continuity throughout.

3. *Control at Operating Position.*

Fig. 3 shows the various switches used, these being entirely separate from and extra to the "safety" switches E and F, Fig. 1, which completely cut off all possibility of danger, no matter how other switches may be misused.

Osglim pilots Q and H denote power on both high-voltage transformers, and each power line is broken by two single-pole shockproof switches in series. W and Y being of different manufacture to X and Z, the reason being that any one specific make of switch might develop the same mechanical defect at one time tending to produce a short, but only under exceptional providences of fate would two switches of different makes produce defects passing voltage in the off position.

There would appear to be a fatalistic lack of trust in switching devices apparent in this writing, but the writer has a wholesome respect for the product of high-voltage transformers, and believes that no precaution is good enough to produce safety.

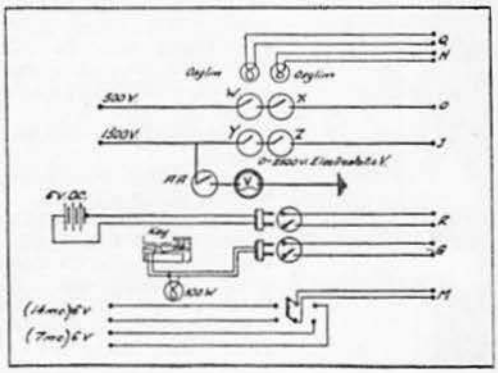

Fig. 3.

Control arrangements at the operating position.

Switch plug leads to primary inputs R and G break the circuits when the plugs are withdrawn, and switch plug to leads G is especially important, as with primary keyed final amplifiers, a key loaded for adjustment purposes, or a key adjusted close for fast sending can energise the high-voltage gear by accidental pressure on the key knob.

The lead from Y to the Electrostatic voltmeter V is broken by a switch AA to isolate the voltmeter during the keying.

With all switches on to the power cabinet, the transmitter is operated by plug switches to leads R and G from the operating position.

The 100-watt lamp across the key has since been replaced by a 60-watt lamp for reducing interference on the occasion of popular broadcasts. The spacer due to this is not audible on DX but is heard locally at R4 with an R8-9 signal. The interference problem is now being experimented with, as the BCL superhet is 10 feet away, but so far the QRM is hardly noticeable when keying 130 watts on 14 Mcs.

4. *The Transmitter.*

The transmitter is a conventional CO.FD.FD, locked amplifier, and the circuit is not given since this was developed from articles by more able writers appearing in the BULLETIN from year to year. The 3.5 Mc. oscillator is an LS5B operating from a four-crystal selector unit, and is a separate unit on the lower shelf of the steel rack. The two doublers are also LS5B's, arranged as separate units on shelves one above the other. The 14 Mc. final amplifier is a locked TGTP with a TY2-60 giving 130 watts input, and immediately above this unit is a replica permanently set for 7 Mc. The TY2-60 in the 7 Mc. final has an SW9 mounted alongside as a standby, and gives 150 watts input.

Aerial tanks permanently set are attached to each final, and in two minutes transmission can be changed from 14 Mc to 7 Mc.

The transmitter rack is specially built, and consists of two square hollow steel posts, slotted at 1-in. centres, and standing on substantial feet, the posts being suitably tied horizontally and to the shack wall.

Fig. 4.

Station G6QX.

Shelves are steel, and adjustable at 1-in. intervals, and the whole rack is silver cellulose spray finished, looks well, and provides more accessibility than the closed cabinet type.

At first it was thought that the presence of so much steel near the transmitter tanks would seriously affect efficiency, but if anything the efficiency is better than with the previous wood rack with glass doors. Better layout, however, is probably responsible for this.

All condensers are provided with 12-in. extension bakelite shafts, and the grid and plate tanks are supported on substantial *Buller* insulators. Tank leads are ½-in. by ½-in. brown metal strip, and coils ⅝-in. diam. brown metal tube (brown metal being an alloy 90 per cent. copper, 10 per cent. tin) all highly polished and cellulose lacquered.

Milliamp. metering is supplied to each plus B lead, and a plug in meter unit provided for the two final amplifiers.

(*Continued on page* 292.)

THE FIRST INTERNATIONAL 28 Mc. CONTEST

"THE event which brought the world on to 28 Mc." aptly describes the International Contest organised by the R.S.G.B. Unfortunately DX conditions during the earlier months set aside for this unique event—which, it will be remembered, ran for a year from October 1, 1934—were dead against European amateurs, with the result that many of those who are to-day active on these frequencies failed to submit entries. However, those who took part in the contest have the satisfaction of knowing that their efforts have popularised this band, and as a result outstanding DX has been worked in recent months.

We feel sure our readers, and amateurs throughout the world, will join with us in congratulating Mr. B. J. Kroger (X1AY), of Mexico City, Mexico, who has been adjudged world winner, and who becomes permanent holder of the very valuable silver trophy presented by the R.S.G.B. The trophy is illustrated in the photograph, and although we have been denied the privilege of presenting it publicly to Mr. Kroger, we feel sure that our sister Society, L.M.R.E., will see that he is fêted in true "ham" style. Mr. Kroger ran up the very high score of 4,542 points with an input of between 40 and 80 watts. His transmitter used two 210's in push pull, but we have no details of his aerial system or receiver.

The Silver Trophy presented to Mr. B. J. Kroger, X1AY, winner of the First International 28 Mc Contest organised by the R.S.G.B.

An analysis of his entry shows that he had *no contacts* at all until the contest was nearly six months old, his first QSO being with W1AVV on March 24, 1935. During the remaining days of March he contacted 29 U.S.A. stations, and one VK. The Australian was VK2LZ. April gave him 23 U.S.A., two VK, and two ZL contacts, the first ZL being 2GQ on the 4th. During May, 38 U.S.A., one VK and one VE stations were worked, the Canadian contact being with 3LU on the 28th. June produced three LU, one VE and 15 W QSO's. The first LU being 1EP on the 9th. Following a three weeks gap, Mr. Kroger worked 15 W's, three LU's and one VK station in July. August was a poor month with only eight W's, five LU's and a VE3, but September broke all records. OA4J was contacted on the 1st, VK4BB on the 14th, VK2LZ on the 29th, whilst 52 U.S.A. and several Canadian stations were also worked.

In contacts with all stations reports were never below QSA 3 R3. A meritorious performance, and worthy of the award which has been made. Well done, X1AY.

Close behind Mr. Kroger came a very old member, Mr. Con. Bischoff (VK2LZ), who piled up 4,071 points. VK's and one ZL account for his first 39 contacts made up to January 27, then followed QSO's with W9NY and 2TP on March 23 after a two months' break. J2HJ was worked on the 24th, whilst X1AY provided the big thrill just a week later. On this day, the 31st, 10 W6's were also worked, as well as W4TZ, VK6SA and J2HJ. During April W4, 6, J2, VK4 and 6 were raised. May was a dud month, only five QSO's, with W6VQ as DX. June was even worse and only produced two VK contacts. July gave him one QSO with W6VQ and one with VK4EI, whilst August was one of those months that try the patience of the best of us—W6VQ was the only contact. Then came September and the beginning of a return to real DX conditions. During the month J2HJ and J2IS were raised with 24 W's (mostly in the sixth and seventh districts) and X1AY.

Congrats, Con., on a fine record.

Third place was taken by Mr. J. T. Dixon, of W4AJY, who scored 2,399 points, mostly from U.S.A. contacts. He had 75 such QSO's during June and 74 during July. In September, OA4J, LU9BV, 1EP, 3DD, 3DH, X1AY and VK4BB were worked.

The most remarkable log submitted was that from Mr. Wareing (W9NY), who finished fourth with 2,260 points. This gave a complete record of every 28 Mc. call transmitted during the contest, and ran to 47 foolscap sheets. A truly remarkable effort. We commend to the attention of all serious 28 Mc. workers an examination of Mr. Wareing's log. As an illustration of thoroughness and neatness we consider it to be of the highest order, whilst as evidence of sublime patience it has few equals, for on occasions W9NY shows making over 100 calls in succession without receiving a reply. Mr. Wareing forwarded a very full description of his station, which we hope to publish in an early issue of this Journal. W9NY had 128 contacts in four continents during the contest.

Fifth position was taken by Mr. K. Shiba (J2HJ) with 25 contacts, most of which were with VK or W6. His total was 1,401 points.

That indefatigable South African ZS1H finished

sixth with 1,067 points. We hesitate to think what Mr. Shoyer's total would have been if the contest had been run three months later! ZS1H used two aerials (a) a vertical array tiered in phase, 54 ft. high with 100 ft. twin transmission feeders 520 ohms; (b) a horizontal array with two 1½ wave parallel radiators, ½ wave apart, one above the other and in phase. His first contest QSO was with G2HG on September 7, 1935. In the remaining few days of the contest he worked 3 G's, 2 ON's, 3 F's, 2 LU's, 2 D's, 2 FA's, 2 W9's and a PA.

The leading British entrant was Miss Nelly Corry, G2YL, who finished ninth with 779 points. European and North African QSO's were the order of the day from May until August 11, when LU9BV was contacted. ZS1H and ZU1C finished off the contest for her with a round 60 points from each contact.

Mr. Swain, G2HG, who was responsible for the original suggestion that an International Contest be held, finished 11th with 698 points.

Space limitations prevent a more detailed account of the other entries, but the total scores of all entrants are set out in the table.

In an earlier issue of this Journal Mr. Swain summed up conditions during the contest period; therefore no useful purpose would be served by covering the same ground again. Our own impressions can be summed up briefly.

1. The contest period was fixed three months too soon.

2. Many European amateurs working on this frequency lost interest due to the poor conditions in the earlier months.

3. Inputs around 50 watts appear to be sufficiently high for DX work on this frequency.

4. Insufficient technical data has been submitted to enable an opinion to be formed as to whether straight or superhet receivers are necessary under present conditions for 28 Mc. work.

5. Multi-stage crystal controlled transmitters with power frequency doublers appear to be as efficient as single-ended power amplifiers.

6. Insufficient information has been submitted to enable an opinion to be formed as to the relative efficiencies of different types of aerial systems for transmitting and receiving.

In regard to paragraphs 3, 4, 5 and 6, we would recommend that members of R.E.S. endeavour to collate information on these points.

Check logs were received from OE3WB and OE1FH.

Late entries were received from: Messrs. R. J. Beatson VK4BB (1627), J. J. McMath VK3JJ (440) and R. J. Taylor ZL1BA (698). It is believed that these entries were held up in transit.

ORDER OF MERIT 28 Mc. CONTEST.

Position.	Name.	Call Sign.	Pts.	Position.	Name.	Call Sign.	Pts.
1	B. J. Kroger	X1AY	4,542	13	W. Kawan	D4BMJ / D4KPJ	659
2	C. Bischoff	VK2LZ	4,017	14	R. G. Blake	ZL3AJ	658
3	J. T. Dixon	W4AJY	2,399	14	R. Stacey	VK2HY	658
4	H. F. Wareing	W9NY	2,260	16	A. Weirauch	OK1AW	556
5	K. Shiba	J2HJ	1,401	17	C. A. Gehrels	PA0QQ	418
6	G. A. Shoyer	ZS1H	1,067	18	J. W. Shaw	W9EGE	240
7	E. H. Conklin	W9FM	929	19	A. W. Alliston	G5LA	204
8	M. R. Carlson	W9FFQ	876	20	R. Belstead	VK4EI	183
9	Miss N. Corry	G2YL	779	21	H. C. Turner	G5OJ	144
10	M. Petitpas	F8OZ	702	22	W. Laun	D4OON	102
11	E. H. Swain	G2HG	698	23	H. V. Wilkins	G6WN	90
12	Y. Mita	J2IS	683	24	A. H. Mackenzie	VK4GK	75

Certificates of Merit have been awarded to the first 10 stations.

News from the States

By YARDLEY BEERS, W3AWH.

Excellent conditions have prevailed until recently on the DX bands. The VK-ZL contest brought these stations roaring through at the most unorthodox times. After the many hours of sleep we have lost on their account during our amateur careers, we took vicious pleasure, while sitting in the comfort of the mid-afternoon, in hearing them say to us, "GM OM." Their usual fine operating continued to make them a pleasure to work.

With all that is being published on the subject, it would be pointless to say much concerning the recent boom on 28 Mc. Yet it should be mentioned that W3AMP heard X1AY on 28 Mc. sending a "QST," stating that he had heard a W2 on 56 Mc. and that after that transmission he would listen for calls on the latter band. We do progress!

The most outstanding technical development of recent weeks is Ross Hull's Super-super or Infra-super receiver for U.H.F. work. * This combines super-regeneration with the superheterodyne, adding the advantages of sensitivity, automatic volume control, and high discrimination against noise of the super-regenerative detector to the selectivity and stability of the superheterodyne. The three-valve input circuit, which includes a pre-selector, uses acorn valves, following which is a conversion to the 1.5 Mc. I.F. Succeeding the I.F. is a second frequency conversion to 21 Mc. for efficient operation of the super-regenerative second (or is it third?) detector.

The invention of this receiver and the "organ pipe" transmitters, which, by the way, are now current in M.O.P.A. versions, the announcement that 14 Mc. crystals are being placed on the market, and the recent DX records, all indicate the application of superior technique of the lower frequency

* See Nov.-Dec. QST.

(*Continued on page* 292.)

BOOK REVIEWS

THE RADIO AMATEUR'S HANDBOOK. 1936 Edition. By the A.R.R.L. Headquarters Staff. 380 pages, plus 96 pages of Catalogue Section. Approximately 500 illustrations. QST format. Published by The American Radio Relay League, West Hartford, Conn., U.S.A. Price: paper binding, $1.00 p.p. in U.S.A. or possessions, elsewhere $1.15; buckram binding, $2.50 in all countries. For prices from R.S.G.B., see Sales Department notice on back cover of this issue.

Sitting before 2 lbs. of ARRL Handbook—with its quarter of a million ancestors and more—and with the job of reviewing it ahead of me, I can think of little but praying for night or Blücher. It is immense!

Let's try some facts: this is the thirteenth edition and 325,000 copies precede it. Consider that figure carefully, because it indicates more than anything else the phenomenal success of this really wonderful little book. I say "little" in the affectionate sense, for it is now a really husky fellow with an extra few cents to cover increased postage charges. More facts: it is nine years old, has 21 chapters with a large appendix, has 96 pages of catalogue section, and is twice as big as before.

Suppose I try to tell you how it differs from the previous edition. Well, the present one is almost entirely a new book. There is a 30-page chapter on valves with 10½ pages of rating and characteristic tables for all American glass and metal types. Receiver design and construction are separated, each having a chapter, and the construction of a line of receivers from the humble two-valver to the aristocratic 12-valve "sniggle-sniggle" is described with concise detail.

A chapter on the principles of transmitter design precedes another on transmitter construction, but only the modern proven apparatus is considered, including multi-band sets with coil switching. Greater space is given to keying methods, and in the treatment of radiotelephony all systems are described, including the controlled-carrier scheme.

Ultra-high-frequency receivers and transmitters have a chapter each, and the new "super-infragenerator" is given in principle and construction.

Power supplies are treated more generously than before, and include receiver equipment, grid bias supplies and regulation, as well as the usual transmitter requirements.

The aerial section was always a bright spot in the Handbook, and it is brighter than ever. Charts and curves make this section of great usefulness when designing a system, and the VH/F. enthusiast will find the directional arrays of great interest.

Measurements and instruments have been awarded a special chapter, and here are considered such items as monitors, frequency meters, multi-range ammeters and voltmeters, valve voltmeters and cathode-ray tubes.

The lay-out of amateur stations and various problems arising in this connection are described in Chapter 18, but in this or other chapters there is no mention that I can find of what "ground," or earth, may be arranged for a transmitter situated on a second or higher floor. This is a problem in many stations. Otherwise, the chapter in question appears to deal with every conceivable point.

Then there are the many tabulations and general data in the appendix.

An innovation is the 96-page catalogue section, giving the specification and prices of standard apparatus. It is interesting to read, as are any well-written and informative advertisements.

Looking at the Handbook generally, it is undoubtedly a wonderful production from any point of view—value, usefulness, technical information, readability, or even as a specimen of book production.

