THE T. & R.

BULLETIN

THE INC. RADIO SOCIETY OF GT. BRITAIN

AND THE BRITISH EMPIRE RADIO UNION

Vol. 10 No. 10 APRIL, 1935 (Copyright) Price 1/6

THE INCORPORATED
RADIO SOCIETY of GREAT BRITAIN

HEADQUARTERS:

BRITISH EMPIRE RADIO UNION

53, VICTORIA STREET, LONDON, S.W.1 'Phone: Victoria 4412

THE T. & R. BULLETIN

CONTENTS.

	Page
Editorial	363
The Measurement of Ultra High Frequencies	364
Aerial Matching Networks as Applied to Amateur Transmitters	369
Recent 56 MC. Work in Australia	374
Five Metre Work in Winter	375
Soliloquies from the Shack	376
Book Reviews	377
Trade Notices	378
New Valves Reviewed	379
Correspondence	380
Research and Experimental Section	382
Hic et Ubique	385
Midland Provincial Meeting	389
Notes and News from the British Isles	390
Around the Empire	400

Honorary Editor :—
H. Bevan Swift (G2TI)

Advertising Manager :—
Horace Freeman, Esq.

Vol. 10

No. 10

THE MARCH OF TIME

A YEAR has now elapsed since we first announced the formation of the Research and Experimental Section. Anniversaries provide an excellent excuse for drawing attention to a particular subject, but we do not, in this instance, feel that excuses are necessary, for the work of R.E.S. is, and should always be, a matter for discussion whenever the need arises.

We hope in this review to show where the section has progressed, and to draw attention to those features which we consider have stunted its growth.

The decision to form an R.E.S. section was made after a careful study of the work achieved by the old Contact Bureau Section, it having become apparent that most of the published accounts of members' activities had a second-hand flavour about them. It was felt that a complete reorganisation might perhaps bring with it new and original lines of thought, and up to a point that hope has been justified, but there is still much to be done if the Section is to assume a leadership in the world of amateur radio.

Our R.E.S. Manager has addressed some frank remarks to his colleagues in the Editorial which prefaces his current set of notes, and we should be lacking in appreciation of his difficulties if we failed to focus attention upon them. The quality of the material sent in by Group members has in general fallen rather below the standard we confidently hoped would be reached under the new regime. The reason is not easy to seek, but on consideration we think that a certain share of the responsibility lies upon the shoulders of those who have the greatest interest in the section. This may appear to be an ambiguous statement, but a word of explanation will make the comment clearer. There has, right from the earliest days of the T. & R. BULLETIN, been a feeling that members like to see their call-signs in print, and it is this fact which has contributed in no small measure to the partial disapproval, by some, of collective notes. Group Managers, like District Representatives have felt it a bounden duty to mention the call-signs of all who have written in to them, and as a consequence many of the reports have been but a recital of trivialities which have no general interest to the majority of readers.

As far as R.E.S. notes are concerned, we are of the opinion that nothing should be published therein that is not an advance on existing knowledge. We realise that such an ideal is hard of attainment, but is it not better that the section should aim high than continue to record the work of mere copyists ?

We have been gratified to observe that on two recent occasions R.E.S. contributions have been reprinted in contemporary journals outside Great Britain. This recognition is encouraging to the authors themselves, and to those who have assisted them in their experiments, but

(*Continued on page* 404.)

THE MEASUREMENT OF ULTRA-HIGH FREQUENCIES.

By A. H. Bruce (G5BB) *

NOW that more and more interest is being shown in ultra-high frequency work the time seems opportune to present some information relating to the measurement of ultra-high frequency transmissions.

Way back in the old days harmonics from known stations enabled us to calibrate simple types of wavemeters, but we had but to miss one harmonic to destroy an evening's work. Ultra-shorts have permitted us to substitute the harmonic method of calibration for the lecher-wire system. Certain amateurs with the room available have in the past installed lecher wires for calibrating wavemeters working around 20 metres, but these instances have been exceptional. A 5-metre system is, however, practical, and can be constructed in almost any suburban garden.

