

THREE VALVES, MAINS OPERATED, SUPERHET RECEIVER

THE T. & R.

BULLETIN

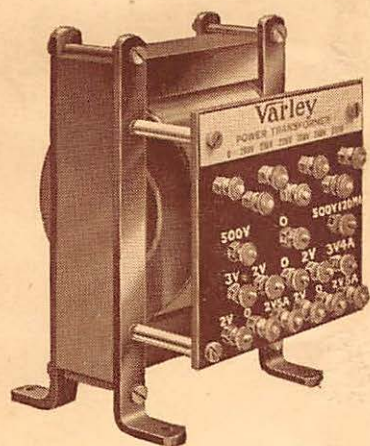
THE INC.
RADIO SOCIETY
OF GT. BRITAIN

AND THE
BRITISH EMPIRE
RADIO UNION

Vol. 10 No. 8

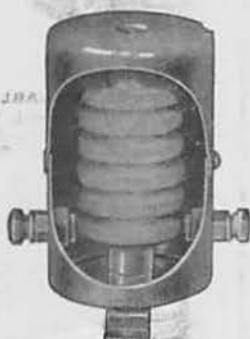
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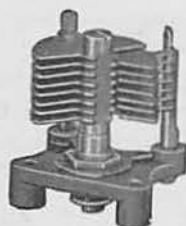


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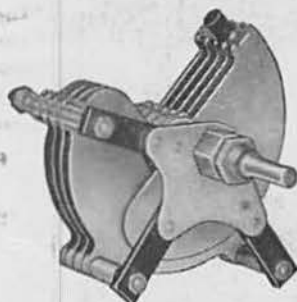
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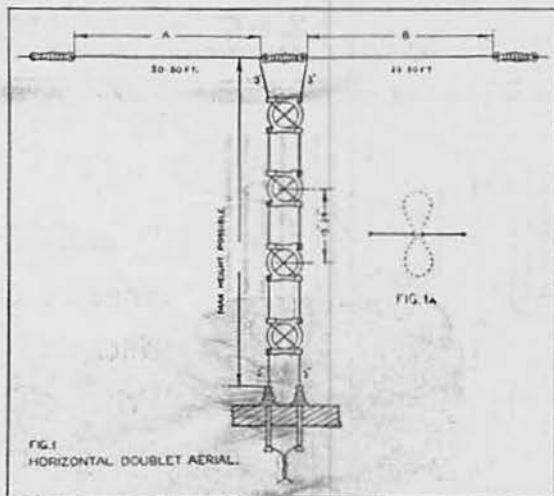


FIG. 1
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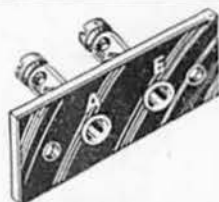
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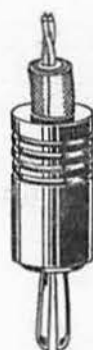
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THE T. & R. BULLETIN

CONTENTS.

Honorary Editor:—

H. Bevan Swift (G2TL)

Vol. 10

	Page
Editorial	279
A Three-Valve Superheterodyne Mains Operated Receiver	280
Band Occupancy	284
The Natural Frequencies of Aerial Wires	286
The 1934 3.5 mc. Contest	290
Soliloquies from the Shack	292
Correspondence	293
Research and Experimental Section	295
A.R.R.L. DX Contest	299
Hic et Ubique	300
District and County Representatives 1935	305
B.E.R.U. Notes and News	315
New Calls for Newfoundland Amateurs	320

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No. 8

OUR SERVICES TO NON-TRANSMITTING MEMBERS.

COUNTLESS thousands of QSL cards have been written and probably many destroyed since we last addressed an Editorial to the B.R.S. and A.A. fraternity who make up a very large proportion of our membership. This time, however, our remarks do not concern QSL's but the members themselves.

We believe we are right in saying that at least 75 per cent. of our present B.R.S. and A.A. men have at heart the desire to possess at some time their own transmitting station. The process of transition depends on numerous circumstances, but in every case the Morse test looms out as the stop-gap to many ambitions. Now it is the function of this Society to assist to the best of its ability every class of member, and not least in its list of services, is that provided gratuitously by the group of Slow Morse practice stations. For months past half-a-dozen unselfish amateurs have transmitted regular schedules for the benefit of those learning the code, with what results? Turn to one of the inner pages of this issue and it will be found that two of the co-operating stations have decided to drop the practices, because no proof has been forthcoming that they are being appreciated. Poor return for the time and trouble they have taken to assist those who aspire to own a G call.

In another paragraph Mr. St. Johnston reports that the number of members supporting the reception tests has dwindled down to a mere handful.

Calibration signals, which are transmitted monthly from G6NF, provide another example of a service which seems to be only used by a mere fraction of those working in the amateur bands.

The irony of the situation is that the Society would probably be subjected to severe criticism if it failed to maintain these services, in fact we would go further and say that if they ceased to-day, a new generation of amateurs coming along in a year or two's time would themselves probably put forward the suggestion to us that these services were needed.

The Society has endeavoured from its earliest days to provide such benefits for its members as it believes are necessary for their welfare, but to continue services which appear to be unwanted is as foolish as refusing to arrange for them to be given.

In placing our views prominently before our non-transmitting members, we hope that some at least will see that they are losing many of the benefits of membership, by failing to make use of the facilities provided for them.

In passing, we should like to emphasise that the organisers of all voluntary services are most anxious to receive constructive criticism and useful advice. If, therefore, you as a non-transmitting member can devise some method whereby the lot of yourself and others can be improved, let us have your views.

(Continued on page 320.)

A THREE-VALVE SUPERHETERODYNE MAINS OPERATED RECEIVER FOR PHONE AND C.W. RECEPTION

By W. L. V. PARKER (G6WJ).

This article was judged to be the winning entry in the Kenya Cup Competition, details of which appeared in the T. & R. BULLETIN dated December, 1933. The receiver is designed for the reception of telephony and telegraphy signals on all Amateur bands down to 28 mc., and is the first mains-operated three-valve superheterodyne to be described in this Journal.

THIS superheterodyne receiver has been designed for use on the five amateur bands, 1.7 mc., to 28 mc., but it can, of course, be operated in any of the short-wave broadcast bands by the use of suitable coils to cover the particular frequencies required.

With the introduction of several new types of mains valves, it was decided to design a mains-driven superheterodyne receiver with a maximum of three valves which would be suitable for telephony or C.W. reception. No coil changing, one knob tuning control, variable selectivity, and automatic volume control were also features that were considered to be absolutely essential in a modern receiver.

General Description

The following is a description of a receiver to cover the above requirements, which works exceedingly well, with an entire absence of mains hum and hand capacity. By using only three valves, valve hiss and general background noises are reduced to a minimum, and sensitivity is in no way impaired.

The tuning dial is a *Polar* micro drive with a 7 to 1 reduction for quickly exploring the band, and a 100 to 1 reduction for fine tuning.

The selectivity can be adjusted by means of a variable condenser, which is used as the band-pass coupling of the intermediate frequency band-pass coils; the use of this selectivity control in conjunction with a beat note tone control ensures a very high degree of selectivity for C.W. reception.

To obviate the need for coil changing, the five pairs of coils necessary to cover the required wave-range are mounted on rotating ebonite discs. The connections to the coils are brought out to switch studs, which are also mounted on the discs, and as the coils are revolved to any pre-determined position, the switch studs of the pair of coils selected make contact with the fixed contact arms mounted on the switch assembly chassis, thereby connecting

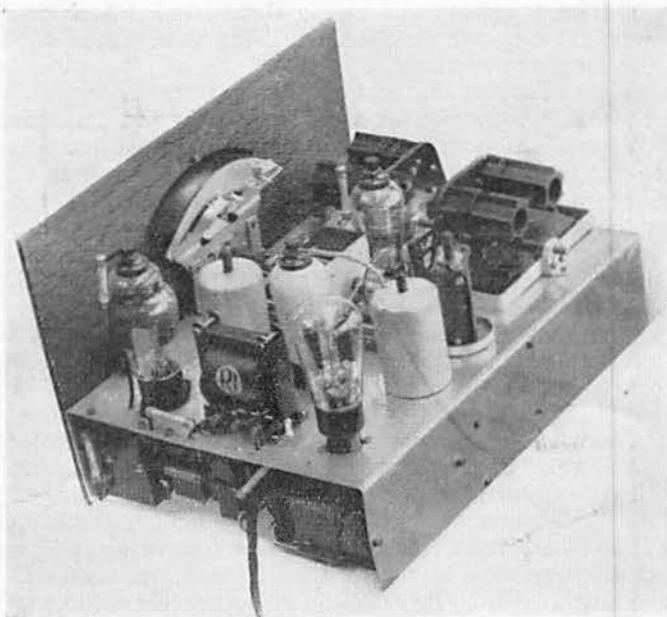
in circuit the pair of coils necessary to tune to the wave-band required.

Automatic volume control is fitted to the intermediate frequency valve only. This gives a fair degree of control, but the writer was not sure that it would be an advantage when employed in a receiver designed for amateur work. However, on 3.5 mc. it is an advantage, and holds telephony transmissions very well, although on the higher frequency bands it is of very little use. Automatic volume control, if applied to the first heptode would give a better control,

but has been omitted in order to avoid any risk of instability.

Circuit Details

The circuit arrangement is given in the theoretical diagram, Fig. 1. It will be seen that the first valve, V.1, is a *Ferranti* V.H.T.4 Heptode, and functions as a first detector and frequency changer; no H.F. stage at signal frequency is fitted. The aerial-grid coil L.1 is tuned by V.C.1, the front section of the two-gang condenser. Connected across this tuning



Side view of completed receiver.

condenser is the small .00005 trimming condenser T.C.1, which is first adjusted on, say, the 7 mc. band, and then on the other bands any other adjustment that is required to keep the tuning in gang is effected by opening or closing the spacing of the coil turns. The resistance, R.1, fitted in the grid lead of the first valve cured a peculiar form of instability which was noticed before it was fitted. C.1 and C.2 are .01 tubular condensers to by-pass any H.F. that may reach the valve via the heater, and thus cause hum. They are connected to the heater leads and to the metal chassis, which forms the common earth return.

The oscillator coil L.2 is tuned by the other section of V.C.2, the two-gang condenser, this circuit is coupled to the grid and anode of the oscillation section of the valve, as shown in Fig. 1,

and gives a good degree of coupling, enabling the valve to oscillate down to 28 mc. The resistance R.5, should be connected as near to the anode terminal No. 1 of the valve as possible, because it serves the dual purpose of reducing the voltage applied to the anode from the 250 v. supply, and also offers a high impedance to the oscillatory circuit, thus maintaining oscillation.

Grid bias is applied in the usual manner by the resistance R.2 shunted with the by-pass condenser C.3. The mixing of the signal frequency and the beat frequency is accomplished by electron coupling within the valve, and the resultant frequency appears at the anode. This is then applied to the intermediate frequency stages which comprise the tuned circuits L.3, T.C.3, and L.4, T.C.4 forming a band-pass arrangement with top coupling through

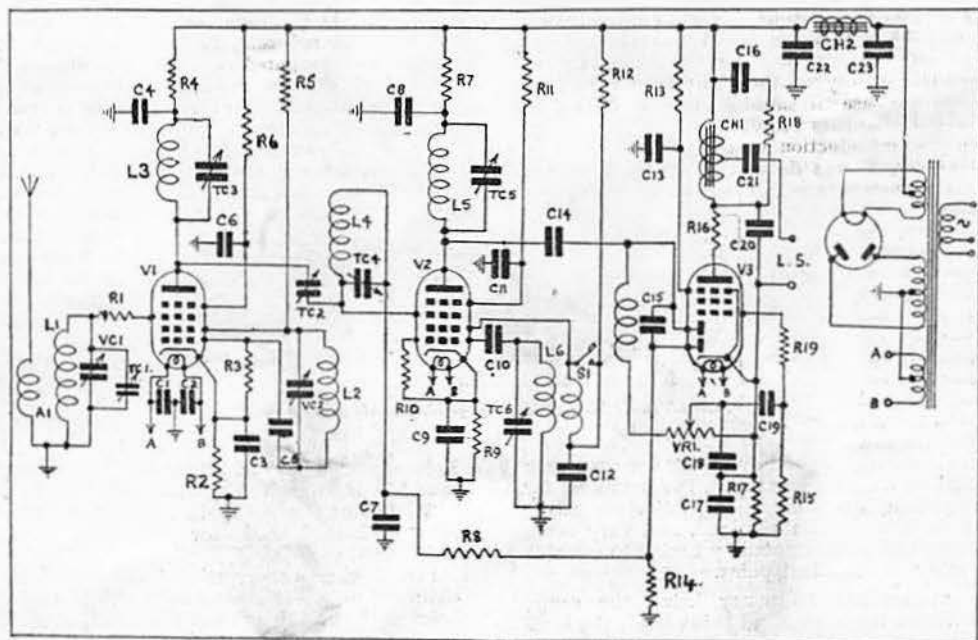


Fig. 1.
Circuit diagram of Three Valve Super-heterodyne
mains-operated Receiver.

- 1 two-gang condenser, .0001 mfd., V.C.1, V.C.2. CYLON "Bebe."
- 1 slow-motion dial, POLAR Micro-drive.
- 1 mains transformer, primary 200 to 250 v., 50 cycles; secondaries 250-0-250 v., 50 m.a., 4 v. 1 amp. centre-tapped, 4 v. 4 amps. centre-tapped. BRYCE.
- 1 smoothing choke, 20 30 henries, 50 m.a. C.H.2. R.I. Hypercore.
- 1 tapped pentode output choke, C.H.1. R.1.
- 37-pin chassis mounting valve holders. BELLING LEE.
- 14-pin " " " " " " BELLING LEE.
- 1 H.F. choke, WEARITE. " " " " BELLING LEE.
- 1 volume control, 1 meg. V.R.1. FERRANTI.
- 1 push-pull two-point switch, S.I. LISSEN.
- 6 baseboard trimmer condensers, .00005, T.C. 1-6. JACKSON BROS.
- 3 fixed condensers, 2 mfd., C.3, 9, 13. T.C.C., type 50.
- 3 " " .01 tubular, C.1, 2, 19. T.C.C., type 300.
- 3 " " 1 mfd., C.4, 6, 11. T.C.C., type 50.
- 3 " " .1 mfd. tubular, C.7, 8, 12. T.C.C., type 250.
- 3 " " .0001 mfd., C.5, 10, 15. T.C.C., type M.
- 1 " " .00005 mfd., C.14. T.C.C., type M.

- 1 fixed condenser .005 mfd., C.16. T.C.C., type M.
- 1 " " 50 mfd. electrolytic 12 v., C.17. T.C.C., type 501.
- 1 " " .0003 mfd., C.18. T.C.C., type M.
- 1 " " .001 mfd., C.20. T.C.C., type 34.
- 1 " " 2 mfd., C.21. T.C.C., type 84.
- 2 " " 4 mfd., C.22, C.23. T.C.C., type 84.
- 1 resistance, 1 watt 1 000 Ω R.1. DUBILIER (metalised)
- 2 " " 1 " 100 Ω R.2 and 16. " "
- 2 " " 1 " 1/2 meg R.3 and 15. " "
- 1 " " 1 " 5,000 Ω R.4. " "
- 4 " " 1 " 10,000 Ω R.5, 7, 13 and 18. " "
- 2 " " 1 " 30,000 Ω R.6 and 19. " "
- 1 " " 1 " 1 meg. R.8. " "
- 1 " " 1 " 1/2 " R.10. " "
- 1 " " 1 " 1 " R.14. " "
- 1 " " 1 " 400 Ω R.9. " "
- 1 " " 1 " 35,000 Ω R.11. " "
- 1 " " 1 " 15,000 Ω R.12. " "
- 1 " " 1 " 150 Ω R.17. " "
- 4 coil screens, 2 in. dia. x 3 in. high.
- 2 FERRANTI valves, V.H.T.4.
- 1 MAZDA valve, A.C.2/Pen. D.D.
- 1 MULLARD valve, D.W.2.

the variable selectivity condenser, T.C.2. The coils L.3 and L.4 are tuned to an intermediate frequency of 450 kc., and the signal is then applied to the grid of V.2, a Ferranti V.H.T.4 Heptode valve which works a combined intermediate frequency amplifier and local oscillator for C.W. reception. The anode of V.2 is coupled to L.5 and T.C.5, which is also tuned to the intermediate frequency; the signal is then passed on to the last valve.

It will be as well before passing on to a description of the output circuit to describe the local oscillator. The idea of using a heptode for both intermediate frequency amplification and local oscillator for C.W. reception was new to the writer, but was evolved after various other methods had been tried.

The oscillator section of the valve V.2 is tuned by the circuit L.6, T.C.6, to the same frequency as the intermediate frequency coils. The mixing of the incoming signal and the local oscillator signal is effected in the valve and by tuning the condenser T.C.6 slightly off the silent point, the beat note for C.W. reception is produced. By adjusting T.C.6, the desired tone can be obtained, and very often interference can be eliminated by tuning to one side or the other of the silent point.

The intermediate frequency being the same, irrespective of the wave-band being used, the local oscillator frequency also remains the same, so that this can be left permanently set if required. For telephony reception, the local oscillator is cut out of action by the switch S.1 mounted on the panel.

The signal, after passing through the above stages, arrives at V.3, the combined second detector and output valve. This is a Double Diode Pentode, one diode being used for detection, and the other for automatic volume control. Any loss in signal strength using diode detection is amply compensated for in the pentode section, which is remarkably efficient.

The diode detector and automatic volume control arrangement is standard practice, and needs no comment. Manual volume control is obtained with the potentiometer V.R.1. Automatic grid-bias is obtained by the resistance R.17, inserted in the cathode lead, and the by-pass condenser C.17, which is a 50 mfd. electrolytic. A resistance, R.19, is connected in the grid lead, and one R.16 in the anode lead of the pentode section to prevent instability that might occur in this part of the circuit.

The output circuit consists of a pentode output choke for coupling to the loud speaker. Resistance R.18 and condenser C.16 are for tone correcting purposes, and can be altered to suit the loud-speaker being used.

Mains Unit

The mains unit consists of the mains transformer giving a rectified output of 250 v. 60 ma., 4 v. 1 amp. for the rectifier, and 4 v. 4 amps. for the filaments

of the receiver valves. No special precautions in the smoothing were found necessary, the set working with an absolutely silent background with the usual 20 henry choke and two 4 mfd. smoothing condensers.

The Construction of the Receiver

The construction should present no difficulties. The coil-changing unit can be home-made, as in the case of the writer's, or one of the commercial units now on the market. The chassis is of No. 20 gauge aluminium sheet, 16 ins. by 18 ins.

Before bending; $3\frac{1}{2}$ ins. is bent down back and front, thus forming the chassis, which will then be 16 ins. wide, 11 ins. deep, $3\frac{1}{2}$ ins. high, the underneath portion being used for by-pass condensers, resistances, etc.

Fig. 2 gives constructional details of the coil-changing unit. It is necessary to cut two square holes in the chassis to clear the two sets of coils, as they are revolved when selecting the wave-band required. The spindle operating the coils is extended through the panel and is fitted with a knob, also a small dial is fitted to the panel, divided round the circumference into five equal divisions, and marked with the wave-bands for each position of the knob.

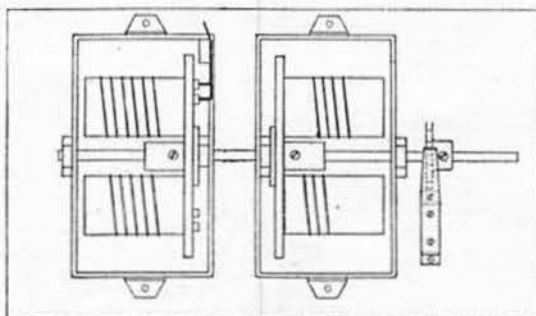
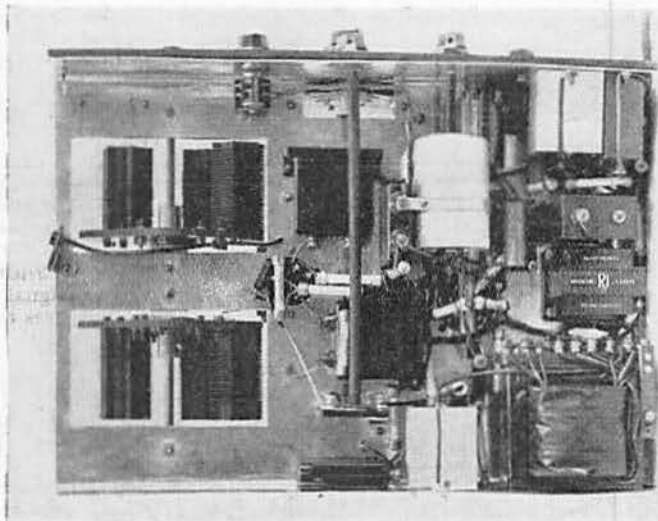


Fig. 2a. Plan of Coil Assembly.



View of underside showing position of mains unit.

The two-gang Cydon condenser is mounted centrally on the chassis, with the Polar double-ganged dial, the extra reduction on the dial being absolutely essential for tuning. For spreading the amateur bands, round the tuning dial, all but two moving vanes should be removed from each of the tuning condensers, but great care should be exer-

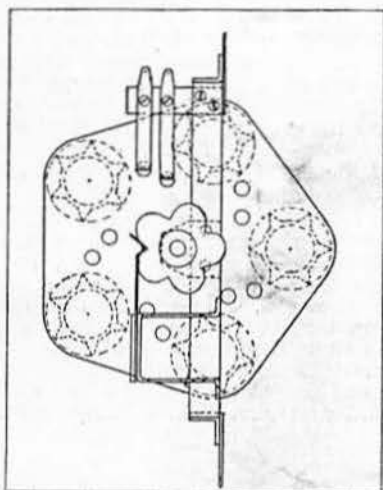


Fig. 2b. End View of Coil Assembly.

cised in winding the coils to suit the circuits unless extra condensers are fitted to set the bands. The writer having decided to use the condensers as originally sent out, i.e., .0001 each section, found no difficulty in tuning with the slow speed Polar dial, which arrangement has the advantage of being able to tune to the S.W. broadcast bands on one or other of the coils when desired.

When the set was first designed, no commercial 450 kc. intermediate frequency coils were available,

consequently these were home-made. Each consists of a paxolin former 1 in. diam. by $2\frac{1}{2}$ ins. long, wound with 170 turns of No. 36 D.S.C. wire. Mounted on top of each coil is a .00005 trimming condenser. The coil units are then fitted in a screening can 2 ins. diam. by 3 ins. high, and the adjusting rod of the trimmer protrudes through a hole drilled in the top of the can. The connecting leads to the coil are taken through the bottom, and wired to their respective positions under the chassis.

The coil L.6, which supplies the beat note, is exactly similar to the three intermediate frequency coils with the addition of a reaction winding of 60 turns. This is wound over the bottom end of the coil, and is spaced from it by four layers of empire tape. The coil is mounted horizontally under the chassis and the trimmer extension is extended, brought through the front of the chassis and panel, and fitted with a knob to vary the pitch of the beat note. The pentode output transformer is mounted on top of the chassis, and the mains transformer, smoothing choke, and condensers are assembled below.

Final Adjustment

After completion, a signal should be tuned in, and each of the I.F. stages adjusted, by means of the trimmers, until maximum signal strength is obtained.

The aerial condenser trimmer is then adjusted for maximum response when tuned to a station at the lower end of the dial, say about 20° . The selectivity can be controlled by adjusting condenser T.C.2, and the tone of the beat note by adjusting T.C.6. The operation of both these condensers should be carried out by extension spindles brought through the panel.

After the receiver had been photographed, it was decided to alter the coils, and in the table are given winding details for each band. Ribbed formers of 1 in. diam. are used for the 28 mc. band, and $1\frac{1}{4}$ in. diam. ribbed formers for the others.

The receiver is of pleasing design, and has given the writer pleasure in designing and operating.

Coil Winding Details.

