

THE T. & R.

BULLETIN

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

Vol. 11 No. 4

OCTOBER, 1935 (Copyright)

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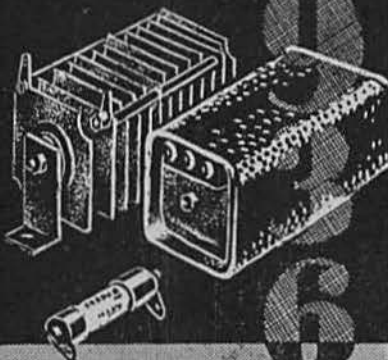
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THE T. & R. BULLETIN

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H. Bryan Swift (G2TL)

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No. 4

TECHNICAL DEVELOPMENT

WE admit quite frankly that we made several prior attempts to write this Editorial, scrapping each in turn, for the reason that we had not succeeded in getting over to our readers the thoughts in our minds. We can only hope that we have now succeeded!

Technical Development is neither an old or a new phrase. In all branches of engineering it has been recognised for years and special groups of trained engineers have been employed to produce new ideas. In the amateur field Technical Development has, for the reason that we *are* amateurs, been slower in becoming recognised as such, but nevertheless numerous important technical advances have been made by amateurs from time to time. The Goyder Lock system, although looked upon to-day by many with disfavour, was a typical example of technical progress, as were the historic experiments of G2OD and others in connection with crystal oscillators and frequency doublers. A decade ago the radio industry was only just beginning to touch the edge of high-frequency problems, but following the pioneer work of Partridge, Goyder, Simmonds and Marcuse, to mention but four well-known British amateurs, little time was lost in setting up laboratories for the development of short-wave technique. Many of our early members were invited to join laboratory staffs, in fact, we go so far as to say that practically every large radio concern in this country and in America had to make use of amateur experience in order to push forward the development of short waves.

Our friends in the A.R.R.L. were undoubtedly the first to recognise the value of technical development in so far as amateur radio was concerned, and we find that a special department in the A.R.R.L. organisation was in operation for this purpose more than 10 years ago. With a paid staff of men who were in close touch with the amateur and his work, and fully alive to his problems, it was to be expected that important developments would take place. Receivers, transmitters, frequency meters, aerials, in fact every phase of the subject has received attention, and as most of us in this country know, the development has been along sound and practical lines.

We should be misjudging our fellow countrymen if we failed to record that several important new developments have been credited to British amateurs, but it is clearly evident that amateurs who have other occupations to engage their main attentions can scarcely hope to compete with those who are employed as development engineers.

All of this brings us to our immediate problem—how are we in the R.S.G.B. to foster technical development? There is only one satisfactory answer—by employing a full-time technical Development Manager, but as our Secretary pointed out during his after-dinner

(Continued on page 162)

OLYMPIA AND OUR TENTH CONVENTION

It is difficult to say just when our Tenth Convention commenced, because the "get together" spirit was in evidence many days before the first official event of the week-end took place. This can be directly attributed to the R.S.G.B. stand at Olympia, which more than ever before lived up to its reputation as being the Mecca and meeting place of amateurs from all parts of the world.

Day after day from August 14 onwards hundreds of members called at the stand to exchange a few words with those on duty. Old friendships were renewed over cooling drinks, and, believe us, they had to be cool to be effective, for on several days the temperature inside Olympia could only be compared with a Turkish bath. Newer members

Curiously enough the short wave converter built by G5TL came in for as much attention as anything on the stand, probably because the general public are beginning to show an interest in short wave work.

The new equipment described in the third edition of the Guide looked good, and we were gratified to receive numerous compliments upon the improved workmanship displayed by the constructors.

The Guide, as we prophesied, had an enormous sale; 100 pages of up-to-date short wave information for sixpence appealed to everyone with the slightest interest in short wave work. It was therefore not to be wondered that on the first Saturday all sales records were broken when over



TENTH ANNUAL CONVENTION.

Many well-known members will be recognised in the Group Photograph. Front row reading from left to right: HB9P, ON4ZO, G6MN, 2MI, 2CX, 2NH, 2TI, 6UN, SAR, 6CL, 5FB, 6TW, 5SY, 6UT, 2WV, YS7GJ, G6QB, 6YK, 2OA and 6WY are in the second row to the left.

with B.R.S. numbers approximating to 20th-century dates were making their first acquaintance with "hams en masse," but we were struck with the fact that many of them had taken no steps to become acquainted with the activities of their local groups. Our D.R.'s and C.R.'s, as a general rule, are busy men, but we feel sure that all of them will be pleased to hear from new members with a view to bringing them into the family circle.

It would be impossible to relate in print all of the humorous incidents which occurred on the stand, but G6LI would have blushed if he had heard the comment of a lady visitor who, after examining his beautifully constructed transmitter, dragged her better half away mumbling that she thought crystal sets had become obsolete.

£27 worth were sold. The total sales for the exhibition period amounted to over £109. Thanks to the generous support of our advertisers and those who purchased copies we were thus able to leave Olympia with the knowledge that the Guide had paid for itself.

The Visits.

For the first time in our history visits to places of technical interest were included in the Convention programme. That they were appreciated by all who attended goes without saying, for who could not wax enthusiastic if given the chance to inspect at close quarters the radio labs of the British Post Office, the Brookman's Park broadcaster, and the Standard Telephone and Cable Company's works, all within a period of 24 hours.

U.S.A. Contacts now possible on 3.5 Mc/s

The Dollis Hill visit, which was attended by 30 members, will be remembered for the opportunities given to examine the standard frequency apparatus and the crystal grinding room. A further interesting feature was the opportunity presented of passing through the training school in which P.O. students receive first-hand information regarding every form of telephone system in current use.

The gathering of the clans on Stand 202 at Olympia later in the evening tested the accommodation to its utmost limits. An overflow meeting became necessary long before closing time.

Whilst most of London's millions slept some 40 stalwarts pulled themselves together early on the Friday morning in preparation for an early start from Leicester Square. All went well with the 'bus carrying the party until Archway Hill, Highgate, was reached, and then some form of engine QRM caused a delay. However, by dint of much persuasion on the part of the driver, Brookman's Park was reached only 10 minutes behind schedule. Considerable interest was shown in the transmitting and modulating equipment. The cherry red glow of certain modulating valves shocked the susceptibility of some visitors, who imagined radio amateurs to be the only persons permitted to run a plate at the colour indicated!

From Brookman's Park the party proceeded to the Bull and Butcher Hotel at Whetstone, where an enjoyable "rag-chew" and informal lunch took place. The Standard works were reached at 2.15 p.m., when the party were met by Mr. R. A. Miles, personnel manager. A very complete inspection of this rapidly growing factory was carried out under expert guidance. Especial interest was shown in the overhead conveyor systems designed to save floor space. The early stages in the construction of the ship to shore transmitters for the *Queen Mary* were also noted with interest.

An excellent tea was provided by the company, at the conclusion of which Mr. N. V. Kipping, works manager, expressed his pleasure at meeting for the first time at the Southgate works representatives of the R.S.G.B. He mentioned that some of those present might one day become members of the Standard organisation, and hoped that those who had received their initial insight to the company's organisation had been interested in all that they had seen.

The writer of these notes was himself a member of the S.T. Co. staff for 21 years, and the occasion of the visit was for him a most pleasurable one.

We record our grateful thanks to all who assisted to make the three visits so enjoyable, remembering especially Mr. Mumford of the G.P.O. research laboratories, and Messrs. N. V. Kipping and R. A. Miles, of Standard Telephones & Cables, Ltd.

Convention.

Convention proper opened at 6 p.m. Friday, August 23, with a conversazione at the Florence Restaurant. Well over 150 members were present at this popular function, including a fair sprinkling of overseas members.

The film show arranged by our President proved highly entertaining. Many of the shots taken by Messrs. Marston and Desmond at provincial district meetings were excellent, as were parts of the film taken by G5UK during the recent visit to Belgium. The technique of cinematography has

not reached a high perfection in the amateur radio ranks, but those who witnessed the show must have felt that the entertainment provided was well worth the trouble taken by all who contributed portions of films.

A running buffet was well patronised, whilst the opportunity provided for "rag-chewing" seemed to be appreciated.

Delegates' Meeting

The annual meeting between Council and the D.R.s took place at 9.15 a.m. on August 24 in the Council Chamber of the I.E.E. The following attended:—Mr. A. E. Watts (President), Mr. J. D. Chisholm, G2CX (QSL Manager), Mr. J. Clarricoats, G6CL (Secretary), Mr. J. Noden, G6TW (District 1), Mr. C. A. Sharp, G6KU (Deputy, District 2), Mr. W. B. Sydenham, G5SY (District 6), Mr. E. A. Dedman, G2NH (District 7, and member of Council), Mr. J. B. Kershaw, G2WV (District 13), Mr. R. A. Fereday, G6FY (Deputy, District 14), Mr. H. V. Wilkins, G6WN (District 15), Mr. G. A. Chapman, G2IC (Deputy, District 16), Mr. A. E. Livesey (District 17), Mr. T. Woodcock, G6OO (District 18), Mr. S. A. French, G6FN (Deputy, Scotland), Mr. G. H. Jolliffe, VS7GJ (representative for Ceylon).

Mr. Watts welcomed the delegates and explained that in order to save time a précis of their reports had been prepared and circulated prior to the meeting.

Four suggestions made by the delegates were discussed; these included a recommendation to use groups of letters, instead of numbers, as a means of identifying B.R.S. members. It was pointed out, however, that such a scheme if adopted would cause confusion with A.A. calls. A further suggestion concerned the publication of new members' lists on a specific page in each issue of the BULLETIN. It was explained that these lists always appear with the Headquarter's notes and can thus be readily found.

Two suggestions in regard to N.F.D. scoring for Northern Ireland were considered but were not adopted, it being felt that, although Irish stations may perhaps be at a slight disadvantage when operating their "A" stations, their "B" stations were in a better position for DX work than most of the English stations.

Mr. Watts then read a letter from Mr. A. D. Gay (Calibration Manager), which had been sent to the members of the Band Monitoring Group. This explained the function of the group, viz., the protection of members' interests. It was agreed to circulate the letter to all D.R.s.

The Secretary was then asked to give a brief outline of the work done by the Tests and Awards Committee in regard to the preparation of a scoring method for the 1936 B.E.R.U. Contest. He pointed out that numerous difficulties arose whenever an attempt was made to depart from a straight-forward system. The meeting agreed to the suggestion that the Committee be asked to devise a system of scoring which would be as equitable as possible for all parts of the Empire.

The Secretary then announced that a well-known member had donated the sum of £10 for the purchase of a silver challenge trophy which would be awarded in future to the leading station in the United Kingdom and Northern Ireland zone in the senior section of the contest. Acclamation greeted the announcement.

Mr. J. D. Chisholm then proceeded to explain some of the difficulties the QSL Section had been experiencing in regard to the handling of cards for home members. He mentioned that many members declined to collect cards because in every batch they would receive a large percentage of European listeners reports.

Mr. Chisholm reported that recent checks had shown that over 75 per cent. of each batch of cards received from D.F.T.V. were from D.E. stations. Realising the position, Council had, some months previously, instructed him to write to the D.F.T.V. and other European societies asking them to consider abolishing the exchange of European listener reports. Mr. Chisholm regretted that no reply had yet been received to his letters. He then explained that Council had deemed it expedient to seek the views of first the delegates, and then the members at the business meeting, before proceeding further with the matter.

especially to obtain up-to-date information of the type imparted.

Mr. Watts then made mention of the proposal to check the commercial occupancy of the channels bordering on to our 7 mc. band. He explained that the I.A.R.U. had supported our original proposal, and that it was now the duty of the Society to begin an organised check. He appealed for volunteers to undertake this service, which he regarded as of considerable importance.

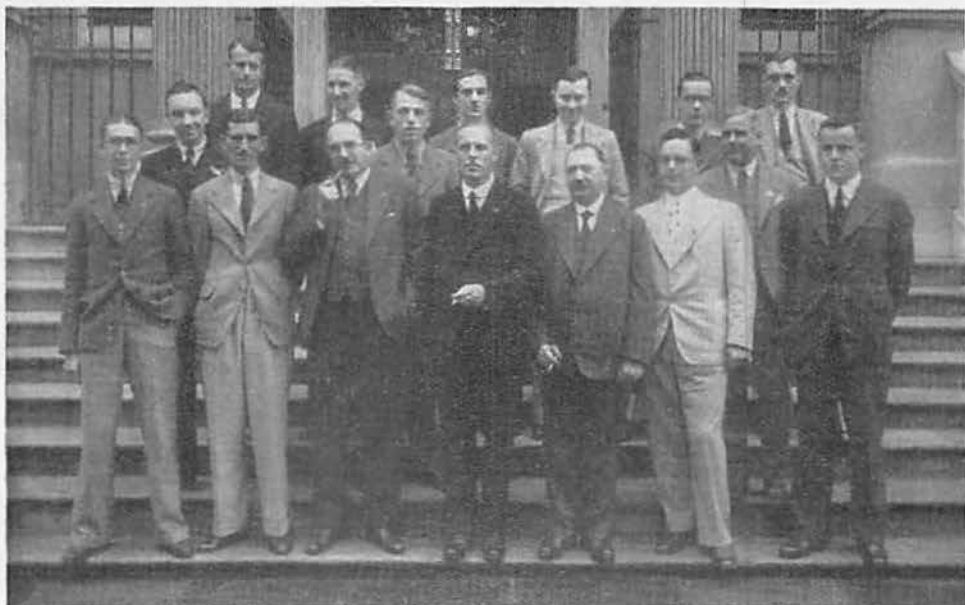
This concluded the Delegates meeting.

Business Meeting.

The business meeting which followed at 11 a.m. was attended by approximately 70 members.

The President formally welcomed all present and then called upon the Secretary to give a résumé of certain matters discussed at the delegates meeting.

Mr. Chisholm was next invited to explain the Council's views in regard to European listeners'



Members of Headquarters Staff with representatives from overseas organisations. VS7GT (second from left, front row), VS7GJ to right of second row, W3AWH and ON4ZO, first and second from left back row, EI6F and EI9D at extreme right of back row. G6JB (ex VK2NR) extreme right front row.

It was unanimously decided to support Council and to recommend to the business meeting that a formal motion of support be approved.

The Secretary recommended that the following be the dates and venues for the 1936 provincial district meetings:—

- March 24, York.
- April 28, Swansea.
- May 26, Nottingham.
- June 30, Cambridge.
- October 1, Liverpool.

The list was approved.

Mr. Clarricoats asked whether the D.R.'s considered that the Headquarter's talk given at these meetings was of value. He was assured that provincial members in general attend the meetings

reports. At the conclusion of his remarks the following resolution was proposed and seconded:—
"That steps be taken by the Council to seek the agreement of the European societies to cease sending listener reports to other European societies." The proposal was carried unanimously. Mr. Watts invited B.R.S. and A.A. members present to give their views on the subject. Those who spoke expressed agreement with the proposal.

The Secretary then outlined in detail the Commercial activity checking scheme and asked for offers of assistance.

Mr. Watts then read extracts from a letter received from the G.P.O. in which it was mentioned that as from January 1, 1936, it was intended to charge transmitting amateurs a fee of 10s. for broadcasting

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apparatus if used for entertainment purposes. Mr. Watts explained that a large proportion of those holding transmitting licences were already paying a fee to the B.B.C., therefore it appeared only reasonable to accept the G.P.O. verdict without comment. He stated, however, that he intended to again raise the question of lower fees for high-power transmitting licences.

This concluded the business meeting, following which informal lunch was taken at Slater's Restaurant in the Strand.

Afternoon Meeting

In accordance with the usual practice the annual Convention photograph was taken on the steps of the I.E.E.

Mr. Watts then proceeded to personally welcome each member as he entered the lecture theatre, a gesture much appreciated by all.

The session opened with Presidential greetings, during which Mr. Watts asked that those Dominion, Colonial and Foreign members present should take back to their local societies the cordial greetings of the R.S.G.B.

Telegrams and messages of good wishes were then read by the Secretary. These came from all parts of the world, the reading of each being received with acclamation.

Mr. Watts then presented the Society trophies for the year.

At the conclusion of the presentations, Mr. Watts called upon Mr. G. Parr to deliver his lecture on "Cathode Ray Tube Developments." It is doubtful whether any previous Convention lecture has been so instructive and interesting as that delivered by Mr. Parr, and the writer in common with many others hopes that a précis will, at an early date, be made available for publication in this journal. The numerous experiments carried out by the lecturer were much appreciated, as were the lantern slides used to illustrate salient features of the address.

At the conclusion of the lecture a very cordial vote of thanks was given to Mr. Parr.

Tea followed at 4.30 p.m.

The Dinner.

Over 150 members were present at the Florence Restaurant for the annual Convention dinner. An excellent repast was followed by a musical programme arranged by Mr. G. Ceci. The toast of the Society at home was given by Mr. Leslie McMichael (Vice-President) who expressed his great pleasure at the progress made by the Society in recent years. He mentioned in passing that he had the honour of being member No. 1. Television, in his opinion, offered numerous opportunities for Society members to make useful contributions to the advancement of the subject. Many problems remained unsolved, but the skilled technique possessed by the amateur fraternity should enable them to tackle these problems with the same zest as was shown during the early days of short wave radio.

Mr. Clarricoats (Secretary) responded. He outlined some of the important advances made by the Society to date, and expressed the hope that the time would not be too far distant when the R.S.G.B. would be in a position to afford a full time Technical Development Manager. He also visualised the time when the Society's Journal would be consider-

ably enlarged, but these "dreams of the future" depended, he said, entirely upon how fast the membership increased. The present rate of development approximated to 350 members a year as against 250 a year up to 1933. He believed that once the 3,000 mark had been reached and maintained a technical development programme could be put into practice. He concluded his speech on a personal note, thanking the President, Council and members for the assistance rendered to himself and his staff during the past year.

Mr. Watts, before proposing the toast of the Society overseas, presented the Senior B.E.R.U. Trophy to Lieut. E. S. Cole (SU1EC). He expressed his pleasure in being able to make the presentation in person, because this was the first occasion that an overseas winner had received his trophy from the hands of the President. Mr. Watts, in his speech, outlined numerous B.E.R.U. activities, and on behalf of all home members welcomed the B.E.R.U. Section members present at the dinner. Lieut. Cole, in reply, mentioned that overseas members located in the smaller Colonies and Protectorates regarded the parent Society as a "father and mother" at all times. The spontaneous assistance given by the R.S.G.B. to its overseas members when in difficulties was of inestimable value.

Mr. G. H. Jolliffe, VS7JG (Representative for Ceylon) supported Mr. Cole in the reply, and emphasised the value of friendly co-operation between amateurs throughout the Empire. He expressed the hope that all who found themselves in Ceylon would make a point of meeting him.

Mr. J. B. Scott, G6JB (ex VK2NR), and Mr. Gavin Sampson (ex ZL4AI) also spoke. The former delivered greetings from W.I.A., and also gave an outline of the work being done by our sister society in Australia. Mr. Sampson commented upon the spirit of friendship which he had found ever present since he came to England.

Mr. A. E. Dyson (G6NJ), welcomed our visitors who included amateurs from the U.S.A., France, Belgium, Holland, and Switzerland. Mr. Yardley Beers (W3AWH) responded, and associated himself with Mr. Sampson in his remarks regarding the friendly welcome which had been accorded him. He paid a tribute to the excellence of the T. & R. BULLETIN, which emphasised the cordial spirit of co-operation present amongst the R.S.G.B. members individually.

Mr. Carl Keel (HB9P) also responded, and thanked the Society for making his stay in England so enjoyable. He conveyed greetings from U.S.K.A. to R.S.G.B.

The Draw.

During the evening our Secretary staged his annual draw, a feature which never fails to hold the company from first to last.

In introducing the item, Mr. Clarricoats explained that its preparation had been handled exclusively by Miss Gadsden. He paid a tribute to all manufacturers who had contributed to the success of the draw, and mentioned that some 60 gifts were available for distribution.

A full list of donors follows:—

Wingrove & Rogers; Telegraph Condenser Co.; Dubilier Co., Ltd.; Weston Instrument Co.; Stratton & Co., Ltd.; LectroLinx, Ltd.; Belling
(Continued on page 162).

THE PROPAGATION OF ELECTRO-MAGNETIC WAVES.*

By J. L. HOWARD, B.Sc. (HON.), A.C.G.I.

The title of this article admits of a wide interpretation and may be dealt with in several different ways. It will therefore be advisable at the outset to state briefly those aspects of the subject which will be treated in the following discourse.

It is proposed to say a few words on the mechanism of radiation, on reflection from the two ionised layers and on reflection from the earth's surface. Then a consideration of the design of short-wave beam aërials and a description in outline of some of the methods employed to determine the angle at which short waves are incident at a receiving aerial will follow. This last has been included because of its obvious importance for long-distance transmission and reception.

What differentiates radiation through space from the more familiar considerations of the power engineer is the conception of current flowing through a dielectric.

If we define a current of electricity as that which will give rise to a magnetic field in accordance with Ampère's Law, we must distinguish between conduction current, i.e., the movement of electrons or charged ions along a conductor, and the displacement current or the rate of change of electric strain in a dielectric. Using this comprehensive definition of current we can say that a current is always circuital; for instance, the change in electric strain across the plates of a condenser as the plates get charged is equivalent in its magnetic effect to a flow of electricity from the +ve to the -ve plate. When the plates are fully charged the electric strain (which is equal to the number of tubes of force per unit area) ceases to alter further and the displacement current, as well as the conduction current, becomes zero. At every instant during the charging process, the conduction and displacement currents are quantitatively equal.

We may consider the displacement current as being analogous to the displacement of a solid when a mechanical force is applied to it internally; the solid will be displaced in accordance with its elastic properties and will return to its original state upon the removal of the force; so with the displacement current. If, however, a force is applied internally in a liquid, movement will continue as long as the force is applied: so with the conduction current.

Now consider what happens when an aerial is supplied with h.f. energy. Conduction currents rush up and down the aerial and as the condensative circuit to which it belongs must be circuital, the currents return to earth in the form of displacement currents set up by the changing electric strain in the surrounding medium. Thus we have a complete electric circuit enclosing an area and this will give rise to a magnetic field threading it. All effects must be transmitted with a finite velocity, and a time must elapse between a given state in the aerial and the corresponding displacement current at a distant point. Hence we have a moving electric

field which is giving rise to a moving magnetic field, and of course intensities are varying in accordance with the aerial current.

Once we have started the wave it follows from the two laws of electro-dynamics that it must continue, for it is self-supporting, the moving electric field giving rise to a magnetic field perpendicular to the electric field and the direction of motion of the wave (Ampère's Law generalised by Maxwell), and this same moving flux density giving rise to an electric field perpendicular to the direction of motion and to the magnetic field. Thus the two components of the waves are different manifestations of the same phenomenon and travel out into space together, the energy per unit volume attenuating in accordance with the inverse square law, as long as the medium in which it is travelling is homogeneous. Now in the upward direction, the first departure from this condition occurs when the Heavyside Layer is encountered. Let us turn our attention to the ionosphere for a few moments.

THE HEAVYSIDE AND APPLETON LAYERS.

The existence of two conducting layers—the E layer at a height of approx. 100 km. and the F at a height of approx. 250 km. above the surface of the earth has now been amply demonstrated. The apparent heights are variable and dependent upon several factors.