Nearly all the apparatus described is on metal panels and sub-panels. Much of the apparatus is complex compared with what obtained a few years ago. The simpler schemes are dropping out with the need for higher technical performance and the advent of multi-electrode valves. Unfortunately—or fortunately, according to one's views—radio gear does not wear out as rapidly as fashions change, nor does an amateur's finances increase in proportion to technical progress. And while the best the state of the art allows is of very great interest technically, and impressive in performance, it should not be forgotten that the majority of amateurs have very limited funds for their hobby and often few facilities for the more complicated constructional work. As a purely personal opinion, I venture to suggest that this point is not always as well appreciated as it might be by editors of amateur publications both here and in the U.S.A. This is not meant as a criticism of the present state of affairs so much as of the trend which appears to have set in. In the Handbook the less ambitious amateur is not neglected by any means, and, at any rate, the usefulness to my mind of such a book is the very excellent exposition of the fundamentals and the guidance towards correct design, rather than the slavish copying of given specifications. In the Handbook you have all the necessary information for intelligent design and operation.

The page numbers are printed in really large type; why is this not done in all text-books? It makes reference much more pleasant, but is only one point which demonstrates the care and thought which has been spent on this edition.

Despite the fact that the Handbook is right "up-to-the-minute," it may reintroduce the mediæval custom of chaining books to the bench, for I can imagine the present edition becoming known as "The Book Which Will Not Be Loaned."

You know how good the previous editions were: this one is heaps better, and is a real investment for small capital and huge dividends.

T. P. A.

WIRELESS TELEGRAPHY. Notes for Students. By W. E. Crook. 189 pages and 228 diagrams. Published by Sir Isaac Pitman & Sons, Ltd., London. Price 7s. 6d. net.

The compiler, who is the Senior Wireless Instructor of Air Service Training, Ltd., has prepared this book of notes for students who are studying for the P.M.G.'s Air Licence for W/T Operators. The book covers the theoretical side of the course given for this purpose at Hamble.

The preface explains that the compiler considers dictated notes a waste of time and are of doubtful value unless carefully checked at frequent intervals. Later, he says that the present book is to be used in conjunction with students' own notes and suitable textbooks; also, one presumes, with the help of a teacher, for no numerical examples are given, as "this is the province of the textbook and of the instructor." All this leaves one in rather a difficulty in describing the book; but one does feel that the only vague part of the book is the preface.

One thing seems certain: this book will prove very helpful indeed to those preparing for this examination, for it gives a sound treatment of the theory, particularly the fundamentals of alternating currents on which the whole science is based.

The reader is expected to have a knowledge of elementary mathematics and of such terms as Force, Energy, etc. The theory is built up in short "notes" under various headings and grouped together suitably into chapters. The beginner will find that he can start with the electron and the basic ideas of electricity, and pass in a well-planned sequence through the various fundamental circuits and conceptions right up to the application of these to radio work.

The author has decided not to include any information on primary and secondary cells, as this may easily be obtained elsewhere.

The explanations have been carefully written and phrased, and the result is not only fluent, but clear and concise. In only two places did I feel that some improvement might be made in future editions. In the early pages a definition: "Substances whose molecules consist of one atom only are called elements . . ." might be revised with advantage. And on page 127 the voltage and current distribution on a vertical earthed wire oscillating at its natural frequency is shown as linear instead of approximately sinusoidal.

The treatment of two sections, alternating current theory and direction-finding, seems particularly neat and useful.

A short section is given to short-wave apparatus, amateur work being referred to on more than one occasion.

The book deals with principles and not practice, and there are, therefore, no descriptions of commercial gear.

It will be surprising if this book is not very popular indeed with those studying for the air licence, and it will have a much wider appeal to students and amateurs.

T. P. A.

THE BRITISH RADIO ANNUAL. Contributed articles by members, and summaries of lectures read before the British Radio Institution. Volume 3; 1934-5. 96 pages with numerous illustrations and diagrams. Published by "The Institution of Electronics," 85, Gloucester Place, London, W.1. Price 2s. net from W. H. Smith & Son, Ltd., or 2s. 3d. post paid from the General Secretary at the above address.

The British Radio Institution has recently been granted incorporation, and the name has been changed to The Institution of Electronics.

This Annual consists of a large number of articles, summaries of lectures, book reviews, notices, etc. Some of the articles and summaries are very brief notes, but others are full-length and rather comprehensive. The book reviews are more in the form of short notices of publication.

W. T. Macnab contributes an article on "Amateur Short-wave Working," which gives a very fair account of the development and present conditions. It is gratifying to note that the purpose and activities of the R.S.G.B. are described at considerable length.

Physicists will be interested in an article by L. M. Myers, B.Sc., on "The Application of the Electrometer Triode to the Determination of Piezo-electric Constants." The article deals with the Osram Electrometer type "T." Piezo-electric and photo-electric effects are also the subject of an article by F. W. Britton, D.Sc., who deals with the atomic mechanism of these phenomena.

D. A. Bell, B.A., contributes a critical discussion of C. H. Smith's "Amplification of Transients" (*Wireless Engineer*: Vol. 10, p. 296) and investigates the problem further.

D. Aldous, A.B.R.I., contributes a long and interesting article on "Gramophone Recording, Record Manufacture, and Record Defects."

In an article, "Dry Electrolytic versus Wet Electrolytic Condensers," A. R. Twiss, F.T.S., M.I.R.E., A.M.I.Prod.E., compares the types in a very practical and informative way.

J. G. White surveys the theory and practice of "superhets" and, considering the stages separately, he indicates the lines the design should follow.

I have mentioned these articles merely to give readers an idea of the subject matter; the articles are too numerous to mention individually, but among the authors are: P. P. Eckersley, N. W. McLachlan, G. Parr, J. C. Wilson, Bernard Leggett, and others.

The Annual is well illustrated, and the Institution is to be congratulated on a useful publication, and the efforts it is making to encourage the study of electronics.

T. P. A.

Empire Calls Heard

By G2TK (Scarborough) during October:—

28 Mc.: g5fv, vk3bz, 3bd, w1aep, 1ahi, 1akd, 1aur, 1avv, 1df, 1dze, 1fjn, 1hdv, 2bcr, 2cdz, 2clm, 2dtb, 2goq, 2tp, 3bph, 3chh, 3dbx, 3dyf, 3evt, 3si, 4agp, 4bbr, 4cby, 4tz, 5ql, 8cxc, 8dsu, 8fyc, 9bpu, 9drd, 9huv, su1sg, zt6x, zu5p, zu6p.

Strays.

G2TK is anxious to contact ZS, ZT and ZU stations during January and February. A directive aerial array is in use. He will transmit on 7,060, 14,120 and 28,240 kc. with a power of 50 watts, on Sundays from 10.00 to 14.00 G.M.T. and on most week days.

* * *

BRS2073, 44, Cranmer Road, Hayes End, Middlesex, would like to correspond with any B.E.R.S. member. He will undertake to answer all letters received.

* * *

In connection with the Commercial Activity check, G2MI would be very glad to hear from a member who would be willing to loan him an electric recording outfit for a week. Full responsibility for its safety would, of course, be undertaken, and carriage would be paid.

SOLILOQUIES FROM THE SHACK.

By Uncle Tom.

(In which the great-grandad of amateur radio removes his side-whishers and thinks of the days when he was young.)

'S A FUNNY thing, you youngsters, being a writer of world-wide repute. One has to be so careful that one is in the mood before one writes. By another peculiarity of journalism, one has to write one's copy some long time in advance. And thus it wert, twert it not, that I am sitting down to write this on Christmas Day as ever is, knowing full well that you young bloods won't read it until your hangover has almost disappeared, and the bicarbonate has been put away for another year.

Furthermoreover, I've had a big dispute with myself. Should I write this *before* Christmas Dinner, when I was all alert with youthful *joie de vivre* (or what have you ?), or *after* Christmas Dinner, when I was slightly mellowed down, not to say internally pickled ? And what d'you think, kiddies ? Your old Uncle decided to level things up by having *two* Christmas Dinners, and writing this in between them ! *Wasn't* he a clever old man ? (Oi ! You're not writing your column for Tiny Tots' Weekly now, you old dodderer—Ed.) O.K., Ed. Patience, my sweet.

Well, the result of all this is that I have dreamed a dream, in which I have discovered myself in my two guises, which we may call the Pre-Blowout and the Post-Blownout Egos. The one, six feet three of fine upstanding English manhood, clean-limbed, muscular and alert (see any modern novel by a female).

The other—my true self, I regret to say—a slightly shrivelled, bearded, be-whiskered old fossil with distinct traces of tomato sauce on his shirt-front. And this same old fossil is the one who rubs you up the wrong way with monotonous monthly regularity, *and* likes doing it, *and* is publicly thanked for it (see the Sec.'s report).

Well, the point of all this is, what are we going to do about it ? Or whom ? And why ? Do you all like having your corns trodden on once per month ? Because your old Uncle is beginning to think that his pearls are being cast before people with rotten receivers. He even imagines that things that he says in deadly earnest are being treated as light, airy jests. And should this be so, he will just disappear, right centre, and trouble you no more.

And in this afore-mentioned dream I saw myself as I used to be, when radio was radio, my lads,and I'm wondering whether it wouldn't be better to sink into dignified oblivion and think of the dear old past. (Incidentally, if anyone knows what I'm getting at, then some of you are more intelligent than I ever imagined.)

1925. . . . (Blessed string of dots—what should we do without you ?) A transmitter, and a receiver, *home-built*. The pre-commercial era. 20 metres as an ultra-short wavelength on which one, or possibly two Yanks might be heard. A Test call, with 10 watts (real watts) input. And a Yank coming back ! Ye Gods, has radio ever produced such a thrill since ? I don't think it has.

1929. . . . and W2JN and ZS4M both coming through on 10 metres. A hurried decision to get down there . . . a power-amplifier triode designed for audio work. 50 watts (British ones this time). And back comes the Yank ! Thrill No. 2.

1935. . . . About seven thousand five hundred Yanks on 20 metres, together with the riff-raff of every country in the world. Chirps, squiggers, raspberries, man-made static, " Come in, please," and the rest. A Test call with (Censored, Ed.) And nothing happens. That's progress, that was.

I'm just beginning to come round, by now, and to see that radio is only just beginning to be rational. In the old days, we were selfish, I suppose. We found new bands, which we had all to ourselves, and derived a peculiarly selfish pleasure from using them. Nowadays, when the bands are cram full, owing to the work of us pioneers (spare my blushes), I suppose we old fogies ought to fade away and leave the bands to you youngsters.

But, Lordy, what a mess you'd make of them if you were left to yourselves. Could you be trusted to keep on wave, if it weren't for the thought of retribution of a particularly violent kind ?

Could you be trusted not to put out gramophone records *ad lib* on the " top band " (horrid expression), if it weren't for the thought of seeing yourselves ridiculed in The Bull next month ? What's that ? You could ! No, I won't believe it.

And so you see where we get off. Us pioneers, as I said before, are necessary incumbrances. Without our experience, tact and personal charm, you young 'uns wouldn't get anywhere. Without our little QRP signals on the air, the bands would sound all wrong. So you've just got to put up with us after all.

(Aunt Thomasina has just brought in a cup of tea and a complaint about snoring. In some miraculous way the above copy seems to have written itself during the interval between the last mince-pie and the present cup of tea. It seems pretty good, so let it pass, and don't enquire who wrote it. I'll tell you one of these days. But it's the first time this page has been written by a syndicate.)

And now we're starting properly, let me tell you this. Some of you clever fellers that think you know your Uncle's call-sign are on the watch for him, and imagine that they hear him running formula QSO's, sending doubles, calling long " Test " calls, and so on.

Well, you're all wrong. Uncle Tom has no call-sign. He is always on the air, sometimes in one guise, sometimes in another, but you'll never hear him. He listens and thinks and chews the cud. But he doesn't transmit. He is just an elusive, elfish, ethereal creature. And don't you forget it. But sometimes he assumes material form, with very, very large boots and a nasty, cutting tongue.

And that, dear children, concludes our contribution to the Christmas festivities, and we'll start in earnest next month if we're still alive.

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G.M. :

F. W. BENSON (2BWF), 53, Corona Drive, Thorne, Doncaster.

THE beginning of a new year seems a suitable time to announce some alterations in the R.E.S. organisation. All members of the Section received a circular letter during November, and to them the following will not come as a surprise. It is hoped, however, that other members of the Society read these notes, and therefore, at the risk of appearing boring, we wish to explain the changes in some detail.

It has been apparent for some while that there is a considerable overlapping of the activities of the various Research and Experimental Sections, and to avoid this, certain alterations have been made to the present organisation. For the smoother working of R.E.S. there will in future be appointed certain men to be known as *Section Managers*. Their duties will be to supervise the work of *all* groups in their particular section. For example, the Section Manager appointed to supervise work on Aerial Design will be responsible for Aerial Design work on all bands. In a similar way the Transmitter Design Section Manager will have the care of all Transmitter Design groups, no matter what band of frequencies the groups may be studying. At the beginning of these notes will be found a list of the new sections and their managers.

The exceptions to this rule are Receiver Design, where the groups will be split into "Straight" and "Super Heterodyne," and the various subsidiary sections, such as Auxiliary Apparatus, Valve Design, and Contemporary Literature, etc. These subsidiary sections do not lend themselves readily to the above arrangement, and will therefore be under the direct charge of the S.M., unless he desires to appoint Group Managers.

All *Section Managers* have been advised as to their duties, and they will, in due course, advise those in their groups as to the dates for reporting and kindred matters.

We should like to make it quite clear that the new arrangements do not supersede the present Group system in any way: they merely make it much more effective. Group Managers will be appointed as before.

A careful study of the title at the top of these notes will show that R.E.S. is now in the plural—in other words, we are no longer a Research and Experimental Section, but two separate sections. Membership of the Experimental Section is open to all who apply for membership, but membership of the Research Section will be accorded only to those who are doing genuine research work, and this will be at the discretion of the R.E.S. Manager.

However, the latter Section need not concern the general membership at the present time. It will be formed, and will work on the same lines as the Experimental Section, as occasion arises.

This month we bring to the attention of members a 56 Mc. Power Amplifier article contributed by G5ZR and G5NU. Brief study of the accompanying diagram makes it clear that this circuit is somewhat unusual judged by present-day amateur practice. In particular the use of R.F. chokes in the filament leads, allowing the input to be made to the filament instead of to the grid, is something we do not remember having seen before. The use of filament chokes on 56 Mc. is to be recommended in all cases. They present very little difficulty in design, owing to their small dimensions. Unlike chokes for lower frequency bands they offer negligible resistance.

The fact that neutralisation is so much easier with this arrangement is also a great point in favour of its use. We shall be glad to hear the experiences of any of our members who may try this type of power amplifier.

G6PA.

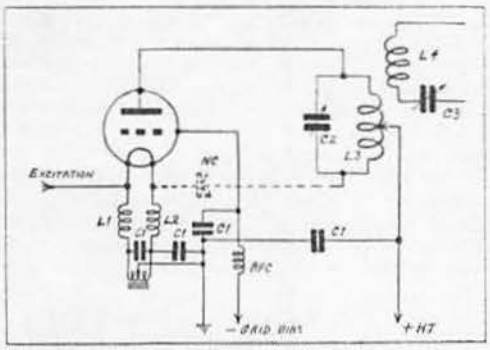
THE INVERTED ULTRA-AUDION POWER AMPLIFIER ON 56 MEGACYCLES

By S. Rayner (G5ZR) and W. H. Lord (G5NU).

Introduction.

PROBABLY no problem occupies the mind of the up-to-date amateur of to-day as does that of stable frequency transmissions on the 56 Mc. band. To attain this object, the use of MO-PA transmitters is becoming more popular, though unfortunately some people will persist in using wobbly single-stage transmitters grossly over-modulated. The only suitable single-stage transmitter would be one of the Long-Lines type, but this has the great disadvantage of bulkiness, and cannot be accommodated conveniently in the average shack. Frequency multiplying from a crystal oscillator, though it attains high stability, has its disadvantages—its expense and low power output being the chief ones. A CO-PA, using a tourmaline crystal ground to the fundamental, would be the ideal, but here again the question of expense looms large, as tourmaline is very hard to obtain. We have been in communication with the leading crystal manufacturers in Europe and America, but we have failed to obtain a plate at a reasonable price.

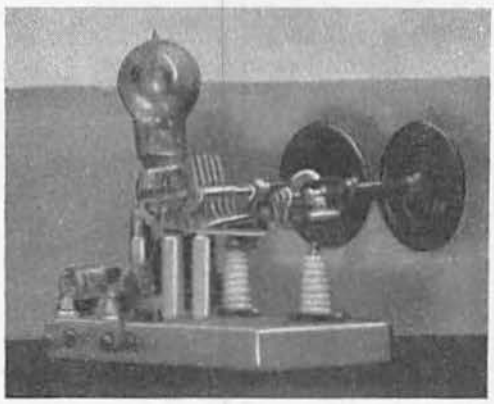
The next best thing to direct crystal control is, in our opinion, an ECO-PA transmitter. Here, however, as in all 56 Mc. power amplifiers, neutralisation is difficult and critical. In the power amplifier about to be described, neutralisation, if needed at all, is very simple; and the output is very stable.