BAND.	AERIAL COIL A.1.	GRID COIL L.1.
28 mc.	3 turns No. 26 D.S.C. close wound and $\frac{1}{4}$ in. away from earth end of L.1	$3\frac{1}{2}$ turns 1 in. diam. No. 16 enamel, spaced over 1 in.
14 mc.	4 turns No. 26 D.S.C., close wound and $\frac{1}{8}$ in. from earth end of L.1	5 turns $1\frac{1}{4}$ in. diam., No. 18 enamel, spaced over $1\frac{1}{2}$ ins.
7 mc.	8 turns No. 26 D.S.C. close wound and 3-16 in. from earth end of L.1	11 turns $1\frac{1}{4}$ in. diam. No. 18 enamel, spaced over $1\frac{1}{2}$ in.
3.5 mc.	15 turns No. 26 D.S.C. close wound and 3-16 in. from earth end of L.1	23 turns $1\frac{1}{4}$ in. diam. No. 18 enamel, close wound.
1.7 mc.	20 turns No. 30 D.S.C. close wound and 3-16 in. from earth end of L.1	50 turns $1\frac{1}{4}$ in. diam. No. 22 enamel, close wound.

OSCILLATOR COIL L.2.

28 mc.— $2\frac{1}{2}$ turns 1 in. diam., No. 16 enamel, spaced over 1 in.
 14 mc.— $4\frac{1}{2}$ turns $1\frac{1}{4}$ in. diam. No. 18 enamel, spaced over $1\frac{1}{2}$ ins.
 7 mc.— $10\frac{1}{2}$ turns $1\frac{1}{4}$ in. diam., No. 18 enamel, spaced over $1\frac{1}{2}$ ins.
 3.5 mc.—22 turns $1\frac{1}{4}$ in. diam., No. 18 enamel, close wound.
 1.7 mc.—47 turns $1\frac{1}{4}$ in. diam., No. 22 enamel, close wound.

BAND OCCUPANCY.

IN May, 1933, we published in this journal a *résumé* of the work which had been carried out by a group of members, mostly non-transmitting, in connection with occupancy checks they had made on certain of the amateur bands. Interesting as these were, they could only be regarded as a rough indication of what was taking place, for the reason that the organisation was not then in full swing. The article in question covered only three check periods, and although we were aware that the figures under-estimated the full activity, they nevertheless served a most useful purpose at the Madrid International Conference.

With the passing of time, the work of the Band Occupancy Group has become almost routine in character and effectiveness, the credit for this satisfactory state of affairs being very largely due to the untiring energies of the Group Manager, Mr. L. Hill (G5WI), of Bristol. Mr. Hill has been ably assisted throughout by a number of keen members, several of whom have had many years of transmitting experience, but the "donkey work" of segregating and analysing the reports has been his responsibility.

holding itself responsible for checking certain bands. Where possible, the members forming a section live within easy reach of one another, an obvious advantage.

The call of every British station heard is logged on special forms prepared by Headquarters, and the sheets are sent to Mr. Hill, after each week-end, for analysis. In many cases a specific station is heard working on more than one band, and its call is, therefore, added to the total calls heard on that band over the period, but the important figure is the one showing the *total individual stations active*, for this is the figure which we believe will count in International discussions.

When the first checks were projected, it was estimated that not more than 35 per cent. of the total British call-signs allotted would be heard during the comparatively short check periods, but as the Tables show, this figure has been well surpassed—in fact, the figures for the 1934 checks indicate that nearly 60 per cent. of licensed British stations are making good use of their call-signs—a healthy and progressive sign, and one which we can regard with more than ordinary interest.

TABLE I.
STATIONS ACTIVE PER BAND.

Series	Date.	Bands (MC.)						Totals
		1.7	3.5	7	14	28	56	
1	July, 1932	60	52	133	—	—	—	245
2	November, 1932	171	102	164	—	—	—	417
3	March, 1933	153	187	331	—	—	—	671
4	September, 1933	203	204	446	189	11	56	1109
5	March, 1934	249	203	448	257	—	34	1191
6	September, 1934	194	176	543	250	8	25	1196

Bands Checked.

The first two checks made in July and November, 1932, covered only the 1.7, 3.5, and 7 mc. allocations, but with an increase of helpers, it was found possible to extend the checks to 14, 28, and 56 mc. The 14 mc. investigations are interesting and helpful, but for various reasons it has not been possible to obtain reliable data concerning the two high frequency bands. Statistics have, however, been obtained which are shown in tabulated form in this article.

Check Periods.

From 1933 onwards, the checks have taken place during four Sundays in March and September. It is realised that greater activity would be reported during the Spring period if the checks were made a month earlier, and similarly, more stations are invariably active in November than in September, which is a holiday month for many, but in order to obtain a fair average, the months March and September have been selected.

Method of Observing.

The Band Occupancy Check Group is divided into sections of two or more members, each section

The 1.7 mc. Band.

No band has caused the Council of the R.S.G.B. more concern than that stretch of territory lying around 1.7 mc., for these are the frequencies which are being looked upon with envious eyes by numerous commercial undertakings. Fortunately, we in this country have the British Post Office behind us, and come what may, we have few fears that we shall lose our hold on this valuable allocation, providing we can show that full and good use is being made of the band. From the Tables it will be noticed that the activity on 1.7 mc. has been maintained at around 200, with a peak figure in March, 1934, of 249. These totals provide conclusive proof that the "top band" still has a bigger appeal in spite of power restrictions and interference problems.

The 3.5 mc. Band.

Considering now the 3.5 mc. band, which is, as all members are aware, shared with other services, we find that an almost similar amount of activity takes place there as on 1.7 mc.

An interesting feature to be noted when studying the occupancy figures for this band is the fact that although 176 stations were active in September,

ber, 1934, only 20 of these stations took part in the November 3.5 mc. Transmitting Contest. From observations made during the week-end of the Contest, the impression has been formed that the vast majority of our members are not particularly interested in these competitive events.

The 7 mc. Band.

The figures obtained during observations made on 7 mc. are astonishing, and are the most conclusive proof possible that the amateurs of the world require an extension of territory around this frequency. No less than 543 individual British stations were heard during the September check, a figure which is probably 200 lower than would have been obtained if the checks had been made during either the B.E.R.U. or the A.R.R.L. contests.

Five hundred and forty-three British stations sharing with many thousands of others less than 300 kilocycles! No wonder single-signal superheterodyne receivers are becoming standard practice in this and other countries.

The September figure is a record for the checks, being 95 in excess of the March total. At the present rate of progress, it will be within a stone's throw of 1,000 before the Cairo Conference opens. Such a figure will provide the I.A.R.U. delegates with most valuable ammunition, but we should like to know that other countries are also preparing similar data to add weight to the demands which will be made for a wider band of frequencies. In this connection we would record that a suggestion has been made to the I.A.R.U. that all Member Societies of the Union should immediately take steps to put into operation a Band Occupancy Checking scheme in their own country.

The 14 mc. Band.

Checks on 14 mc. are not quite so easy to make as those on the other commonly-used bands, therefore the Group adopted a suggestion made by Headquarters, and logged the calls of all G stations heard being called by overseas stations as well as direct calls. As a result, it has been possible to prove that approximately 250 stations are using this band, although this figure, we are confident, is considerably under-estimated.

The 28 and 56 mc. Bands.

Referring now to the 28 and 56 mc. bands, it was originally decided to obtain information by direct observation, but for obvious reasons the results were rather unsatisfactory, consequently several of the B.O.C. Group members personally canvassed all local transmitters believed to be

TABLE 2.
INDIVIDUAL STATIONS ACTIVE.

Series.	Date.	Totals.
1	July, 1932	211
2	November, 1932	355
3	March, 1933	526
4	September, 1933	706
5	March, 1934	751
6	September, 1934	745

active on one or more of these bands, and from the replies received it was possible to produce a series of figures. It is, however, known that the 56 mc. band figures are grossly inaccurate for the reason, that activity in March and September is negligible as compared to summer time activity.

The poor conditions which have existed for several years on 28 mc. are directly responsible for the low check figures obtained on that band.

Conclusions.

Sufficient has been written to show that the work which is being conducted by the Band Occupancy Group is of vital importance to the future of the amateur movement, and in closing this account, we should like to thank all those who have co-operated in bringing the checks to such a high peak of success. The work of this Group will continue, we hope, for many years, and it is anticipated that their services will be used for many other important duties outside band checking. Already steps are being taken to check the commercial activity which is taking place on each side of the 7 and 14 mc. bands, and we believe that this information, coupled with the band occupancy figures, will prove of the utmost value when frequency allocations are discussed two years hence.

The Television Report.

The Postmaster-General's announcement, made on January 31 last, had been eagerly awaited by radio manufacturers and the general public alike. As anticipated in the technical and lay press the recommendations made by the Commission followed a course which a long experience of broadcasting has shown to be a wise one. The recommendation to set up a single high-power station in Central London is an indication of their cautiousness.

The information that 240 line transmissions operating on frequencies around 45 megacycles are to be employed, is a clear proof of the faith which the Commission held in short wave high definition systems. The fact that these frequencies will now come in for considerable attention leads us to anticipate that more suitable circuits, components

and valves may shortly become available for amateur and experimental use.

We shall look forward with interest to the publication of technical descriptions dealing with the transmitters themselves, because the frequency control difficulties which have to some extent hindered experimental progress on 56 mc. will undoubtedly have been overcome by the time the first commercial transmissions take place.

The advent of short wave television should throw much light on receiver and antenna problems, and as a result our own experimental field should be considerably enlarged.

The television report is now available from H.M.S.O. or from Headquarters, price 7d. per copy post free.

THE NATURAL FREQUENCIES OF AERIAL WIRES.

By F. CHARMAN (G6CJ).*

It is a well-known property of a length of aerial wire that it is in resonance when it is about half a wavelength long, and a fairly simple theory can be produced to make this resonance occur on exactly the half wave of wire. We find in practice, however, that this length needs to be cut by anything up to 10 per cent. This is a typical experience with physical laws, namely, that they exhibit a beautiful simplicity at first, but when we come to study them in somewhat closer detail, we have to make corrections for various factors previously neglected, until the complication of the law is only limited by the accuracy of result desired.

It is proposed here to study the tuning of aerial wires in detail in order to find some rules (possibly empirical) by means of which it is possible to predetermine the correct length of half-wave and harmonic aerals.

STANDING WAVES.

The simple theory considers a wave travelling along the wire and reflected at the ends (since it must do something, and cannot go on or pile up). If the velocity of the wave on the wire is the same in the wire as in free space, then a wave starting at one end will reach the other end (half wave wire) in exactly half a cycle, and its reflection will get back home at exactly the right time to go off with the next advancing wave cycle. A little consideration of the phases of the going and returning waves will show how they add differently in different places, and thus produce what are known as "Standing Waves." For example, in Fig. 1, where the wire is a half wave long, the amplitude of the current at any given point is represented by the length of the arrows, whilst the phase is given by their directions. A wave is travelling from point 1 to point 5 (Fig. 1a). Now it takes half a cycle to travel this distance, so that the oscillation at 1 is half a cycle behind that at 5, or the phase of the current at 1 is half a rotation behind that at 5. The rotation is distributed proportionally at intermediate points. Fig. 1b shows the conditions in the returning wave which has been reflected at 5. Because of the reflection the current is now flowing in the opposite direction, and so an immediate phase reversal is shown together with the progressive rotation along the wire. The total current at any point is the sum of the going and returning currents, and these are added, allowing for phase differences as in Fig. 1c. The resultants are plotted in Fig. 1d, and the familiar current distribution of a half-wave aerial will be recognised: the end currents cancel out, the centre ones add directly.

Owing to the fact that some energy is radiated as the wave travels, the velocity in the wire cannot be regarded as the same as in free space. The loss by radiation is somewhat akin to friction, and the wave is slowed up slightly as a result. Looking at it another way, the standing waves do not build up correctly because of a progressive loss which makes the reflected wave less than the advancing one, so that cancellation does not occur at the right place.

In Fig. 2, the velocity of the wave has been reduced so that it takes 9/16ths of a cycle to reach the far end. The same procedure as for Fig. 1 is followed, and the resultant currents are seen in Fig. 2c, their amplitudes being plotted in Fig. 2d. It is now obvious that the aerial is out of tune, and must be cut by 1/4th of its length to allow for the slower wave velocity.

A tuned aerial may be regarded as a tuned circuit in resonance, and therefore as a resistance. The untuned case of Fig. 2 must be regarded as a resistance together with a reactance, i.e., as an impedance. In order to cut the aerial to resonance we must find what this reactance is and what proportion of the aerial it represents.

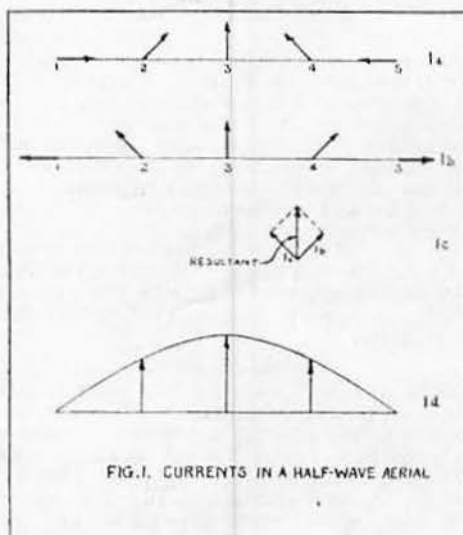


FIG. 1. CURRENTS IN A HALF-WAVE AERIAL

WIRE IMPEDANCE.

To calculate the impedance of a wire it is necessary to divide the wire into infinitesimal elements and consider the magnetic and electric fields of each element, due allowance being made for the phase and amplitude of the current in each one. The summation of the total of all these results gives us the power relations in the system regarded as a whole, and thus its self-impedance. In accounting the effect of one element it is necessary to consider the effect of its field on the surrounding space and also on each one of the other elements, not forgetting that in the case of wires which are of appreciable size compared with the wavelength it takes appreciable time for the field to travel from one part to the other.

In the simpler case where the wire is very short these finite times of field propagation do not occur, and the result is the fairly simple formula for the self inductance of the wire, but in this case there can be no radiation either. It will thus be realised why the efficiency of a radiator increases with its size.

The summations mentioned would be impossibly laborious by ordinary arithmetical methods, but by means of the Integral Calculus it is possible to deal with them in one set of equations fairly quickly. The result will give us formulae for the power radiated (and hence the radiation resistance) and also for the effective capacity and inductance. Knowing these latter we can obtain the characteristic impedance, the quantity which determines the ratio of voltage to current for a given power in the system.

The impedance at an exact half wave, full wave, etc., are given by this treatment as:—

$$\left. \begin{aligned} Z &= 73.5 + j42.5 & \text{Half wave} \\ &= 94 + j45 & \text{Full wave} \\ &= 106 + j46 & 3/2 \text{ wave} \end{aligned} \right\} \dots\dots\dots (1)$$

with respect to the current at one current maximum. The first of each pair represents the radiation resistance; that is, for one ampere in the centre of a half-wave wire 73.5 watts would be radiated. The +j means that the remaining portion of the impedance is inductive to the extent of 42.5 ohms in the first case, and so on.

Now the wire is regarded as a tuned circuit, and to bring it into resonance it is necessary to shorten it until the "j" term vanishes, and the problem is now to find how much per cent. detuning this term represents. This will involve the knowledge of some other property, such as the inductance, or the characteristic impedance.

CHARACTERISTIC IMPEDANCE.

It can be shown from the definition that the characteristic impedance is equal to the inductive reactance when the circuit is in resonance.

The analysis indicated in the preceding paragraphs gives us the value of the characteristic impedance, Z_0 , in terms of the geometry of the system, namely,

$$Z_0 \text{ or } \omega L = 138 \left(\log \frac{.56\lambda}{2\pi r} \right) \text{ ohms} \dots\dots\dots (2)$$

where λ is the wavelength, and $2\pi r$ is the circumference of the wire. The common Log is used.

The first thing to notice is that this expression is slightly different from that for feeders, in that the wavelength enters into the Log. function. This is because we are dealing with a system containing standing waves.

The value of Z_0 or ωL for various wires has been calculated in Table 1, and from these values we will proceed to determine the correction factor.

The problem resolves into finding how much the wire is off tune for a given resistance and reactance. Having found this we can cut in proportion. Thus, if it is δf cycles off the resonant frequency f , we cut off $\delta f/f$ of the length.

Now the residual reactance X is given by

$$X = (\omega L - 1/\omega C) \text{ where } \omega = 2\pi f$$

and at the resonant frequency the inductive and capacitive reactances cancel, leaving zero. At a frequency near resonance say δf cycles off, we can use an approximation * and obtain

$$X = 2\pi\delta f L = 2\delta\omega L \dots\dots\dots (3)$$

Dividing this by $2Z_0$ we get

$$X/2Z_0 = 2\delta\omega L/2\omega L = \delta\omega/\omega \dots\dots\dots (4)$$

The wire is therefore shortened from an exact half wave by the proportion $X/2Z_0$. X is given in equations (1) and Z_0 is obtained from Table 1. Examples will follow later.

*See Appendix.

EFFECT OF GROUND.

There is, however, another factor which has not so far been considered, namely the effect of the earth and objects adjacent to the aerial, and here we have to work from experience. The effect of these factors is to increase the effective capacity by introducing some dielectric into part of the field, without affecting the inductance, thus raising the natural wavelength still further.

It now becomes necessary to use a little intelligent guesswork, and it is suggested that the second correction for a horizontal wire is 1% when the wire is a wavelength high, and inversely in proportion, so that it would be 2% for a height of half wavelength. This is more or less in agreement with experience, but results of further experience would be valuable to the writer.

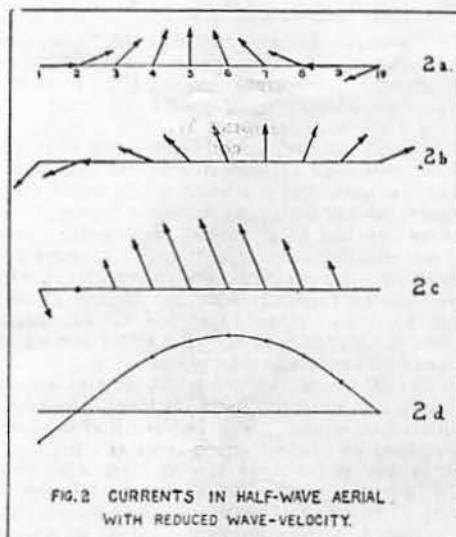


FIG. 2 CURRENTS IN HALF-WAVE AERIAL WITH REDUCED WAVE-VELOCITY.

As an example, suppose we are to use 14 s.w.g. wire on 7,000 kc.

$$\lambda = 42.8 \text{ metres, or } \frac{42.8 \times 39.4}{12} \text{ feet}$$

$$\begin{aligned} \lambda/2 &= \frac{42.8 \times 39.4}{24} \\ &= 70.3 \text{ feet or } 70' 4". \end{aligned}$$

Now for 14 s.w.g. at 7 mc., $Z_0 = 628$ ohms and $X = 42.5$ ohms.

So correction $\frac{X}{2Z_0}$ is $\frac{42.5}{1256}$ or 3.4% of the length.

Now, on 14,000 kc. Z_0 is 586 ohms, and X is 45 ohms, so the correction is $\frac{45}{1172}$ or 3.85% of a half

wave. The reactance is actually spread over two half waves or two tuned circuits, so the actual correction is 1.92% of the length. The wire for 7 mc. thus misses the harmonic by about 1.5% on the score of natural effects alone. We shall see that practical factors accentuate this error.

Assuming that the wire is to be 60 ft. high, that is about half a wavelength; the correction for the ground is 2% on our empirical scale. When on 14 mc., however, it will be twice as high in

wavelengths, and the correction is only 1% Summarising,

7 mc. natural 3.4% of 70.3 feet
ground 2.0% ..
5.4% .. or 3' 10", leaving
66' 6"

14 mc. natural 1.9% of ..
ground 1.0% ..
2.9% .. or 2' 0", leaving 64' 4"

Difference between 7 and 14 = 1' 10"

which is of the order of difference which has been observed in practice.

Looking at these results another way, suppose we have cut the 5.4% off for 7 mc., then the resonant frequency near 14 mc. will be $14000 \times \frac{68' 4"}{66' 6"}$ which comes to just 14,400 kc.!

On 28 mc. Z_0 is 544, and X is 46.2 ohms, and the correction is 1.06% only. Adding $\frac{1}{2}\%$ for the ground we get, say 1.6% correction, leaving 69' 3". The natural frequency of a wire cut for 7,000 kc. comes to 29,600, and is thus still in the band allowed, but only because of its convenient extension compared with the others.

These notes would not be complete without some attempt to deal with the presence of a house very near to one end of the wire and similar circumstances, and here again a mixture of experience with some perhaps not quite so intelligent guesswork will be brought to bear. Here a difficulty arises in assessing the distance of the nearest earthed body: thus in the case of a vertical wire with one end near the ground, we are not sure to a foot or so where the electrical ground starts—certainly not usually at ground level. A distance of one to three feet below is the usual answer as determined by the reflection from the ground, so that in the case where the vertical wire comes within a foot of the surface we cannot be very sure of our figures, but it will probably suffice to take the benefit of the doubt to the extent of a couple of feet.

EXAMPLES.

Two experimental cases are available. The first was a 14 mc. half-wave vertical at a height of 3 ft. from the ground at the bottom. This wire wanted the length of 30 ft. 3 in., quite short by usual standards. The second was a 7 mc. top, with one end 60 ft. high and the other only 30 ft. high. This latter was of the type known as "M.I.F.," the feeders being splayed out and tapped symmetrically about the centre. It was cut 66 ft., but it was impossible to obtain balanced currents in the feeder until about 6 in. was lopped off the low end.

Now suppose we postulate the original empirical rule, but consider it as applying to the affected half only.

In the first case we have:—

14,400 kc. 16 s.w.g., full H.W. ... 34' 2"
Less 3.5% for 16 s.w.g. on 14 mc. (1' 3") 32' 11"
Less $\frac{1}{2}$ of 2% for top end $\lambda/2$ up, and
 $\frac{1}{2}$ of 16% for bottom at height $\lambda/16$
(2' 11") ... 30' 0"
Experimental ... 30' 3"

Here the extra foot taken for the dry earth crust makes a lot of difference, so there is some sugges-

tion of a "wangle," but it is in agreement with experimental work on reflection from the ground at high frequencies. It is believed to be justifiable to measure the height of the affected end as most of the electrostatic field originates there.

TABLE I.

CHARACTERISTIC IMPEDANCE OF LONG WIRES.

Wire	Diam.	Z_0				
		56 mc. 28 mc.	14 mc. 7 mc.	3.5 mc.		
	$\frac{1}{8}$ "	393	434	476	518	559
	$\frac{1}{4}$ "	435	476	518	560	600
10 s.w.g.	.128"	475	516	558	600	641
12	.104"	487	528	570	612	653
14	.080"	503	544	586	628	669
16	.064"	518	561	600	643	684
" 7/22 "	—	As 10 s.w.g.				

In the second case:—

7,000 kc. top ... 70' 4"
Less 3.5% for 14 s.w.g. on 7 mc. (2' 6") 67' 10"
Less 2% if it were 60' high and horizontal
(1' 4") ... 66' 6"
Less extra half of 2% as one end is 30'
high (8") ... 65' 10"

In practice a cut of 6 in. was found to be near enough correction for the low end to obtain symmetry.

These two examples are not very conclusive, and it would therefore be valuable to have the results of any other experiences.

SHARPNESS OF RESONANCE.