These layers must be formed by the presence of free ions and/or electrons at the respective heights. The co-relation of transmission phenomena with day and night indicate that the ionising agent is of solar origin and might be due to ultra violet light or to neutral particles shot out by the sun. Although there was general agreement in favour of the electrons in the upper layer, some doubt existed concerning the agent in the lower layer. Evidence derived from measurements during the total eclipse of the sun in August, 1932 (1)*, has decided in favour of the former; for whereas night-time conditions were approached during the optical eclipse, no change was observable during the particle eclipse. (Due to the slower velocity of particles as compared with light, the two eclipses should take place at different times and places and their effects could therefore be separated.)

The effect of the free ions is to reduce the dielectric constant of the medium. Outside the layers the only currents existing are the displacement currents caused by the changing electric strain, but within the layers the $e m f$ due to the wave causes movement of the ions and therefore the introduction of ionic currents. These lead the $e m f$ by 90° , whereas the displacement currents lag by the same amount. The two therefore oppose and effect a reduction of the total.

Now in the absence of the ions the current is directly proportional to the dielectric constant so that their presence is equivalent to a reduction of this constant. In other words, the same $e m f$

*A lecture delivered to the London Membership on December 28, 1934.

*The number in () brackets refers to Bibliography.

causes only a fraction of the former current. The presence of the ions has thus reduced the effective value of K and the reduction will be greater the higher the ionic density, N .

The velocity of propagation it is well known is given by $S = \frac{C}{\sqrt{Ku}}$ (2), K being the effective dielectric constant and C the velocity in vacuo where $K = 1$ and $u = 1$. (Starting from fundamentals - C in the equations from which the velocity of a wave is derived is the ratio between the electro-magnetic and electro-static units of quantity. As C agrees with the velocity of light, Maxwell was led to believe that light is an electro-magnetic wave).

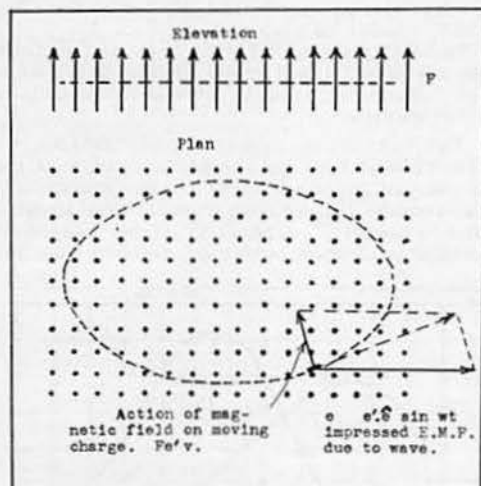


Fig. 1.—Motion of an electron under the action of an alternating E.M.F. applied perpendicularly to a steady magnetic field.

As the wave penetrates the ionisation density increases from zero so that the part of the wave front which first enters the layer will travel faster, the consequence being that the path of the ray is curved towards the horizontal, just as light is refracted on passing into a medium of different refractive index. The phenomena are precisely similar. The continuation of the bending as N further increases will eventually cause the wave to be returned to earth provided the maximum value of N is great enough. Thus the wave is refracted down from the conducting layers.

The higher the frequency employed, the less will be the opposing ionic current, because this depends upon the average velocity of the ions which obviously will be relatively smaller when they are more frequently reversed in direction. Hence the dielectric constant will not be reduced to the same extent at the higher frequencies and short waves will therefore be more penetrating than the longer ones.

EFFECT OF THE EARTH'S FIELD

If a charged ion is subjected to both an alternating E.M.F. (due to the wave) and to a magnetic field (the earth's) perpendicular to it, it will execute an ellipse in a plane perpendicular to the lines of magnetic force. The importance of the pheno-

menon will depend upon the ratio of charge to mass of the ion, and at the frequencies concerned it becomes important if the ions are of electronic mass (Fig. 1).

We have already seen how the motion of the ions due to the electric field associated with the wave propagation has modified the effective dielectric constant of the medium and the velocity of propagation. The additional ion motion due to the superposition of the earth's field will further modify K and S (the velocity). Also the extent of the modification will depend upon the angle that the direction of propagation makes with the direction of the earth's field. Obviously the effect of the earth's field will be nil when its direction is parallel to that of the alternating electric force, i.e., for radiation from a horizontal aerial in an E—W direction on the equator or from a vertical aerial in a N—S direction near the poles.

Now a plane polarised electric force can be considered as the resultant of two circularly polarised electric forces having the same angular frequency, opposite senses of rotation and constant amplitudes (Fig. 2), i.e., a plane polarised wave is equivalent to two circularly polarised waves having contrary directions of rotation.

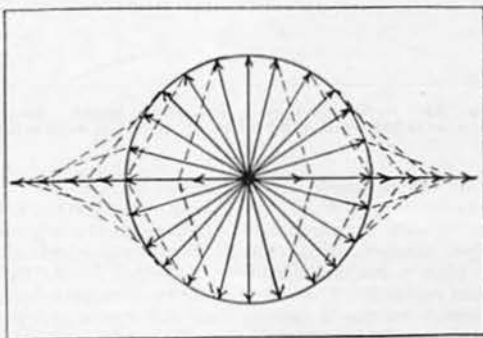


Fig. 2.—A plane polarised wave is equivalent to two circularly polarised waves having opposite senses of rotation.

Whilst the fundamental separation of the plane wave into two circularly polarised is mathematical, the actual separation can be performed physically. It is somewhat akin to the argument which occurred a few years ago on the subject of amplitude modulation versus sidebands: the amplitude modulated wave can be analysed into carrier and sidebands, whilst in practice a wave which has been amplitude modulated can be made to deliver up its sidebands separately. There was much misunderstanding before people realised that if you could look at a thing two ways mathematically then you could also do so physically: this, of course, is the essence of mathematics.

Referring again to the case of propagation along the lines of force, it will be seen that the +ve ions will describe ellipses in a L.H. sense looking from transmitter to receiver. The direction of rotation is given by Fleming's L.H. rule. Hence one would expect that the component of the electric force having a L.H. rotation, being more in sympathy with the natural motion of the ions, will have a smaller refractive index and a greater velocity than

the other circularly polarised component. Mathematical analysis confirms that such is the case.

Now, if the ions are of electronic mass, the natural frequency of the spiraling phenomena will be round about 1400 kc. (214 metres)—assuming $H = .5$ gauss. $\frac{e^1}{m} = 1.77 \times 10^7$. We should, therefore, expect that at this frequency signals transmitted in a S.N. direction in the Northern hemisphere will return to earth with a predominantly L.H. circular polarisation—particularly if the distance between transmitter and receiver is such that the reflected ray emerges from the ionised layer in a direction which is approximately parallel to the earth's field at that point.

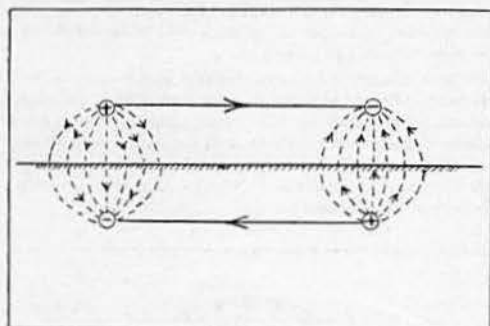


Fig. 3a.—Aerial images. Horizontal aerial. Image current is reversed in direction for perfectly conducting earth.

In the Southern hemisphere we should expect a predominantly R.H. rotation of the electric field for N—S transmissions. Experiments to test these theoretical conclusions have been conducted in both hemispheres and the expected results have been realised. These experiments, then, give strong support to the magneto ionic theory—which predicts the splitting of the incident wave into two components having unequal refractive indices. Also it is an indication that ions of electronic mass are present in the layer (3) and (4).

A full analysis of the case of propagation at right angles to the earth's field, the electric vector in the wave being perpendicular to the field, shows that

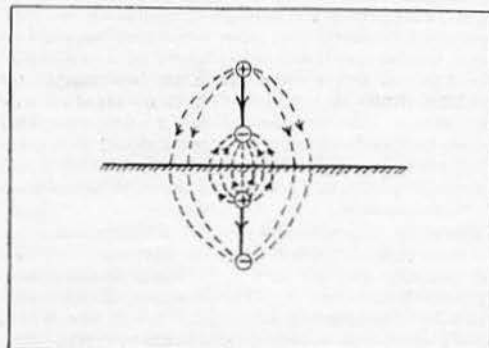


Fig. 3b.—Aerial images. Vertical aerial. Image current is not reversed in direction for perfectly conducting earth.

the incident wave will be split into two plane polarised waves, double refraction again taking place. Full mathematical treatment for propagation in a direction oblique to the earth's field leads to the conclusion that in general the incident wave is split into two component waves, each having a complex refractive index and suffering unequal absorptions.

Evidence derived from the splitting of echoes, i.e., the production of two or more primary echoes from one pulse in the case of reflection from the F layer, amply confirms the theory. For the E layer, although echo splitting has not been so definitely observed, the polarisation experiments mentioned lead to the conclusion that at least some of the ionisation is due to the presence of free electrons.

When the frictional term to take account of collisions is introduced into the equations, the refractive index becomes very complex (5).

The short wave now having been turned down from the layer, it will travel undisturbed until it again comes down to earth, when it will undergo a further disturbance.

THE ELECTRICAL PROPERTIES OF THE SOIL.

The conductivity and dielectric constant of the soil play an important part in radio propagation. If we consider the radiation from an aerial situated above a perfectly conducting plane, the effect produced is identical with that resulting from the

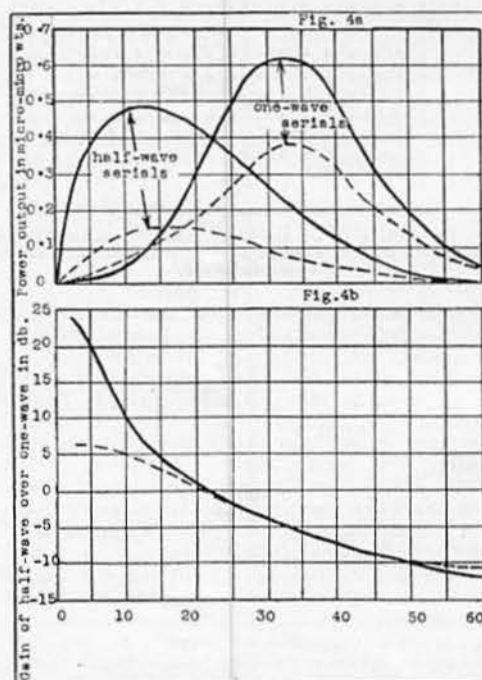


Fig. 4.—(a) Shows vertical directional patterns of half-wave and one-wave vertical aerials. The solid curves are for ocean water (dielectric constant = 80, conductivity 4×10^{-13} e.m.u.). The broken curves are for Homdel ground (dielectric constant = 25, conductivity 1.3×10^{-13} e.m.u.). The wavelength is assumed to be 25 metres and the incident field intensity one microvolt per metre. In (b) the ratio of power expressed as a gain is plotted for the two types of ground. The angle δ is measured from the horizontal. The lower ends of the aerials are assumed to be in close proximity to the ground.

removal of the plane and the substitution of an image of the aerial below the plane position. The sign of the image must be opposite to that of the real, i.e., a positive charge has a negative image and vice versa. Considering the aerial currents as being due to the motion and to the growth and decay of charges along the conductors, we see from Fig. 3 that in the case of a vertical aerial the image current will flow in the same direction as the aerial current, whereas the converse is true for a horizontal aerial. Putting it in another way—the phase change on reflection for a horizontally polarised wave is 180° and for a vertically polarised wave—zero.

The image effect can be made use of when computing the vertical plane directional properties of an aerial system—provided appropriate corrections are made. The corrections are dependent upon the finite conductivity and the dielectric constant of the soil at the place considered—the angle of incidence of the wave to be reflected and its state of polarisation.

The combination of the direct and the reflected waves at some distance from the aerial will produce a resultant field, the magnitude of which will depend upon the variables already cited. This means that if we are to retain our image, we must replace every elemental current length in the aerial by an image current length differing in both magnitude and phase from the original. These magnitude and phase changes for different earth constants, angles of incidence and states of polarisation are derivable from Fresnel's equations and have been worked out and published by the N.P.L. (6).

When the design of short-wave or ultra short-wave beam arrays is under consideration, the effect of imperfect ground has to be considered—particularly if vertical radiators are to be employed, because the shape of the vertical plane radiation polar diagram is dependent on the soil constants. Hence, it is of importance that these should be known. The extent of the variation may be gathered from Fig. 4, which has been taken from a paper by Friis, Feldman and Sharpless—Bibliography (8).

THE CALCULATION OF THE VERTICAL PLANE. RADIATION CHARACTERISTIC DIAGRAMS OF AN ARRAY.

Of the several types of short-wave arrays in general use, nearly all employ half-wave radiators so connected together by feeders that at any instant the current direction is the same for all radiators in any one curtain.

To illustrate the method employed to calculate the vertical plane polar diagram of the array, let us first consider the case of an array composed of horizontal radiators, so that apart from the effect of its image, each radiator, if isolated in space, would radiate equally in all directions in the vertical plane perpendicular to it. When any one angle of propagation is considered, the values of the magnitude and phase changes for the image of the doublet remain constant for all doublets similarly orientated and may therefore be applied to half-wave elements in one operation. Now when considering the resultant field from an array of radiators at a point some distance from the array, it must not be assumed that the components of the resultant field due to the radio frequency currents in each of the radiators in turn bear the same phase relationships to one another as do the currents from which they arise. This follows because the lengths of the paths

traversed by the components of the wave front at the distant point have travelled unequal distances from their points of origin. Taking as our reference an imaginary radiator at ground level in the place of the array and referring all phase displacements to this—"the space phase angle" of any radiator in the curtain will depend upon its height above ground and the angle to the vertical made by the line joining our distant point to the array. It will be given by $+h \frac{2\pi}{\lambda} \cos \theta$, h being the

height of the radiator above ground and θ the angle to the vertical considered. Each of the radiator images, in addition to possessing a "space phase angle" due to its position of $-h \frac{2\pi}{\lambda} \cos \theta$, has

associated with it a further phase change as well as an amplitude reduction due to the ground imperfection. The last two are given by the curves already mentioned. The radiation in a given direction from each radiator and from each image thus has associated with it a magnitude and a phase angle and may therefore be represented by a vector. The vector sum for all such radiators and images in the array yields the relative magnitude of the total electric field in that direction. Repeating this process for several directions, we can obtain the vertical plane directive diagram.

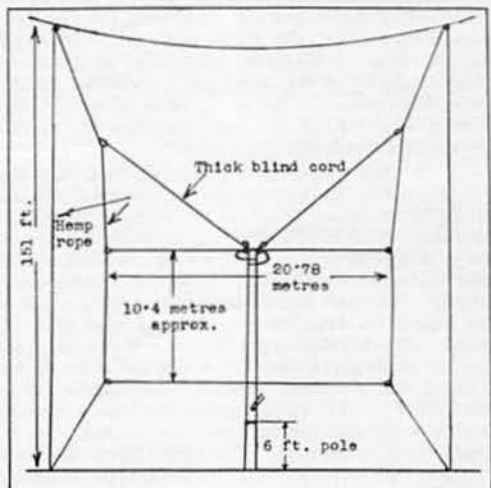


Fig. 5.

Turning to those cases where in free space the radiation from a conductor is not equal in all directions in the considered plane—for example, that from a vertical aerial in a vertical plane or from a horizontal aerial in a horizontal plane—we have to deal with summation of vectors varying both in phase and magnitude—the magnitude variation being due to the inability of a straight wire to radiate in an "end on" direction.

Now for point-to-point communication, the direction of the beam in the horizontal plane should obviously be along the great circle path joining the two stations. No such simple solution is available when the vertical plane directivity has to be decided. If the wave is projected horizontally the attenuation for long distances is altogether too

severe, and if the angle of projection approaches the vertical the number of hops between the ionised layers and the earth is large and the attenuation rises due to the great length of the path traversed and the repeated reflections involved. The optimum angle will be dependent upon the geographical direction, the wavelength and even the time of day and year. The only satisfactory method of determining it is to carry out special tests for the purpose.

THE ANGLE OF ELEVATION OF THE BEAM.

Such tests have been conducted between this country and the United States of America and other countries. They naturally fall into two main divisions.

(a) the determination of the angle of projection of the axis of the beam to give maximum signals at the other side and—

(b) the measurement of the angle at which the signals come down at the receiving site.

Method (a) has been employed over here by the P.O., method (b) in America by the Bell Telephone Laboratories and in this country by the Radio Research Board.

* (a) The angle of projection of this beam to produce maximum field strength at the receiving station (7).

An evident method of determining this angle would be to design arrays having their vertical plane maximum lobes at various inclinations and to measure the distant field strength when each of the transmitting arrays in turn is fed with h.f. energy—corrections being made for power input and radiation resistance. Expense precludes such experiments, but, by using a relatively simple raisable array, it is possible to achieve a fairly wide variation of field strength in any one direction by merely raising and lowering the system.

Fig. 5 shows the type of aerial used for this purpose. This particular one is designed for use on 20.78 meters. It consists of four half-wave horizontal elements, connected as in the Keomans array, whose height is continuously variable from ground level to about 140 ft.—a little over two wavelengths. Suitable adjustments have to be made to the length of transmission line as the aerial is raised. The middle figure of Fig. 6 shows how the vertical plane polar diagram of this aerial is affected as the aerial is raised. The full curve shows it for the height = $1\frac{1}{2}$ wavelengths, the chain line for height = 1 wavelength and the dotted line for height = $\frac{1}{2}$ wavelength. The upper figure gives the diagram for the two-half wavelength elements shown on the left at a height of one half wavelength. The lower curve on the lowest figure shows the ratio of the variable height four-element aerial field strength to that of the two element fixed height aerial assuming an angle of propagation of 70° to the vertical, i.e., the intercepts of the $1\frac{1}{2}$, 1 and $\frac{1}{2}$ curves expressed as ratios of the intercept on the upper curve are plotted as ordinate against the height of the four-element aerial as abscissa.

As this method becomes invalid if two or more rays of comparable strength are incident at the receiving array, evidence that this is not generally the case should be forthcoming if reliance is to be placed in the results thus obtained. Such evidence is derived from the downcoming angle measurements already referred to—which will now be

described. They show that in general one downcoming ray is predominant but that others of smaller amplitude are present. Frequently, however, the amplitude of the main ray is sufficiently great relatively to the others to render the error negligible.

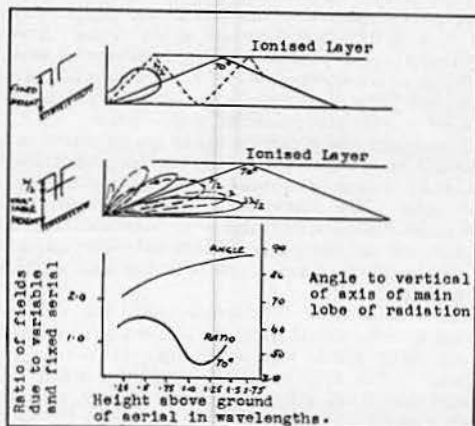


Fig. 6.

MEASUREMENT OF ANGLE OF ARRIVAL OF DOWNCOMING WAVES.

These measurements may be sub-divided into two classes—namely—differential output measurements and phase difference measurements (8).

Differential Output Measurements.

The principle employed is similar to that dealt with when considering the best angle of projection of the beam, i.e., the gain or loss of one array over a different type of array is measured and the required angle deduced from their respective polar diagrams, corrections being made, as in the former case for the different radiation resistances involved. The types of aerial which have been most extensively employed are:—

1. A full-wave and $\frac{1}{2}$ -wave vertical aerial and
2. Two separated full-wave horizontal aeriels at different heights above ground level.

Phase Difference Measurements.

In this method two similar aeriels are employed and are spaced some distance apart on the great circle passing through the transmitting station. It possesses two advantages over the differential method in that the results are independent of the ground constants and it is possible to obtain an approximate idea of the angle of spread of the arriving waves if more than one wave is incident at the aeriels. The principle employed will be clear from Fig. 7, which has been taken from the paper by Friis, Feldman and Sharpless (8).

The wave front reaches the aerial 1 before 2 and the outputs will therefore differ in phase by that same fraction of a cycle that the length $d \cos \delta$ is of a wavelength. If therefore the phase difference can be measured, the angle δ can be derived.

The piece of apparatus marked ϕ is a variable phase changer. It is made up of two coils perpendicular to one another, the currents in which differ in phase by 90° . Thus a rotating magnetic field is produced. The phase of the currents in that part of the line between ϕ and the receiver depend upon

*This section is mainly a condensation of part of the paper by T. Walmsley. See Bibliography (7).

the orientation of a search coil placed in the rotating field. φ is adjusted until the inputs from the two aeriols cancel one another, when of course the phase difference is 180° . The phase retardations due to the lengths of transmission line induced are determined from separate tests and so, as φ is known, the initial phase difference is derivable.

In another phase method, employed by the Radio Research Board, (9), the outputs from two similar aeriols are suitably "stepped down" in frequency and applied to the two pairs of deflecting plates of a Cathode Ray Oscillograph. Now if the two signals are in phase and of equal amplitude, a line inclined at 45° will result on the screen. If a phase difference is present an ellipse will be displayed, and the magnitude of the angle is deducible from the ratio of the major to the minor axis.

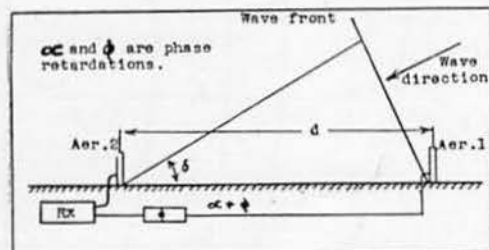


Fig. 7.—Similarly spaced aeriols used in the phase method, the phase shift is obtained with a variable phase changer.

The Use of Pulses.

More definite information concerning the number and relative magnitude of the downcoming waves can be learned by the study of the reception of pulse transmission. Pulses of about 0.1 to 0.2 millisecon. duration are sent out 50 times a sec. or so from the transmitting station and received on a wide band receiver across the output of which is joined a cathode ray oscillograph provided with a synchronised linear time base. The number and relative magnitude of the incoming waves can be derived from the display resulting.

Used in conjunction with either the differential output or phase methods the angles of incidence of the different pulses can also be determined; in the first method by filming the trace and measuring the magnitude of each of the pulses received on each of two aeriols forming the system and, in the second, the phase method, by steering a null at each of the pulses in turn and so deducing the downcoming angles corresponding to each pulse.

As a result of these experiments it has been found that, as a rule, several waves of different angles of arrival are incident at the receiving aerial, but that frequently one is much stronger than the others, this being the second or third pulse. Also usually the angles do not vary erratically but remain steady or vary slowly. During the winter months the angle of the main pulse, as measured in this country, remains steady throughout the day, but later in the year it would appear that the angle of incidence rises from about 72° at noon to $80-85^\circ$ at sunset. This may possibly be attributed to the "tilt" of the F layer, ionisation becoming stronger and the effective height of the layer greater in the West and less in the East as the day advances due to the

Westward journey of the sun. The fact that the converse has been experienced in the U.S.A. adds weight to this deduction.

