A NEW TRI-TET 100 WATT TRANSMITTER

THE T. & R.

BULLETIN

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AND THE BRITISH EMPIRE RADIO UNION

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BETWEEN NOW AND THE CAIRO CONFERENCE

THE time seems opportune to mention, especially for the benefit of the 1,000 or more new members who have joined us since the last Editorial dealing with international matters was written, that once every five years the governments of the world meet in conference to discuss all matters relating to telecommunications. This Conference deals with every aspect of radio and line communication.

At the conclusion of each Conference regulations are drawn up which eventually are ratified by the governments concerned. Decisions affecting our welfare as radio amateurs and the welfare of our colleagues in every part of the globe are tabulated in the final Convention, and therefore, in order that we shall be fully represented when these decisions are made, the International Amateur Radio Union (I.A.R.U. for short) arranges to send delegates to attend the Conference.

The next International Telecommunication Conference is to take place in Cairo in 1938, whilst a technical meeting of experts will be held in Bucharest early in 1937.

From now until the Cairo conference all national societies will endeavour to prepare the way for the submission of certain recommendations aimed at improving our operating facilities.

This will be achieved in numerous ways, but the most important from our point of view will be the establishment of close relations with the Post Office authorities. Already we have a satisfactory liaison with that body, and as time progresses the Society's representatives will endeavour to obtain an assurance from the Government delegates that the recommendations of the I.A.R.U. will receive favourable consideration from them at the Conference.

Two tasks which were initially suggested by the R.S.G.B. have now been followed up by overseas societies. First, Band Occupancy checks, second Commercial Activity checks. The story of our own Band Occupancy Group work appeared in a recent issue of this Journal, whilst a preliminary announcement regarding the Commercial Activity checks was contained in our Secretary's report published in January last.

These two tasks are of vital importance to our future welfare, but they cannot be brought to a successful issue without the whole-hearted support of a number of keen members. We would urge all who have an interest in International Amateur Radio to offer their services to the organisers of these two groups.

It is our intention to keep our members fully informed on International matters, because we feel that they should share with us at Headquarters the responsibilities which are attached to a National organisation.

A 100-WATT TRI-TET EXCITED TRANSMITTER

By G. McLean Wilford (G2WD).

PART II.

THE METERS AND METER PANEL.

IT is the intention of the writer in this part of the article to give some practical operating notes regarding the Tri-tet excited transmitter described in the last issue of this journal, but before doing so it is desirable to explain the various meters which are shown in Fig. 6. All meters are of the *Howard Butler* type.

Bottom left, 0-3 m.a.
Bottom right, 0-100 m.a. } For modulator unit.

Meter panel from left to right :—

(1) Tri-tet, 0-100 m.a.
(2) 1st F.D., 0-50 m.a.
(3) 2nd F.D., 0-50 m.a.
(4) P.A. Grid, 0-20 m.a.
(5) P.A. Screen, 0-100 m.a.
(6) P.A. Plates, 0-250 m.a.

The knobs on the modulator panel are for Gain control (above jack) and microphone battery control (right edge).

By referring to Fig. 2 in Part 1, it will be noticed that there is a panel to which are fitted three sockets, the middle being a 7-pin and the two outers 5-pin types. Fig. 7A shows the connections to the meters looking *at* the sockets, whilst the bottom socket on the speech amplifier is shown in Fig. 7B. From the meter input sockets cables are taken to the exciter and P.A. unit sockets, which are shown in Figs. 3 and 4, Part I.

OPERATION AND TUNING.

It is proposed to describe the operation of the three units in detail, and in the following order:—

(*a*) Exciter unit.
(*b*) P.A. unit.
(*c*) Modulator unit.

(*a*) *Exciter unit.*

Before describing this unit, the writer would like to reiterate a warning regarding the tri-tet oscillator. *It is fatal to the life of a crystal to tune the plate circuit of the C.O. pentode to the same frequency as the crystal and the cathode tank circuit.* The reason for this is that the No. 59 valve is not a true screen-grid valve, and there is a possibility of heavy R.F. feed-back to the crystal occurring, which will have dire results as far as the crystal is concerned. The writer has found that by using the smallest possible capacity in the grid cathode circuit that will give good oscillation, a high harmonic output for doubling in the plate circuit can be obtained.

Proceeding now to the actual operation of the exciter unit ; it will be assumed that the transmitter is to be operated in the 3.5, 7 and 14 mc. bands, using a 1.7 mc. crystal. The coils L6, L7, L9 and L11, correspond to those shown in the coil table as A, B, C, D, respectively. It is now desired to test the tri-tet portion of the exciter unit on 3.5 mc. The switch S2 is open and S5 operated to the position which will cut-in the coil L8. The valves having previously had their heaters warmed up, the H.T. (350 volts) is switched on. The condenser C9 is set at the minimum value which will give good oscillation at the crystal frequency. C16 is then tuned until a dip is observed in the plate milliammeter. Oscillation can be checked at this point by means of a loop and lamp.

Proceeding now with the two halves of the doubler valve, S2 is closed and the H.T. switched on to the first half of the No. 53. The familiar resonance dip will again be noticed and incidentally C16 may require to be slightly retuned. The output is again checked by a loop and lamp. The H.T. to the second half of the 53 is now switched on and this stage tuned to resonance by means of C18 ; again it may be necessary to readjust C16 and 17 in order to obtain the best output.

The plate currents observed by the writer when testing the transmitter described

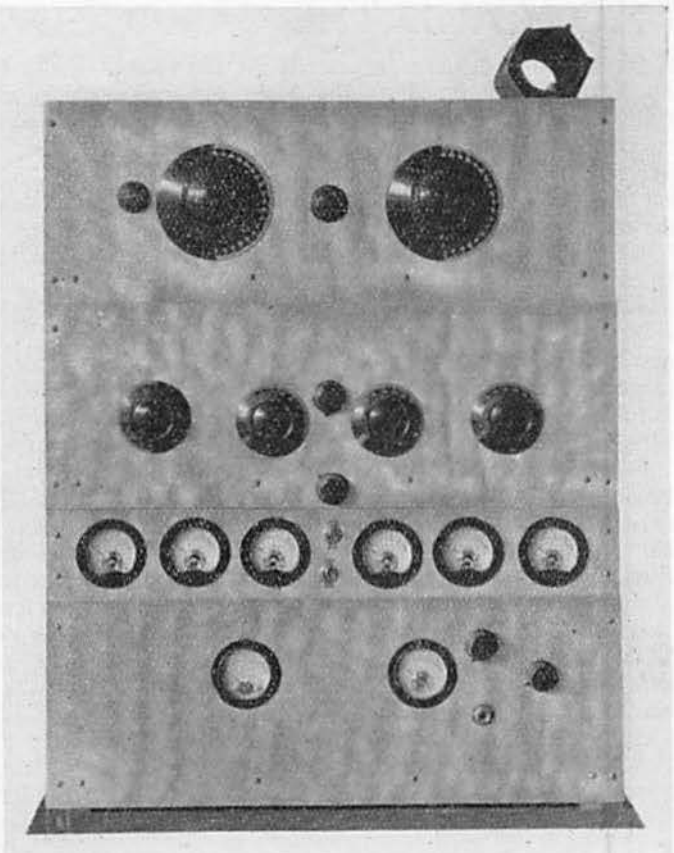


Fig. 6.
Front view of the complete transmitter.

were as follows: Tri-tet 40-50 m.a. 1st F.D. 10-15 m.a., 2nd F.D. 20 m.a., but it must be remembered that these figures will vary slightly in all cases.

It will now be seen that by moving the switch S5 into its appropriate position, the output of whichever band it is required to use, is immediately transferred to the P.A. grid circuit. If it is desired to change frequency slightly, the 3.5 mc. crystal can be cut into circuit by the switch S1, but before doing this the H.T. must be switched off both valves and the grid cathode condenser put full in, so that the outside plate, which is bent slightly, will short-circuit this part of the circuit. The No. 59 is now operating as a pentode oscillator.

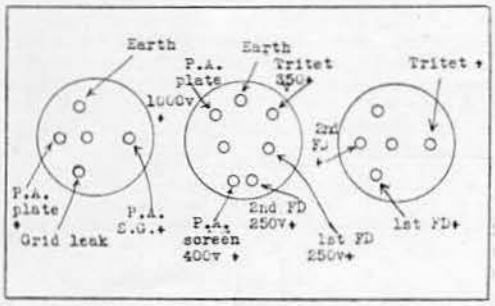


Fig. 7A.
Shows the connections to the meter sockets.

The same tuning procedure is carried out as described above and may be effected with all the H.T.'s applied, as the change in frequency due to the 3.5 mc. crystal being in use, will not be very great.

For other bands the operations will be the same, except that the appropriate coils must be inserted into the correct sockets, as shown in the coil table.

Since Part I. was written, the author has found it necessary to change the values of two of the condensers, C13 and C25, due to there being insufficient R.F. excitation. These are now C13 0.0001 mf. and C15 0.0003 mf.

It must be emphasised that the H.T. to one or both halves of the No. 53 valve must be cut off by means of switches S3 and 4 on the meter panel, if this valve is not in use.

(*b*) *P.A. Unit.*

On referring to Fig. 3 in Part I., it will be noticed that four coils are shown in the right-hand side of the photograph. These are mounted in the *Bulgin* SW.22 tuning unit, and the full circuit showing the connections appears in Fig. 8.

The coils in this unit are, starting at the ends nearest the valve sockets, 28 mc., 14 mc., 7 mc., 3.5 mc. These are plugged in permanently and the link coils brought up to a small paxolin terminal board on which are mounted four pairs of *Clix* sockets. Two plugs are inserted into the sockets and these are permanently attached to the input terminals, as will be seen from an examination of the top right-hand corner of Fig. 2.

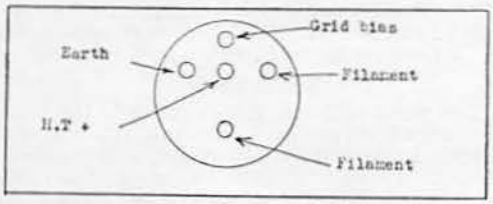


Fig. 7B.
Shows the connections to the speech amplifier socket.

It should be mentioned that the grid bias resistance shown just behind this coil unit has now been made variable by using a *Bulgin* RV.12 15,000 ohms potentiometer, it having been found that better control of the P.A. output could be obtained on various bands by varying the bias slightly. It will be appreciated that no definite values of resistance can be given as this will alter with individual valves.

The filaments of the valves having been lighted, the appropriate grid coil is put into circuit. As the procedure is similar for all bands, that for 14 mc. will be taken as an example. This transmitter is keyed in the centre tap of the filament transformer for the RK.20's and has the usual type of click filter. The exciter having been tuned as described previously, S5 is put to the correct position in order to pick up the 14 mc. excitation, and the switch on the grid coil unit operated to cut-in the 14 mc.

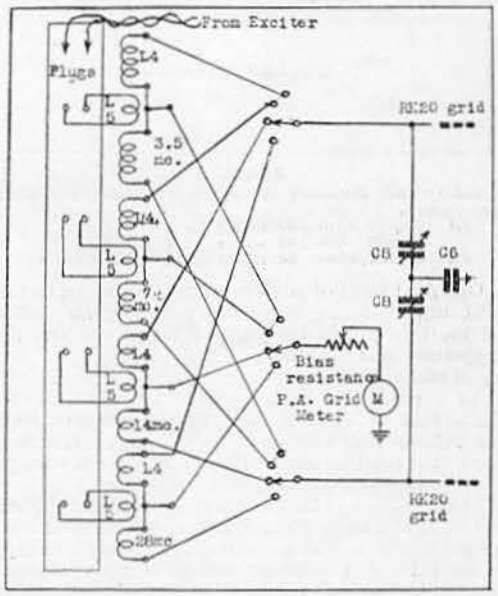


Fig. 8.
Circuit diagram showing the arrangement of the grid coil unit used in the P.A. unit.

grid coil. The two plugs are inserted into their correct sockets. *No H.T. is applied to the RK*20's at this stage of adjustment.

The key is now closed and condenser C8 rotated until the second F.D. plate milliammeter dips, indicating resonance between the P.A. grid circuit and the second F.D. plate circuit. At the same time the meter in the RK20 grid circuit will show a reading of approximately 6 milliamps; this value should be found ample to fully excite the RK20's, and the bias resistance should be adjusted until this approximate value is obtained.

The clips on the P.A. tank inductance can now

be attached at their correct positions as shown in the coil table.

As the RK20's do not need neutralising, the next operation is to open the key and switch on the H.T. to the P.A. unit. The key is then closed and the plate tank circuit tuned quickly to the lowest value of plate current. The key is then opened and the H.T. cut off. The aerial may now be coupled to the P.A. tank inductance, and the H.T. again switched on. The author employed a Collins's coupler in the preliminary tests, and the points of attachment for the two input leads were at one turn either side of the centre tap, but this position will probably vary a good deal with other transmitters. The operation of the Collin's coupler was dealt with by the writer in the April, 1935, T. & R. Bulletin.

A point of the very greatest importance for correct operation of the RK20 type valve, is that of the plate and screen voltages. The only satisfactory method known to the writer is that of using a voltage divider as shown in Fig. 9. For phone work this question of voltages is extremely important.

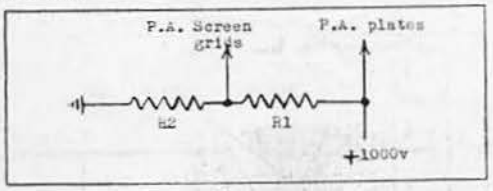


Fig. 9.
A voltage divider used in connection with the RK20 type valves.
R1 17,000 ohm 100 watts for 1 RK20
10,000 ohm 100 watts for 2 RK20's
R2 20,000 ohm 50 watts for 1 or 2 RK20's

One final word of advice before passing on to the next unit: during preliminary tuning *the switch S6 must be put to the position which connects the suppressor grids to earth.*

(c) *Modulator Unit.*

As a result of recent experiments with G5VM, the author decided to alter the resistance of R11, the value being changed to 5,000 ohms. The tests demonstrated that modulation was not full enough using a 10,000 ohm resistance.

The operation of this unit is quite normal. When the H.T. is switched on and the switch S6 is connected to the modulator output, it is only a matter of switching on the microphone battery and moving the gain control to its correct position. The suppressor grids are then biased negative.

Assuming that the valves in the P.A. unit when used for c.w. operation take 150 m.a. and the screen 30 m.a., the aerial current should be around 1.5 amps. if the figures taken at the author's station are used as an indication. On changing over to telephony, the P.A. plate current will fall to about 100 m.a. and the screen will rise to about 40 m.a. The aerial current will be approximately halved. Modulation is now in order.

From articles in *QST* and other journals, the suppressor grid bias for telephony work is given as 45 volts negative, but this has been found rather low and 60 volts appears to produce more satisfactory results. On talking into the microphone, the aerial ammeter should move slightly *upwards*, but the plate and screen currents should not vary. If this is noticed, over-modulation is taking place. The current on the modulator unit is 50 m.a. and the 0-3 milliammeter should not show more than .2 or .3 m.a. on modulation.

No more definite rules than those set forth above can be given, but it is a matter for individual constructors to discover for themselves the best settings. Many, of course, may wish to use an entirely different range of valves to those employed by the author.

GENERAL.

It is, of course, realised that a greater output can be obtained when using c.w., by positively biasing the RK20 suppressor grids, and to this end the method shown in Fig. 10 will be found useful. This shows the connections of a change-over switch arrangement developed by the author. The switch S6 is left in the modulator connection position, and in order to change from c.w. to phone it is only necessary to throw one switch to alter the suppressor grid bias from positive to negative.

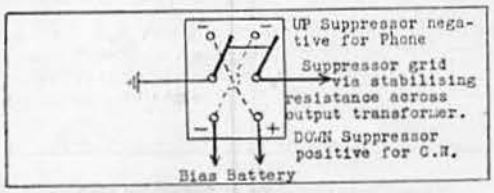


Fig. 10.
A double pole-double throw switch arrangement which enables the RK20 valves to be positively biased.

Readers will realise that the exciting unit is a very efficient low-power transmitter in itself, and is capable of giving an output of about 10 watts. The type 53 valves, however, should not be operated, with more than 350 volts H.T.

In conclusion, the author would like to thank all who have co-operated in operating tests using this transmitter, and further he will be glad to receive correspondence from those who in the future may construct the equipment described.

COIL DATA.

Crystal Coils. All 4-pin Type.

Coil A. 1.7 mc. 42 turns 24 s.w.g. enamelled close-wound 1½-in. diam.

Coil A1. 3.5 mc. 18 turns 24 s.w.g. d.s.c. spaced wire diameter 1-in. diam.

Coil A2. 7 mc. 8 turns 24 s.w.g. d.s.c. spaced twice wire diameter 1-in. diam.

Other Exciter Coils. 5-pin Type.

Coil B. 3.5 mc. 35 turns 23 s.w.g. d.c.c. tap for exciter 12 turns, length 1¼ ins.

Coil C. 7 mc. 20 turns 18 s.w.g. enamelled, tap for exciter 6 turns, length 1¼ ins.

Coil D. 14 mc. 10 turns 18 s.w.g. enamelled, tap for exciter 3 turns, length 1¼ ins.

Coil E. 28 mc. 4 turns 16 s.w.g. enamelled, tap for exciter 1½ turns, length ¾ in.

Link Coil.

Two turns of same size of wire as the main coil, wound *in between* the bottom turns of coil. Length is the space occupied on 1½-ins. diameter former. Five-pin sockets are required in each case, except for the grid cathode coil, which is a 4-pin type.

(*Concluded on page* 484).

A REVOLUTIONARY DEVELOPMENT.

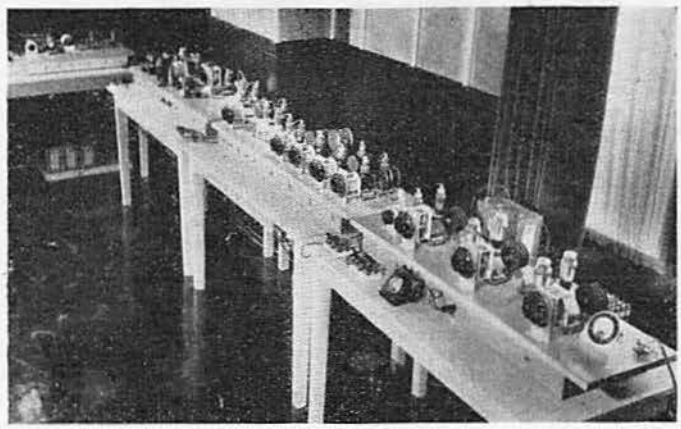
Through the courtesy of Mr. John Grinan, VP5PZ, and the Public Information Department of Columbia University, U.S.A., we are able to publish information regarding a new system for overcoming the effects of static, valve noises, and fading, which has been developed by Major E. H. Armstrong, inventor of the Regenerative, Super-regenerative, and Superheterodyne circuits.

A NEW and revolutionary system of radio transmission and reception which wipes out the effects of static, valve noises, and fading has been invented by Major Edwin H. Armstrong, Professor of Electrical Engineering at Columbia University.

The invention is based on principles directly opposed to accepted scientific theories of action of electrical disturbances on radio circuits. It makes ultra short-wave broadcasting practical, and assures the transmission of musical programmes of a quality beyond the range of present-day broadcasting possibilities.

A new era in the field of point-to-point communications on ultra-high frequencies has been inaugurated as a result of tests of the new apparatus. The problem of chain television will be solved, making possible the linking up of different parts of the country.

The achievement is the outcome of twenty years of research on the elimination of static, begun by Major Armstrong when a pupil of the late Prof. Michael I. Pupin, of Columbia University.



The original modulating apparatus used by Major Armstrong at the Empire State Building.

For the past year the new apparatus has been undergoing continuous tests, which have been conducted with great secrecy, between the Empire State building in New York City and private homes in Westhampton, Long Island, and Haddonfield, N.J. Major Armstrong declares that multiplex transmission has been effectively carried out by new methods during these tests, four separate channels having been operated simultaneously between New York and Haddonfield.

The Fundamental Principle.

A fundamental principle consists in introducing into the transmitted wave a characteristic which does not exist in the waves produced by Nature. A receiving system is then used which is not responsive to waves of natural origin, but only to the waves having the special characteristic.

"The principle is carried out by the use of a discarded method of modulation known as frequency modulation," Major Armstrong states. "This method of modulation has been known for over twenty years, and the hitherto unsurmounted difficulties due to distortion and other troubles in both transmitter and receiver have caused its abandonment by all who worked with it.

Practical Results

"The original demonstrations of the system were made at Columbia University in the beginning of 1934, where it was explained to some of the leading engineers of the country. As a result of these demonstrations the short-wave transmitter on the Empire State building was placed at my disposal by the National Broadcasting Co. about a year ago.

"Tests have been continuous, but so secret that our work passed unnoticed, except by amateurs who frequently advised the engineer in charge of the station to find out what was wrong with his transmitter."

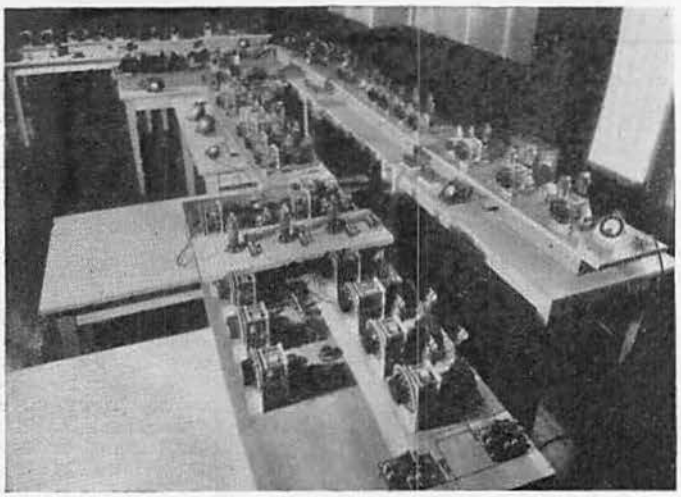
Last June demonstrations were made between the Empire State building and Westhampton, Long Island, at the home of Mr. George Burghard, an old-time amateur and friend of Major Armstrong.

Subsequently the apparatus was removed to Haddonfield, N.J., near Camden, where it was located in the home of Mr. Harry Sadenwater, of the R.C.A.-Victor Co., also a friend of the amateur days of Major Armstrong. Although the power used at the Empire State transmitter was under two kilowatts, at no time during the last year, either at Westhampton or at Haddonfield, were the programmes interrupted by either static or fading. On the other hand, in the summer time it was frequently impossible to listen to either of the 50-kilowatt stations WJZ and WEAF on account of the static.

In the winter time selective fading frequently

interrupted the programme almost as badly as static in the summer time. Neither occurred with the new system.

The system is capable of multiplex operation, and as many as four channels have been simultaneously transmitted and received using a single transmitter and a single receiver. Some multiplexing work of great importance has been carried on with Mr. C. J. Young, of the R.C.A.-Victor Co.



The second transmitter modulating equipment used at the Empire State Building, showing the multiplexing apparatus.

NOISE REDUCTION.