Circuit diagram of inverted ultra-audion power amplifier for work on 56 Mc.
C1.—.0003 μF T.C.C.
C2.—50 μμF Cyldon "Bebe" (see text).
C3.—50 μμF Eddystone.
L1, 2.—Special chokes 10 turns No. 16 s.w.g. ⅛ in. diameter.
L3.—Five turns No. 12 s.w.g. ⅜ in. diameter.
L4.—Two " " " "

Description.

The input from the exciter stages is not fed to the grid, as in the conventional circuit, but to the filament, which is above earth potential as far as radio frequency is concerned on account of the chokes in the filament lead. These chokes are mounted on midget stand-off insulators (and can be seen located at the rear of the valveholder). The grid is by-passed to earth through a .0003 μF mica condenser. The plate tank is conventional, except that the neutralising condenser (if needed) goes to the filament instead of the grid. The neutralising condenser should have a very low minimum, to the order of 1-2 μμF. In some cases the neutralising condenser can be dispensed with entirely. If the valve used in the amplifier has a filament to plate capacity of 2 μμF or less, neutralisation is not necessary. The actual valve used in these tests with this amplifier was an old French Fotos transmitting valve, with a very wide spacing between the electrodes. However, there is no apparent reason why modern valves should not be used. In effect, the triode is acting as a screen-grid valve.



The amplifier is built on an aluminium chassis, measuring 10" by 5" with 1" vertical sides. The valve-holder is mounted on three 2½" *Eddystone* DL-10 pillars, and is mounted alongside the plate-tank condenser, which is a *Cyldon* "Bebe" .0003 μF cut down and triple-spaced to 50 μμF. This condenser is mounted on a stand-off insulator by means of a copper bracket. The plate tank coil is mounted directly on to the condenser terminals, and consists of five turns of No. 12 S.W.G. bare copper ⅜" in diameter. The aerial tuning condenser is mounted in the same manner as the tank condenser, while the aerial coil is mounted on two D-L 10 pillars, 2½" high. The filament chokes and associated by-pass condensers are located behind the valve-holder.

Conclusion.

This amplifier will give good results with all types of exciter units, but the one in use here may be of some interest. It is mentioned in the *A.R.R.L. Handbook*, and uses two Type '58 tubes, and gives a good stable output. The apparatus described is still in its experimental form, and the only excuse we offer for this premature publication of details is that by promulgating particulars of this line of research, sufficient interest may be roused to induce other amateurs to experiment on similar lines, so that a better design may be forthcoming in a short time.

PRACTICAL USE OF ARTIFICIAL AERIALS

By L. E. H. Scholefield (G5SO).*

IT is intended in the following article to give a brief *résumé* of successful artificial antenna circuits, and designs, which have been tested by the group and others, and which it is hoped will cover the needs of both A.A. and other members.

Many of the experiments now conducted on a radiating antenna could be carried out more conveniently on an artificial aerial, and this would help considerably to reduce interference.

In the circuits to be described, loose coupling was employed between the tank output circuit and the artificial aerial coil. When this was not done, a double-hump effect was noticed; this is familiar to most experimenters in antenna coupling design, and is shown by graph in Fig. 1.

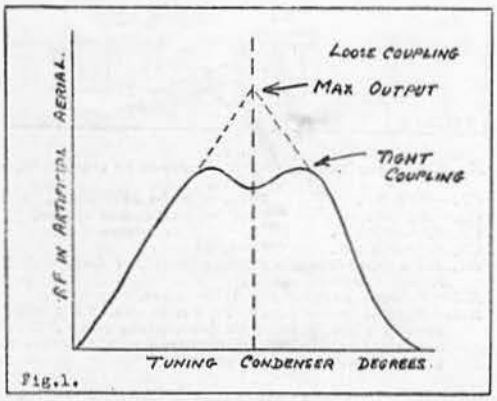


Fig. 1.
Unless loose coupling is used the double hump effect illustrated will occur.

It may not be out of place here to say a word or two to A.A. licence-holders. Many letters have been received from these members concerning the radiation of A.A. transmitters. Transmitters of this type should radiate *as little as possible*. In some cases it is well nigh impossible to prevent radiation outside the building containing the transmitter, but to minimise this effect, the transmitter and the A.A. should be shielded and link coupling used. This is especially necessary in districts where amateurs are numerous.

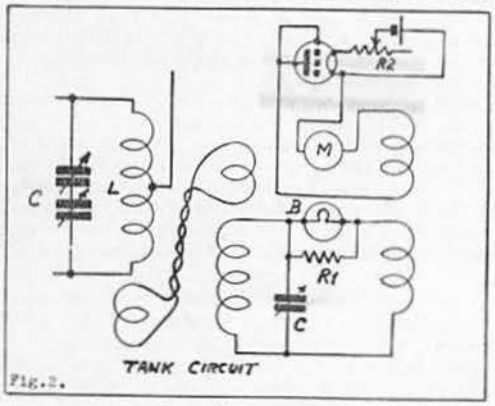


Fig. 2.
A simple A.A. circuit in which a triode operates as a diode. R1 is 200 ohms, R2 is adjusted for no current at no load. The values of L and C in each circuit should be equal.

Artificial Aerials, G.M., R. & E. Sections.

To commence with, the somewhat familiar design of a triode valve working as a diode is given in Fig. 2. Link coupling is strongly advised, as this allows the A.A. circuit to be placed a convenient distance from the tank circuit; the H.F. loss being negligible at amateur frequencies. The resistance R1 is necessary to prevent chirps when the bulb is warming up. The flex used for link coupling must be of the large type, such as that known commercially as "Dynamo Flex." The meter depends upon the power used—a 0-5 m/a meter for inputs in the region of 25 watts, and a 0-1 m/a meter for ten watts input. L is the same as the tank coil. Any small 2-volt flashlamp bulb serves the purpose. Using this circuit, the writer has never utilised more than ten watts input to a P.A. stage, hence this is useful for taking inputs at low power, say up to 25 watts.

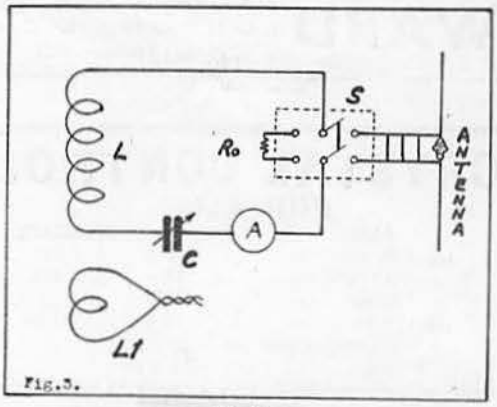


Fig. 3.
An A.A. circuit which can be used at a transmitting station where a feeder aerial system is installed. R_o is a 600-ohm non-inductive resistance. C is a .00025 μF variable condenser. The coil L should be the same size as the final amplifier tank coil. L1 is the link coil. The resistance should be adjusted to suit the resistance of the feeder under test.

The circuit shown in Fig. 3 has been put forward by G5LG for use by amateurs feeding their antenna by Zeppelin methods. This is simply an impedance-meter-cum-A.A., R_o being so adjusted so that when S is changed from left to right, no alteration occurs in the ammeter. This should work satisfactorily with considerable inputs if L, etc., are made larger in proportion. It is quite simple to make, and it is hoped wider use will be made of it as a result of this article.

For higher powers, the circuit shown in Fig. 4 is put forward by G2KV, and has been tested by some members of the group. It may be used with powers up to half-a-kilowatt, providing the H.F.

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portion of the circuit is made correspondingly large. As described here, it may be used with 50 watts. The resistance RA is wound on a former previously described in R.E.S. Notes, using Eureka wire (see T. & R. Bulletin, December, 1934). It is given again for reference. It has effective values of about 20, 30, and 40 ohms on 3.5, 7 and 14 Mc/s. respectively. To dissipate 320 watts on 3.5 Mc., it therefore requires a circulating current of 4 amps. A condenser of .0001 μF has a reactance of 400 ohms at 3.5. Mc., and would need 1,600 volts

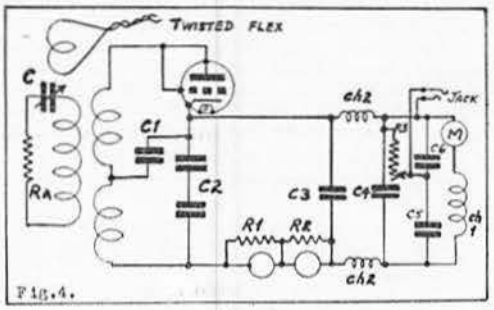


Fig. 4.
An A.A. circuit for use at higher-power transmitting stations.

C1.—.001 μF. *CH1.—Choke 30H 300w.*
C2.—.05 μF. *CH2.—Short-wave choke.*
C3, 4.—.002 μF. *M.—Milliammeter 0-2.*
C5, 6.—.006 μF. *C.—.001 μF.*
R1, R2 approximately 5,000 ohms, but final value found experimentally.
R.3—Volume control for telephones.
RA.—Special resistance: 11 turns No. 30 s.w.g. spaced ¼ in., wound on ½-in. glass rods 3 ins. apart. Length of wire required approximately 6 ft. Resistance 10.3 ohms.

across it. This condenser has, therefore, to be of the transmitting type, capable of standing 320 volts on CW, and about 600 volts on telephony.

Taking 125 watts as average high power, all ratings are halved. With 55 watts, good receiving condensers serve the purpose, but at the writer's station, sparking occurred when using telephony with this type of condenser, so double-spacing is recommended. G2KV points out that extensive decoupling is necessary to prevent the phones acting as an aerial, and to stop H.F. creeping into the L.F. amplifier.

Nothing very original is claimed for the above article, but it covers queries raised in many letters sent to the writer. It is hoped it will prove useful not only to the fully-licensed amateur in helping him to reduce the deplorable state of interference on the 7 Mc. amateur band, but also to the A.A. fraternity as a means of increasing their interest in transmitter design, etc., with that type of licence.

Ham Howler

The following is culled from an Adelaide newspaper: "Miss Nelly Corry . . . communicated with every *country* in the world during Sunday's freak conditions, which were due to changes in the sunspots."

Thanks.

The Secretary wishes to thank all those who sent greetings during the festive season. These expressions of goodwill were very much appreciated.

NEWS AND VIEWS FROM 53.

LONDON MEETING.

Mr. E. A. Dedman, G2NH, will be the lecturer at the next London meeting to be held on the 31st instant, at the Institution of Electrical Engineers, London. He has chosen as his subject "Random Notes from an Amateur's Log Book."

We can promise members a most interesting evening, as Mr. Dedman hopes to demonstrate a crystal controlled transmitter working on 56 Mc. and also a modern single signal superhet receiver.

Tea will be served at 5.30 p.m. and the lecture will commence at 6.15 p.m.

Radio Insurance Policy

G6CT informs us that he has entered into an agreement with certain Underwriting Members of Lloyd's whereby they are prepared to issue a special Policy of Insurance compensating a radio amateur for bodily injury to himself, loss or damage to the radio equipment of his station, as well as liability to other persons for personal injury or damage to their property.

Full details of this insurance and the premium can be obtained from G6CT, of 23, Eastwood Boulevard, Westcliff-on-Sea, Essex.

Radio Magazine Handbook.

We have been informed by the publishers of this handbook that, due to new technical developments, the 1936 edition has been delayed. Delivery is promised during February.

We trust that those who have reserved copies will accept this explanation.

American 7-Pin Valve Holders.

Last month we approached *Messrs. LectroLinx* regarding the production of a seven-pin holder suitable for valves of the American 53 and 59 classes. We are given to understand that the above company would be willing to go into production, providing a reasonable market exists. At present members are compelled to purchase imported sockets.

The Secretary has agreed to inform *LectroLinx* of the possible demand; therefore all members who are interested in this attempt to have British sockets made available are requested to send a postcard to Headquarters not later than January 31, giving a rough estimate of their requirements.

We take this opportunity of thanking *LectroLinx* for their help in the matter.

R.A.F. Auxiliary Reserve.

One of our members who is interested in the Wireless Section of the Royal Air Force Auxiliary Reserve, with headquarters in London, informs us that there are vacancies in the section for keen radio men.

London and Home Counties members interested in this matter may forward their letter of enquiry via the Secretary.

W.B.E. Certificates.

The following W.B.E. certificates have been issued:—

Name.	Call Sign.	Date.
A. H. Mason	G6MS	November 14, 1935
W. F. Meyer	ZU6P	,, 15, ,,
G. W. Slack	G5KG	,, 19, ,,
A. Guildford	VK4AP	,, 21, ,,
D. H. Priest	G2ML	,, 27, ,,
H. V. Booth	G2AS	,, 30, ,,
E. T. Pethers	G6QC	December 2, ,,
W. Rach	D4ADF	,, 4, ,,
R. F. Galea	ZB1E	,, 11, ,,
G. Hornsby	G6IR	,, 18, ,,

Electrical Abbreviations and Symbols.

Our attention has been drawn to an error in the list of electrical abbreviations and symbols published in the October, 1935, issue of this Journal. The symbol for "One Thousand" was given as "Kilo—K," whereas by the terms of the *British Standards Specification* 423 the symbol "k" should be used to define "kilo-".

As a result of discussions with prominent officials interested in the above subject, we have agreed to recommend to our members that the following terms and symbols be used when describing the radio frequency spectrum:—

Gamut.	*Term.*	*Symbol.*
Below 100 kc/s ...	Low frequencies...	L/F.
Between 100 and 1,500 kc/s	Medium frequencies.	M/F.
Between 1,500 and 6,000 kc/s	Intermediate frequencies	I/F.
Between 6,000 and 30,000 kc/s	High frequencies	H/F.
Below 30,000 kc/s	Very high frequencies	VH/F.

VU Members—Please Note!

Mr. J. Shepherd Nicholson, VU2JP, Munnar P.O., Travancore, S. India, has for some months been issuing a very comprehensive Letter Budget, in foolscap sheet form, but owing to the growth of interest in amateur radio in India he has now decided to have future issues printed in book form.

The purpose of this notice is to draw the attention of all members resident in India to this very praiseworthy effort, and to invite them all to become subscribers to the Budget.

B.E.R.S. members in particular are urged to send details of their work to Mr. Nicholson for inclusion in future issues.

RK20 Valve Connections

Our attention has been drawn to the fact that the socket connections for the RK20 valve as shown in the diagram on page 410 of the May, 1935, issue, are incorrect if viewed looking down on top of the socket. They are correct, however, if viewed from the underside of the socket.

Listen for ET1KD.

Last month we were informed by Captain Hayter that he was piloting a Red Cross plane (a Dragon DH84) to Abyssinia on behalf of the Ethiopian Red Cross Mission. The plane has been fitted with a small single-valve transmitter constructed by Miss Corry (G2YL) and Mr. A. W. Alliston (G5LA). It is intended that the plane shall work from the ground to Addis Ababa on a wavelength of 18 metres, but in the event of a forced landing Captain Hayter, who is an old Canadian amateur, will endeavour to send a distress signal on either 7 or 14 Mc.

The call sign to be used will be ET1KD, and the input will be around 5 watts. Any member picking up signals from the plane is asked to communicate with Headquarters immediately.

Before the flight commenced, Mr. A. E. Watts, Miss Corry, Mr. Alliston and Mr. Clarricoats were received at Croydon by the pilot.

Activity in Cardiff.

Mr. H. Phillips (BRS1949), 132, Clare Road, Cardiff, informs us that a Short Wave Club has been formed by local members resident in Cardiff. Meetings are held in Barry's Hotel, St. Mary Street, Cardiff, on the 1st and 3rd Tuesdays in each month.

All members living within easy reach are invited to attend the next meeting, which is fixed to take place at 8 p.m. on January 21.

Town Representatives, 1936

In response to the request made in our last Editorial, several additional nominations have been received for Town Representatives. We have pleasure in publishing below a complete list of members who have been elected or nominated since the first list appeared.

DISTRICT 1.
- Burnley and Nelson — Mr. R. M. Hardy (G2RB).
- Manchester ... — Mr. W. Lucas (G2OI).
- Oldham ... ... — Mr. F. Hirst (G2BK).
- Rochdale ... ... — Mr. A. F. Clare (G6AX).
- Warrington ... — Mr. F. A. Vost (G2DF).
- Whitehaven and District ... ... — Mr. H. Tinnion (G2HT).

DISTRICT 2.
- Bradford ... ... — Mr. C. A. Sharp (G6KU).
- Darlington ... — Mr. M. H. Munroe (G6MF).
- Huddersfield ... — Mr. J. Dale (G5VD).
- Stockton ... ... — Mr. R. J. Bradley (G2FO).
- Tynemouth ... — Mr. H. F. M. Baker (G2LD).