In conclusion the thanks of the author are due to the Engineer-in-Chief of the Post Office for permission to publish this paper, to Mr. T. Walmsley for the loan of slides, to Mr. A. H. Mumford for permission to use a 20 cm. array system for the purpose of demonstrating interference effects during the reading of the paper, and particularly to Mr. N. Bordeaux, to whom the merit of the demonstration is mainly due.

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- (8) This method is treated at length by H. T. Friis, C. B. Feldman and W. M. Sharpless: "The Determination of the Direction of Arrival of Short Radio Waves." *Proc. I.R.E.* Vol. 22, p. 47.
- (9) A. F. Wilkins: "Measurement of the Angle of Incidence, at the Ground of Downcoming Short Waves from the Ionosphere." *J.I.E.E.* Vol. 74, p. 582.

TRADE NOTICES.

Microfuses, Ltd., have sent us details of their latest flat type microfuses. The fusible element is a thin gold film, and cannot therefore depreciate with time. *Microfuses* are of robust design, and are made in 88 stock ratings. Their speed of operation varies from 1-10th second at three times overload to 1-1,000th second at eight times overload. This permits the use of a fuse of sufficiently high carrying capacity to be immune from slight harmless overloads of short duration without lessening the degree of protection. The fuse will carry its rated current indefinitely, and will operate at twice that current.

Ferranti, Ltd., have sent us a copy of their new amplifier booklet R105, which deals with the construction of four amplifiers giving outputs of 1,000 milliwatts, $2\frac{1}{2}$, $6\frac{1}{2}$ and $12\frac{1}{2}$ watts respectively.

The price of this publication is 6d., post free, and copies will be sent to those interested on request.

The information contained in this book should prove invaluable to those desirous of constructing high quality amplifiers.

REGULATION OF POWER SUPPLIES.

By R. H. N. JOHNSTON, G2ZP.

WITH the arrival of the grid in Yeovil and with the prospect of a change over to A.C. mains at the writer's station, considerable attention was given to the requirements of the new power supplies. Enquiries made at several stations in the London area revealed that G.U.I.'s were the most popular rectifiers in use for 1,000 volt supplies, but the way in which the average amateur abuses them is appalling! Incidentally, the way in which they stand up to these conditions reflects considerable credit on their design.

In no case was such an important piece of apparatus as a choke input filter seen. Replies to questions as to why this was not used were to the effect that:

"Without a condenser input filter the voltage output is very low and insufficient."

With the possibility of a trial of class B modulation in mind it was at once realised that a condenser input filter would be useless. What was required was a constant voltage power supply capable of delivering 1,000-1,100 volts whilst a maximum drain of 250 ma. would cover the most exacting demands for power amplifiers and modulators that would ever be likely to be installed at G2ZP. A perusal of some back numbers of *Q.S.T.* and the *A.R.R.L. Handbook* revealed the importance of the first choke, and although some rough data was available it did not show how the requirements could be calculated for any supply frequency.

Messrs. Ediswan kindly pointed out that an interesting paper on the design of smoothing circuits had been published in the *J.I.E.E.* by Mr. C. R. Dunham, of the G.E.C. Research Department of Wembley.

This paper was obtained and digested, and by kind permission of Mr. C. R. Dunham and the I.E.E. a portion is being reprinted. As there is a certain amount of mathematics in the article this has been condensed considerably and the mathematical work omitted, because it was felt that anyone who was sufficiently interested could obtain the paper for themselves.

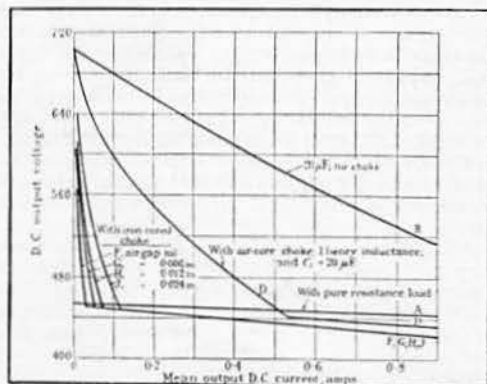


Fig. 1.

Regulation curves of biphas half-wave rectifier (transformer voltage 500+500).

Suffice it to say that a condenser input filter gives very poor regulation, and increases the ratio of peak to mean current flowing through the valves. From this it is obvious that as the rating of these rectifiers is based on the maximum safe peak current, a condenser input filter reduces the mean D.C. output current available from a given rectifier.

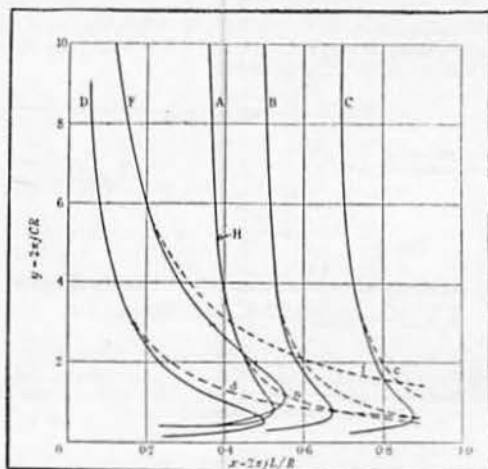


Fig. 2.

Fundamental curves for design of biphas half-wave rectifier.

- (a) Curve for good regulation. Peak-current/mean = 2.
 - (b) Peak-current/mean = 1.71.
 - (c) Peak-current/mean = 1.5.
 - (d) Curve for ripple reduction.
 - (e) Load resonance at $0.9 \times$ supply frequency.
- Full curves are for single-section filter, dotted curves are for double-section filter with $L_2 = \infty$.

Regulation curves are appended showing the output of 2 G.U.I.'s supplied with 500-0-500 volts R.M.S. in a full wave circuit:—

(a) With no choke or condenser. Here the output falls very gradually, due to a constant voltage drop in the valves of approximately 15 volts, and to the regulation of the transformer. (b) With a 20 mfd. condenser input. The rise in voltage on light loads is most marked.

(c) With the inclusion of a 1 henry air cored choke preceding the filter condenser. The voltage remains practically constant from 50-100 per cent. full load.

(d) With an iron cored choke consisting of 1,780 turns of No. 20 D.S.C. wire on 100 pairs of No. 28 Sankey's Stalloy stampings, with various air gaps, and a 20 mfd. condenser.

After examining the regulation curve of "d" it is necessary to see how this can be obtained in practice for any particular supply. If R is the load resistance in ohms it is shown that for flat regulation

$$\frac{2 \pi f L}{R} \text{ should not be less than } 4.25$$

and $2 \pi f C R$ " " " 3.0
where f is the supply frequency in cycles per

second and L and C are the inductance and capacity in henrys and farads respectively.

If the values of inductance and capacity for the first choke and condenser are so chosen that the point (x, y) lies on the curve A in Fig. 2 the maximum current flowing through either rectifier anode is equal to twice the mean D.C. output current. In certain cases where it is required to load the valves up as much as the cathode emission will allow it is advisable to increase the inductance of the first choke above that in A. Curves B and C are drawn for peak to mean currents of 1.71 and 1.5 to 1 respectively. Another condition is that X and Y must always be to the right of curve D, if they are to have any appreciable smoothing effect on the ripple. A further condition is that the load circuit must not resonate at the supply frequency.

This is obtained by choosing X and Y so that they lie to the right of curve F which represents resonance at $0.9 \times$ the supply frequency.

If $V =$ is the output voltage of the rectifier, $V = \frac{2E}{\pi} - e$ where e is the voltage drop in the conducting valve between anode and cathode and E is the peak voltage supplied by the transformer.

Example: For the design of a supply to deliver 1,000 volts 250 ma. with a 50 cycle supply using valves of peak rating of 1.5 amps. (G.U.1 type). Peak voltage necessary for transformer secondary.

$$E = \frac{(1,000 + 15) \times \pi}{2} = 1,595 \text{ volts}$$

$$\text{R.M.S. input required} = \frac{1,595}{\sqrt{2}} = 1,125 \text{ volts.}$$

At 250 ma. load resistance = 4,000 Ω

250 ma. is well within the limit of peak of 2:1
 \therefore use curve A in Fig. (2).

$$L = \frac{4,000 \times .42}{2 \times \pi \times 50} = 5.34 \text{ henrys.}$$

and

$$C = \frac{3}{2\pi \times 50 \times 4,000} = 2.38 \mu\text{F.}$$

\therefore use a 3 μF condenser.

At 100 ma. $R = 10,000\Omega$. With a condenser of 3 μF
 $Y = 2\pi f.C.R. = 2\pi \times 50 \times 3 \times 10^{-6} \times 10,000 = 9.4$.
 From graph (A) \times corresponding to a Y of 9.4 = .38.

$$\therefore L = \frac{10,000 \times .38}{2\pi \times 50} = 12.1 \text{ henrys.}$$

At 25 ma.

load = 40,000 Ω .

From the graph it is seen that although Y has now increased considerably, X has become nearly constant, so we may take X as $\approx .37$.

$$\therefore \text{Inductance required} = \frac{40,000 \times .38}{2\pi \times 50} = 48.5 \text{ henrys.}$$

As 25 ma. is 10 per cent. of the maximum load current this is considered to be the minimum current down to which the regulation should remain flat, and so a resistance of 40,000 Ω should be connected across the output of the last smoothing condenser. What is required, then, is a swinging choke of approximately 5-50 henrys at 25-250 ma. Of course, if a larger bleeder current can be tolerated, then the inductance need not be so large at the upper limit.

These values represent minimum ones, and, of course, better results may be obtained by increasing L and C as required. Double section filters do not affect the calculations much; the dotted portions of curve A, B, C must then be used, but there is not room to consider this here and anyone interested is advised to look up the journal of the I.E.E. for September, 1934.

In conclusion, the author would like to thank Mr. C. R. Dunham for his help and the I.E.E. for their permission to reprint the two figures.

Ten-Metre News

Conditions for local European and North African working during September were very poor. G2MV worked D4MDN and heard D4KLR, Y4DSH and F8CT on September 4. Harmonics from Germany and Danzig were audible on the 8th and 15th, and a strong harmonic from EA8AF was heard on several days.

This falling off of the good local conditions was not due to the band "going dead," but to a lengthening of the skip which has enabled the DX stations to come over fairly consistently.

The period of good DX conditions commenced on the 5th, when BRS1847 heard WICZ at 22.40 B.S.T.

On September 7 ZS1H and G2HG made contact at 16.20 B.S.T. G5WP worked the South African at 17.40, and was also QSO LU1EP.

On the 8th G5WP again heard ZS1H, and G2YL and ZS1H made contact on both the 9th and 10th.

On September 15 a weak LUS was heard by G2HG at 19.10 B.S.T.

September 22 was another good day, with a further QSO between G2YL and ZS1H. Miss Corry also heard LU1EP and LU9BV during the evening.

September 23 brought in ZS1H again, who also worked G5FV. ZU1C was heard calling G5FV, but without success.

G2YL gave ZU1C his first DX contact on ten on the 24th, and made another QSO with ZS1H.

At the time of writing there is no news as to conditions on the 25th, 26th and 27th, but on the 28th ZS1H was audible for some hours (mostly at R8), and worked G5FV at 17.20 B.S.T. ZU1C and G2HG were QSO at 17.30.

The 29th opened with an SU harmonic at 11.45, and at 13.30 B.S.T. ZS1H came through and remained audible until 18.30. LU3DD was heard calling CQ at 17.00, and LU1EP at 17.15, but soon faded out. G2HG.

STOP PRESS

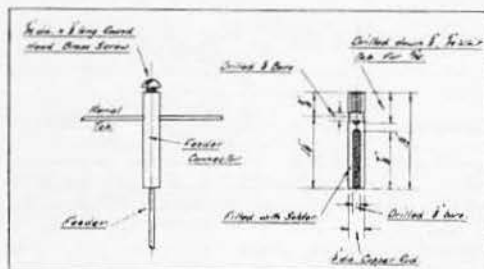
ON4AU and F8GS
 Worked
 VK2HZ and VK2LZ on
 28 Mc/s.

OCTOBER 6, 1935

BRIGHT IDEAS.—No. 3.

The sketches show a very simple feeder connector developed to allow easy adjustment of single-wire feeders.

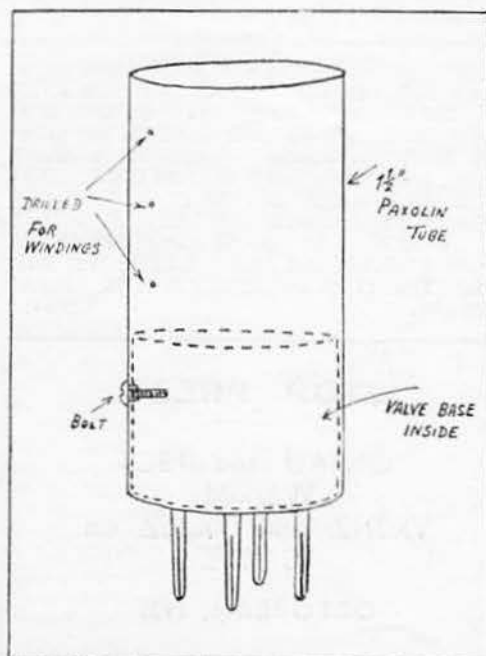
The usual method of turns round the aerial and sweating do not allow easy adjustment when the feeder position is being experimented with or the tap changed.



Application is simplicity itself. Merely tin the end of the feeder wire for 1 in., hold the connector over a gas ring until the solder melts, and slowly insert the tinned end of the feeder into the hole, so that the surplus solder does not splash.

Slip the connector on the aerial wire before fastening to the insulators, and when the feeder has been adjusted to position, drive the screw down tightly; the countersink made in the connector by the drill point before tapping gives ample "bite" to prevent the feeder moving.

G6QX.

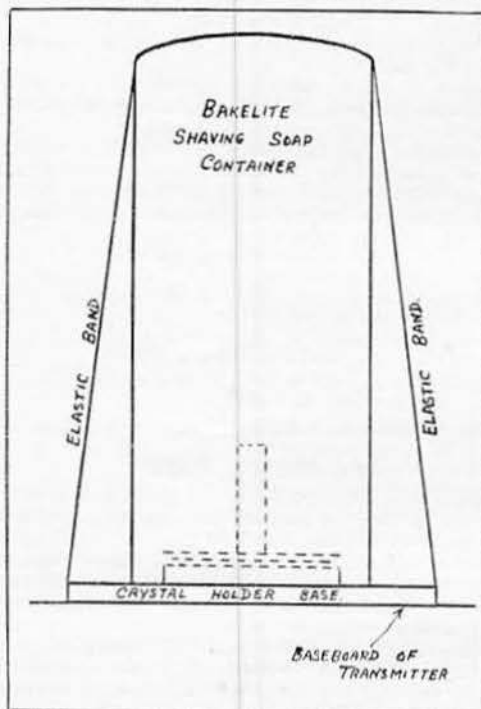


While on the look-out for a cheap type of coil former for experimental purposes, it was found that a 1½-in. diameter paxolin tube fits nicely over an old Mullard valve base. The tube can be cut off in convenient lengths of about 2 ins., when it is only necessary to bolt same to the valve base.

These coil formers have been used both in receivers and the low-power stages of transmitters; they are especially useful for grid coils in transmitters using link coupling.

G6US.

An open-type crystal holder needs continual cleaning and often one finds the top half on the floor if the set is near a window and there is a breeze blowing. The accompanying diagram is practically self-explanatory, but here are the details. Obtain a



bakelite shaving soap container; these are usually about 4 ins. high and about an inch and a half diameter and will slip easily over the bottom plate of the holder. Unscrew the holder base from the transmitter baseboard and pass an elastic band underneath, then screw down again. When the bakelite container is placed over the holder, pull the elastic band up over the top and this will make a rigid support to the cover, which can be quickly removed for any adjustments.

G2VV.

STRAY.

VQ4CRR wishes reports on his 14 mc. transmissions, and all such reports will be acknowledged.

Let us have your Bright Idea

ELECTRICAL ABBREVIATIONS AND SYMBOLS.

ACCURATE and consistent symbolism is essential in all physical and mathematical work. Radio engineering with its numerous quantities and constants is no exception. Even the most straightforward articles are laborious to follow if it is necessary to refer continually to the list of symbols used therein.

While it is always advisable to preface an article with a list of symbols employed, where common quantities or units are involved the recognised and accepted ones should be used. So many contributions reach the Editor's hands with such diverse and often antiquated mathematical characters and abbreviated units that considerable work is entailed in bringing them into line with current general practice.

The following few notes are therefore addressed to would-be authors with a hope that they will endeavour to use the symbols which follow wherever applicable. These have been recommended by the British Engineering Standards Association since 1931, being based on the work of the Electro-technical Commission and are recognised and used throughout the electrical engineering world.

There are two varieties of symbols necessary. One class consists of abbreviations for various quantities such as volts, amperes, etc., and generally follow a numerical value. The other class contains the so-called "constants" of a circuit or device such as resistance, inductance, or capacitance where the units are not specifically stated. In the first class the basic unit is generally represented by a single letter, usually of the upper case (i.e., a capital letter) and the larger or smaller units are formed from the basic unit by multiplying or dividing by some power of ten, i.e., ten, one hundred, one thousand, etc. This process is indicated by certain symbols of which the more common are given below:—

One-tenth	deci-	d	(10 ⁻¹)
One-hundredth	centi-	c	(10 ⁻²)
One-thousandth	milli-	m	(10 ⁻³)
One-millionth	micro-	μ	(10 ⁻⁶)
One-billionth	micro-micro-	μμ	(10 ⁻¹²)
One-thousand	Kilo-	K	(10 ³)
One million	Mega-	M	(10 ⁶)

For example, the symbol for a farad, the unit of capacitance, is F. Thus a microfarad becomes μF and a micro-microfarad is μμF. Note that mF is a millifarad or one-thousandth of a farad. The old symbol of mfd. has no such logical derivation and has no merit beyond saving the printer from having to rummage in the junk box for a μ. It is rapidly vanishing from modern technical publications. Similarly the symbol for the ohm is the Greek capital omega, Ω. The milli-ohm (one-thousandth part of an ohm) is mΩ while our old friend the megohm becomes MΩ. The small omega, ω, which was fashionable at the same time as mfd., is now reserved strictly for the representation of the quantity 2πf, where f is the frequency of an alternating current or voltage.

SYMBOLS REPRESENTING UNITS OF MEASUREMENT.

To be followed by a numerical value.

Ampere	A	*Decibel	db
Volt	V	*Metre	m

Ohm	Ω
Coulomb	C
Joule	J
Watt	W
Farad	F
Henry	H
Watt-hour	Wh
Volt-ampere	VA
Ampere-hour	Ah
Milliampere	mA
Kilowatt-hour	KWh
Megohm	M

SYMBOLS REPRESENTING QUANTITIES AND CONSTANTS.

Length	l
Mass	m
Time	t
Energy	W
Power	P
Efficiency	η
Frequency	f
Wavelength	λ
Period	T
Angular Velocity	2π × f = ω
Phase displacement	φ
Quantity of electricity	Q
Electric Force	e
Electro-static Flux	Ψ
Electro-static Flux Density	D
Potential difference	V
Electromotive Force	E
Current	I
Magnetic Fieldstrength	H
Magnetic Flux	Φ
Magnetic Flux Density	B
Magnetic Force	F
Reluctance	S
Permeability	μ
Intensity of Magnetisation	J
Resistance	R
Capacitance	C
Self-Inductance	L
Mutual Inductance	M
Reactance	X
Susceptance	B
Conductance	G
Impedance	R + jX = Z
Admittance	G + jB = Y
Specific Inductive Capacity	k
*Anode Impedance	Ra
*Amplification Factor	μ
*Mutual Conductance	g
*Conversion Conductance	g'
*Characteristic Impedance	Z ₀
*Transformer Turns-ratio	p
Imaginary Quantity	-j = j

All the above have been taken from British Engineering Standards Specification No. 423 except those marked with an asterisk. These are additional quantities which are in common use in radio engineering and the symbols most frequently met in published work have been inserted. It is suggested by the writer that these should be adhered to in future articles appearing in the BULLETIN.

Having Read—Mark and Learn!

CORRESPONDENCE

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

THE 28 MC. BAND IN AUSTRALIA.

The Editor, T. & R. BULLETIN.

DEAR SIR,—During the past twelve months I have been representing the Ultra High-frequency Group of the W.I.A. (Vic. Division). Working in conjunction with similar groups in other States, considerable success has been achieved in creating interest in the 28 mc. band, with the result that there are now close on 50 VK stations working on this frequency. The 28 mc. contest promoted by the R.S.G.B. has been very helpful, and is now being followed closely by many of our stations.

Every summer since 1928 there have been a few VK's on 28 mc., but last summer was the first time since 1930 that ZL stations started to come through, and many contacts were made with them. March 17 last produced the first real DX contact between VK3BW and J2HJ. The following week-end the W's started to come through, W6VQ often reaching R7/8 in Vic., but in N.S.W. and Queensland his signals were apparently much stronger. During April and May many weak W's were heard in Vic., but apart from VK3YP, who worked three of them, they could not be raised. W6VQ has worked nearly every VK3 on the band, but he must be in an exceptional location. J2IS has been worked by VK3NM, and several have worked J2HJ. During June and July (mid-winter) no DX signals were heard, but I understand that VK2EP has continued working W's off and on right up till the end of July.

My object in writing is to say that we think the most likely time to work Europe will be during the coming months, September, October and November. Please inform G stations and continental Europeans interested that VK's will be keeping a special watch for them during our afternoons and evenings, particularly on Sundays. From our experience with U.S.A. during the past period the most likely times will be between 07.00 and 14.00 G.M.T., and we will be active regularly between those times from September.

Should the 28 mc. Section of R.S.G.B. have any different ideas re likely times, etc., I would be pleased to hear of them as soon as possible.

It may interest you to know that VK3EG recently heard ON4AU on 28 mc. R7 at 1 a.m., but this was thought to be a harmonic from 14 mc., and we are hoping that it was freakish, and no indication of the best time for Europe!—Yours faithfully,

J. J. McMATH (VK3JJ).

Rep. UHF Section, W.I.A.

136, Kerford Road,
Albert Park,
Victoria, Australia.
August 5, 1935.

MEASUREMENTS OF ULTRA-SHORT WAVELENGTHS.

The Editor, T. & R. BULLETIN.

DEAR SIR,—I am interested in Mr. Mowatt's letter published in the December BULLETIN, and

particularly in his method of eliminating the bug-bear of arithmetic. I fear, however, that the application of the method of measuring ultra-short waves which I described in an earlier issue is not fully appreciated, and it seems to me desirable that the matter should be cleared up.

My idea in evolving the method was to provide a check for "special occasions" as I do not imagine that any individual would go to the lengths described every time he wished to ascertain whether or not he was in the amateur band. The whole process, including the calculation of results, is too lengthy and involved to be employed for this purpose and, personally, I normally use an absorption wavemeter (calibrated from a Lecher wire system) for ordinary measurements.

For the purpose of "special measurements" it seems to me that the method has advantages over a Lecher wire system, chiefly:—

- (a) That most amateurs have not the space indoors in which to leave a Lecher wire system erected for immediate use at any time.
- (b) That it is not always convenient to couple the apparatus under test to Lecher wires.

As to the question of accuracy of results, I am afraid that apparently I did not make it sufficiently clear in my original article that my own frequency meter is not accurately calibrated throughout its range and that the actual figures given were, therefore, not "up to standard."