"The amount of noise-reduction which can be obtained depends on the strength of the noise. One of the worst disturbances encountered on short wavelengths are the noises due to the motion of the electrons in the circuits and in the valves of the radio receiving set itself. On the New York-Haddonfield circuit the energy of this disturbance is reduced to one-thousandth part without losing any of the signal strength. As the strength of the disturbance increases the ratio of improvement becomes less.

"The action is something like that of the 'tin hat' worn during the War, practically perfect against fragments up to a certain size, but not effective against a six-inch shell!

UTILITY ON SHORT AND ULTRA-SHORT WAVES.

"The practical utility of the system will be principally on the ultra-short and micro-wave signalling systems, as the bands of frequency or width of the channel required are greater than on normal broadcast wave lengths.

"For example, the band width at present used on the Empire State-Haddonfield circuit is about 150,000 cycles. This would not be a practical band width to use on present-day broadcast channels, but it is quite feasible on the 40,000,000-cycle wave used at the Empire State building. The range of modulation frequencies which can be transmitted from the best transmission systems to-day does not extend beyond 8,000 cycles, and only frequencies up to about 5,000 cycles can be effectively used without encountering interference from adjacent channels.

"On account of the extremely short wavelengths it has been possible to transmit all modulation frequencies from thirty to 16,000 cycles, and to receive them with what engineers call a flat characteristic.

HOW THE PROBLEM WAS SOLVED.

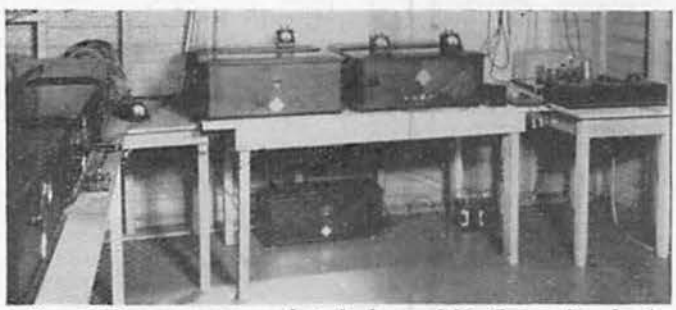
"The theory on which the problem was solved flies directly in the face of all previous mathematical deductions. The old theory of the way to shut out static assumed that the best that could be done was to narrow the band of the selective systems at the receiver as much as possible without shutting out the signal. By narrowing the band down to a width just sufficient to admit the signal it was believed that under these conditions the signal to static ratio would be the best.

"Where the signals and disturbances are of the same order of magnitude I find the exact opposite to be true. With proper methods of transmission and reception the wider the band the better will be the signal to noise ratio.

"Of all the inventions which I have made, regeneration, the superheterodyne, and super-regeneration, the present was by far the most difficult to do and is the hardest to understand. An illustration of the difference between research in 1912 and present-day research is the comparison between the work on regeneration and this invention.

"Regeneration was finished in 1912 after six months' work. One valve was used, and one measuring instrument only was employed in making a few dozen measurements. In this invention, during the experimental work over a hundred valves were in operation simultaneously, tens of thousands of measurements were made, and countless pieces of apparatus built.

"The total number of pieces of apparatus constructed in this work has long been lost sight of, but some idea of the amount of work involved can be gathered from the fact that the records since last October show fifty-five panels constructed and put into operation."



The receiving apparatus used at the home of Mr. George Burghard, West Hampton, L.I.

D.X. RECEPTION ON 1.75 MC.

Observation on British, Russian and American Signals

By B. W. F. Mainprise (G5MP)

DURING the latter part of 1934, the writer, who was recovering from an operation, was advised to spend the winter abroad. The winter was spent in the Canary Islands, and the following is an account of observations made on the 1.75 mc. band from mid-December, 1934, to mid-March, 1935. It will be seen that signals from over 170 stations were identified, of which more than 100 were of trans-Atlantic origin.

Synopsis of Conditions.

Before passing to the analysis of the results obtained, it will be convenient to give a synopsis of conditions existing on this band. In Europe, unfortunately, the band is not entirely amateur in its allocation. Within the past few years many of the countries possessing a costline have established transmitters for small boat communication round this region of the frequency spectrum, and, owing to poor frequency stability and unsuitable modulation arrangements on board the small boats, very heavy interference is commonly met with. In addition to this service, a fair amount of meteorological and other stations are to be heard at times. In some countries, such as Germany and Czechoslovakia, amateur operation has been entirely suppressed. In others, amateur operation is permitted, usually with certain restrictions, such as the necessity for special application for permits, etc. Such countries are England, Sweden, Spain, Belgium, and others. As a result of these restrictions, the band does not, in Europe at least, receive the attention it deserves, and except for a good number of British calls, chiefly at week-ends, there is a sad lack of activity.

In America, conditions are very different. The band is wholly reserved for amateur use, and is further divided into two sections. C.W. stations may operate throughout its length, from 1,715 to 2,000 kc., while telephony stations are licenced from 1,800 to 2,000 kc. In the interests of all concerned, the C.W. stations keep to the low-frequency end prohibited to those using telephony. During the course of the article, the use of the expression, "the 'phone end of the band," will indicate the region from 1,800-2,000 kc.

Geographic Details.

The Canary Islands are situated off the north-west coast of Africa. Seven or eight in number, they are of volcanic origin, and the more important of them have been developed for the production of bananas, tomatoes, and other fruit. Tenerife is the largest, and apart from its size, is conspicuous for the peak which rises over 12,000 ft. above the Atlantic. The observations detailed were carried out on the north coast of this island, at Puerto Orotava. The position was admittedly good as regards lack of local screening, for nothing but the Atlantic lay between the island and America or South-west Europe. The writer's station was about 50 ft. above sea-level, behind it ran the ridge or backbone of the island, rising to roughly 8,000 ft., with the Peak rather to the south-west.

Apparatus Employed.

As it was uncertain how long the writer would be in Tenerife, an entire receiving and transmitting equipment was taken out, consisting of a two-stage transmitter, crystal controlled on 1.75 or 7 mc., with its attendant power supply and accessories, being complete to the aerial insulators. Actually, the transmitting equipment was not employed, as it was realised that there would be difficulty in obtaining a licence, on account of the writer being an alien, and it was decided to concentrate on receiving. Here the apparatus was of the simplest. The receiver consisted of a simple reacting detector, transformer coupled to a low-frequency stage, and entirely battery operated. Care was taken that the reaction was extremely smooth, and that background noises were at a minimum. While such a receiver cannot be compared to the modern single-signal receivers as regards amplification and selectivity, it was of a type very suitable for travelling with, in that both filament and plate batteries required but seldom replacement, while if a fault did develop during rough transit, it could be traced and rectified without the use of instruments in a few moments. The aerial ran from a 50 ft. stone tower or "mirador," to use the local name, down to about 15 ft. from ground level, the length of wire being some 70 ft. For earth connection, a long wire had to be taken to an iron bar, buried in only six inches of soil, covering the volcanic rock. The poorness of this earth connection was clearly shown by the change of the load imposed by the aerial-earth system whenever rain fell, which, incidentally, was on very few occasions.

European Signals Heard.

To open the analysis of results obtained, the list of European signals will be given at this point. The American signals, by reason of their greater numbers, unfortunately cannot be listed here, owing to space considerations, but will be considered below.

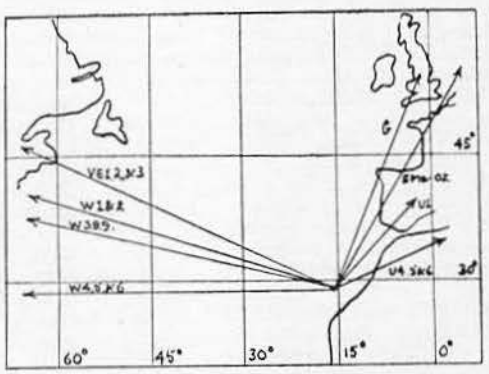


Fig. 1.—The position of the Canary Isles with relation to the countries heard.

G2ao, bi, dq, ii, in, ix, jg, jl, kt, ld, lz, np, oc, oo, ox, pl, qb, uy, vo, vq, wl, xb, xc.

G5fi, is, ju, kg, kt, lt, qm, ri, rz, ry, um, wu, yv, zt.

G6fa, fn, iz, jt, om, oo, ox, qb, qk, rb, rq, so, sy, ua, uj, wy, yj, zr.

EA4 ao, F8RJ, HB9t, HB9y, ON4au, UIbc, U3bs, 3vc, 4lh, 4oh, 4az, 5ad, hs, Oz2h, 7mp, 6ah, aq, UK1bl, SM6gk.

In addition to the above 74 European calls, 104 American or Canadian calls were logged. These will be considered first.

(*a*) *American and Canadian Calls.*—The districts represented were W1, 2, 3, 4, 5, 6, 8, 9, VE1, 2 and 3. The First American district leads with 24 calls, followed by the Eighth with 22 calls, and the Second with 21 calls. It is excellent to see that in spite of the low frequency, the Ninth American district, which is a considerable distance from the coast, obtains fourth place with the total of 15 calls, the distance being roughly 4,000 miles. Even more surprising was the reception of two stations from W6 and two from W5, the distance being respectively about 6,000 and 5,000 miles. Only the Seventh district was not heard.

Rather unfortunately, C.W. stations are in the great minority on this band as far as trans-Atlantic signals are concerned, and this was clearly shown during the observations. Night after night, the 'phone end of fhe band was alive with carriers and heterodynes up to perhaps R.4/5 on the two-valve receiver, while the C.W. end was devoid of any sigals for long periods. Had a receiver employing R.F. amplification been used, the strength of the 'phones would have been sufficient to enable them to be identified in a large number of cases. Of the 104 stations logged during the observations, less than a dozen were 'phones, and when it is realized that the 'phones outnumbered the C.W. stations by at least 10 to 1, and probably more like 20 to 1, with their carriers at any time, the number of American stations logged would probably have been between 500 and 1,000, had their strength been slightly greater on the receiver. Owing to the ease with which 'phone calls may be mis-read, observations were concentrated on the more or less deserted C.W. end of the band. Reception can by no means be cited as freakish, except for some of the more westerly districts. For instance, during February, on only three dates were no American code stations received, reception being impossible on two of these dates, owing to some ignition QRM being radiated from a machine, while on the third, it was left till too near daylight! In addition, some of the Americans were received time and again, outstanding examples being W2GCE, W2HXL, W8ASI, and others. During the R.S.G.B. 1.75 mc. contest, some of the British stations working between 1,800 and 2,000 kc., were almost swamped by the carriers of the trans-Atlantic 'phones. During the W-G tests on week-ends in February and March, two of the American stations who were evidently intent on being heard in England, namely W1BB, and W1DBM, were received at R.8 and R.7 respectively, and this on a two valve receiver, but further details of these tests will appear in another article.

(*b*) *British Calls.*—Of the British stations, 55 were heard. In view of the fact that their inputs were limited to only 10 watts, their performance in putting R.4/5 signals across the 1,500 or 1,700 miles to the Canary Islands is most satisfactory on this low frequency. Their strength was maintained at this figure almost every week-end, and except when static was unusually heavy, they could easily be copied. Probably few of them, working stations a hundred miles or so distant, realised that they were being copied in the Canary Isles. Of the regular users of this band, those most consistently received were G6UJ, 2II, 2DQ, 5WU, 6FA, and others. It is good to note that G5NW was received on 'phone, and as he is situated in Scotland, he undoubtedly holds the British record for long distance 'phone reception on 1.75 mc. One other British 'phone station, whose call was not quite readable, was logged.

(*c*) *Russian Calls.*—Russia obtains third place of the European countries with a total of 11 stations. The reception of these was at the end of January and early February, when it appeared that they were holding a contest. The first, third, fourth, fifth and sixth districts were received, and during this period, U3VC and U4OH were logged night after night, with the nine others on various occasions. The reception of these Russian stations is of interest, as their signals were passing over land for the greater part of the 3,000 miles, and serves to answer the criticism that the fact that so many W and G calls were heard was due to the sea, and not land, intervening between the transmitters and the receiving station. After their contest, the Russians were heard no more and apparently moved to the hiigher frequencies, as some of them were logged on 7 mc. later. G6UJ was heard working U5HS on February 2, being received at R.6, while the Russian was R.5, and had other British stations been on the band, many interesting long distance contacts could have been set up.

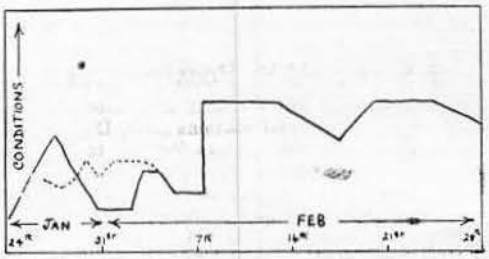


Fig. 2.—The diagram shows roughly the variation in reception of American signals over a five-week period. The broken line shows the variation of Russian signals during the Soviet contest.

Overtones.

In a few cases signals were received from stations transmitting on 3.5 mc., examples being the reception of G6RB, G6ZR, HB9Y, W8CNC, and possibly others. The question arises as to whether the transmitting station is actually radiating a 1.75 mc. signal, or whether the strength of the 3.5 mc. signal is sufficient to beat with the harmonic of the oscillating detector in the receiver, and thereby be audible. The writer suggests that the following method might be employed to determine whether the receiver was picking up a 1.75 mc. signal radiated by a transmitter on 3.5 mc. Tune

in the suspected "overtone" on the 1.75 mc. band, and couple to the aerial lead-in an absorption wave-trap. Note whether the signal can be decreased in strength by tuning the wave-trap. The effect of the wave-trap will possibly affect the tuning of the receiver slightly, and must be allowed for. If there is no change in the signal strength, it would appear that the station is heard by virtue of its fundamental frequency being of sufficient strength to produce an audible beat with the harmonic of the oscillating detector; on the other hand, if there is a decrease of strength, it would appear that the incoming signal is definitely on 1.75 mc. The "overtone" of G6RB was received on December 19, 1935, on which date the "overtones" of HB9Y and W8CNC were also heard. In addition, HB9Y was heard on December 18.

Static.

On this low frequency band, static may be an important factor with regard to the readability of signals. On account of the Canary Islands lying only a short distance off the African coast, the writer had expected it to be considerably more marked than in England. Rather surprisingly, during the period in review, it was on the whole no stronger than that of England during the corresponding period of the previous year, and on very few dates was it really sufficient to render most signals unreadable. The worst appeared early in January, but after observations had been in progress for a month or two, the ear seemed to grow accustomed to ignoring the static to a greater degree, and concentrating on the signal. Snow fell to a slight extent on the mountain ridge on January 22, while a far heavier fall occured on January 29, covering the Peak, and a good proportion of the ridge above 6,000 ft. or so. On each occasion, it was noticed that the static took the form of a fairly high-pitched hiss, quite different to the more usual lower-pitched crashes more often heard in sultry weather. On both dates, conditions were extremely poor for trans-Atlantic signals, but it must be noted that on the second date, the Russian 1.75 mc. contest was in progress, and a number of signals were heard, including U3VC, 4OH, 5AD, and 2NE (?), static rendering other calls unreadable. Other periods of bad static of the English variety were round January 24 and early in February.

Conclusions.

During the period of observations, from December 16, 1934, to March 18, 1935, the total number of stations identified was 178, giving an average of nearly two *new* calls per day. As reception was only carried out for short periods at a time, this total would seem very satisfactory, and would have been greatly exceeded, had a greater amplification been available at the receiving end, for large numbers of the W 'phones would have been identified. On the other hand, it must be mentioned that conditions in the Canary Islands would seem superior to those of England for trans-Atlantic reception. During the attempts to make two-way contacts between England and the United States, it was noticed that though numbers of the American stations were heard calling CQ-G at the allotted times, the British stations heard only very few in comparison. However, this will be dealt with more fully, when the logs of the British stations come to hand. In addition, it is expected later to give an account of the transmitters, inputs and aerials used by the more consistent of the American stations. Meanwhile, it is hoped that as a reult of this article, greater attention will be paid to long-distance communication on this low frequency band than has been the case in recent years.

Lastly, the writer wishes to express his sincere appreciation of the courtesy and assistance accorded him by the Islanders during his stay in Tenerife.

56 mc. DX Possibilities

The reception of 56 mc. harmonics around 1100 G.M.T. from commercial stations DIO, DFJ, CNR, and others unidentified, has led us to predict possible DX communications on this band. Similar effects were noticed over distances of only 40 miles during portable experiments carried out in 1934 between G6NF and other stations.

These combined observations indicate that ultra high frequencies are being influenced by certain conditions, not unlike the effect of the upper ionised strata on lower frequencies, and that stations well beyond the optical range of a receiver may sometimes be heard under conditions similar to those experienced on the lower frequencies.

STRAYS

G5OQ (Tunbridge Wells) requires reports on his 14 mc. transmissions.

* * *

W9PK (Chicago) asks us to mention that G stations who have worked him and have not received his QSL should send him a reminder.

* * *

OZ7ZL is now active in Finland on a frequency of 14125 kcs., and wishes to contact British stations.

G5BK (Cheltenham) advises us that he is now licenced to use the portable call G5BM at Brenta, Leckhampton Road, Cheltenham. Mr. F. H. Watts is the licensed operator.

* * *

VP5IS (W. H. J. Stephens, of Jamaica) is anxious to make contact with G stations. He is using 60 watts (phone) at the high frequency end of the 14 mc. band.

* * *

G5BP (Hull) claims the first G three-way one spot break-in QSO; the co-operating stations were W2CLM and W2EVI. A further triple contact of the same type was effected with VE3TD and W4BDV.

* * *

G6RV (Stirling) claims the British record for the largest number of VE5 stations contacted in a single morning, a total of six being worked recently. He also worked three W7's and two VK's on the same day. His input power is 50 watts.

* * *

W3EBC (New Jersey) wishes to arrange schedules with British stations working phone or c.w. on 14 mc.

THE H.F. PENTODE OSCILLATOR.

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

EVERYONE is familiar with the Screened-Grid valve as a dynatron and the ease of building Radio Frequency oscillators for test purposes. It is well known, however, that there are inherent drawbacks to the Screened Grid dynatron, such as its general instability unless compensation is applied and also the fact that its high negative resistance of about 50,000 ohms makes the use of a low-loss tuned circuit imperative. In this article it is proposed to describe the use of

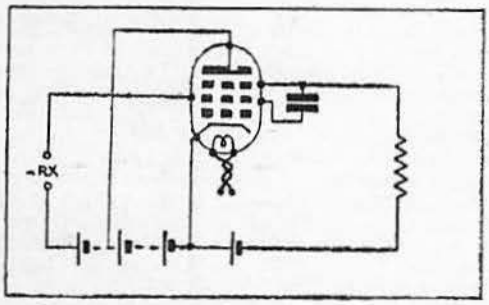


Fig. 1

an H.F. pentode to produce oscillation by the negative transconductance method and also the means of selecting the optimum value of components.

In Fig. 1 the circuit of an H.F. pentode is given, showing how to obtain a negative resistance. It will be observed that the control grid is connected directly to the cathode, as in the usual dynatron circuit, but the remainder of the circuit is somewhat different. The suppressor grid is connected through a resistance to a negative voltage and also via a condenser to the screen grid. The negative resistance is observed between the screen grid and

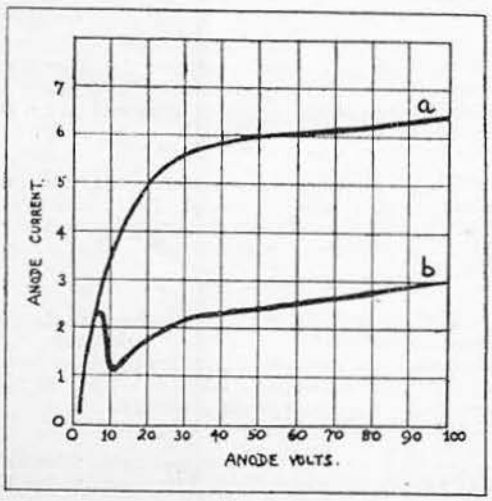


Fig. 2

H.T. positive. The operation of the circuit is as follows : An instantaneous rise in voltage across the negative resistance circuit is conducted via the coupling condenser to the suppressor grid, increasing its potential and thereby decreasing the screen grid current. As the suppressor grid is negatively or

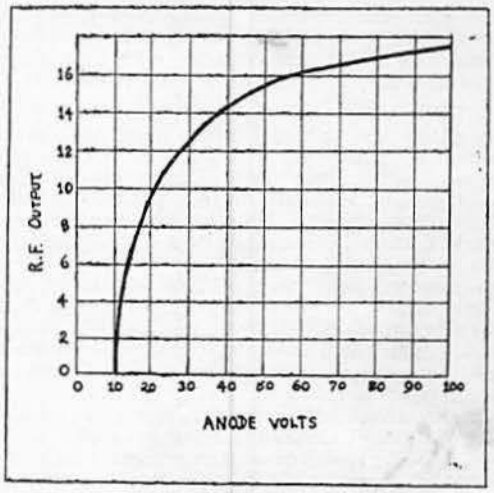


Fig. 3

zero biased and takes no load, the total current in the negative resistance circuit is determined only by the screen grid current. It is evident, therefore, that the instantaneous rise in voltage across the negative resistance circuit is accompanied by a reduction in current. This, of course, indicates that the circuit has a negative resistance characteristic. From the above it is seen that the negative resistance is only obtained across a suitable oscillatory circuit. A static characteristic of the circuit shows no negative resistance.

Fig. 2 shows the static curve (a) of the circuit with no oscillatory coil. The curve was taken at $V_a = 100$, $V_{sup} = O$, $V_g = O$ and indicates the usual I_a/V_a curve. If, however, a suitable tuned circuit is incorporated the curve immediately becomes as (b), showing at an anode voltage of from 8 to 10, the usual negative resistance phenomena. Measurement of this part of the curve indicates a negative resistance of only 1,500 ohms, as compared to the dynatron's 50,000 ohms. This immediately indicates that oscillation will be obtained from normally inefficient circuits. Another disadvantage of the dynatron oscillator is the variation of the R.F. voltage produced at different wavelengths of the same coil. This has been almost entirely obviated by the use of the negative transconductance method.

In a circuit using a V.P.4 as oscillator, the screen voltage was fixed at 100 and the suppressor and control grid returned to cathode. A coil of 75 uH was used shunted by a 150 uuF condenser. A circuit tuned to 1,500 kc. was then coupled to the coil and connected to a valve voltmeter in order to

measure the R.F. volts generated by the oscillator. Fig. 3 indicates the R.F. volts developed at various anode voltages. It will be observed that oscillation

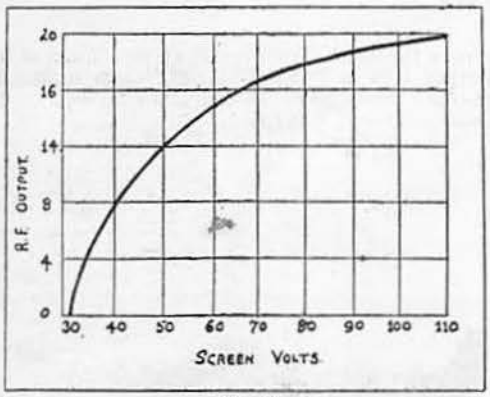


Fig. 4

ceased below 11 volts. Above 40 volts the R.F. output is sensibly constant and it was therefore decided to fix the anode voltage at 40 volts. Fig. 4 shows the R.F. voltage developed with varying screen volts; oscillation ceased below 32 volts and reached a maximum with maximum voltage. The value of the coupling condenser did not appear very critical at first sight, but subsequent measurements of frequency stability, ease of oscillation and maximum R.F. indicated a possible value of 200 uuF for radio frequencies from 60 kc. upwards.