Finally, a note on the sharpness of tuning or accuracy of length of Hertz aerials. We have seen that in the half-wave case the resistance is 73 ohms, and the reactance ($\omega L = Z_0$) in a typical case about 550 ohms. The equivalent coil magnification is $\frac{550}{73}$ or about 7.5. The mag. of a good receiver coil is 100, so that we see the aerial is fairly flatly tuned. Now from equation (4) we can determine the reactance of an aerial off tune by rewriting it as

$$X = 2Z_0 \delta \omega / \omega = 2Z_0 \delta / 1 \dots \dots \dots (5)$$

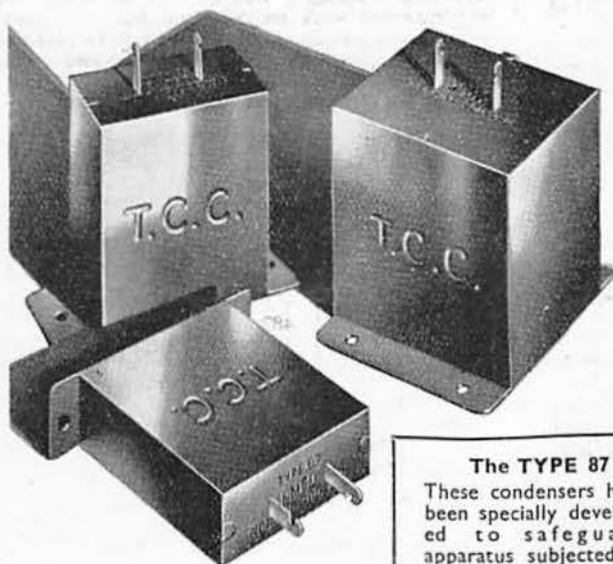
Taking a typical case of a 7 mc. aerial pitched in the middle of the band, and assuming it to be of the thinnest reasonable wire, in order to make it as sharp as possible, say 16 s.w.g., Z_0 is 640 ohms, and the reactance at 7,000 kc. is given as:—

$$X = 2 \times 640 \times \frac{150}{7000} \text{ or } 27.5 \text{ ohms}$$

The reactance at 7,000 kc. will be capacitive as it is too short, and at 7,300 kc. an equal amount inductive. (To determine the type of reactance, imagine it very short when it is obviously a capacity, and remember that it changes sign at each half wave.)

This reactance is standing against 73 ohms of resistance, and by vector addition the impedance is 77.5 ohms, so that at each end of the band the current will only be lower than that at the centre by about 6%. The writer has habitually used half-wave aerials at all parts of the band, and has noticed no appreciable difference in performance anywhere, either in terms of current in the feeders or in terms of signal strength.

(Continued on page 320)

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THE 1934 3.5 MC. CONTEST.

THE 3.5 mc. Contest, held during the last week-end in November, provided a keen competition for the 20 members who entered. As reported in our last issue, Mr. R. A. Bartlett (G6RB) finished first, a few points ahead of Mr. W. E. Dunn (G2LR), of Cranwell, a new competitor.

Incidentally, this contest provided the first clues that improved DX conditions on this band were occurring, a fact which was reported upon by G6RB last month. Several trans-Atlantic QSO's were made during the contest period, but from subsequent information received, we believe the number would have been much greater if the event had been arranged a month later.

The hours for this contest, it will be remembered, were drastically reduced, as compared to its fore-runner; furthermore, only one week-end, instead of two, was employed for the test, it having been realised that many of the entrants in previous years wasted time during the second week-end

and Birmingham, were all similarly silent. It was left to Glasgow among the main centres to vie with Bristol in the quest for points.

The First Three.

Considering now the leading stations, we find that Mr. Bartlett, using an input of 50 watts to a locked amplifier, made 48 contacts with 18 countries, giving a total of 936 points. His best contacts were with VE1BV (T9, W5, R7) and SU6HL (T8, W4, R4). His aerial system was described in the January issue, page 245. The receiver was an 0-SGV-1.

Mr. Dunn, with 910 points, made 62 contacts with 14 countries; VE1BV was his DX. The transmitter was a conventional CO BA PA with a DET.1 in the final. A 3.5 mc. Zeppelin voltage fed aerial, with quarter-wave feeders inductively coupled to the P.A. tank coil, was used. The receiver was 0-SGV-1 parafeed to pentode.

Mr. Canning had 51 contacts with 16 countries,

Position.	Name.	Call.	Town.	Input.	Points.
1	R. A. Bartlett	G6RB	Bristol	50	936
2	W. E. Dunn	G2LR	Cranwell	10	910
3	F. R. Canning	G6YJ	Newport	10	880
4	E. G. Ingram	G6IZ	Aberdeen	10	864
5	S. A. French	G6FN	Edinburgh	45	780
6	H. Jones	G6ZT	Preston	25	670
7	J. Wyllie	G5YG	Glasgow	20/45	612
8	C. F. Scruby	G5YU	Sidcup	10	570
9	R. D. L. Dutton	G6QQ	Oxford	10	494
10	I. Auchterlonie	G6OM	Heswall	48	429
11	S. W. Henton	G5VU	Nottingham	10	350
12	G. R. S. Farnie	G5FI	Cefn Coed	9.5	275
13	A. Watson	G6UJ	Driffield	50	260
14	V. G. Mellor	G5MR	Dover	45	207
15	J. Walker	G5JU	Bristol	9	160
16	M. H. Munroe	G6MF	Edinburgh	—	128
16	J. H. Hum	G5UM	Welwyn	8.8	128
18	R. V. Allbright	G2JL	Newport	10	105
19	N. A. Richardson	G5HJ	Finchley	10	45

through their inability to find new stations to work. This innovation and the reduction in hours proved very popular, but from a Society point of view, we were astonished to find so few competitors.

Several entrants criticised certain members who regularly work on 3.5 mc. for calling them during periods when points could be obtained from European QSO's. Seemingly, many non-competitors, although well-known members, were not aware that the contest was taking place!

A further point of criticism was directed against those who used broadly modulated telephony, many contacts being ruined through this cause.

The writer of these notes was surprised to find that no other London station, with the exception of G5HJ, showed an interest in the event. Something must be seriously wrong when the usual habitués of 3.5 mc. cannot devote a few hours to a contest such as this. London was not alone in this dignified isolation, for Manchester, Leeds,

and like G6RB, worked VE1BV and SU6HL. His input was 10 watts, a microscopic input for trans-Atlantic work. A T25D was used in the final, and the aerial was a G6JV type, 100 ft. long and 40 ft. high. An 0-V-1 receiver was employed. The positions and scores of all entrants are set out in the Table.

Competitors' Comments.

Space limitations prevent more than a few brief comments being published. G6RB said, "as regards DX, I am afraid we struck a very unfortunate week-end. . . I called VE1BV for 1½ hours before I finally hooked him; QRM was bad on his side, due to the A.R.R.L. Sweepstakes Contest."

G2LR said, "Most enjoyable week-end—on whole time—impressed with splendid manner in which Europeans co-operated." G6UJ reported hearing W1, 2, 3, 8, VE1FL, VOSHK, UK3AA, and LX1JW, but could not contact. He noticed some curious skip effects, and was able to raise

several stations on 5 watts, which could not be contacted with 10.

G5ZT said, "This was the first contest I had entered. Phone QRM from non-competing G stations ruined many of my contacts, including one with SU6HL." G5YG was operated by Mr. Jim Stove, the official second operator of Mr. Wyllie's station. A triet oscillator, working on fundamental, was employed for driving the neutralised P.A.

G5YU "enjoyed every moment of the contest, though domestic duties allowed but 16 out of the 31 hours available!" G6QQ lamented the fact that whenever we stage a contest, other European organisations seem to follow suit! "the general standard of operating from Continental stations was very high and the quality of their notes good. Most of the Germans seemed to be using E.C.O. or C.C."

G5VU said, "Out of 35 stations worked, 23 were the result of answering CQ calls. Test calls sent indiscriminately would have dropped my score considerably." G5YG was blessed for beating him to it on several occasions! He commented upon the snappy operation of the D's, and had some kind words for a certain Frenchman! G5FI supports G5VU and says, "I did not have one QSO as a result of a test call." He worked 25 stations in 17½ hours, and logged VE1BV at R9. He considered the hours of the contest excessive, and suggests a reduction to between 12 and 15 hours. Any supporters? He also considers that 50-watt stations should be handicapped. Considering that G2LR and G6YJ (both 10 watts) finished hot on the heels of G6RB, we are not convinced that the 10-watt man is seriously handicapped.

G5MR worked unlicensed stations in OZ9B and YZ2N. G5UM was handicapped by mains transformer trouble. He considers further contests should be reduced to a period of 24 hours, and suggests 1500 to 1500 G.M.T.

G2JL was troubled by local QRM in the shape of a spark set. He suggests that a ½ point be awarded for contacts with British stations over 20 miles distance, in order to make the contest more interesting in daylight hours. (The Awards Committee are not in favour of this suggestion, but are prepared to give it full consideration if a general request is received.)

G5HJ was only on for a very short period, but managed to contact CT3AB and LX1JW, countries which deluded many of the "full timers." The Scottish contingent was mute on this occasion! Not a single comment can be traced on any of their entry forms.

Awards Committee Comments.

Attention is drawn to the fact that several of the leading entrants worked unlicensed German stations. It has been agreed to accept all entries on this occasion, because of the delay which would occur if an attempt was made to check the *bona fides* of every station worked. On the other hand, the rule referring to this matter must be more rigidly adhered to in future, and to assist in this connection, we suggest that entrants endeavour to discover before a contest starts the calls of licensed stations on the Continent. We have in mind the fact that several German stations were worked who were using the initial letter "E" after the "D4,"

all such stations are unlicensed, as will be seen from examination of the Call Book.

In regard to power limitations, hours, periods and scoring methods, it would seem that the present arrangement has proved generally satisfactory, therefore, unless good reasons are given before the 1935 Contest is arranged, the rules will remain as at present.

The Committee deprecate the practice employed by several members of giving their scores over the air after a contest closes. This they believe is partially responsible for the poor entry, many members with low scores refraining from sending in a return, knowing in advance that they have been beaten.

Finally, the Committee wish again to draw attention to the fact that the entry forms for this and any other R.S.G.B. Contest are available for examination by any member who is interested in extracting data. With but one exception, no application for a perusal of entries has ever been received by Headquarters. The Committee are of the opinion that certain R.E.S. groups could obtain from them most interesting information regarding conditions.

Thanks are due to Messrs. Taylor (VE1BV) and Hill (SU6HL) for their assistance in making the contest a success, and to the latter in particular, for forwarding a detailed copy of his log.

DX TELEPHONY ON 3.5 MC.

Mr. Powditch, G5VL, informed us on January 23 that since his initial QSO, on December 30-31, with VE1EI, he had to date effected 13 successful contacts with that station, the lowest report received being R5 and the best R9. VE1EI at first used a 7-valve superhet with short wave adapter, but later changed to a 4-valve A.C. receiver, which seems to give equally good results.

At G5VL, the Canadian's signals on 3,900 kc. are usually received at local strength, competing successfully with a French phone on about the same frequency.

VE1EI is anxious to receive reports from other G stations. His input varies between 250 and 325 watts as against a carrier power of between 60 and 65 watts at G5VL. During all contacts telephony only has been used at both stations.

* * *

G6RB informs us that at 18.45 G.M.T., Sunday, January 27, he heard VK3GQ on about 3,550 kc. He had previously arranged a schedule with SU6HL, who agreed to attempt to put him in contact with the VK, but conditions between Bristol and Cairo were poor at the time. G6RB reported VK3GQ QSA 2 R2. American signals have faded away recently, and a peculiar skip has been observed.

VS8AA.

With reference to the paragraph published in our last issue, Mr. Faithful advises us that he is using the call VS8AA from his station at Cable and Wireless, Ltd., Bahrein Island, Persian Gulf. All reports should be sent direct or via Headquarters.

SOLILOQUIES FROM THE SHACK.

By UNCLE TOM.

(Our short-wave Minister of Transport continues to run joyfully round amongst his beacons.)

RATHER a lot of moans last month, boys and girls, and I promised that I'd be more cheerful this time. And so I will, bah gnom. I'll hand out a few bouquets first of all.

Hams of 1.7 mcs., I salute you! Having neglected this band myself for some time (shame!), I thought I'd have a little listen round-up there during the 1.7 mc. tests. Bowing my head with shame, I confess that I expected to hear rotten notes, bad operating, and all the rest of the tripe that we're so familiar with on 7 mc.

What I heard was this: good signals, good notes, extremely good and intelligent operating, and the nicest lot of hams you ever heard. (No, South London, you needn't bow, because you weren't there. There was only one solitary South London station taking part in the tests, and he was no better and no worse than most of the others on the air.)

There is a moan, but it isn't hams this time—it's trawlers! I had no idea how good the French fone on 7 mc. really was; if you want to hear real dyed-in-the-wool spitch, go and listen to the trawlers on the 1.7 mc. band.

Strangely enough, a letter from a member brings up this same question, and I want to quote a lot of it. Quoths he (bad grammar): "Dear Uncle Tom,—Can I have the loan of one end of your tub, because I should like to thump it a bit? Yesterday in the press there was a report headed 'Wireless Amateurs Jeer at B.B.C.' These amateurs (?) had been heard about 10 or 11 p.m. on Sunday nights telling questionable stories, and a man is alleged to have said 'I don't care for the stuff the B.B.C. puts out.'"

"I write from memory, but perhaps you saw it. Now I ask you, the Dignified Old Man of Amateur Radio, have you ever heard anything to which objection could be taken? (I mean over the air, not at district meetings.) Of course, the complaints may apply to pirates, but I don't think so.

"Now, on the 1.7 mc. band every night are trawlers using 10 times the power and 20 times the language—and they get away with it. I've no halo and I'd tolerate that, but more is to come. They frequency-modulate and their carriers walk up and down the band like sentries outside the barracks. Civil aircraft puts an R9 harmonic into the top of the band and nobody says a word.

"To sum up—why should not the other services be made to observe the same regulations to which we are bound? Yours, etc."

And echo answers, "Why Not?" And if any squeamish people near the coast happen to get some of the trawlers that I hear, down on the bottom end of their broadcast receivers, there will be some letters to the press. I'm no angel, and I've never heard anything like it. As for their super-spitch—well, . . .

But, once more, before we leave the subject, 1.7 mc. hams, I salute you! Your behaviour on the air is exemplary. (Of course, there are one

or two glaring exceptions, as I've been forced to say before.)

And how's this B.E.R.U. business, all you DX-ites? I wonder how many stations will be heard on the air during B.E.R.U. month, who are never heard at any other time in the whole year? That, to my mind, is the chief argument against Contests. There are certain people to whom amateur radio is nothing but one big competition, and when they're not employed trying to cut other people's throats, they don't come on the air at all.

All the same, B.E.R.U. is great stuff, and I'll get the Rettysnitch to the man who says it isn't. There is just that nasty feeling at the back of my head all the time that Contests foster this nasty spirit—rivalry rather than co-operation. Perhaps, there isn't anything in it. Perhaps there is. What think you, nephews and nieces?

And now here's my irrepressible B.R.S. correspondent with some more verse:—

"There was a young ham of Malacca,
An obstinate bloke, he would stack a
Thousand volts 'cross the crystal,
Making that pebble whizz till
The C.O. went off like a cracker."

"There was a transmitter of Bow,
Who never could quite QSO;
To all his "test" cries
He heard no replies—
For why? His RX wouldn't go."

"A young OK ham, name of Xavier,
Found that wearing cans made his hair wavier;
Since he found out this way,
He wears them all day,
And now he's the beau of Moravia."

And lastly:—

"A keen young bloke out in Vienna
Used his mains as a sending antenna;
When he shorted a fuse
His valves got the blues,
And he now calls CQ from Gehenna."

And all that because I'm not feeling funny this month, and we have to keep appearances up somehow.

Referring back to my advert. in the December issue, I've only had one application for QSL cards, and he wanted to buy the lot. As the price he offered, however, was less than I should have had to pay for an equivalent acreage of wall-paper, I declined with thanks.

Well, so long, Cads of Empire (and Hippodrome as well). I'll be seein' ya.

TYPE 47 VALVES.

It has been noticed that the type 47 Pentode now available in this country under the trade name "Columbus" has the suppressor grid internally connected to the control grid and not to the filament. This can be clearly seen by an examination of the valve.

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.

IN REPLY TO ZL4AI.

To the Editor, T. & R. BULLETIN.

DEAR SIR,—Mr. G. G. Samson's letter, in the December BULLETIN, expressing his views on the R.S.T. System, interested me a great deal. In view of the enthusiasm with which the system is being received in general in other parts of the world, it came as quite a surprise. I have not the slightest desire to become involved in a personal argument with Mr. Samson. He has every right to express his own views. However, I should feel it an injustice to the system were I to allow some of his statements to pass unchallenged.

First, I should like to make it clear that the R.S.T. System was not drawn up with the requirements of radio engineers or physicists in mind. It is an amateur system—made for amateur use. For most of us radio is a hobby. We are in it for the enjoyment that we derive from contacts with our unseen friends, and most of us have only meagre ideas of the fine points of the art. We are generally not interested in the absolute strength of signals in microvolts per meter, nor yet in how many DB one signal is above another. Only with extensive laboratory equipment can scientifically accurate data be obtained. We ordinary amateurs must content ourselves with qualitative data, as obtained aurally.

I shall take up the various points with which I take issue in the order that they appear in Mr. Samson's letter.

A tone code is most certainly useful to the amateur. The fact that about 98 per cent. of the amateurs consistently use a tone description of some sort in their reports should be sufficient justification for the existence of a tone code. There are, however, other important reasons.

I question the ability of a signal to completely lose its modulation somewhere in the transmitting medium. It is true that the modulation will have relatively small amplitude on a weak signal, but, to my mind, about the only conceivable way in which a heavily modulated note could appear to be "T9" would be after passing through a crystal filter. Of course, an accurate tone report cannot be given when the signal is observed on a crystal-filter receiver. Very often distance has just the opposite effect on signals from that stated by Mr. Samson.

An ordinary monitor will indicate only the presence of amplitude modulation. Unfortunately, frequency and phase modulations can also affect the character of a signal. The most stable, crystal-controlled transmitters are quite commonly bothered with phase modulation. One of the most common causes of this trouble is A.C. filament supply. The monitor will indicate a pure wave leaving the station, but at a distant point, due to multi-path transmission, the A.C. hum is readily apparent. After all, it is at the distant point that the character of the wave counts, not at the transmitting station. This point was very forcibly brought home to me some time ago.

One day it was my lot to receive in the mail a little green ticket from the Federal Radio Commission, stating that my signals were observed on the West Coast as being heavily modulated. Was my face red! I was complying with all requirements as to filter supply, and the monitor gave no indication of anything wrong. It was later determined that the trouble was due to phase modulation, and I was greatly relieved when I learned that, with the help of the A.R.R.L., I was absolved of blame for unlawfully using a modulated wave.

Another instance will show that this same condition can happen in the best of circles. Some years ago, G5SW was being received in this country with an objectionable amount of A.C. hum on its carrier. All indications were that the wave was pure at the transmitter, and you may be sure that the monitoring equipment was of the best. Subsequently it was found that phase modulation was the cause of the trouble, and this was quickly remedied. Frequency modulation can have the same effect on a wave.

Of course, if a person is using crystal control, it is evident he does not need to be told so. However, it might be of advantage to some amateurs to know whether their signals possess crystal-like stability as they are received. Several things may cause even a crystal-controlled transmission to lose its "crystal" characteristics. The tone code is the only means we have of indicating these troubles to the sender. Why "prevent the majority of amateurs from amassing useful data" by dropping this essential element of the report?

Whatever may be the amateur's interpretation of the QSA and R codes, the fact remains that they are incorrect. When definitions are given, we must adhere to them, until they are changed officially. Anyone can see for himself the definition of "QSA," if he will take the trouble to look it up.

The conclusion that my suggestion is "really an alteration of the present code" is perfectly correct. The letters R.S.T. were chosen to most appropriately signify the characteristics for which they stand. Obviously, the designations had to be changed, so that no confusion would result where either method of reporting might be used. My method constitutes a true system, in that a definite order of sending the report is always followed. The old methods followed no system at all.

I do not know what the sensitivity of the ear is down in New Zealand, but in the Northern Hemisphere about the minimum change in sound intensity that the normal ear can detect is one DB, see page 373 of L. B. Turner's *Wireless*. I refer to an eminent British authority, so that it may not be thought that any "true American impetuosity" is getting away with me. Using Mr. Samson's figures, it is seen that each R step actually represents six increases in volume to the ear, and not two.

Now we come to a very important consideration, which Mr. Samson has entirely ignored. Although it is possible to detect a one-DB change in the intensity of a tone when the intensity is suddenly

switched from one level to another, it is not possible to detect so small a difference in intensity when the ear has no reference level to start from. As an example, say that to-day you go into the laboratory and set the level of a tone to 25 DB above the lower limit of your audibility at that frequency. When you come back to-morrow, you find that someone turned off the tone and took away your DB attenuation box, leaving you nothing with which to vary the volume of the tone but an uncalibrated potentiometer. You turn on the tone and increase the volume until you think you are again 25 DB above minimum audibility. Now the DB box is returned to you, and you actually measure the level. How close were you? If you were within five or six DB of the 25-DB level, you are exceptional. Around 10 DB would be nearer to what the ordinary person would be able to estimate.

In my signal strength code of five divisions, it is no coincidence that each step figures out roughly 10 DB. This code was designed for use in estimating absolute levels, not relative ones, and I believe it will be found to satisfy that requirement quite well. Very few amateurs would judge a given signal level to closer than 10 DB. For those that must indicate small changes in level, it would be better by far to use DB directly and not rely on such crude estimating methods as the amateur codes. It may probably be said that the number of scientific and commercial organisations in the world that are equipped to accurately measure the incoming field intensity (independent of the angle of arrival) of a high-frequency signal can be counted on the fingers of one's hands. Why, then, worry about getting a change in intensity so accurately when the value of the intensity itself, which is of far more importance, can only be guessed at? Rather than to prevent the gathering of data, I believe I have shown how more accurate data can be obtained by amateurs than has heretofore been possible. I may add that I am quite in favour of the use of any "Q" or other signal, along with the report, which may help to give additional useful information.

The amateurs of the British Empire have an enviable reputation in the radio fraternity for their initiative and progress. The manner in which they have responded to the new system has been most gratifying. It is hoped that those who, from habit or otherwise, still cling to the old methods will carefully consider the merits of the R.S.T. System and give it a fair trial.

Very sincerely yours,

ARTHUR M. BRAATEN (W2BSR).

Riverhead, Long Island.

New York.

THE 1.7 MC. CONTEST.

The Editor, T. & R. BULLETIN.

DEAR SIR,—The R.S.G.B. 1.7 mc. contest in January was one of the most patent demonstrations that the "top band" can be used at all times of the day, during broadcasting and outside broadcast hours, without any disturbance to B.B.C. listeners. The fact that several dozen amateurs were on the ether throughout the whole period of the contest proves this conclusively.

As far as I could hear, at least a hundred British stations participated in the event, of whom only a score or so are regular habitués of 1.7 mc. Where

will the rest of them go for the remainder of the year? Surely they do not require a Contest Trophy as the sole inducement to use any frequency band!

When reliable communication up to 800 to 1,000 miles is possible on 1.7 mc., it is a waste of energy to conduct inter-European communication on, say, 7 mc., which is crowded enough in all conscience.

Those who wish to make a start in developing all-the-week use of the band should fix schedules in the early evening and—unless they are in really thickly-populated districts—not be afraid of the BCL.

J. HUM (G5UM),

Manager,

1.7 and 3.5 mc. R.E.S. Group.

KEY CLICK ELIMINATION.

The Editor, T. & R. BULLETIN.

DEAR SIR,—When experimenting with the key-click eliminator described in the March, 1934, BULLETIN by G5FV, I found that, owing to the layout of the F.D. circuit, it was extremely difficult to place the absorption coil near the F.D. coil without considerable alteration of the whole of the transmitter.

By using a simple link coupling, however, it was found possible to place the absorption coil at a distance from the F.D. circuit and still effectively key the circuit, in fact, it appeared to key it more efficiently.

The link is simply a length of twin flex bell wire, the ends of which are joined and slipped over the respective coils. It will be found that the position of the link with regard to the coils alters the amount of absorption.

In my particular case, for lifting the condenser plate, I have used an old P.O. sounder, a large number of which have been "junked" and which are being sold by several dealers very cheaply. By attaching the moving condenser plate by means of a strip of ebonite to the adjusting screw on the moving arm of the sounder the required amount of lift can be easily obtained, and apart from the necessity of quietening the sounder, no further alteration is necessary.