I see no reason why the percentage accuracy of a measurement by my method should not be almost exactly the same as the percentage accuracy on the fundamental range of the frequency meter, and surely it will be admitted that a well-constructed valve oscillator is more accurate than an absorption meter—especially on these very high frequencies when the mere act of bringing the absorption meter within, say, 3 ins. or 4 ins. of the apparatus will materially affect the frequency.

My own objection to "harmonic" methods of measuring high frequencies is that the percentage accuracy is the same as on the fundamental of the oscillator, i.e., the absolute accuracy in kc. is less and less as the frequency increases. Thus, assuming an accuracy of 0.1 per cent. on 1,500 kc. (absolute accuracy—1.5 kc.), the accuracy with which 60,000 kc. can be measured is still 0.1 per cent., but this means an absolute accuracy of 60 kc., and this is clearly useless if we are to make the most of the band allotted to us.

I should be very pleased to hear other members' views on the question of accurate measurement of frequencies of this order.

Yours faithfully,
A. STEWART CLACY (G6CY).

A Good Performance

G5BD reports working all nine U.S.A. Districts in 2 hours 55 minutes between 2205 G.M.T., August 15, and 0100 G.M.T., August 16. The times are unusual for such a performance.

VK Worked from Europe on 28 Mc/s

BOOK REVIEWS.

LES FILTRES ÉLECTRIQUES (2nd edition). By Pierre David. Preface by Général Ferrière. 211 pages, 113 diagrams, and tables. Published by Gauthier-Villars, 55, Quai des Grand-Augustins, Paris (6e). Price 50 fr.

There is no need to emphasise the great and growing importance of electrical filter work in nearly all branches of electrical engineering, but particularly in the communications branch.

The average student and engineer, though he may realise this importance, often has great difficulty with the subject, because of a comparatively limited mathematical knowledge. Much of the theory is based on rather abstract mathematics, which is discouraging to such technical men with limited time.

The object of this work is to make the theory and its application more easily understood by sacrificing generality to clearness, and by somewhat limiting the horizon.

The author divides the book into two parts. Part I deals with the general theory and establishes formulae. Approximate solutions are used at times for simplicity, and proofs are made as brief as possible. Calculations are also reduced to a minimum.

The second part is so arranged that anyone interested only in the choice and design of a filter may, by accepting the formulae established in Part I, proceed to the required calculations. The author provides many helpful tables, graphs and examples which much facilitate the work.

An appendix of 12 pages deals with the benefits obtained by the introduction of mutual inductance between the individual elements of a filter and the practical difficulties which thereby arise.

A comprehensive supplement of 78 pages is added at the end of this edition to bring the work up to date. The treatment here presents filters as a generalisation of coupled circuits. Two-terminal impedances and various groupings are first considered; then four-terminal networks and complex arrangements. Finally, the resistance of filters and transients each receive a chapter.

Each section of the book is provided with a very extensive bibliography.

The treatment throughout aims at enabling the reader to choose and design the correct filter for a particular requirement, and the author adds many hints based on his own personal experience.

The book is in French.

T. P. A.

POPULAR TELEVISION. By H. J. Barton Chapple, Wh.Sch., B.Sc. (First Hons. Lond.), A.C.G.I., D.I.C., A.M.I.E.E., Hon.M.I.W.T. 112 pages and 46 illustrations. Published by Sir Isaac Pitman & Sons, Ltd., London. Price 2s. 6d. net.

In future years perhaps a list of early television heroes will be compiled, and the names of those authors who wrote small explanatory books for the general public should be somewhere near the top, though at the present time one might be excused for thinking it will not be a *thin* red line.

It is an extremely difficult task. Technical and semi-technical men are so accustomed to the

multifarious words and phrases connected with scientific work that they often fail to realise the layman's difficulty. So many branches of science are represented in television work that the layman, no matter how intelligent, often has scientific indigestion from the surfeit of new ideas.

This is the difficulty the author faces, and he needs considerable space if he would carry the non-scientific reader to an understanding of the fundamentals.

If the reader has a technical interest of even a very ordinary sort, and has become accustomed to technical terminology of the simpler variety, he will be well served by this book and will have no difficulty in learning by clearly explained steps the many processes in television.

The author's treatment of the subject is along the rather well-beaten path: scanning, high and low definition, ultra-short waves, intermediate film, cathode ray work, etc.

There are many very clear and interesting photographs of apparatus and studios, and the author has, rightly, steered clear of circuit diagrams, but given many helpful diagrammatic representations of processes which, being more or less mechanical, are very easily assimilated by the lay mind.

The style is fluent and attractive, though sometimes just a little "scientifically exact." On page 32 the author unconsciously invents a new tongue exercise in: "Aperture after aperture this spot light trace takes place..."

The book is attractively produced and good value.

T. P. A.

Reports Wanted

G6YR (Southport), on his 7,164 and 14,328 kc.'s transmissions. All reports will be acknowledged.

G6KS (Liverpool) on his 7,160 and 14,320 kc.'s transmissions. He will be pleased to arrange schedules during week-ends.

Empire QSO Party

Mr. R. Barr (G15UR) was the only home member, so far as we know, who took part in the Empire QSO party arranged for the week-end August 10 and 11. He had four QSO's: three with VE1 and one with VQ4CRR.

N.F.D. 1935

Those who took part in the above event will be interested to learn that VO4Y at Corner Brook, Newfoundland, heard the following "B" stations: G6GZ (R6), 5QY(R4), 6UT(R3), 6IN(R4), 2KS(R4). The first three stations were called and all reception was between 00.01 G.M.T. and 00.05 G.M.T., June 2.

Author Wanted.

Will the member who contributed anonymously a humorous article entitled "Ultra High-frequency Reflections," please get in touch with Headquarters?

MODULATION MEASUREMENT BY CATHODE-RAY TUBE

W. A. ROBERTS (G2RO).

This is a description of a method used commercially in the testing of telephony transmitters. It is equally applicable to amateur transmitters.

The layout of apparatus is shown in Fig. 1.

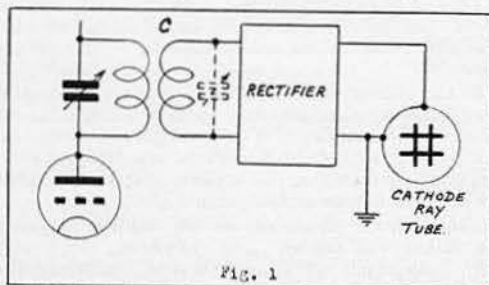


Fig. 1

To the output of the transmitter is coupled a pick-up coil C. This may be tuned, if necessary, by a parallel condenser to obtain greater pick-up. This circuit, however, should be either right in tune or right out of tune to avoid distorted side-band pick-up.

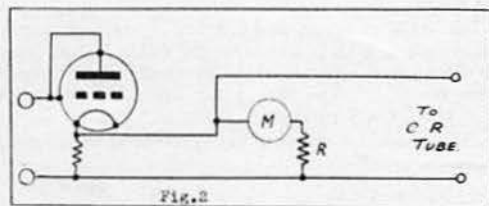


Fig. 2

The rectifier can be of any straightforward circuit. A suitable form is shown in Fig. 2. A load resistance R of 20,000-50,000 ohms. is used. An 0.5 millimeter in series with this will indicate resonance and the amount of pick-up being obtained. Also, the product, current times R, will give the output voltage.

The output of the rectifier is applied across one pair of plates of the Cathode-Ray tube. These are suitably biased so that the spot takes up a position a little way from the edge of the screen (A in Fig. 3).

When the unmodulated transmitter is switched on, the steady rectified voltage applied to the C.R. tube plates will move the spot over to a second position B (which for convenience should be at the centre of the screen).

For the purpose of taking readings a strip of graph-paper should now be stuck along the line AB, so that the spot is just on the edge of the paper.

If the transmitter is now modulated by any fixed tone the alternating voltage produced across the plates will draw the spot B out into a line CD.

The percentage modulation is then given by:—

$$\left(\frac{B-A}{\frac{1}{2}(D-C)} \times 100 \right) \%$$

If the graph-paper graduation opposite A is numbered 0, then the modulation is given by:—

$$\left(\frac{B}{\frac{1}{2}(D-C)} \times 100 \right) \%$$

Faulty Indications.

"Fuzzy" Spot. A "fuzzy" spot which cannot be focussed to a sharp pin-point is due to R.F. pick-up. This can be cured by an R.F. filter at the tube input. The circuit shown in Fig. 4 has been found effective in practice, though not always necessary. Care must be taken that the condensers do not affect the audio input.

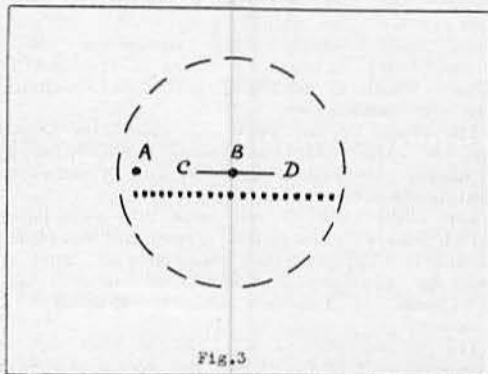


Fig. 3

Broad Spot (not "fuzzy"). A "spot" which appears as a very short line is due to unwanted transmitter modulation (such as hum). The remedy lies in the transmitter.

Unequal Spread. When the line spreads unequally about the spot this is a sure indication of distortion. This effect will be produced when the transmitter is over-modulated. It is a sign of audio harmonics. It may also be produced if the rectifier is overloaded (e.g., low filament emission).

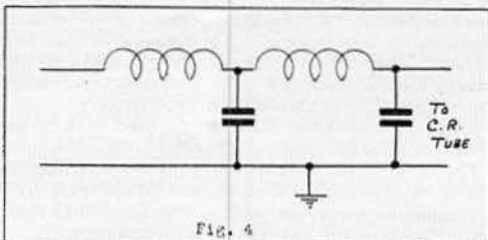


Fig. 4

Application.

A linearity characteristic and a frequency response curve are generally taken.

For the linearity curve input modulating volts (measured by valve voltmeter or high impedance rectifier meter) are plotted against modulation obtained. For very high quality this curve should be straight up to about 80% or 90% modulation, but for normal working 60% is good.

For the frequency response curve a constant input voltage is used, and frequency of input is plotted against the degree of modulation obtained. Instead input volts may be varied to give a constant degree of modulation and plotted against the frequency.

Modulation measurements by cathode-ray tube will be found to give very satisfactory and conclusive results.

WELL DONE, BRISTOL!

AMATEUR Radio, and the R.S.G.B. in particular, received one of its finest boosts last month when our Bristol members, led by Mr. W. Andrews (G5FS) and Mr. Ted Brookes (G6VK) organised a stand at the Bristol Radio Exhibition. This event took place in the Bristol Coliseum and ran from September 23 to 28.

Due to the efforts of Mr. Andrews, the Society were given space for a stand free of charge. This advice was not received until the eleventh hour, with the result that an urgent meeting had to be convened by Mr. Brookes on September 19. Whole-hearted support was promised, with the result that in a few hours gear had been collected, Headquarters advised, publicity literature sent and the stand dressed.

Arrangements were made to rig up a duplex 56 mc. channel between the stand and the end of the hall. This became a most popular feature. Also on the stand were a T.P.T.G. Power Amplifier, with DET. ISW, an amateur bands receiver, another 56-mc. receiver, a transportable amateur bands receiver, a 1.7 mc. D.F. receiver as used for field days, and G5FS's "little perker," which, he told everyone, cost 7d. to build!

The background of the stand was covered with QSL cards, whilst the words "Radio Society of Great Britain" were displayed in 2-ft. letters 13 ft. long.

During the opening speeches, Mr. McMichael spoke warmly of the R.S.G.B., and invited all present to inspect the stand. Immediately after the show opened, Mr. McMichael made the first 56 mc. duplex contact. His Worship the Lord Mayor of Bristol followed.

Other distinguished visitors were Mr. Frank Murphy, and Mr. Kidd ("Gridleak" of the *Daily Sketch*), whilst radio engineers from G.K.U., Portishead and B.B.C. stars all came along to see what was happening!

Over 300 copies of the new Guide were sold, and valuable publicity given to our cause.

Besides those mentioned above, we learn that G5JU, 6GU, 2BMV, 2BOM, 2BYU and BRS686 did excellent work on the stand. G6GU was christened "The New Champ" in recognition of his efforts in selling Guides. "The Barker," we understand, was the name bestowed upon the assistant C.R.—2BYU.

In closing this account, which has been prepared from rough notes written in the thick of the fray by G6VK, the writer, on behalf of the Council, wishes to place on record the Society's thanks to Messrs. Brookes, Andrews, Bartlett, Hill, and many others who gave such a splendid showing at such short notice.

Well done, Bristol!

G6CL.



R.S.G.B. STAND AT BRISTOL.

The Lord Mayor of Bristol speaking over the 56 mc. circuit at the Bristol Radio Exhibition. Mr. Leslie McMichael (Vice-President) is second from the right, and Mr. Brookes (G6VK), C.R. for Gloucester, is to the left. Extreme right the Sheriff of Bristol, and in centre the Lady Mayoress. Photo, Western Mail.

FORTHCOMING CONTESTS.

R.S.G.B. Contests, 1935-6.

DATES.

The dates for future Contests are as follows:—
The 3.5 mc. Transmitting Contest, November 23 and 24, 1935.

The 1.7 mc. Transmitting Contest, January 11 and 12, 1936.

GENERAL RULES FOR ABOVE CONTESTS.

1. Entrants must be fully paid-up members of the Society, and be resident within the British Isles.
2. The British Isles, for the purposes of all contests includes England, Scotland, Wales, Northern Ireland, the Irish Free State, and the Channel Islands.

3. Contests commence at 16.00 G.M.T. Saturdays, and continue until 11.00 G.M.T. Sundays, recommencing at 15.00 G.M.T. Sundays, and concluding at 20.00 G.M.T. Sundays. (Note.—This gives an operating period of 24 hours per contest.)

4. Entries will only be accepted on official log sheets, which can be obtained free of charge from Headquarters prior to the commencement of each specific contest. Entry forms must be returned within 14 days of the conclusion of each contest.

5. Entry forms, unless completely filled in, will be disqualified.

6. The declaration at the foot of the entry form must be signed by the operator.

7. Proof of contact or reception may be required.

8. Contacts with or calls from ship or unlicensed stations will not be permitted to count for points.

9. Only one person will be permitted to operate a specific station during any one contest.

10. Leading stations will be granted certificates of merit, whilst trophies may be awarded at the discretion of Council.

11. Council have the right to amend or alter the rules at any time prior to the commencement of a specific contest, and their decision will be final in all cases of dispute.

RULES FOR TRANSMITTING CONTESTS.

1. An exchange of reports (QSA, QRK, and Tone) will be required before points for a contact can be claimed.

2. Only one contact with a specific station will be permitted to count for points during each contest.

METHOD OF SCORING FOR THE 3.5 MC. TRANSMITTING CONTEST.

1. No contacts with stations located in the British Isles will be permitted to count for points.

2. One point will be scored for each contact with Europe, two for Africa, three for Asia, four for America, and five for Australasia.

3. An extra 10 points will be added to the total score for each country worked outside the British Isles. In the case of contacts with Canada or the U.S.A. each District counts as a separate country. The U.S.S.R. counts as one country.

4. No competitor may use more than his licensed input power, and in no case more than 50 watts.

METHOD OF SCORING FOR THE 1.7 MC.

TRANSMITTING CONTEST.

1. One point will be scored for Inter-British Isle and European contacts, and five points for contacts outside Europe.

2. The input to the final amplifier must not exceed 10 watts, nor may this figure be exceeded on any previous stage.

Trans-Oceanic Tests, December, 1935.

Dates.

1st Series. December 15, 16, 17, 18 (starting 23.45 G.M.T. December 14).

2nd Series. December 19, 20, 21, 22.

Times (All G.M.T.) Listening Periods. Transmitting

	Europe keeps silent.	Others keep silent.	All stations.
1st Series	23.45 to 24.00	00.00 to 00.15	00.15 to 02.00
2nd Series	05.00 to 05.15	05.15 to 05.30	05.30 to 08.00

Frequencies.

To assist searching and minimise QRM it is hoped that all stations will fall in with the following frequency allocations.

3900 to 4000 kc. American and Canadian phone.

3850 to 3900 kc. Canadian phone.

3730 to 3850 kc. European phone and CW—except British stations.

3630 to 3730 kc. British phone.

3500 to 3630 kc. European (including British) CW ONLY. It is hoped that phone stations will leave these frequencies clear for low power and DX CW.

American and other CW stations, outside Europe, have the choice of 3730/3850 kc. and 3500/3630 kc.

Listening Periods.

Stations, during the listening periods, should call "TEST R.S.G.B. de . . .", giving their own call-signs very frequently. After the second listening period, that is, the European transmitting period, European stations should run through the dial for calls before going on the air themselves.

R.S.N.I. Contest.

The Radio Society of Northern Ireland will hold a transmitting contest for the Leonard Trophy during the week-ends October 26-27 and November 2-3, 1935. The contest will start at 00.01 G.M.T. each Saturday and end at 24.00 G.M.T. each Sunday.

The contest is open to all licensed amateurs in Ireland (GI and EI), and entries from both Northern Ireland and the Irish Free State will be heartily welcomed. Scoring will be based on the following method:—

Inter Irish QSO's	...	0 points
With Great Britain (outside Ireland)	...	1 point
With other European stations	...	2 points
With stations outside Europe	...	3 points

In conjunction with this event a contest for British and foreign stations will be held. Entrants will be required to work Irish stations (GI and EI). A gold medal will be awarded to the winner and a silver medal to the runner-up. One contact per band per week-end will be allowed, and each such contact will gain one point in this contest. No multipliers will be used and contacts must be made on either 7 or 14 mc.

Logs of the usual form (with code word) should be sent to the Hon. Secretary, Mr. J. Cowan (GI50Y), 74, Wheatfield Crescent, Crumlin Road, Belfast.

TRY EIGHTY METRES!

"ONCE upon a time"—actually on December 23, 1923,—G2KF worked two-way with AIMO. The operators were Messrs. Partidge and Warner and their's was the first G-W amateur contact. F8AB had been "first across" a few days earlier, and G2SH and G2OD were runners-up within a week. The latter station used only 30 watts to work A2AGB.

Now, twelve years later, we propose to organise comparative tests, using our corresponding "low frequency" band, 3.5 mc., to demonstrate what can be done with present-day conditions and equipment.

All of which leads to an announcement of a series of 3.5 mc. tests for the week December 15-22, 1935. Whilst trans-Atlantic working is specially mentioned above, we do not forget the possibility of other DX cropping up. The season is not a good one for VK, but details have been sent to all B.E.R.U. representatives and societies on the chance.

Some of us are apt to think of "80" as a "Sunday morning band." For these, let me quote G6RB's 1934-5 list. It shows 55 American stations in districts 1, 2, 3 and 8, 3 in W9, one each in W4 and W7, 8 in VE1, 2 and 3 and 2, VO stations. Many were multiple contacts. G5VL in the first ten weeks of 1935 with under 60 w. of phone worked VE1EI more than 30 times. Other phone contacts were: W1, 2, 3 and 8 (20), W4 (4), VE1 and 2 (4). And, for those to whom it appeals, most were "first" contacts with G and all such on phone.

So, having spread the ground-bait, let's get to business. We want to get greater use made of the 3.5 mc. frequencies. Join in these tests and use the band for all-round working. If you have not an "eighty permit" see about getting one at

once. To avoid trouble, let me say here that G5VL is responsible for the details of the tests. The Society sponsors them but it's not fair to throw bricks at H.Q., at any rate on this subject! The arrangements this year are purely experimental, if results merit, alterations can be made in future series.

We have to cope with our biggest trouble, QRM. Therefore all stations are asked to fit in with the suggested frequency allocations. This, in some cases, will undoubtedly cause inconvenience, but it seems impossible to meet the trouble otherwise. The time schedules should be easier to observe. Our friends of the A.R.R.L. are giving us wholehearted support for all the arrangements through Q.S.T. publicity, and backing the appeal for organised working. All European societies have also been asked to press for work on these lines. We can only hope!

The "silent" or listening periods must be kept. They will give a unique opportunity for logging. It will be seen that we do not transmit for the first 15 minutes of each period, concentrating upon logging the "test" calls heard from outside Europe. For the following 15 minutes we call "test" with a view to getting heard and logged afar off. After this, it is purely two-way working for the rest of each period.

The arrangement to use a different time for each half-week is to suit those who may not be able to fit in one or the other. It will also give some comparison of results, with the hoped-for reduction in QRM, between midnight and morning conditions.

It is asked that all results obtained should be sent to G5VL, either direct or via R.S.G.B. Thanks are due to G6CL, G6RB, G5UM, and Mr. F. E. Handy, of A.R.R.L., for their advice and assistance in the initial arrangements. G5VL.

TRADE NOTICES.

Jackson Bros., one of the oldest variable condenser manufacturers in Great Britain, and one of the first to produce condensers designed especially for short-wave work, send us details of their new products:

"Baby Gangs" with ball-bearing rotor are an entirely new model, as are the superhet baby gangs tracked for 465 and 473 kc. in two or three gangs.

In future, midgets will be fitted with $\frac{1}{2}$ -in. spindles as standard.

An airplane pattern dial with large circular scale and double-ended pointer, should appeal to those constructing frequency meters. This dial gives a bold wavelength calibration and is supplied with dual lamp-holder and escutcheon fitted with glass. The standard finish is white scale with chrome or bronze escutcheon, but special finishes can be supplied to order. The price is 5s. 9d. A similar dial, but fitted with a dual ratio drive, 8 to 1 and 100 to 1, costs 6s. 6d.

New midget condensers for short and ultra-short wave work are listed. These condensers would be ideal for band-spreading purposes. In the plain types, standard capacities are 15 and 30 mmf. at 3s. 9d. each, and in the two-gang range capacities vary from 15 to 45 mmf. at 5s. each. Karamot insulation is standard.

Westinghouse Brake & Signal Co., 82, York Road, London, N.1, have submitted for review the 1936 (8th) edition of "The All-Metal Way." It is unnecessary to mention, to older members of the Society, how useful is this publication, for its worth has been well tested through previous editions, but we would draw the attention of our newer members to the numerous applications of Westinghouse products, and in particular their metal rectifiers and westectors. Every feature of metal rectification is fully dealt with within its 48 pages.

"The All-Metal Way" is a text-book in itself, and no amateur radio room is complete without this attractive and informative publication.

The *General Electric Co.* have sent us a copy of their latest Osram Valve Guide, which contains 64 pages of invaluable information. Various valve applications are explained with the aid of clearly reproduced circuits.

A copy will be sent free of charge to all mentioning this Journal.

SOLILOQUIES FROM THE SHACK.

By UNCLE TOM.

(Mounting on his creaky chair, our hard-hitting correspondent belabours what little is left of his tub once more.)

'Morning, everybody. Hope the kippers are nice this morning—and don't smear the butter all over this page of the BULL. When you are too old to dream, etc., you'll be turning back and reading my soliloquies instead (or will you?)

It's a horrid confession to make, but everybody within earshot of me seems to have behaved so darn well this month that I've nobody to kick. Fortunately, lots of my worthy readers appear to have man-sized grouses that they want me to air for them, so here goes.

No. 1 concerns the 1.7 mc. band, about which I didn't think there *could* be any grouses, except those that concern trawlers. However, someone has apparently forgotten the terms of his licence so far as to put out strings of gramophone records, with intermittent announcements of "Hullo, Mr. So-and-so, I hope you are receiving our little concert well this morning," and all the other familiar expressions of 1922-3.