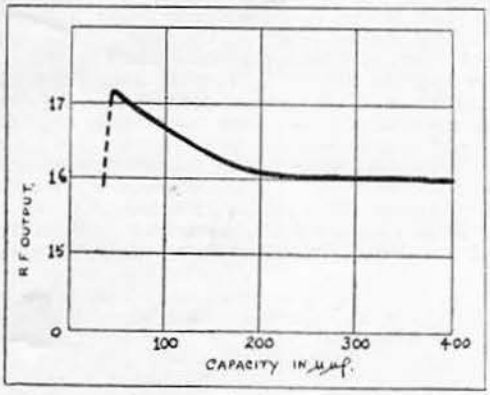


Fig. 5

Fig. 5 shows that the R.F. volts developed across the tuned circuit is a maximum when the coupling condenser is only 50 uuF, but from 200 uuF upwards no great alteration is observable. The value of the coupling condenser, however, has a bearing on the frequency developed, as can be observed from Fig. 6. Above 500 uuF no further frequency change takes place, and it would seem preferable to use a coupling condenser of 500 uuF. However, as a fixed condenser is used in this position and the 200 uuF condenser is necessary for the higher frequencies, it was decided to use the latter value.

The next step was to determine the value of the resistance connected between the suppressor grid and bias. Measurement of the R.F. volts developed across the tuned circuit showed that the maximum occurred at a value of 0.1 megohm. The actual figures are shown below :—

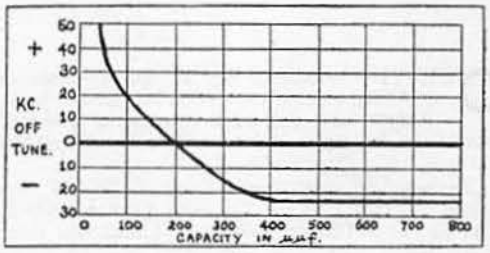


Fig. 6

Grid resistance	0.02	0.05	0.1	0.5	1	2 meg.
R.F. voltage	...19	19.25	19.5	19.2	19.1	19

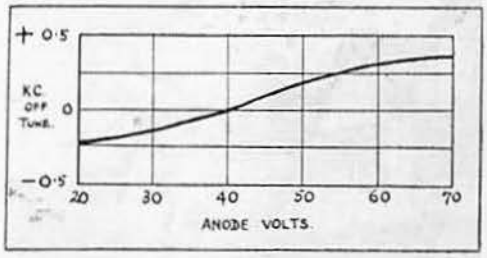


Fig. 7

It was therefore decided to use the indicated value of 0.1 megohm, which was found suitable for all frequencies required.

The stability of the circuit is shown by Figs. 7 and 8. In Fig. 7 it will be noticed that a variation of 20 per cent. only results in a frequency change of 0.2 kc., which is equivalent to approximately 0.013 per cent. The variation of screen volts results in a similar percentage change, and if extreme accuracy is not required, the attenuator can be in the form of a potentiometer controlling the screen voltage.

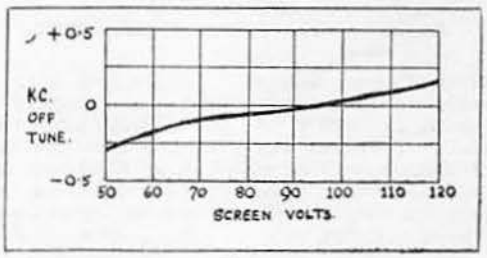


Fig. 8

At the conditions $V_a=40$, $V_s=100$, $V_{sup.}=0$, $V=0$, grid coupling condenser: 200 uuF, grid resistance: 0.1 megohm, the oscillator will be found to be quite satisfactory from 60 kc. to 10 mc., providing, in the case of the 10 mc. range, the coil has an inductance of not less than 4.5 uH. If a coil is used having a smaller inductance than this, it is necessary to apply a negative bias to the suppressor grid. In any case, it is advisable to

(*Concluded on page* 484)

WE VISITED NINE

By The Sec.

OUR Vice-President, Mr. E. D. Ostermeyer (G5AR), in company with Mr. L. O. Jones (G2JO) and the writer, made a 250-mile tour of the London and Home Counties during the National Field Day week-end.

Commencing with North London, G5BOP was visited at James Farm, Ganwick Corner, at 5.40 p.m. on the Saturday evening. At that time three contacts had been made, using a 25 watt c.c. transmitter built specially for the job by G5BO. A

The Start.
From left to right: G2JO, 6OT, 5AR, and 6CL.

Collins Coupler with 45 ft. feeders was much in evidence. From this site, the party proceeded to the No. 12 District "A" station located one mile north of Potters Bar. An enormous marquee, erected, so we were informed, by three stalwarts headed by G5QF, housed the complete station and provided sleeping accommodation for the operators. During our stay several "shots" were taken of "ham radio in the raw" by our President, Mr. Watts (G6UN), who was also on a visit.

A 32-mile journey north saw us at the No. 8 District station G5FBP at Rickling Green, six miles north of Bishops Stortford. In a charming old-world cowshed, with spacious ventilators, the chief op—G5FB—quickly removed any feelings of disquiet by producing some excellent brew contained in long-necked bottles. Our Treasurer abstained! Before leaving this country house party, a careful inspection of the piggery showed that the three operators would not be too lonely during the night. We counted up to a dozen of the largest sows in Britain, and left them to it. In the first three hours ten contacts had been made, using a modern T.P.T.G.!

G2MIP—Burham Downs, Kent. G2MI extreme right.

Thence across country to that old Elizabethan manor, Rookwood Hall, Abbess Roothing, near Chelmsford, where G6UTP had just gone into active operation after a three-hours conversazione. The theory advanced by the operators when asked why there had been a delay is worthy of record: "In starting late we shall have every other 'A' station queuing up for us during the night"! We hope the theory worked in practice. Whilst on this site we had the pleasure of meeting Miss Rowe, the good angel of the District; we had been informed that she is a good "ham"—our short acquaintanceship confirmed the fact. Thanks, Miss Rowe.

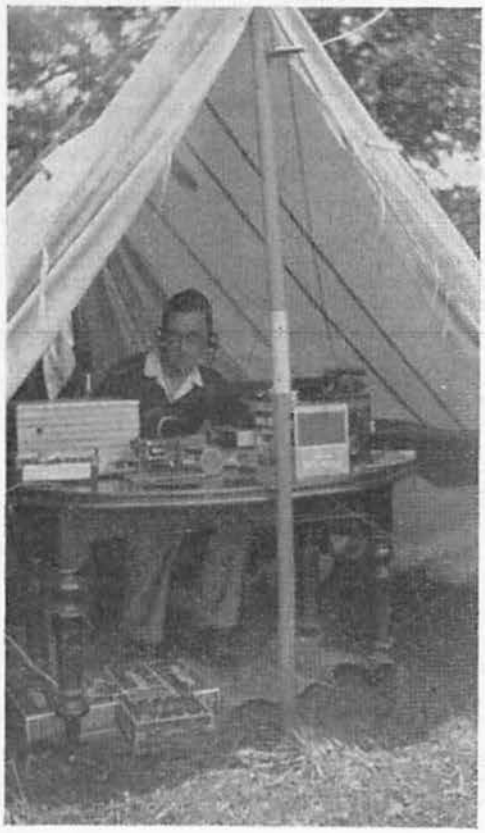
The moon having by now appeared, the course was set for South Woodford, which was reached by 9.45 p.m. Four visits, 72 miles.

From G5AR contacts were made with several of the British "A" stations, many of whom

G6CBP—Westerham, Kent. Operating tent on left.

probably wondered why c.w. was emanating from such a well-known phone station. G6CL was to blame!

Rain during Saturday night and early Sunday morning made it a deal unpleasant at some of the stations, but the visits on Sunday did not reveal that discomfiture had been experienced by those who normally like the comfort of sheets and blankets. Such stuff are hams made of!



G6QBP—Ide Hill, Kent. G5QB at the key.

The first station visited on Sunday was that at Burham Downs, Bluebell Hill, near Rochester. It would be difficult to find a more wonderful spot for portable work, situated at the top of the hill a view is obtained up to forty miles on a clear day. No wonder G2MI and his cheerful crowd of operators were able to work a dozen Yanks in an hour or so during the wee small hours of Sunday.

An 18-mile journey through the Weald of Kent brought us to Ide Hill, the site of G6QBP, where some disappointment was being shown due to the fact that the dry batteries normally designed to deliver a load of about 5 mas. had "jibbed," after being thoroughly "soaked" all night. Their station was also on very high ground, and should have put up a fine score.

Just before arriving at Ide Hill we passed a Baby Austin by the road, which was distinguished from other cars of the same make by virtue of a little dipole aerial stuck at the back. A hasty braking of Ack R's new Ford V8 allowed us to make prompt enquiries. The operator was found to be G5JW. As we approached we heard him informing all and sundry at the A station a mile or so away to put out the flags for our arrival!

The receiver used by G5JW evoked considerable interest, and we hope to describe it next month.

From Ide Hill we made a countryman's five-mile journey to the South London B station—G6CBP—following at a discreet distance a noble Buick steered by G2LW, the official cine operator for the District. The Westerham site left nothing to be desired, being in a field close to the Westerham Guest House. Outstanding exhibits here were:

(1) A notice (dictated, we presume, by either Herr Hitler or Signor Mussolini) outside the operating tent forbidding all but the chosen to enter.
(2) G5OX with a 56 mc. station that really worked.
(3) "Chissy's" car.

It has been rumoured that Exhibit 3 will eventually be presented to the writer when he celebrates his Silver Jubilee as Secretary.

G2WV, looking quite natty in the latest "Ham" outfit, confided to us that they had had a spot of bother the previous evening, but from an examination of the log at 12.45 p.m., Sunday, it was just as well for the other Districts.

Tea Time at G5LAP, Walton-on-the-Hill, Surrey.

Due to bad management on the part of the Secretary or the Treasurer (each blamed the other), lunch was a little delayed. The ladies of the party, however, seemed to enjoy the fact that through failing to order victuals on arrival, we had to wait for the second, third, fourth and subsequent courses to be caught and/or picked, baked, and served.

However, the delay gave us an opportunity to discover some interesting personal facts regarding our jovial Advertising Manager, Mr. Horace Freeman, who joined us with his "baby" daughter. If any member desires to attempt a Channel swim, we recommend him to go to Craven House, Kingsway, for some hints and kinks!

Off at 2.43 p.m. for a cross-country run to Walton on the Hill, where the District 7 station, operating

under the call G5LAP, was located. Taking great care to carry out the numerous exhortations, the V8 cut out its engine some miles from Walton in order to prevent any nasty noises offending the delicate little valves in the high-grade receiver built entirely from —— components by G6SC. (Sorry we cannot mention the firm, but we must remain impartial.)

G2YL with 2UX were knocking off stations quite briskly when we arrived, but apparently our presence was the signal for tea, for the next we saw of Miss Corry was a crouching figure in " Ally's " car waiting . . . for what ? Can't you guess ? Yes, waiting for the ops on the receiver to finish a bout of listening. Car QRM had to be scientifically avoided.

We gleaned from enquiries that the car had gone to bring the tea—anxious to see what happened at one of these " tea fights," we hung on and were rewarded by obtaining a first-hand impression of why everyone likes to live in No. 7. The tea itself arrived in an urn which would have done justice to a battalion of soldiers, whilst the cakes and other goodies would have kept the ops at all N.F.D. stations combined from starvation for several weeks. Yes, the tea was the high spot of the visit. Thanks, YL, Mrs. LA, Joan and Betty . . . we nearly forgot Buzzy !

4.34 p.m. saw us begin our next trek across country to Uxbridge, but we forgot one point, it was Epsom Sunday, and before we knew where we were, the V8 was one of about 10,000 other cars nicely jammed around Tattenham Corner. However, it was an experience we shall remember.

Crossing the river at Kingston, we eventually pulled in at Rushey Green Farm, near Denham, off the Oxford Road, at 6.20 p.m., to find the Brothers Wilkins (G6WN) surrounded by a most efficient group of Scouts from the Ealing Group (B.S.R.S.1). Under canvas, the station had been putting out a fine signal all the week-end, and should have finished well up amongst the " A's." Here again an excellent spot had been chosen.

Leaving Denham at 6.50 p.m., a 25-mile journey from West to North London saw us back at the Ganwick Corner station just in time to make a futile test DX call as the clock struck 8 p.m.

A most enjoyable week-end, at the conclusion of which we had but a single regret, we were sorry that we could not visit more stations.

Ten-Metre News

The 28 mc. band is once more awake. May 1 saw a great improvement in conditions, as far as the reception of commercial harmonics was concerned, and these became more numerous each day until the 7th. On the 8th amateur signals from OK and FM8 were coming in well, and stations in these countries were worked. On this day G2YL heard SU1AQ at 17.45.

On May 9 skip became longer, and, although the more local Europeans were inaudible, FF8MQ and EA8AF were received at good strength. From then on hardly a day passed without some station of interest being worked.

On the 13th G6YL heard ZT6K at R5/4, and this would appear to be the first real DX heard this year.

The International 28 mc. Contest has greatly increased interest on this band, and stations in EI, F, PA, ON, D, OK, OE, HB, YM, SM, OZ, FM8, FF8 and EA are active.

It is gratifying to notice the use which is being made of the band by British stations. Some 15 stations in and near London are active. A similar interest is being displayed in other parts of the country, and a large number of G stations have been heard being called by the Continental stations.

The commercial harmonics which have been audible are mostly from European countries, the only exceptions known being HJO and TDH.

News from abroad is scarce, but W6CAL has worked W1AV, 2TP, 3CYF, 1CUN, 8IXS, 4AJY, 9NY, 9FFQ, 9KPD, X1AY, VK2LZ, 2EP and J2HJ. He has been heard in Europe by EA4AD, but no details of this reception are available.

G6NF reports the reception of an harmonic from DIO on 56 mc/s., when German stations were heard at good strength on 28 mc/s.

As it is desired to make this monthly article a record of the activity on 10 metres, will members send a note of anything of interest they may hear to Headquarters by the 25th of each month ?

E. H. S.

Low-Power Contest, 1935

THE Low-power Contest was very poorly supported, there being only 13 entrants. The 3.5 mc. band appears to have been used more widely than in previous years, the leading station making nearly all his contacts on that band. Only one contact was made with a station outside Europe, that between GI6TK and W1ME. It would have been interesting to have read the scores, had the R.E.F. contest not coincided with our own, for the entries read like a page of the French section of the Call Book !

The scores and positions of the competing stations are as follow :—

		Pts.
1.	L. W. Jones (G5JO)	95
2.	F. A. Robb (GI6TK)	86
3.	J. H. Cant (G6FU)	67
4.	I. C. I. Lamb (G6LD)	58
5.	J. Haigh (G6HA)	53
	J. P. Stove (G5ZX)	53
7.	I. J. P. James (G5IJ)	46
8.	S. A. Taylor (G5TL)	39
9.	P. G. Tandy (G2DU)	30
10.	A. Robinson (G6RJ)	28
11.	K. T. Harvey (G5KT)	18
12.	J. F. Isaac (G5JI)	11
13.	S. B. D. Young (G2YY)	2

Some difficulty was experienced by the contestants in obtaining reports from the French stations, who were interested only in exchanging code words. In the few cases where the foreign station refused a report, the code word has been accepted by the Awards Committee as proof of contact. Incidentally this made no difference to the final positions.

Apparatus Used

Details of the apparatus and power used by the first five stations follow :—

1. G5JO.—Transmitter, CO-FD on 7 and CO-PA on 3.5 mc. Valves, LS5B and T25D. No

details of input given. Aerial, half-wave single wire, east to west, free end pointing west. Receiver, all mains H.F. detector and pentode.

2. G16TK.—Transmitter, push-pull CO, using type 47 valves. Input, 4.8 watts. Aerial for 3.5 mc., 66 ft. and 66-ft. counterpoise. Aerial for 7 and 14 mc., 66 ft., direct coupled. Receiver, four-valve superhet.
3. G6FU.—Transmitter, pentode CO (Pen 220), driving neutralised PA (Osram P2). H.T. supply, 120 volts triple capacity *Vidor* dry battery. Input, 2.4 watts. Aerial, half-wave end-fed Hertz, due north and south, fed at north end. Receiver, detector and 2L.F. No aerial used for reception.
4. G5LD.—Transmitter, T.P.T.G. push-pull, with crystal across grid. Valves, "362" P2. Power supply, 120 volts dry battery, input 3 watts. Aerial, 66-ft. Zepp., 55-ft. feeders, coupled direct to transmitter by Collins' matched impedance coupler, direction east to west. Receiver, detector 1 L.F.
5. G6HA.—Transmitter, CO (PT4), FD (MH4) and PA (PX4). Aerial, A.O.G., 66 ft. 6 ins., tapped on tank coil. Receiver, S.G. detector and 1 L.F.
5. G5ZX.—Transmitter, CO PA Tri-tet oscillator (AC/S2/Pen), link-coupled to PA (T25D). Aerial, Zepp, with 45-ft. feeders loosely coupled to PA tank by parallel-tuned coil. Receiver, three valves, untuned H.F. S.G. detector and pentode. Separate aerial used for reception to allow for "break-in" operation.

Quiescent Carrier Telephony

By P. Carment (G5WW).

Nothing original is claimed for this system, but as far as can be ascertained it has been given no publicity in the Bulletin beyond a passing remark by G6LI in his recent article on "Practical Amateur Telephony."

Quiescent carrier telephony was used at G5WW during October and November, 1934, with excellent results, and it is thought that a description of the system may interest those who have to rely on dry batteries for transmitter H.T. supply, as an input equivalent to approximately 10 watts can be obtained without excessive drain on the H.T. batteries.

A C.O.P.A. transmitter is used and is adjusted in the conventional manner for grid modulation. The grid bias on the P.A. is then increased until the anode current to the P.A. is reduced to zero *with* the drive *on*. The modulating voltage is then applied and it will be found that the P.A. anode current rises from zero to a value sufficient to transmit just the right amount of carrier signal for full modulation with the depth of speech provided by the modulator. In other words, a whisper will produce a small increment in anode current, and a shout a large increment. No carrier is transmitted during the periods of no modulation and no anode current flows, consequently there is only an intermittent drain on the H.T. supply.

In practice this system offers one or two advantages over ordinary grid control. In the first place, when adjusting the transmitter before applying the extra bias, it is unnecessary to reduce the drive from the C.O. until grid current is zero and, secondly, it is not necessary to use a valve capable of handling four times the steady anode dissipation, although if one is used it is possible to obtain full modulation with a very small modulator valve.

Some actual details may be of interest: The C.O. employed an M.P.T.4 pentode dissipating 9 watts, which would normally drive a P.A. to 25 watts or more. The P.A. valve was of the indirectly heated type, a Standard Telephones 4024B, but an LS5 and UX210 were found equally satisfactory.

Stations worked on 7 mc. reported no alteration in signal strength or quality, which was given as "good" and in cases "very good."

On 1.7 mc. reports varied according to the distance. No difference was noticed by local stations when the change-over was made, but those further away reported a slight falling-off in both quality and signal strength.

I should be pleased to hear from anyone who puts this system into use.

Amateur Club Meeting by Radio

By Harry K. Bourne (G2KB).

The first meeting to be held across the world between two radio societies took place on January 18, 1935. The societies concerned were the Schenectady Amateur Radio Association and the Zero Beat Radio Society, Sydney, Australia. The corresponding stations from which the transmission were radiated were W2XAF and VK2ME. W2XAF is the General Electric Co. station at Schenectady, and VK2ME belongs to the Amalgamated Wireless of Australasia, Ltd., at Sydney. The wave-length used in each case was about 32 metres.

At 7.30 a.m., a number of enthusiastic members of the Schenectady Radio Association assembled in one of the studios of WGY. The first speaker to take the air was N. K. Eaton, the President of the Schenectady Club, who gave a short talk in which he outlined the organisation of the club and the routine of its meetings. A reply was then heard on the loud speaker in the studio, from G. Movine, the secretary of the Zero Beat Radio Society, who gave a description of that society and its activities. Other speakers from Schenectady were Gerald Gayner, on Five Metre Activity in the U.S.A.; Alfred Korb, who gave a description of the station W2XAF; Norbert Sauter on Amateur Radio Activities in the U.S.A.; and Harry K. Bourne, G2KB, on an English Amateur's Viewpoint on Amateur Radio in the U.S.A. From Sydney, Ray Hutchinson, VK2ZD, described the station of the Zero Beat Radio Society, and another speaker chose Ten Metre Work in Australia as his subject.

The meeting lasted a little over half an hour. The transmissions from Schenectady were received well in Sydney, but reception of VK2ME in Schenectady was not good, owing to the presence of much static. This was of the type known as "snow static," and is due to charged snow-flakes being blown against the receiving antenna. A blizzard was raging in Schenectady at the time. It is hoped that a similar meeting will be held shortly between Schenectady Amateur Radio Association and a radio club in Buenos Aires.

SOLILOQUIES FROM THE SHACK.

By Uncle Tom.

(Calling spitch ; calling spitch ; come in, somebody.)

GOOD morning, clads. I hope we're all well after our night out. N.F.D. is all very well in its way, of course, but it reveals a certain amount of truth in Napoleon's famous dictum about the part of its anatomy on which an army proceeds.

Personally I think good cooking meant more points than good operating ; and if only one or two people had remembered that sausages . . . (let's cut it out, shall we ?)

Before we leave the subject, here's a Tall Tale about N.F.D. I can't vouch for it, having only heard it at second hand, but it sounds good to me. A certain enterprising district, finding among its members several large and expensive American superhets, decided that one of them would make just the cutest little portable receiver for N.F.D.

H.T. consumption wasn't too bad—just a battery or two, y'know—and L.T. could doubtless be arranged off a car battery. So far, so good ; all reception difficulties solved. Presently, however, old X —, rather good at figures, unearthed his slide-rule and started on the L.T. problem.

His first ruling was that the requirements would be 16 amps. at 4 volts ; later, I believe, he managed to reduce it to 14, or thereabouts. Whatever the final figures were, I know it implied a change of large-capacity batteries about every four hours. What the answer was, other than the proverbial lemon, I don't know. Probably a Det. and L.F., I shouldn't be surprised, so to speak, as it were.

Next comes a letter on impressive notepaper emanating from a stately edifice not unconnected with the administration of justice (figure that out !). It's a trifle verbose, not to say prolix, or, in other words, wordy, so I will quote the fruity parts only.

Starting off with a complaint about the excessive use of telephony on the 14 mc. band, the writer goes on : " In particular I refer to an anonymous station who has apparently forgotten his call-sign. I agree that it is *great fun* to re-broadcast the B.B.C. programmes, to grind out gramophone records, to whistle ' Annie Laurie,' to breathe stertorously into the microphone, to broadcast a mechanical nightingale (or other fowl), and to count up to ten. But when all this balderdash is put out with 150 per cent. modulation, it ceases to be amusing for the rest of us."