Messrs. Clarke (G5FV) are to be congratulated on this ingenious device, which I tried as a last resource after using unsuccessfully almost every other method.

Contrary to the expectation that the signals would have "tails," reports show that the transmitter gives a clearer, purer note than before, and I believe, as my transmitter is worked from a pure D.C. source, that the usual key filter, with its capacity, inductance and resistance, has the effect, even though it be ever so slight, of introducing modulation into an otherwise pure crystal-controlled transmission.

Yours faithfully,

R. H. JACKSON (G6ZU).

PHILATELISTS

Mr. M. W. Pilpel, G6PP, has agreed to undertake the organisation of the Exchange Club suggested in these columns two months ago. He will be pleased to hear from interested members at home and abroad.

RESEARCH AND EXPERIMENTAL SECTION

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ASSISTANT MANAGER :

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No. 3: ARTIFICIAL AERIALS

No. 4: ATMOSPHERE AND FADING

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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.

Notice to R.E.S. Group Managers

EDITORIAL attention is drawn to the poor literary style shown by several of the Group Managers, which results in a considerable amount of unnecessary work falling upon the Editor or Dr. Bloomfield. In future, reports must reach G5MG by the 20th of each month, and must be written legibly on one side of quarto paper only. The use of "radioese" and contractions is deprecated.

Reports received after the 20th, and any that fail to conform to the requirements mentioned, will not be published.

It has been observed recently that certain Group Managers send on to Dr. Bloomfield rough reports received from their Group Centres. In all cases it is the duty of the G.M. to prepare a condensed report himself from the notes sent him.

Each G.M. is requested to observe the title heading used above his notes as they appear in this issue. This arrangement must be adhered to when preparing notes for publication.

Sketches must be sent on separate sheets.

H. B. S.

The influence of atmospheric conditions on the reception of radio signals is prominent in the reports of two groups this month. I cannot altogether agree with the third statement of Group 4C, namely, that all DX vanishes when a storm is in the immediate vicinity. During 1929 and 1930 I frequently listened on a single-valve receiver to the Tuesday afternoon concerts broadcast from Bandoeng, Java (frequency in the neighbourhood of 20 mc.), and best reception during this period was secured when a violent thunderstorm was raging overhead, no aerial being connected to the receiver. This storm had approached in a direction at right angles to that of Bandoeng. No trace of static was heard, apart from that due to the actual lightning flashes.

I am glad to see that reorganisation of Group 2 is now well under way.

G5MG.

56 MC Group (No. 2.)

Owing to reorganisation districts are not yet reporting fully. The response from old group members has been very gratifying, and judging by present indications 56 mc. will soon be progressing by leaps and bounds. Several members have asked for a 56 mc. contest, but I feel that district organisation must take priority of place over all other matters. Many have asked for a standard time for transmission and reception. The period between 14.00 and 15.30, Sundays, would appear to be generally suitable. Any such standard times of transmission and reception should be regarded as DX periods mainly, as experimental transmissions will be arranged locally by co-operating stations by schedule, and will not affect this period.

It is impossible for me to write to each individual member, but I have answered all letters and queries to date. I propose to write to each district every month (when I know to whom to write).

Congratulations to North Ireland on getting away first of all districts within three days of receipt of my circular. G16TK and BRSS77 are deep in experimental and research respectively. In their experimental work on E.C.O. they find balanced circuits better than single ended, while the research section is engaged in study of the properties of dielectrics and their effect on velocity of propagation. Their conclusions bear out to a certain degree observations published in *Wireless Engineer*, January, 1935, Abstract 252, and they are continuing this line of research.

No. 4 District has reported via G2WS, who, although not a member of this group, is busy with tests on "shadows," using vertical dipoles for transmitter and receiver.

No. 10 District has reported via G5FI, incorporating G6YJ in his remarks.

No. 11 District has organised itself with G6IW and G2II as respective managers of research and experimental.

No. 12 District is not yet organised, due mainly to our work on national group, but G5BB is experimenting with Lecher wires, and is carrying out frequency measurements so as to be able to assist

in checking and calibrating wavemeters for this district.

No. 16 District is represented by one letter from G6CY, who is very interested in E.C.O. for this band. I would also like to acknowledge reports from BRS1211, 1624, 1511, 1352, 193, 1209 and 1469, 2AVN, 2BTZ, 2AZX, 2BAW and 2BIW, G6NF, 2NH, 2RM, 2OO, 6NV, 5TS, 6WJ, 6QB, 2JX, and hope to hear further from them via their District representatives.

Apart from sundry test transmissions, my own time has been taken up with group work and experiments with a parallel wire transmitter.

In brief, the research and experimental sections will operate in the following manner. Research members will be asked to devote some time to the various technical and laboratory work appertaining to ultra high-frequency work.

Experimental members are required to devote some time to putting into practice and testing various ideas, suggested from time to time, for improvements in efficiency and frequency stabilisation. I would like experimental members who come up against a problem to pass it on to the research side for an opinion. G5VY.

Atmosphere and Fading Group (No. 4).

First an apology to G5AM for two misprints in his report in the December BULLETIN. He mentioned "a phenomenon . . . fading on G2QY," not G2QV, as quoted.

Reports from the following group have been received this month: 4A are continuing routine observations. 4B includes the usual log from BERS209 in Malta. He says that conditions during December on 14 mc. have been very poor, except on the 24th, when western DX was very strong. On this day a shallow depression was moving east, and was being replaced by another disturbance also moving east. Similar conditions were noted on 7 mc. on the 20th, when similar weather prevailed. 4C, besides giving the list of storms for the month, contributes the following summary of the effect of thunderstorms on radio conditions:—

General Local Conditions.

1. Before storm arrives, heavy QRN.
2. As storm approaches or departs, fading will be pronounced, with possible good DX in a direction opposite to that of the storm.
3. While the storm is in the vicinity, QRN vanishes except for crashes from lightning flashes, and all DX vanishes, locals coming in strongly.

Before recording the general summary, we will give the theoretical explanation of the above supplied by G5AM. He says that a storm should be heralded by heavy QRN, since "brush" discharge will occur long before lightning can take place. When it does, the cloud will induce an intense region of ionisation about 10 km. below the E layer, i.e., at relatively high pressure; consequently, any waves which would normally be reflected in this region will be almost completely absorbed. Hence conditions in a region of thunder activity may be expected to be poor. Similarly, waves which have had to pass through such a region may be expected to be damped out.

Secondly, after the thunder (or heavy storm) cloud has passed, the ionisation it produced will

diffuse into, and augment that of, the E layer whilst recombination will take place at lower levels. In consequence, DX may be better received, since it may perhaps be assumed that waves of considerably higher frequency will be reflected off at glancing incidence.

General Summary.

Localities around a storm centre may be roughly divided into four areas by concentric rings approximately 100 miles apart. The actual size may vary considerably, and may be extended by the presence of secondary storms. In the primary area, within a circle of radius 100 miles, QRN is almost completely absent except for isolated crashes; local signals may be strong, DX non-existent. Fading may be expected, but will be more pronounced at the circumference. In the second area, a concentric ring from radius 100 miles to 200 miles, fading will be more pronounced.

As the third area is approached, and all through the third area, say, from 180 miles to 300 miles, echoes may be heard from distant or local stations, with quick fading and dispersion.

In the fourth area, beyond 300 miles, QRN becomes very pronounced, fading will be marked, and DX may be good in the direction opposite to that of the storm.

4D have continued routine observations.

4E are continuing investigations on sunspots, but appear to be having some difficulty in obtaining contemporary information on sunspot activity. Can anyone help, please? (G. M.)

4G have got well under way, and routine observations have been carried out. In connection with the observations of this group, conditions on December 29 appear to have been very abnormal. The G.M.'s attention was called to it by G2MI, who kindly rang up from Maidstone, reporting: "At 20.15 G.M.T., conditions on all bands, 30 to 60 mc., very abnormal. Very strong local signals, G's., with long trailing echoes, making signals quite unreadable." It is interesting to note, therefore, that G6OZ reports Aurora Borealis visible at 18.45-18.57 on this day at Bristol. The G.C. reports the 29th as the best day for DX on 7 mc., and BRS1560 reports reception of X1BA and CE1IF at 14.50 on 14 mc.

G5AM contributes a long and carefully prepared summary of a lecture by Chapman on "General Effects of Solar Radiation on the Atmosphere." (Proc. Roy. Soc., 1931, Vol. 132.) Here are the main points, very much abbreviated.

There are known to be three layers in the atmosphere:

- (a) The Ozone layer, maximum density at about 50 kms. height.
- (b) The E layer, maximum density at about 100 kms.
- (c) The F layer, maximum density at about 220 kms. The Ozone layer absorbs the ultra-violet radiation from the sun down to $\lambda=2200 \text{ \AA}$. (1 \AA unit = 10^{-8} cms.) It probably absorbs 4 to 5 per cent. of the total solar radiation, and its temperature is accordingly abnormally high. Any simple solar radiation has a definite absorption coefficient(A) with respect to each atmospheric constituent, varying greatly for each constituent—in the present case absorption of each type of radiation will be due mainly to one constituent.

Secondly, the rate of absorption will also depend on density, and, therefore, height, and on temperature, involving a constant H (in the nature of a height).

Ninety per cent. of any absorption occurs within a range of heights, $h = -1.5$ to $+3.5$, i.e., a range of $5H$. The value of H for oxygen from heights 40 to 100 kms. is 10, so that the radiation absorbed is mostly in a layer 50 kms. thick ($5H=50$). The Ozone layer, with its maximum density at about 50 kms. up, is likely to be produced by absorption by oxygen of solar radiation of about 1850 Å and less; consequently, most of this energy will be absorbed between 35 and 85 kms. For the E and F layers, with maxima at 100 kms. and 220 kms., H is 10 and not greater than 30 respectively. So 90 per cent. of radiation absorbed will be between 85 kms. and 135 kms. for E layer, and 175 kms. and 325 kms. for F layer.

In other words, three types of radiation are absorbed in three distinct regions.

In the Ozone layer the energy absorbed mostly builds up ozone, but some (2200-3400 Å), dissociates ozone into molecular and atomic oxygen; the higher frequency radiation dissociates molecular oxygen to atomic oxygen, while radiation absorbed in the E and F layers dissociates atoms and molecules into ions (i.e., produces ionisation).

The number of ions existing at any moment depends not only upon the rate of dissociation but upon the rate of recombination, consequently, in the Ozone layer the reactions occurring may be

(a) By dissociation:

$$O_2 = 2O, \text{ and } O_3 = O_2 + O.$$

(b) By recombination:

$$2O = O_2, \quad O + O_2 = O_3, \quad O + O_3 = 2O_2, \quad 2O_2 = 3O_3.$$

Since the rate of these reactions depends on collisions, the ratio of atomic to molecular oxygen increases with height, and there is evidence from the spectrum of aurora that atomic oxygen is permanently present in the upper atmosphere.

The energy required to ionise any one constituent is more than double that required to dissociate ozone or oxygen molecules.

Ions are mostly produced from atomic oxygen; only a small band (910-770 Å), has any effect on atomic nitrogen. Atomic oxygen absorbs most ultra violet radiation at a height of 200 kms.

The lower layer has some other constituent—molecular nitrogen most likely—ionised by a different agent, yet of solar origin, possibly uncharged particles from the sun. This is deduced from observations of magnetic variations, for which the E layer is responsible. (Charged particles would be deflected to the poles.) In the F layer the number of free electrons is probably equal to the number of +ve ions, but in the E layer electrons easily attach themselves to neutral particles.

G5AM remarks: "This is of interest in that it suggests that ionised layers should be quite sharply defined; the Ozone layer, referred to sometimes as the D layer, is occasionally stated to be responsible for reflection of very long waves. It would seem, however, that theoretically there are no free ions existing in it, and in any case none of the ordinary radio experimental observations have ever revealed a layer below 100 kms." G2GD.

Aerial Group (No. 9)

I am very disappointed with the apathetic attitude shown by certain members of this group, a fact which is causing a general lack of co-operation. Since the early part of November only two letter budgets have been returned from four groups, a most unsatisfactory state of affairs. It is not to be expected that every member can produce information each month, but an occasional report is necessary to show that the member concerned is taking an active part in the work of the group. In order to secure better results I have decided to reorganise the groups, consequently a number of those who have failed to report will be dropped. Incidentally, quite a number of members who joined No. 9 with the sole object of obtaining information, lost all interest in the group once it had been obtained. The section has several very good members on its books, but their work is being seriously handicapped because information is not being promptly circulated.

From the one budget and the few reports to hand the following has been extracted. G2PL and 5BT are interested in midge aërials for restricted spaces, and the former has been obtaining good results with about 10 ft. of wire on 7 mc. There appears to be no theoretical reason why such an aerial should not radiate as efficiently as some of the aërials used on long waves where the wire is much less than a quarter wave. The chief point to be observed is the correct coupling of the aerial to the transmitter. In making tests of this type it is, of course, necessary to remove or lower any big aërials that may be likely to influence results.

The universal coupler is under discussion by Group 9D and two members, G5GC and 5XB, have been using it with success. This system gives greater efficiency than most of the others besides ensuring freedom from B.C.L. interference. Its main advantage, however, is that it can be used with almost any aerial system regardless of frequency, and gives a good match to the transmitter and a good balance of feeder lines.

G5GC and others have forwarded diagrams relative to various systems, and it is hoped to illustrate these at a later date.

In connection with the discussion on directional effects, members are reminded that information regarding these is of no value unless complete details of the system, including fairly accurate directions, are stated.

G6CJ.

28 MC. Group (No. 11)

Group 11A.—G2YL made 15 QSOs with local stations, and also heard several commercial harmonics. On December 30 she reports hearing a very pronounced echo on G2MV's signals. As the distance between the two stations is only six miles, the possibility of the transmission being anything but ground wave seems very remote.

G2HG reports hearing several commercial harmonics during the month, including WQU and WIZ on December 29. Also on this day a weak Canadian amateur station was heard calling CQ, his call was thought to be VE1GZ. He has received information from G2GD to the effect that Aurora

Borealis was visible at Bristol and elsewhere on that day. G2HG also reports a strange effect on December 30, when he received a report on his 28 mc. transmissions from West Hampstead. Mr. Swain was greatly surprised, as previously during tests his signals have been inaudible in that part of London.

G2XS reports tests with G6CW, but results have been nil so far. He hopes to be more successful in the future, using reflectors.

2BIW sends in a long report, in which he gives details of an electron-coupled circuit that has been in use at his station.

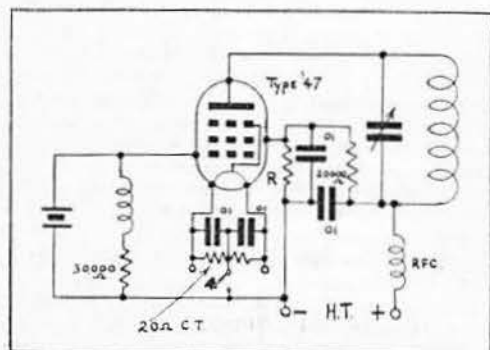
Group 11B. G6ZV forwards his usual report, and gives details of constructional work he has undertaken during the last month. He is proposing to use telephony with Heising modulation; the scheme being solely for local work. He has recently received a report on his transmissions from BRS1538, who resides about eight miles distant, this being considered good as there is a great amount of screening between the two stations.

G5SY has been conducting transmitter tests, and finds a push-pull output circuit using 4211 valves very beneficial. He is using variable magnetic coupling between the last FD and the final stage, and states that a greater amount of drive is available, and also greater output than in the case of using variable capacity coupling. G5SY has also been making tests with a S.S. super-het on 28 mc.

ELIMINATING CHIRPS WHEN KEYING A C.O. STAGE

In the January issue of *Radio*, "Jayenay" gives some useful advice regarding the elimination of chirps when keying a crystal oscillator stage.

In the conventional pentode C.O. circuit the screen voltage is obtained from the plate power supply by means of a series dropping resistance. When an attempt is made to key in the centre tap of such a circuit a chirp is invariably noticed. When the key is up the screen voltage rises to the same voltage as the plate voltage, usually between 350 and 450 volts. With the key open no space current flows through the valve, and because there is no current through the screen dropping resistance, there is no volts drop across the resistance. The high voltage is thus applied to the screen.



BRS1515 reports active, and has been experimenting during the last month with both straight and super-regenerative receivers.

G5FV has been active with the receiver mostly, as the transmitter has been out of action owing to the H.T. transformer failing to do its duty! Conditions appeared to improve somewhat on Saturday, December 29, when the harmonic of WQT remained audible between 15.00-15.30 G.M.T. Strength varied between R8-0. Another commercial harmonic was heard for a long period, but the call was not identified.

VK2LZ, an individual member of this group, sends in a long and interesting report describing the great amount of work that has been done during the past three months in Australia and New Zealand. He himself has been conducting antennae tests, and has found, after very exhaustive tests, that a full-wave horizontal Zepp is definitely superior to a half-wave vertical for distances up to 1,200 miles.

The following schedule has been forwarded from ON4AU and ON4JB:—Call on both bands, 14 and 28 mc., at 08.00, 12.10, 13.15, 13.30 and 17.30 G.M.T. daily. If heard on 28 mc., call on 14 mc., as follows: ON4AU on ten ON4AU on ten ON4AU on ten de VP4AA VP4AA, etc., etc. No reply will be given to any other method of calling at the above-mentioned times.

G5FV.

When the key is pressed, and space current starts to flow in the valve, the screen current causes a voltage drop across the usual series resistance and the screen voltage, drops back to normal—100 volts. However, it does not drop back instantaneously; during the time the screen voltage is dropping there is often a noticeable change in frequency which causes chirp.

The chirp can be eliminated by keeping the screen voltage approximately constant, whether the key is up or down. This necessitates the use of a voltage divider, instead of a series dropping resistance as a source of screen voltage, as shown in the circuit.

The value of the resistance R should be chosen so that the voltage on the screen, when the key is down, is 100 volts when measured with a high resistance voltmeter.

THE FIRST ROUND.

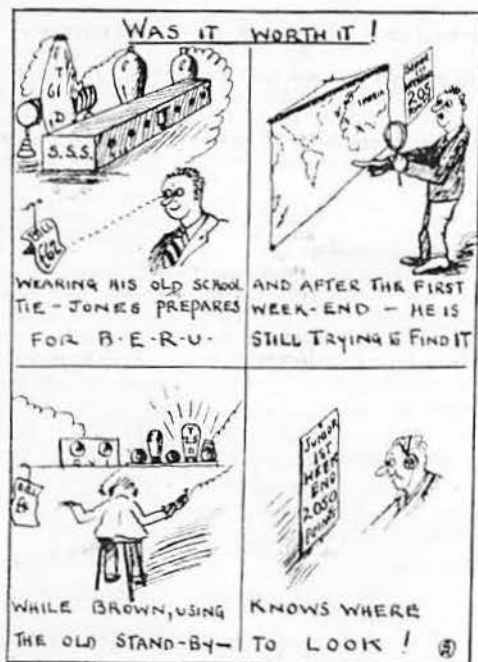
BY A LONDON LISTENER.

Impressions of the first round of the Heavy-weight Championship of the British Empire were many and varied. 17.00 G.M.T. arrives on the Saturday—many stations already half-way through their first QSO—a profusion of VK's, who all seemed to fade right away a few minutes later.

Up come the VQ's and ZS's, with poor little ZE1JN, at the bottom of the band, calling his heart out, and not a soul replying except "locals"—to him, that is. VQ4CRL saying "next, please," to a long queue of stations. ZU6E, ZU6B and ZU6P all calling test at once, and apparently all the G's doing likewise.

Beautiful mess at top of band—G6NF, G6WY and G6CL all on top of one another. Another mess in

the middle—ingredients G6HP and G5YH. With these five going all out there was almost as much audio as radio in the band!



... Ask **SUIEC**

Numbers of people with dud receivers, judging by the way they all called the most obvious BERU stations and completely neglected the far more interesting ones who were a little weaker.

Numbers of people, likewise, wasting hours calling test, and very often failing to get stations who replied to them. Still more numbers of people losing time by continuing to call a DX station long, long after he had replied to someone else. UCS needed here.

Conditions seemed to buck up in the small hours, particularly for Africa. Early Sunday morning on 7 mc. didn't seem too bad, either, but 14 mc. during the morning was a washout except for SUIEC, ZC6FF, SU6HL and other "semi-locals." How many G's did OM Cole work that morning? And how long did the last one have to wait?

Mid-day Sunday saw the louder Aussies coming through well—best seemed to be VK4GK, VK4BB and VK3MR. Everybody after them, hardly anyone noticing some distinctly interesting signals from the West Indies during the rush!

It pays to listen a bit more—which is why the writer hasn't been key-punching this year. And so through the weary afternoon, sometimes on 14, sometimes on 7, until 5 p.m. arrives. And still some stick to it, calling "Test BERU" at 17.10 and after. Won't the Awards Committee need their blue pencils?

Three more rounds to come. First round, should say, distinctly in favour of a centrally placed zone like SU piling up a terrific score.

A.R.R.L. DX CONTEST

Introduction of Bonus for Bands and Basic Time.

THE Seventh International Relay Competition, sponsored by the A.R.R.L., opens at 0001 G.M.T., March 9 next, and continues until 2359 G.M.T., March 17.

Certificates will be granted, as usual, to the highest scorer in each prefix zone in countries remote from U.S.A. and Canada, in addition to the awards in those countries. Awards will be based on the Station total, and will be made to the individual operator making the largest part of this total.

All amateurs are cordially invited to participate, and no previous entry is required.

The detailed rules of the contest are published in QST for February, 1935, which also contains an example of the Contest Log in which form entries should be made, to reach A.R.R.L. Headquarters not later than May 28, 1935.

The contest follows the usual lines and is mainly concerned with the exchanging of six-figure groups during a contact.

Each participant chooses for himself a three-numeral group for use throughout the contest as the first half of the six-figure numbers that have to be exchanged. The remaining three figures are those taken from the first half of the six-figure combination received in the contact immediately previous. For the first contact (and immediately after a "partial" or incomplete exchange of numbers has been made, as no W or VE identifying number is available), the six-figure group transmitted will consist of the chosen three figures and three zeros.

For entries from Stations remote from W/VE, each six-figure group "received" counts 1 point, and each number "sent" (and acknowledged) counts 2 points.

The total points obtained are then multiplied by the number of U.S. or Canadian licensing areas (districts) worked.

The figure thus obtained is then subject to the addition of bonus points, according to the number of amateur frequency bands on which successful number exchanges have been effected. An additional 500 points for one band, 1,000 for two bands, 2,000 for three, 4,000 for four, and 8,000 for five bands.

THIS WILL BE RECOGNISED AS AN INNOVATION: AND IT IS NOT THE ONLY ONE.

Ninety hours is specified as a *basic* "time of operation." No actual time limit is fixed, but if more than 90 hours is spent in operating time, the grand total, obtained as above, must be multiplied by 90 and divided by the total operating time.

"Contest operating time" is defined as when "you listen for W or VE stations with the ability to call them if, as and when you hear them, whether you do any calling or not. The whole period is to be charged against 'Contest operating time,' and not just the time after you started transmitting."

Under the heading of Contest Notes the A.R.R.L. recommend:—

- (1) The use of "MH" and "ML" tuning (see January, 1935, BULLETIN, p. 262).

(Continued on page 320)

HIC ET UBIQUE.

Headquarters' Notices—Calibration—Q.S.L. & Q.R.A. Sections— Slow Morse—Reception Tests.

I.E.E. Meetings

Mr. R. H. Hammans (G2IG), will open a discussion on the subject of "Single Signal Super-heterodyne Receivers for Amateur Use" at the next London meeting, which will take place at 6.15 p.m. on Wednesday, February 27, at the Institution of Electrical Engineers. Tea will be served from 5.30 p.m.

The March lecture will be held on Friday, the 29th.

National Field Day, 1935

In response to several requests, Council have agreed to change the dates for this event from June 8 and 9 to June 1 and 2.

Mr. V. M. Desmond and Mr. L. W. Parry Co-opted to Serve on Council

Council, at their January meeting, decided to co-opt Mr. V. M. Desmond (G5VM), of Birmingham (Representative for No. 3 District), and Mr. L. W. Parry (G6PY), of Barnsley (Representative for No. 2 District) to serve on that body. In making this decision, Council had in mind the desirability of obtaining the support of two well-known members who are in close touch with provincial activities.