In case such a gentleman happens to be reading this, may I remind him that he is liable to receive a far more resounding kick in the pants, direct from the G.P.O., than even I could ever hope to deliver.

Another grouse, from a gentleman signing himself "S.P.Itch (SP1CH)," which I feel sure represents neither his real name nor his call-sign, concerns my remarks on the two kinds of spitch. He adds a third kind, which he dubs "infra-spitch," defined as "modulation from an overloaded amplifier, imposed on an unstable carrier-wave containing 50 per cent. of A.C." Sounds pretty good to me, but then, to my untrained ear, spitch of any kind gives me just about that impression.

With the terrific spread of this craze for long-distance 'phone, I suppose we shall have to admit, bashfully, that our own output in this direction isn't too bad. Nevertheless, the use of grid modulation on a transmitter using Goyder Lock should be punishable by deportation for life.

While we're on the subject of spitch and speech, I might mention that some of these high-power long-distance QSO's strike me as being rather less polite than they might be. I have heard a Continental 'phone man telling a "W" "I can give you two minutes, dear old man. There are many more calling me, and I cannot spare much time therefore." What bunk! Why this irresistible desire to snaffle every darn station on the band, instead of having a respectable, friendly QSO with one or two?

Are we all turning into radio robots? Is our life to be made miserable because we know thirty stations heard us, and we only had a QSO with one of them? I suppose the mentality that results, finally, in the installation of a complete commercial station, is responsible for that.

(By the way—first a commercial receiver, then a commercial transmitter—why not a commercial operator to handle it all while the proud owner goes out rabbit-shootin', or somethin'? Think of the joy of possession! My *only* hat—what are we coming to?)

Grouse No. 3, coming from a rather surprising quarter, concerns the lack of interest shown by the majority of the DX-hounds in 5-metre work. One or two of them have apparently put the writer's back up by telling him that they consider it childish! Translated into plain English, of course, that means that they haven't yet succeeded (in their manly way) in making a 5-metre receiver oscillate. But that, of course, is another story.

There is a certain type of ham (and don't we all know him?) who considers it beneath his dignity to speak to anyone within 2,000 miles of him. I can just *begin* to see his point of view. I may be giving him more credit than he deserves, but I really believe it is partly the *difficulty* of doing reliable DX work that makes it attractive rather than the mere thrill of it.

Assuming that that is so, and assuming also that it is as difficult to work duplex over 20 miles on 5 metres as it is to work a Yank on 20 (actually it's more so), why isn't 5-metre work better patronised by this type of ham? Search me, I don't know!

The final grouse concerns the queer subject of local society meetings. I simply dare not give a clue as to which part of the country it comes from, but the writer complains that he travels a good distance to attend the regular meetings of the local "gang," and when they get together, they discuss practically everything except radio. Barring the beer and sandwiches, he considers it the most complete waste of an evening that he can think of.

Personally, I look on it as rather a healthy sign that hams *are* becoming capable of talking on subjects other than radio. There was a time when they had no space in their craniums (or crania?) for anything else. But I suppose a local meeting ought to devote just a *little* time and thought to radio.

Incidentally, it's long been a pet peeve in my bonnet that each R.S.G.B. District ought to have its own official station, located somewhere in a shack, and built from spare gear donated or lent by all the members. How many districts in the British Isles *can* boast a headquarters station? They manage it all right on N.F.D., but it would be rather an idea if such a station could be kept intact all the year round, and district QSO parties held periodically.

Time and time again I appeal for more local or "inter-G" work, and this would be a really fine means of encouraging it. Failing that, some sort of official test might be organised, the object being for at least one station in every district to try to QSO all the other districts within twelve hours or so. Formula-QSO's to be barred, and at least 15 minutes' ragchewing to be insisted upon.

What say you, nephews and nieces? Don't you feel, sometimes, that you hardly know a single British amateur outside your own district, thanks to the fact that all your QSO's on the air are with foreign countries?

Chuck the bricks at me this time, for a change, and let me know just what your opinions are. *Next* month I will probably be Dr. Jekyll again.

RESEARCH AND EXPERIMENTAL SECTION

MANAGER :

H. C. PAGE (G6PA), Plumford Farm, Ospringe, near Faversham, Kent.

ASSISTANT MANAGER :

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

GROUP MANAGERS :

No. 1: 1.7 and 3.5 MC. WORK

J. H. HUM (G5UM), "Byeways," The Drive, Welwyn, Herts.

No. 2: 56 MC. WORK

Messrs. J. N. WALKER (G5JU), 4, Frenchay Road, Downend, Bristol, and A. J. FORSYTH (G6FO).

No. 3: ARTIFICIAL AERIALS

L. E. H. SCHOLEFIELD (G5SO), 2, Balmoral Road, St. Annes-on-Sea, Lancs.

No. 4: ATMOSPHERE AND PROPAGATION.

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

No. 5: TELEVISION

C. W. SANDS (G5JZ), Springfield, Heathfield, Sussex.

No. 6: CONTEMPORARY LITERATURE

Dr. R. A. FEREDAY (PAOFY), Radio Research Board, Slough, Bucks.

No. 9: AERIAL DESIGN

F. CHARMAN (G6CJ), Orchard Cottage, Stoke Poges, Bucks.

No. 10: VALVE RESEARCH

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

No. 11: 28 MC. WORK

W. A. CLARK (G5FV), "Lynton," Hull Road, Keyingham, Hull.

No. 12: AUXILIARY EQUIPMENT

A. O. MILNE (G2MI), "Southcot," Larkfield, Kent.

THIS month there seems to be very little to comment upon, owing to the fact that very little of outstanding interest has come to hand. We would like to point out that the amount of material, and its interest, is entirely dependent on the efforts of our members. In fact, the more everyone decides to "leave it to George," the less there will be of interest herein.

Last month we promised more information on the subject of 56 mc. and stabilised transmitters. During the month it has been our good fortune to visit several 56 mc. stations; in every instance these stations were well built, and well kept, but in no case was anything of an original design seen. On engaging the owners in conversation it was admitted quite readily that the present day 56 mc. gear is out of date, and we really ought to see about stabilised, driven transmitters and better receivers, but there seemed to be no desire to make a start in this direction.

Now something has just got to be done about this, and whilst we will not promise great reward to anyone who will help in this direction, we would assure you that anyone who will volunteer to assist us in work on the frequency stability of 56 mc. transmitters will not lose by it. Therefore, we shall be glad to receive the names, and qualifications of anyone so inclined, with a view to a discussion on the methods to be tried. All such applications should be addressed to the R.E.S. Manager personally.

It is with regret that we have to announce the resignations of our Transmitter and Receiver Design Group managers. The Transmitter Design Group managership will probably be filled very shortly, but at the moment we have no one in view for Receiver Design, and shall be glad to receive applications for the post from any responsible members of the Society.

G6PA.

Atmosphere and Propagation

Group 4C, under the leadership of G5JH, has been conducting some interesting experiments in atmospheric potential measured by the Water Dropper in conjunction with a Kelvin electrometer. As is well known, the potential varies considerably during the day, and it was observed that on a clear sunny day the highest potential occurred at about 1100 G.M.T.; moreover, unless clouds and rain appeared on the scene, this potential remained around its highest up to about 1700 G.M.T. But this was not invariable, for on other days under identical conditions, the potential would be much lower and vary considerably in a few hours or even minutes; also the highest potential would be reached as early as 08.00 G.M.T. During cloudy weather the potential was very much lower than during fine, and the time of maximum varied considerably; but when a thunderstorm was about the potential would reach very high values for a very short period, and on rain falling would change from positive to negative in less than a minute. After the storm had passed, the potential would gradually change, returning to normal about two hours afterwards.

The correlation between atmospheric potential and short-wave radio "conditions" was noted, by which it appeared that certain relationships exist, although at times there was contradictory evidence; the ratio of positive results to negative being about 4 to 1.

It was found that poor "conditions" for DX occurred when potential was highest, and conditions were normal when potential was fairly low. Good conditions were noted when the potential was low, i.e., about 20 to 40 volts per metre.

These results seem to corroborate existing theories. Very high potential suggests the presence of some strongly-charged clouds, which, as has been mentioned previously in the BULLETIN, would cause

strong ionisation below the E layer, and hence great absorption. The low potential might be caused by high humidity and so discharge of the cloud, which would remove the ionising cause, and this would be followed by recombination and diffusion upwards, resulting in good DX.

Tests made by G2KJ and G6GQ seem to confirm these theories.

The group has also been observing the relation between sunspots and DX "conditions" on 28 mc. It is interesting, therefore, to find that good "conditions" coincided with sunspot activity, thereby fulfilling the prophecies.

The question of earthquakes is also being investigated. It is worthy of note that, during an earthquake at Quetta on July 14, the magnetometer was recording very unusual and violent vibrations. Whether this is coincidence or cause and effect remains to be proved, but it does suggest that the frequent reports of good "conditions" following earthquakes may be justified, due to some disturbance of the earth's magnetic field.

G2GD.

"Muck Saw" Facts

For those unacquainted with these saws, they consist essentially of a metal disc rotating in a trough of carborundum and water. The quartz rests on top of the disc, feeding down by its own weight as the disc, edged with a thin film of carborundum mud, cuts into it. Experience gained with a motor-driven muck saw similar to that described in a recent issue of *Q.S.T.*, led the writer to try out the capabilities of a hand-driven machine. As very little power is required and the speed necessarily low, hand drive is quite practicable, and a disc clamped to a bench-grinder was found to make an effective rig. The abrasive wheel is not disturbed, its flywheel action providing steadiness of drive, and it is only necessary to lengthen the spindle and clamp the disc up to a distance piece, giving a separation of two or three inches.

Hard copper is recommended for the disc, but brass or even tin plate answers quite well. With tin plate, however, there is a tendency, after some use for the edges to tear.

A suitable diameter is about 6 in., and thickness about 24 gauge. A thin disc naturally cuts much faster but needs to be stiffened by large washers. If a cutting depth of 2 in. is provided for, it will be ample. There is a tendency, especially with a thin disc, for the edge to curve over slightly with use, saucer fashion, and, therefore, to avoid broken blanks, this should be watched for, and the disc hammered true. Regarding speed, about 300 to 400 r.p.m. is best. A really high speed is not proportionately faster in cutting, as the carborundum is thrown off the disc before reaching the quartz.

The best grade of carborundum is 220, cutting at a fair rate and very smoothly. A coarse grade cuts more rapidly, but chips the blank, and means a longer grinding job to finish the crystal.

It should be mixed with water to a thin, volatile, mud, and as the cutting proceeds water will need to be added, and the mud occasionally stirred. A spot or so of machine oil on the disc makes for easier running when the cut is deep.

As the name implies, these saws are messy arrangements, and the trough should be well hooded to catch any splashing. It is a good plan to house the whole machine in a box, open at the front only; this confines the mess and obviates the risk of carborundum being found plastered on the wallpaper or ceiling.

The piece of quartz to be cut is held in a clamp at the end of a short length of batten, the other end being hinged to an upright pillar. For the batten, about 12 in. of 2 in. by $\frac{1}{2}$ in. is required, and for the pillar about 9 in., according to the height of the disc, of 2 in. by 2 in. The pillar must be fixed rigidly perpendicular, and the batten hinged to it must align with the disc face.

A short piece of metal strip bolted over the quartz, through the batten, serves for the clamp. A packing of cork will be a great help in holding firmly an irregularly shaped lump of quartz.

The quartz should be carefully selected; when broken it should show a brilliantly clear interior with no trace of foreign matter or flaws. It is best not to cut rough slices off the raw piece and square them afterwards, but to cut first a true cube or bar, parallel to a major face of the crystal, and to cut the blanks from this.

On a cut nearing completion there is a risk of the blank breaking off unless care is taken. In *Q.S.T.* this was prevented by embedding the whole crystal in plaster of paris, thus ensuring a clean cut throughout. "Y" blanks are definitely easiest to make oscillate. A 3.5 mc. blank finishes at about .022 in. and a 1.7 mc. at .044 in. thick for the top of the band.

Great care should be taken in adjusting the machine. A true, thin, blank is soon ground to the desired frequency, but a thick blank, wedged-shaped, perhaps, is a tedious job to true and grind, apart from being a waste of quartz.

G2IZ.

DX CHART No. 11

DX CONDITIONS: AUGUST 15 TO SEPTEMBER 15, 1935.

G.M.T.	14 mc.	7 mc.
0500	W6.7	W1.6
0600	VK	ZL; HJ
0700	VK	ZL; VK; LU; W
1300	VK; ZB; SU	
1400	J	
1500	VS1.6; VK3.4.5	
1600	VK; W6.7; ZD; XU	
1700	VK; PK; VU; VS1; ZE	
1800	ZT; KA	
1900	W7; ZE; ZS; CM; ZD	
2000	PY; VP2	
2100	PY; W5; VP2.5; TI	ZT; VK
2200	PY; LU; CE; ZC	ZS; KA
2300	CX; LU	W1
2400	X1; LU	W1

NEWS AND VIEWS FROM 53.

I.E.E. Meetings

We are pleased to announce that well-known London members have offered to open discussions at the next two I.E.E. meetings.

On Friday, October 25, Mr. L. H. Thomas (G6QB) will talk on the subject of "Modern Amateur Equipment"; whilst at the November meeting, to be held on the 22nd of that month Mr. Gavin Samson (ex ZL4AI and past winner of B.E.R.U. Senior Trophy) will discuss "Amateur Band Superheterodyne Receivers."

After the annual general meeting on Friday, December 20, Mr. F. Addey, B.Sc., M.I.E.E., Assistant Inspector of Wireless Telegraphy, will lecture on British Wireless Services.

It is hoped that as many members as possible will support these meetings. Tea is served from 5.30 p.m., and, with the exception of the annual general meeting, all lectures begin at 6.15 p.m. sharp.

Contests 1935-1936.

The following dates have been selected for forthcoming Contests:—

1935.
Nov. 23-24.—3.5 mc. transmitting.

1936.
Jan. 11-12.—1.7 mc. transmitting.

Feb. 1-2.—Senior B.E.R.U.

" 8-9.—" Junior B.E.R.U.

" 15-16.—" Junior B.E.R.U.

" 22-23.—" "

" 1-2.—Receiving B.E.R.U.

" 15-16.—" "

June 6-7.—National Field Day.

It has been decided not to organise a Low Power Contest.

The question of a Receiving Contest for home members is held in abeyance pending receipt of information from Mr. P. Seymour, 2AZX, who has volunteered to endeavour to obtain an assurance from not less than 30 non-transmitting members that they will support such a contest if same is arranged. Council were very disappointed with the poor support given to the last series of receiving contests.

New D.R. for Mid-East England.

Council have pleasure in announcing that the Rev. L. C. Hodge (G6LH), of Boston, has accepted their invitation to act as D.R. for District 17, in succession to Mr. A. E. Livesey (G6LI), who has been compelled to resign from the position for business reasons. Mr. Brister (G6AK), of Grimsby, has been invited by Council to become the new Lincolnshire C.R. and has accepted.

This opportunity is taken of thanking Mr. Livesey for his past services, and to wish him success in his new sphere of activity.

Guide to Amateur Radio, 3rd Edition.

We wish to draw attention to the fact that in the list of parts for a 2-valve battery operated receiver, the value of condenser C3 is given as .00035 mf. This should read .000035 mf. Eddystone Type 942.

A New Trophy.

Council are pleased to announce that Lt.-Col. C. W. Thomas, G6MW, has donated a trophy to the Society. This will be awarded annually to the leading G or GI station in the senior section of the B.E.R.U. Contest.

VK-ZL DX Contest

Mr. Cunningham (VK3ML) informs us that in Rule 6 the word "foreign" is intended to mean "Empire and Foreign."

W.B.E. Certificates

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

Name.	Call sign.	Date.
J. A. Faithful	VU2BX	August 12, 1935
A. M. Crowell	VE1DQ	" 29, "
S. H. Cox	SU1AQ	" 29, "
W. L. Harston	VK4RY	September 10, 1935
G. E. King	ZE1JF	" 12, "
J. R. Adams	G5KF	" 12, "
S. Roberts	G6QS	" 16, "
G. A. Chapman	G2IC	" 17, "
F. Johnstone	ZB1F	" 20, "
W. A. Wilson	ZL2CI	" 25, "

I.R.T.S.

Council have much pleasure in announcing that the Irish Radio Transmitters' Society have been granted honorary affiliation with the B.E.R.U. Societies. This very active organisation has a membership of over 35.

New French Prefixes

The R.E.F. have been notified by the Minister of the Post and Telegraph Office that the following prefixes have been approved for use by amateur stations situated in the French Colonies:—

F3 & F8—France.	FMS—Martinique.
FA3 & FAS—Algeria.	FNS—French India.
FBS—Madagascar.	FOS—Oceanic Settlements.
FDS—Togoland.	FPS—St. Pierre and Miquelon.
FES—Cameroons.	FQS—French Equatorial Africa.
FFS—French West Africa.	FRS—Reunion.
FGS—Guadeloupe.	FT4—Tunis.
FIS—French Indo-China.	FUS—New Hebrides.
FKS—New Caledonia.	FYS—French Guiana.
FLS—Somali Coast.	CNS—French Morocco.

Gear for Disposal

Much of the smaller apparatus from the station of the late Don Price (G6HP) is still unsold, and G6QB appeals to us to urge anyone interested to make enquiries.

Among the gear are the following:

Mains transformers, 210-230 primaries, high insulation, 4v. 6a., 4v. 3a., and 6v. 4a., all centre-

tapped, 14s. each; 400-0-400, 21s.; Ferranti milliammeters, 0-150, 17s. 6d. each. Innumerable small variable condensers, H.F. chokes, fixed condensers, and resistances, etc.

Two very fine wooden cabinets with close-fitting lids and glass sides. Front panels ready cut for Ferranti meters and drilled for variable condensers—two shelves to each. These two cost over £5 and are for sale at £1 each, or nearest offer.

All applications should be made to G6QB at 66, Ingram Road, Thornton Heath, Surrey, who has the gear at his QRA and is anxious to dispose of it for Mrs. Price.

Commemoration of Armistice Day

The *Reseau des Emetteurs Francais* invites the radio amateurs of the world to commemorate with them the anniversary of Armistice Day, November 11, 1918. Last year, it will be recalled, a "silent minute" ceremony was observed. At precisely 1100 G.M.T. every station on the air in France, and a number in foreign countries, allowed their transmitters to run with full carrier power, unkeyed and unmodulated, for one minute. This impressive observation of the minute of silence traditionally spent in homage for the heroes of the great war is again to be carried out this year. The R.E.F. requests every amateur to stop transmitting at exactly 1100 G.M.T., holding the key down but not sending code or speaking into the microphone. From hundreds of other amateur stations the same ceremony will be observed, and from their antennas the "silent carriers" will be transmitted, indicating the silent presence of the amateurs at their posts.

Amateurs in all countries are asked to collaborate with their French comrades in making this same gesture, and in uniting with them in thought.

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. Reports may be sent via the Society's QSL section. If, however, replies direct are desired, stamps should be enclosed. Stations willing to assist, particularly from those districts at present without a service, are invited to communicate with Mr. T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4. Telephone: Silverthorn 2285.

SCHEDULE OF SLOW MORSE TRANSMISSIONS.

Date, 1935.	G.M.T.	Kcs.	Station.
Oct. 19, Sat. ...	2245	1930	G5OD
" 20, Sun. ...	0930	1785	G5BK
" 20 " ...	1000	1850	G6VD
" 20 " ...	1100	7104	G6PJ
" 20 " ...	1200	7102	G5GC
" 24, Thur. ...	2300	1990	G6AU
" 26, Sat. ...	2245	1930	G5OD
" 27, Sun. ...	0930	1785	G5BK

Oct. 27 Sun. ...	1000	1850	G6VD
" 27 " ...	1100	7104	G6PJ
" 27 " ...	1200	7102	G5GC
" 31, Thur. ...	2300	1990	G6AU
Nov. 2, Sat. ...	2245	1930	G5OD
" 3, Sun. ...	0930	1785	G5BK
" 3 " ...	1000	1850	G6VD
" 3 " ...	1100	7104	G6PJ
" 3 " ...	1200	7102	G5GC
" 7, Thur. ...	2300	1990	G6AU
" 9, Sat. ...	2245	1930	G5OD
" 10, Sun. ...	0930	1785	G5BK
" 10 " ...	1000	1850	G6VD
" 10 " ...	1100	7104	G6PJ
" 10 " ...	1200	7102	G5GC
" 14, Thur. ...	2300	1990	G6AU
" 16, Sat. ...	2245	1930	G5OD
" 17, Sun. ...	0930	1785	G5BK
" 17 " ...	1000	1850	G6VD
" 17 " ...	1100	7104	G6PJ
" 17 " ...	1200	7102	G5GC

NEW MEMBERS.

HOME CORPORATES.

- C. COATES (G5CS), 66, Mount View Road, Stroud Green, N.4.
 P. HAMLYN (G5HA), "Eversley," Southfield, Hesse, E. Yorks.
 G. H. KILEY (G6GK), 57, Vicarage Road, Plumstead, S.E.18.
 F. W. DORWARD (G6UD), 22, Beechwood Crescent, Southwick, Sunderland.
 E. G. FLANAGAN (2AAU), 247, Warwick Road, Kensington, W.14.
 M. W. CHITT (2AIF), Lawtence House, Imperial Service College, Windsor.
 A. D. NARAWAY (2APW), School House, Moreton, Oswestry, Salop.
 H. W. ROBINSON (2BBT), 35, Forty Acres Road, Canterbury, Kent.
 W. B. SMITH (2BFD), Ivy Cottage, 2, Wigston Road, Oadby, near Leicester.
 J. H. EMMERSON (2BJK), Lawtence House, Imperial Service College, Windsor.
 D. L. MIDDLETON (2BPY), 16, Hatley Avenue, Barkingside, Ilford, Essex.
 F. E. SPERRING (2BSI), 23, Old Road, Llanelly, Carmarthenshire, Wales.
 W. J. MILLER (2BUL), 2, Chiltern Leys, Coventry.
 K. O. WILSON (2BWS), "Berulieu," Southfield, Hesse, E. Yorks.
 J. L. D. de BARY (BRS1985), 29, Westminster Palace Gardens, Artillery Row, Victoria, S.W.1.
 A. M. READ (BRS1986), Heyfield, Little Sutton, Wirral, Cheshire.
 D. E. ECCLESTON (BRS1987), High Town, Congleton, Cheshire.
 F. HOOSON (BRS1988), 237, Chingford Mount Road, Chingford, E.4.
 A. K. SLEATH (BRS1989), Chemist, Clipstone, Notts.
 P. G. SPENCER (BRS1990), 11, Nightingale Road, Bushey, Herts.
 P. ELMS (BRS1991), "Taunton," Nightingale Road, Wendover, Aylesbury, Bucks.
 G. G. MACFARLANE (BRS1992), "Deanston," Airdrie, Lanarkshire, Scotland.
 D. H. JONES (BRS1993), Victoria House, 14a, Fore Street, Northam, North Devon.
 A. C. GEE (BRS1994), Eastwood Lodge, Eastwood, Southend.
 L. A. RICHARDS (BRS1995), 33, Langton Road, East Molesey, Surrey.
 W. CROSSLAND (BRS1996), "Griz-nez," Queen's Road, Whitstable, Kent.
 F. LEES (BRS1997), 67, Siddall Street, Oldham, Lancs.
 A. A. GOFF (BRS1998), 4, Reigate Way, Wallington, Surrey.
 A. CRAWLEY (BRS1999), Chester Road, Sutton Weaver, Near Warrington, Lancs.
 J. SANDS (BRS2000), 23, Wish Road, Hove, Sussex.
 W. CLEGG (BRS2001), 37, Randlesham Street, Heaton Park, Manchester, Lancs.
 MISS E. M. LETEMPLER (BRS2002), Goblin Corner, Ruan Minor, South Cornwall.
 E. J. M. CASEY (BRS2003), 14, Quarry Road, Broseley, Shropshire.
 B. L. HEY (BRS2004), 1, Tennyson Street, Keighley, Yorkshire.
 J. WASHER (BRS2005), Brook Cottage, Sutton Valence, Kent.
 K. L. W. COOK (BRS2006), 23, Wood Street, Swindon, Wiltshire.
 R. W. PARFITT (BRS2007), 6, Grange Parade, Woodham Lane, Woking, Surrey.
 H. W. SKINNER (BRS2008), Hillcrest, Roundwood Lane, Harpenden, Herts.
 A. W. G. ANDERSON (BRS2009), 25, Otan Avenue, Maybury Road, Hull, Yorks.