And so say all of us. Furthermore, if I may hurl another brick on my own behalf, I should like to say that the use of the 7 mc. band for *local* telephony contacts has never been amusing to most of us, especially when the 1.7 mc. band, obviously ideal for such work, is so grossly neglected except for just an hour or so on Sunday mornings.

I maintain that 8 or 10 watts of 'phone on 1.7 mc. will serve just as well for local contacts as 50 watts on 7 mc., and will cause no more B.C.L. interference.

Joke No. 2. Your poor old Uncle himself was working with a " G " station and enquired about his note. The other man, on 'phone, replied, " Very nice note indeed, beautifully clean-cut, and your sending is nice to copy—thank goodness you don't use a bug, for I can't stand the wretched things at any price."

Many of you will agree with that sentiment, but the joke, of course, is that it *was* a bug. Probably it didn't sound like one, because your Uncle, no longer in the prime of his youth, has grown out of the amazing habit of sending the dots at 40 w.p.m. and the dashes at 15. (Spare my blushes about the nice report, but he *did* say that, really !)

What has happened to The Rest of the World on 56 mc. ? Last year North London was grousing about lack of co-operation on that frequency. This year the whole of South London is using the band, and there seems to be no one else to work with.

The extraordinary thing about 56 mc. work is that it seems to absorb the most unlikely people. One or two real DX fans have taken it up—rather half-hearted at first—but have found it so engrossing that their 14 mc. transmitters are either covered with cobwebs or have been partially dismantled to supply gear for the 56 mc. rig.

In the words of one 56 mc. enthusiast, " This is the band that the hams *should* be working on. There's nothing they can do on 7 and 14 mc. that hasn't already been done much better by the commercials. Why the deuce don't they concentrate on the band where some original work is really possible ? "

And echo, as is her well-known habit, answers " Why ? "

It may be very thrilling to make two-way 'phone contacts with the U.S.A. night after night, but, take it from me, our big brothers in the commercial field have been doing all that for years and years. But when it comes to reliable work from one screened locality to another, with very low power on 5 metres, we leave 'em all standing.

A man who is supposed to be a " Big Knob " in that sphere assured me in all seriousness that two stations on either side of a 300-foot hill couldn't hope to effect a QSO with less than 1 kilowatt per each ; and yet some of us have been floating through the air with the greatest of ease with 5 watts or so.

And so " The Ham " has had to say good-bye, the Editor being unable to spare the time to keep it going. Too bad, for it was a bright little publication. But it is to be continued in Letter-Budget form—in other words, it will be almost unchanged, except that only one copy will be printed.

Some of you districts with dull letter-budgets ought to see what North-West Kent can do on those lines ! Take that stirring little poem " The Dipole Dance," by Airy Nix, commencing " Little Bo Squeak has changed his Freq., And now on five you'll find him ; He went down there to get some air, And leave the noise behind him."

But the last verse runs : " Now if you've got a microwatt, And half a yard of cable, Just come and swell the merry H . . ., The Local Tower of Babel!" So perhaps " five " isn't so quiet in some parts.

Just by way of a finale, also from " The Ham "—How to cure key-clicks : Use telephony.

BRITISH EMPIRE CALL SIGNS

MEMBERS will recollect that mention was made in the July, 1934, issue of this journal of negotiations which were being carried on with the authorities in an endeavour to have approved a revised list of Empire call signs.

For some years it had been apparent that confusion was being caused because similar prefixes were being used in widely different parts of the Empire. The VP group was an outstanding example.

We are pleased to announce that the Colonial Office has now approved the list submitted by the Radio Society of Great Britain in so far as it affects territories within their jurisdiction. The Colonial Office has sent a despatch to all officers administering the governments of the Colonies, Protectorates, etc., requesting them to conform to this list in future and to change any existing call signs also to conform to the list. We are continuing negotiations with the Government of India in order to obtain, if possible, uniformity in regard to prefixes used by islands and territories under their control.

The revised list of approved Empire Call Signs follows :—

Present Assignments.	*Suggested Assignments.*
AMERICA *—	
VP4. British Honduras	VP1. British Honduras
	VP2. Leeward and Windward Islands
VR1. British Guiana	VP3. British Guiana
VP4. Trinidad	VP4. Trinidad and Tobago
VP5. Jamaica	VP5. Jamaica, Cayman Islands, Turks and Caicos Islands
VP6. Barbados	VP6. Barbados
VP7. Bahamas	VP7. Bahamas
	VP8. Falkland Islands and South Georgia
VP9. Bermuda	VP9. Bermuda
AFRICA—	
	ZD1. Sierra Leone
ZD2. Nigeria	ZD2. Nigeria, and Cameroons under British Mandate
	ZD3. Gambia
	ZD4. Gold Coast, and Togoland under British Mandate
	ZD5. Free
	ZD6. Nyasaland
	ZD7. St. Helena
	ZD8. Ascension
	ZD9. Free
ZU9. Free	ZU9. Tristan da Cunha
VP1. Zanzibar	VQ1. Zanzibar
VQ2. North Rhodesia	No change
VQ3. Tanganyika	No change
VQ4. Kenya	No change
VQ5. Uganda	No change
	VQ6. Somaliland
	VQ7. Free
V8. Mauritius	VQ8. Mauritius and Dependencies, including Chagos Archipelago
VQ9. Seychelles	VQ9. Seychelles and Dependencies
ASIA—	
VS1. Straits Settlements	No change
VS2. Federated Malay States	No change
VS3. Unfederated Malay States	No change
	VS4. Sarawak and North Borneo
	VS5. Labuan and Brunei
VS6. Hong Kong	No change
VS7. Ceylon	No change
	VS8. Bahrein Island and Khuria Muria Islands
	VS9. Maldive Islands
ZC1. Trans-Jordan	No change
	ZC2. Cocos Islands
	ZC3. Christmas Island
	ZC4. Cyprus
	ZC5. Free
ZC6. Palestine	No change
OCEANIA—	
VP1. Gilbert and Ellice Islands	VR1. Gilbert and Ellice Islands
VP1 and 2. Fiji	VR2. Fiji
VQ1. Fanning Island	VR3. Fanning Island
	VR4. British Solomon Islands
	VR5. Tonga Islands
	VR6. Pitcairn Island
	VR7-9. Other Pacific islands under British Government
EUROPE—	
VP3. Malta	ZB1. Malta
	ZB2. Gibraltar

* It is suggested that should any further prefixes be required under the heading "America," that VM or VN might be used.

TENTH CONVENTION

This year we shall celebrate our Tenth Annual Convention. We hope to make it the biggest and brightest yet arranged.

BOOK THE DATES

Thursday, August 22nd

TO

Saturday, August 24th

FULL PROGRAMME NEXT MONTH

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.

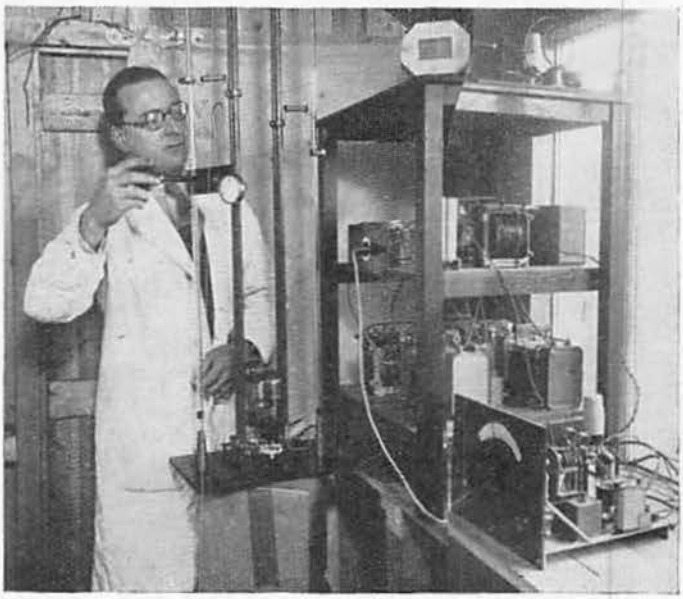
58 M.C. TESTS FROM G6SL

To the Editor, T. & R. BULLETIN.

DEAR SIR,—We have pleasure in sending you details of our ultra short wave experiments which were carried out on Sunday, May 19. Our station G6SL was radiating on a frequency of 58 mc. (5.17 metres) and we were using a power of 50 watts with an aerial beamed south-east of Birmingham. The results, from the point of view of establishing a long distance record, were not as good as we hoped for, but they have furnished us with quite a considerable amount of information and scope for future experimental work in the Midlands.

On Sunday, the weather in Birmingham was overcast and at times it rained heavily. We formed the opinion that conditions for long distance work under such circumstances were bad. One observer at a distance of about five miles from us, who was able to receive our signals at loud-speaker strength, found that on the approach of a very large black cloud and heavy rain our signals dropped to weak 'phone strength, and as soon as the storm had passed the signals were again received on the loud-speaker. In general, reports from observers show that within a distance of twenty miles in the direction of our beam, signals sufficient to work a loud speaker were obtained. This was the case at both Kenilworth and Coventry. At the back and sides of our beam, we were also very well heard within four to five miles radius, although not at such strength as in front. Another interesting report came from a portable observer, who was receiving us at loud-speaker strength on the main Coventry Road at the top of Meriden Hill. On descending the hill, our signals almost disappeared, but as he increased his distance from the hill towards Coventry, the signal strength rose again. It would appear that within five to six miles radius, screening effects are not so pronounced since we have had several reports from local observers on low-lying ground with high ground intervening, who gave us excellent strength. As the distance is increased, screening effects become much more pronounced. One of our observers, with portable apparatus at a distance of one mile out, was surprised to find that our transmission, which he was receiving at R9 while travelling in his car, when underneath a very wide and long iron girder railway bridge, which is also so low that the road has to dip under it, results were not affected and the same signal strength was maintained.

The farthest points of reception were at Banbury and approaching Daventry, by observers with portable apparatus. In both cases, however, signals were very weak. With the conditions prevailing and considering that our transmitting aerial is only some sixty feet above the ground and our observers were working on the ground from cars, these reports are hopeful, and we think they show promise for better things in the future.



The 58 mc. Transmitter at G6SL.
Mr. George Brown (G5BJ), adjusting the experimental 56 mc. transmitter operated from the works of Stratton and Co., Ltd., Birmingham.

It is our intention to arragne for an experi- mental ultra short wave transmission on Sundays from about 10.30 to 1 p.m. We shall use omnidirectional aerials and beam aerials, and we are anxious to get as many observers as possible with portable apparatus to give us reports. We shall probably organise a field day for this purpose and any radio enthusiasts with apparatus will be welcome to take part.

We have pleasure in giving you brief details of the apparatus we used, which are as follows :—The transmitter comprises a straight line inductance oscillator with two Mullard TZO/25 valves in push-pull, giving an output of 50 watts. The modulation portion for speech and music comprises a Class B amplifier with an output of 25 watts. The whole of the apparatus works from A.C. mains. The aerial system used for our tests was beamed in a south-easterly direction and comprised four ½-wave vertical radiators, spaced a ½-wave apart from each other, with four vertical reflectors a ½-wavelength behind each radiator. The feeder line from transmitter to aerial was tried with both parallel

and series condenser tuning, and we were more successful with parallel tuning arrangements. This was contrary to our expectations and we are not yet satisfied that parallel tuning is the best. The feeder line was coupled to the oscillator by means of a hairpin coupling device.

With thanks for your co-operation,

We remain,

Yours faithfully,

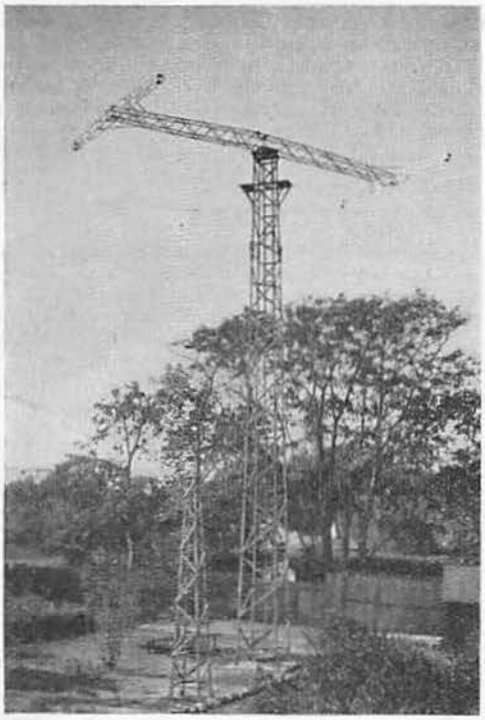
G. S. Laughton,

For Stratton & Co., Ltd.

A 14 MC. BEAM AERIAL

To the Editor, T. & R. Bulletin.

Dear Sir,—I am enclosing a photograph of my 14 mc. beam aerial, which may be of interest to some of your readers. The mast, which is constructed of wood, is 54 ft. in height, the top portion being 36 ft. long and 18 ft. wide, and rotates on ball-bearing rollers. The array consists of two half-wave vertical aerials spaced half-wavelength apart and fed in phase, together with two half-wave reflectors, the whole system being coupled to a 500-ohm transmission line. When used for reception, the array is coupled through an impedance matching filter to the pre-selector unit of the National FBXA receiver, and it is possible to receive DX signals which are absolutely inaudible on a good single-wire aerial 132 ft. long. In addition local interference outside the beam is considerably reduced.



The Beam Aerial used by ZS1H.

Yours faithfully,

G. A. Shoyer (ZS1H.)

ASSISTANCE REQUIRED

The Editor, T. & R. Bulletin.

Sir,—I am developing a promising system for landing aircraft during bad visibility; and shall be highly indebted to you for placing me in touch with members experienced in the transmission of ultra-short and micro-wave electromagnetic radiation, with facilities for conducting experiments to co-operate with me.

Yours faithfully,

D. Sharman.

108, St. Paul's Road,
London, N.1.

Editorial Note.—London members will recollect that Mr. John Grierson emphasised the importance of a system for landing aircraft during bad visibility, when he lectured to the Society on January 25, 1935.

L.F. FILTERS

To the Editor, T. & R. Bulletin.

Dear Sir,—In the April issue appeared a short article entitled "A Novel L.F. Filter." As a matter of interest, I suggested the possibility of audio-resonant selection in a lecture before the R.S.G.B. during 1924 (see *Wireless World*, Vol. XIV, June 11, or G. G. Blake's *History of Radio Telegraphy and Telephony*, (Chapman & Hall).)

This question was more fully dealt with in my lecture before the Society on May 25, 1929 (see our own journal, or the *Wireless Engineer*, Vol. IV, pp. 493-501, August, 1927). At the lecture I demonstrated that if a number of signals, each on a separate musical frequency, were reproduced simultaneously from one loud-speaking telephone, the result would be an unintelligible jumble of sounds. I then showed that by tuning a tubular resonator to any one of the musical notes, it was possible to pick up the signals coming through on that note and cut out all the other signals completely.

During my experiments I found that a "hot-wire" microphone placed at the orifice of the resonator was much more sensitive and reliable than a carbon granule microphone placed at the far end of the tube as now suggested.

I am most interested to see that this old suggestion of mine is again occupying the attention of amateurs.—Yours faithfully,

G. G. Blake,
M.I.E.E., F.Inst.P.

HAM SPIRIT

To the Editor, T. & R. Bulletin.

Dear Sir,—I should like, through the columns of the Bulletin, to thank G5BD and G5CY for the kind tuition and help in matters pertaining to amateur radio which they have given me in the past. It is largely as a result of their encouragement and assistance that I recently succeeded in obtaining the call sign G2WR, and the thrill of the first QSO has prompted me to express this appreciation of their efforts. I hope that one day I shall be able to assist others in the same manner.

Yours faithfully,

J. V. Warner (G2WR).

TOPICAL TOPICS FROM TORQUAY

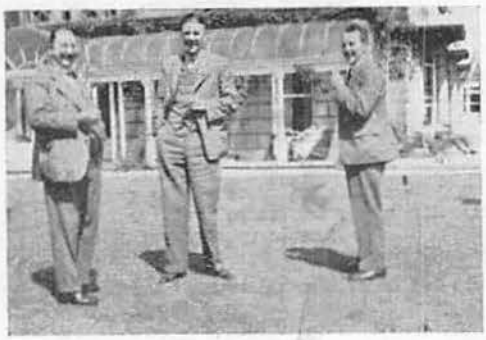
THE D.R.'s smile of satisfaction. Like the sun, it functioned almost continuously.

The need for town-planning in Torquay. The Hon. Treasurer is said to have returned three times to the centre of a circle (query hotel in centre ?) in vain attempts to reach the D.R.'s house. A rumour that he was finally delivered as an " Express Package," his overweight covered with Jubilee stamps, is denied.

The Secretary's *joie-de-vivre*, especially the woolly hat. A connection between a giddy goatskin hat and playing the giddy goat seems to be established. At least, we know he did the latter and had the former.

And, too, his speech. Lots of good news and information, rolled out without a pause. But we think there was some misunderstanding regarding the liquid refreshment provided by the management. The Secretary-bird took one sip, before starting, and forgot the remainder. We were interested in this phenomenon and investigated the matter. It was lemonade !

Although, to all appearances, the Hon. Treasurer was sound asleep during the speech, just one reference to additional expenditure brought him to his feet, eyes still closed, to say that the Society's funds would not run to this. It is a gift for any Treasurer to have such automatic reactions and



Torquay Tales.
H. J. Powditch (G5VL) (right) puts over a new one for the benefit of the Hon. Treasurer, G5AR, and H. A. Bartlett, G5QA (centre).

our Treasurer is, consequently, a gift to the R.S.G.B.

Whilst No. 6 District gambolled in mass upon the putting green of one of Torquay's more resplendent hotels, we noted the facial expressions of some other hotel visitors. " Washed up by the tide ? " would seem to summarise the general thought.

We look forward to the reproduction in BULL of a photo showing G5VM entwined with a marble statue. It will be published under the title of " Innocence."

Has G5VM any interest in the film trade, we wonder ? Or does he shoot off yards of film just to encourage industry generally ? When he tired, G6CL got hold of the machine ; the winding apparatus promptly seized up from overheated bearings. The first two miles of film will be shown at Convention, we hear.

We wondered at the lack of restfulness shown by some London friends during the " sit down" luncheon. We have since learned they travelled down by motor bike. So, another problem is solved. Since, it is stated, that they had a rather exciting journey back after sampling cider as made at Teignmouth. Those one gallon jars are too tempting.

Speaking of Teignmouth, we do, sometimes, pity the poor agriculturalist. Sometimes ! But, when we looked from that cider dispensary across a mass of apple bloom to a deep coombe with red Devon cliffs framing a patch of sunny sea in the distance, we withheld all pity. Central heating and electric light plant, too ! And—what a ' doong 'eap " ! !

S.L.D.T.S.

We are advised by the Publicity Manager of the South London and District Transmitters' Society that overseas members of the R.S.G.B. will be specially welcomed at their August meeting on the 7th of that month. Communications should be addressed to Mr. E. T. Woodhouse-Rayner, 21, Solway Road, London, S.E.22, or Mr. H. D. Cullen (G5KH), 144, West Hill, Putney.

Well-known European Amateurs at Cambrai, France. Left to right : ON4HM, F8FC, F8EO, and ON4JB. Centre : F8EB and F8EX. Rear : F8WB.

RESEARCH AND EXPERIMENTAL SECTION

MANAGER:

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

ASSISTANT MANAGER:

Dr. G. F. Bloomfield (G5MG), 34, Morton Way, Arnos Grove, London, N.14.

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), 4, Buckingham Place, Clifton, Bristol.

No. 3: ARTIFICIAL AERIALS
Mr. 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
A. Ferreday (PAOFY), Abrikozenstraat, 87, The Hague, Holland.

No. 7: RECEIVER DESIGN
E. N. Adcock (G2DV), 206, Atlantic Road, Kingstanding, Birmingham.

No. 8: TRANSMITTER DESIGN
A. E. Livesey (G6LI), Stourton Hall, Horncastle, Lincs.

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 I am glad to be able to include an article by our new 56 mc. Group Managers, and I trust that those who are interested in such work will give the proposals careful consideration. After due thought it has been decided that the best plan will be to make a complete re-organisation of the 56 mc. Section, and therefore all who wish to join a 56 mc. Group should send in their names to the new Managers as soon as possible. In all cases it will be necessary for intending members to state as fully as possible what work of this nature they have done in the past, so that they may be placed according to their experience. The point to be borne in mind is that one should try and decide what useful knowledge one can bring to the section, and not merely what one can get out of it. I would assure all intending members that anyone who joins with the latter intention will soon be asked to resign, for it is not intended to carry any passengers in the new groups.

There is one correction which must be made to the notice regarding G2GD's schedules on 14312 kc. These will take place between 18.15 and 18.19 B.S.T., and not as stated in the last issue. It is hoped that members who hear these transmissions will be good enough to report on them immediately to G2GD. All reports are required as early as possible.

I am pleased to be able to announce that there have been two offers of help with the preparation of R.E.S. Notes. BRS1739 and G5HF have both offered to assist with the typing of material for publication, and I extend my sincere thanks to them. All material for publication should be sent to Headquarters as usual, but it will facilitate the early publication of articles if these are sent as early in the month as possible. On no account should material intended for prompt publication be left until after the 20th of the month.

G6PA.

Harmonics and Sub-Multiple Frequencies

In recent issues of this Journal it has been noted that members continue to refer to overtones in spite of the data which have been given in R.E.S. notes. This may be due to the fact that under the old method of reporting, R.E.S. notes were somewhat disjointed, as an instalment appeared only once a month, but by dealing with the whole subject here the writer hopes to clear up any misconceptions which may exist.

The first point to remember is that for *radio-frequency* work there is no such thing as an overtone. This can be explained by quoting the definition of an overtone :—

"An overtone is a vibration of a *mechanical system* in a mode of frequency *higher* than that of the fundamental." From this it would appear that a harmonic and an overtone are identical, but that this is not so is shown by the following :—

"A harmonic is any one of the series of 2F, 3F, 4F . . . nF, where F is the fundamental or first harmonic, and nF is the nth harmonic of the fundamental F.

"The overtones of many mechanical systems have frequencies which are very near to those of the harmonics of which the first is the fundamental of the frequency of the system, *but overtones and harmonics should not be regarded as identical.*"

As a matter of convenience, Vigoureux, in his book on quartz resonators and oscillators, defined the nth overtone of a system as that overtone whose frequency was very nearly equal to the nth harmonic, but it was recognised from this that this practice was not desirable in every case.

It will thus be realised that electrical circuits may be said to produce *harmonics* but not *overtones*, and that mechanical systems produce overtones which are not strictly harmonics.

The N.P.L. say that :—" We usually refer to the frequencies F/2, F/3, F/4, etc., as *sub-multiple frequencies*, and we think that the frequency F/N is conveniently referred to as the *n*th sub-multiple frequency of the fundamental F. We do not think that the term ' sub-harmonic ' which is sometimes used in this connection is justifiable."

G5WW

[A very interesting submission ; but even now we do not know the *real* difference between a harmonic and an overtone. G5WW says they are different, but *how* are they different ? Both are higher frequencies than the fundamental. When a sonometer string is plucked at half its natural length, do we generate a harmonic or an overtone ? Further, what about the violinist who produces harmonics ? Are they *really* harmonics or is the word a misnomer ? These points need an authoritative reply before we can regard the controversy as cleared up.—G5UM.]