Technical Committee Formed

Council have appointed the following members to serve on a Technical Committee: Messrs. A. D. Gay (G6NF) (Chairman), G. W. Thomas (G5YK), J. W. Mathews (G6LL), E. A. Dedman (G2NH), H. A. M. Clark (G6OT), and D. N. Corfield (G5CD).

Sub-Committees

The following members have been appointed to serve on sectional committees for the year 1935:—

Tests and Awards: Messrs. T. A. St. Johnston (G6UT), and A. O. Milne (G2MI).

QSL: Messrs. J. D. Chisholm (G2CX), E. A. Dedman (G2NH), J. J. Curnow (G6CW), and D. A. Weale (BRS300).

QRA: Mr. M. W. Pilpel (G6PP).

Calibration: Mr. A. D. Gay (G6NF).

Editorial: Messrs. H. Bevan Swift (G2TI), A. O. Milne (G2MI), F. Charman (G6CJ).

R.E.S.: Messrs. H. C. Page (G6PA), G. Bloomfield (G5MG), and E. A. Dedman (G2NH).

New Zealand B.E.R.U. Representatives

We are pleased to announce that the Council of N.Z.A.R.T. and R.S.G.B. have agreed to the appointment of the following B.E.R.U. sub-representatives:

Mr. L. Mellars (ZLIAR), Mr. W. A. Wilson (ZL2CI), and Mr. S. Hudson (ZL4FO).

Mr. C. Parton (ZL3CP) will continue as the official New Zealand B.E.R.U. Representative.

New Clause in Transmitting Licences

The attention of home transmitting members is drawn to a new clause (7c) which has recently been incorporated in licences.

The clause reads:—

"The station shall not be used for social or political propaganda, or for the purposes of any social or political organisation, and no such organisation shall be allowed to control the station or the use made of it by the licensee, or in any way to take part in the experiments conducted by means of the station."

TECHNICAL PROGRAMME 1935.

The Editor will be pleased to consider, with a view to publication, articles dealing with the following subjects:—

Constructional.

- A one-valve pentode C.O. for use on 1.7 or 3.5 mc.
- A 56 mc. transmitter suitable for field day work, employing some method of obtaining frequency stability.
- The design of a crystal controlled 7 and 14 mc. transmitter suitable for field day use.
- A 28 mc. transmitter employing a tri-tet oscillator working on 7 mc.

Theoretical.

- A thesis on the principal television systems under development in all parts of the world.
- Results of experiments carried out with cathode ray tubes.
- Results of field strength measurement tests.
- A summary of radio conditions covering the years 1925-1934.

Members willing to undertake the preparation of articles dealing with any of these subjects are requested to notify Headquarters prior to their commencement.

W.B.E. Awards.

Members anticipating making a claim for a W.B.E. certificate are referred to the rules governing this award published in the May, 1934, T. & R. BULLETIN, page 368. In all cases a guarantee must be given that the power used for establishing the contacts did not exceed that for which the member was licensed. A minimum report of QSA 3 is also required.

Evidence of two-way working in the shape of QSL cards or letters must also be furnished. Awards cannot be approved on the strength of entries on Contest forms.

Commercial Activity Checks.

In preparation for the Cairo Conference it has been decided to begin work at once on checking the commercial activity which is taking place on frequencies adjacent to our 7 and 14 mc. bands. It is believed that this information will be invaluable when the question of wider bands is discussed.

The organisation of this important work has been delegated to the Band Occupancy Group Manager, Mr. L. Hill (G5WI), of 53, Ravenhill Road, Lower Knowle, Bristol.

In order that the checks shall be carried out on a sound basis, assistance is required from about ten reliable members. Mr. Hill will be pleased to hear from any member who is interested. Such members should indicate the hours and days in each week when they are free to carry out checks.

G.P.O. (Radio Section) New Address.

Members are requested to note that the address of the Radio Section, G.P.O., is now Armour House, St. Martin's-le-Grand, London, E.C.1.

Electrical Interference With Broadcasting.

Members who are interested in this subject will be pleased to learn that the interim report of the Committee set up by the Council of the Institution of Electrical Engineers has now been issued.

The R.S.G.B. was represented on this Committee, which held seven meetings during 1933 and 1934. Several documents have been prepared by the E.R.A. dealing with the suppression of specific forms of interference, including interference from automobiles and trolley-buses. These documents will be available to the public at an early date.

CALIBRATION SECTION FEES.

CRYSTALS, 1s. 6d. each; FREQUENCY METERS, 2s. 6d. for five points, plus 6d. for each additional point. These prices do not cover cost of return postage, which must in all cases be remitted as a separate amount.

Crystals and frequency meters should be sent for calibration, at owner's risk, to Mr. A. D. Gay, 49, Thornlaw Road, West Norwood, London, S.E.27.

Reply Postage.

The attention of members is drawn to the fact that a stamped and addressed envelope should always accompany requests for information addressed to D.R.s, C.R.s, and those in charge of services and sections.

This requirement is unnecessary in the case of correspondence sent to Headquarters.

A.R.R.L. Contest.

W9FO tells us that a copy of the March issue of the *Radio Amateur Call Book*, of which journal he is Editor, will be sent to the first British station worked by him during the forthcoming A.R.R.L. Contest. His frequency will be 14092 kc.

Congratulations.

We note with pleasure that His Majesty the King has conferred the M.B.E. upon one of our members resident in Kenya—Mr. H. J. Walker. Mr. Walker's name appeared in the New Year's Honours List, and the award has been made in recognition of his long service in the Civil Service of Kenya Colony.

Mr. Walker was present at our last Convention, in company with Mr. W. E. Lane and other VQ4 members.

Calibration Section.

Manager: A. D. GAY, G6NF.

May we take this opportunity of thanking those members who have sent in reports on the reception of the last 3.5 mc. transmissions. The reports on signal intensity, conditions of QRM, fading, etc., from different parts of the country, are most valuable and will be carefully preserved in a special file for future reference.

We are unable to acknowledge each report individually, so that a brief description of the four-stage transmitter used may be of interest. The first stage consists of a completely shielded *Mazda* AC/SG valve working as an electron-coupled oscillator. The frequency is trebled in the anode circuit which is coupled to another AC/SG, also screened, acting as a buffer stage. Both these stages are supplied with an independent H.T. supply of 180 volts.

The buffer stage drives an LS5B as frequency-doubling stage with a 500 volt H.T. supply, and this is coupled to a 4211E stage which is driven up to 100 watts. A Marconi type of antenna is used with series capacity, earth connection.

The electron-coupled oscillator is maintained in synchronism during transmissions with harmonics of a crystal controlled low frequency oscillator (T. & R. BULLETIN, January, 1933) by means of a special monitor consisting of a 3.5 mc. detector and 1L.F. stage.

R.S.G.B. Reception Tests.

Below will be found details relating to Series 33 Reception Tests. Information required by new participants will be found on page 143 of the October, 1934, issue of the T. & R. BULLETIN. On request new members will be sent this information. The closing date for Series 33 is March 21, when all letters and logs received will be circulated to all participants in the form of a budget. The attention of the B.R.S. membership is again called to these tests, which they will find an excellent means of improving their code and in obtaining information relating to the procedure which they as licensed operators will need to observe. There are at present a number of districts unrepresented, and it is hoped that further members will therefore join in and send

in their logs. At the conclusion of the tests logs should be sent to Mr. T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4.

SERIES 33.

Test Letter.	Date, 1935.	Period, G.M.T.	Band, m.c.
A	Feb. 17 Sunday	0800-0900	7
B	" 17 "	0930-1030	1.7
C	" 17 "	1100-1200	56
D	" 24 "	0900-1000	3.5
E	" 24 "	1130-1230	14
F	" 24 "	1830-1930	28
G	Mar. 3 "	0930-1030	28
H	" 3 "	1100-1200	56
I	" 3 "	2230-2330	7
J	" 10 "	0900-1000	14
K	" 10 "	1130-1230	1.7
L	" 10 "	1830-1930	3.5
M	" 12 Tuesday	2100-2200	28
N	" 16 Saturday	1800-1900	14
O	" 17 Sunday	0700-0800	7
P	" 17 "	0930-1030	28
Q	" 17 "	1030-1130	3.5
R	" 17 "	1130-1230	1.7

R.S.G.B. Slow Morse Practices

Dates and times for February-March are to be found below. As usual, test matter will be taken from recent issues of the T. & R. BULLETIN. The page number and month of issue will be given at the end of each test. More reports will be appreciated, and are desired, in order to ascertain range of transmissions and numbers utilising the service. Should a reply be needed, please enclose a stamped envelope or post-card. In the schedule below it will be noticed that two stations, G2OI and G2II, have been omitted, at their own request, and both have complained of lack of reports. It is too bad of the B.R.S. membership as it is known that the service is being used by many of them. Both G2OI and G2II are hereby thanked for their past services and no doubt will be prepared to resume should sufficient requests be sent them. Stations willing to assist on the 1.7 mc. band—particularly in those districts at present without a service—should get in touch with Mr. T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4. (Tel.: Silverthorn 2285.)

SCHEDULE OF SLOW MORSE TRANSMISSIONS.

Date, 1935.	G.M.T.	Kcs.	Station.
Feb. 24	1000	1815	G2DQ
" 24	1030	1911	G2JL
" 24	1100	1.7 mc.	G2UV
March 3	1000	1815	G2DQ
" 3	1030	1911	G2JL
" 3	1100	1.7 mc.	G2UV
" 10	1000	1815	G2DQ
" 10	1030	1911	G2JL
" 10	1100	1.7mc.	G2UV
" 17	1000	1815	G2DQ
" 17	1030	1911	G2JL
" 17	1100	1.7mc.	G2UV

QSL Section.

Manager: J. D. CHISHOLM (G2CX).

Council at their January Meeting considered a report from the QSL Committee dealing with the present wasteful operation of the R.S.G.B. Bureau, and it was decided that international co-operation would be sought to prevent accumulation of unwanted cards which are clogging the files.

It was also agreed that if those members who do not require reports from nearby receiving stations

In order to assist the Q.S.L. Manager and Headquarter's staff, will all home members who do not wish to collect Q.S.L. cards advise us accordingly.

would inform H.Q. a considerable saving could be effected. We appeal, therefore, to all transmitters who have views on this very vexed question, to let us have them, so that we may have an opportunity of compiling a list of call signs to whom such reports are not to be forwarded.

QRA Section.

Manager: M. W. PILFEL (G6PP).

NEW QRA's.

- G2AW.—J. L. HILLS, 242, High Street, Bromley, Kent.
 G2CD.—W. H. MATTHEWS, 7, Beddington Road, Seven Kings, Ilford, Essex.
 G2CJ.—S. TOWNSEND, Barnwood House, Gloucester.
 G2MV.—S. MARTINGELL, "Haycott," Homefield Road, Old Coulsdon, Surrey. (Correction of QRA appearing in the December BULLETIN.)
 G2NT.—CAPT. A. C. C. WILLWAY, Knole, Ashley Rise, Walton-on-Thames, Surrey.
 G2UW.—A. J. WILSON, 15, Bennett Park, Blackheath, London, S.E.3.
 G5AX.—A. W. ATKINSON, 18, Prospect Crescent, Scarborough, Yorkshire.
 G5BP.—H. N. D. BAILEY, 163, Newland Park, Hull, Yorkshire.
 G5DS.—J. L. DANKS, "Inglenook," Tilford Road, Farnham, Surrey.
 G5FA.—J. A. FARRER, 14, Wellington Road, Whalley Range, Manchester.
 G5JX (ex-SUISJ).—S. E. JAMES, 2a, The Crescent, Woodthorpe, Nottingham.
 G5KR.—C. THORPE, 17, Rostwaite Road, West Derby, Liverpool.
 G5LR.—W. P. CARGILL, Ladywell Sanatorium, Eccles New Road, Salford, 5, Lancashire.
 G5OA.—G. E. OAKLEY, Thames Bank House, East Greenwich, London, S.E.10.
 G5OP.—F. H. PEMBERTON, 3, Merlewood Avenue, Churchtown, Southport, Lancs.
 G5PR.—G. C. PROCTER, Great Flanchford Farm, Reigate, Surrey.
 G5QX.—J. N. SMITH, "Ben-Venuto," Hawthornden Drive, Belmont, Belfast.
 G5TP.—R. G. W. PAGE, Roland Cottage, Stoke Row, near Henley-on-Thames, Oxon.
 G5TT.—T. CALDICOTT, 63, Central Avenue, Hucknall, Notts.
 G5VQ.—E. TAYLOR, 149, Westbourne Grove, Westcliff-on-Sea, Essex.
 G5XG.—J. BUTCHER, "Kentaun," Hookwood, Horley, Surrey.
 G5XL.—H. P. TOWNHILL, 223, Newark Road, Bracebridge, Lincoln.
 G5ZR.—S. RAYNER, 5, Portland Street, Southport, Lancashire.
 G6OH.—G. S. SAMWAYS, 55, Gilling Court, Belsize Grove, London, N.W.3.

- G6PI.—R. E. PIDSLEY, 27, Herbert Street, Queens Crescent, London, N.W.5.
 G6QZ.—A. G. PARKER, 37, Oxford Street, Norwich, Norfolk.
 G6RH.—R. HOLMES, 39, Danson Road, Bexley Heath, Kent.
 G6RI.—W. ROBERTSON, 41, Lilybank Crescent, Forfar, Scotland.
 G6RN.—G. O. RAVENSCROFT, "Sunny View," Anningson Lane, New Waltham, Lincs.
 G6TM.—F. WISEMAN, 5, Hollins Street, Buxton, Derbyshire.
 G6US.—N. E. READ, 37, Willow Street, Oswestry, Shropshire.
 G6UU.—T. W. READSHAW, Hollywood, Eskbank Road, Bonnyrigg, Midlothian.
 G6YO.—G. EVANS, 7, Moorlands, East Burley, Bradford, Yorkshire.
 2AAF.—A. ADAMS, County Police Office, Poulton-le-Fylde, Lancashire.
 2ABS.—A. H. SCOTT, "Harcroft," St. Matthews Avenue, Surbiton, Surrey.
 2AIO.—R. W. ROGERS, 21, Chester Avenue, Southport, Lancashire.
 2AKA.—M. GEDDES, 44, Lindisfarne Avenue, Leigh-on-Sea, Essex.
 2ANH.—M. A. BROOKES, "Coniston," Lichfield Road, Four Oaks, near Birmingham, Warwickshire.
 2AOL.—S. SOUTGATE, 26, Fulbrook Road, Cambridge.
 2ARZ.—J. THORPE, 2, Norton Lees Crescent, Sheffield, 8, Yorkshire.
 2AUB.—E. GRISS, 37, Parkers Road, Sheffield, 10, Yorkshire.
 2ANQ.—W. W. LEONARD, 7, Wood Street, Tunbridge Wells, Kent.
 2AYA.—J. H. FARRER, 26, All Saints Road, Peterborough, Northamptonshire.
 2AYM.—H. WILD, 1, Elm Street, Middleton, Lancashire.
 2BAU.—E. W. BROWNJOHN, P. O. Lower Froyle, Alton, Hampshire.
 2BCH.—G. A. JESSUP, Jr., 11, South Avenue, Rochester, Kent.
 2BKR.—F. G. APPLETON, "Le Mans," Neville Close, Potters Bar, Middlesex.
 2BMA.—C. H. RANFT, 59, Beresford Road, Cheam, Surrey.
 2BPC.—H. J. CARTER, 29, South Esk Road, Forest Gate, London, E.7.
 2BXD.—W. D. INGLE, 3, Montpelier Terrace, Edinburgh, 10, Scotland.
 2BYH.—A. S. MACNAB, 30, Elton Road, Bishopston, Bristol, 7.
 The following are cancelled:—2ADY, 2BAO, 2BCY, 2BGO, 2BJP, 2BMV, 2BPY, 2BRB.

NEW MEMBERS.

HOME CORPORATES.

- A. TOMLINSON (G2QN), Waverley, Feniscowles, Blackburn, Lancs.
 H. BAILEY (G2UF), 35, Manchester Road, Denton, Manchester.
 H. S. EDWARDS (G2ZH), 1388, Coventry Road, S. Yardley, Birmingham.
 W. G. H. BROWN (G5BK), 19, Clarence Square, Cheltenham, Glos.
 G. S. SOUTGATE (G6SU), 26, Park Road, Gravesend, Kent.
 R. R. SMITH (G6TQ), Keston, Woodlands Road, Gillingham, Kent.
 F. LAWTON (2AXA), 317, Huddersfield Road, Stalybridge, Ches.
 J. WYLDE, jun. (2BHA), 8, Osborne Road, Wallasey, Ches.
 F. B. PRIOR (2HJR), 47, Stafford Road, Waddon, Croydon, Surrey.
 L. SHEPHERD (2BRT), 21, Whitehead Place, Fagley, Bradford, Yorks.
 L. F. S. PARKER (2BVI), 16, High Street, Wellingborough, Northants.
 W. M. PANNELL (BRS1058), 245, Mill Road, Cambridge.
 A. E. JONES (BRS1059), 42, Pentremalaw Road, Morriston, Swansea, Glam.
 E. A. ROGERS (BRS1060), 17, Harcombe Road, Stoke Newington, N.16.
 D. CHALMERS (BRS1061), 5, Woodholm Avenue, Kings Park, Glasgow.
 K. W. KEENAN (BRS1062), 18, Pemberton Road, Old Swan, Liverpool, 13.
 J. T. FOSTER (BRS1063), 4, Melrose Crescent, Withernsea, S.E. Yorks.
 R. B. LEGGE (BRS1064), St. Mark's Vicarage, Victoria Park, E.9.
 E. A. HAYWARD (BRS1065), 44, Llanishen Street, Cathays, Cardiff.
 K. H. PEARCE (BRS1066), 14, South Avenue, Oldfield Park, Bath, Som.
 J. D. COCHRANE (BRS1067), 22, Cairnmount, Jedburgh, Roxburghshire.
 O. H. HELLIER (BRS1068), 26, George Road, Hay Mills, Birmingham.
 B. P. WARD (BRS1069), 15, Westland Road, Yeovil, Som.
 P. FRAZER (BRS1070), 1, Ramsey Road, St. Ives, Hunts.
 R. A. HOSIE (BRS1071), 94, Norway Street, Waterloo, Liverpool, 22.
 R. E. G. DURRANT (BRS1072), 58, Christchurch Road, Norwich, Norfolk.
 L. BALDWIN (BRS1073), 51, King's Road, Bradford, Yorks.
 J. S. JEWERS (BRS1074), 170, Nether Street, Finchley, N.3.
 C. A. CORBIN (BRS1075), 55, Southwark Park Road, S.E.16.
 A. T. SOFER (BRS1076), 4, Bury Fields Lane, Guildford, Surrey.
 G. W. GREEN (BRS1077), 17, Jefferies Road, Ipswich, Suffolk.
 F. J. DE COURCY (BRS1078), Gorse Hill, Bally, Co. Dublin, I.F.S.
 H. L. KERSEAW (BRS1079), 14, Talbot Street, Oldbury, Birmingham.
 J. T. WIMBUSH (BRS1080), 95, Charlotte Street, Rochdale, Lancs.

- T. ARNOLD (BRS1081), Wireless Station, Fort Dunree, c/o G.P.O., Londonderry.
 J. RUSSELL (BRS1082), Longcroft House, Longcroft, by Bonnybridge, Stirlingshire, Scotland.
 J. C. H. TUCKER (BRS1083), Girdlestoneites, Charterhouse, Godalming.
 C. J. GREEN (BRS1084), Mare Lane, Hascombe, Godalming, Surrey.
 F. E. SAUNDERS (BRS1085), 36, Blakeney Road, Beckenham, Kent.
 J. JAGGER (BRS1086), Rose and Crown Inn, Thurstonland, near Huddersfield.
 S. A. O'HAGAN (BRS1087), 293, Rothbury Terrace, Heaton, Newcastle-on-Tyne.
 E. H. HOPKINS (BRS1088), 144, Birchfield Road, Headless Cross, Redditch, Worcs.

DOMINION AND FOREIGN.

- R. L. BARKUS (AC8LB), The New Engineering and Shipbuilding Works, Shanghai, China.
 A. PASSINI, Via Marassi No. 24, Genova, Italy.
 R. LEPRONT (SU1RL), 36, Rue Allen Bulkeley, Ramleh, Palestine.
 W. DYKE (W7BPJ), Forest Grove, Oregon, U.S.A.
 D. GR. BARLU (YF5BD, YR5BD), str. T. G. Duca 124, Calarasi, Talomita, Roumania.
 J. APAP (BERS209), 14, Sda Scozzese, Valletta, Malta.
 H. G. BOSTOCK (BERS270), No. 1 Bungalow, R.A.F., Raisalpur, N.W.F.P., India.
 P. H. DUTTON (BERS271), 20 (AC) Squadron, R.A.F., Peshawar, N.W.F.P., India.
 R. M. PENDE (BERS272), 1st Bhatwadi, Girgaon, Bombay, India.

Death of R.S.E.A. President.

It is with very deep regret we record the death, on December 26 last, of Mr. R. F. Mayer, O.B.E., first President of the Radio Society of East Africa. Mr. Mayer had been resident in Kenya Colony for some 35 years, and was well esteemed. He was a Director of the East Africa newspaper, *The East African Standard*, and had been Mayor of Nairobi. At the time of his death he was President of many local societies and associations. Mr. Mayer was a keen radio enthusiast, and his passing will be mourned by all members in East Africa.

Listen for VQCN and VQLD

Mr. W. E. Lane advises us that the Kenya and Uganda Railways and Harbours have installed short wave transmitters on two of their boats sailing on Lake Albert and up the Nile. The schedule of transmissions follow:—S.S. *Robert Coryndon* (VQCN), 47.5 metres, transmits every two hours from 05.30 G.M.T. to 15.30 G.M.T. on alternate week-ends, Friday to Sunday, commencing February 1 to 3. S.S. *Lugard* (VQLD), 47.5 metres, similar schedule except that it extends from Friday to Monday, commencing February 1 to 4.

Reports should be sent to Mr. Lane, P.O. Box 570, Nairobi, Kenya.

Reports Wanted.

VU2JP, on his 7,100 and 14,200 kc. transmissions at 13.00 G.M.T. daily.

ZS6AL on his 14 mc. transmissions.

VU2DX (Lahore) on his 7 and 14 mc. transmissions.

G5OP (Southport) on his 1.7 mc. transmissions.

56 MC. Direction Aerials.

Mr. H. C. Daynes (G5YD) informs us that the circuit for the field strength measuring device, mentioned by Mr. Dedman, in his recent article, was supplied by him, and not by Mr. Mowatt (BR877). He states that the circuit is a modification of an idea given to him by the late Count Galletti, an Italian engineer, who was associated with Messrs. Ferranti, Ltd.

DX CHART—No. 3.

DX CONDITIONS: DECEMBER 15, 1934—JANUARY 15, 1935.

G.M.T.	14 Mc.	7 Mc.	3.5 Mc.
0100		W1.2	VE1; W1.2; VO
0200		W1.2; PY	and so throughout night with
0300		W1.2; PY	skip steadily increasing until
0400		W1.2; PY	by 0600:—
0500			
0600			VE3,4; W5,7,9
0700		ZL	VE3,4; W5,7,9
0800		ZL	Fade
0900	ZL; PY2; VK2; LU		
1000	CX1; ZL4; TF; VK		
1100	W1; VK; ZL		
1200	W1; ZL; VP5		
1300	W1; ZD; VK3.6; VE3; VU		It is hoped that VK and ZL will come in about 0700— towards the end of February
1400	W1; 5; ZD; OZ7; VE		
1500	W1; 6; VE; ZT		
1600	W1; 6.7; ZS		
1700	W1	KA1; ZL2	
1800	ZS	VK2; PK1; CR7; VU2	
2000		ZT5; VK	NY5
2100		VK3; W1.2	VO
2200		FB8; W1.2	VO
2300		J; W1.2	VO
2400		LU6.7; J; PY; CX; W1	VE1; W1.2; VO; SU
		FB8; W1.2	VE1; W1.2; VO

(A) W1 in the 14 mc. column signifies W1, 2, 3, 4, 8, and 9 when conditions are good. (B) Bold type indicates strong signals.