- G. H. RANDLE (BRS2010), "Westville," 26, Clumber Street, Melton Mowbray, Leicestershire.
 P. LOADES (BRS2011), 13, Tower Street, King's Lynn, Norfolk.
 A. V. HEWELL (BRS2012), 57, Westway, Grand Drive, Raynes Park, S.W.20.
 J. D. S. HOUGH (BRS2013), "Eastwood," Newby Bridge, Ulverston, Lancashire.
 S. C. HEDGES (BRS2014), 57, East Street, Sittingbourne, Kent.
 E. C. ILOTT (BRS2015), 36, Montana Road, Upper Tooting, S.W.17.
 R. A. W. LUCAS (BRS2016), "Denvilles," 52, Montrose Avenue, Chatham, Kent.
 J. DOWDING (BRS2017), 5, Well Road, St. Peter Port, Guernsey, Channel Islands.
 A. J. G. RUMP (BRS2018), 21, Essex Road, Lowestoft, Suffolk.
 K. E. SALMON (BRS2019), 80, Agraria Road, Guildford, Surrey.
 W. R. CHAFFE (BRS2020), 21, Rosslyn Park Road, Plymouth, Devon.
 J. D. CAMERON (Junior), (BRS2021), Balgonie, West Linton, Peeblesshire, Scotland.
 C. H. WATSON (BRS2022), 131, Old Lane, Beeston, Leeds, 3.
 P. N. PHILLIPS (BRS2023), Berry Lodge, Great Berry Road, Crownhill, Devon.
 G. W. HAYWARD (BRS2024), "Meadowlands," Alsford Road, Purbrook, Portsmouth.
 N. H. PICKERING (BRS2025), 30, Avenell Road, Highbury, N.5.
 L. D. MADDRICK (BRS2026), 7, Freeland Place, Hotwells, Bristol.
 J. K. GAPPER (BRS2027), "Windermere," Lyne Road, Axminster, Devon.
 P. W. BORTHWICK (BRS2028), 75, Mayfield Road, Edinburgh, Scotland.
 J. A. SEY (BRS2029), 32, McKinnay Street, Glasgow, C.5, Scotland.
 H. E. SUTTON (BRS2030), The Wong, Horncastle, Lincolnshire.
 H. MCCONNELL, Jur. (BRS2031), "Ashgrove," 23, Carrick Road, Ayr.
 J. G. CARROLL (BRS2032), 9, George's Place, Kingstown, Co. Dublin.
 W. J. PHILLIPS (BRS2033), "Sandhurst," Queen's Hill Crescent, Newport, Mon.
 H. B. BOLTON (BRS2034), 15, Factory Lane, Manchester 9.
 C. B. THOMAS (BRS2035), "Cliftonville," Brynteg Road, Gorseinon, Near Swansea, Glam.
 J. O. DYKES (BRS2036), 16, South Charlotte Street, Edinburgh 2.
 R. A. BUTTERWORTH (BRS2037), 24, Market Place, Middleton, Manchester.
 J. F. STONE (BRS2038), 91, Erskine Hill, N.W.11.
 A. G. P. BRIGHTMORE (BRS2039), Barn Close, Townhead Road, Dore, Near Sheffield.
 M. W. MCINTYRE (BRS2040), "Glenroy," Maidstone Road, Wigmore, Chatham, Kent.
 H. O. SULLS (BRS2041), "Elmhurst," Briar Gate, Long Eaton, Derby.
 P. A. TREMAINE (BRS2042), Burghy Brook, Witham, Essex.
 F. G. ANDREWS (A), 24, Grimdyke Crescent, Barnet, Herts.
 P. J. WEYELL (A), 21, Salisbury Road, Richmond, Surrey.
DOMINION AND FOREIGN.
 G. LOWE (VU2DH), 22, Overseer Road, Kirkee, Poona, India.
 W. MILNE (ZE1JY), 8a, Main Street, Bulawayo, Southern Rhodesia.
 J. H. PULLIN (ZS5Z), P.O. Box 1981, Durban, South Africa.
 W. F. MEYER (ZU6P), 24, Sandown Road, Bramley, Johannesburg, South Africa.
 B. F. FIGUEIREDO (F.R.S.37), 114, Richmond Road, Earl's Court, London, S.W.5.
 A. M. LAWSON (BRS312), c/o Richardson & Cruddas, 1st Line Beach, Madras, India.
 C. CADDICK (BRS313), c/o U.A.C., Ltd., Sapele, Southern Nigeria, B.W.A.
 A. G. W. SHANKS (BRS314), Orang Tea Estate, Orang P.O., Assam, India.
 LIEUT. G. LOWE (BRS315), The Prospect Hotel, Panchgani, Satara District, B.P. India.
 E. BAXTER (BRS316), c/o United African Co., Ltd., Motor Dept., Onitsha, Nigeria, B.W. Africa.

QRA Section

Manager: M. WILLIAMS (G6PP).

NEW QRA's.

- G2BL.—P. B. BURNETT, 42, Brook Dale, New Southgate, London, N.11.
 G2DN.—M. N. DURNFORD, "Merrilyn," Nettlecombe Avenue, Southsea, Hants.
 G2YN.—R. H. G. GARSIDE, 2, Norwood Crescent, Southport, Lancs.
 G50J.—H. C. TURNER, "Sunnybrook," Ewhurst, Surrey.
 G5PZ.—W. BURROWS, 11, King's Avenue, Seaburn, Sunderland, Co. Durham.
 G5RW.—R. B. WILLIAMSON, 74, Lady Lane, Chelmsford, Essex.
 G5YU.—C. F. SCRUBY, 7, The Grove, North Cray, Kent.
 G5ZS.—J. SMITH, 31, Sandy Lodge Way, Northwood, Middlesex.
 G6AS.—G. A. SWINSON, 23, Hawthorn Croft, Quinton, Birmingham.
 G6FB.—E. W. BURGESS, St. Ann's House, St. Ann's Street, King's Lynn, Norfolk.

- G6FI.—F. G. INGLETON, 168, Cherry Tree Avenue, Staines, Middlesex.
 G6FW.—A. WRIGHT, 106, Knowsley Road, St. Helens, Lancs.
 G6KS.—H. CAUNCE, 24, Vanbrugh Road, Anfield, Liverpool, 4.
 G6SF.—MISS B. SALTmarsh, Ivy Cottage, Tilford, near Farnham, Surrey.
 G6UG.—G. BECKITT, 24, Alfred Street, Grimsby, Lincs.
 2ACY.—R. G. LAVIS, 14, St. Mark's Road, Bath, Somerset.
 2BAI.—K. L. HOWELL, 148, Gunnersbury Lane, London, W.3.
 2BCM.—D. A. HOGG, "Arduaine," Leith Avenue, Portchester, Hants.
 2BCQ.—C. F. BARNARD, 90, Coombe Road, Brighton, 7, Sussex.
 2BJN.—R. JENNINGS, 9, Wheatley Road, Whitstable, Kent.
 2BTQ.—L. B. THOMAS, 48, Glennie Road, West Norwood, London, S.E.27.
 2BWG.—M. C. BUNTING, 40, Clarendon Square, Leamington, Warwickshire.
 E15F.—H. HODGENS, Deepark Road, Mount Merriem Estate, Dunsrum, Dublin.
 The following are cancelled: 2AWI, 2BGJ, 2BOW, 2BQR, 2BQX.

CORRESPONDENCE.

LET'S FILL THE DESERTS!

To the Editor of T. & R. BULLETIN.

DEAR SIR,—Some months ago in an Editorial you urged British amateurs to make more use of the edges of the 40-metre band.

My own experiences may be interesting. I have been using a crystal ground to 7,283 kc. This is right at the high-frequency edge of the band. There is rarely a station lower than me in wavelength.

In 44 QSOs, spread over seven days, I had only one report of QRM! This on the 40-metre band working during a week-end and in the evenings, when the QRM is heaviest! Also, I was working from a London address with an input of only 8 watts.

It would certainly seem worth while for more British transmitters to come out into these wide open spaces.

The fact that the width of the band is not generally recognised is shown by the futile energy of a well-known South London amateur who called me at great length, fighting the most horrible QRM and telling me to "check QRG"!

W. A. ROBERTS (G2RO).

L.F. FILTERS

To the Editor of T. & R. BULLETIN.

DEAR SIR,—With further reference to the short article entitled "A Novel L.F. Filter," which appeared in the April issue, I see, and was very interested in, a letter from Mr. G. G. Blake on this subject in the June issue.

I used the sound filter in order to reduce atmospherics in 1926. The idea was suggested to me by a German in South America, where we were both troubled by continuous static. I had not thought of using the method to make it easy to read, and pick out one musical Morse note from others, as by concentration, after a lot of practice, one ignores the note one is not reading, but the sound filtering did definitely appear to amplify the note to which it was tuned, and reduced the atmospheric content of the output from the receiver.

I had a certain amount of trouble with the carbon microphone (which was the only one I had available), but perhaps the date (1926) at which this method was used in practice, and successfully, by me is an excuse.—Yours faithfully,

W. A. D. HOWES (G2CF).

NOTES and NEWS



BRITISH ISLES

DISTRICT REPRESENTATIVES.

DISTRICT 1 (North-Western).

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

DISTRICT 2 (North-Eastern).

Yorkshire (West Riding, and part of North Riding), 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. H. B. OLD (G2VQ), 3, St. Jude's Avenue, Mapperley,
Nottingham.

DISTRICT 5 (Western).

(Hereford, Oxford, Wiltshire, Gloucester.)
Mr. W. B. WEBER (G6QW), 2, Balmoral Road, St. Andrews,
Bristol.

DISTRICT 6 (South-Western).

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

DISTRICT 7 (Southern).

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

DISTRICT 8 (Home Counties).

(Beds., 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. T. VAUGHAN WILLIAMS (G6IW), "Malincourt," Grosvenor Ave.,
Rhyll, Flintshire.

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 (Eastern).

(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.)
Mr. T. WOODCOCK (G6OO), "Conakry," Cardigan Road, Bridlington.

SCOTLAND.

Mr. JAMES HUNTER (G6ZY), Records Office, 51, Camphill Avenue,
Langside, Glasgow.

NORTHERN IRELAND.

Mr. W. GRAHAM (G1GGV), 5 Ratcliffe Street, Donegal Pass, Belfast

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

DISTRICT 1 (North-Western).

Manchester Section

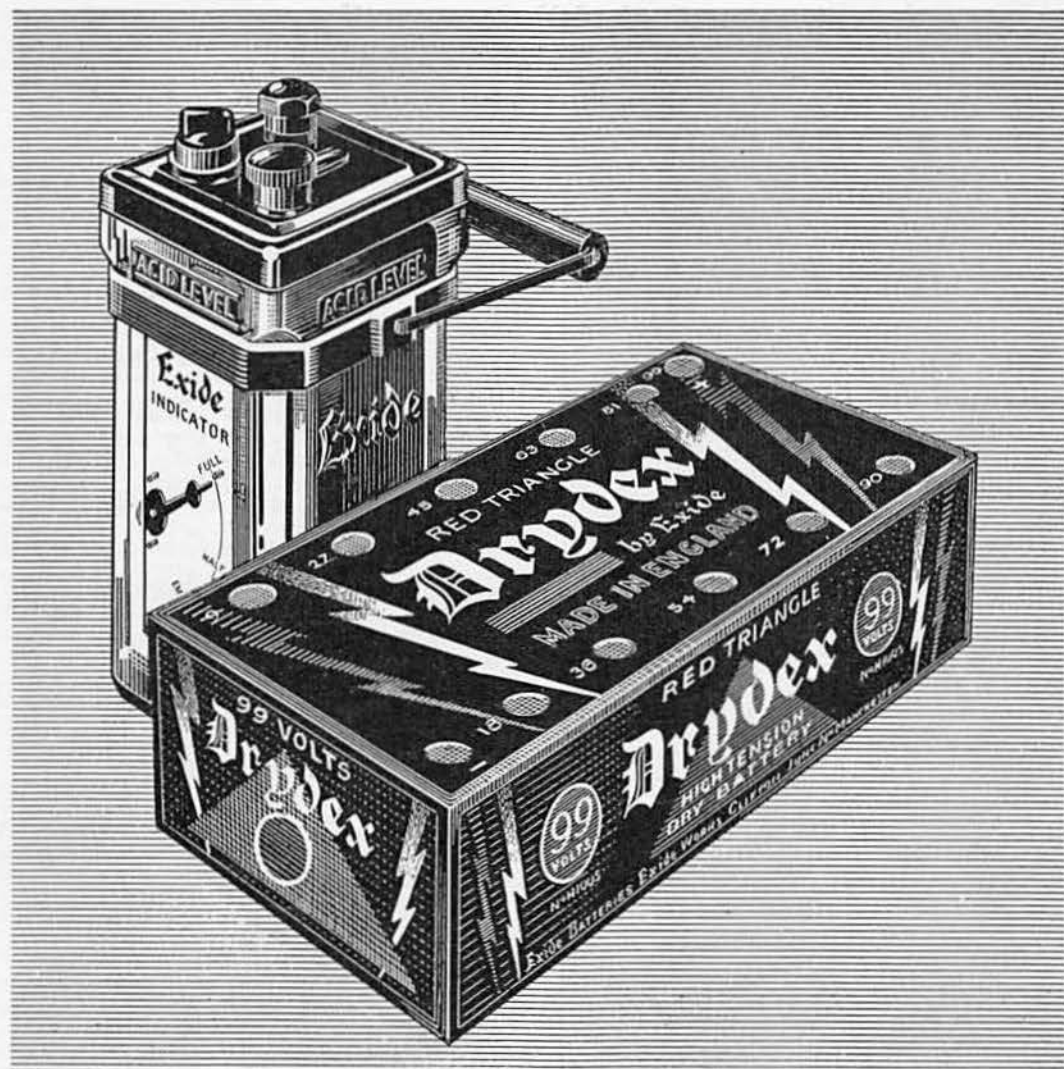
Now that Convention is over things seem to be brightening up a little in this section, and, judging by the attendance at the last meeting, when 28 were present, members are looking forward to some really fine meetings during the winter months.

Members are busy arranging a programme for the meetings ahead which will be interesting to all. They are hoping to obtain the films of the N.F.D. groups to be shown at one of the meetings, and on November 6 are having a practical 56 mc. night; all members are invited to bring their 5-metre gear for demonstration purposes. G2WP is to give a talk at the October meeting.

The following are individual reports covering the last two months:—5YD active on Thursdays and Sundays on 56 mc. and 1.7 mc. 5CH active on 14 and 1.7 mc. 2ACP has now built the new Ham Band two; also MO, BA, PA, with low power

mod. on BA. 2RB is re-organising after removal to shack. 5XC is working on mains transformers and simplifying switching. 2BJG is congratulated on passing test for full ticket; he is awaiting his call sign, and keen to get that brand new Zepp up. 2BZX building pentode CO. PA for 1.7 mc. G-201 working mobile TX on 56 mc. with excellent results; also busy on 14 mc. 2QN sends in his first report, and is active on the higher frequencies, working in co-operation with 2ACP. 2DH active on 14 mc. trying different radiators. 5AL reports QRT. 2DF active on 7 and 14 mc. testing grid modulation. 2AXH QRM from car. 6TL active on 1.7, 7 and 14 mc. 5PX busy on 1.7, 7 and 14 mc. 2JC rebuilding 56 mc. receiver; also standing by for 2DF. 5OZ now active again after illness, and thanks all those who sent 73's. 6ZU active on 14 mc. 2WP rebuilding for winter DX. 5FA active on 14 mc. The C.R. again thanks 2IN for collecting the following Southport district activities:—2AIO is now 6YR. (Congrats, om, and good

Support Your Local Meetings



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CI.72337

hunting.) He is working 14 mc. with some DX. 6SX is rebuilding, and will be on 14 and 1.7 by the time this is in print. He requires only VU, WBE and WAC. 50P on holiday, working 1.7. 6KY at camp with the O.T.C. 5ZR and 2AMQ active on 56 mc. 5ZI erecting 56 mc. gear at new QRA;

FORTHCOMING EVENTS.

- OCT. 16.—District 1 (Liverpool section). 8 p.m., at The Creamery Café, Whitechapel, Liverpool. Talk by H. D. Bramwell (G2RF). "Short - wave Receiving Aerials."
- * OCT. 17.—District 13 8 p.m., at Brotherhood Hall, West Borwood.
- OCT. 23.—District 14 (Essex section). 8 p.m., at G5VQ, 149, Westbourne Grove, Westcliff-on-Sea.
- * OCT. 23.—District 15. 7.30 p.m. at G6WN, 81, Studland Road, Hanwell.
- OCT. 24.—District 14 (East London section). 8 p.m., at BRS1977, 3, Burwell Road, Leyton, E.10.
- OCT. 25.—London meeting at I.E.E. 6.15 p.m. Tea, 5.30 p.m.
- OCT. 30.—Scotland A District. 7.30 p.m., in Room A, Institute of Engineers and Shipbuilders, 39, Elmbank Crescent, Glasgow.
- Nov. 3.—District 7. 2.30 p.m. at G2YB, 4, Hemdean Rise, Caversham, near Reading.
- * Nov. 6.—District 1 (Manchester section). 8 p.m., at Brookes Café, 1, Hilton Street, Manchester.
- Nov. 6.—S.L.D.R.T.S. 8 p.m., at Brotherhood Hall, West Norwood. Lecture: "The History of Amateur Radio," by J. D. Chisholm (G2CX).
- Nov. 12.—District 12. 7.30 p.m., at Wander Inn Café, Church End, Finchley. Talk by H. A. M. Clark (G6OT). "Some Notes on Low-Frequency Amplifiers."
- Nov. 22.—London meeting at I.E.E. 6.15 p.m. Tea, 5.30 p.m.
- * Sale of disused apparatus at this meeting.

busy on 1.7, 7 and 14 mc. 2IN working W fone at QSA5 R9 on 14 mc.; also fone on 7 and 3.5 mc. Reports ZL's good early morning on 7 mc. 2AAI on code, finished new H.F., Det. and 2 L.F. receiver waiting for full call. BRS1422 reports W fone good all through the summer. The Southport group are very much alive, and members will hear a lot of them during the coming winter.

The following stations are known to be active, but have not sent in reports:—2GA, 5VN, 5US, 6ZS, 6UQ, 6AX and 6QA. 2BK reports active on his RES group, also on 14 mc. The following

members visited London Convention:—2DF, 6ZU, 2BK, 2OI, 5YD, also our D.R. 6TW. 5OL, who is at present staying in London, was also present. Don't forget that next meeting—look at the District Calendar.

Liverpool Section

An attendance of 22 was recorded at the Liverpool meeting held on September 18, including 6SX and 6KY from Southport. Mr. E. Grey (VE5KP) visited the meeting and gave an interesting talk dealing with radio activity in British Columbia. Among other things he mentioned that the "VE5's" thought that the terrific W7 QRM accounted for the few contacts with "G" stations. During the meeting it was decided to form a committee of five to deal with the coming winter meetings. The following were elected to serve on the above:—Messrs. Stacey (G6CX), Bramwell (G2RF), Drudge-Coates (G2DC), Williams (2BNA), and Moss (BRS1839). Members who have any suggestions for future meetings are asked to get in touch with any of the above.

The following stations report:—G2DC experimenting with low-power portable 56 mc. gear for duplex working. G2RF has removed shack owing to landline QRM. Had VE5KP as visitor. Schedules have been arranged with VE5FL. G6DP is experimenting with E.C.O.'s, but finds difficulty in obtaining pure note. G2JT has been experimenting with doublers and an exciter unit. Also making detailed AA tests. G6CX having trouble from motor car QRM on 14 mc., and would welcome suggestions for its cure.

DISTRICT 2 (North-Eastern).

At the last meeting of the Newcastle area the local representative, Mr. Hornsby (G5QY) tendered his resignation, owing to increasing private work. Mr. Hornsby is a very popular member, and has been the means of creating a very active area around him, and it is with regret that we have to accept his resignation. He has the satisfaction of knowing that he leaves the post with the area in a "healthy" condition. Best wishes are sent to Mr. O'Hagen (2BGC), who has consented to carry on in his place.

We are sorry to lose G5FD, who has removed to Cambridge. G5RI has returned from his stay in S. Africa, where he met many of the local amateurs. Some unusual results with aerials have been obtained by G6IR, who will give full details later when the tests have been concluded. Link coupling has been adopted by G6AV with increased efficiency, and good results on QRP have been obtained on 7 and 14 mc. He expects to be on 28 mc. soon. A 33-ft. vertical Windom has been erected by G2LD, at a height of 85 ft.; he is getting fine results with it.

Reports from the Stockton area indicate continued activity. G5XT returns after a year's absence. 2BQO is using a system of remote control; aerial tests are being tried by G6ZT, who is now using a 66-ft. Zepp. with 50-ft. feeders; G6MF hopes to solve his trouble by removing to a new QRA.

Telephony on 7 mc. is being tested by G6CV, whilst G2FO is working on both 7 and 14 mc. with a new TX. There is plenty of 56 mc. enthusiasm locally, and it has been decided to run

Report Your Activity—Regularly

a series of skeds between G2FO, of Stockton, and G6MF, of Darlington, a distance of 12 miles. The pirate trouble seems to be at an end, as the stations are now being dealt with by the G.P.O. Our best wishes and *bon voyage* are sent to G2HZ, who has just left for Singapore.

The Leeds group are busy, and at a recent meeting, 6AZ, 6MY, 6WJ, 6VT, 5CX, BRS1098, 1650, 1834 were present, when a talk on Modern Receiver Practice was given by Mr. Ellesmere, of the Johnson Talking Machine Co. Work on 56 mc. occupies the attention of 6WJ, 6VT and BRS1650. 5CX will soon be on the air again from a new QRA.

A note is to hand from 2BWF, of 55, Corona Drive, Thorne, Doncaster, who would like to correspond with any member in the area regarding transmitting circuits.

The Bradford area is still in a healthy state, and the winter session of the Bradford Radio Society is now in full swing, where members attend regularly.