Looking at 56 MC.

The new scheme of things in connection with R.E.S. has a particular bearing on the work of the 56 mc. section. Briefly, nothing that is (*a*) not original, or (*b*) does not open up some new line of thought or indicate some fresh idea, will in future be published. This is not to say that those who are at present active on five metres are wasting their time—far from it—but we must look at the facts.

So far as the bulk of 56 mc. activity is concerned, the situation at the moment is analogous to the use on 1.7 mc. of spark transmitters (with or without " reflecting " systems !), working to coherer-receivers. In other words, on our highest-frequency communication band, we are still playing about with apparatus and methods which most people would have hesitated to use on 200 metres ten years ago.

During the past three years it is safe to say that all the possibilities in connection with " visual range " working with simple gear have been thoroughly explored. We have had tests from mountain-tops, aeroplanes, gliders and moving cars, and there have been a succession of " transceivers," each one smaller and less efficieint than the last, produced by enthusiastic members with a desire to achieve the *dernier cri* in portability. All this work has been most interesting and instructive, and several commendable records have been set up, but have we yet done anything towards investigating the behaviour of the reflected wave ?

A great deal is heard about the so-called " quasi-optical " nature of waves in the neighbourhood of 56 mc. But is there not good reason to suppose that so far we have only succeeded in controlling the ground-wave, which, as we know, has tremendous penetrative power over short distances and then attenuates very rapidly, much as might be expected in view of the behaviour of the ground-wave on 28 and 14 mc.? Therefore, why has it been so quickly assumed that these frequencies are " quasi-optical " when in fact they are as far below light-waves in terms of frequency as alternating current frequencies are below 56 mc. ?

Going back 30 years, we can imagine a case where two stations with spark transmitters and coherer receivers, working on what would then have been the phenomenally low wavelength of 200 metres, were unable to get QSO over, say, 20 miles. One of the operators then devises a simple reflector arrangement, and finds that QRK at the other end goes up from R½ to R7. The result of that bit of research would undoubtedly have been immediate publication of the news that waves round 200 metres were " quasi-optical " !

Returning to 1935, it seems to us that the next line of work on 56 mc. must be the development of controlled transmitters, radiating CW to equally stable receivers, all the equipment being at least as efficient as that which most of us expect to use on 14 mc. Hand-in-hand with this goes the design of suitable aerial systems both for transmission and reception, in connection with which much has been done already.

Until there are several stations working along these lines, with the idea of getting QSO over a distance well outside the ground-wave range—QRA to QRA, in other words—it looks as if there can be no further progress on 56 mc. Except for purely local portable work, the day of self-excited one-lung over-modulated transmitters, radiating " wobbly " signals to equally inefficient receivers, is definitely and finally done.

We know that there are more than a few members holding views similar to those outlined here, and it is their co-operation which is required for the formation of the new 56 mc. R.E.S. groups. At the same time, let it not be thought that new ideas and experiences regarding the old methods of working are not wanted. Anything and everything which is outside the limits of our present knowledge will be of interest and may be of the greatest value.

In the meantime, applications for membership of the new 56 mc. groups are invited, and should be addressed either to G5JU or G6FO. Members of the old groups are hereby notified that *fresh* application must be made, and all those applying are asked to send in their requests, together with any material of interest, as soon as possible after publication of this notice.

G6FO/G5JU.

Cellophane

The following interesting information is sent by G2CD :

The trouble discovered by A.O.M. when using cellophane jam pot covers can be overcome by testing the wrapping by moistening a corner with the mouth. If the material is waterproof there will be no effect, whilst wrinkling will prove that the specimen is unsuitable.

These transparencies are usually either viscose, cellulose acetate or gelatine, all non-waterproof, but the first two can have their natural surfaces destroyed by processing, which makes them waterproof, and very suitable diaphragm material. From memory, I believe " Tom Long " tobacco is wrapped in moisture-proof material, and the size is very convenient.

If one desires to stick these moisture-proof materials to the sides of the microphone, the following hint may help. A little ethylene, glycol, acetone, or amyl acetate will probably dissolve sufficient of the surface, if it is placed *in situ* quickly after several applications, or an adhesive can be made by dissolving a gum in the solvent ; resin

may do, or a piece of the transparency dissolved in the solvent will make an adhesive, but it is not easy material to fix.

G2MI.

Neon Bulbs as Current Regulators

Many amateurs are familiar with the voltage stabilising qualities of the ordinary "Osglim" bulb, but the following idea may be new to some.

With a M.O. or C.O.-P.A. type of transmitter, the stages of which are fed from common H.T., a signal is often spoiled due to voltage fluctuations caused by keying, affecting the stability of the oscillator.

A neon bulb in series with the oscillator anode serves to smooth out any such fluctuations, maintaining the oscillator supply at a limited and constant value.

Going a step further, a bank of these neons, two, three, or four, in series according to the H.T. voltage in use, shunted across the power pack output, will give complete regulation.

At G2IZ, using a motor generator for H.T., a neon bank is indispensable. It has a big advantage over the more usual bleeder resistance in as much as it only draws current when the key is up, the neons striking upon the opening of the key and extinguishing on closing.

Before advantage can be taken of these stabilising qualities it is necessary to remove the ballasting resistance from inside the cap. The connecting wires must then be lengthened and a new cap fitted.

The resistance has a value of about 12,000 ohms. It is wire wound and rated at five watts, and could readily be put to some other use.

A common failure with these bulbs when in their ordinary use is caused by this resistance burning out; if, therefore, a few such "duds" can be obtained from a local electrician, they will serve the purpose equally well.

Minus the resistances, these bulbs are useless for lighting, and some distinguishing mark should be made on them to prevent their being the cause of blown fuses.

G2IZ.

56 Mc. Tests

Co-operation with R.E.S. members is absolutely essential when any special long distance 56 mc. tests, either from open country or otherwise, are contemplated, in order that the fullest information may be obtained on the direction, intensity, stability, etc., of the radiated signals, which can only be done when many are taking part.

It is therefore advisable that full details of such tests are sent to the Group Manager by the 16th of the month previous to publication of the BULLETIN, for inclusion in the R.E.S. Notes. Immediately after the event, all participants are requested to send in reports, when the results will be tabulated and published in the BULLETIN.

G5JU.

* * *

Further tests from G6SL, the station operated by *Messrs. Stratton & Co.*, of Birmingham, will take place on June 16, 23, July 7, 14. A detailed schedule follows :—

10.30 a.m. to 11.30 a.m. : Beam aerial.
11.30 a.m. to 12.30 p.m. : Omni-directional aerial.
3 p.m. to 4 p.m. : Beam aerial.
4 p.m. to 5 p.m. : Omni-directional aerial.

The beam aerial is directed 50 degrees East of South and the omni-directional is an orthodox vertical di-pole.

Transmissions will be telephony frequently interspersed by signals of 3 dash seconds of 500 cycle note for identification purposes. Power—50 watts.

Transmission periods of 10 minutes, commencing 10.30 a.m. until 12.30 p.m., with 10 minute intervals for listening or for possible two-way communication.

Re-commencing 3 p.m. to 5 p.m.

Written or telephoned reports will be welcomed.

* * *

G2GB will carry out portable 56 mc. tests from Newquay during the period June 15 to June 29, and would be glad to have reports from any station. In particular, co-operation is required from amateurs in Southern Ireland and South Wales, as Newquay is favourably situated for overseas QSOs. A portable transceiver will be used. The main test will begin at 20.30 B.S.T. on Sunday, June 23, but a number of transmissions will be made during the whole fortnight. Reports should be sent to C. S. Pollard, Highbury Hotel, Island Crescent, Newquay Cornwall, to reach that address before June 29, or to 19, St. Mary's Avenue, Shortlands, Kent, after that date. All reports will be welcomed and acknowledged.

* * *

On Sunday, June 30, from 10.00 B.S.T. until 17.00 B.S.T., G2IN and G5ZI will be transmitting continuously, except for QSO and listening periods, with telephony and I.C.W. under G2IN's portable call, from a hill near Southport, Lancs.

G5JU will also be operating on the Mendip Hills, and as in each case a nation-wide range is expected, it is requested that all who can possibly do so will join in these tests, either from fixed QRA's or portable, and send in a report to G5JU.

G5JU.

HB9B

HB9B, the short-wave station of the Basle Radio Club, transmits programmes between 22.00 and 24.00 B.S.T. every Monday, Thursday and Friday. The frequencies used are 7,118 and 3,770 kc. Reports on these transmissions will be greatly appreciated and should be addressed to Radio-Club Basle, Postfach, Basle 1, Switzerland. Every report will be acknowledged.

STRAY

W3EDP, H. J. Siegel, has moved to 120, Renfrew Avenue, Trenton, N.J., U.S.A.

Technical Hints Wanted

HIC ET UBIQUE.

New Licence Facilities—Congratulations—Result of Questionnaire—R.S.G.B. Slow Morse Practices—"John Williams V."

New Licence Facilities

We have much pleasure in announcing that the Society has been instrumental in obtaining two new and important licensing facilities for its members.

The first concerns the use of the suffix P when an amateur transmitting station is operated as a portable. For some years we have been endeavouring to obtain official permission for an identifying letter to be added to the call-signs used by such stations, because it has been realised that more local replies are likely to be received from stations known to be portable. The G.P.O. permission will be welcomed by all who operate field day and other portable gear.

The second facility is of even greater importance. Members will remember that since 1932 we have not been permitted to use the 3.5 mc. band during the summer months (May to September), except at week-ends. This restriction was imposed because of service requirements, but for the past few years we have felt that the services are not making very great use of our portion of the band during week-days. As a result of these observations the G.P.O. were asked whether the summer-time ban could be partially or wholly lifted.

We have now been advised that British amateurs may use the 3.5 mc. band (providing, of course, that authority has been granted) at any time during the months January to August and October to December. September, therefore, will be the only month in the year when week-day operation is prohibited.

We wish to emphasise that this new arrangement is subject to the important condition that amateur stations will cease transmitting immediately on request from :—

(1) A Naval station using its international type call-sign.
(2) An Army station using the call-sign ARM.
(3) An Air Force station using the call-sign ATF.

Those members who have been using the 3.5 mc. band during recent months will remember that the G.P.O. requested us to refrain from working on the spot frequencies, 3530, 3542, 3580 and 3690 kilocycles. This restriction has now been removed as the result of our discussions.

* * *

The above announcement will, we believe, do much to assist British amateurs, and on their behalf we wish to record our thanks to the Engineering Section of the G.P.O. for their help in bringing the negotiations to a successful conclusion.

Congratulations

On behalf of their many amateur friends we offer our heartiest congratulations to Messrs. G. W. Thomas, G5YK, and E. A. Dedman, G2NH, both well-known members of Council, who have recently entered the state of matrimony.

A further wedding of Society interest takes place on June 22 when Mr. J. W. Mathews, G6LL, becomes a bridegroom.

To all three couples we extend our best wishes for health, happiness and prosperity.

Brussels Visit

We are asked by Mr. Buckwell (G5UK) to mention that all members who desire to join his party to the Brussels Exhibition during the August Bank Holiday period should communicate with him not later than June 30. His address is 19, Meadway, Westcliff-on-Sea.

A Jubilee Award

Congratulations are extended to Mr. W. T. Chappell (BERS229), of Nairobi, who has been awarded the King's Silver Jubilee Medal.

THE KING'S SILVER JUBILEE

On the occasion of the Silver Jubilee, Mr. Arthur E. Watts, President of the Society, addressed the following message to His Majesty :

"The Council and Members of the Incorporated Radio Society of Great Britain and the British Empire Radio Union respectfully tender their loyal greetings and heartiest congratulations to His Majesty King George, and Her Majesty Queen Mary on the occasion of their Silver Jubilee."

The following telegram was received from Sir Clive Wigram, Private Secretary to His Majesty :

"The King is much gratified to receive the message of congratulations which you have sent on his Silver Jubilee, and I am desired to express His Majesty's warm thanks to all who joined in these good wishes."

Result of Questionnaire

The 280 odd members who were kind enough to return the questionnaire enclosed in the April issue of the BULLETIN will be interested in the following information :

75 per cent. were in favour of Convention being held during the period of the R.M.A. Exhibition.
68 per cent. were in favour of Convention commencing on the Thursday evening.
77 per cent. were in favour of a Business Meeting being held, and
83 per cent. were in favour of the meeting being held on the Saturday morning.
68 per cent. were in favour of short talks being given on the Saturday afternoon.
220 members signified their intention of being present providing Convention is held at a time convenient to themselves.
Finally, 67 per cent. voted in favour of the continuation of District Notes in their present form.

Support R.E.S.

W.B.E. Certificates

The following W.B.E. certificates have been awarded :

Name.	*Call Sign.*	*Date.*
M. W. Weeks	W1WV	... Oct, 31,1934
J. MacIntosh ...	VS2AF*	Mar. 21, 1935
E. J. Dell... ...	G2UL	May 2
J. Moens	SU1RO ...	,, 9
W. W. Storer ...	G6JQ	,, 10
A. MacNaughton...	VK2ZH ...	,, 15
D. Brown ...	ZL1HY ...	,, 15
J. M. Ross ...	ZT6A	,, 21
A. Pollard ...	G2PN	,, 21
W. Heathcote ...	ZT6X ...	,, 28

* First Malaya award.

W.B.E. Awards

We have been asked by Mr. Robillard (V8AF) to confirm that a QSO with Mauritius counts as an African contact for W.B.E. purposes.

The rules governing this award appeared in the May, 1934, issue of this journal.

B.E.R.U. Contests 1935

Owing to pressure on our space it is regretted that the results of the above contests cannot be published this month. The full report will appear in the July issue.

QRA Section.

Manager : M. W. Pilpel (G6PP).

NEW QRA's.

G2BL.—P. B. Burnett, 18, Raleigh Drive, Whetstone, London, N.20.

G2FD.—F. W. Davies, 73, Willowdale Road, Walton, Liverpool, 9.

G2ZX.—A. N. Porter, "Littlefield," Audrey Walk, Westbury-on-Trym, Bristol.

G5KJ.—K. M. C. Evans, "Hillside," Llanelly, South Wales.

G5OV.—C. Symonds, Station Road, Over, Cambs.

G5RC.—R. C. Crisp, 305, Liverpool Road, Hough Green, near Widnes, Lancs.

G5XC.—G. Haworth, "Merova," Wheatley Lane Road, Barrowford, Lancs.

G6BJ.—D. J. Beattie, 56, St. James' Avenue, Beckenham, Kent.

G6CX.—H. W. Stacey, "Sandleas," Eddisbury Road, West Kirby, Cheshire.

G6HJ.—H. Jackson, 88, Wyley Road, Radford, Coventry, Warwickshire.

G6IF.—M. E. Tapson, "The Chalet," Woodside, Belfairs Garden Estate, Leigh-on-Sea, Essex.

G6JW.—J. Werley, Bilton Road, Neath, Glamorgan.

G6LQ.—W. Johnson, Milton, Somerset.

G6OF.—M. Shaw, 54, St. George's Road, Ilford, Essex.

G6TL.—F. Lawton, "Brooklands," Huddersfield Road, Stalybridge, Cheshire.

G6TO.—K. H. Arthur, 72, West Street, Old Market, Bristol.

2AIC.—A. E. Clipstone, 15, Epperstone Road, West Bridgford, Notts.

2AJZ.—E. Mitchell, 40, North Marine Road, Scarborough, Yorks.

2AMO.—D. E. Herbert, 19, Seaton Avenue, Mutley, Plymouth, Devon.

2ATF.—H. C. Stone, 41, Rosamund Road, Wolvercote, Oxford.

2AWG.—A. W. Godden, 14, Inglis Road, Ealing, London, W.5.

2AWZ.—R. H. Davies, 8, Tyisaf Road, Gelli, Pentre, Rhondda, Wales.

2BAI.—K. L. Howell, 148, Gunnersbury Lane, Acton, W.3.

2BIC.—A. S. Chadwick, 100, Frederick Road, Stechford, Birmingham, 9.

2BKK.—R. J. Rider, 97, Gloster Road, Old Woking, Surrey.

2BUO.—G. F. Wakefield, 67, Southwark Park Road, London, S.E.16.

EI8G.—F. de Burgh Whyte, "Eastbourne," Glenageary, Co. Dublin, I.F.S.

The following are cancelled :—2ABQ, 2AMY, 2BCQ, 2BFJ, 2BLL.

NEW MEMBERS.

HOME CORPORATES.

E. W. V. Butcher (G5AN), 16, Manor Gardens, Purley, Surrey.
R. W. Newton (G5NQ), 94, Parkhill Road, Hampstead, N.W.3.
H. Beardwood (G3ZB), 105, Cemetery Road, Heckmondwike, Yorks.
D. E. Palin (G6DP), 62, Belle Mont Road, Overton, Frodsham, *via* Warrington.
F. J. E. Starkey (G6KY), 27, Norwood Avenue, Southport, Lancs.
W. Spink (2AMS), 32, Shirley Road, Southampton, Hants.
N. Best (2BBK), 31, Lister Street, Dalton, Huddersfield.
D. W. C. Allen (2BYA), Girdlestoneites, Charterhouse, Godalming, Surrey.
D. K. Garland (BRS1823), 126, Forthill Drive, Broughty Ferry, Angus.
R. T. Dealey (BRS1824), 34, East Sheen Avenue, East Sheen, S.W.14.
H. J. Hooker (BRS1825), "Lemington," London Road, Wickford, Essex.
C. P. Angear (BRS1826), Merrivale, Exton, near Exeter, Devon.
J. Langrish (BRS1827), 23, Sedlescombe Road North, St. Leonards-on-Sea.
R. A. Watson (BRS1828), c/o Messrs. E. A. Jarrett, 432, Hoe Steet, Walthamstow, E.17.
H. H. J. Connor (BRS1829), 55, Hervey Park Road, Walthamstow, E.17.
E. R. Ward (BRS1830), 54, Bentley Street, Cleethorpes, Lincolnshire.
J. Kirkpatrick (BRS1831), 40, Henrietta Street, Kilmarnock, Ayrshire, Scotland.
F. Brown (BRS1832), 33, Hampden Road, Roker, Sunderland.
M. P. Bayliss (BRS1833), 22, Park Road, Kenilworth, Warwickshire.
J. H. Hemingway (BRS1834), 13, Alexandra Grove, Leeds 6.
H. C. Higgs (BRS1835), 7, London Street, Greenwich, S.E.10.
J. W. T. Mooney (BRS1836), 15, Bath Street, Gourock, Scotland.
R. F. Brook (BRS1837), 336a, Holdenhurst Road, Bournemouth.
E. N. Weston (BRS1838), 77, Kingswell Road, Bournemouth, Hants.
K. C. Moss (BRS1839), 55, Willoughby Road, Wallasey, Cheshire.
F. J. End (BRS1840), 83, North Street, Wellington, Somerset.
B. H. Douthwaite (BRS1841), 28, Haslemere Avenue, Hendon, N.W.4.
A. L. Hodges (BRS1842), 185, Redland Road, Redland, Bristol 6.
G. R. Almond (BRS1843), 30, Merton Road, Rathmines, Dublin, I.F.S.
R. S. Page (BRS1844), "Newbry," Croutel Road, Felixstowe, Suffolk.
R. Watson, L.C.P. (BRS1845), The School House, Wraysbury, Middlesex.
E. Dean (BRS1846), 155, Cotmanhay Road, Ilkeston, Derbyshire.
J. A. Jagger (BRS1847), Berwick, Stoke Road, Guildford, Surrey.
F. M. Trier (BRS1848), Fairlawn, West Horsley, Surrey.
N. K. Read (BRS1849), "Netherton," Herington Grove, Hutton Mount, Essex.
L. J. Davis (BRS1850), 223, Leigh Road, Leigh-on-Sea, Essex.
T. H. W. Wills (BRS1851), 2, Jessamine Road, Shiregreen, Sheffield 5.
A. P. De Boer (BRS1852), Flat 4, 11, King's Gardens, Hove, Sussex.
J. Elliot (BRS1853), Vanessa, Bockings Grove, Clacton-on-Sea.
E. W. Hunt (BRS1854), Keyhaven House, near Lymington, Hants.
E. Powell, jun. (BRS1855), 44, Pritchard Street, Tonyrefail, Glam.
W. J. Steel (BRS1856), 218, Bexley Road, Erith, Kent.
J. Elphick (BRS1857), Blacktoft Vicarage, Howden, E. Yorks.
W. L. Howat (BRS1858), 11, Kirkland Park Avenue, Strathaven, Lanarkshire.
D. Davy-Thomas (BRS1859), "Halnoweth," Gulvia, Penzance, Cornwall.
D. Q. Aldridge (BRS1860), "Oakburn," Lochgoilhead, by Greenock, Scotland.
B. P. R. Parsons (BRS1861), 13, Grove Court, Drayton Gardens, S.W.10.
J. W. Richardson (BRS1862), "Chichelea," Claylane, Newport Pagnell, Bucks.
W. S. Knox (BRS1863), 105, Grafton Road, Keighley, Yorks.
H. W. Collins (BRS1864), 75, Latham Street, Kirkdale, Liverpool.
H. Percy (BRS1865), "Lynhurst," Blackwell Avenue, Walker, Newcastle 6.
S. J. Sugden (BRS1866), 6, Ashfield Road, Shipley, Yorks.
J. D. Panton (BRS1867), "La Estancia," Marine Drive, Bridlington, Yorks.
F. C. A. Ferguson (BRS1868), 40, Walnut Road, Torquay.
J. Hamilton (BRS1869), 11, Meadow Bank Avenue, Strathaven, Lanarkshire, Scotland.
G. E. Glasgow (BRS1870), 39, Causeyside Street, Paisley, Scotland.
J. A. Marsh (BRS1871), 99, Rendel Street, Grimsby.
H. Diamond (A), London Missionary Society, Livingstone House, 42, Broadway, S.W.1.

DOMINION AND FOREIGN.

K. J. Cook (SU1AQ), No. 1 Company, Egypt Signals, Abbassia, Cairo, Egypt.
G. C. Perakis (SU1GP), 24, Orfi Pacha Street, Sporting, Ramleh, Egypt.
J. D. Turabian (SU1JD), 221, Thebes Street, Sporting, Sidi-Gaber, Egypt.
W. C. J. Meredith (VE2HM), 1228, Pine Avenue West, Montreal, Canada.
N. MacNaughton (VK2ZH), 21, Liverpool Road, Malvern Hill, Croydon, N.S.W., Australia.
T. P. Myers (VP5AD), 116, Tower Street, Kingston, Jamaica, B.W.I.
A. Tibbits (VP2AT), High Street, St. John's, Antigua, B.W.I.
T. O. Cadell (VU2EB), Army Signal School, Poona, India.
E. W. Bramblerry (XU8CB), Shanghai Telephone Co., 460, Fokien Road, Shanghai, China.
D. Brown (ZL1HV), Seddon Street, Waihi, New Zealand.
R. A. Dersley (ZT2B), P.O. Box 413, East London, S. Africa.
K. S. Mehal (BERS282), 10, Chi Wo Street, First Floor, Kowloon, Hong Kong.
G. A. K. Rockwood (BERS283), Kudsia, Rockwood Place, Colombo, Ceylon.
Capt. J. Bloor (BERS284), 6a, Church Street, Bangalore, South India.
P. H. Peacock (BERS285), Currency Note Press, Nasik Road, C.I.P. Railway, India.
A. G. Strutt (BERS286), 84, Squadron, R.A.F., Shaibah, Iraq.
Capt. R. M. Higgs (BERS287), Inspector of Wireless, Burma Military Police, Pyawbwe, Upper Burma.
T. A. Adams (BERS288), Bombay City Police, Kingsway Police Station, Matunga, Bombay, India.
W. Q. Lennane (BERS289), c/o Gramophone Co., Ltd., 33, Jessore Road, Dvm Dvm, India.
H. P. Buckley (BERS290), Bhangnga, Siam.
A. Pardo Soublette, 122, Bvd Exelmans, Paris 16e, France.