DISTRICT 5.
- Wiltshire, excluding Swindon ... — Lt.-Col. W. S. Palmer (G2BI).

DISTRICT 6.
- Exeter ... ... — Mr. C. L. Wood (G5WY).
- Penryn and West Cornwall ... — Mr. H. Wright (2AQB).
- Plymouth ... ... — Mr. V. E. Herbert (2AMO).

DISTRICT 7.
- Weybridge ... — To be elected.

DISTRICT 9.
- Norwich ... ... — Mr. M. Nicholson (G2MN).

DISTRICT 10.
- Swansea ... ... — Mr. E. Dell (G2UL).

DISTRICT 15.
- Richmond and Twickenham ... — Mr. F. C. Crocker (G2NN).

DISTRICT 16.
- Folkestone ... — Mr. G. A. Chapman (G2IC).
- Gravesend ... — Mr. R. S. Martin (G2IZ).
- Tunbridge Wells ... — Mr. W. H. Allen (G2UJ) (5 nominations).

DISTRICT 17.
- Grimsby ... ... — Mr. T. S. Brister (G6AK).

Mr. E. Dell (G2UL) was elected T.R. for Swansea by 7 votes to 1.

Mr. R. Denny (G6NK) has withdrawn his name as T.R. for Weybridge.

Mr. E. F. Baker (G5OQ) was nominated by one member for Tunbridge Wells.

QSL Section.

Manager: J. D. CHISHOLM (G2CX).

As in previous years it is my pleasant duty to offer the Section's greetings to all.

To those who have written with suggestions or criticism we are grateful and hope that in the future we shall merit more of the former and less of the latter.

The Section's work during 1935 was considerably heavier than during the previous year—in fact, it became necessary to increase the staff to deal with the cards. Miss Buckingham joined the office last June as an assistant and has proved herself to be an efficient and useful successor to Miss Spence, who is now transferred to other duties.

I am glad of this opportunity to express to both members and staff my grateful thanks for help during a year which has been a difficult one for the Section.

The restriction on listeners' report cards to and from Europe was decided upon in September last only after the most serious consideration by the Council and by the membership at Convention. Members may rest assured that every angle of approach to this question was explored before such a step was taken. There are bound to be some misunderstandings on this point, but if those who conceive themselves to be aggrieved will write to me, I will see that a reply to their complaints is made. Don't grumble amongst each other unless you are sure of all the facts, please!

Calibration Section.

Manager: A. D. GAY (G6NF).

As only one communication was received in reply to last month's query, it seems quite clear that a Standard Frequency Transmission on 3,600 kc. is not required by the rest of our 2,600 membership.

A slight misunderstanding concerning our request that postage on crystals and frequency meters should be remitted separately has led one member to send a 1½d. stamp in an envelope, posting it separately from the package containing the crystal. Perhaps we might have made things clearer by saying "Return postage on crystals and frequency meters must be remitted as a separate *amount*." When the postage is attached to the postal order, Headquarters ultimately received both the calibra-

tion fee and the return postage, necessitating a financial adjustment between the Section and Headquarters.

R.S.G.B. Slow Morse Practices

A list containing dates, times and frequencies of the stations sending slow Morse for the benefit of those members wishing to learn or improve their code will be found below. 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. It is emphasised that reports will be appreciated and are desired in order to ascertain range of transmission and numbers utilising the service. If, however, replies are desired stamps should be sent. The sending stations are complaining that reports are few and far between; an appeal is therefore made to those members utilising the service to report periodically in order to encourage those who are giving up valuable time for their benefit. Stations willing to assist, particularly from those districts without a service, are invited to communicate with Mr. T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4. Telephone: Silverthorn 2285. From the list below it will be noticed that G5OD, of Colwyn, has been omitted, Mr. Ogden having given up owing to lack of reports; he has, however, promised to renew the service should the local membership request it. A fresh station, G6GC, of South Shields, is now giving his services. Owing to QRM on the 7 Mc. band, G5GC, of Hull, will in future send on the 1.7 Mc. band. The addresses of the stations giving the service are as follows:—

G6AU: C. C. Algar, 63, Margery Park Road, Forest Gate, E.7.
G5GC: G. A. H. Eckles, 57, Sutton Road, Beverley High Road, Hull.
G6QM: A. J. Mathews, 74, Hawthorn Road, Hornsey, N.8.
G5BK: W. Brown, 52, Winstonian Road, Cheltenham.
G6PJ: B. Pashley, 124, Nicholson Road, Sheffield 8.
G6GC: J. G. Carlson, 116, Ashgrove Avenue, S. Shields.

SCHEDULE OF SLOW MORSE TRANSMISSIONS.

Date, 1936.			G.M.T.	kc/s.		Station.
Jan.	23	Thursday	23.00	1930	...	G6AU
,,	26	Sunday	00.00	1769	...	G5GC
,,	26	,,	09.00	1860	...	G6QM
,,	26	,,	09.30	1785	...	G5BK
,,	26	,,	11.00	7104	...	G6PJ
,,	26	,,	11.15	1810	...	G6GC
,,	30	Thursday	23.00	1930	...	G6AU
Feb.	2	Sunday	00.00	1769	...	G5GC
,,	2	,,	09.00	1860	...	G6QM
,,	2	,,	09.30	1785	...	G5BK
,,	2	,,	11.00	7104	...	G6PJ
,,	2	,,	11.15	1810	...	G6GC
,,	6	Thursday	23.00	1930	...	G6AU
,,	9	Sunday	00.00	1769	...	G5GC
,,	9	,,	09.00	1860	...	G6QM
,,	9	,,	09.30	1785	...	G5BK
,,	9	,,	11.00	7104	...	G6PJ
,,	9	,,	11.15	1810	...	G6GC
,,	13	Thursday	23.00	1930	...	G6AU
,,	16	Sunday	00.00	1769	...	G5GC
,,	16	,,	09.00	1860	...	G6QM
Feb.	16	Sunday	G.M.T. 09.30	kc/s. 1785	...	Station. G5BK
,,	16	,,	11.00	7104	...	G6PJ
,,	16	,,	11.15	1810	...	G6GC
,,	20	Thursday	23.00	1930	...	G6AU

QRA Section.

Manager: M. WILLIAMS (G6PP).

The following two prefixes were recently allotted:—
OX—Greenland. OY—Faeroe Islands.

NEW QRA's.

G2FS.—L. K. WINSOR, 375, Hessle Road, Hull, Yorks.
G2HW.—H. WHALLEY, 3, St. Alban's Road, Darwen, Lancs.
G2KU.—R. HERBERT, The Nook, Smitham Downs Road, Purley, Surrey.
G2KY.—G. CURRAN, 11, Whiteholme Avenue, Chorlton-cum-Hardy, Manchester, Lancs.
G2LC.—C. J. GREENAWAY, 24, Percy Road, Leigh-on-Sea, Essex.
G2NG.—J. M. R. SUTTON, 15, Caradoc Street, Cwmcarn, Cross Keys, Mon.
G2PK.—J. R. ELLISON, Alder House, Pudsey, Yorks.
G2PS.—E. A. PARSONS, 65, Parchment Street, Winchester, Hants.
G2QF.—F. BUTLER, 154, Beadall Street, Hucknall, near Nottingham.
G2VJ.—A. E. WYBROW, 54, Lordship Lane, East Dulwich, London, S.E.22.
G2WL.—T. A. WILSON, 20, Battlefield Gardens, Glasgow, S.2.
G2XN.—E. H. HOPKINS, "Alandale," Birchfield Road, Headless Cross, Redditch, Worcs.
G2ZF.—D. S. WATSON, 2, Tower Street, Rugby, Warwickshire.
G2ZI.—G. C. W. ADDISON, 35, Hillside Avenue, Douglas, Isle of Man.
G5LN.—W. LILBURN, Plot 229, Hillsborough Road, Garrowhill Estate, Ballieston, Glasgow.
G5MV.—E. MITCHELL, 40, North Marine Road, Scarborough, Yorks.
G5NU.—W. LORD, Birch Villa, Lulworth Road, Birkdale, Lancs.
G5QN.—N. BEST, 31, Lister Street, Dalton, Huddersfield, Yorks.
G5TR.—N. A. L. TIMBERS, 10, Parramatta Street, Rawtenstall, Rossendale, Lancs.
G5WQ.—J. R. WITTY, 25, Wensley Road, Leeds, 7, Yorks.
G5YX.—W. BLYTH, 17, Elgin Terrace, Edinburgh, 7, Scotland.
G5ZT.—H. JONES, 69, Ribbleton Avenue, Preston, Lancs.
G6BR.—G. H. RAMSDEN, "Dunluce," Ilkley, Yorks.
G6IM.—W. B. SMITH, "Ivy Cottage," 2, Wigston Road, Oadby, near Leicester.
G6IT.—R. B. FOSTER, 62, Harlow Terrace, Cold Bath Road, Harrogate, Yorks.
G6LZ.—W. LEE, 27, Dearne Road, Wombwell, Barnsley, Yorks.
G6XC.—A. CROSS, 21, St. Helens Road, Swansea.
2ACD.—H. CROSLAND, Lydgate View, New Mill, near Huddersfield, Yorks.
2AIF.—M. CHITTY, Lawrence House Radio Club, Alma Road, Windsor, Berks.
2AJD.—J. DOWDING, 5, Well Road, St. Peter Port, Guernsey, Channel Isles.
2AST.—REV. S. NEWBY, 19, Clarence Road, Moseley, Birmingham.
2ATU.—C. F. TURNER, 4, Hammonds Lane, Warley, Essex.
2BCC.—F. CARTWRIGHT, 102, Carlton Road, Derby.
2BIS.—I. M. HAWKINS, 68, Elmhurst Road, Reading, Berks.
2BJC.—J. ELPHICK, Burnham College, Somerset.
2BLT.—S. F. GEARY, 3, Earlam House, Margaret Street, London, W.C.1.
2BNK.—N. K. READ, "Netherton," Herington Grove, Hutton Mount, Brentwood, Essex.
2BXL.—R. G. SHEARS, 52, Lytton Road, New Barnet, Herts.
2BXT.—F. C. BREWER, 10, Penwemis Terrace, Falmouth, Cornwall.

The following are cancelled:—2ACP, 2AGZ, 2AJW, 2AMQ, 2ARS, 2BHF, 2BWP.

NEW MEMBERS.

HOME CORPORATES.

J. DICKSON (G2HV), Hove College, Kingsway, Hove, Sussex.
G. R. MARSH (G2IW), Oriel Lodge, Lower Swainswick, Bath, Som.
H. FROST (G2NA), Woodlands, Barr Common, Walsall, Staffs.
J. M. COOPER (G2UD), 9, Abbotsford Place, Stirling, Scotland.
J. A. YEATS (G2YA), 4, Prospect Terrace, Aberdeen, Scotland.
A. R. IRWIN (Gi5TK), Granshaw, Comber, Co. Down, N. Ireland.
D. J. SIMPSON (G6VO), 67, Middlefield Terrace, Aberdeen, Scotland.
A. E. SMITH (G6XK), 30, Beverley Road, Rubery, Birmingham.
J. J. PLATT (2AGK), Purlea, Ferncliffe Drive, Keighley, Yorks.
H. FEARNLEY (2AHF), 10, Leeds Road W., Ardsley, near Wakefield, Yorks.
J. MCDERMOTT (2AHH), 2, Mobberley Road, Shaw Heath, near Knutsford, Ches.
O. M. DERRICK (2AJP), "Gowanhill," Drip Road, Stirling, Scotland.
J. W. MASON (2AXL), 146, Tulketh Brow, Preston, Lancs.
C. F. BARNARD (2BCQ), 90, Coombe Road, Brighton, 7, Sussex.

N. F. Bursłem (2BNB), Randolph House, Woodthorn Road, Tettenhall, Staffs.
F. E. Wingfield (2BIU), 17, Gore Park Road, Eastbourne, Sussex.
D. P. Boyle (W6FMP), at 45, Princes Gardens, West Acton, W.3.
G. H. Haclin (BRS2147), Shalimar, Pepys Way, Girton Road, Cambridge.
J. C. B. Carr (BRS2148), 38, St. Clair Street, Kirkcaldy, Fife.
W. J. C. Nott (BRS2149), "Holmeroft," 7, Highland Road, Bromley, Kent.
A. J. Stephens (BRS2150), 98, Pole Hill Road, Hillingdon, Middlesex.
C. Turner (BRS2151), 4, Grosvenor Avenue, Whitefield, Manchester.
B. J. Reichman (BRS2152), 81, Hanover Terrace, Brighton.
C. C. Newton (BRS2153), 6, Savery Terrace, Lipson, Plymouth.
H. M. Tee (BRS2154), 104, Rectory Road, Burnley, Lancs.
J. O. Widdowson (BRS2155), Manor House, Swaton, near Billingboro', Lincs.
H. Stretch (BRS2156), 12, Newcliffe Road, Higher Blackley, Manchester.
W. Gamble (BRS2157), Rainey Street, Magherafelt, Co. Londonderry, Northern Ireland.
A. Hill (BRS2158), 353, Green Lane, Bolton, Lancs.
L. F. Bennett (BRS2159), 64, Roseford Road, Cambridge.
B. O'Brien (BRS2160), "Caldy," Irby Road, Heswall, Cheshire.
G. R. Foster (BRS2161), 3, Bromley Mount, Sandal, Wakefield, Yorks.
D. L. Werschker (BRS2162), 19, St. Kilda Road, West Ealing, W.13.
J. W. B. Evans (BRS2163), The Apiary, Conway, N. Wales.
Miss C. R. Hall (BRS2164), North Waltham Rectory, Micheldever, Hants.
J. A. Reid (BRS2165), 9, Lugar Street, Cumnock, Ayrshire, Scotland.
H. Lunn (BRS2166), Kincraig, St. Bernards Road, Olton, Birmingham.
R. Tunney (BRS2167), 23, Fir Lane, Lowestoft, Suffolk.
A. Bryan (BRS2168), 11, West Furlong, Retford, Notts.
H. Atthill (BRS2169), The Three Gables, Alma Lane, Heath End, Farnham, Surrey.
F. M. Farleigh (BRS2170), "Wolboro," 21, Regent Street, Dawlish, Devon.
P. C. Morton (BRS2171), 22, High Street, Whittlesey.
J. E. Ironmonger (BRS2172), 20, Myrtle Street, Retford, Notts.
T. A. Stevenson (BRS2173), 66, Sandy Lane, Weston Point, near Runcorn, Cheshire.
B. Kauffmann (BRS2174), 105, Walm Lane, Cricklewood, N.W.2.
W. H. Graham (BRS2175), 157, Sileby Road, Barrow-on-Soar, near Loughborough.
H. Still (BRS2176), 11, Clayton Street, Grimsby, Lincs.
J. H. Worrall (BRS2177), 37, Margravine Gardens, Baron's Court, W.6.
S. C. Isaacs (BRS2178), 5, Stanway Gardens, Acton Hill, W.3.
D. W. Harries (BRS2179), 99, Ardington Road, Northampton.
H. W. Simpson, B.Sc. (BRS2180), 50, Stoneycroft Crescent, Old Swan, Liverpool 13.
E. B. Butler (BRS2181), Lambden Road, Pluckley, Kent.
H. P. Arnfield (BRS2182), 45, Hyde Bank Road, New Mills, near Stockport.
C. E. Parini (BRS2183), 19, Jubilee Road, High S. Budeaux, Plymouth, Devon.
L. F. Taylor (BRS2184), 12, Pleydell Avenue, Stamford Brook, W.6.
J. T. Parker (BRS2185), 48, Nigeria Road, Charlton, S.E.7.
A. A. H. Moss (BRS2186), 29, Forrest Avenue, Marsh, Huddersfield, Yorks.
G. A. Whittlesey (BRS2187), 33, Repton Road, Bulwell, Nottingham.
R. H. Robinson (BRS2188), Channel Head, Nether Kellet, near Carnforth, Lancs.
A. Woffenden (BRS2189), 5, Gledhow Avenue, Gledhow, Leeds 8.
F. H. Fennessy (BRS2190), 90, Leeds Old Road, Thornbury, Bradford, Yorks.
J. P. P. Tyndall (BRS2191), West Park Drive, Roman Avenue, Leeds 8.
K. H. R. Maynard (BRS2192), 7, Willersley Close, Sidcup, Kent.
H. A. Matthey (BRS2193), 7, Elm Road, Chelmsford, Essex.
W. E. L. Malings (BRS2194), 269, Liverpool Road, Warrington, Lancs.
W. Lumb (BRS2195), Alpine Mount, Grimscar, Huddersfield.
D. C. Hings (BRS2196), 15, Chiltern Avenue, Bushey, Herts.
G. H. Winkley (BRS2197), 40, Haseley Road, Handsworth, Birmingham.
C. H. Jones, (A) 43, Westbrooke Road, Welling, Kent.