Meetings at members' stations will be continued during the coming months, and notice will be given of them in these notes, in place of the individual notices sent previously. Members are asked to make a note of this change, as the number of stations in the area is increasing. Members, whether in the area or not, are welcomed to all meetings.

Some tests on 56 mc. were recently carried out by 6KU and 6MC, using a car receiver. 6QS hopes to start up on this band soon. Fine DX has been worked lately by 6XL on 14 mc., and general activity by most stations is reported, these include 6BX, 5TQ, 2VO, 5VD, 5WK, 2QM, 2UY. Most members have been heard on 1.75 mc. on Sunday morning.

The Leeds meeting will not be held at BRS1834 on October 21, as the latter will be on holiday that week.

DISTRICT 4 (East Midlands)

A very successful meeting was held in Nottingham on September 22, at which it was decided that the Notts and Derby groups should hold combined monthly meetings in different towns throughout the District, in order that long distance travelling will not always fall to those living in outside areas.

The next meeting will be held on October 27, at 3.30 p.m., in the St. James' Restaurant, St. James' Street, Derby. Tea will be provided.

In order to make these meetings successful, a good attendance is essential. Don't forget—October 27.

G2SD.

DISTRICT 5 (Western)

The Bristol section held their usual monthly meeting during September, when 29 members attended.

It was arranged that the Technical Committee should consider the subject for a future lecture, and that the Field Day Committee should consider a 56 mc. field day and also proposed visit to Backwell radio station.

G5DJ are taking over for a few weeks the slow morse transmissions formally attended to by G5JH. G5KT read a most interesting paper on QRM, and dealt exhaustively with the subject afterwards, answering all questions most fully.

A special meeting was called and held at Bristol

on September 19, when 30 members were present to arrange for apparatus and the staffing of a R.S.G.B. stand at the Bristol Radio Exhibition.

All members willingly assisted on this stand, and over 350 copies of the R.S.G.B. Handbook were sold to interested enquirers, and many new members are expected in the near future.

The Oxfordshire C.R. reports activity somewhat curtailed this month owing to members being on holiday.

They welcome BRS1955 as a new member, and congratulate G5HS on working two ZL's on real QRP and G2CL on working his first VS6 and VK.

The Wiltshire letter budget was well supported last month, although many members were on holidays.

DISTRICT 6 (South-Western).

Although Convention took place in August, the D.R. was unable to make any comment on the proceedings, owing to the fact that the Secretary required the District reports for that month before Convention was over. The D.R. for the South-West would therefore like to take this, the first opportunity in District Notes, of thanking all those who contributed towards making Convention a very pleasant and interesting time for him. In this connection he would particularly like to mention G6LL, who has ever been a sincere friend of District 6.

The D.R. attended both the delegates and the business meetings, but as these will be dealt with fully elsewhere there should be no need to comment on them here. Apart, however, from the formal meetings, many members showed a great interest in the greatly increased activity of the South-West, and the local members may therefore rest assured that their District is no longer unknown.

There have been further additions to the membership in practically all parts of the District during the past month or so. These appear to be in the localities of Torquay, Plymouth, Taunton, Penryn and Bideford. In connection with the last-named town, it is of interest to note that G6FO, who is now residing close by, is arousing local interest, and hopes soon to have a small band of enthusiastic members.

The winter monthly meetings are commencing this month in Exeter and Torquay, the latter holding its first on Thursday, October 3. As far as possible, these will be held on the first Thursday of each month. Will any members who contemplate visiting the District kindly note? G5WY is arranging to hold the first Exeter meeting on October 24, and as this BULLETIN should have been out a week or so by then, it is expected that there will be a good attendance. The members in Plymouth and Taunton should now see to it and get their meetings on the go. What about it, OM's? There should also be meetings soon in the Penzance area, as G5IJ is doing his best to get the members together.

As regards individual activities, G6FO hopes to be going soon on 170 and 80 m., but has not yet had time to get the gear together. Some interesting QSO's on the latter band should be possible later. 5WY is looking forward to using an RK20, which is on the way, and reports a VK contact on 14 mc.

at 22.30 B.S.T., a most unusual time for the South-West. BRS1924 is now 2BPK. Congratulations!

The latest addition to the band of 56 mc. enthusiasts is our old friend G6WT, who has already had good reports with 4 watts input from dry batteries. 5SY heard LU1EP on 28 mc. at 20.10 on September 21. There have been a surprising number of visitors from other districts this month and the D.R. has been especially interested to have visits from 6RF and a BRS friend, 5IS, 5LL and PA0FB.

DISTRICT 7 (Southern).

The November meeting is fixed for Sunday, November 3, at G2YB, and full particulars are given in the District Calendar.

There are a number of individual reports this month. The D.R. is grateful to several members who have collected reports from members in their own immediate locality, for this assists a lot and also gives us news from those who for one reason or another are unable to report direct.

G2ZR sends the I.O.W. news; he has been active himself, and working two new countries this month has brought his total up to 22. G5UI is away at Portland and has not been on the air. G5ZQ is active, using a 3-watt CO-PA. The gale early in the month was felt at full force on the island, and did considerable damage to G5TZ's station on Arretton Down. The roof was lifted off the hut which houses the TX, and the eddy created by the gale did considerable damage inside the roofless building. Most of the damage was to valves and meters. The main 90-ft. mast was left standing, although made loose in spite of the fact that it was embedded about 12 ft. down into solid chalk!

G5JI has been doing very well on QRP, having worked a number of W's, SU and ZB with 5 watts input, using D.C. mains for power supply. He has found a half-wave Zepp much more effective than his old end fed half-wave.

G5XH sends the Croydon report. He himself has moved to Beddington, and hopes to be on the air before this appears in print. G2SR has moved, and is at present inactive, due to business. G6UB is busy with 100 kc. work, and finds some time to appear on 56 mc. G5XH says that G2TL, our worthy Editor, is actually back on the air on 56 mc. We trust that this revelation will escape the Editorial pencil. (It did.—Ed.!) G5BT has finished his very commercial looking TX, but, unfortunately, results are not all that could be expected.

Several Croydon members are interested in the formation of a North Surrey Radio Transmitters' Club, with headquarters in Croydon. Will anyone interested please get in touch with G5XH at 39, Lavington Road, Beddington?

G5ZK has been operating on 14 mc. exclusively this month, and in all has now worked 26 countries in three continents. First reports are to hand from BRS1940, West Wimbledon; BRS1995, of East Molesey; and Mr. Andrews, of Banstead.

Will those new members who have written the D.R. for particulars of the monthly meetings please note that particulars of these are given month by month in the District Calendar? It is an impossible task for the D.R. to give individual written notice of these meetings to each member by post.

In conclusion, will all BRS members please support 2AZX in his effort to get together at least 30 promises of entry, so that the Reception Tests, held in conjunction with the Society's contests throughout the year, may be saved from extinction? 2AZX wants at least three volunteer entries from each district, and the D.R. trusts that at least that number will be forthcoming from No. 7. BRS men so often complain that there is not much useful reporting available for them that it seems incredible that sufficient entries are not forthcoming when a fine opportunity like this arises. Promises of entry should be sent to 2AZX as follows: No. 356164 Cpl. Seymour, R.A.F., c/o Officer-in-Charge R.A.F. Records, Ruislip, Middlesex. No mention of radio must appear on the envelope.

DISTRICT 9 (East Anglia)

We are sorry to say that District 8 has not yet advised us of the date of their meeting. If, however, it should be fixed to take place before the next issue of the "BULL." is published, members will be advised.

G6QZ has been on a "ham visiting" holiday, and had a very good time in Yorkshire.

2ABX, who lives opposite the D.R., is now on the phone—King's Lynn 681. Members, please note.

G6FB has returned to school at Oakham, and taken his gear with him. He will be looking out for No. 9 on 7 mc.

Not many notes this month, members, but whose fault is that?

DISTRICT 10 (South Wales and Monmouth).

The meeting at Newport, on September 12, was attended by thirteen, including one new member. BRS1131 and 727 are now 2BBO and 2BSN, respectively. A hamfest was held at Cefn Coed by G5FI last month, but the report of this will appear next month. The only activity reported from Swansea is from G2UL, who hopes to be on increased power shortly and has been rebuilding with this in view.

The attention of C.R.'s and members is drawn to Editorial Notes at the top of page 105 of the September issue. Anything for the next issue should reach the D.R. at least three days before the end of the month.

DISTRICT 12 (London, North)

At the September meeting, G5CW related his radio experiences in a Cadet camp. His portable TX was used by the Signals Section to demonstrate the advantages of radio for communication. "Ham radio" came into its own when parades were over, and much interest was aroused. Some 20 Cadets took the G.P.O. Morse Test in connection with the Corps, and also became operators of G5CWP. The TX started as a CO-FD-PA, but owing to the inability of the crystal to stand up to the 600 volts delivered by the district generator, finished its days as a TPTG-BA-PA. On 7 mc. only Europe was worked, but on returning from camp, G5CW got down to a little DX, his bag including PK, VK, ZL and W6. At this meeting it was agreed that an organized sale should take place once a quarter, commencing at the November meeting, which will be held on Tuesday the 12th, at the "Wander Inn," Finchley. The gear for sale will be displayed throughout the meeting.

and prices must be clearly marked. The disposal will take place after the interval.

G5DJ reports again after being inactive for the past two months. He has not been idle, however, and has visited many of the South Coast members. BRS1754 has obtained his A.A. and is now 2ADK. G2QY has at last worked ZL, and now awaits confirmation for his WBE and WAC. He is testing aerial arrays and hopes to work some real DX soon! Intelligible speech may now be heard from this station, as a transverse current mike has been acquired.

G5BB is again active on 56 mc. and is co-operating with 5VY and 5JI on their Sunday morning transmissions. The input at 5BB is 8 watts, and reports will be gratefully received. G2SX has obtained a 28 and 56 mc. permit, and hopes to be on these bands shortly. He has commenced a complete rebuild, using c.c. on all bands. Both he and 5BO are getting down to superhets for use on all the bands. G5NQ is also building a C.C. TX for all bands from 7 mc. downwards. G2AT has worked VE1 on 14 mc. with an input of 5 watts. G5CD has been out with a 56 mc. portable, but has not reported on results. G5QF had his aerial blown down in the recent gale, but in spite of the unfortunate occurrence he managed to work ZS and ZE.

G6CL, now that 28 ft. masts have been erected, is working DX with more consistency. Schedules with ZL stations and with ZDSA have been maintained. For the information of local stations, his crystal frequency, when working at the top end of 14 mcs., is 14376 kcs. The crystal is an A.T. cut supplied by Quartz Crystal Co. This frequency has been checked on numerous occasions by the Band Monitoring Group and can be taken as accurate.

To give variety to district notes, three members have volunteered to take turns in preparing them. The D.R. wishes to point out that if these notes are to be topical, all members must report to him by the 20th of the month.

DISTRICT 13 (London South).

The district meeting, held on September 12, was attended by 18 members. Mr. Shersby (G2GZ) was, unfortunately, prevented from attending and no report could therefore be made on the progress of the "56 mc. Who's Who." It is earnestly hoped, however, that everyone interested in this branch of radio will support Mr. Shersby in his difficult task. As has been said so often before, "it's up to you, OM's."

The most important event during September in South London was the Conventionette held on Sunday, the 29th. Through the courtesy of the Air Ministry, a party visited Kenley Aerodrome and afterwards adjourned to the "Rose and Crown" at Kenley for tea. It is regretted that permission could not be obtained for a party in excess of 25 to visit the aerodrome and that, therefore, those members who made last-minute application for reservations had to be disappointed. We believe that those who did attend thoroughly enjoyed the event, in spite of the wet weather, and with the necessary support it is hoped to organise a Conventionette next year on a much larger scale in order that everyone may be enabled to attend. The D.R. would like to take this opportunity of

thanking 2BKT for all his valuable assistance in arranging the outing.

The next district meeting will take place at the Brotherhood Hall on October 17, when it is hoped to dispose of certain junk gear in order to swell the district funds. It will be remembered that several months ago many members promised to supply junk for sale, and it is hoped that these amateurs will not forget on October 17.

Now for individual reports, which are numerous this month. G2UW reports activity on micro waves. He is spending a great amount of time experimenting with BK oscillations. G5OX is still active on 56 mc. when business will permit, whilst G6GK reports no activity owing to illness. Hope you are fit again, OM! G2ND is rebuilding in anticipation of a good winter season. He intends to be active on 7 and 1.7 mc. and will be glad to



SOUTH LONDON CONVENTIONETTE.

September 29, 1935.

G6NF, 2BKT, 5LA, and 2WV in front row, third to sixth from left.

hear from anyone who desires co-operation on either of these bands. G5HF has been using 'phone on 7 and 14 mc. with suppressor grid modulation and intends to try series modulation, which he finds very satisfactory on 56 mc. G5HF also mentions that whilst using crystal control and a Collins coupler on the 14 mc. band, his signals have been reported outside the limits of the band. He would like to warn other users of a Collins coupler that this result may occur when too tight a coupling is employed.

G2GZ is still active on 1.7 mc., using 3.5 watts input, and reports continued success on the 14 mc. band. G2SB has lately been active also on 14 mc. and phone is now being tried on 7 mc. with encouraging results. We congratulate 2BUS on obtaining his radiating licence and call-sign, G2RD. He is anxious for contacts on 56 mc. (Apply to G2GZ, OM!) G2AI is rebuilding. G2HG is upholding the reputation of South London in the 28 mc. contest; his latest contacts are with LU and ZS. Good luck, OM, and may you come

out top! G6QN has now completed his new transmitter and reports having been in communication with 60 American stations during the past month. We extend a hearty welcome to 2AOP, who is a new member of the Society in this district. Good luck, OM, and do not forget to come along and meet the rest of the District at our next meeting.

On November 6, the next meeting of the S.L.D.R.T.S. will take place at the Brotherhood Hall. At this meeting Mr. Chisholm, G2CX, will deliver a lecture dealing with the history of amateur radio. Visitors to these meetings are always welcome and details of membership may be obtained on application to the Secretary, G5KH, or to the D.R.

DISTRICT 14 (Eastern).

At the October meeting of the Essex section, held at the QRA of G6CT, Westcliff-on-Sea, the attendance was 11. G5UK is away in Italy. G2KT on 14 mc. is getting good fone results from W. G6IF has built new 7 mc. TX and wants reports on his fone. Both 2BCF and 2AKA are experimenting with TX's in readiness for their full tickets. G6CT is testing on 14 mc. a new matched impedance aerial. 2BAI of Acton travelled specially to attend the Westcliff meeting. G6NW is obtaining the use of A.C. mains after years of patient waiting. G6CT is progressing with his "super." 2BWP, 2AKA and 2BCF have promised support to 2AZX who is trying to obtain sufficient numbers to influence the Society to reopen reception contests. It has been suggested that components be given as prizes instead of cups and certificates.

At the East London meeting, held at G6AU, Forest Gate, the attendance was 17. The following new members of the District attended for the first time and were welcomed: G6KM of Upminster, 2AVH of Chingford, 2BPY of Ilford, 2BBP of Poplar, BRS1926 of Ilford, BRS1174 of Forest Gate and BRS1977 of Leyton. In addition, HB9P was welcomed at the meeting and described methods employed by the U.S.K.A. for teaching its members the code. Arrangements were made for reopening the Morse class held at 2AYB, 16, Station Road, St. James Street, Walthamstow, E.17, at 8 p.m. on the following dates: October 21, 30, November 4, 13 and 20. The offer of premises by 2AYB is greatly appreciated; offers to instruct have been made by G5DY and 2BDI. The following stations were visited by HB9P: G6UT, G6CT, G5VQ and 2BWP.

DISTRICT 15 (London West and Middlesex)

A record attendance was had at the first meeting of the new session. A total of 24 turned up, including VE3WE, who has joined the area. Our thanks to 2BCN, who had to put up with such a crowd. It is hoped that at the next meeting it will be possible to show the N.F.D. films.

It is pleasing to note that a balance in hand has been obtained on this year's N.F.D. This will help towards our next effort.

The D.R. has been endeavouring to obtain views concerning the letter budget, and there seems to be three ways of running it. Firstly, it could carry on in the usual way and circulate to those who contribute; secondly, it could go

round to a rota each month, and those who failed to send in a letter for two or three months in succession should have their names removed; or thirdly, it could circulate as a circular budget in the shape of a book. Each person receiving it would be expected to write his report and send it on its way. In this latter way it would be difficult for the D.R. to get any sort of report for the BULLETIN unless a separate card was sent to him concerning activities alone. The first suggestion is not very good in practice, owing to the lack of regular reports each month, with the result that a member replying to the previous month's correspondents is not at all sure whether the members concerned will ever see the budget. The second way seems to be the best. Will members please let the D.R. have their comments?



Also, will members note that the D.R. should have their reports by the 25th of the month at the very latest.

Members who have not yet supplied their crystal frequencies should send them along to 2ASP (J. Paine, 38, Alpha Street, Slough) as soon as possible.

The D.R. has had a letter from 2AZX, appealing to him to encourage B.R.S. and A.A. members to help him to persuade Council to re-consider their decision regarding receiving contests. He requires at least three members in each district to volunteer to enter, and once having agreed, they must fulfil that agreement. Will those who are interested please drop the D.R. a line at once?

G5LI has now qualified for both W.A.C. and W.B.E., and only awaits the cards. He regrets the budget takes such a time to get round. G6VP lost his big mast during the gale and has tried a temporary half-wave vertical, only to find his

strength down two points, but can still work some DX. G5JL thinks the people who read district notes are those estranged and want to see what is going on at home. He reads District 9 notes before 15. He has managed to get a transmitter on the air again. G6CO is using link-coupling to a locked T.P.T.G. with fixed tuned grid, also re-built speech amplifier. G6WN has been on 14 mc., and managed WAC and WBE twice within a fortnight. BRS1226 has been busy with BCL set, and now finds he is not leaving the district. Has nearly finished rearrangement of station. 2BAI is on holiday and is visiting others instead of being visited. Has heard VO for the first time. G2BY not on much, but managed KA, W6, ZE and other usual DX.

DISTRICT 16 (South-Eastern).

The Folkestone group were very pleased to receive a visit from "Clarry" and 6PA one Sunday afternoon last month. The visitors arrived at about 3.30 p.m. at the QRA of 2GD, where they were welcomed by 2GD, 2IC, the Kent C.R. and 2AZM. 2GD having recently been appointed assistant manager of R.E.S., the hour before tea was occupied with a discussion on the working of the Section.

We heartily congratulate 2GD on his appointment.

The announcement of tea was the signal for the arrival of 6FJ and 2QT from Headcorn and Smeeth respectively, whilst 6XB and 2BZZ arrived shortly afterwards. It was a very merry party, and all the usual problems which beset the average "Ham" were discussed, and the results of the investigation of 2GD's isobar theory were discoursed upon at length.

After tea the gear installed upon the Hythe lifeboat was inspected by the visitors, and Clarry QSO'd 2GD from the beach under the call GWSP.

The party then proceeded to Folkestone, where 6XB's shack, which is reached by climbing about ten flights of stairs, was visited. The gear at this "five metre only station" was inspected with care, and very much admired.

Unfortunately there was not time to visit the Valiant Sailor, the site of many N.F.D. and 56-mc. tests, but the situation on the cliffs was pointed out in the distance.

The last visit was to the station of 2IC, where 2VI, 6CH and 2BAX were waiting to welcome the visitors, and where barley-water and sandwiches were, *inter alia* (!), consumed. Clarry made such potent remarks about the gear that all G2IC's efforts to wear a hat have since been abandoned.

After a very enjoyable afternoon the visitors departed with 6FJ at 7.30 p.m., in the forlorn hope of getting to Headcorn under pain of death in time for dinner at 8 p.m.!

So much for Folkestone. G2GB reports as follows:—

Whilst the lower frequencies are still being used by some of the North-West Kent group, 56 mc. still claims the attention of the majority. They are becoming increasingly super-het minded, and much good work has already been done. G2NK, with his excellent quality stabilized signals, forms a good station on which to test super hets. (We'll lend him to other districts at a small charge!) The hurricane did its best to rid the band of 2GB with his dual-note I.C.W. oscillator, but his dipole, which is suspended on rope and guyed with thin

string, defied its efforts. The dual-note, also adopted by 5LB, is produced by means of two LF oscillators on different frequencies, the result being musical. 2AW created a minor sensation by hoisting his long lines 56 mc. oscillator up the mast with no aerial on it, and radiating better signals than many people using aeriels. A general polishing of aeriels is likely to ensue. Other active stations on the ultra-shorts are 2ML and 5RK, with occasional transmissions from 2XW.

From Tunbridge Wells, G5OQ reports with grief that the gale brought his aerial down, and, as the 40-ft. high pole is embedded 5 ft. deep in concrete, it looks as though he will be QRT for some time. 5OQ and 2UJ keep regular 56 mc. skeds on Sunday mornings, and are getting ready to build a MOPA. 5KV and 6OB have new TX's, and are active on 7 and 14 mc., whilst 2UJ is doing well with phone and C.W. on 1.7 mc. 2AVN and 2AUM are not active, and 2BTI has not been seen for a month.

Six members of the Ashford group attended the last meeting at Folkestone, and it was gathered by way of report that they have not been very active lately, but are proposing to get down to some serious 56 mc. work at once.

In the Medway area, 6NU is doing some remarkable DX work on QRP, including LU and ZL, and is now WAC, on which achievement we congratulate him. 6VV is preparing to defend the trophy in the local contest. 5FN has been conducting experiments on angles of radiation with good DX results; his mast is now "*hors de combat*"—gale! 2CM has commenced experiments with electron-coupled circuits. 2VA has rebuilt his TX, and now uses a superhet with xtal. 6QC is now WAC (congrats.), but he also lost his mast—more gale—not so good! 2CS reports another mast down. 6RQ is very active; so is 2IZ. 5XB is building a SS super. 2MI has been finishing off 2IG's SS super, which he has bought. Reports no damage to aeriels during the sale, just to be different! BRS745 contemplates superhet for a 56 mc. receiver. The M.A.T.S. hope to hold their annual contest for the "Observer" Trophy and Harding Receiving Trophy during October and November. Stray-Conversation overheard locally: "The 1.7 mc. band still has a couple of broadcasting stations in the Medway towns."

From Sussex individual reports have come to hand from BRS1173 and BRS1852. The former has nothing special to report except that he is active, but the latter has been carrying out some very interesting reception tests on 7 and 14 mc. from the top of Clayton Hill on the South Downs, 700 ft. above sea level. With only a 15-ft. aerial and an O-V-2, he has heard some excellent DX with an average R strength of 6/7. Showing that a good location counts an awful lot in spite of all Uncle Tom says!

G2IC has undertaken the job of District scribe, and will in future prepare the notes. All reports, therefore, from both Kent and Sussex, should be sent to him, at 109, Cheriton Road, Folkestone, by the 15th of the month. The notes will actually be typed on the 20th of the month, so that any reports received after that date cannot possibly be included.

STOP PRESS: Received from the North West Frontier:—

"Hurricane wins second round,
2GB's aerial down!"

DISTRICT 17 (Mid-East).

Owing to an impending change of occupation, leading to absence from the district, the District Representative has been obliged to relinquish his appointment and also to resign all other Society work for the time being. Council of the R.S.G.B. will consider the appointment of a successor, to be announced later. To all who have helped and co-operated during past years is extended a lively appreciation and grateful thanks.