R.S.G.B. Slow Morse Practices

A schedule of dates, times and frequencies of the stations sending slow Morse for the benefit of those members wishing to learn the code is given 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. More reports will be appreciated and are desired in order to ascertain range of transmission and numbers utilising the service. The schedule below contains one additional station, G5GC, of Hull, who will be sending on the 7 mc. band. Stations willing to assist on the 1.7 mc. band—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.		B.S.T.	kc.	Station.
June 23	Sunday	0000	1761.5	G2WO
,, 23	,,	0930	1785	G5BK
,, 23	,,	1000	1850	G6VD
,, 23	,,	1015	173λ	G5JU
,, 23	,,	1030	1911	G2JL
,, 23	,,	1100	7104	G6PJ
,, 23	,,	1130	1761.5	G2WO
,, 23	,,	1200	7102	G5GC
,, 30	,,	0000	1761.5	G2WO
,, 30	,,	0930	1785	G5BK
,, 30	,,	1000	1850	G6VD
,, 30	,,	1015	173λ	G5UH
,, 30	,,	1030	1911	G2JL
,, 30	,,	1100	7104	G6PJ
,, 30	,,	1130	1761.5	G2WO
,, 30	,,	1200	7102	G5GC
July 7	,,	0000	1761.5	G2WO
,, 7	,,	0930	1785	G5BK
,, 7	,,	1000	1850	G6VD
,, 7	,,	1015	173λ	G5JU
,, 7	,,	1030	1911	G2JL
,, 7	,,	1100	7104	G6PJ
,, 7	,,	1130	1761.5	G2WO
,, 7	,,	1200	7102	G5GC
,, 14	,,	0000	1761.5	G2WO
,, 14	,,	0930	1785	G5BK
,, 14	,,	1000	1850	G6VD
,, 14	,,	1015	173λ	G5UH
,, 14	,,	1030	1911	G2JL
,, 14	,,	1100	7104	G6PJ
,, 14	,,	1130	1761.5	G2WO
,, 14	,,	1200	7102	G5GC

"John Williams V."

The London Missionary Society's auxiliary schooner *John Williams V*, sailing between Suva (Fiji), Samoa and the Gilbert and Ellice Islands, will transmit by telephony, on a wavelength of 48 metres (6,250 kc.), a message addressed to the mission station of the Society at Beru, Gilbert Islands (VP3AP), at 20.00 G.M.T. daily from July 25 to August 24, except when in harbour at Suva, Apia or Pango Pango.

The message will be in the following form:—

"This is the London Missionary Society's schooner *John Williams* call sign MPSZ calling the Society's mission station at Beru, Gilbert Islands VP3AP (repeated three times).

"Our position is (latitude and longitude given). We are on a voyage from —— to —— having left Suva at (time) and expecting to arrive at (particulars as required)." Followed by a report as to weather conditions and health of passengers and crew.

The whole message will be repeated twice, slowly. Reports from amateurs who may hear this message will be appreciated and may be sent by letter or QSL card, addressed to the London Missionary Society at Livingstone House, 42, Broadway, Westminster, S.W.1.

Calls Heard

By VK6RL (W. Australia) on 7 mc. during February-March: Zl3an, 3jr, 2bh, 2ki, vs6ag, aq, v8ac, vu2by, 2cq, vs2af.

By G5BD, (Mablethorpe) on 28 mc. during May: Ok1aw, oe1fh, d4bar, 4bbn, g5fv.

OBITUARY

There died in the past few weeks a personality whose demise removed from our midst one who was formerly the keenest of keen amateurs.

Geoffrey Gore (G5DA), during his term of office as "D" District Officer in Scotland, did much to awaken the enthusiasm now prevalent in that district, and much credit is due to his likeable personality. Resident latterly in London, in the service of the B.B.C., he was compelled to his keen regret, by the nature of his duties, to give up amateur work. Though he dropped out, his interest in amateur work remained keen, and it is almost certain that had he been spared, he would ultimately have resumed it.

Our sympathies are with his sorrowing wife and family.

Q.S.L. with Discretion

DX CHART—No. 7

DX CONDITIONS: APRIL 15 TO MAY 15, 1935.

G.M.T.	14 mc.	7 mc.
0100		W1.2.3
0200		W1.2.3
0300		W1.2.3
0400		
0500	**W7** ; OA	ZL
0600	**W6.7** ; **K6** ; VK ; TI	ZL ; VK
0700	**W6**	VK
0800	VK	
0900	VK	
1000		
1100		
1200	**J**	
1300	**J** ; PK3 ; VE4	
1400	XU ; X2 ; VU ; W6 ; J ; VE4	
1500	**VS1.6** ; W6.7 ; VK ; VE4	
1600	**ZB1** ; W6.7 ; VS1.6 ; VE4	
1700	VS7 ; VU ; PK1 ; VE4	
1800	**VQ4** ; ZE1 ; TF ; VE4 ; KA1	J
1900	**PY** ; VQ4 ; J ; CX1	J
2000	PY ; CX1 ; J	PK1 ; ZS
2100	VP4 ; J ; CX1	
2200	HJ ; VP2 ; K4.5 ; W5 ; LU ; PY ; CX1	PY9 ; LU1
2300	VP5.6 ; W7 ; VE4 ; LU ; PY	W1.2.3
2400	K4 ; LU ; PY	W1.2.3

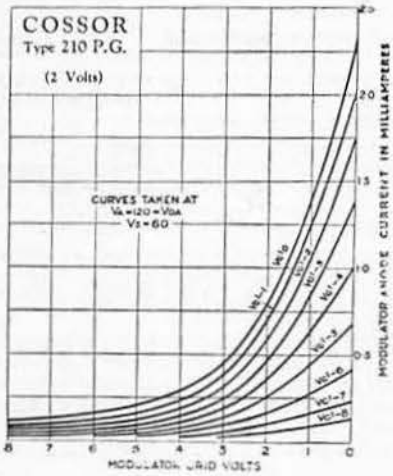
W1.2.3.4.8.9. Normal on 14 mc. between 1400 and 2400 G.M.T.
(A) Bold type indicates strong signals.

Valve Review

COSSOR 210P.G.

This valve is a battery pentagrid convertor fitted with a seven-pin base and a screw-top cap.

Characteristics.	*Makers.*	*Measured sample.*
Filament volts	2.0	2.0
,, current (amp.)	0.1	0.10
Anode volts (max.) ...	150	150
Screen ,, ,, ...	80	80
Oscillator anode volts (max.)	150	150



The makers' curves are shown herewith ; the sample was found to have curves quite close to the published curves, except that the cut-off was less sharp, but this is not material.

On test the valve functioned quite satisfactorily. The oscillator coil should be adjusted so that the R.M.S. valve of the oscillator grid voltage is about 5. The valve is quite suitable for use in receivers employing A.V.C., as the control grid has a vari-mu characteristic, the range being about 0 to —9 volts or, if desired, the control may be manual and linked up with that of the R.F. or I.F. amplifier.

The conversion gain is in the order of 30 times, using average I.F. transformers, which is very satisfactory considering the economical current consumption.

D. N. C.

Osram Valve Guide

We are advised by the General Electric Co. that copies of the Osram Valve Guide will be supplied free of charge to members mentioning this journal. All requests should be addressed to the Publicity Manager, Magnet House, Kingsway.

TRADE NOTICE

MESSRS. FERRANTI advise us that they are now manufacturing to special order microphones and modulation transformers especially suited to the requirements of amateur transmitters. They will be pleased to submit quotations upon request.

NOTES and NEWS from the BRITISH ISLES

DISTRICT REPRESENTATIVES.

DISTRICT 1 (North-Western).
(Cumberland, Westmorland, Cheshire, Lancashire.)
MR. J. NODEN (G6TW), Fern Villa, Coppice Road, Willaston, near Nantwich, Cheshire.

DISTRICT 2 (North-Eastern).
Yorkshire (West Riding, and part of North Riding), Durham, and Northumberland (Middlesbrough is in this district.)
MR. L. W. PARRY (G6PY), 13, Huddersfield Road, Barnsley, Yorks.

DISTRICT 3 (West Midlands).
(Warwick, Worcester, Staffordshire, Shropshire.)
MR. V. M. DESMOND (G5VM), 199, Russell Road, Moseley, Birmingham.

DISTRICT 4 (East Midlands).
(Derby, Leicester, Northants, Notts.)
MR. H. B. OLD (G2VQ), 3, St. Judes 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. Rhyl, 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.)
MR. A. E. LIVESEY (G6LI), Stourton Hall, Horncastle, Lincs.

DISTRICT 18 (East Yorkshire).
(East Riding and part of North Riding.)
MR. T. WOODCOCK (G6OO), "Conakry," Cardigan Road, Bridlington.

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

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

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

DISTRICT 1 (North-Western).

AN attendance of 27 was recorded at the last Manchester meeting, and a junk sale held at this meeting realised the sum of 20s. 8d., which was credited to the Field Day funds.

Most of the evening was devoted to Field Day talk, final arrangements being made, and thanks are due to those who offered gear for use during the contest, and to the men who by the time these notes are in print will have operated the station.

Four new BRS members, to whom a hearty welcome is extended, have joined this group.

A committee was formed to arrange all the details in connection with the North-Western provincial meeting, which will be held in Manchester on July 21. Will all members please make a note of the date, and reserve the day so that they can attend? Further details in the next BULLETIN.

Congratulations are due to Mr. Robinson, who is now 2AXH, and a welcome is extended to G5IZ, who is now residing in Preston.

Individual reports are left over this month, due to N.F.D. activity. All the Manchester group are very busy and most are taking advantage of the good conditions on the 14 mc. band to work some DX, while the BRS men are hotting up receivers or busy with R.N.W.A.R.

G6JN, who, at the time of writing, is in Rangoon, India, is busy making personal contacts with Calcutta amateurs. He has visited VU2LU, 2CS, 2AY and BERS135, and is spending some very enjoyable moments with them.

At the next Manchester meeting, SU1MM will give a talk on conditions in SU, and will also have a number of photographs to pass round.

* * *

The membership of the Liverpool group continues to grow and 20 members attended the May meeting, when final arrangements were made for N.F.D. Unfortunately, some difficulties occurred in connection with the proposed site, and it was necessary to cancel the original arrangements to set up the station at Barnston. Thanks are due to the following:—G2OA for the provision of the transmitter and receiver, 2DC for motor generator and low-tension supply, 2RF for the high-tension supply for the receiver, 2KZ for the monitor, 6CX for the

aerial components and 6TT for the provision of chairs and tables.

Members will note from the Manchester section report that the conventionette is to be held on July 21, at Manchester, and those who propose to attend are asked to send a postcard to the C.R. so that arrangements can be made to reserve the necessary accommodation.

Individual reports are as follow :—The 1.75 mc. band continues to show great activity and stations can be heard working each evening during B.B.C. hours. The following are a few local stations heard working on this band : G2FD, 2IN, 2IF, 5OP, 5GY, 5KL, 5ZR, 5JG, 5RY, 5XD, 5TH, 2KZ, 6OM, 6QR, 6FA, 6PO, 6FX, 6SX, 6LY, 6KY, 6JT and 6US. G6PO has worked PA0XD on this band, and G5OP has had reports from Switzerland on his phone transmissions ; G5KL and G2IN are on duplex ; and G2FD and G5RY are carrying out aerial tests with interesting results, using a commercial " all-mains " receiver as speech amplifier, and coupling the output to a CO transmitter.

Added to trawler and commercial QRM is a new one in the form of certain stations putting out a modulated carrier, leaving it running for some length of time, and switching off without making any announcement, which is very annoying when one is standing by to give a report. If the perpetrator of this unmitigated nuisance happens to read this comment, will he please read, mark, learn and inwardly digest same ? Individual reports follow :

G2OA listening on 28 mc. for European signals ; G6TT, using National H.R.O., finds that matching antenna and feeding system makes great improvement in results on transmissions on 14 and 28 mc. ; G2RF built new receiver : will members let him know if they can work duplex CW ? G2DC active on 7, 14 and 56 mc., trying out neutralised T.P.T.G. amplifier ; G2FD 1.7 mc. fone ; G2JT and G6DP investigating break-in telephony ; BRS1395 on 56 mc. ; 2ASO changing C.O. to Tri-tet ; G2KZ and 2AVK acting on 14, 7 and 1.7 mc. ; G6CX rebuilding station at new QRA : has two 40-ft. masts in position and hopes to be working by time these notes are in print. Mr. Stacey's new address is Sandleas, Eddisbury Road, West Kirby, Cheshire.

NORTH-EASTERN PROVINCIAL MEETING

SUNDAY, JUNE 23, 1935

at

The Guildford Hotel, The Headrow
LEEDS

Assemble - - -	1.30 p.m.
Business Meeting - -	2.30 p.m.
High Tea - - -	5.30 p.m.

Inclusive Charge 4/6

Reservations to Mr. L. Parry, G6PY, not later than June 20.

DISTRICT 2 (North-Eastern).

The chief event of the month is the North-Eastern provincial meeting, which will be held on June 23, at the Guildford Hotel, The Headrow, Leeds. Members will assemble from 1.30 to 2 p.m., and at 2.15 p.m. a cup of tea will be served. The meeting will then be held, at which our secretary (G6CL) and members from H.Q. will be present. After this a hot lunch will be taken at 5.30 p.m. Tickets are 4s. 6d. each and can be paid for at the meeting. It is essential that a card, stating your intention to be present, be sent to G6PY, 13, Huddersfield Road, Barnsley, before the 20th of the month, in order to have suitable accommodation made for members visiting the conventionette. *Please send your card to-day and help the D.R. to avoid unnecessary trouble.*

The majority of the Sheffield members are active, although the regular meetings have been suspended until the autumn. Amongst these are G2AS, 2HQ, 5HK, 6LF, 6PJ, 2ARB, 2AUB and BRS1067. 6PJ has lately carried out tests on 7 and 14 mc. with a 33-ft. indoor aerial tapped on to the tank, and reports fine results with an input of 8 watts. Two new stations have started up during the month, and our best wishes are sent to both of them—these are G6KL and BRS1800.

The duties of manager for the Stockton area have been taken over by G2FO, who reports that 2HZ has put up a Windom and worked ZL with his first test call, and 6ZT has worked his first W. Experiments with tri-tets are being made by 2FO, whilst 2BQO is busy grinding crystals. G6CV and G5XT seem to be inactive, and G5QU is heard occasionally on 7 mc. Attempts are being made by 6ZT and 2FO to contact 6AY in Newcastle on 56 mc., but so far without success. A hearty welcome is given to G6MF, a newcomer to the district, and also to BRS1358 (ex-YI5KM), and SU5KM, who is now residing at Catterick, at the R.A.F. depot, and who hopes to be transmitting at a later date.

The Bradford area members continue their activities, a meeting being held during the month at G6KU, when a good attendance was had, and the usual discussion and inspection of gear, which included the N.F.D. transmitter, took place. An interesting addition to the station of G6BX is a panel which comprises a tri-tet, EC oscillator, and the more usual CO. Switching is so arranged that rapid changes can be made from one system to another. Amongst the usual stations which are heard on the various bands are G6BX, 2VO, 5SZ, 5TQ, 5WK, 6KU, 6AZ, 6PY, 6XL, 2QM, and most of the AA and BRS stations are active. Several of the latter are attending a morse class at the Radio Society each week, which is creating much interest just now as the meetings during the summer are quite informal. A report from a new member, BRS1819, is received, and our best wishes are extended to him.

In conclusion, we wish to thank all those members who gave donations and assistance in many ways to the running of the station during the Field Day Contest.

DISTRICT 3 (West Midlands)

Although it is to be regretted that no notes appeared last month no apology is tendered, for the compiler does not possess any powers of thought-reading.

Once again it is necessary to appeal to the members in the district for their assistance. If No. 3 notes are to appear, reports should be sent in to the D.R. not later than the 20th of the month, otherwise—well, otherwise!

The ever-busy G5BJ and 6DL have been collaborating in modulation experiments and with a pair of 210's are rejoicing on seeing upward modulation of an input of about 200 watts.

DX to date includes VK, OM, VS1, HI7, VO, W6 and W7. Surely something to rejoice about. They are also "teamed up" in the 56 mc. experiments that are taking place from G6SL in Birmingham on Sunday mornings.

They have also been experimenting with directional receiving aerials, ganged H.F. stages and regenerative I.F. It will be allowed that there is some activity in the District!

G5NI is welcomed back after his trip to he U.S.A. During his visit he kept in touch with home affairs by means of skeds with his own station (operated by G5VM) and with G5BJ.

G2ZW makes a very welcome reappearance in these notes. In his usual whole-hearted manner he urges the claims of the R.N.W.A.R., particularly to the old-timers "who have now worked every or nearly every country in the world," and who, he suggests, have in the Reserve an opportunity of increasing their experience and utilising their hobby in the interests of their country.

A welcome is extended to SU6HL (G6HL, ST2D) on his return to "Home Establishment." He is in the throes of construction and plans to operate a 56 mc. mobile unit attached to a motor cycle outfit. We hope he will not miss the "gentle caress" of the "Khamseen" too much.

Congratulations to G5JF, who awaits confirmation only for WBE and WAC. He also reports contacts with W5.

DISTRICT 5 (Western).

The Bristol Section held their usual monthly meeting during May, which was very well attended.

The main business of this meeting was to receive reports from the Field Day and Club Room Committees and to appoint an Assistant C.R. Mr. G. E. Hellin, 2BYU, has kindly undertaken the duties, and his address is 16, Covan Walk, Knowle, Bristol, 4.

On Sunday, May 12, about 50 members visited the Portishead Station, 20 members staying on afterwards for tea and general "rag-chew."

BRS1708 and 1796 both report very active on morse practice using valve oscillator. Individual activity is still very much in evidence throughout the whole section.

The Wiltshire letter budget is still going strong, but members are asked to please post it on to the next member in good time. The Oxfordshire C.R. reports activity well maintained.

DISTRICT 6 (South-Western).

There is not the slightest doubt that the most important event of the month has been the Provincial Meeting. This was held at Torquay on Sunday, May 12, when there was an attendance of thirty-four members. In view of the fact that most members had to travel long distances, and that the number was more than double those of previous similar meetings, the effort is considered distinctly creditable, and the DR takes this opportunity of cordially thanking all those who supported him so well, and who helped him to make the meeting a great success.

The meeting was honoured by the presence of Mr. Dawson Ostermeyer, G5AR (Hon. Treasurer), Mr. J. Clarricoats, G6CL (Secretary), Mr. V. Desmond, G5VM (DR District 3 and Member of Council), and Mr. Reeves, M.A., one of our oldest Vice-Presidents.

Members first assembled at G5SY, and after sundry photographs had been taken, a move was made to the Victoria and Albert Hotel for luncheon and the business meeting. At the latter the DR outlined the progress which had been made in the district, particularly stressing the fact that membership had increased from 37 to 70 in the last two years. He also mentioned that monthly meetings were being held in various centres. The CR's were thanked for their great help, as was Mr. C. Wood, G5WY, who has done good work in getting meetings going in Exeter.

"Clarry" then addressed the meeting, and in his usual excellent manner gave an interesting account of how things are done at Headquarters. One could see that this was especially absorbing to the newer members. Afterwards, the Secretary very ably answered a number of questions. During the votes of thanks the members were treated to some interesting reminiscences by Mr. Reeves on the early days of the Society.

After tea a visit was made to G5GD at Teignmouth, where the traditional brew of Devon was sampled! Back to Torquay for the 1934 N.F.D. films, and then a further move to G6WT.

FORTHCOMING EVENTS.

June 16.—District 11, 6 p.m., at G2II, The Flagstaff, Colwyn Bay.

June 16.—District 2 (Newcastle section), 6.30 p.m., at 14a, Pilgrim Street, Newcastle-on-Tyne.

June 23.—North-Eastern Provincial Meeting at Leeds.

June 25.—District 14 (East London section), 8 p.m., at 2AYB, 16, Station Road, Walthamstow (near St. James's Street Station).

June 26.—District 14 (Essex section), 8 p.m., at 2BWP, 24, Percy Road, Leigh-on-Sea.

June 28.—District 4, 7.30 p.m., at Turkey Cafe, Granby Street, Leicester.

July 7.—London and Home Counties Summer Outing to Ongar Radio Station.

July 10.—District 1 (Manchester section), 8 p.m., at Brookes' Café, 1, Hilton Street, Manchester.

July 18.—District 13, 8.30 p.m., at Brotherhood Hall, West Norwood.

July 21.—North-Western Provincial Meeting at Manchester.

Aug. 14-24.—R.M.A. Exhibition at Olympia. R.S.G.B. stand No. 204.

Aug. 22-24.—Tenth Annual Convention in London.

We finally allowed " Clarry " to go to bed in the small hours of the morning !

* * *

With regard to other activities the higher frequencies seem to be coming into their own again, with 56 mc. to the fore. The Somerset members, especially 6II, 6LQ, 5AK, and 2JM are all interested in this band. 6II is building a super-regenerative two, using Hivac Midget valves. 5GD, 5SY and BRS1821 have carried out further experiments on this band. It is hoped to arrange for some field day tests on 56 mc. between Somerset and Haldon Moor.

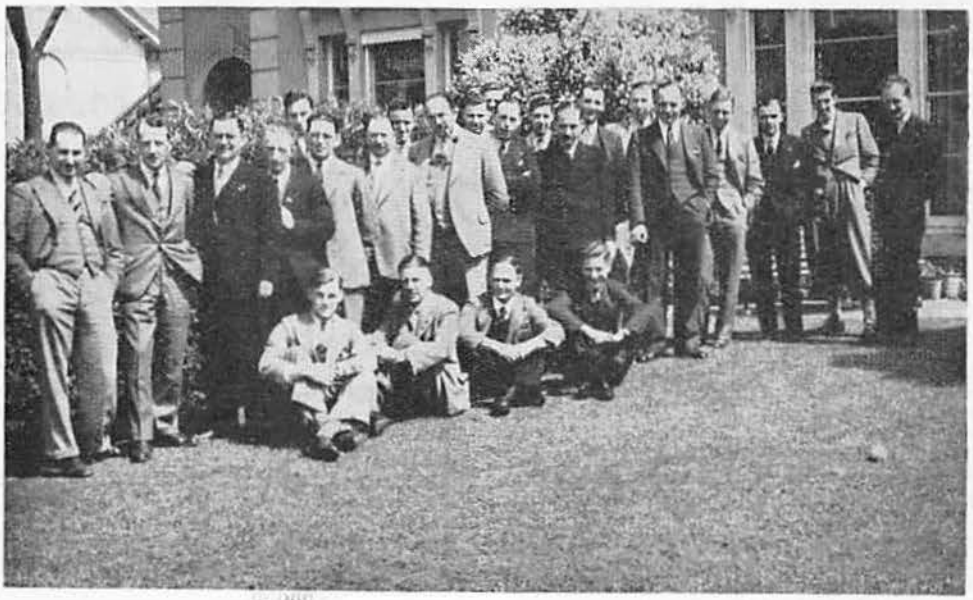
5QA is just completing a rebuild for 7 and 14 mc., and it is this gear which he very sportingly allowed us to use for our " B " station. 5YR has

DISTRICT 7 (Southern).