It is the purpose of this article to describe the construction of such a system and to give details of a wavemeter of the absorption type. This will be followed by information showing how accurate measurements can be obtained by the use of simple gear in conjunction with a lecher-wire system.

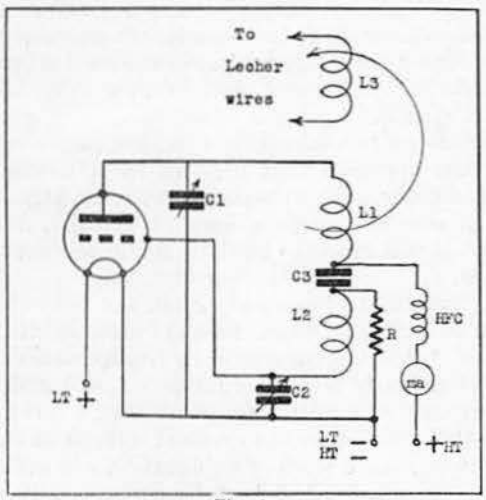


Fig. 1.
The split Colpitt's circuit used by the author.
C.1.—.000030 mfd. *L.1. 1 turn 3-16 in. copper tube 2¾-n diameter.*
C.2. .000030 mfd.
C.3. .005 mfd. Mica. *L.2. Ditto.*
R. To suit valve. *L.3. Ditto.*
H.F.C. ½-wave choke.

The apparatus required consists of a stable oscillator, a lecher-wire system, a good moving-coil milliammeter (preferably one with an 8-in. scale), and a " magic wand " consisting of a 6-in. length of No. 8 s.w.g. wire mounted on the end of a stick 3 ft. long.

The Oscillator.

After testing several types the split Colpitt's circuit shown in Fig. 1 was adopted. Rigid components are essential, for once oscillation commences it should remain constant at the frequency to which the circuit is tuned. This is most important, for the accuracy of measurements will depend to a very large extent upon the rigidity of the job. The valve used can be of the 2-volt super-power class providing it has a low inter-electrode capacity. It is hardly necessary to add that the oscillator condensers should be fitted with extension handles, as it is desirable to work as far away from the oscillator as possible when changing wavelength.

The Wavemeter.

The earliest 56-mc. wavemeter used by the author was calibrated by the harmonic method, and it is of interest to record that recent checks show that it was substantially correct, although it must be admitted that we were never able to state with certainty the exact wavelength of a specific transmission. With a meter calibrated against lecher wires this information can be given with a high degree of accuracy. Given a good wavemeter one realises now how very flatly tuned were some of our earlier transmitters. As a case in point we found recently that the spread from an old transmitter amounted to as much as 200 kc., a point that mattered little at the time the transmitter was built, but its use to-day would be subject to criticism.

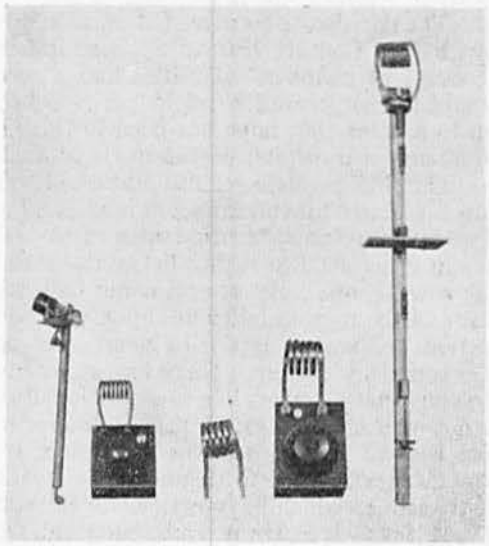


Fig. 2.
Group of meters described by the author. Reading from left to right: (1) early type, using valve-base coil and condenser mounted on dowel stick; (2) small meter 8 turns 1-in. diameter coil (80° spread 5.00 to 5.40 metres); (3) standard meter with 2 5-turn coils (180° spread 5.00 to 5.40 metres); (4) cross-bow meter (dial calibrated every .025 metre from 5.00 to 5.40 metres, spread approximately 140°). No. 1 constructed in 1930, No. 2 in 1933, Nos. 3 and 4 in 1935

VK and W2 Contacts on 28MC.