We are glad to welcome G6RB as a contributor to the 3.5 MC. Section.

EMPIRE CALLS HEARD.

B. W. F. Mainprise, Hotel Marquesa, Puerto Orotava, Tenerife, Canary Islands:—

HEARD ON 1.7 MC. DURING DECEMBER.

G2ld, 2np, 5ju, 5qm, 2ox, 6rb, 6uj, 5ju.

G6LI, A. E. Livesey (aboard m.v. "La Paz," Liverpool to Panama). (Receiver, SG-Det-Pen.)

NOVEMBER 28, 500 MILES S.W. LIVERPOOL.

3.5 mc.: g2oc, 6ak, gi6tk.

NOVEMBER 29, 750 MILES S.W. LIVERPOOL.

7 mc.: g2du, 2np, 2qo, 2lr, 2vz, 5vw. velet, 2ge, 2it.

3.5 mc.: g5vl (R7 fone), 5yu, 6sr.

NOVEMBER 30, NEAR 46° 36' N., 20° 07' W.

7 mc.: g2gb, 2in, 2kz, 6gm. su6hl, zn2cx.

3.5 mc.: g5yu.

DECEMBER 1, NEAR 45° 05' N., 22° 58' W.

7 mc.: g2kx, 2rf, 6io. vk7pa.

3.5 mc.: g2dq, 6jt.

DECEMBER 2, NEAR 43° N., 26° 20' W.

3.5 mc.: g5fi, 5of, 5yu, gi6tk.

DECEMBER 4, NEAR 38° 30' N., 33° 31' W.

14 mc.: g2pl. vk3cp, 3ht, 3kx, 3mr, 3oc, 5su, vq8a, zslh.

3.5 mc.: g5yu.

DECEMBER 5, NEAR 37° 02' N., 35° 53' W.

14 mc.: vk3hg, 3mr.

DECEMBER 6, NEAR 35° 40' N., 39° 10' W.

7 mc.: g2tr. vk2qk, 2qp, 3zb.

DECEMBER 8, NEAR 32° 25' N., 45° 25' W.

3.5 mc.: g5pz (?), g6wy, Ei9d.

DECEMBER 9, NEAR 30° 17' N., 49° 04' W.

14 mc.: g2pl, 2zq, 5cy, 5nd, 5xb, 6nj, 6tt, 6uj, 6vp, 6wu, 6wy, 6xn. vp5ab.

DECEMBER 10, NEAR 28° 06' N., 52° 37' W.

3.5 mc.: g5yu.

DECEMBER 12, NEAR 23° 28' N., 59° 56' W.

14 mc.: g2pl, 2ul. zs2a.

Positions: These are noonday (local time) observations. Almost all signals logged during local daylight. Early morning listening not carried out.

G6ZU, R. H. Jackson, 54, Prince's Street, Stockport, October to December, 1934:—

14 mc.: ve4du, vk2cy, 2lz, 2xu, 2xv, 3gp, 3mr, 3kx, 3wx, 4bb, 4ei, 5jb, 7jb, z14bt, 4ck, zc6ff, zelff, 1jj, zi2u (Schooner off Cape Town), zslau, 1h, 1p, ztlr, 6x, yi2fk.

BERS245 Beira, Mozambique, November 19 to December 16 (sent via ZE1JF, ZS1H, SU1EC, G6WY).

7 mc.: vk2dr, 2wj, 6lr, vp5pa, g6wy.

14 mc.: ve2ee, 2fq, 2hf, 2om, vk2wj, 3wr, vs6aq, vu2co, 2jp.

H. S. Bradley (66, Main Street, Hamilton, N.Y.). 7 or 14 mc. fone: g2pl, 6ag, zelff, ztlr, 2f.

VE5HR between August, 1933, and November, 1934: G2io, 5hb, 6lk, 5rx, 6rb, 6rx, 6wy, 6vp, 6nj, 5ku.

DISTRICT & COUNTY REPRESENTATIVES, 1935

BELOW appears a complete list of the British Districts, with the names and addresses of all Representatives.

District 1.

D.R., Mr. J. NODEN, G6TW, COPPICE ROAD, WILLASTON, nr. NANTWICH, CHESHIRE.

West Lancashire and West Cheshire :—

Mr. H. W. Stacey, G6CX, 42a, Hampstead Road, Fairfield, Liverpool.

East Lancashire and East Cheshire :—

Mr. W. Lucas, G20I, 64, Worsley Road, Winton, Patricroft, Manchester.

Cumberland and Westmorland :—

Mr. R. H. G. Garside, G2YN, 7, Egremont Road, Hensingham, Whitehaven, Cumberland.

NOTE.—The division between Cheshire and Lancashire takes place along the line Lancaster, Preston, Wigan, Warrington and Crewe, all five towns being regarded as being in the East Cheshire—East Lancashire section.

District 2.

D.R., Mr. L. W. PARRY, G6PY, 13, HUDDERSFIELD ROAD, BARNLEY, YORKS.

Northumberland and North Durham :—

(To be appointed).

South Durham and Middlesbrough :—

(To be appointed).

Yorkshire (West Riding) and that portion of the North Riding lying west of the L.N.E.R. main line :—

Mr. H. Rayner, G5TQ, 32, Grange Road, Cleckheaton.

District 3.

D.R., Mr. V. M. DESMOND, G5VM, 199, RUSSELL ROAD, MOSELEY, BIRMINGHAM.

Shropshire :—

Mr. R. Westlake, 2ARP, "Ardlui," Wenlock Road, Shrewsbury.

Staffordshire :—

Mr. A. E. Dyson, G6NJ, 52, Burton Road, Burton-on-Trent.

Warwickshire :—

Mr. G. Brown, G5BJ, 62, The Ring, South Yardley, Birmingham.

Worcestershire :—

Mr. H. Littley, G2NV, "Radlohm," Bridgnorth Road, Stourton, Kinver, Staffs. (Acts as C.R. for Worcester.)

District 4.

D.R., Mr. H. B. OLD, G2VQ, 3, ST. JUDE'S AVENUE, MAPPERLEY, NOTTINGHAM.

Derbyshire :—

Mr. R. H. Streete, G2SD, Waverley Lodge, Haven Baulk Lane, Littleover, Derby.

Leicester :—

Mr. P. R. Chapman, G5VH, 399, Uppingham Road, Leicester.

Northants :—

Mr. R. J. Pankhurst, G5YF, 9, Shakespeare Road, Kettering.

Nottinghamshire :—

Mr. J. Lees, G2IO, 17, Trevoze Gardens, Sherwood.

District 5.

D.R., Mr. W. B. WEBER, G6QW, 2, BALMORAL ROAD, ST. ANDREWS, BRISTOL.

Gloucestershire :—

Mr. A. E. Brookes, G6VK, 19, Alexandra Road, Uplands, Bedminster Down, Bristol.

Oxfordshire :—

Mr. H. J. Long, G5LO, Stanton Harcourt, near Eynsham.

Wiltshire :—

Lt.-Col. W. L. Palmer, G2BI, "Elmfield," Calne.

East Somerset :—

(To be appointed)

District 6.

D.R., Mr. W. B. SYDENHAM, G5SY "SHERRINGTON," CLEVELAND ROAD, TORQUAY.

Devon :—

Mr. J. J. G. Taylor, G6XD, Willowby, Radford Road, Plymouth, Plymouth.

Cornwall :—

Mr. J. Tamblyn, G6QH, Barkla Shop, St. Agnes, So. West Somerset and Dorset :—

Mr. J. G. E. Tinning, G6II, Gidlands, Wellington, Som.

District 7.

D.R., Mr. E. A. DEDMAN, G2NH, 63a, KINGSTON ROAD, NEW MALDEN, SURREY.

Berkshire :—

Mr. G. Marcuse, G2NM, The Ranch, West Drive, Sonning on Thames.

Hampshire :—

Mr. R. C. Neale, G6GZ, Farnboro' Road, Farnborough.

Surrey :—

Mr. R. J. Denny, G6NK, 32, Waverley Road, Weybridge.

District 8.

D.R., Mr. G. FEATHERBY, G5FB, 30, LINDSEY ROAD, BISHOP'S STORTFORD, HERTS.

Bedfordshire and Cambridgeshire :—

Mr. B. M. Scudamore, G6BS, 39, Owistone Road, Newnham, Cambridge.

Buckinghamshire :—

Mr. K. E. B. Jay, G2HJ, "The Quinta," Elm Close, Amersham.

Hertfordshire :—

Mr. H. R. Scobell, 2AZD, "Sherborne," Bucknall's Drive, Watford.

Huntingdonshire :—

Mr. B. Rowell, G5RL, 14, Market Hill, St. Ives.

District 9.

D.R., Mr. H. R. SADLER, G2XS, REDWAYS, WOOTTON ROAD, GAYWOOD, KINGS LYNN, NORFOLK.

Norfolk :—

Mr. A. A. Barrett, G5UF, 14, Cliff Avenue, Cromer.

Suffolk :—

Mr. C. A. Jamblin, G6BT, 121, Queen's Road, Bury St. Edmunds.

District 10.

D.R., Mr. D. LOW, G5WU, "NANTISSA," WESTBOURNE ROAD, PENARTH, GLAM.

Glamorgan :—

Mr. R. H. Hall, G2SN, Newholme, Llwyn Mawr, Sketty, Swansea.

Monmouth :—

Mr. R. V. Allbright, G2JL, 2 Palmyra Place, Newport.

Breconshire :—

Mr. G. R. S. Farnie, G5FI, The Grange, Cefn Coed, nr. Merthyr Tydfil.

District 11.

D.R., Mr. T. VAUGHAN WILLIAMS, G6IW, "MALIN-COURT, GROSVENOR AVE., RHYL, FLINTSHIRE.

Flintshire :—

Mr. J. H. Wood, BRS.1211, "Deepdale," Marine Road, Prestatyn.

District 12.

D.R., Mr. S. BUCKINGHAM, G5QF, 9, BRUNSWICK PARK ROAD, NEW SOUTHGATE, N.11.

North London :—

Mr. A. W. Hartley, 2BTZ, 111, Lichfield Grove, Finchley, N.3.

North-West London :—

Mr. D. N. Corfield, G5CD, 10, Holders Hill Gardens, N.W.4.

District 13.

D.Rs., Messrs. J. B. KERSHAW, G2WV, 13, MONTPELIER ROW, BLACKHEATH, S.E.3 and H. D. PRICE, G6HP, 12, HILLCREST ROAD, SYDENHAM, S.E.26.

District 14.

DR., Mr. T. A. ST. JOHNSTON, G6UT, 28, DOUGLAS ROAD, CHINGFORD, E.4.

East London :—

(To be appointed)

Essex :—

Mr. M. Buckwell, G5UK, 19, Meadway, Westcliff-on-Sea.

District 15.

DR., Mr. H. V. WILKINS, G6WN, 81, STUPLAND ROAD, HANWELL, W.7.

West London :—

Mr. G. A. Exeter, G6YK, 29, Askew Crescent, Shepherd's Bush, W.12.

Middlesex :—

Mr. S. K. Lewer, G6LJ, 17, Norval Road, Wembley.

District 16.

DR., Mr. A. O. MILNE, G2MI, "SOUTHCOT," LARKFIELD, KENT.

Kent :—

Mr. G. A. Chapman, G2IC, 109, Cheriton Road, Folkestone.

Sussex :—

Mr. C. W. K. Sands, G5JZ, "Springfield," Heathfield Tower.

District 17.

DR., Mr. A. E. LIVESEY, G6LI, STOURTON HALL, HORNCASTLE, LINGS.

Lincolnshire and Rutland :—

Rev. L. C. Hodge, G6LH, The Bungalow, Skirbeck Road, Boston, Lincs.

District 18.

DR., Mr. T. WOODCOCK, G6OO, "CONAKRY," CARDIGAN ROAD, BRIDLINGTON.

Yorkshire (East Riding) :—

Mr. W. A. Clarke, G5FV, "Lynton," Hull Road, Keyingham, Hull.

Yorkshire (North Riding, that portion that lies east of the L.N.E.R. main line) :—

Mr. R. B. Mortimer, 2AUN, Graycroft, Wheatcroft Avenue, Scarborough.

SCOTLAND

HONORARY MANAGER, Mr. J. WYLLIE, G5YG, 31, LUBNAIG ROAD, NEWLANDS, GLASGOW.

Assistant, Mr. J. P. Stove, G5ZX, 35, Melville Street, Glasgow.

A District :—

Mr. A. C. Brown, G6ZX, "Amulree," Carstairs Road, Clarkston, Glasgow.

B District :—

Mr. T. Laing, G6LG, "Cragg Choinnich," Woodhill Road, Aberdeen.

C District :—

Mr. E. J. Allen, G5NW, "Red Oak," Forthill Road, Broughty Ferry, Dundee.

D District :—

Mr. G. O. Kollien, G5IG, 15, Groathill Avenue, Craigleith, Edinburgh.

NORTHERN IRELAND

DR., Mr. W. GRAHAM, G5GV, 5, RATCLIFFE STREET, DONEGALL PASS, BELFAST.

DISTRICT 1 (North-Western).

ELEVEN members attended the January meeting in Manchester, which was at the last minute postponed to the second week in the month on account of the Christmas and New Year holidays. Party tricks and jokes were the vogue of the evening, and radio for once took second place. G2OI wonders if any of those present benefited by "to-night's the night"!

It was decided that another junk sale should be held at the next meeting in conjunction with a talk on N.F.D. gear, etc.

The members in this section are still waiting to hear why the Liverpool group declined to join in with District 2 for a joint Northern Convention, and would like to state here that they did not turn this scheme down, as one or two of the members outside the District seem to think. The Manchester group are still of the opinion that it would be a very good idea, and a means of linking the two Districts more closely together.

(It is hoped that many members in District 1 will attend the Leeds meeting, and that a similar response will be given by District 2 to the Manchester meeting.—Ed.)

G5OZ reports business QRM, but rebuilding in R1 time; 2WQ has completely rebuilt his transmitter—first test raised ZL; 5CH awaiting A.C. change-over; 5YD re-designing PA and building new receiver; 2BVP on receiver work; 5ZT has built new speech amplifier—entered 3.5 and 1.75 contests; 6GV getting ready for 1.75 mc. (watch out for the big noise!), testing 132 ft. ant. with 33 ft. feeders, also testing on television with 30 line scanning; BRS1504 building new super, also busy with R.N.W.A.R., 201 working on automatic control, also duplex with S.S.S. and frame. Heard a W station on CW on 1.7 mc., but could not raise him! 6QA working duplex at times on 1.7 mc.; 5WR building for 1.7 mc., also trying fone on the other bands; G2PP now has a junior op. and everyone sends him and also

Mrs. 2PP heartiest congratulations (no more sitting up for DX now OM, but still plenty of late nights nursing the junior!); 2HL working 1.7 mc. and contemplating going on the other bands. 5PX, 5XF, 5VN, 5XM, 5RX, 2BK, 6GX, 2DF heard at times on different bands. What about it, if you can't attend meetings a post-card reporting activities will help. 6ZS is working on 1.7, 7 and 14 mc. 6AA still has very little time for radio, due to illness at home.

Will all those interested in 56 mc. work of a serious nature please drop the C.R. a line? Also offers are wanted by one or two BRS men from some local transmitter to send out 56 mc. sigs for special test work; will anyone oblige?

The January meeting in Liverpool was well supported by 17 members, including two enthusiastic members from North Wales. Whether this excellent attendance was due to the C.R.'s remarks in the last issue of the BULLETIN, or to New Year resolutions on the part of the members, is not known, but the C.R. was very pleased indeed. One or two well-known faces were not present, however, and it is hoped that they will make an effort to attend the meeting in February.

The C.R. opened the meeting by announcing the date fixed for the District Conventionette at Manchester, and explained that Council had approved Scheme No. 1, which had been explained to the members at the last meeting. National Field Day was the next item on the agenda, and suggestions for a suitable site for the transmitter in this area will be very welcome. The visitors from North Wales (2ALX and BRS1156) issued an invitation to local members to attend the next meeting in District 11, to be held on the third Sunday in February at G2II. If any local members can attend this meeting it is hoped that they will do so and give District 11 some support in return for the support given by them to the Liverpool meetings. As no set programme had been arranged suggestions were invited, and after

some reference to Uncle Tom's remarks in the BULLETIN about the purchase of commercial receivers a lengthy argument developed between the supporters of Uncle Tom's remarks and the "heathens"!

2BNA gave a short talk on the construction of a Condenser Microphone, and produced a home-made sample, which was taken to pieces and passed round. G2KZ reported that he had tested this and had obtained excellent results, and it is understood that he will probably be using it in connection with his phone transmissions during the next few weeks.

Mr. Wylde is congratulated on obtaining his A.A. ticket under the call 2BHA.

Local activities are as follows:—G2KZ rebuilding for push-pull operation with the assistance of 2AVK. 2BWG just built tritet transmitter, using MPT 4 Catkins as oscillator and doubler. BRS1613 building SG Det.-L.F. and learning Morse. BRS1641 introduces himself as willing to report for fellow members. G6TT on 14 mc. again after rebuilding. BRS1589 learning Morse and experimenting with receiving aeriols. BRS1652 getting ready for A.A. licence. G5RY on 1.75 again with good results and is trying out fone. G2FD trying low power phone on 1.7 mc. G2RF

STANDARD FREQUENCY TRANSMISSIONS.

SUNDAY,
February 24th, 1935

0930 GMT.	3525 KC.
0940 GMT.	3625 KC.
0950 GMT.	3725 KC.

Accuracy within 0.01 per cent.

experimenting with suppressor grid modulation with a 59 valve. 2BNA giving up hope with his code. G6CX has now completed his new transmitter, and is ready for radiating tests.

DISTRICT 2 (North-Eastern).

The D.R. wishes to advise all members living in Northumberland and North Durham that a meeting will be held at 7.30 p.m. on Sunday, February 24, at G2LD, 4, Prior's Terrace, Tynemouth, for the primary purpose of electing a C.R. Refreshments will be served during the meeting.

Activity around the Central and South Yorkshire areas seems to be fairly well maintained, and those members who sent in reports are thanked for the assistance given.

Hearty congratulations are extended to G6WJ, who it will be remembered won the prize last year for the best article on an original 56 mc. receiver, on repeating the performance this month by winning the "Kenya Cup" competition for the best home-

built receiver to the specifications given about a year ago, when the competition was announced.

Several novel features are included and the receiver is described in this issue.

The Bradford area keeps up its recent habit of announcing a new station each month, this time being G6YO, operated by Mr. G. Evans, of Birkenhead, to whom we offer our best wishes.

The last meeting was held at G5QC, when the attendance exceeded all expectations, about 27 being present. This was perhaps due to the fact that a discussion on a crystal register and the QRM which has arisen on the 1.75 mc. band locally was announced. After many views had been aired, the matter was voted upon and resulted in a suggestion regarding the allotment of frequencies for the various stations being dropped, as it was felt that this might be the cause of a division of the members into several parties. Great interest was displayed in the station's equipment, particularly the cathode ray oscillograph. An excellent time was had by all.



Individual activities are as follows: G6BX is doing duplex and triplex work on 1.75 mc., with G5TQ, 2QM, 2UY, and 5YW. The complete QRO transmitter of G5SZ has been rebuilt and is working very satisfactorily, whilst G6XL and 6KU are hoping to be in on B.E.R.U. by now. Reports on a 4 watt, class "B" modulated signal, will soon be requested by G2XK on the 160 metre band, whilst at the other end, BRS1151 will be pleased to report on 56 mc transmissions. Reports of general activity are to hand from BRS1298 and BRS1333, and all the usual stations have been heard working during the past few weeks.

It is hoped that all active members will come to the next meetings as arrangements for N.F.D.,

which has been changed to June 1 and 2, will have to be made.

From Sheffield, G6PJ reports that a local radio club is being formed for those who are interested in short-wave reception generally. This will be affiliated to the R.S.G.B., and will have the support of the members there.

G2AS finds that keying the CO cures BCL trouble, which it is understood has been experienced by G2JY also. Activity is also being maintained by G2HQ, 5HK, and 6LF. Congratulations are offered to BRS1512 and 1468, who are now respectively 2AUB and 2ARZ.

BRS1625 also continues to be active, and the usual meeting will be held on February 16 at the Angel Hotel at 7.30 p.m.

DISTRICT 3 (West Midlands).

At the time of writing there is great activity in the district, antennas and transmitters are

MIDLAND PROVINCIAL MEETING

SUNDAY, MARCH 24, 1935

at

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

Assemble	-	-	-	12 noon
Lunch	-	-	-	1.15 p.m.
Business Meeting	-	-	-	2.15 p.m.
Tea	-	-	-	4 p.m.

followed by a visit to a place of interest.

Luncheon 3/6. Tea 1/6.

Reservations to Mr. V. M. Desmond, G5VM,
or Mr. H. B. Old, G2VQ, not later than
March 20.

being overhauled, spares of every description are being obtained, and there is a general air of excitement—all in preparation for the B.E.R.U. Contests. On account of this there are no monthly reports, but all the usual stations are active. A hearty welcome is extended to BRS1639, and we hope to meet him at our local meetings.

March 24 is the date fixed for the Midland meeting; make a note of it and roll up to support it in numbers. This will be the first of the Provincial meetings, so let us see that the Midlands can vie with London when it comes to big gatherings. We hope to see a good muster from Districts 1, 2, 4 and 5, not forgetting our London friends.

DISTRICT 4 (East Midlands).

The D.R. regrets that no notes have come to hand from Nottinghamshire, Derby or Leicester. Steps will be taken to improve this condition at an early date.

Northants started the New Year well by adding four new members to their register. These are:—G2CH, 2ATV, 2BVI and BRS1562. Welcome,

om's! G2NJ is active, 5NX is obtaining DX results with phone, BRS1491 is a new convert to 3.5 mc. and reports hearing many W and VE stations on that band. 2BXG, BRS1251 and the C.R., G5YF, have put in a good deal of time at G5KN, the station operated by the Kettering Radio Society.

DISTRICT 5 (Western).

The Bristol Section held their usual monthly meeting during January, when the following 30 members were present:—G2GQ, 2ZX, 5JU, 5KT, 5UH, 6FO, 6JG, 6OZ, 6RB, 6TO, 6VF, 6VK, 6YA, 2AHK, 2BHI, 2BOM, 2BVL, 2BYH, BRS686, 689, 744, 1426, 1546, 1649, 1433, the D.R., and four visitors, including G6AC.

The D.R. opened the meeting and introduced the new C.R., Mr. A. E. Brookes, G6VK, who then placed before the members his future plans for the section for 1935.

Members had been advised that there was to be a lecture by the Westinghouse Co., but this, unfortunately, was cancelled by them at the last moment.

The D.R., however, filled the gap by showing the N.F.D. films, together with others, and a most interesting evening was thus thoroughly enjoyed by all present.

The C.R. is arranging similar interesting evenings for each monthly meeting, and expects the support of all members.

The C.R., together with BRS1433, visited 26 stations during January, and reports he found a remarkable amount of experimental work in hand at many of them. During February he expects to visit about 50 stations in this section.

Stations reporting are:—

G2HX, who, experiencing the beginning of matrimony, has found no time for radio.

G2ZX, testing out a link-coupled neutralised T.P.T.G. with a 6-turn coil coupled to the F.D. and connected to grid coil of P.A., has increased drive by 30 per cent., is using a DO25 and single-stage mike amplifier for fone, receiving R9 reports from most European countries. Hopes to have new aerial ready for B.E.R.U.

G5FS is experimenting with crystals of the quartz cylinder type, and the potential differences set up by changes of pressure are applied to a T valve, followed by a H.I. valve, and finally to a Cathode ray tube producing a pressure diagram on the screen. (Please may we have an account of this interesting work for publication?—Ed.)

G5JH is assisting the Gloucester B.R.S. members with Morse lessons.