DOMINION AND FOREIGN.

H. Schulz (D4CSA), Koenigsberg i PR, Albrechstr, 6, Germany.
K. E. Harp (VE4FP), 116, Lipton Street, Winnipeg, Manitoba, Canada.
W. S. Argaet (VK4KH), "Kingsley," Kingsley Terrace, Wynnum, Queensland, Australia.
C. S. Ludwig (VQ4KSL), Bunyore Mission, P.O. Kisumu, Kenya.
L. H. Reynolds (ZS6AN), 428, Double Storey, Married Quarters, East Rand, Transvaal, South Africa.
R. B. Wood (ZU6V), Public Cleansing Department, Municipal Offices, Johannesburg, South Africa.
Telegraphist J. F. Lynch (BERS324), 8, Mess, H.M.S. *Cyclops*, c/o G.P.O., London.
G. Richmond (BERS325), R.A.F. Sergeants' Mess, H.M.S. *Glorious*, c/o G.P.O., London.
R. O. Williams (BERS326), c/o Anglo-Oriental "Malaya," Ltd., Malim Nawar, Perak, Federated Malay States.
W. J. Godsman, B.Sc. (BERS327), Dig 'Boi, P.O., Upper Assam, India.
A. W. Brown (BERS328) No. 84 (B) Squadron, R.A.F., Shaibah, Iraq.
Rev. N. H. F. Waring (BERS329), 35, Wellington Road, Dublin, I.F.S.
J. A. Arthur (BERS330), 5, Nel Street, Roodepoort, Transvaal, South Africa.
E. A. Luckhurst (BERS331), D1 Room, H.Q. Flight, R.A.F. Station, Hal Far, Malta.
T. C. Bockel (BERS332), 28, Pope Street, Bellevue, Johannesburg, South Africa.
A. W. Reid (BERS333), Upper Sorianalle Estate, Sorianalle P.O. Travancore, South India.
Lim Gim Soo (FRS.38), 50, Kuantan Road, Penang, S. Settlements.

DX Forecasts (No. 2.)

JANUARY 15—FEBRUARY 15.

G.M.T.	14 Mc.	7 Mc.	3.5 Mc.
0900 to 1200	ZL ; VK CX ; ZC VP2 ; VP5	(From 0700) VK ; ZL	VE and W skip increasing up till 7 a.m.
1300	VK ; VP5		
1400	VK ; VP5 ; PK2 ; X1		
1500	ZT ; PK2 ; VQ4	KA ; VK	
1600	W6 ; ZT ; VP ; PK	ZL ; VK	
1700	ZC6 ; VS8 ; FB8 ; ZT VQ4	ZL ; VQ4	SU
1800	ZS ; ZE ; FB8	VK ; VQ4 ; ZU	VK
1900	VQ4 ; ZE PY	VK ; VQ4 ; VU	VK
2000		VK ; PK1	
2100		ZU ; 2B	

Empire Calls Heard.

VK3EG (*Tallangatta*), *August* 1-5 :—

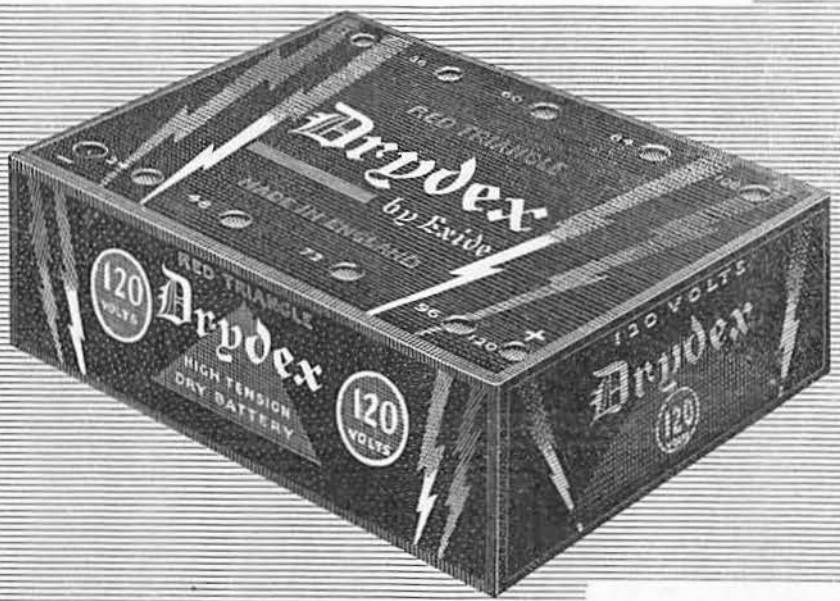
14 Mc. : vs1aj, 2ag, 3ae, 6aq, zb1i, g5gq, 5gq, 5wp, 6cj, ei6f. 7 mc. : vr1am, 2rk, vs1aj, 6ax, 6aq, vu2cq (fone), 2fy, zu6l, 6p.

ON4AU, *September* 1 *to September* 27 :—

14 Mc. : su1ch, 1kg, 1ro, 1rk, 1ss, 1tm, 1wm, 5nk, 8la, vp1jr, 2bx, 5pz, 9o, vq3msn, 4cro, 4crq, 4kta, vs1aj, 2ag, 6aq, 6ax, 6bd, vu2by, 2dk, 2ep, 2jp, ve4fv, gc, gi, is, ro, sv, uq, 5bg, 5gi, vk2as, az, bk, bw, bx, el, eo, er, ex, fy, dd, hq, hp, hz, ic, oe, ov, 2sq, tf, th, vq, zc, zh, zp, zw, xm, xu, vk3cn, co, cp, cx, eg, kg, ki, kr, nw, rj, rx, ox, pg, qe, xq, yp, zw, vk4bb, do, ei, er, cg, ka, le, pg, vk5gf, jc, fm, hw, kl, kz, le, ly, rt, su, wj, wk, wr, vk7ck, jb, zd2c, 8a, ze1jb, 1jn, 1js, zl2ci, 2gn, 3dj, 3ja, 4bq, 4bt, zs1al, 1b, 1h, 2x, 4j, 4u, 5j, 5z, 6t, zt1R, 5p, 5v, 6ac, 6ak, 6al, 6b, 6e, 6m, 6w, zu6b, 6e, 6p, 9b.

28 Mc. : zs1h (QSA5 R7 T9), zu1c (QSA4 R5 T9).

'No battery can equal this for value!'



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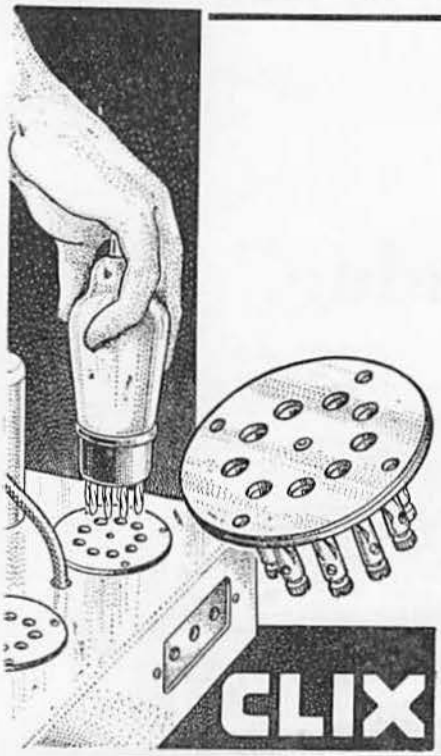

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The question of efficient contact becomes more important as the number of pins increases.

Only by the use of the "Clix" patented features can perfect contact be guaranteed —contact which unbiased laboratory tests have proved to be more than four times as efficient as any other.

The Clix range of Valveholders now includes the following types: Standard 4, 5, 7 and 9-pin. "Airsprung" 4, 5 and 7-pin. Ceramic Base s/w type, 4, 5, 7 and 9-pin. Baseboard type for ultra Short and Short-wave work; 4, 5, 7, and 9-pin.

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B.T.S.

NOTES and NEWS from the 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), Durham, and Northumberland (Middlesbrough is in this district.)
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. R. A. BARTLETT (G6RB), 31, King's Drive, Bishopston, Bristol, Glos.

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., Bucks., Cambs., Herts. and Hunts.)
Mr. G. FEATHERBY (G5FB), 30 Lindsey Road, Bishops Stortford, Herts.

DISTRICT 9 (East Anglia).
(Norfolk and Suffolk.)
MR. H. W. SADLER (G2XS), Redways, Wootton Road, Gaywood, 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 (G2II), "The Flagstaff," Colwyn Bay, Denbighshire.

DISTRICT 12 (London North).
Mr. S. BUCKINGHAM (G5QF), 9, 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 (Eas'ern)
(East London and Essex.)
MR. T. A. ST. JOHNSTON (G6UT), 28, Douglas Road, Chingford, E.4.

DISTRICT 15 (London West and Middlesex).
MR. H. V. WILKINS (G6WN), 81, Studland Road, Hanwell, W.7.

DISTRICT 16 (South-Eastern).
(Kent and Sussex).
MR. A. O. MILNE (G2MI), "Southcot," Larkfield, Kent.

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.)

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

NORTHERN IRELAND.
MR. W. GRAHAM (GI5GV), 5 Ratcliffe Street, Donegal Pass, Belfast.

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

DISTRICT 1 (North-Western).

LIVERPOOL SECTION.

IT is very gratifying to report that the Liverpool meetings are receiving splendid support, and members are finding the new meeting place a great improvement upon the old one. Space is no longer at a premium, the room is equipped with a blackboard and lecturer's stand, and the catering is really good. Morse practice classes are held every other Wednesday evening, and these are quite well attended. (See District Calendar for particulars.)

In spite of fog, the December meeting was well attended, and local members were very pleased to welcome several visitors from Southport. The meeting was taken in hand by G2RF, the new Town Representative for Liverpool, and he opened the proceedings with an urgent request to all members to send him without delay a post card giving the frequencies of all crystals in their possession. Will all members who have not already done so please do it now!

The proposed hot-pot supper must, unfortunately, be regarded as "off," as the Manchester and North Wales members feel that the necessity for a journey to Liverpool in bad weather would adversely affect the attendance from their districts, and at least fifty guests are required to make the function possible.

It was necessary to postpone the visit planned to Seaforth Radio Station, but it is hoped that suitable arrangements will be made later.

Although it is apparently a little early in the day to talk of N.F.D., the subject was mentioned by 2RF, and members are asked to make suggestions regarding a suitable site, as it is desired to make a real attempt to break records this coming year.

Two pirates are operating in this area every Sunday on the 56 Mc. band, and if they are known to any of the members they are asked to do their best to bring them into the ranks so that they can be well and truly converted!

The District Scribe (G6CX) mentioned the question of District Notes once more, particularly in regard to reports of individual activities. Opinion seems very divided on this subject, but members are asked to confine their reports to matters of general interest and practical value to other members. The result of bringing up this subject is that no reports at all have been received! Don't forget to refer to the District Calendar.

Support Your Local Meetings

The meeting concluded with an excellent talk by Mr. Jones (G2JT) on " Principles of Transmitter Design," and members were only too sorry that more time was not available for questions after the talk.

MANCHESTER SECTION.

An attendance of 28 was recorded at the last Manchester meeting, when the N.F.D. films taken by various districts were shown, or attempted to be shown. Let it suffice to say that, after trying in vain to piece together in the mind's eye a lot of black dots and white patches to resemble something connected with a radio field day, the attempt was abandoned as a bad job, with the earnest hope that would-be film-makers will use a 1,000-watt lamp next time they enter a tent to take pictures. Unfortunately, having been disappointed in obtaining a large and powerful projector, members had to rely on a very small model, hence the poor results.

The rest of the evening was given over to informal talks, and a junk sale.

The following stations report active :—2JC, 2OI, 6KS, 6TL, 2DH, 5XF, 5ZN, 5YD, 2BK, BRS2051, 1810, 2059, 2145, 2046. BRS2067 reports that a local short-wave club has been formed in Burnley by G2RB and G5XC. BRS1643 sends in a fine log of DX received from all continents on 28 Mc. ; he also puts forth the theory that an indoor aerial is no use when it is raining heavily, due to screening by the wet building. This, he says, is very noticeable on 28 Mc. Will any other BRS stations working on this band get in touch with BRS1643 ? Congratulations to 2ACP who is now G2HW. The following stations are rebuilding :—G2QN, 6GV, 5CN and BRS2046.

SOUTHPORT SECTION.

G2IN sends in the following report from Southport :—G5OP is rebuilding, and now adds his voice to the list of B.B.C. commentators. G5ZI has been and is still radiating signals from 22.00 to 24.00 daily on 56 Mc. Reports welcome. A mobile receiver held these signals from Liverpool to Blackpool at QSA5. G2IN is working regular sked on fone with W1CND on 14 Mc. at 12.00 daily, with an average QSA5 R7 ; also taking part in 3.5 Mc. tests. The Southport group will be conducting tests from Ashurst Beacon on 56 Mc. on the last Sunday in January, and schedules with other stations will be welcomed, particularly stations over 200 miles away. The call sign used will be G2INP. G6SR and 6YR are active.

G6JN is again home for a very short stay, after tapping the key all round the world.

DISTRICT 2 (North-Eastern)

Members in the Sheffield area are giving the new T.R., G2JY, their full support, which is much appreciated. Suggestions for meetings are being considered. Best wishes are sent to our new member, Mr. North (BRS2112) in his future experiments. Greetings are also sent to G2RO, who, following his seafaring profession, is now at Calcutta, and will be away for several months. Letters, which are always welcome, can be sent to him via G2LF. Some nice phone signals are being put out by G2HQ, who assures us of his support when duties permit. G5HK is pleased with his new HRO ; G2AS and G6LF are active, and the latter contemplates a rebuild. Indoor aerials are not considered to be very good by G2GN, who is putting up a " 2BI " aerial.

G2JY is active when time and rectifier trouble permits. G5LT asks for co-operation on 28 Mc. A visit to G5TO was paid by BRS2112, who was greatly impressed by a well laid out station. BRS1934 is busy with morse practice, and also provided us with useful phone reports. BRS1625 looks forward to being a fully-licensed member.

In the Durham district, G5XT has re-erected his shack, and is busy with tests on a speech amplifier, whilst G6MF is putting up the gear again at a new QRA which has been specially chosen for radio. First contacts with W6 and 7 are reported by G2FO, who has now received a VK QSL and seeks a S. American for WAC. This is also being sought by G6ZT, for a similar purpose, he is also making tests on 56 Mc. with directional aerials in collaboration with G2FO, who is using a MO-PA circuit. Morse practice is being continued by 2BQO, BRS 2135 is welcomed to the district.

Complaints of pirating are made by G2PN and G2GC. Reports on 7 Mc. signals from stations

WEST MIDLANDS CONVENTIONETTE

SUNDAY, JANUARY 19, 1936

at

" Hope and Anchor " Hotel, Edmund St., BIRMINGHAM

Assemble - -	12.15 p.m.
Lunch - - -	1.15 p.m.
Business Meeting -	2.30 p.m.
Tea - - -	4 p.m.

Followed by station visits.

Luncheon 3/6. Tea 1/6.

Reservations to Mr. V. M. Desmond, G5VM.

G5AY and G6PB are requested. An increase of signal strength from the South, when the aerial is lowered to about 15 ft. from the ground, is noticed by G5AY. A 28 Mc .contact with W8CXC is reported by G5WZ ; G6AY has worked W1, 2, 3, 4, 8, 9, on this band. We are sorry to learn that the latter is leaving the district to take up residence in London, as he is one of our more experienced amateurs ; our best wishes are extended to him. The next meeting is at 2BGG, 297, Rothbury Terrace, Heaton, Newcastle, on Sunday, January 19, 1936, at 6.30 p.m.

In the Bradford area, we welcome 2BUI, who is designing a new transmitter. A visit to Germany is soon to be made by BRS1561, who is to stay at Chemnitz ; he hopes to meet some of the amateurs there. Our DR, G6PY, has left the 1.75 Mc. band for a while, owing to a rebuild of the TX, but is working on 7 Mc. regularly. A change of QRA has been made by G5HB, who is now on the air again. G2DM was home for Christmas, and is to take back to Liverpool with him some mains gear for a station there. Preparation for BERU is being made by certain stations ; reports of activity are scanty, but it is known that the following are active : G5TQ, 6BX, 6PL, 5YV, 5SZ, 5WK, 5VD, and 2PK. Extensive tests have been made with a Collins coupler by G6KU, who finds that it functions perfectly, but no more RF goes into the aerial ; he attributes this

FORTHCOMING EVENTS.