The D.R. apologises to all for missing last month's notes. Due to an oversight they were not compiled until about a week after press day. Now for two months' news.

The last two monthly meetings were amongst the most successful we have ever had. Firstly, the April meeting at G2NM : we had an attendance of 45 and in view of the bad weather this was highly satisfactory. We only hope that " Gerry " was able to get his station straight after we had gone. Our thanks once again to both him and Mrs. Marcuse for a most entertaining afternoon.

The other high light was our conventionette at Winchester. We think that every one of the 50 who were present will agree that it was our best yet. We were particularly pleased to welcome the visitors, who included VP3A, G5JO from Cam-



The South-Western Provincial Meeting at Torquay. G6MN, G5VL, G5SY (D.R.), and G5WY on the left, G5AR and G6CL (with pipe) in centre, G5QA second from left, seated.

some very excellent photographs of the Provincial Meeting for any of the members present who would like to have them, but, please OM's! don't forget the stamped addressed envelope when writing. The next meeting of the Exeter and District membership will be on Thursday, June 20, between 7 and 8 p.m., at G5WY's QRA.

One excellent tit-bit the DR has kept till last. The District is very fortunate in the fact that Mr. H. Wright, 2AQB, of Penryn, has made and presented to the District a very fine shield for annual competition. He has agreed to the DR's suggestion that this shall be awarded each year to the member doing the best work on either 28 mc. or 56 mc. On behalf of the district the DR thanks Mr. Wright for his great thoughtfulness, and also for the many hours of labour he must have given on behalf of his fellow members. (Headquarters also wish to offer their thanks to Mr. Wright.—J. C.)

bridge and our old friend G2BI. The catering was excellent and the discussion at the afternoon meeting was devoted to a short talk by the D.R. on the work of the Society in general and a technical discussion on Tritets, aerial matching net works, transmitting pentodes, and the usual subjects dear to a ham's heart.

We welcome several new members, including BRS1874, who sends an interesting report ; he would like code practice with any other member in the Guildford district.

The Reading club continues to flourish and seems to be able to find some very fine lecturers. During the last month G5RT gave them a talk on the properties of porcelain insulators and Mr. Dixon, of the Post Office, delivered a lantern lecture on the radio work at the G.P.O.

Every member in Berkshire reports active, which must be a record. The D.R. remembers the time,

and it was not so very long ago, when the number of active stations in Berkshire was exactly one! The Reading club are holding a series of field days during June, July and August. Full particulars can be had from G5AO.

G6NK, the Surrey C.R., is trying an interesting experiment. Mid-monthly meetings, primarily intended for BRS and AA members, are being held at the Hand and Spear Hotel, Weybridge. These meetings are to supplement the ordinary monthly meetings, but, of course, do not replace the latter. Full particulars from G6NK.

A short-wave club is being formed in Winchester to assist the members in that area, and G2PS will be pleased to hear from all local members who are interested.

G5FB, D.R. of No. 8 District, asks for our co-operation in conjunction with a 56 mc. field day he has organised for July 21; we hope that all our 56 mc. members will do their utmost to have their gear going on this day. 5FB also hopes that we will give his summer outing on July 7 as much support as we did last year at St. Albans. No. 8 district outings are always most enjoyable and the D.R. trusts that No. 7 will be there in force to back him up.

Finally, many thanks for the messages of congratulation and condolence that I have received on the occasion of my marriage. I hope to reply to them all personally as soon as time permits. As I shall be away this month, please send all news for the July BULLETIN to G6GZ, who has kindly undertaken to do the notes for me.

DISTRICT 8 (Home Counties).

The D.R. has received several enquiries asking when and where the district conventionette is being held. In case this point is still not clear, please note that we are joining with Districts 12 and 14 in the fixture of July 7 as printed elsewhere. G5FB is organising this outing and hopes many members of District 8 will make a special effort to be present.

Once again St. Ives comes to the rescue with news and practical help. A last minute N.F.D. upheaval was averted by G5RL, 6WA and 6DX, to whom the D.R. is greatly indebted.

A new member after a week as B.R.S. comes on the air as G5OV. Good going. Several more members in the offing.

BERS88 on leave from Burma, is collecting gear for his return in September, as he hopes to be on the air from that country.

56 mc. promises to furnish the long awaited stimulant for this district. In view of the increasing interest which is being taken in this frequency, G5FB is organising a District 8 Five-Metre Day on Sunday, July 21. The co-operation of other districts is being enlisted—full particulars on July 7 and next BULLETIN.

A meeting of District 8 members will be held in the evening of this day at G6XN in Welwyn.

DISTRICT 9 (East Anglia).

The District meeting in Norwich, held on May 19, provided an opportunity for a very interesting "rag chew," because many of our members seldom meet, except over the air.

In the evening visits were made to 2BSO (who is applying for his full licence) and to G6QZ and G5UD, both of whom have interesting outfits. Altogether a good day, and thanks are again due to G2MN for the excellent arrangements. BRS1719 visited G2XS on May 26, and we gather that Lowestoft will soon be making itself heard on the air again.

Hurry up the letter budget, OMs. We hear it is doing well so far, and it has a long way to go; besides, we want to get No. 2 on the way!

DISTRICT 10 (South Wales and Monmouth).

It is with sincere regret we have to announce that Mr. D. A. Low (G5WU) has been compelled, owing to illness, to resign his office as D.R. Mr. Low has rendered invaluable service both to Council and to the members in his district, and we take this opportunity of conveying to him our thanks for all that he has done in the past, and to express the hope that he will quickly be restored to full health.

LONDON & HOME COUNTIES

Summer Outing

to

ONGAR RADIO STATION

Sunday, July 7th, 1935

Meet 2.45 p.m. at station.

Tea, 5.15 p.m. at The Thatched House, Epping.

Those intending to be present are requested to advise G5FB not later than July 4th.

We are pleased to announce that Capt. G. C. Price (G2OP), of Pembroke Dock, has offered to act as D.R., and we shall therefore be glad if all members in the district will send reports of their activities direct to him in future.

Capt. Price, it will be remembered, was for many years No. 5 District representative, consequently he possess a very wide and comprehensive knowledge of Society affairs.—G6CL.

DISTRICT 11 (North Wales).

The meeting at G6IW, on May 19, was not too well supported, but this may have been on account of the weather. An excellent talk on "Thunderstorms and their Effects on Radio Apparatus" was given by 2AZJ, who dealt with the formation of electric storms, and the reasons for the electrical discharges which we know as lightning. He also showed numerous photographs of "man-made" lightning.

The members present included G2RF and BRS1395 from Liverpool, G2JT, of Helsby, and G6GV, of Manchester; District 11 were represented by G6OK, 2AJT, 2BKH, BRS1802, 1060, and G6IW. G2II was unable to be present owing to the fact that he had fallen in the morning, and it was thought that he had broken his arm; this is

fortunately not so, and he was able to operate District 11 stations on NFD!

2AJT and BRS1450 have been very busy with Lecher wire calibrations on 56 mc., and are experimenting with various types of wavemeters.

DISTRICT 12 (London North).

The May meeting, held at the Wander Inn, Finchley, was occupied chiefly by a discussion on the final arrangements for N.F.D.

Our thanks are due to Mr. J. Goddard (2AHM) for his very practical help in the selection of the sites at Potters Bar.

The activity of the district is maintained. G5AM reports working W on 7 mc. with 4 watts; several other stations in the district report good DX with low power. 2AHM is at present engaged in the construction of a monitor.

A district 56 mc. field day is proposed for June 27, when District 8 will also be on the air. Any practical assistance in the shape of gear or transport should be addressed to the D.R.

DISTRICT 13 (London South).

The Monthly District Meeting held on May 16 at the Brotherhood Hall, West Norwood, was again attended by a record number of members. Most of the time set aside for business matters was devoted to final arrangements for N.F.D. As this event will have taken place by the time that these notes appear in print, it is felt that the only comment to be made is that District 13 *should* have made a good show this year, judging by the enthusiasm displayed. The most sincere thanks of the D.R. are offered to all those who came forward so readily with valuable offers of assistance. N.F.D. stations cannot be put into operation without a great deal of support, and it is a great pleasure to see so much willingness in South London.

We are pleased to have received many more reports this month of activity on the 56 mc. band. As was mentioned last month in these notes, we do feel that much useful data is being missed on this frequency through lack of co-operation. The same thought was outlined in the Editorial to last month's BULLETIN. G2JB reports that some very successful tests were carried out on 56 mc. during April with G2QR on Keston Common, when most of the North Kent stations were worked. The D.R. would be very grateful if any stations in future contemplating such a series of tests would inform him of the fact, when he will endeavour to notify the other members of the District interested in this band. By this means some really useful co-operation may be obtained.

G6QB has been mostly on 56 mc. and is hoping shortly to be on 112 mc. G2GZ having now got his 1.7 mc. gear working to his satisfaction, is turning his attention to 56 mc. 2BUS and BRS1357 are also active on this frequency, as is G2UW, who has now received his permit, and is very anxious for reports on his transmissions. G5JW has rebuilt his PA unit, and is now using 2-RK25 screened pentodes in push-pull on 7 and 14 mc. Suppressor grid modulation is being used with some success. G5OX is active on 56 mc., and both he and G5JW are agreed that of late this band has seemed quieter than ever, with the exception of May 19, when the *Daily Telegraph* tests appeared to stimulate interest and the band for a few hours sounded like 7 mc.

BRS1417 has received an AA permit and is now 2BVO. G2ND and G6CS ar both active, whilst G2LW hopes to be on the air shortly. G6AN has been active on 7 mc., and is turning his attention to 14 mc. It is reported that G2AI may very soon be heard on the air again on 1.7 mc.

It is learnt that District 8 is organising a 56 mc. day on July 21, when most of the stations within the district licensed for this frequency will be active. The D.R. suggests that South London should offer its assistance on this day, so please make a note of the date. Further particulars will be available in due course. Two other dates to be remembered are June 13 and July 18, the days fixed for future District 13 meetings at the Brotherhood Hall, West Norwood.

DISTRICT 14 (Eastern).

At the Essex section meeting, held at 2BNR, Southend-on-Sea, portable receivers for N.F.D. and 56 mc. were displayed. In the Southend district one station is active and several three-letter-call members are doing their part with receivers on 56 mc. and co-operation is looked for by friends in Kent. G6IF is active again at his new QRA. Members were sorry to hear of the bereavement of G2WG and tender him their sincerest condolences.

ON4VC, the station acting for the Réseau Belge at the Brussels Exhibition, is being replaced by the official station, ON4WS, which will be working mainly on 7 and 14 mc. A goodly number of members from the district are going to Brussels with G5UK in August, and it is hoped that members from other districts will also join the party. G5KA and BRS233 have resigned membership.

The field day rehearsal held by the East London section at Abbess Roothing was attended by G6LB, 2ZJ, 6LL, 6MN, 6TX, 6SG, 6VT, BRS1605 and 1497, and, in addition, the station was visited by the following: G5UK, 6IF, 6UT, 2KT, 2SA, 5YP, 2BNR and BRS1647. During the week-end both the TX and RX were put through their paces in anticipation of N.F.D. As usual on these occasions an enjoyable time was spent and many interesting QSO's made. Through the courtesy of 2BLM the heavy gear was transported to and from the site. G6FY (PA0FY) has now returned from Holland for good; G6FJ, at present at Tynemouth, is returning shortly; BRS1849, of Brentwood, a new member, has reported; G2PX has applied for a 56 mc. permit. 56 mc. is becoming active and on a recent Sunday G6UT heard no less than five other stations between 10·00 and 11·00 B.S.T. Members are reminded to use the band at this time, as mentioned in the May notes. G5FB, of District 8, is staging a 56 mc. field day on Sunday, July 21, and asks for the co-operation of the members of District 14. Members are reminded of the London and Home Counties summer outing on July 7, and are asked to inform their D.R. or C.R. of their intention of attending so that arrangements for the party can be made. Interesting detailed reports of top band telephony are contained in letters from BRS1295, of Muirkirk, Scotland, who seems to receive District 14 stations better than they are able to receive each other; these letters are read out at the district meetings. Mr. Davie, of Chingford (ex FOA8H, Cape Town) has joined the Society and has applied for a permit.

At the May meeting, held at 2AYB, the attendance was 18; a number of new members put in their first attendance. Morse classes, to be held at 2AYB, 16, Station Road, St. James Street, Walthamstow, were arranged for 8 p.m. on the following dates: June 3, 12, 17, 26, July 1, 10, 15. The following will instruct: G6JI, G5DY and Mr. Davie. All members of the district join in wishing G6LL all the very best in connection with his forthcoming marriage and are sorry to hear that he will then be moving out of the district.

DISTRICT 15 (London West and Middlesex).

About 18 members and two prospective members attended the May meeting. It was decided that no meetings will be held during the summer months, therefore the next will be in September. The date will be announced in the August Calendar.

The D.R. wishes to thank all members who contributed towards the financial side of N.F.D.

As a result of the letter asking for subscriptions, several reports came to hand at the same time and are included herewith. It is to be hoped that those members who did write a few lines will continue to send along something each month and so help to make it possible to restart the letter budget.

G2BY reports from Poland, where he has been sent on business; has been working his usual amount of DX. G6VP is experimenting with a new aerial and getting better reports from W6 and 7, also contacted J, K and VQ4. G6CO has returned to amateur radio after two and a half years and finds conditions have changed a lot. G2KI, with 8 watts, has worked VK, ZL, W and VE; it is rumoured he is building short-wave superhet. G2NN, with 10 watts, worked VS6 and putting out good telephony, using Telefunken method of modulation. G2LA also on telephony and works U.S.A. on CW with 10 watts. G6MN is on telephony on 3.5 mc. G2VV contacts W with 9 watts on 14 mc. and hopes to start 56 mc. Saturday evening QSO party. G6WN partly rebuilding and spending rest of time on 28 mc.: managed to QSO OK1AW on that band. BRS1621 has been too busy for much radio. BRS1226 hopes to start again in June. BRS1500 wants to see the B.R.S. letter budget running. BERS38 is in the Royal Navy and is not very often home. 2BAI has been visiting Brighton stations while on holiday. He has a circle of correspondents in different parts of the world, and any BRS or AA interested, please write him.

DISTRICT 16 (South-Eastern).

G2IZ and 5SU report active from Gravesend. 2IZ is still busy grinding crystals and hoping for some DX.

An interesting letter has been received from an old member of the District, SU2TW, who hopes soon to be on the air. 6VC is active and also partly rebuilding. G6NU is experimenting with amplifiers, 2CM has built a new rig, 2CS is using a Collins Coupler with great success, 5FN has worked all W districts in the last month and is going QRO on 56 mc, G6QC is trying for Eastern DX, 6VV building a new shack, 2VA doing well on 7 watts, BRS745 is building 56 mc. receiver, 2MI is snowed under with R.S.G.B. work.

Two Sussex members report direct, BRS939 is now 2BFL, and BRS1827 is a new member. We extend a warm welcome to you, O.M. It would be pleasant to see a little Kentish enthusiasm infused into Sussex.

G2GB reports from Beckenham that the local group have decided to call themselves the North-West Kent group as the former name of "North Kent" gave a false impression as to their locality. The group is very active and 15 members, including ZL4AI, turned up at the last meeting. Almost all are on 56 mc. with 2HG and 5OJ chasing DX on Ten and 6WY remaining aloof on the higher wavelengths. They stood by for 6SL's tests without success but 2AW worked 5KA on the *Daily Telegraph* building.

Ashford ran the "A" station for N.F.D. under the able supervision of G6SY.

From Tunbridge Wells 5OQ reports that all are active. 2AXQ is applying for his full licence and 2AVN is learning morse.

In Folkestone G6XB and 2IC have worked some excellent duplex phone on 56 mc. and are now experimenting with "long lines" a method of frequency stabilisation which has found much approval in the eyes of G2AW, who leads the "North West frontier gang" on this band. 2AZM, now at Farnborough, is visiting stations in that district. 2GD is active with RES work.

We have just heard that 2AW has had an R8 report on his 56 mc. signals from Hendon, 20 miles distant.

DISTRICT 18 (East Yorkshire).

G2TK has been heard using modulated C.W. on the 56 mc. band, at a distance of 15 miles, an appreciable improvement for the low-lying districts of East Yorkshire. 2AMM has now received permission to carry out television work on the 28 mc. band, using "A.A." only. 2AUN completed and delivered a transmitter for use on 1.7 mc. during N.F.D. BRS1480 sends in a list of telephony stations heard during the month. BRS1710 has been granted "A.A." and becomes 2AJZ.

The Scarborough Short Wave Club has been granted an "A.A." permit. An enjoyable evening was spent at their clubroom, when 2AMM showed a number of slides portraying various local and other amateur stations; the slides were home-made from various negatives. G6UJ and G6OO have both been busily engaged solely in the preparation of apparatus and sundry arrangements, for N.F.D.

The Hull membership has been likewise engaged and too busy to report.

SCOTLAND

In conformity with our usual custom, these notes will be discontinued until the October issue. Already the news value of the reports we receive is negligible, and we do not propose to pad with "blurb," for that is what it would amount to.

This month brings no communication of any sort from "B" and "C" districts. In "A" District, three new "A.A." licences have been granted: 2AZN to Mr. Russell (BRS1682), 2AYN to Mr. Mennie (BRS1781) and 2BDU to Mr. Mackie (BRS1392).

The District held its annual dinner on May 22, when there was a fair turnout. We were glad, however, to be able to welcome quite a useful contingent from "D" District. "A" District

meetings are now discontinued until September 25, and then it is possible that they may be resumed at a new location, as the proprietors of the present premises have given up business.

It is not necessary to say much here relative to G6ZX's 56 mc. transmission to Ben Lomond, but we would like to comment very favourably on the enthusiasm shown by our young local society, the Glasgow and District Radio Club, as it was their work which rendered the test practicable.

Two of our members, G6ZV and G2TM, have, as we go to press, made 28 mc. contacts. "ZV" with Germany and Belgium, and "TM" with Czechoslovakia, so it looks as if this band were waking up at long last.

We were pleased to receive a visit recently from G5BA (Captain Stevens, of Berwick). "BA" is one of the old-timers but has never ceased to be an enthusiastic amateur, although his time for amateur work is very limited.

We were sorry indeed to learn from him of the death of our old "D" District officer, Geoffrey Gore (G5DA). Gore had been out of the game for a long time, but his enthusiasm when he was permitted to be active makes pleasant the memory of a real good chap.

"D" District closes its season with a supper at F. & F.'s in Princes Street, Edinburgh, on June 5. We hope to be privileged to attend.

Of individual activities, apart from those mentioned, there is really little of note. G2TM has been doing a wonderful lot of DX in the early mornings, as also has G6RV, who worked five VE's on a recent morning. On the QRP side, G5HL reports that after a year's work on 7 mc., with very low power, he has worked 40 countries. Among these contacts are included WI, 2 and 3, also VOI. He is experimenting with his aerial system and will welcome reports. G5YG is busy collecting data on a new type of aerial system, but with conditions fluctuating as at present, it is a very difficult business. Practically all our transmitting stations are known to be active, which is always something.

Well, we have nothing more of interest, and will conclude by wishing you all the best of vacations.

Au revoir!

SCOTTISH HEADQUARTERS.

Northern Ireland.

Congratulations to 5WD on the arrival of daughter, and to 2KR, who has now a son and heir.

We extend welcome to Mr. W. Sullivan, who has forsaken his BRS number for GI5XS.

At the time of writing, N.F.D. is upon us, so perhaps we should have headed this paragraph "Faith, Hope and Charity"—not that any of these admirable qualities abound in large amounts. On the contrary, numbers one and two are almost down to freezing point, and we could well do with a large does of the third.

As mentioned last month, the A station was at Greengraves, Newtownards, Co. Down, and we must congratulate the chappie who so aptly named the place. It is a kind of ruined Ruin situate at the top of a small hill, and is inhabited by a large herd of cows (?), which viewed our activities with embarrassing interest. We are quickly learning to "shoo" in a determined manner!

Station B at Stormont was much more favourably situate, being in the private gounds of the Northern Parliament, and we take this opportunity to thank 2KR for obtaining the necessary permission and arranging matters with the police. The station was situate in a large hen-house, and we shall refrain from making pointed remarks about "old hens," "cutting the cackle," and so on.

We shall write as to how we fared during the event in next month's notes.

Belgium.

By ON4AU.

The most notable work of the month was the 28 mc. contact between ON4JB and ON4CJJ, of Belgian Congo. Conditions on this band were very good during the last few days in May, and ON4JB, 4AU and 4SD have had contacts with SM, YM, D, OK, OE, G, GI, F, and FM. ON4AU heard a CQ Ten de ?5WR, but could not make out the two letters of the prefix.

The start of the month was outstanding for a number of QSO's with K6, and telephony from K6BAZ was received at R8.

The station of the R.B. at the Exhibition in Brussels will soon be working on 14 and 3.5 mc., using C.W. and fone. ON4JB will be on the air all day and night on 28,500 kc., using C.C. with an input of 75 watts.

We await visitors from the R.S.G.B. to the Exhibition. Full particulars are obtainable from ON4UU, 312, rue Royale, Brussels III. The call-sign of the R.B. station at the Exhibition will be ON4WS. Contacts with G stations are welcomed and will be confirmed with a special QSL card.

Finland

By OH2NE (*via* GI5UR).

At the annual general meeting of the S.R.A.L., held in Helsinki on February 23, the following officers were elected:—OH2NM, president; OH2HF, vice-president; OH2ND, secretary; OH2NQ, treasurer; OH2NE, communications manager; OH1NT, 2NV, 2NX, and 5NF, committee.

There are at the moment about 250 radio amateurs in Finland, of which number not more than 50 are active. The equipment in use is of a high standard, and nearly all stations use crystal control. The receivers in general use are of the Schnell type. Tests on 28 mc. are being carried out in the 1st District, and 56 mc. tests in the 7th District.

Finnish amateurs regret to learn of the death of G6HP, and send their sympathy to his relatives and friends.

Reports Wanted.

G5ZK (Surrey) on his 7,145 and 14,290 kc. transmissions.

G2LR (Cranwell) on his 14180 kcs. transmissions; he is testing out an aerial array and reflector system.

G6ZO (Cheltenham) on his 7,143 kc. transmissions.

Empire B.E.R.U. News.

B.E.R.U. REPRESENTATIVES.

Australia.—H. R. Carter (VK2HC), Yarraman North Station, via Quirindi, N.S.W. *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) No. 2 Mess, 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; and A. L. Cusden, (VE5HJ), 1465, 17th Avenue, New Westminster, British Columbia.