G5JU is working schedules every Sunday 14.30-15.00 G.M.T., and welcomes reports. Worked many W's on 3.5 mc. with 9 watts input receiving R6 reports. Used new M.O.P.A. in the 1.7 mc. contest with 6.9 watts input QSO'ing (other than G's) F, OZ, and SM. G5KT is experimenting with frequency multipliers, using crystal oscillations on 160 metres and exciting P.A. on 20 metres without intermediate stages. Had a good time during the 1.7 mc. contest, securing 33 contacts.

G5UH is unfortunately inactive owing to illness. G5WI is working schedules with W3 and 4 on Fridays, 22.30-23.00 G.M.T., but finds conditions

rather poor. Hopes to be using link-coupled neutralised T.P.T.G. for B.E.R.U. Has also been very busy with formation of new band checking group.

G6DJ using new crystal on 7 mc. appears to have picked a frequency plumb in the middle of "spitch QRM." Has changed from grid to plate modulation. Suggest a code word be used by stations taking part in contests to show that a "snappy" QSO is required instead of a "rag-chew"! G6FO has been spasmodically active

is not very superior when compared with 0-v-1 on the higher frequencies. Is testing out a new 66 ft. Windom on 3.5 mc. with loose-coupled series tuning. Finds conditions on 1.7 mc. improving, and has been learning many new words from the trawler operators!!

G6MZ is experimenting with new A.C. receiver, using 2-stage H.F. all well-screened.

G6OZ has joined Group 4G. R.E.S., which is interested in the Isobar Theory, and would be pleased to receive reports of any DX worked or heard by Bristol amateurs on 7 mc.—such information for use by this R.E.S. group.

G6RB finds conditions on 3.5 mc. very good for U.S.A. contacts. DX has been worked as early as 23.00 G.M.T. and as late as 09.00 G.M.T. Best DX contacts were: W9, W5, VE3, and VE4, but owing to very bad U.S.A. QRM, no contact has been made yet with W7, although he has been heard there at good QRM. Between midnight and 01.30 G.M.T. on January 10 contact was established with four members of the A.R.R.L. headquarters staff, viz., WISZ, WJFS, WIUE and WBDI, the latter being Handy of Handbook fame. Over 100 contacts have been made across the "pond" since December 9, with W1, 2, 3, 5, 8, 9, VE1, 2, 3, 4, and VOS.

G6TO has been rebuilding his transmitters on to metal chassis, and has tried out link-coupling with excellent results. Has designed a "capacity" key for absorption or F.D. keying, and can work at all hours 100 per cent. clear of B.C.L. trouble. G6VF has built new 0-VSG-1 receiver which gives less "background," and puts another two to three R strength signals received, enabling him to work W1, 2, 3, 4 on 7 mc. consistently.

G6YA inactive regarding operating, but doing much experimental work; he has just completed a very nice 50 watt R.C. push-pull Modulator which works well. Is continuing Microphone-research with investigations on the Olson Ribbon (Velocity) Mike. (BULLETIN article, please, O.M.—Ed.) 2BHI is completely rebuilding all gear and making general preparations for obtaining a full "ticket."

2BYH is constructing a three-stage C.C. outfit with a push-pull P.A., also building an 18-valve S.S. Super for mains operation of his own design! Reports hearing W5BCF, W5CO, and W1A1D, all on telephony on the 1.7 mc. band at 03.00 G.M.T. on December 23.

BRS689 has redesigned and rebuilt his receiver for B.E.R.U. BRS1432 is trying out aerial systems, and building a new receiver.

The Oxfordshire C.R. reports activity has been well maintained, most stations reporting active in one way or another. Several members of the Oxford Short-Wave Radio Club attended the January meeting of the Reading T. & R. Club, which was enjoyed by all.

It is hoped to arrange a meeting in Oxford about the middle of February, and the Reading group have been invited to attend. With the coming of the better weather, it is hoped that co-operation between these two groups can be arranged in the matter of field days, five metre portable working, etc., to the mutual benefit of all.

The C.R., Mr. H. J. Long, G5LO, has been the recipient of a letter of thanks and some excellent

DISTRICT CALENDAR

February/March, 1935

- Feb. 19.—District 16 (North Kent section), 8 p.m., at G5LB, 45, Monivea Road, Beckenham.
- Feb. 19.—District 12, 7.30 p.m., Ark Café, Temple Fortune, Golders Green. "Questions and Answers" night.
- Feb. 20.—District 1 (Liverpool section), talk by G2RF on "Suppressor Grid Modulation," followed by an inspection of his transmitter.
- Feb. 20.—District 13, 8.30 p.m., at G6HP, 12, Hillcrest Road, Sydenham.
- Feb. 20.—District 15, 7.30 p.m., at G2UV, 143, Abbots Drive, Wembley. Nearest station, Sudbury Town, or Bus No. 18. "Questions and Answers" night.
- Feb. 26.—District 14 (East London Section), 7.30 p.m., at BRS207, Percy House, 2, Ramsay Road, Forest Gate, E.7. (near Thatched House).
- Feb. 27.—District 14 (Essex Section), 7.30 p.m., at G6IF, 115, Hadleigh Road, Leigh-on-Sea.
- Mar. 3.—District 7, 2.30 p.m., "Tumble Down Dick" Hotel, Farnborough, Hants.
- Mar. 6.—District 1 (Manchester section), 7.30 p.m., at Brookes' Café, 1, Hilton Street, off Oldham Street, Manchester.
- Mar. 7.—District 5, 7.45 p.m. at Full Moon Hotel, Bristol.
- Mar. 16-17.—District 14. Field Days, Rookwood Hall, Abbess Roothing, near Ongar.
- Mar. 17.—District 11, 6 p.m., at G6IW. Talk by G2RF on "QRP Telephony transmitters."

on all hands. Is handicapped by lack of time and poor facilities for transmission—the aerial question being the difficulty. Hopes to shortly move to another QRA more suitable for radio activities, is, however, keeping a schedule on 1.7 mc. with G5WU, Penarth.

G6JG has completed his S.S. Super, using 126 kc. intermediate frequency, and reports same more selective than the 460 kc. Using X21 Heptode as frequency-changer, finds anode and screen voltage very critical on 14 mc. band. This receiver, although a great advantage on 1.7 and 3.5 mc.,

photographs from Mr. John Grierson for his co-operation during his Arctic Air Route flight last summer.

Most of the Wiltshire members report active, and their letter budget is still a well-supported and interesting one.

DISTRICT 6 (South-Western).

Work and progress in the District seems in the main to be going on very satisfactorily, most members report active and nearly all the amateur bands seem to have their share of support. As far as general district affairs are concerned most of the points aimed at by the D.R. seem to be developing on satisfactory lines. The East Devon Budget is going very well and the members concerned are doing their part in keeping it in motion. We are pleased to report that the C.R. for Somerset and Dorset has launched a Budget for that area and has about ten members on the mailing list. The D.R. appeals to all to forward this book promptly so that it goes the rounds in good time. Any member in the Somerset and Dorset area who is not at present a contributor to this Budget and who would like to join in, is asked to write to the C.R., G6II.

The big fly in the ointment at present is the unsatisfactory state of affairs regarding the West Devon and Cornwall Budget. The C.R. for Devon, G6XD, agreed to take this on and has done his best to push it. But, as on a previous occasion when a budget was tried in the S.W. extremity of England, *someone* will persist in holding it up. Whether it is the same person is not known, but please O.M., if you don't want the Budget, kindly insert a note to that effect and send it along at once. The C.R. will leave your name out of the list then. Surely that's the only decent thing to do. If we could get all three Budgets going along smoothly it would be an excellent thing for the District.

Another of the D.R.'s little dreams seems to be coming true! G5WY has kindly arranged for a first meeting of the Exeter group to take place at his QRA on February 9, in order to fix up a programme of monthly meetings for that town. It is sincerely hoped that the members in Exeter will make a success of these meetings.

With an increase of membership in the Torquay area the D.R. is endeavouring to arrange regular monthly meetings in that town as well. There will be more to report regarding these activities in our next notes.

Now then, Somerset and Cornwall, what are you going to do about it? In regard to individual activities, 5WY and 5QA are still mainly concerned with 14 mc. DX. 5YR was at one time interested in 3.5 fone, but nothing has been heard lately. 5VL is still doing good work on the band, and has been able to keep an 80 per cent. successful sked with VE1EI on 3.5 fone. Having heard rumours that 5GD is putting in a house lighting plant at last, we are looking forward to further activity in that direction. During the month 3.5, 7, 14, and 28 mc. bands have all been used at G5SY, and it is hoped that co-operation will soon be forthcoming for further tests on 28 and 56 mc. The aerial system has changed to the 33 ft. 2BI type in order to make comparisons between this and last year's B.E.R.U. results.

DISTRICT 7 (Southern).

The D.R. apologises for District 7 notes being absent last month, but, in the Christmas rush, they were forgotten until after press day. The December meeting was held at G2NH, and we were fortunate in securing the services of Mr. P. Johnson (G5IS). Mr. Johnson gave a talk on h.f. voltage, and the accompanying demonstration of drawing one inch arcs with a ten-watt 7 mc. oscillator was most interesting. Small "electric motors" driven by h.f. power were also shown, and the Brock's benefit at the end of the demonstration was worth coming miles to see. Our thanks to you once again, 5IS. Thirty members and friends sat down to tea at the local restaurant.

The January meeting was held at Guildford, but the attendance was smaller than usual. The whole afternoon was given over to general discussion, and several knotty problems were settled more or less satisfactorily. It was resolved that all No. 7 District stations who had, or were willing to construct, 28 mc. transmitters, should arrange to be on the air on this frequency every Sunday morning from 10.00 G.M.T. onwards. Several interesting local QSO's have resulted from this decision, and 28 mc. now seems to be definitely on the map in this district.

May 5 has been fixed as the provisional date for our Conventionette, and the venue is to be either Winchester or Southsea, depending on the accommodation available. The D.R. would welcome assistance from any member in these two towns, regarding the accommodation available on this date.

Activity at the moment is somewhat naturally concentrated on the final refurbishing process preparatory to B.E.R.U. and the A.R.R.L. contests, although several stations have found time to carry out experiments with low power suppressor grid modulation. The venue for the next meeting will be found in the District Calendar.

DISTRICT 8 (Home Counties).

The D.R. is pleased to learn of considerable activity in the district. It would seem that the B.E.R.U. contest is responsible for a dozen members discarding their hermit-like existence and coming out into the open for "the junior." Good luck to them.

The St. Ives family is doing well—twins no longer mark you, but a lusty quartet and hopes of still another. G6WA, of this place, is keeping a crystal register for the Hunts. and Cambs. gang.

A welcome spark of life is noted in Bedfordshire: 2AGF, now of Luton, hopes to be on the air before long.

Here is the "active" list: 2RL, 6WA, 6DX, 6XXN, 5RL, 6YP, 5PI, 5VT, 5JO, 6BS, 5FB, 2PI, 2XV, 2AGF, 2AZD, 2ASP, 2ACX, BRS1452.

DISTRICT 9 (East Anglia).

Reports of increased activity from all parts of the District continue to come in; evidently everyone is cleaning things up in preparation for B.E.R.U.

We are glad to note that N.F.D. has been fixed for a week earlier; otherwise we should have been sadly handicapped. The Swaffham site is now more or less certain for our North station, but as yet we have no definite news regarding the South station, as the site which G6BT had in mind will possibly

not be available. The N.F.D. film arrived unexpectedly on January 10, and was shown at G2XS to a small gathering. As the film took but half-an-hour to run through, only those with an easy method of transport were advised as it was not considered that the others would wish to travel so far for so short a time.

Incidentally, No. 9 must be on that film this year, so please chase up friends with a 9 m.m. camera.

G5UF, who decided on the "shack" idea last summer, is not finding the East Coast mist very agreeable to his apparatus. However, he is rebuilding and hopes to be soon on again with a new RX as well. G2MN has now received his 3.5 mc. permit and intends being on that wave very soon.

We hear that something very good is being put together by our Sheringham member, G6ZJ, and hope to be hearing him ere long. Two new BRS members, 1537 and 1603, of Ipswich, report active. G6BT, the Suffolk C.R., is very active; after completing a really good year of DX on 10 watts and under, he started the new year with a ZL contact. We think a chat by him on how he manages this QRP DX would add considerable interest to our next meeting.

G2XS is teaching Morse to a couple of prospective members, and G2JS is again rebuilding.

DISTRICT 10 (South Wales and Monmouth).

Activity has been most marked throughout the District and recent contests have been well supported. G6YJ is to be heartily congratulated on gaining third place in the 3.5 mc. Contest and with 62 points to his credit in the 1.75 mc. event there is every prospect that this excellent effort will attain a higher position in this Contest.

The meeting at Newport on the 17th was well-attended, and we have pleasure in extending a hearty welcome to two new members, Messrs. Sutton, of Cwmarn, and E. A. Hayward, of Cardiff.

The Blackwood Radio Society are to be congratulated on the very successful Hamfest held at the Central Café on the 21st; the R.S.G.B. was represented by 6YJ, 5BI, 6PF, 2BPG, 2JL and Mr. Sutton, who all enjoyed a really jolly evening, terminating with 2JL taking one of the prizes in the draw.

Stations in Newport area reporting active are G5KK, 6YJ, 5FI, 6PF, 2JL, 6GW, 5BP, 2BPG, 2AJL, 2APF and BRS1490.

G5WU and G2XX are now on the active list, the latter having been successful in producing a very fine mike of the Reiz type, which delivers the goods. In the Cardiff area all members are active.

In the Swansea area G2WO is very active on 1.75 mc., and had moderate success in the Contest on this band. G2UL is awaiting confirmation of his final contact to gain W.A.C. G5PH is putting out an excellent signal, but has had no luck in his effort to gain those elusive VK-ZL contacts. 2TY, 5TW, 2BYB, 2BLI, 2AQI are all active, with 2SN having rebuilt his TX now active on 7 mc., and preparing for regular working on 1.75 mc.

G2OP writes to say that Pembroke is not a ham's paradise, but in spite of the absence of facilities he hopes to be on the air shortly.

DISTRICT 11 (North Wales).

The attendance at the meeting held at G6IW, on January 6, was not as well attended as might be

expected, and the D.R. once again appeals for full support from everybody. The members present were G6IW, 2II, 6OK, 2ALX, BRS1156 and 1211, the last named taking up his activities as newly-elected C.R. for Flintshire. After welcoming three visitors from No. 1 District, namely, G2RF, 2BWG and BRS1395, the business was dealt with, it being resolved that future monthly meetings will be held on the third Sunday in the month, in lieu of the first Sunday. (Absent members please note.) The next meeting, therefore, will be held at G2II, on Sunday, February 17.

At the March, May and July meetings, to be held at G6IW, sales of members' surplus gear will take place; it is rumoured that G6IW will be hon. auctioneer, complete with a 2-lb. hammer! Please look through your junk boxes, and don't forget these "Bring and Buy Sales."

G6OK has been doing excellent work with QRP on 1.75 mc., having been given R2 QSA5 at 35 miles, using an input of 0.05 watt to his crystal-controlled pentode oscillator.

DISTRICT 12 (London North).

Activity in the District is much improved, and judging by the results obtained by the few stations who report, a fair amount of activity should be taking place in the B.E.R.U. Contest. G5DV, using 9 watts, has worked ZT (QSA5 R5) on 7 mc.; G5CW has again worked VK; G6WU has had contacts with FB8 and CR7, and has been running schedules with OZ7ESK in North Greenland. G2QY has worked LU on 7 mc. with 10 watts.

At the last District meeting, Mr. S. Lewer (G6LJ) gave an interesting talk on the subject of "Late nights in the early days." During the Business meeting, G5MG appealed to the members in the district to support R.E.S., and already several of those present have volunteered to undertake duties in connection with the 56 mc. groups.

A "Questions and Answers" evening will take place at the Ark Café, on February 19, at 7.30 p.m. Each member is asked to bring along a question on paper, which will be placed in a box to be provided, after which they will be withdrawn and each question discussed separately. No name is to appear on the question paper. It is hoped at this meeting to discuss preliminary details regarding N.F.D.

The dates for forthcoming meetings are as follows:—March 23, April 23, May 18.

DISTRICT 13 (London South).

The first District meeting of the New Year, held on January 16, was an unqualified success, there being an attendance of 30 members. This was a large increase on last month's total, and shows that South London amateurs are very much alive, and very enthusiastic. We should, however, like to draw attention to the fact that only 50 per cent. of those present reported to the D.R.'s, in spite of special requests. What about it, fellows?

Among the subjects which came up for discussion was the forthcoming B.E.R.U. Contest, and we look to the District to make a good show in February. Considerable time was also given to the question of arrangements for National Field Day, and in this connection we should particularly like

to thank those members who came forward with some very useful and concrete suggestions.

Mr. Vickery's 56 mc. circular was also brought to the notice of those present, and it is hoped that the 56 mc. enthusiasts, of whom there are many in South London, will give G5VY their full support and co-operation.

G6QB mentioned that, in spite of talk of much local activity on 1.7 mc., he was the district's sole representative on the band during the R.S.G.B. tests.

The Letter Budget is now on its second round, with 33 contributors, and we trust that everyone will endeavour to pass it on as quickly as possible.

The S.L.D.R.T.S. held its Annual Dinner at Herne Hill, on January 24.

Reports are plentiful again, and are shortened as much as possible. G2AI is now remotely controlled, and has been re-built for B.E.R.U. tests. G2ND is active on 1.7 mc., and thinks conditions are deteriorating. G2GZ has rebuilt TX and RX for B.E.R.U., with great success. G2WV is busy designing his new station, and hopes to start up shortly.

G2FS is also starting afresh, with a "cardboard shack" in his room. G2TH has just finished a new push-pull locked TX. G2YG has been delayed in his rebuild through family sickness. G2UW is active on 1.7 mc., and is getting ready on 7 and 14. G2JB, likewise, is sprucing things up, he recently visited XOH3NQ in the Surrey Docks, and had a fine personal rag-chew.

G5JW has replaced his 15-ft. R.F. link aerial coupling by extending his Zepp. feeders indoors, and is now coupling through a low-pass impedance-matching network; his note has been greatly improved and signals sharpened.

G5GF is building a further three stages of PA and FD to an existing transmitter, in order to try and double down to 56 mc. from a 3.5 mc. crystal! This work will be dropped during B.E.R.U.

G5WS has left for Malta, and hopes to be operating from there shortly. G6AN has reported. G5QN has replaced his famous meat-hook aerial with a superior affair, and is experimenting with Heising modulation. G6CB is improving things for 7 and 14 mc. with 9 watts. G6HM has been working on his RX, and keeps a crystal register.

G6HP has been active on 14 mc., working W6's and VK's, he has put up a new aerial, installed two E.S.U. 40 rectifiers, and improved his receiver. G6QB has developed a sudden craze for 1.7 and 3.5 mc., and is keeping out of the DX people's way for the B.E.R.U., during which he is becoming a B.R.S.! He wants to arrange a District QSO party on 1.7 mc.

2BKT hopes to have a "Ham-Band Two" going very shortly. 2AGW finds conditions poor, and has added an L.F. stage to his O-V-O.

BRS250 has been busy with "band-monitoring," with occasional bursts of DX on 3.5, 7 and 14 mc. On 7 mc. recent DX conditions were excellent, and he logged CR7, FB8, VU, VS6, VS7, VS, VK all districts, KA and ZS between 15.00 and 19.00 G.M.T. Also took part in the "Centenary" contest. BRS1357 is anxious to stand by for tests on 1.7 mc. BRS1417 awaits B.E.R.U. contests with interest. BRS1518 is ex-G5OX, and

finds that his old call is still available; he hopes to be on the air with it soon. BRS1604 reports activity in most bands.

The next District meeting has been arranged for 8.30 p.m., on February 20, at G6HP, and he is prepared for an even greater attendance than in January.

DISTRICT 14 (Eastern).

At a meeting held at 2APS, Ilford, there were ten members in attendance. Another Field Day at Abbess Roothing was arranged for March 16-17 in order to try out gear for N.F.D. A monthly collection for N.F.D. expenses was inaugurated. Will members unable to attend meetings send in donations to the D.R.? At this meeting there was displayed two Portabout RX, one for the 1.7 mc. band and one as used by the police forces; both were demonstrated by G2RR, and it was understood that G6DD was responsible for their construction. It appears that BRS1534, of Dagenham, became lost in transit while vainly trying to find the new QRA of 2APS!

Nineteen members attended the meeting held at G5UK, and the BRS membership were there in force. Various junk was disposed of. G5UK demonstrated television for the first time; those present, however, were not sure whether the Step-Daughters or a row of Belisha Beacons appeared on the screen!

Will members note that the telephone number of G6UT is Silverthorn 2285?

DISTRICT 15 (London West, and Middlesex).

A total of fourteen members travelled the rather awkward journey to Northwood to attend the January meeting.

Owing to the diversity of opinions expressed during the discussion on Station Layout, it was decided that no definite form is possible, and that a choice is governed chiefly by surrounding conditions. In connection with the actual transmitter, there are, it appears, three schools of thought, one which favours rack form, the second vertical, and the third breadboard. Most agree that a protection against dust is almost a necessity.

Junk sales are proving very popular, and each month a few more shillings are added to the District exchequer.

The next meeting will again be a "Questions and Answers" night, and it is to be hoped that everyone will bring at least one question and hand to the D.R. on arrival. Preliminary arrangements for N.F.D. will be discussed. (See Calendar for date and venue of meeting.)

Will active members let the D.R. have a few lines, so that he can include a report of their work in these notes?

Our old friend and C.R. for Middlesex has moved to just outside the district, and as a result he offered to resign his position as C.R. In so doing he made way for someone within the area. He, however, still intends to attach himself to the No. 15, so we are not actually losing him. The D.R. and members of the district thank him for his efforts in the past in keeping the county alive.

We welcome his successor, G6LJ, and the D.R. hopes he will receive every help from the membership.

DISTRICT 16 (South-Eastern).

The 1.7 mc. Contest was well supported in the district. The usual activity continues in the Medway area, G2MI and 5XB are preparing for the B.E.R.U. Contests.

In Folkestone, G2IC has now recovered from his illness, and is back on the active list, having worked his first VK on 14 mc. He is pleased that all Kent sections have reported. G6NC has obtained W.B.E. on 10 watts, the Asiatic contact being YA2U, of Baluchistan, who reported him R6. 2TW is active at Rochdale and has worked his first W on 14 mc. 20F is now active with QRP at Ramsgate. Ex-VU2BM is also at Ramsgate, but his movements are uncertain. The C.R.'s chief lieutenant, 2VI (commonly known as Tim), has gone down with water on the knee, and we wish him a speedy recovery. When 2AZM is not acting as nurse to the various invalids, he is testing with self-excited TX. 6CH, 2BAX and 2GD are active.

G6SY sends a detailed report from Ashford, and good attendances have been recorded at the local meetings.

G2JV, 2KJ and 5QL all report active. Experiments are proceeding in connection with echoes from the moon. 6SY has also been experimenting with directional receiving aerials, and has made the surprising discovery that W6 signals come from the east, which makes them better DX than ZL!

In Dover, G5MR has started television tests. In Beckenham, the last meeting was held at 2HG, when ten members attended. All bands are in use in the district and the B.E.R.U. contests are stimulating interest. "The Ham" is going ahead steadily.

G5OQ reports that Tunbridge Wells is still alive. 2BPJ hopes to have his two-letter call soon. (It makes one wonder who the first G4 or G7 will be!—D.R.) 2BAW has left the District. 2AVN is on 56 mc. 2BFJ and 5OQ have added H.F. stages to their receivers. 5OQ has worked all Europe on 2½ watts.

G2IZ sends a detailed report from Gravesend concerning his own activities. He is experimenting with silvered crystals.

No reports have been received from Sussex for the last two months, except one, direct to the D.R. from BRS1571, who is piling up DX on 7 mc., and has been receiving the B.B.C. television.

The C.R. has compiled a few notes from rumour! G2AX has recently been active on 28 mc., but no results are known by the C.R. G5UY has been active on 14, 7 and 3.5 mc., 5RO is also active. He is using the Collins method of coupling and states that it is very successful.