JAN. 16.—District 6 (Exeter section), 7 p.m. at G5WY, 95, Fore Street, Exeter.
JAN. 16.—District 13, 8 p.m. at Brotherhood Hall, West Norwood.
JAN. 19.—District 2 (Newcastle section), 6.30 p.m. at 2BGG, 297, Rothbury Terrace, Heaton, Newcastle.
JAN. 19.—District 3, Conventionette at Hope & Anchor Hotel, Edmund Street, Birmingham.
JAN. 20.—District 14 (Southend section), 8 p.m. at BRS1946, 46, Woodfield Road, Leigh-on-Sea. Discussion on aerial systems, opened by G5VQ.
JAN. 22.—District 1 (Liverpool section), 7.30 p.m. at 38, Mason Street, Liverpool. Morse practice.
*JAN. 22.—District 15, 7.30 p.m. at 2BCN, 167, Botwell Lane, Hayes, Middlesex. Discussion to be opened by G6CJ.
JAN. 26.—District 8, Meeting in Cambridge. Full details from G6BS, 39, Owlstone Road, Newnham.
JAN. 26.—District 11, 6 p.m. at G5OD, "Rocklyn," Peulwys, Old Colwyn.
JAN. 26.—District 7, 2.30 p.m., at G2NH, 75, Woodlands Avenue, Coombe, New Malden.
JAN. 26.—District 4, 3.30 p.m., at St. James Restaurant, St. James Street, Derby.
JAN. 28.—District 14 (East London section), 8 p.m. at G6UT, 28, Douglas Road, Chingford.
JAN. 29.—Scotland "A" District, 7.30 p.m., Institute of Engineers and Shipbuilders, 39, Elmbank Crescent, Glasgow. Lecture on "Television" by G6MS.
JAN. 31.—London meeting at I.E.E., 6.15 p.m., tea 5.30 p.m.
*FEB. 5.—District 1 (Manchester section), 7.30 p.m. at 1, Hilton Street, Manchester.
FEB. 5.—S.L.D.R.T.S., meeting, 8 p.m. at Brotherhood Hall, West Norwood. Lecture by G6UB.
FEB. 6.—District 6 (Torquay section), 7 p.m. at G5SY, "Sherrington," Cleveland Road.
FEB. 6.—District 4, 7 p.m., at G6VD, 9, Cecilia Road, Leicester.
FEB. 11.—District 12, 7.30 p.m. at Wander Inn Café, Church End, Finchley.
*FEB. 20.—District 13, 8 p.m. at Brotherhood Hall, West Norwood.
FEB. 21.—London meeting at I.E.E., 6.15 p.m., tea 5.30 p.m.
MAR. 4.—District 1 (Manchester section), Special Lecture by Messrs. Stratton & Co., Ltd. Full details next month.

* Sale of disused apparatus at these meetings.

to the fact that the latter was already cut to resonance, and working efficiently. Owing to the usual private engagements at this time of the year, the meeting of members in January will be postponed until early in February. Best wishes for 1936 are sent to all members from G6KU, who hopes to meet them all in due course.

DISTRICT 3 (West Midlands).

An almost unheard of event has taken place in this District—a report has been received. As the perpetrator of this deed, we have to congratulate 2ANH, who, perhaps, has been urged to this indiscretion by the passing of his Morse test. He now awaits his call sign, and we wish him every success.

Once more are we able to register the success of G5JF. Following his win in the R.E.F. Cup Contest, as noted in the November issue of THE BULLETIN, he has now "scooped the pool" among the "G's" in the Polish Contest of 1934, the results of which have recently been published. Well done, Jeff!

May we remind all that the District Conventionette is to be held on the 19th instant, the Sunday following the date of publication of this issue. Full details were given on page 236 of the December issue. An interesting agenda is promised, and we hope to see our friends of the past and the present, as well as new faces. Don't forget, the Hope and Anchor Hotel, Edmund Street, Birmingham, at 12.15 G.M.T., on Sunday next.

The opening paragraph of these Notes will provide a clue regarding their non-appearance in recent months. To adhere to the policy, reports from members are needed.

DISTRICT 4 (East Midlands).

The Notts and Derby section meeting held at Nottingham on December 22 was, considering the foggy weather, well attended. An enjoyable dinner was followed by an informal meeting.

Two trophies were promised by G2IO and G6CW for competitions to be held each month, the nature of which is to be decided by general vote at each meeting. The first phase of the competition will be on the results of the senior and junior B.E.R.U. contests, although a preliminary test is being decided on the best 28 Mc. work done up to January 26, 1936. Further particulars can be obtained from the various T.R.'s.

The Leicester and District section have held two meetings on December 5 and January 2, with an average attendance of 50 per cent.; this is far less than was expected, and greater support should be given to the T.R.

Members have been active on all bands. G6GO has held daily duplex telephony contacts with PAOFB and the Irish Free State, on 1.7 Mc. On 3.5 Mc. G5KG has had several contacts with VK, VE and W stations. Several members, including G2SD, 5JX, and 6VD, have been working DX on 7 and 14 Mc/s. G2IO, 2WS and 6CW have worked nearly all continents on 28 Mc. 2BMR has done sterling work on 56 Mc. with C.C. transmitters.

The next meeting of Leicester and District will be held at G6VD, 9, Cecilia Road, Leicester, on February 6, 1936, at 7 p.m. The Notts, Derby and District meet at St. James Restaurant, St.

James Street, Derby, on January 26, at 3.30 p.m.

Will all members who are able to attend the West Midlands Conventionette at Birmingham on Sunday, January 19, please notify G5VM as soon as possible ?

DISTRICT 5 (Western)

Activity in the district appears to be fairly normal for the time of year, and conditions on all bands certainly show an improvement on last year for all-round working.

The usual monthly meeting was held in Bristol, when there was a good attendance. It was decided to hold a local hamfest some time in February, to which ladies will be invited, actual date and venue to be given later. A debate took place between G6RB and G5FS on the question of high *versus* low power transmission, and after a very interesting discussion the vote went in favour of low power.

Although there is nothing outstanding to report in the Oxfordshire section, activity is well maintained. The local Short-wave Club in Oxford holds meetings fortnightly, and these are usually well attended. Congratulations to G5LO on being appointed to carry on as T.R. for Oxford.

Wiltshire reports a fair amount of activity, especially in Swindon, where a Short-wave Club is being run successfully. The letter budget in this area is going as well as ever, and does great credit to G2BI, who organises it.

DISTRICT 6 (South-Western)

There does not seem to be anything of outstanding merit to comment upon this month. Most members are active, and apparently carrying on with their particular pet subjects. 5QA is working on 7, 14 and 28 Mc/s, 5RN and 6XD are concentrating on 7 Mc. 'phone, 5VL and 6FO are on 3.5, while a number of members in the South Devon area, notably BRS's 1821, 1918, 1580 and 1581, have all been assisting 5SY in directional experiments on 56 Mc. 2AMO hopes shortly to sit for his Morse test, and we wish him success.

The D.R. is disappointed that there was not a better response to the request for T.R. nominations. It is sincerely hoped that by the time these notes appear, T.R.'s will have been appointed for all our chief centres, otherwise it will become the D.R.'s job once more to ask members to take these positions. It should certainly be unnecessary for him to do this.

Meetings have been held in Torquay and Exeter. The Torquay meeting was well attended, and proved very interesting, but with regard to the Exeter meeting, the D.R. has another grouse. Exeter has the largest membership of any town in No. 6, and it is little short of disgraceful that only three out of a total of about 16 could attend last month. The D.R. travelled up from Torquay, and 2AMO came all the way from Plymouth, to meet—*three* Exeter members ! Now, O.M.'s, this won't do, so make up your minds, each of you, to attend the January meeting at G5WY's QRA on Thursday, January 16. The Torquay meeting will be at G5SY on February 6. The Plymouth meetings are at present being organised, and it is impossible to give dates yet.

There was a very poor response to the request for contributors to a new Letter Budget, and it is felt that there may have been some misunderstanding, so the request is repeated. What is wanted is a group of ten or a dozen members who would like to take part in a letter budget on the old lines worked in this District. It would deal in general with experimental matters, and would be circulated monthly in exercise book form. BRS and AA members can apply. Please let us have your names.

G5SY takes this opportunity of thanking all those who sent him expressions of good-will during Christmas. The cards received were far too numerous to answer individually, but all the same, the D.R. appreciates the good wishes, and hopes sincerely that all members in No. 6 will have the very best of Health and Happiness during 1936, with plenty of good contacts and good experiments successfully carried through.

DISTRICT 7 (Southern).

Individual reports are very scarce this month, probably due to the intervention of the Christmas festivities.

G6GS sends his first report as T.R. for Guildford, based upon personal listening on the air. G6LK and 5WP are working ZL and VK on 14 Mc. as a respite from the concentrated activity on 28 Mc. G5RS is also heard occasionally on this band. G6LK, 6GS, 5WP, BRS1847, and 2BKK are all active on 28 Mc. G6GS has just completed an A.C. three-valve Autodyne receiver based on the design given in the A.R.R.L. Handbook, and is very satisfied with it.

G5AO sends the Reading report. G2YB is rebuilding to link coupled TX-G5 and G5AO to CO-BA and link-coupled TPTG PA. G5HH has received an R9 report from Guildford on 28 Mc. G6GT is rebuilding his TX into rack form. G6WO is trying the Collins network. G5TP has worked his first VK. Congratulations to BRS1655 on obtaining his AA call—2BIS. He is experimenting with a 3.5 Mc. crystal and pentode C.O. The next meeting of the Reading and District members will be held on Wednesday, January 22, at 7.45 p.m.

In the Northern section of the district, 2BNS is building a TX; the D.R. spends Sunday mornings trying to work duplex fone on 7 Mc. with G6CW, the rest of the day being devoted to 28 Mc. He has a very successful c.c. outfit going on 56 Mc., using a 7 Mc. xtal and two *Osram* N41 valves. More of this anon. Congratulations to G2YL on winning the Powditch transmitting trophy for the highest G score in the recent 28 Mc. International contest, and to G6LK for his certificate of merit in respect of the first 28 Mc. VK contact. It is a real pleasure to see both of these awards coming in to No. 7 District.

The December meeting was held at G2YL's, and we had what must have been a record attendance, including a large number of visitors from other districts. The discussion covered the subjects of town representation, receiver design and activity on 28 Mc. Our thanks once again, YL.

Will all members please note that the next meeting is on January 26, at G2NH, 75, Woodlands Avenue, High Drive, Coombe Hill, New Malden. There will be no meeting on the first Sunday in February, this arrangement having been made in order to allow members to compete in B.E.R.U. G2NH's new QRA is a mystery to most members,

so here are a few helpful instructions. From New Malden station take a No. 213 'bus going to Kingston, alight at High Drive, and Woodlands Avenue is the *third* turning on the left down High Drive. Best wishes for 1936 from the D.R. and T.R.'s.

CAMBRIDGE HAMFEST

SUNDAY JANUARY 26

AT THE

WAFFLE SHOP

PETTY CURY

CAMBRIDGE

MEET AT 3 P.M.

DISTRICT 9 (East Anglia)

Will members intending to be present at the Cambridge meeting please notify G2XS as soon as possible? Only two reports this month—one complaining of the shortness of our district notes. It is, however, the considered opinion of the D.R. that if other districts kept their notes as short in proportion, there might be more room for useful technical articles in the BULLETIN. All the same, there is plenty of room for reports of our activity if members will only send in a few remarks.

In brief, we hear that G2UT is changing the address of his radio shop, G2MN is very busy with crystals, etc.; G6QZ is active; G6FB is having trouble in locating DX on 14 Mc.; G2XS was very pleased to have a QSO with G6BT and to hear that the latter's health is much improved.

DISTRICT 10 (South Wales and Monmouth).

The D.R. takes this opportunity of wishing everybody a bright and prosperous New Year, with good DX during the BERU tests. G5BI has been appointed District Scribe and reports should reach him by the 25th of each month at 15, Parkville, Tredegar, Mon. The Western Provincial meeting has been arranged for Sunday, April 26, and will take place at the Queen's Hotel, Newport, Mon. Support has been promised from London, Birmingham and Bristol. Please make a note of the date. Local arrangements are in the hands of G2JL, to whom reservations should be sent.

We extend our sympathy to G5VX in his bereavement. The following stations are active:—G2JL, 2XX, 2NG (the new call of 2ARS), 5BI, 5FI, 6GW, 6PF, 2UL, 2OP.

BRS1949, the new T.R. for Cardiff, reports that all members are active there, and that a short-wave club has been formed. The first meeting took place on January 7, and the second meeting has been provisionally fixed for January 21, at 8 p.m., at Barry's Hotel, St. Mary Street, Cardiff. It is proposed to hold future meetings at the same place and time on the first and third Tuesday of each month.

DISTRICT 11 (North Wales).

As reported, previously Mr. Vaughan Williams (G6IW) has resigned his position as D.R., and Mr. David Mitchell (G2II) has been appointed as his successor.

The new D.R. joins with all members in thanking G6IW for his past work in the district, and takes this opportunity of wishing all in No. 11 a Happy and Successful New Year.

The whole district has been circularised with the object of ascertaining the percentage of active members, but it is regretted that only five members have had the decency to reply. Now fellows, this is not playing the game, and is really very unfair, so please reply *now*, and let us have the pleasure of seeing you at future meetings!

An unofficial meeting was held at 2AJT on December 1 with an attendance of 14 members, which included two from Liverpool and two from Coventry. Special thanks are due to those who came long distances in order to be present, and to 2AJT for organising the meeting and providing tea. Some interesting work was done with 56 Mc. gear brought over by G2RF; and G5MQ showed us a very interesting midget 2 Mc. receiver as used by the Liverpool Police on their bicycles.

The official December district meeting was held at G5OD on the 22nd, but although this had been announced previously in "Forthcoming Events," only four members and one non-member attended. Those who did not consider it worth their while to attend missed a treat, as two most interesting pieces of apparatus were exhibited. Firstly, G6OK's six-valve regenerative single-signal superhet, which amazed all present with its selectivity and wonderful signal to noise ratio. 6OK is to be complimented on the excellent construction of this receiver, and it is hoped that the splendid results obtained will inspire others in the district to build similar receivers. (Article, please.—Ed.)

The second exhibit was a three-stage four-band portable receiver, completely contained in a small suit-case, and built by 2ACB. (Article, please.—ED.)

The exhibition of apparatus makes meetings more interesting and instructive, so will all members having gear of general interest please bring same along to future meetings?

N.F.D. was also discussed, and a plan decided upon, but in view of the small attendance this will not be disclosed until after the January meeting, as it is felt that other members should be allowed to make their suggestions. Those interested in this event are especially asked to attend the meeting, which is announced in the appropriate place in this issue.

DISTRICT 12 (London North).

At the last meeting impromptu discussions were the order of the day. The programme for the next six months was mapped out, and if it is possible to adhere to it we may expect some interesting talks. At the February meeting, Mr. Newton (G5NQ) will give a talk on the basic principles and the construction of simple mains receivers. This will take place on Tuesday, February 11.

We offer our congratulations to 2AHM, who is now G2GO, 2BLK, now G6ZO, and BRS1890, who is 2BLT. 2BOC is awaiting his full call. G5DJ, now licensed for 25 watts input, is building a 7-valve superhet. G6QM is constructing a tritet-ECO D.C. mains TX. G6QI informs us that he has been on 56 Mc. since last March, and would like co-operation on this band. He is also active on 1.7 Mc. G2SX is testing his new tritet-ECO transmitter, and also an electron-coupled mains receiver. G5BO, also testing out a new TX, had his first 28 Mc. QSO with a W9. Six more W's have been worked since then. G6CL worked U.S.A. on 3.5, 7 and 14 Mc. in a few hours on December 21, but attempts to make contacts with the States on 28 Mc. that day were unsuccessful.

The following additional stations reported :— G2AT, 2QY and 6PI.

DISTRICT 13 (London South)

The District meeting held on December 19 was well supported, and one of the matters discussed was the forthcoming junk sale. It was finally decided to hold this on February 20. A percentage of the receipts will be placed to the credit of the District Fund for N.F.D., and it is hoped that as many members as possible will bring along gear for sale on that date.

We are glad to be able to announce that the first copy of the " Who's Who on 56 Mc. " has now been circulated. Those members who have not received a copy and who are active on this frequency should communicate with Mr. Shersby, G2GZ, who is responsible for keeping the " Who's Who " up to date.