Ceylon.—A. T. Kingston (BERS. 196), P.O. Box 100, Colombo, Ceylon.

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

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

Hong Kong.—C. Emary (VS6AX), R. C. Signals, Hong Kong.

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

Jamaica, British Honduras, Turks Island and Cayman Island.—C. M. Lyons, (VP5MK), P.O. Box 36, 12, Port Royal Street, Kingston.

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

Malaya and Borneo.—R. J. Bee (VS2AG), P.W.D., Kuala Kangsar, Perak.

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.—J. W. Mavis (ZE1JE), P.O. Box 160, Umtali, South 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.

Canada (Third District).

By VE3WA *via* EI6F.

Several members of the Frontier Radio Club of Windsor, Ont., have been working on 28 mc.; their usual operating hours are from 20.00 to 24.00 G.M.T. VE3ER and 3KF have during the past few weeks established contact with a large number of Empire stations; the latter in particular would like reports on his 14104 kc. phone transmissions. VK and ZL signals have been heard at good strength from 04.00 to 07.00 G.M.T.

Egypt and Sudan

By SU1SG *via* G2YY.

CAIRO.—SU1FS has been troubled with bad note when using T25D in P.A., so has gone back to 45's in PP.

SU1AQ has been testing grid modulated fone with success, and is preparing DX charts for circulation. He has established link with the elusive ZS1H and passed B.E.R.U. traffic.

SU1AA is station experimenting with the ultra shorts and not SU1AQ as mentioned in last month's notes. Is awaiting new RCA "acorn" valve.

SU1RO is using good quality grid modulation for local QSO's.

SU1CH has worked U.S.A. with his self-excited 500-watt rig; he is now rebuilding to C.C.

BERS215 has not yet made use of his gear. BERS170, ex 2BXI, reported this month. It is regretted the existence of this station was unknown, and he will be put in touch with the rest of the group.

BERS202 is engaged in ultra short-wave research work in the Egyptian University.

PORT SAID.—SU1RK had his first W contact spoiled by QRM, his Xtal freq. being in the middle of the American fone band. He has successfully built and tested 56 mc. TX.

ISMAILIA.—BERS225 rebuilding RX. Finds conditions bad on 3.5 mc., but good on 14 mc., and sends list of calls heard.

SUDAN.—ST2WF has to rely on accumulators and rotary for power. After trying out various circuits is now using self-excited P.P. built with dilapidated gear.

ALEXANDRIA.—SU1GP rebuilding to Xtal. SU8MA interested in local duplex fone. SU1KG has gone up to 14 mc. and is enjoying himself with the W's. SU1WEM is waiting for valves. SU1JD is QRT.

Help to make these Notes Interesting.

Conditions in general have been patchy. SU1AQ and SU1SG have worked W6 several times between 04.00 and 05.00 G.M.T. On one occasion SU1SG worked one at 20.00 G.M.T., which is unusual. He has linked up the various districts on 7 mcs for interesting rag chews.

Hong Kong.

By VS6AX *via* VS6AQ and G6CJ.

VS6AQ has now moved to a new QRA, and results seem to indicate a good position. BERS265 has returned from Japan and leaves for England early in June; he hopes to open up with a G call soon. VS6AH has been attempting to get on 28 mc., and has been rewiring his transmitter. VS6AX has rebuilt his station, but blew the main transformer; this has been rewound and he will be active soon on 14 mc. Separate reports have been forwarded by mail from BERS265 and 273. BERS265 will be active on all bands on his homeward trip. The following report active: VS6AQ, BERS265 and 273.

Irish Free State

By EI9D.

The I.R.T.S. D.F. hunt on May 11 was a great success. The first search party successful in locating the transmitter, well and truly hidden near Dunboyne, Co. Meath, consisted of EI4D and EI9D, who were presented with a brace of valves in recognition of the achievement. It was felt that the bases might still be of value!

The usual activity has taken place during the month, but there is nothing of particularly outstanding interest to report. On 14 mc. EI2B with 7 watts continues to QSO VE and W. EI5B has not reported. EI5F has added a few more countries to his already very long list of DX. EI4D is temporarily QRT. EI9D is still awaiting H.T. generator. EI8B have been active with QRO on 28 mc., and on May 19 were QSO OK and D obtaining R9 reports. BERS246 is active and intends visiting ON amateurs in near future.

Mr. Charles McCarthy, of "Ardeevan," St. Clares Avenue, College Road, Cork, is now EI6G; and BRS1429, Mr. F. de Burgh Whyte, Eastbourne, Glenageary, Co. Dublin, is EI8G. Congrats. OM's.

The I.R.T.S. QSL Bureau has now been taken over by Mr. H. Reilly, EI2G, of 58, Belmont Avenue, Donnybrook, Dublin, to whom in future cards should be sent. The opportunity is taken to record our appreciation and sincere thanks to Mr. Sadlier, EI4D, for the admirable manner in which he, for many years past, carried on this unenviable task.

The old Wireless Society of Ireland has now been finally wound up and their funds—about £60—and gear transferred to I.R.T.S.

Kenya, Uganda and Tanganyika

By VQ4CRH.

Conditions during April were more favourable on 14 mc., the 7 mc. band being fairly quiet, except for fone.

We extend a hearty welcome to VQ4SNB as a member to this group.

VQ4CRM has made a reappearance on the air after returning from leave.

VQ4CRL has been very successful with fone on the 14 mc. band and had a R7 QSO with OK1AK and R5 with ON4SV during the latter part of last month. He is using suppressor grid modulation with an R.K.20 valve. Much time has been spent calling G5ML, who has been coming over very well here, but for some reason or other CRL has not been able to contact. Perhaps when he has worked all the W's he will turn an ear to VQ4!!!

Congratulations to BERS229 OM Chappel on receiving the King's Silver Jubilee Medal.

Malaya and Borneo.

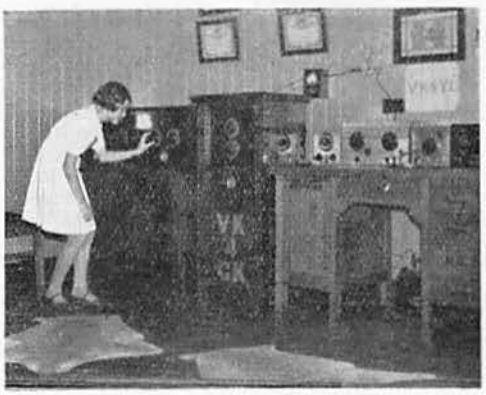
By VS2AG *via* VS1AJ and G6CJ.

Jubilee celebrations and the necessary preparations for same must be the excuse for decreased activity this month, but as usual VS1AJ, E.L.S. for Malaya, has a good record for activity. He reports hearing VK, J, W6, K6, X1, and X8 on May 15 on 7 mc., but QRN has been considerable throughout the month. A station using the call CB6A was also heard on this band. On 14 mc. practically every country in the world has been heard, whilst QRN has only been very slight, although peculiar fade-out time variations were noted, particularly in a westerly direction. Phenomenal blanketing effects were experienced on the evening of May 18. A good daylight contact was established with FB8C on May 3, on 14 mc., when signals were reported R6-7.

Russian commercial stations working on about 7,250 kc. caused considerable interference during the early part of May.

VS3AE has been putting out good telephony, VS2AG has been carrying out preliminary aerial tests with low power his aerial masts are 30 ft. poles fixed to the top of 70-ft. coconut palms. He is investigating minimum number of fronds necessary to support life in the palm and to produce the minimum of wind sway.

We welcome this month new members in Messrs. H. P. Buckley, Pangnga, Siam; H. E. Cornish, Kedar; and B. Pook, R.A.F. Base, Singapore. The latter is one of the operators at VS1AJ.



The Empire's Youngest Licensed Radio Amateur. Miss Madeline Mackenzie, VK4YL, of Wynnum, Brisbane, Australia, is only 12 years of age, but in her Proficiency examination she scored 98 per cent. marks for morse, and 96 per cent. for theoretical knowledge. Miss Mackenzie is a daughter of VK4GK, one of our Australian Sub-Representatives. She has already been in contact with Amateur stations in Great Britain.

Malta.

By ZB1C, *via* ZB1E and G6WY

Conditions have improved lately on 14 mc., ZB1B worked J2, ZB1E had his first LU contact, and ZB1F worked ZS and OM.

This month we welcome BERS277, but regret to lose ZB1F, who is leaving the Island permanently for England. ZB1F was a leading station here, an active R.E.S. member and a DX worker.

On April 11, the ZB1 Group met and spent an enjoyable evening, the meeting being closed by a visit to ZB1B's station. It was decided that in future, meetings will be held regularly on the second and last Sundays of the month. Station visiting will take place on the former, and on the latter the meeting will be held at ZB1B's address, 5, Church Street, Birzebbugig, at 6.30 p.m. ZB1C having obtained an H.T. generator, is now looking for a noiseless prime mover. ZB1E and BERS277 are still waiting for their PR12 receivers. ZB1G and ZB1B report. The N.F.D. portable will operate under the call of ZB1C.

By ZB1E and GI5UR.

Fortnightly meetings have been held at ZB1C and the attendance has been very satisfactory. The main topic discussed at the last meeting was N.F.D., when preparations were made for its success. Ten-metre permits were also discussed.

This month BERS277 becomes ZB1H and BERS279 becomes ZB1I, and is very active. ZB1D is hoping to be back in Malta soon. The following are active: ZB1D, ZB1E, ZB1C, ZB1H, and ZB1I.

Northern India

By VU2LJ (*via* VS1AJ and G2KZ).

During the latter part of April conditions were very good for DX in all directions. Special mention must be made of the splendid piece of E.L.S. work by G2YL, who took the March notes direct from VU2LJ when the latter was using only 6½ watts input.

VU2BL maintains his 28 mc. schedules and has been reported R5 in D4 and R9 in Bahrein Island. These tests are heard regularly at 2LJ, but on a frequency of approximately 21,400 kcs.! After May 23, the times of transmissions were changed to 12.00 and 13.00 G.M.T. daily, with extra schedules at 05.30 and 06.30 G.M.T. on Sundays and Thursdays.

VU2LJ has given up the idea of using grid bias modulation until time permits further experiments; this type of modulation seems particularly susceptible to R.F. feed back through the speech amplifier. On changing over to "Class A," perfect results were obtained on low power; no DX has been worked, only local reports being received.

VU2FP has been transferred to Darjeeling and is on the air occasionally, using a portable transmitter, worked from flash-lamp batteries. Arrangements will be made to change over to A.C. as soon as a suitable QRA is found. VU2DK, a new call, is active on 14 mc., but sends no reports.

Southern India.

By VU2JP, *via* VU2LJ, VS1AJ and G6CJ.

General conditions have been marred by unusually severe storms, these generally taking place in early evenings. DX on 14 mc. is patchy but improving; 7 mc. is useless, due to heavy QRN. VU2JP is working on 28 mc., as this band seems to be lively. VU7AB is inactive and does not report. VU7FY is active on both bands, but does not report. W, LU and EA phone is very strong round about 01.30 G.M.T.

Northern and Southern Rhodesia.

By ZE1JE.

In connection with the recent prohibition of amateur transmissions on the 7 mc. band, an interview took place, at the request of our Postmaster-General, in Salisbury, on April 15, between the Chief Engineer of the Department of Posts and Telegraphs and his first technical assistant, and two members of the Rhodesian B.E.R.U. Group, Mr. R. A. Hill (ZE1JB), of Bulawayo, and Mr. W. G. Leyland (ZE1JM), of Salisbury.

At this interview the reason for the prohibition was disclosed for the first time, although repeated requests for details had been made to the Postmaster-General during the five weeks the prohibition had been in force. The reason given was that morse code transmissions had caused interference with reception at Salisbury Wireless Station, ZEA, on 45 metres of the Imperial Airways transmissions on that wavelength. It had been assumed that the interference emanated from amateur stations operating on the 7 mc. band, but no definite proof could be furnished that such was the case. Nevertheless the prohibition was enforced! The discussion which followed resulted in the withdrawal of the prohibition on April 25.

At the same interview it was suggested by our Postmaster-General that a Radio Advisory Committee be formed to administer amateur radio matters and to effect closer co-operation between amateurs and the Department of Posts and Telegraphs. This matter will be placed before Government for approval.

(Having been privileged to read all relative correspondence which passed in connection with the 7 mc. embargo mentioned above, we take this, the earliest opportunity, of extending our congratulations to the Rhodesian B.E.R.U. Group for having presented such a splendid case on behalf of the amateurs in Southern Rhodesia.

We are especially glad to hear that the Rhodesian B.E.R.U. Group are applying for honorary affiliation with the B.E.R.U. Societies. Already branches of the Group have been started in Bulawayo with Mr. R. A. Hill, as Chairman, and in Salisbury with Mr. B. C. Fynn as Chairman.

Mr. J. W. Mavis will continue as heretofore to act as the official B.E.R.U. Representative for the two Rhodesias. (J. C.)

South Africa

By ZT6X (*via* ZS1H, SU1RO, SU1FS, SU1SG and G2QT).

The S.A.R.R.L. held their annual conference in Capetown during Easter. The conference was opened by the Mayor of Capetown in the City Hall, and the proceedings were broadcast by ZS1B.

ZS1AJ and ZS1H read interesting papers on modulation and direction finding, and in the

(*Continued on page* 484)

100-WATT TRANSMITTER (*Contd. from p.* 446)

P.A. Grid Coils.

3.5 mc. 23 turns, each half, 23 s.w.g., d.c.c. Link coil 3 turns, 23 d.c.c.

7 mc. 12 turns, each half, 23 s.w.g. d.c.c. Link coil 3 turns, 23 d.c.c.

14 mc. 5 turns, each half, 23 s.w.g. d.c.c. Link coil 3 turns, 23 d.c.c.

28 mc. 3 turns, each half, 23 s.w.g. d.c.c. Link coil 2 turns, 23 d.c.c.

P.A. Inductance.

3.5 mc., whole coil. 7 mc., 16 turns. 14 mc., 8 turns. 28 mc., special copper tube, 4 turns, $\frac{3}{16}$-in. tube, $1\frac{1}{2}$-in. diam.

These coil values are only correct when used with the condensers specified.

H.F. PENTODE OSCILLATOR—

(*Continued from page* 453).

apply a negative bias when working on the higher frequencies, as ease of oscillation is ensured. Normally for a coil of 4.5 μH inductance a negative bias of —3 volts should be applied and a voltage of —6 volts for a coil of 2.5 μH. With this latter coil it is possible to obtain oscillations as low as 15 metres. If negative grid bias is applied above

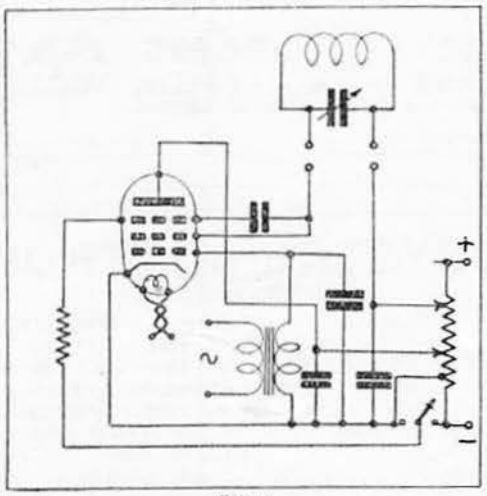


Fig. 9.

13.5 volts, oscillation will entirely cease. This also occurs when applying bias to the control grid, but here it is found that as little as 1.5 volts will cause the oscillations to cease. In Fig. 9 is shown the complete circuit diagram of the oscillator as used by the writer for some considerable time. Modulation can be obtained by energising the primary of the transformer in the control grid circuit with a suitable audible frequency. The stability and ease of adjustment prove this apparatus to be exceptionally useful, and it is recommended to all serious experimenters.

EMPIRE NEWS—(*Continued from page* 482).

evening the Postmaster-General's speech at the annual dinner was broadcast. The programme included visits to ZS1H, ZT1M, ZT1B, ZS1AH, and the Klipheuvel Beam wireless station.

Delegations from all divisions were full of their praise for the hospitality of Division 1.

An experimental radio and television section has been formed to cater for the associate members, and it is hoped that this will increase interest in this branch of the League.

Conditions on all bands fell off during April; the 7 mc. band was almost dead except for local stations, but a few English stations were heard weakly on 14 mc.

R9 Ltd.

We have been advised by the publishers of *R9* that their new address is 7460, Beverly Boulevard, Los Angeles, California. The corporate name of the firm has been changed from *R9, Ltd.*, to *Radio, Ltd.*, but the title of the magazine remains *R9* as heretofore.

Members wishing to subscribe to this journal should communicate with the above address.

Modulation Unit Components

We are advised by Messrs. Varley, Ltd., that their DP6 input and DP7 output transformers are entirely suitable for the modulation unit described by Mr. Welford in his article.

* * * *

Benson Boss, Jnr. (W3DAZ), age 16, is anxious to exchange correspondence with British amateurs. He works on 14 mc. with an input of 100 watts.

* * * *

F3FB, 105, Rue Sadi Carnot, Algiers, on his 7060 kc. transmissions. Mr. André Serve is a newcomer to the amateur ranks, and is using an input of 50 watts.

MELBOURNE CENTENARY CONTEST.

Our photograph shows a group in the studio of Melbourne Broadcast Station 3DB, on the occasion of the presentation of prizes to winners of the Melbourne Centenary Contest. From left to right: VK3HL, 3JQ, 3GQ, 3MR, Mr. J. Malone, Chief Inspector of Wireless. Photo by H. Asmus, VK3ET.

EXCHANGE AND MART.

RATES.

Private members' advertisements 1d. per word, minimum 1s. 6d. Trade advertisements 2d. per word, minimum 3s., cash with order. First line, if desired, will be printed in capitals. Copy to reach 53, Victoria Street, or the Advertising Manager, Parrs, 121, Kingsway, W.C.2. not later than the 1st of the month preceding date of publication.

BARGAINS.—.01, .002 mfd. Bi-pass Condensers; H.F. Chokes, 6d. each; L.F. Chokes, Transformers, from 3s. each; Rola M.C. Speaker, unused, 22s. 6d. Number of 2 and 4 v. valves from 1s. each. Write for list of gear.—G2DZ, 25, Coombe Gardens, New Malden, Surrey.

"BERS 38," free September 5, seeks employment with reputable firm, 12 years' experience in radio communication; excellent references. Would consider investing small sum.—24, Pyrmont Road, Chiswick, W.4.

BROWN'S "A" type diaphragms, only 2s. 6d. per pair, ear caps 1s. 6d. each.—CURNOW, 28, Garrard Road, Banstead.

ENCLOSED TYPE CRYSTAL HOLDERS, 4s. post free. Special multiple holders to order. —G6WQ, 10, Aberdour Road, Goodmayes, Essex.

FOR SALE.—High Voltage Transformer. Full wave 1,000 volts, tapped at 500 and 750. Rated 200 m.a.; Primary 200-240+10. Brand new. £2.—G2OC, 140, Wollaton Road, Beeston, Nottingham.

G5DK requires secondhand "S.S." superheterodyne battery or mains, must be perfect, price reasonable, due financial cramp, details.—DYKES, Thorncliff, Skelmorlie.

G6DS **For neat and snappy QSL Cards, Log Books and Pads. Send for samples. QRA, "Inglenook," Orlando Drive, Carlton, Nottingham.**

G6RL.—Semi-automatic Bug Type Keys. The finest job on the market, £2 12s. 6d. 5-meter gear in stock.—32-34, Earls Court Road, London, W.8.

G6US FOR VALVES.—American types: Raytheon 59 for Tri-Tet, 10s. 6d.; Raytheon 210 for PA, 16s.; Peerless 866 Mercury Vapour Rectifier, 18s.

This month's bargains: Mullard SG3, new, £2 15s. 6d.; Standard Telephones, new, 4211E, 65 watts anode dissipation, 15s. each.—N. E. READ, Willow Street, Oswestry.

G6VP.—Phones, Transformers rewound. Brown's "A" a speciality; any resistance; 24-hour service; lowest terms in the trade.

HAMMARLUND Comet Pros; write for details and current prices. Instruments always in stock. Supplied cash or on hire-purchase.—G2NO, 11 Lichfield Street, Wolverhampton.

LONDON'S CENTRAL RADIO STORE: unlimited bargains for callers at 23, Lisle Street, Leicester Square, W.C.2.

Ex-G.P.O. Multi-contact rotary switches, with platinum breaker points relay operated, 8 travelling contacts making alternative connection with 25 different stops. Send for photo. 5s. each.

Polarised relays, ex-G.P.O. double breaker type. Send for photo. 7s. 6d.

Phillips high-voltage Condensers, 1 mfd. 3,000 volts working, last few. 6s.

Piezo-electric Speakers, Rothermel model number R:95, listed at £2 15s., while they last, 27s. 6d.

Ex-Talkie Transformers, 100/140 input, output volts, H.T.750, O.750 volts, 150 m.a., L.T. windings, 3 at 7.5 volts, each, 2 at 3 amps, 1 at 4 amps, 9s. 6d.

All goods guaranteed and sent post free. 'Phone: Gerrard 2969.

METRES to Kilocycles Conversion Tables, new pocket edition; price 1s. 6d., post free, from H. C. VAN ROOD TECHNICAL PUBLICATIONS, 93, Berrylands, Surbiton, Surrey.

MOTOR GEN., 12-30 v. in, 600 v. 120 mils out, £1. Large Epoch energised speaker in oak cabinet, 50s.; Adolph Mike and stand, 3s.; PT625 (new), 3s. 6d.; LS6A, 4s. 6d.; LS5, 3s. 6d.; Loewe Pick-up Head, 3s.; 3-gang Cond. and 2 Varley B.P. Coils, 4s. 6d.—G2PF, 6, Alexandra Road, Chichester.

"PAREX" ALUMINIUM CABINETS, CHASSIS, etc., as supplied to B.B.C. and Leading Amateurs. Let us quote you.—E. PAROUSSI, 10, Featherstone Buildings, High Holborn. Phone: Chancery 7010.

PHILIPS 1 mfd. Condensers, 3,000 volt working, tested at 6,000 volts, 6s. 9d.; T.C.C. Dubilier and G.E.C. 1 mfd., 2,000 volts working. 3s. 9d. each; Everett Edgcumbe Electrostatic Voltmeters, 0-2,000 volts, no current type, listed at £2 5s., few only at 15s. Unlimited bargains for callers. Ferranti Meters, moving coil type, ranges 0-7 volts, 16s.; 0-150 milliamps., £1; .1 to .7 amps., 18s. All goods guaranteed and post free.—ULTREX RADIO, LTD., 23, Lisle Street, Leicester Square, London, W.C. 'Phone: Gerrard 2969.

QSL'S AND LOG BOOKS.—You want the best—then write.—G6MN, Worksop, for samples and prices.

RECEIVERS FOR SALE.—Emerson Superhet (16-550 metres); 7-valve 230 v. A.C. What offers?—G5CY, Sutton-on-Sea, Lincs.

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GEE & CO., Patents and Trade Marks throughout the World.—H. T. P. GEE, Mem. R.S.G.B., A.M.I.R.E., etc., 51-52, Chancery Lane, London, W.C.2. (Two doors from Government Patent Office). 'Phone: Holborn 1525. Handbook free.

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