G5YA has recently been to Spain and has been QRT. 2CF is moving his QRA.

BRS1173 entered the 3.5 and 1.7 mc. contests, and is looking forward to B.E.R.U.

G5JZ has been fitting a lighting plant for the house and shack.

BRS1526 is learning the Morse code. He "push-bikes" nearly 20 miles in order to visit the Heathfield Society. (Enthusiasm!)

The C.R. would be very grateful if the members in the Brighton and Hove Districts would send a report for the next two months. How about it O.M.'s?

DISTRICT 17 (Mid-East).

With the approach of the Contest season, it is good to be able to report that the district as a whole is active. It is sincerely hoped that all members will give their keen support to the various Contests.

Reports from different parts of the district bring interesting accounts of progress being made. G2LR has been experimenting on 7 mc. with a ½ matched impedance aerial with 400 ft. untuned feeders. At first trouble was experienced, owing to there being standing waves on the feeders, but these were eventually removed by eliminating a sharp bend in the feeder system.

G5BD reports conditions very poor on 14 mc., but says that he has had good QSO's on 7 mc., with KA1EE, ZL and VU. G5CY has been turning out some very nice phone on 7 mc., but has not succeeded in raising any DX on that band.

2BQR, who has been building a single-signal superhet, has been forced to give up the attempt, as he found the signal-noise ratio too high. He is now using S.G.-S.G., Det.-L.F. BRS1590 sends in his first report. He is still at school and has built a 1-v-1 for CW and a five-valve superhet for telephony. Good man!

BRS1487 is still concentrating on his Morse, and also reports that G6AK is now on the air again, and that G6RN is busy getting together his power pack. G2QH has been putting out some very nice telephony.

G5XL is now back on the air again and has resumed his skeds with G2LR. G6GH has managed to erect an outdoor aerial in a very difficult location. Tests with a field strength measurer proved that the effective height was unfortunately not so great as the apparent height! He has had surprisingly good results with a CO-FD and an indoor aerial, and has now worked SU on 14 mc. with this combination.

G6LH is now CO-FD-PA, but conditions on 14 mc. have not given much opportunity of testing it. On 7 mc. he has worked SU.

The next summer should see a good deal of 56 mc. work in South Lincolnshire. G2LR and G6AC promise their co-operation.

DISTRICT 18 (East Yorkshire).

G5GI is building a C.O.F.D. Push-pull P.A. 2AMM is constructing P.A. equipment with 1,000 volt power supply. BRS1316 is listening on 3.5 mc. and 1.7 mc. and reports fair conditions. G5AX has worked 15 countries on 7 and 14 mc. and is now rebuilding. BRS1321 is experimenting with 56 mc. gear. BRS1480 has heard VE1EI, W1AW and WIHAV on 3.5 mc. tone. BRS1420 has built a 2v. mains RX and 5 watt Amplifier. G2TK has nearly finished his new TX. 2AUN is rebuilding his Television apparatus.

The Scarborough Short Wave Club has decided to apply for licence facilities.

G5VO entirely rebuilt his transmitter on an aluminium chassis and is now testing out a S.S. Super built with the aid of 2APU.

G6UJ did well, but not quite well enough, in his efforts to bring the 1.7 mc. Trophy to our District, and is to be congratulated on a good show.

G6OO is preparing to remove to a new and larger residence where he should be installed by the end

of February. Unfortunately, this interferes with entering the B.E.R.U. Contests, his new QRA is to be found elsewhere in this issue.

G2QO reports bad conditions on 7 and 14 mc. He is proposing to install a S.S. Superhet owing to interference from local stations. G5BP (ex-2BPY) has now obtained his full call and is running an 8-watt schedule with U.S.A. and getting consistent QSA5 reports. He is testing a UX210 in the final stage.

Mr. H. N. D. Bailey is to be congratulated on recently passing the Inter B.Sc. examination at such an early age. G5CC has now worked W and RV on QRP and is preparing for the B.E.R.U. Contest. G6OY is once more preparing his gear for 28 mc. operation and is considering using a 14 mc. crystal with new valve for the C.O. A new receiver is being built using valve base coils.

2AVR has been busy with really stable M.O.'s and obtains best results from a push-pull Colpitts, using a high C tank circuit; he feeds to the A.A. with link coupling. He is using a Pen R.F. stage in his receiver with good results.

G5FV has had trouble with his power transformer, but is on the air again and getting ready for the B.E.R.U. Contest.

The 56 mc. Circular was read at the Hull Meeting, but so far there has been no response.

SCOTLAND

January has seen us make quite a brisk start, and the following changes of status took place during the month:

2BMY, Mr. Kerr, of Glasgow, is now fully licensed as G5KX, and 2AXM, Mr. Winton, of Larbert, as G6XW, while Mr. Tyre, 2AMY, of Glasgow, awaits the G.P.O. verdict.

There has also been much movement among the BRS men, and the following "AA" calls have been allocated:

2AGM to Mr. Blyth, of Edinburgh, BRS1410; 2AXG to Mr. Lamb, of Stranraer, BRS1466; 2BXD to Mr. Ingle, of Edinburgh, BRS1379; while the following await word from the G.P.O.: BRS1300 Glasgow, BRS1609 Edinburgh, BRS1342 Glasgow, and BRS1446 Greenock.

Now, as a famous worthy once said: "This 'ere progress, it goes on," and that is quite all right, but what about filling those gaps in the BRS ranks? I would comment this thought particularly to the District Officers of C. and D. Districts, where the BRS contingent is now decidedly below strength, also bearing in mind the fact that recruits are more easily made and held while the social activities of the various districts is at its height. In this connection I might add that all applications for membership should be sent to Scottish Headquarters for registration before they are transmitted to London.

We have recently been approached from several quarters with a request that Fifeshire should be transferred from "C" District to "D" District, the grounds for the request being that certain Fifeshire members find it much easier to reach Edinburgh, which is the focal point of "D" District, than to travel to Dundee for the "C" District meetings. There is certainly something to be said for the change, but it would be manifestly unfair

to isolate the Northern Fifeshire members in towns such as St. Andrews, East Newport, etc., from Dundee, in order that those in Southern Fifeshire might benefit from Edinburgh facilities. A compromise may, however, be arranged, and we shall have something further to say on the subject next month.

The recent 1.7 mc. Contest attracted what is perhaps the largest Contest entry ever made from Scotland. The following stations took part, and the scores are given in parenthesis following the call-sign: G6IZ (59), G6FN (54), G5ZX (34), G6MF (27), G6IN (27), G2OX (22), G6ZX (15). We personally "observed" the battle from the RX end, and can only say that 7 mc. on a Sunday forenoon is "peace, perfect peace" compared to 1.7 mc. on the occasion of a Contest.

Gentlemen, we commend your courage—and your ear-drums!!

Prospects for a large entry for the B.E.R.U. Contest appear to be very good, and we understand that quite a number of QRP men are included.

While on the subject of QRP, a recent performance of newly-licensed G6RI deserves comment. With an 8-watt outfit and a "mongrel" aerial, he, on practically what was his second week-end on the air, worked W2, W3, W8, and VE1, this giving him a total of three continents, 23 countries in that brief period—no mean performance.

In the matter of District Meetings, "A" District recently had a "hat" night, which proved very entertaining, if hardly informative. "D" had its mid-season supper on January 16, when a most enjoyable evening was spent. News of a recent Meeting in "C" also reaches us indirectly, but at time of writing we have no direct report from Mr. Allen.

"B" District has been prolific in recruits this month, but we would draw Mr. Laing's attention to the fact that there is not a single "A.A." permit in the District, and that "B" is the only District with this distinction. "B" had its first meeting for the year on January 18, when there was a good turn-out. G5LG and G2OX in this District are now licensed for 3.5 mc.

Now we conclude with a question directed particularly at A.A. and fully-licensed men. Do you keep a proper log? If you don't, just take a few moments to read over the terms of your G.P.O. licences. This is *not* an idle question. It is the outcome of knowledge that the G.P.O. are taking more interest in logs than formerly. Ughuh! Guess that makes your collar sit uneasily!

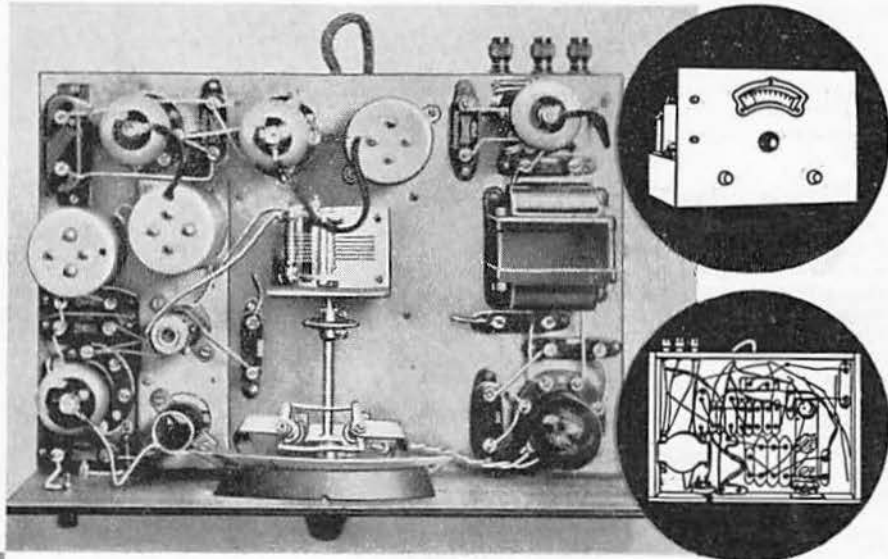
Northern Ireland.

National Field Day has now been fixed for the week-end of June 1 and 2 next. Will those members who desire to assist advise the D.R. as soon as possible, in order that the necessary arrangements may be put in hand.

Last year's N.F.D. film was screened at the R.T.U. meeting on February 2.

BRS1414 has disposed of his two-valve receiver and is to build a single signal. G12CN is on the air again after a long absence. Mr. Fenwick is now 2ASB. 6YW is again suffering from "B.E.R.U.-itis," his H.T. transformer having gone "phut!"

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B.E.R.U. NOTES AND NEWS

Australia

By VK2HC via ZL4AI and G5YH.

General conditions for DX on 14 mc. were good on most days during January, especially around 12.00 G.M.T., when Europeans were heard and worked consistently. The 7 mc. band was only fair between 14.00 and 20.00 G.M.T.

Results on 28 mc. were not equal to those recorded during December. Numerous contacts took place, but, generally speaking, low pressure systems which are favourable for work on this band have cleared.

Indications point to a good entry in the B.E.R.U. Contest.

Canada (Third District).

By VE3WA via G6NJ.

Conditions have been very poor on 14 mc. for G, but the excellent volume of South African stations makes it likely that many contacts will be made from this district in the B.E.R.U. tests. The Frontier Radio Club of Windsor expects to enter National Field Day Contest next June. VP5PZ arranged sked for VE3WA with VU2CD, in order to get W.B.E.; VU2CD heard VE3WA R3, but nil at VE3WA.

Ceylon.

By VS7GJ.

VU2CQ, with his awful band spread, is spoiling reception on 7 mc. Many local members are complaining bitterly of this interference, which has also been reported from North India. VU2CQ, if this meets your eye—please think of others.

Egypt.

By SU1EC, via G6WY.

Absence of notes last month is regretted, the lapse was due to unavoidable circumstances. Conditions seem quite normal for this time of the year; plenty of DX, but not an excessive amount. Conditions look promising for the B.E.R.U. tests, and I sincerely hope that the air is not cluttered up by continual phone—a most improbable state. Egypt will have four or five participants in the tests.

The R.S.T. system has caused a controversial argument, probably the case in most countries. Great credit is due to Arthur Braaten for a sound attempt to break away from the stereotyped, and in many cases, misleading report system. But the writer is of the definite opinion that the old system if used sensibly and intelligently is adequate.

SU1CH is active and has added a preselector to his FBX receiver and runs nightly schedules with W. SU1EC took a semi-portable out for a ten days' motor expedition into the Desert, and satisfactory communications were maintained nightly with Cairo. SU6HL is almost QRT; he leaves for England shortly; the greater part of his gear has already left. SU1RO is working daily English schedules at 11.00 G.M.T.

SU1KG, SU1TM, SU1SG, SU1FS and SU2GA are all active. SU5NK also has been active, and hopes to participate in B.E.R.U.

Hong Kong

By VS6AX, via ZL4AI and G5YH.

The 14 mc. band was little used during January, and on 7 mc. conditions were very erratic with periods of bad static. Rapid fading has been experienced during European QSO's. KA1OR has been active on 7,200 kc. with an input of 60 watts, but reports conditions poor. On December 21, VS6AL, President H.A.R.T.S., gave a Hamfest which was attended by all VS6 amateurs. VS6AX and AS have been experimenting with a Collins antenna tuning system. VS6 stations are looking forward with keenness to the B.E.R.U. Contest. Active stations are 6AX, 6AH, 6AQ, 6AS, KA1OR.

Jamaica.

By VP5MK, via VP5PZ, SU6HL and G6ZR

Interference from American stations appears to be getting worse on all bands. VP5PA is using telephony on 14 mc. and has two new transmitters and a Comet Pro. VP5AC has erected two 50 ft. masts and a new antenna system; he hopes to be working soon. VP5PZ and W8CRA have worked all continents three ways, making first three-way W.A.C. contacts with VK2XU, W6BIP, J2GX, G6TT, HC2MO and SU6HL. All members in Jamaica are looking forward to the B.E.R.U. Contest.

Malta.

By BERS201, via ZB1E and G6WY.

The following is a résumé of conditions between December 20 and January 20. Reception of DX has still further improved on both 7 and 14 mc. bands. Excellent conditions were observed on 14 mc. for all-round Morse between 15.30 and 19.00 G.M.T. on December 24, January 1 to 7, and again from 16th to 18th; most other days QRN was troublesome. Similar excellent periods on 7 mc. were observed between 19.30 and 21.00 G.M.T. on December 28 to January 7, and on 12th to 20th. This band has, however, fallen off in the early mornings at the time of writing, DX being absent most days after 08.00 G.M.T. Signals have been coming over much better from VE on 14 mc., but no DX has been heard on 3.5 mc., and heavy QRN has prevailed most nights on this band.

BERS209 is awaiting his ZB1 call and hopes to be on in time to enter the B.E.R.U. Contests. The only reports to hand this month are from ZB1E and BERS209.

New Zealand.

By ZL2OV, via ZL2CI, 4AI and G5YH.

N.Z.A.R.T. members extend their greetings and best wishes for 1935 to all readers of the T. & R. BULLETIN.

With a view to co-operating to a greater extent with the B.E.R.U. Societies, a general appeal has been made for all ZL amateurs to refrain from operating their stations in the band of frequencies from 7,125 to 7,175 kc., and in particular to keep off the frequencies used by G5YH and G6WY.

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N.Z.A.R.T. Headquarters have been transferred to Wellington this year, and at the Annual Convention, which was held recently, members and supporters came from all parts of the Dominion. One of the most important subjects discussed at the business meeting was the forthcoming Cairo International Conference, and the solidifying of N.Z.A.R.T.'s international relationships. The question of checking commercial stations operating in bands fit for amateur use was also dealt with, and a recommendation made that the incoming Council should set up a Committee to investigate this important matter.

I have pleasure in advising that the Executive Committee of N.Z.A.R.T. have confirmed the appointment of Mr. Wilson (ZL2CI) as an official B.E.R.U. sub-Representative for New Zealand. District Representatives are being considered by the Association.

Northern and Southern Rhodesia

By ZE1JE, via ZE1JF, ZS1H, SU1EC and G6WY.

Return of DX is reported on 14 mc. in spite of frequent thunderstorms and abnormal rains, and at times terrific QRN. 7 mc. is unreliable, except for local and African traffic.

An attempt is being made to organise a Rhodesian Radio Society, but beyond the formation of a local unit in Salisbury, very little progress is reported, which is regretted.

Great interest is being taken in the B.E.R.U. Contests this year, according to the number of stations that intend to compete. Congratulations are extended to ZE1JF, who has qualified for W.B.E. certificate with a VE QSO. He only requires the same Continent to be W.B.E. on phone. ZE1JM is active on low power, and ZE1JO, who is now QRO, has several QSO's to his credit. Both these stations will be taking part in the B.E.R.U. Contest.

South Africa

By ZT6X via ZS1H, SU6HL and G2IM.

Conditions have greatly improved on the 14 and 7 mc. bands, and VE and VKs are coming through very well. A number of South African amateurs are putting out very good Class B fone, and from DX reports received their signals should be easily heard in the United Kingdom. Reports would be greatly appreciated. In the Cape area, W's are prominent on 14 mc., while a few of the rare ZLs have been either heard or worked. These include ZL4BQ, 2BZ, 4BT, 3AJ and 3DW. Judging from the number of stations who are redesigning their outfits, the coming B.E.R.U. Contest should prove very popular in South Africa.

Southern India.

By VU2JP, via VP5PZ, SU6HL and G6ZR.

VU7AB is again the only station to report in South India; he is trying to solve the H.T. problem by means of a battery and Ford spark coil! VU2JB has obtained a fair amount of DX on 14 mc. and a little on 7, but owing to bad QRM had to stop his daily schedules with VP5PZ. Letter budget information has been scarce, due to the Christmas

festivities, but it is hoped that the new year will bring renewed enthusiasm and that members will report regularly and so keep up interest. The success of the letter budget depends entirely upon the support given by local members. Telephony transmissions appear to be on the increase and in several cases flat tuning is responsible for excessive interference.

THE FIRST NEWFOUNDLAND AMATEUR RADIO CONVENTION

By J. MOORE (VOSAW).

MONDAY, November 12, 1934, will be remembered as a red letter day amongst VO amateurs, for it was on that day that our first Convention was held, the venue being the Newfoundland Hotel, St. John's. Present were: VOSH, 8W, 8A, SHK, SZ and the writer.

Early in the day visits were made to VON, Signal Hill, and to VONF. At the former historic site two neat and efficient transmitters (one operating with an input of 100 and the other with 500 watts) were demonstrated by Mr. Myrick. Of interest also was the D.F. gear, so simple to operate but a nightmare to wire.

At VONF Mr. Butler explained the new medium power B.C. transmitter, and showed as a *piece de resistance* the big water-cooled valve which requires 748 watts to heat its filament.

Visits were then made to the amateur stations VOSA, 8W, SH and SHK, a most pleasurable proceeding, especially for the writer, who, through living 70 miles from St. John's, has to depend upon fists rather than faces for his amateur radio pleasures.

Chief interest centred around the rack and panel c.c. transmitter at VOSA, the fly power gear at 8W, the famous portable and new Collins 32B at SH and the fine 50-watter at SHK. At the latter station a message of greeting was received from 8Y, who was unable to join us.

The Convention concluded with a dinner, at which the Hon. T. Lodge and Mr. C. F. Hunt were the guests. During the evening VOSH gave a résumé of amateur activities, and supplied answers to numerous queries. The souvenir programmes were religiously autographed and a 210 valve donated by Messrs. Charles Hutton, found its way into the shack of VOSAW as the result of a lucky number draw.

At the business meeting it was decided to form the Newfoundland Amateur Radio Association, and the following officers were elected:—

President, Mr. J. Moore, VOSAW.

Vice-President, Mr. E. V. Jerrett, VOSH.

Secretary-Treasurer, Mr. E. Holden, VOIH.

A constitution and set of bye-laws are being drafted for submission to the membership. We hope this brief account of an enjoyable day will interest our many friends abroad.

Unlicensed Transmissions

Mr. McCormick (G2MC), reports that his call has been pirated by a station working on 14 mc.

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and MODERN TELEVISION

Monthly

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MARCH

NUMBER

on sale Feb. 22.

Published by George Newnes, Ltd.

EDITORIAL.—(Continued from page 279).

This issue contains an account of the sterling work affected by the Band Occupancy Check Group. The checking of the amateur bands provides excellent training for one seeking a transmitting licence, and we have no doubt that many of our newer members would find in this work a means of improving their knowledge of amateur radio procedure.

THE NATURAL FREQUENCIES OF AERIAL WIRES.—Continued from page 288.

In the case of the full-wave aerial however, it is to be observed that one half generally feeds through the other, that is one tuned circuit feeding through another, and in this case the reactance rises, or the current drops, much more rapidly. Also, the figure for the radiation resistance, 93 ohms really applies to the whole system, although it refers to a current on one loop. Now we know from coupled circuits theory that at optimum coupling, i.e., when the energy in each is the same, that one circuit appears to have twice its normal resistance. The two halves of the aerial will thus be much sharper than a single half wave as they will be like two circuits of about the same Z_0 , but only 46 ohms resistance instead of 73. Add to this the fact that the reactance goes off about twice as fast, and it will readily be appreciated why the 7-14 mc. Window is very critical on 14 mc. and will not "walk about the band" successfully. It is therefore standard practice to adjust the Window carefully on the full-wave frequency, and let it look after itself on the half wave, where the damping and effect of detuning cause no appreciable difficulty.

APPENDIX.

Reactance of a Circuit Slightly off Tune.

$$\text{At any frequency } X = \omega L - \frac{1}{\omega C}$$

$$\text{At the resonant frequency } \omega_0^2 LC = 1 \text{ or } \frac{1}{C} = \omega_0^2 L$$

$$\therefore \text{At any frequency } X = \omega L - \frac{\omega_0^2 L}{\omega}$$

$$\text{and putting } \omega = \omega_0 + \delta\omega$$

$$X = L \left(\omega_0 + \delta\omega - \frac{\omega_0^2}{\omega_0 + \delta\omega} \right)$$

$$= L \left(\omega_0 + \delta\omega - \frac{\omega_0}{1 + \delta\omega/\omega_0} \right)$$

and as $\delta\omega/\omega_0$ is small, we may approximate and write

$$\omega_0(1 - \delta\omega/\omega_0) \text{ instead of } \omega_0/(1 + \delta\omega/\omega_0)$$

$$\text{So } X = L[\omega_0 + \delta\omega - (\omega_0 - \delta\omega)]$$

$$= 2\delta\omega L$$

A.R.R.L. DX. CONTEST.—

Continued from page 299.

- (2) The use of R.S.T. where full reports of signals are made (as suggested after last year's Contest).
- (3) The NON use of "CQ" by W/VE stations. *Verb sap.*

New Calls for Newfoundland Amateurs.

Our representative, Mr. E. Holden, sends us the following information relative to VO calls:—

DISTRICTS.

- No. 1. City of St. John's within the municipal limits.
- No. 2. All stations outside District No. 1, and located South of Lat. 49 and West of Long. 56.
- No. 3. All stations located North of Lat. 49 and East of Long. 56.
- No. 4. All stations located South of Lat. 49 and West of Long. 56.
- No. 5. All stations located North of Lat. 49 and West of Long. 56.
- No. 6. All stations located in Newfoundland, Labrador.

CALLS AS AT DECEMBER 15, 1934.

Old Call.	New Call.	Name.	Address.
VO8B	VO1B	Stevens, Clifford	Radio Bldg., New Gower Street, St. John's.
VO8H	VO1H	Holden, E.S.	Box 650, St. John's.
VO8HK	VO1P	Hayward, Ellis	46, Rennie's Mill Rd., St. John's.
VO8W	VO1W	Mitchell, Clarence	17, Long's Hill, St. John's.
VO8X	VO1X	Hutton, Hubert	58, Cochran Street, St. John's.
VO8AW	VO2J	Moore, Jr., James	Carbonear, Conception Bay.
VO8O	VO2O	Burke, A. J.	Terrenceville, Fortune Bay.
VO8S	VO2S	St. Croix, Rev. S.	St. Alban's, Bay D'Espoir.
VO8Z	VO2Z	Jerrett, E. V.	Brigus, Conception Bay.
VO8AE	VO3R	International Grenfell Ass.	St. Anthony.
VO8K	VO4K	Kerwan, Rev. J. F.	Port au Port.
VO8Y	VO4Y	Stansfield, A. R.	Corner Brook.
VO8WG	VO6Q	Paddon, Dr. H. L.	North-West River, Labrador.

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The photograph shows Kenneth Jowers at work on his recently designed receiver the "Quartz-crystal Super."