Before passing on to individual reports, we must correct an error that occurred in our last Notes. It was stated that the mercury arc rectifiers in use at the Droitwich Broadcasting Station were of Brown Bouverie manufacture. It has been pointed out that these are actually made in this country by the British Thomson Houston Company, and we would offer our sincere apologies to the B.B.C. for this regrettable mistake.

Again, individual reports are numerous. G2YG reports no activity of late, whilst G2ND is active on 1.7 Mc. and mentions that a Polish contest is arousing great interest on the 7 Mc. band. G6QB has been working DX on 28 Mc. G5OX is on 56 Mc., and is building a superhet for use on this frequency. G2UW reports phone activity on 1.7 and 56 Mc. 2AGW reports poor conditions. 2BTQ has been logging good DX on 28 Mc., whilst G2JB has had phone working on 7, 14, and 28 Mc. BRS1357 intends applying for a radiating licence in the New Year. G2RD is constructing a long lines transmitter for 56 Mc. BRS1675 is anxious to co-operate with any local amateur on the 28 Mc. band. G6QN is busy with Commercial Activity checks, and finds his results so far very interesting. G6AN has burnt out the secondary of his mains transformer, but hopes to be on the air again very soon. G2AI is constructing a superhet, whilst G2LW reports that his 56 Mc. transmissions are now in full swing. BRS2015 and BRS2146 are both building new receivers, whilst BRS2100 hopes to have his station active in a few weeks.

2AMW is conducting experiments with a simple push-pull self-oscillator. He mentions having constructed an automatic morse sender from two rotary selector switches as detailed in the BULLETIN a few months ago. He hopes to apply for a full licence very shortly. G2GZ has recently turned his attention to 28 Mc. Whilst listening near this band he was interested to hear American police " Calling all cars " ! BRS250 reports activity on 7, 28, and 56 Mc. He was pleased to log recently VP2KM, a a rather unusual station situated on the island of St. Kitts, B.W. Indies.

It is hoped that South London will put up a good show in the B.E.R.U. Tests. Finally, the D.R. would like to wish everyone a very happy and prosperous New Year. May 1936 be a really successful year for the R.S.G.B., and may District 13 continue to prove conclusively the inaccuracy of the statement, " South London is dead " ! Details of future meetings will be found elsewhere in these pages under the heading " Forthcoming Events."

DISTRICT 14 (Eastern).

The last Southend meeting was held at G2LC, Leigh-on-Sea, the attendance being 12. Suggestions as to a suitable site for N.F.D. were discussed, and a district crystal register was compiled. Mr. Adams, Hon. Secretary of the Southend and District Radio Society, announced that the R.S.G.B. would in future have representation on the newly-formed Committee of the S.D.R.S.—G2WG, G6CT and G2LC having been nominated to serve on the above body.

By the time these notes are in print 2AKA should know the result of his Morse test. In order to make the district meetings more attractive and instructive, it was decided to inaugurate a series of discussions. At the next meeting to be held at BRS1946 (see " Forthcoming Events "), the opening discussion will be on " Aerial Systems," and it is hoped that members who make this their special study will be present to relate their experiences. Congratulations to BRS1849 (of Brentwood), now 2BNK ; and to BRS1891 (of Warley), now 2ATU. BRS1367 (of the Isle of Arran) has moved to Ilford.

The D.R., in conjunction with 2BNC, BRS1572 and 2042, is trying to fix up a Sunday meeting at Witham, also a Sunday meeting at Brentwood, which 2BNK, 2ALX and 2ATU will be organising.

At the East London Section December meeting, held at G6AU, the attendance was nine, and included G6CT, G2LC and 2BCF from Southend. Dates of Morse classes held at 2AYB, 16, Station Road, St. James Street, Walthamstow, E.17, are January 29, February 3, 12, 17, at 8 p.m. G6FJ is leaving Portsmouth for Devonport. Recently XOH5AN, who works on the amateur bands, visited G2XG and G6UT. His ship is the s.s. *Delaware*.

DISTRICT 15 (London West and Middlesex)

With eighteen members and two visitors present at the December meeting a record for the District was set up. During the past four months eighty-eight members have availed themselves of the opportunity of attending these meetings.

We were very pleased to have G6SI and BRS1287, both of North London, with us, and hope they enjoyed their visit.

The District Magazine is now a reality, and the first printed issue was to be available about the

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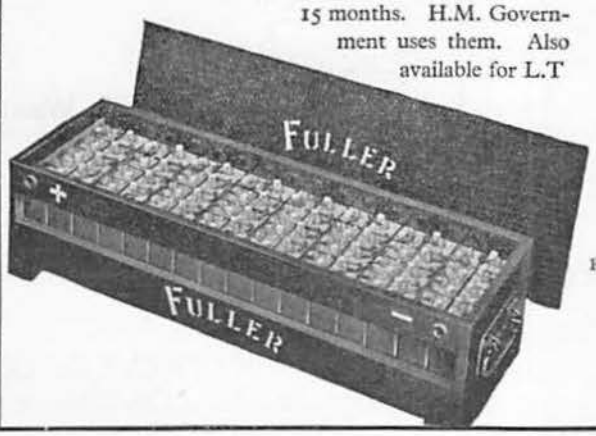

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N.B.—We must apologise for the continued delay in issuing our own 1936 list, but all who have registered their name with us will receive a copy before the end of this month. If you have not applied for a copy, why not write us now for a copy of both lists?

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12th of this month. The membership present at the last meeting were prepared to risk their subscription in having the magazine printed in the hope that sufficient numbers will signify their willingness to support the venture. A subscription costs three shillings, and includes postage. Sixty-four subscribers are needed, but to date we have only twenty-seven, so if you have not notified the D.R. of your intention to subscribe please communicate with him at once to ensure getting the first issue. (We enjoyed reading the first typed issue.—G6CL.)

One other point—don't forget the Editor wants late news and short articles of interest.

The D.R. takes this rather late opportunity of wishing the members, both at home and abroad, "Success and Prosperity in 1936." He is pleased to see that members have been looking after their interests in electing T.R.'s. The problem of district meetings is troubling him, and he would like to hear from anyone who could assist by taking one of the meetings at their QRA. Another worry of his concerns members who turn up at his home without previous warning. He would appreciate it if members restrict their visits to Mondays and Wednesdays, and, if possible, drop him a line in advance.

Reports:—G2BY testing grid-current modulation. G5CV trying for some 56 Mc. reception records with the help of the Swiss mountains. G5ND rebuilding ready for B.E.R.U. Contest. G6CO busy with transmitter and receiver overhaul. G6WN on 28 Mc. worked FF, OH, VP5, W1, 2, 3, 8, 9, ZE and ZT with a total of twenty contacts, using *RFP* 362 as FD and a *Collins* coupler. 2ADA, 2AJX and 2BAI are practising code together. BRS2146 and 2178 are new members reporting for the first time, and we welcome them to the district.

DISTRICT 16 (South-Eastern).

The Medway Amateur Transmitters Society held their annual dinner on December 4. There was an excellent gathering, with visitors from Ashford and Gravesend. Capt. Leonard Plugge (Patron), presented the prizes won in the local contest. These were the Observer Trophy, the Harding Trophy, and a further trophy presented by the Patron. Dinner was followed by speeches and an excellent cabaret. The whole district report activity during the month.

The Ashford Society is also very active, especially on 56 Mc.; 5QL and 2JV recently visited 2GD and 2IC to get an accurate calibration on this band.

G5OQ reports that the Tunbridge Wells Group are active, but that no achievement of outstanding interest has taken place. This is probably one of the most active groups in the county, and certainly the best from the point of view of regularly reporting. Others would do well to copy.

North-West Kent's greatest optimist is 2BAV, who recently had to go to hospital. Determined to remain active, he took with him a BCL set and a 56 Mc. receiver; he not only received local 5-metre stations, but also reported to them! This is the sort of spirit we like to see, and we hope you will soon be fit again OM. Two schools of thought flourish in the group: 5LB advocates CC and straight receivers on 56 Mc., and 2AW MO-PA and properly designed super-regenerative receivers. Lets have an article OM.

Erecting 35-ft. poles on the exposed top of a cliff in hail, sleet, rain, fog, and an icy gale is not the most pleasant of pastimes, and for this reason G2FA, the station of the Folkestone Radio Amateurs, is not, at the time of writing these notes, in operation on 56 Mc., but both transmitting and receiving masts are now up, and a couple of fine week-ends should see the aerials finished.

BRS1173 again supplies the report for Sussex. He states that 56 Mc. is QRT because 5JZ and 6HH are out of action, so 2AO has no one to QSO. Look out for 2FA. 1173 has been raking in some DX on 3.5 Mc.

G2IC, the County Rep. for Kent, has to consider himself sacked as a result of the new system of Town Representatives, and relinquishes his post with regret! He has always found the job very interesting and congenial in spite of the large amount of correspondence and hard work involved at times. The T.R.'s are wished good luck and a pair of heavy boots with which to chivvy the laggards. As district scribe, however, IC will probably be able to make himself just as noxious as ever.

The D.R. and the Scribe take this opportunity of wishing everyone a Happy and Prosperous New Year. Good Luck and Good Hunting.

DISTRICT 17 (Mid-East).

This month there is a falling off in the reports received, due presumably to the season's counter-attractions. Judging from the reports to hand the Northern part of the District is the less frivolous, since the bulk of them come from that area.

The 3.5 Mc. District meeting on Thursday evenings is proving a great success and will be even better when a few more members are licensed for that band. It is to be hoped that by means of these weekly schedules members will be able to keep in touch with one another. It would be interesting to know how many of the BRS and AA members are receiving these transmissions. No one has yet sent in his crystal frequency for the District Register; please do so when next reporting.

The Grimsby and District Short Wave Club continues to make progress and they are now looking for better and bigger headquarters. G5GS has recently been testing on 1.7 in addition to the other bands and is now planning a rebuild using an RFP 362. G2VY is on 7 Mc. with telephony. G6UG has not been seen lately and presumably is engaged in building his new TX. G6RN is held up awaiting the arrival of gear. G6AK is taking part in the 3.5 Mc. schedules and is working on a new modulator. 2BVU continues to brings news from the Hull District. 2BFC is testing out various modulation systems, while 2BYS is busy with power amplifiers and home-made microphones. Congratulations to BRS1515, who is now 2AZH, and 1830, who is now 2BWV. BRS1021 is winding his own transformers, while 1871 is trying to improve his receiver and intends to listen on all the amateur bands.

BRS1951, at Brigg, has been granted an AA licence, but the call is not yet to hand. He is to build a rack and panel TX using 2,53's in the exciter unit and a type 10 in the P.A. His new receiver uses a tuned h.f. stage screened grid detector and pentode output, and after a few troubles at the beginning is now going remarkably well. BRS1892 is now using an electron coupled

H.F. pentode in his super-het; he has cured rather a troublesome hum in his AC receiver by running the filaments from a separate transformer.

We are glad to welcome BRS2155, whom we were glad to see at the Louth meeting.

The chief news from Boston this month concerns G6GH, who, taking advantage of the absence of the local *masseuse*, worked ZU6. The D.R. is slowly recovering from the Christmas rush of weddings, etc., and is now returning to the fold on 7 Mc. He is experimenting with a *Tungsram* APP4C, which he hopes to get going as a Tri-tet oscillator so that he can get on 28 Mc.

The District now has TRs in Grimsby, Cranwell and Boston, consequently the D.R. will be able to keep in touch with the activities of all members. It is hoped that the TRs will continue the good work that has been done during the past few months.

DISTRICT 18 (East Yorkshire).

G2TK is rebuilding in preparation for B.E.R.U., and awaits a new *RFP* 362 valve. Suppressor grid modulation is to be used, whilst a directive aerial array is being erected for ZS. Congratulations to 2AUN on recently passing his final accountants' and auditors' examination. G5MV and 6CP are active. 2AHW is congratulated on obtaining his full call G2CP; he is on 7 and 14 Mc., with inputs up to 10 watts; reports will be appreciated. Most of the BRS are active. G6UJ is doing useful fone work on 1.7 Mc., after installing a Collins coupler.

Northern Ireland

The Radio Transmitters Union of Northern Ireland has been affiliated to the R.S.G.B. The R.T.U.N.I. was founded in 1926 and will therefore celebrate its tenth birthday this year.

In the words of 5SJ, 5GV has been "rotary-converted" and is building for A.C. drive. 5SQ has completed his new transmitter and finds results well up to expectations. 6XS is going well and is working quite a lot of DX. 5UR has applied for an extension of licence power to 25 watts.

We hope that during 1936 GI amateurs will inform the D.R. of any items of interest so that these notes may be kept in existence.

Scotland.

This month it is our privilege to record a large number of changes in the status of the membership. "A" district has the most changes: Mr. Money (ex-BRS1836), becomes G6IJ; while the following have obtained A.A. Licences: Mr. Begg (ex-BRS 1400), 2BJG; Mr. Sneddon (ex-BRS1457), 2ARS; Mr. Murdoch (ex-BRS1758), 2ANM; and Mr. Kirkpatrick (ex-BRS1831), 2BIK. In "B" district there is one change, Mr. Beattie (ex-BRS1690) has been issued the artificial Aerial licence 2BVF; while "D" district has two changes, Mr. Blair (ex-BRS2070) having been issued with the full call G5FT, and Mr. Lawson (ex-BRS1425), 2ANL.

Mr. Ridley (BRS1367) has departed for England, having obtained an appointment there.

At the "D" district meeting, held on December 4, Mr. T. Miller (G2TM) was elected "D" district Officer for 1936. For the benefit of the membership we will repeat the full list of District Officers for 1936: "A" district, Mr. D. M. Tyre (G5TY); "B" district, Mr. H. H. Taggart (G5TA); "C" district, Mr. I. C. I. Lamb (G6LD); and "D" district, Mr. T. Millar (G2TM). We hope that the membership will support the district officers by reporting regularly and assist them to make 1936 a record year.

The meeting of the Wyllie Trophy awards committee took place on December 11, at G5YG'S QRA, and all districts were represented, with the exception of "C," whose representatives were unavoidably prevented from being present owing to the lack of return travel facilities. After very careful and thorough consideration of the entries, lasting several hours, it was at last found that Mr. A. C. Brown (G6ZX) had gained the greatest number of points. Therefore Mr. Brown was declared winner for 1936, and will hold the trophy for one year. The award of the trophy was made at the December meeting of "A" district, and Mr. Wyllie, before handing the trophy to Mr. Brown, gave a full account of the manner in which the contest had been conducted. Mr. Brown suitably acknowledged his presentation.

Photo: G. Ferguson, 2AFY.

Mr. A. C. Brown, G6ZX, of Glasgow, First Holder of the Wyllie Trophy. Our photograph shows the winner with his new 50-watt Transmitter.

(*Continued on page* 292.)

Empire B.E.R.U. News.

B.E.R.U. REPRESENTATIVES.

Australia : I. V. Miller (VK3EG), P.O. Box 41, Tallangatta, Victoria; Sub Representatives: J. B. Corbin (VK2YC), 15, Yanderra Flats, East Crescent 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, Akyab, Burma.

Canada : C. S. Taylor (VE1BV), Stewiacke, Nova Scotia; Earle H. Turner (VE2CA), 267, Notre Dame Street, St. Lambert, P.Q.; W. P. Andrew (VE3WA), 1337, Dougall Avenue, Windsor, Ont.; A. E. Howard (VE4CJ), 2401, 25th Street West, Calgary, Alberta.

Ceylon : G. H. Jolliffe (VS7GJ), Frocester, Govinna.

Channel Islands : Capt. A. M. Houston Fergus (G2ZC), La Cotte, La Moye, St. Brelades, Jersey.

Egypt, Sudan and Transjordania : F. H. Pettitt (SU1SG), Catholic Club, Mustapha Barracks, Alexandria.

Hong Kong : C. Emary (VS6AX), P.O. Box 391, Hong Kong.

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

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), 44, Sda. San Benedetto, Chircop, Malta.

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

New Zealand : C. W. Parton (ZL3CP), 69, Hackthorne Road, Cashmere Hills, Christchurch.

North and South Rhodesia : R. A. Hill (ZE1JB), P.O. Box 484, Bulawayo, S. Rhodesia.

North India : J. G. McIntosh (VU2LJ), Baghjan T.E., Doom Dooma P.O., Assam.

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

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

Canada (Second District).

By VE2CA *via* VO1I and G5ML.

Conditions for European work have been poor for the past few months, but an improvement is expected in February. An old friend in VE2HM was married last December, and has sailed for England. Considerable activity exists on 28 Mc.: VE2EE worked G5ML on two-way phone; and R9 reports were given by both operators.

Canada (Third District).

By VE3WA, *via* G6NJ.