Reports of activity come to hand, upon the occasion of composing this last set of notes, from 2LR, 6AC, 6GH, 6LH, 6UG, 5FY, 5CY and 5BD.

6AC is seriously occupied with ultra short waves with a view to certain commercial developments. All in the district who are interested will perhaps help where possible.

G6UG is the new call sign of the late 2BQR, our old friend G. Beckitt, of Grimsby, a staunch supporter of our field days and outings. 6AK writes to suggest a scheme of furthering close contact for the collection of notes. His letter has been passed to the C.R. at Boston.

The divided camps over receiver design have a chance of hearing 5CY's Comet Pro. or 6GH's latest straight set and judging or condemning either.

The C.R. can now be called over the land-line on Boston 746, please note.

Members in the north are asked to give what help they can to our new member, Mr. Hargreaves Pawson, at Brigg, who stands in a somewhat isolated locality now that 5LQ is no longer active.

DISTRICT 18 (East Yorkshire).

Owing to Convention and other circumstances, it was not possible to forward notes for the last issue. Information covering the last two months is therefore included in the report which follows. The D.R. and G5VO were the only two members from the District present at Convention. It is hoped that a better effort will be made in future.

G5BP sends in some interesting news regarding Hull activities. His own station, which was put on the air last December using a c.o. f.d. with an input of 7 watts, was soon in contact with W3. The present apparatus consists of three stages with two "10's" in push-pull to the final operating on 7, 14 and 28 mc. The valves in the final stage are wired with the grids in push-pull and plates in parallel. The aerial is a 67-ft. Windom, 25 ft. high at one end and 6 ft. at the other. Considerable work has been done in connection with aerial coupling and angle radiation. Low-angle radiation has certainly been achieved. The receiver is an SG-V-1 with R.A.C. for plate supply. NY2AB was recently contacted on a test call, whilst all U.S.A. districts, excepting W7, have been worked, together with VE, K4, VU, PK4, J, YI, ZC6, PY, LU, SU, U9 and VP5. During September, G5BP installed a Collins coupler for 7 mc. work, and a new aerial, using heavier gauge. R6 reports have been received with this arrangement from VE5, VS6 and PK. On September 18, a 14 mc. contact was made with VK2HY, giving this station qualifications for W.B.E. and W.A.C. VK3EG has since been worked on 7 mc., giving a total of 57 countries since April.

G6OY has been active on 14 mc., working W5, 6, 7 at an average report of QSA 5 R6. ZT has also

been worked, at last, after rebuilding the transmitter, using an 89 as C.O. and a crystal frequency of 7,015. This station will shortly be active on 3.5 mc. G5GC, although busy with Society work, continues to put out good quality phone on 7 and 14 mc. He recently worked W and VE on 14 mc. G6KN, recently licensed, is active on 7 mc., and has worked 12 countries to date. G6OS recently rebuilt for A.C. operation after a changeover in supply. He has constructed a Westector phone monitor, and is well satisfied with the results. A new A.C. receiver has also been installed, and the speech amplifier rebuilt. A tri-tet C.O. is being tested. G2QO, after an illness, is carrying out aerial tests on 7 and 14 mc., and has resumed his schedules on the former band with VK3EG. W6AW, a seagoing operator, recently visited G2QO and 5BP. G6PQ is active, but still finds that American stations are elusive on 14 mc. G5MN is not fully satisfied with his Collins coupler, on 7 mc., but has worked XU and W on this band. G6FQ, who was granted the call-sign G6WX by mistake, is putting out a strong signal on 7 mc. He, together with 6KN and 6PQ, the three recently licensed Hull stations, are congratulated on the excellence of their transmissions.

Two new B.R.S. members, 1936 and 1948, are heartily welcomed to the district. Their continued support at the local meetings is much appreciated, as are their useful reports on local telephony transmissions. BRS1948 is entering for the VK-ZL contest.

The Scarborough Short Wave Club held their general meeting at the Bellevue Hotel, Scarborough, when it was decided that fortnightly meetings and lectures will be held on alternate Mondays.

Mr. Hamlyn, of Hessle, becomes G5HA. He is using an A.C. pentode as modulator on 7 mc. 2BWS, also of Hessle, is applying for membership, and hopes to obtain a full call before Christmas. He possesses some very fine transmitting and modulating equipment.

It is understood that G2QO, 5BP, 6OS, and 6OY are taking part in the DX contest, and the D.R. wishes them every success.

Hull and District members are requested to send all reports in future direct to G5BP, who has been appointed District scribe. His telephone number is Central 7120 for those who do not wish to forward written reports. In this area great keenness is being shown by the members, and it is proposed to revive fortnightly meetings at G5BP's station. The D.R. would like to have the opinions of members on this point.

SCOTLAND

Scottish news is still rather scant, the winter activities are not yet in full swing.

G2MG had an interesting QSO on August 18, at 18.00 G.M.T., with VS3AC, of Malaya. This station is owned by Mr. Maxwell, who, until a few months ago, was G2RQ, of Musselburgh. VS3AC reported G2MG's sig. as QSA 5, R5, while VS3AC's sigs were R4/3. Since this contact, G6FN has had four contacts with VS3AC on sked. G6FN, however, reports that conditions

for working Malaya have deteriorated considerably recently.

The following changes fall to be recorded: Mr. Harrower, 2AVC, is now G6NX; Mr. Wilson, BRS1374, is 2AWD; while Mr. Landles, 2BWV, has been offered a full licence subject to his passing the morse test.

The Scottish Radio Exhibition, held in Glasgow, was well attended by members.

Scottish Records Office wishes to draw the attention of members to the fact that the only address through which it may be reached is 51, Camphill Avenue, Langside, Glasgow, S.1. Another point to which we wish to draw members' attention concerns crystal frequency allocations; recently several instances have come to our notice of members buying crystals without first having consulted the register for an allocation. The register is maintained for the mutual benefit of all concerned, and if members ignore it much of its value is lost.

The first meeting of "A" District was held on September 25, and a record attendance of members was present, including G6IZ from Aberdeen and a party from Edinburgh.

Two important presentations were made during the evening. As all are aware, Mr. Jack Wyllie recently retired from the position of Scottish Manager. This formed a most suitable opportunity to show the appreciation of the members for his long and untiring efforts on their behalf, and it was decided some time ago to raise a fund to purchase a gift. At the opening of the meeting, Mr. Ingram, G6IZ, was called upon to make the presentation to Mr. Wyllie on behalf of the Scottish members. Mr. Ingram gave a short resumé of the past efforts and achievements of "YG" in the work of the Society in Scotland. Following this, Mr. Ingram handed over the gift, which was an all-electric super-het, bearing an inscribed plate to commemorate the occasion. After Mr. Wyllie suitably acknowledged the gift, he sprang a great surprise upon the audience by intimating that he had decided to present a trophy for award to the Scottish membership. The trophy is a very beautiful silver cup. The conditions of award are as yet undecided, but an announcement will be made very soon. On behalf of the members in Scotland, Mr. Kollien, G5IG, accepted the trophy and heartily thanked Mr. Wyllie for his generosity.

Arrangements for meetings in "B," "C," and "D" Districts are still uncertain. "D" are still seeking suitable accommodation. In "A" district it has been decided to hold additional meetings for BRS and A.A. members, to assist them to qualify for further advancement in status. At time of writing details are not yet to hand, but full information will be given next month.

Northern Ireland

Conditions have been rather patchy during the past few weeks, but several stations have been collecting good DX. 5UR has worked the following new countries: ON4JJ, VS6, VS1, K5, PK4, W5, and ZE1, whilst 5QX reports contacts with K5, VP2, VP5, HP1, VS1, and VK5.

6YW got WAC in 5 hrs. 40 mins. on the 14 mc. band, with the following QSO's: VK5, VS6, ZE1, W6, PY2, and OH.

6TK asks us to express his appreciation to PAO amateurs for the welcome given during his recent visit.

GI amateurs wishing to purchase copies of the third edition of the "Guide" can obtain same from the D.R. CEYLON.

EUROPEAN NOTES

Denmark.

By OZ7Z, E.D.R.

The annual meeting of E.D.R. was held on September 15, in Copenhagen, where the following new council was elected: James Steffenson, OZ2Q (President), Ahrent Flensburg, OZ1D (Secretary), H. T. Petersen, OZ7Z (Assistant and Foreign Secretary), W. D. Bowadt, OZ5CC (Hon. Treasurer), Poul J. Jensen, OZ7GL (QSL Manager), Helmer Fogedgaard, OZ7F (Editor, "OZ"), Steen Hasselbalch, OZ7T, K. Larsen, OZ7KL, E. Eliassen, OZ2E.

The financial position of the society has improved much during the past year, so that it is now possible to reduce membership dues from 18 kroner annually to 12 kroner. There are now more than 300 members and the number is steadily increasing.

The newcomers have, however, caused E.D.R. great trouble as a great many start transmitting without a licence. This in spite of the fact that licences are easy to obtain in this country. It appears that more than 150 unlicensed calls have been used and a number of licensed calls pirated, so if foreign amateurs are without an answer from Danish amateurs, they will know the most probable reason. The Danish QSL bureau does not forward cards to unlicensed amateurs, but the cards are kept in the hope that the cards in future can be forwarded when the amateurs in question get their licence.

The new Council is aware that this state of affairs cannot be tolerated in future. All illegal transmitters will now be traced and when found they will be fined and, perhaps, their transmitters will be confiscated, which has already happened in some cases. All information, which may help the Society to trace illegal Danish transmitters, will be highly appreciated.

During August our new President, OZ2Q, visited Holland, where he was cordially received by the Dutch fraternity. They were highly impressed by 2Q's ability to speak the Dutch language. He had learned it by QSO's with PA stations and by studying with a Dutch friend!

Helmer Fogedgaard, OZ7F, Editor of "OZ," and OZ8X visited the World Exhibition in Brussels, and were cordially welcomed in the Television Hall by the operators of ON4WS.

According to reports, OZ2M, 9WB, 1NW, 8D, 5J and 1A/7S have been the most active DX workers lately.

The following new stations are licensed: OZ2J, 2PX, 4Z, 7CC.

Foreign amateurs who intend to visit Denmark, are invited to communicate with the Society, and everything possible will be done to make their stay as pleasant and as interesting as possible.

(Continued on page 162.)

Empire



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, Vict.; A. H. Mackenzie (VK4GK), Fire Station, Wynnum, Brisbane; G. Ragless (VK5GR) South Road, P.O., St. Mary's, S.A.; N. F. Ollivier (VK6FO), 26, Merriwa Street, Hollywood, W.A.

Bahamas, Bermuda and the Eastern Part of the West Indies.—P. H. B. Trasler, (VP4TA) Pointe 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 St. 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 Transjordan.—F. H. Pettitt (SU1SC), Catholic Club, Mustapha Barracks, Alexandria.

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

Irish Free State.—Col. M. J. C. Dennis (E12B) Fortgranite, Baltinglass, Co. Wicklow.

Jamaica, British Honduras, Turks Island and Cayman Island.

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

Malaya and Borneo.—J. MacINTOSH (VS2AF), 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, Travancore.

Australia

By VK3EG.

To all appearances 20 metres is undergoing the usual changes noticeable at this time of the year, when the U.S.A. and Canadian signals weaken during daylight hours, and Asia starts coming in around 7 p.m., our time. Later Europeans will be heard here around 11.00 G.M.T., if conditions follow on as usual.

Already VS1AJ and VS3AE have been heard at 09.00 G.M.T. VK2EP has been working fone to W and VE on 14 mc., and the reports have been very encouraging. This station takes pride of place for DX fone work on 14 and 28 mc. VK4BB also puts over nice fone, working W with 18 watts input.

In the north 28 mc. has been very consistently workable, but elsewhere in VK nothing of note has been heard or worked.

Summer conditions are returning on 7 mc. VK3EG worked VS and VU early in August, and from now our VE contacts will be on this band. VK2XQ is again on the job, after being off for a year or more.

Everyone is preparing for the DX contest, and this year we again look for enthusiastic support from G amateurs. Slight alterations in the rules provide for an additional 500 points for each contact DX on 28 mc., and a limit of 50 w. input in the handicap section. English amateurs should watch for VRIAM, who puts out a fine signal.

VK5FM has returned to 7 mc. with an 800 final, VK2HF works DX with a pair of 830's, and quite a number have installed the new graphite anode 203 A's. New calls heard from the west are VK's 6AA, 6AE, 6MO, 6CP and 6E, and activity there is evidently on the increase.

VK4BB worked VP4TC in Trinidad, thus making a W.B.E. in all six continents. The latter station is coming in here very well. VK3EG worked his first EI in EI6F.

ZB1I has been frequently heard on 14 mc., but seems too intent on working G. What about a call, O.M.?

Later News.

The Fisk Trophy Contest has recently taken place. In the south 14 mc. has gone dead at 05.00 G.M.T., but is much better for Europe at 17.00 G.M.T.

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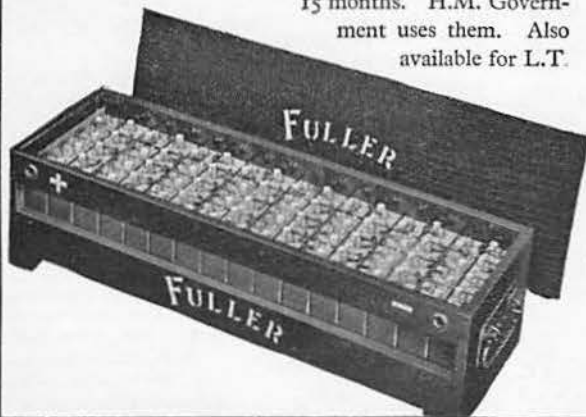
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VK2EP is now VK3BD, and will be on 28 mc. shortly. VK3EG has received confirmation of his reception of ON4AU's 28-mc. signals early in June.

Conditions on 7 mc. have greatly improved. VU stations have been worked with ease, and VQ8AF comes through regularly. ZE1JB was heard by VK3EG at 15.00 G.M.T., September 5, a rare occurrence. VQ4CRQ, a new call, has also been worked.

Commercial QRM seems to be on the increase.

Canada (Third District).

By VE3WA via G6NJ.

Conditions in Ontario have been very poor during the past month on all bands. On 14 mc. Europeans are weak and fading is bad. VK and ZL stations have not been coming through well, and we expect them to disappear entirely when the fall and winter seasons approach. No reports have been received this month from any Ontario Stations. VE3WA is re-building.

Ceylon.

By B.E.R.S. 196.

Lately reception conditions have been very patchy, rarely are two consecutive days of similar conditions. Even signals from the usually consistent stations of VU2 and KA1 have frequently been abnormally weak. During latter end of August, G, PA and OH were coming in well around about 23.30 G.M.T., but none of the local stations appear to have established contacts.

South-west monsoon conditions still prevail, and no doubt this is the cause of the indifferent reception conditions.

A little co-operation from the active transmitting members of Ceylon is needed, for at the moment only VS7RP is showing any keenness in R.S.G.B. affairs.

It is reported that a commercial station, RPA, is causing QRM in the early mornings at the high frequency end of the 7 mc. band.

Egypt.

By SU1SG, via SU1WM and G2AS.

Conditions still remain erratic, but eastern DX can be worked in the early morning and some afternoons, while W6 and W7 can occasionally be heard in the early evenings. SU1RK has been testing on 56 mc., using an input of 7 watts, and has put out good quality phone over a distance of six miles. SU1FS has completed his 3-stage crystal rig, using a pair of 10's in P.P. final. SU1CH is now C.C. and is also putting out a good quality phone signal.

From Palestine we have news that ZC6CN and 6FF are again active; at present they are both using the same rig, but hope to have separate licences in the near future; they are also joining B.E.R.U. It is hoped that all SU members will co-operate in the 80-metre tests organised by the R.S.G.B., which are arranged to take place during December, 1935.

Irish Free State

By EI9D.

Work this month has not produced anything of special interest. EI5F has been getting settled in his new QRA. EI6F, 7G and 8G are busy with approaching examinations.

EI9D had many W contacts following the landing of Lieut. Waitkus, the Transatlantic airman, who was forced down at Ballinrobe on 22nd inst.

A contest open to EI is being run in GI during the week-ends, October 26-27 and November 2-3. Full particulars are obtainable from GI5OY, 74, Wheatfield Crescent, Crumlin, Belfast.

New Zealand.

By ZL3CP via ZL4FO, G6CJ and G6K1.

Since the departure of ZL4AI to England, and the advent of extremely poor conditions, we have been out of touch with Headquarters for some time, but now that contact has been re-established with England we can once more contribute regularly to the B.E.R.U. Empire News section.

ZL3CP has arranged schedules with each of the four ZL districts, and will obtain weekly reports from them on DX conditions.

The 7 mc. band is becoming active after a long spell of poor conditions, and European signals can be heard around 18.00 to 19.00 G.M.T. British stations have been particularly good, amongst those heard and worked being G6AQ, 6CJ, 6VP, 6TM, 6CL, 6K1, 6RV and E1SG. If conditions remain as they are, there should be some good work done during the VK/ZL contest.

Although the 14 mc. band has been somewhat patchy, there have been several excellent periods with really good DX conditions prevailing.

On 28 mc. 3AJ reports silence during July and August, but September has found commercial harmonics becoming audible again, and it is hoped to establish contact at least with VK again very soon.

A new Government regulation gazetted this month limits the input of all ZL amateur transmitters to 100 watts.

Summer-time commenced in N.Z. on September 28, when clocks were advanced half an hour.

Regarding the Empire QSO party, ZL1AR reports general disappointment; very few stations were on the air and none worked in several hours' listening.

Northern India

By VU2LJ via VU2JP and G6NF.

VU2EF, ex-BERS79 and VU2EQ ex-BERS271 are new calls swelling the ranks of active VU amateurs. Unfortunately, VU2EF is due to leave India at the beginning of November, but he hopes to get going as soon as he arrives in England. Both 2DB and 2DK are rebuilding to CO, PA. This will make North India practically 100 per cent. active, which is a record to be proud of.

VU2FP is off the air permanently, all radio having been forbidden by the local authority. VU2LJ is busy trying out a half-wave vertical against a full-wave horizontal aerial, but results are very contradictory as to which is the better.

Conditions generally were poor during the month, blanketing occurring on 14 mc., and difficulty was experienced in working DX stations from Asia, although many were heard.

(Continued on page 162).

EDITORIAL.—(Continued from page 121).

speech at Convention, this ideal condition can only be reached when the Council of the Society can be assured that the membership total is sufficiently high to warrant additional expense with safety. A total membership of 3,000 would seem to be the lowest minimum upon which Council could consider such an appointment, so that our hands must remain tied for the time being. In the meantime, it will be our policy to endeavour to provide our members with the maximum amount of new material possible. That we shall fall short, when compared with American standards, we have no doubt, but our organisation is being built up on solid foundations, and we feel confident that when a fully-paid technical staff is employed we shall be able to hold our own.

At an early date we hope to publish full details of a new trophy which is to be presented for original development work; this, we believe, will provide an incentive to our members to show that British amateurs can still be depended upon to make new contributions to our knowledge.

CONVENTION.—(Continued from page 125.)

and Lee; Sir Isaac Pitman & Sons; George Newnes, Ltd.; Loomes Radio; Quartz Crystal Co.; Barnes and Humby; E. R. Martin; British Blue Spot Co.; W. Andrew Bryce & Co.; Mervyn Radio & Television Co.; Reliance Manufacturing Co.; Edison Swan Electric Co.; General Electric Co.; Jackson Bros.; Fuller Accumulator Co.; British Television Supplies; Oliver Pell Control, Ltd.; Graham Farish; Pertrix Battery Co.; N. E. Read; High Vacuum Valve Co.

The dinner concluded with the singing of "Auld Lang Syne" and the National Anthem.

Appreciation.

It is impossible to record the names of all of those who assisted Headquarters to make our stand at Olympia and our Tenth Convention so successful, but we would mention the following in particular: Messrs. H. Wilkins (G6WN), J. B. Kershaw (G2WV), G. Exeter (G6YK), R. E. Pidsley (G6PI), R. T. Reed (G2RX), J. Goddard (2AHM), S. Pollard (G2GB), P. M. Carment (G5WW), L. O. Jones (G2JO), R. Loomes (G6RL), A. W. Hartley (2BTZ), and S. Buckingham (G5QF). Without their aid and the assistance of many others it would not have been possible to achieve the results obtained.

EUROPEAN NOTES.—(Continued from page 157)**Belgium**

By ON4AU.

During the past month DX has been good on all bands. On 28 mc. LU has been coming through, and ZSIH and ZUIC have been heard at R7 in the afternoons. ON4AC has been heard at R2 by VK4EI on 28 mc. This VK station was received at R4/5 by OH7NC on September 15. A QSO between VK or ZL and Europe is almost certain to take place during the coming winter.

On 14 mc. notable DX were: HJ3AJ, VP90, YS1FM, XU2JM and HH5PA. ON4NC has received his SW3 from U.S.A., and is now working on 14, 7 and 3.5 mc. VK's are very numerous on

14 mc., and QSO's are possible all day. The same applies to W6 and W7.

ON4HB has left for London, where he will doubtless soon be on the air with a G call. We wish him good luck with our friends of the R.S.G.B.

B.E.R.U. NOTES.—(Continued from page 161.)**Northern and Southern Rhodesia**

By ZE1JB.

It is regretted that owing to lack of material no notes were sent in last month, and I again appeal to members to send in to me their reports about the 15th of each month.

The Experimental Radio Advisory Committee proposed by the Postmaster-General has now been formed with two representatives of this Society to act in amateur interests. The first meeting is being held early in October, when it is hoped to have certain matters cleared up and the whole position as to granting of experimental licences placed upon a sound footing.

It has been suggested that the attention of certain English experimental stations should be drawn to the great difficulty experienced in reading their signals on account of the back wave, which is very often of almost the same strength as the keyed signal. The trouble is worst when the signals are weak.

Will any New Zealand amateurs who hear ZE signals please let me know at once with full details of frequency used, times of day and such other information as may be deemed useful?

With the advent of the hot weather DX on 14 mc. has again come into its own, but conditions are inclined to be somewhat erratic. Europe can be worked almost any evening, but the strength varies considerably. On the other hand, the U.S.A. signals sometimes come in during the early afternoon, and on other days they are only audible about 19.00 G.M.T., while sometimes not a signal is heard from there. Three Bulawayo amateurs are at present co-relating their logs and comparing results with pressure observations from all over South Africa and Rhodesia, and some very interesting general theories, supported by the necessary practical data, are expected shortly in connection with reception conditions.

ZE1JE is now using a National HRO receiver. ZE1JH is rebuilding a c.c. outfit, and hopes to be active soon. ZE1JJ was unable to take his final amplifier with him, and so is unlikely to operate on 14 mc. ZE1JN is using a home assembled American superhet, the All Star Junior, and finds it very satisfactory. ZE1JS, a new-comer to the ranks, is doing excellent DX on 14 mc., with about 40 watts input on a pair of 46 tubes in the final of a c.c. outfit. ZE1JB has been having some trouble with QRM between himself and JN, due to the proximity of the two stations, but after a good deal of experiment matters are now satisfactory. Both of us will be pleased when JN moves to his new abode in a few months.

Southern India.

By VU2JP, via G6CJ.

VU2EB reports marked improvement on 7 mc. in August and further improvement in September, but QRN is still bad. 2AU reports having trouble with BCL QRM from keyclicks, and is working to cure this. 2EB reports nil on 28 mc. in September.

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