DX on 28 Mc. seems to be falling off, save for brief periods when it is quite good. VE3DU and 3WA report hearing and contacting many G stations. W activity seems to be increasing by leaps and bounds, and on Sundays the band sounds like 14 Mc. Conditions on 14 Mc. are very poor, and QRM from W1 and W2 (now heard on this band) is terrific. South African stations are coming through well around 20.00 G.M.T., and it appears that a good season is ahead for contacts with that zone. VU2CQ has been heard consistently on 14 Mc. for the past four months. VE3WA would like to know if VU2CQ has receiving equipment, as on some mornings nearly half U.S.A. seems to be calling him only for him to come back with " CQ " again! (Although doubt is expressed on this score, we can reassure our representative, as one of our Home members reports a contact with VU2CQ, who is situated in Bombay.—Ed.) Since the forming of a separate zone for VE3, many stations are showing more interest in the B.E.R.U. tests to be held in February, and it is hoped that Ontario will then be well represented.

Ceylon.

By VS7GJ.

VS7RP reported better conditions in December than for some months past. He worked VK, VS3, PK and KA, besides hearing several Europeans. Most of the VK's had T9 signals, but this cannot be said of the KA's, most of whom produce raucous noises all over the band. Someone said " brute force and . . . " but whatever the reason, it is high time these stations lined up with the rest of the world, and put unselfish signals on the air.

VS7GJ, back from leave in G (where he became a regular caller at " 53 "), is now active. The north-east monsoon is in and as a result DX should be good.

Egypt, Sudan and Transjordania

By SU1SG, *via* G6BS.

The year 1935, in so far as it affected radio amateurs in SU, was quite eventful. The licensing scheme which had been under consideration for some time came into force with dramatic suddenness, and caused a mild panic when the P.O. officials swooped on SU1TM and confiscated his gear. Negotiations by our late representative, SU1EC, resulted in a satisfactory arrangement of our difficulties and all SU amateurs now hold an official licence.

The next event of importance was the excellent performances put up by SU1EC during the 1935 B.E.R.U. Contests, which resulted in him gaining first place in the Senior, and second in the Junior Sections. ZC6FF is also to be congratulated on taking third place in the Junior event.

During N.F.D. the group was active with two portable stations, but although the event was thoroughly enjoyed by all who participated, we were, owing to extremely poor local conditions, unable to repeat the success of 1934. The 28 Mc. tests also received our support and a fair measure of success was obtained by those active on this frequency. At the moment the 3.5 Mc. tests are in progress, and these have also been supported.

The question of increasing the membership of the Society by interesting the right type of people, has also been considered, and SU1RK, after overcoming a certain amount of official prejudice, has been successful in publishing in the local magazine, *Egyptian Radio*, articles on amateur radio calculated to interest prospective members. The introductory article published a few weeks ago received favourable comment, and it is anticipated that when the series is completed the desired results will be obtained.

Looking back on the events of the past year, and taking into consideration our small membership, it is felt that the group has pulled its weight and contributed a fair share to the advancement of the amateur radio movement.

On behalf of the local B.E.R.U. group, the writer sends seasonal greetings to friends at home and abroad.

Irish Free State

By EI9D.

EI stations are active as usual, but due, presumably, to Christmas, very few reports have arrived.

At a meeting of IRTS, held in Jurys Hotel, Dublin, on December 13, an excellent paper was read by EI9F. It cleared up many of the difficulties in the way of prospective participants in Amateur Radio, and was of especial interest to new members.

Commencing at 19.00 G.M.T. on Saturday, January 25, and on every following Saturday until further notice, slow Morse practice will be provided by IRTS on 3,522 kc. The call will be IRTS de EI9D. Code will be transmitted at 5, 10 and 15 w.p.m. It is hoped that these transmissions will prove useful to BERS and new members of IRTS. Reports will be appreciated by EI9D.

All stations are looking forward to B.E.R.U., and a good entry is expected.

Malaya and Borneo.

By VS1AA.

VS2AG, the only member to report, has worked OA and CX to qualify for his W.A.C.

Generally speaking, conditions on 7 and 14 Mc. have been poor, with occasional bright spots on the latter band. A W1 was heard—this is unusual reception for Malaya.

VS2AG bemoans the fact that only 10 per cent. of stations worked QSL. (We could give you a few thousand *useless* report cards if you called at 53!—Ed.)

The lack of reports is concerning the writer—a postcard a month is all that is required. Please, please!

Malta.

By ZB1C, *via* ZB1E and G5YH.

A successful meeting held on December 15 was well attended, and acquaintance was made with new members. The BERU contests for 1936 were discussed. ZB1E has been awarded WBE and has applied for WAC. ZB1H still requires that elusive VE for WBE. Both stations report active on 14 Mc. and state that conditions on this band have been exceptionally good some afternoons; ZL, J and VK were worked. BERS25 is busy with the arrangements for the forthcoming receiving contest, for which full support has been promised. BERS201 has no facilities for activities. BERS297 and 300 are engaged on 28 Mc. The representative regrets that only two reports were received for December, and requests BERS members to send in their reports by the 21st of the month. The ZB1 group wish all fellow members best DX and Success in 1936.

Rhodesia.

By ZE1JB.

There are two matters of interest this month. The first is that at least three stations are now on 28 Mc. in Bulawayo. The second matter is contained in a letter from Mr. Jubb (ZE1JN).

Mr. Jubb carried out tests on 14 Mc. on December 14 with W6CNX, to see the effect of power reduction in the final stage of a crystal controlled transmitter leaving the other stages with usual inputs. He found that he was heard at R3 with no input whatever to his final, but having the filaments of this stage alight and the aerial coupled. Obviously, the signal being heard was that from the frequency doubler. With 30 volts of H.T. on the final and drawing 3 milliamps or 0.1 watt, he was R4. With no input to the final at all and only 0.8 watt to the frequency-doubler he was R2. With the normal input of 11 watts to the doubler he was, as stated, R3. Obviously, those who use, say, 80 watts in their frequency-doublers and reduce the final stage input by bias or other methods to 10 watts, are really putting about 40 watts into their aerials on the average F.D. efficiency of 60 per cent. As Mr. Jubb says, if the criterion for "miles per watt" records is the actual measured power input to the final stage alone, then surely he has the world's record which cannot possible be beaten for with *no input whatever* he was R3 in California! This is a "reductio ad absurdum."

ZE1BJ has been in Umtali for two months, but hopes to be on the air again early in February. He enjoyed meeting the Umtali Group who made him very welcome, particularly ZE1JE, who allowed him to operate his outfit.

ZE1JE is working DX on 14 Mc. and finds the crystal filter on his receiver very useful when the bands are crowded.

ZE1JF is rebuilding his speech amplifier to Class B, and hopes to get a better modulation percentage. ZE1JJ will be back from leave when these notes appear. ZE1JM is still going strong on phone and CW.

ZE1JN is on 28 Mc. and has heard a number of stations but had no QSO's as yet. He puts this down to the fact that he is on 28740 kc., while, according to the BULLETIN practically no stations are heard above 28200 kc. He thinks that listeners do not search as far as his station. He will be on the air every Sunday from 12.00 to 14.00 G.M.T., and would like those who are working on this frequency to look out for him. JN heard F8OZ, OK1AA, PA0AZ and D4JMK on December 8.

Several W stations were heard, but he did not log them in his anxiety to see if his own CQ's were being answered! The stations listed above were called by JN.

JE1JS is going strong on 14 Mc., and has worked over 100 different W stations this season. ZE1JU is also on 28 Mc. On December 8 he was QSO G6WN and D4ARR and has heard the following :—

December 7 :

G.M.T.		G.M.T.	
13.15	OK1AA	16.54	W7FLU
15.20	W8CRA	16.56	W1DGE
15.30	W9HUV	16.58	W2EFF
16.26	W3ENX	16.59	G5WP
16.52	W1CMX	17.00	W2AOO

December 8 :

G.M.T.		G.M.T.	
08.45	F8CT	13.45	OK1AA
08.55	G6WN	16.00	W9ODW
09.20	SU1JT	16.50	W1DGE
09.30	G6WT	16.52	W1AEP
13.35	D4ARR	16.54	W5BF

Ex-CR7IA, who hopes to be licensed here soon, heard the following stations on 28 Mc. on December 1. The reports are given in RST :—

G.M.T.			G.M.T.		
14.50	VE2EE	349	15.27	W1CBZ	329
14.54	W3CHH	339	15.34	W8CRA	449
15.01	W9EAH	459	15.50	W1FJN	449
15.03	W1DZE	458	15.54	W1HDV	349
15.24	W3EVT	349			

(We hope to publish Mr. Jubb's letter in a later issue.—ED.)

THE 1936 1.7 Mc. TRANSATLANTIC TESTS

By DAVID S. MITCHELL (G2II).

FOLLOWING discussions with various 1.7 Mc. stations, and the circularising of a letter to all well-known British 1.7 Mc. operators, the schedules given herewith have been decided upon.

In view of the remarkable conditions prevailing on the higher frequency bands, these tests should prove particularly interesting, and it is hoped that a greater number of stations will take part this year.

The tests are to be held between 05.00 and 07.00 G.M.T. each Saturday and Sunday, commencing January 25 and continuing each week-end until March 15, 1936.

In order to avoid undue QRM, separate 15-minute sending and receiving periods have been arranged.

W and VE stations are to transmit from the hour to the quarter, and from the half-hour to the three-quarter. These correspond with European listening periods.

European stations transmit from the quarter-hour to the half, and from the three-quarter hour to the hour, these being W/VE listening periods.

"G" stations will call "Test U.S.A." and W/VE will call "CQ G."

Even when contact has been established, participants are earnestly requested not to transmit during listening periods, as doing so might ruin the chances of others.

Possibly these listening and sending periods will seem, at first sight, a little complicated, but in reality they are extremely simple, and after the first week-end will become quite automatic. Past experience has shown that this is the only practical method of running a Transatlantic Test on 1.7 Mc.

Participants should call TEST or CQ not more than *three* times before signing, and then send their call-signs *four* times. Last year most stations sent CQ far too many times before signing.

It is suggested that the 15-minute calls could be interspersed with short reports of stations or districts heard and general remarks on conditions.

All European stations must operate between 1,715 and 1,800 kc., as, on the other side of the Atlantic, interference from powerful American and Canadian phone stations usually makes impossible the reception of weak signals between 1,800 and 2,000 kc. However, Europeans are advised to listen over the whole band (1,715-2,000 kc.), as last year the phone band was alive with American amateur signals.

The co-operation of our non-transmitting members will be welcomed, and the tests should give the B.R.S. an opportunity to send some really useful reports. As over 130 stations on both sides of the Atlantic have been circularised, it is hoped that these will be the best tests yet.

Note.—In order to enable more contacts to be made during each period, two stations could be worked simultaneously.

For instance, if G— heard W1BB and VE1EA calling "CQ G" between 05.00 and 05.15, he could reply thus : "W1BB VE1EA de G—," give reports to both, and say "W1BB pse reply first." This would mean that W1BB would reply during the *first* 7½ minutes of the next G listening period, and VE1EA during the latter 7½ minutes.

W/VE stations have also been advised of this procedure in the circular letter sent to them.

MICRO-WAVES.—(*Continued from page* 257.)

Before going further into the construction of the receiver, a word about aerials and reflectors will be given. As stated previously, micro-wave transmission lends itself easily to the use of efficient reflector systems owing to the fact that the length of the wave is only a few feet, and therefore reflectors and emitters can be of the fundamental length.

Professor H. Yagi developed an aerial system consisting of an emitter, reflectors, and directors. The emitter itself is exactly one-half wavelength long and is usually vertical. A parabolic reflector, consisting of vertical wires a half wavelength long and separated by a distance less than a quarter wavelength, is so arranged that the emitter is at the focal point of the parabola. In front of the emitter a line of directors is placed. These again consist of vertical wires a half wavelength long and separated by less than a quarter wavelength. The reason why the distance must be less than a quarter wavelength is that most of the radiation will pass through the reflectors if only a quarter or more wavelength separates them. Fig. 7 shows the arrangements of the complete aerial system. In some experiments the director system extended to as much as 10 metres. In operation, induced currents set up in the reflectors by the emitter oppose the wave and send out waves of their own. They can be likened to transformer secondaries. Of course, the reflecting wires may be superseded by constructing the parabola of copper sheet.

In the next article will be described the construction of a transmitter, with information on the testing of valves for micro-wave purposes.

SAFETY PRECAUTIONS AT G6QX.—(*Continued from page* 263.)

This meter unit consists of one 0-500 mil plate meter, one 0-16v. a.c. voltmeter for filaments, and one 0-50 mil grid meter, all *Ferranti* projecting type, mounted on a plug in panel for quick change-over from the 14 Mc. to the 7 Mc. amplifier.

Two keys are provided, an automatic (rarely used) and a straight key. This key is enclosed in a bakelite box with the variable resistor-condenser spark filter incorporated, and the box is so made that it is practically impossible to accidentally depress the knob whilst carrying out adjustments to the transmitter near by.

Conclusion.

In conclusion, this article is intended as a station safety description where sound common-sense engineering has been applied to station construction without resort to interlocking mechanism and complicated devices familiar to the commercial radio field.

The writer strongly recommends all amateurs, and particularly those entering the field at an early age, to ensure that no chances are taken in their layouts or experiments which involve exposure to voltages exceeding 150 volts d.c.

All amateurs are recommended to procure a copy of "*Regulations for the Electrical Equipment of Buildings (formerly I.E.E. Wiring Rules)*," 1s. net (1s. 2d. post free) paper covers, 1s. 6d. net (1s. 9d. post free) bound in cloth, procurable from the Institution of Electrical Engineers.

NEWS FROM U.S.A.—(*Continued from page* 265.)

bands to 56 Mc. With the development of this superior but less portable equipment, we may expect in the future that the ultra-high frequencies will be used more for fixed station operation and less for portable work than in the past, and we can look forward to reliable communication over greater distances as well as occasional medium DX. In short, the experimental stage of the U.H.F. has passed.

The B.C.L. set manufacturers seem to be excited over the new metal valves, recently put on the market. We believe they are an old story in England. From those who have had experience with ours we learn that they are superior to the glass ones, but the manufacturing processes are not entirely perfected as yet and these valves are not sufficiently uniform. But new tubes!—we gave up trying to keep track of them many years ago.

SCOTLAND.—(*Continued from page* 288.)

At the next meeting of "A" district, to be held on January 29, Mr. A. H. Mason (G6MS) will deliver a lecture on "Television," and we trust a good turn-out of members will be present.

"C" district are to visit "B" some time during January, when "B" hope to repay for the hospitality shown them during their visit to "C." "B" enjoyed their visit to "C" very much, and visited G5WT, G6RI and G6KO, being taken round these stations by car by G6LD and G6RT.

G6RT has succeeded in working VK5 on 14 Mc., and got an R6 report. G6LD has altered his receiver to S.G. detector, and has also been cutting his Windom aerial, and has increased his radiation considerably.

G6ZX has completed his new modulator, and hopes to recommence his 56 Mc. transmissions at an early date. The new transmitter at G6ZX is housed in an all-aluminium rack, and is a very fine piece of work indeed. (See photo.)

Work on 28 Mc. has been continued at G6ZV, but little new has been accomplished, although contact was maintained regularly each week-end with W. QRN has, however, been bad, and has proved very troublesome.

G6JD has just been married, and we all wish him every happiness in the future.

There is very little news to hand regarding the work being done amongst the membership, although it is known that a fair amount of activity prevails.

Empire Calls Heard

BERS273. October 24-*November* 18. *J. R. Cragg, P.O. Box* 391, *Hongkong.*

14 Mc.: g2as (9.4.4.), 6yl (8.5.5.), ze1js (9.4.4.), zs4u (8.4.5.), 6af (9.4.4.), zt5v (7.5.8.), 6q (8.5.5.), zu6r (9.4.4.), vq4crm (9.3.4.), 8ac (6.5.8.), vu2cq (9.5.6.), 2lj (9.5.5.), vs2ag (9.5.7.).

7 Mc.: g2in (dc.3.4.), vu2an (9.5.9.), 2cq (9.5.8.), vs7rf (9.5.9.), vq8af (8.5.5.), su1sg (8.5.6.).

BERS309. October 30-*November* 18, 1935. *N. C. B. Cleveley, Royal Signals, Hongkong.*

14 Mc.: zt6m (9.4.5.), 6ak (9.4.5.), 5v (9.3.5.), 6l (9.3.4.), ze1jo (9.5.6.), vu2cq (9.4.6.), 2jp (9.3.4.), vs1aj (9.4.5.), 3ac (9.4.5.), vq2rs (9.3.4.).

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