*Member of 56 mc. Groups of R.E.S.

The wavemeters used by the writer have from the earliest days been of the absorption type with flash-lamp bulb. For various reasons these have been preferred to a monitor, a thermo-couple or hot wire type of meter. The writer is of the opinion that a monitor working on ultra-high frequencies is difficult to tune for direct calibration, whilst expense and added capacity are the main reasons for not using the other two types.

The first meter constructed was fitted to the end of a piece of dowel rod and consisted of a three-turn coil (wound on a valve base), a small variable condenser and a bulb, with a fixed dial on which were marked eight divisions, the centre of the dial indicating the centre of the 56-mc. band. This meter is shown to the left of the group of meters in Fig. 2.

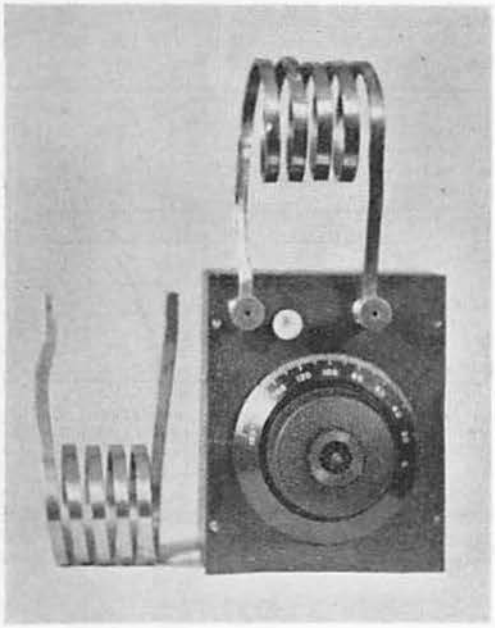


Fig. 3.
Standard check meter giving a band spread of 180°. Coil fitted to meter is slightly wider spaced between turns, and legs are ½in. shorter. This coil tunes high-frequency end of band.

As time went on it was considered that some greater degree of accuracy was called for, consequently another meter of the more conventional type was built, using an air-spaced coil of eight turns No. 12 s.w.g. wire 1 in. in diameter. This gave a band spread of approximately 80°, or 50 kilocycles per degree, on the dial, and this was calibrated against lecher-wire measurements. The particular meter is shown in Fig. 2, and is the second from the left. The graph obtained using this meter is shown in Fig. 10. These calibrations were taken two years ago and checked again in 1935, and it is interesting to note that they showed no variation. It should be mentioned, however, that the meter had been carefully used throughout the time.

As the popularity of the 56-mc. band increased, and with it the number of transmissions, it was decided that greater band spread would be an advantage, and as a result the writer set out to obtain a 20 *kc. separation per degree.* In so doing he was made to realise what infinitely small capacities are used for these high frequencies!

It was finally decided that two meters should be built, one as a standard and the other for general purposes. The latter was mounted on a stick in order to reduce body capacity effects when checking the transmitter or the receiver.

Construction.

The method of constructing the standard meter will be seen from the photographs, Figs. 3 and 4. This meter covers a band from 5.00 metres to 5.40 metres using two substantially built air-spaced coils, five turns each. The coils are made from copper strip ¼ in. by ⅛ in., and are wound on a 2-in. diameter former, but owing to the spring in the metal the final inside diameter is 2, 3/16 in. One coil is half an inch shorter in each connection prong, and is spaced slightly wider between turns than the other. The spacing is carried out afterwards when arranging the final calibrations, a point which is well worth the time and patience involved in order to obtain a proper band spread. The larger coil has a 2½-in. leg and the smaller a 2-in. leg. The circuit used is not illustrated, for the reason that it is the usual arrangement of coil, condenser and lamp in series. The connections inside the meter are made with ¼-in. by 1/32-in. copper strip, and the lengths are of importance. A 2-in. length goes from the fixed vane of the condenser to one terminal, a 2¼-in. length from the moving vane to the bulb holder, and a ¼-in. length from the bulb to the other terminal.

The Condenser.

This is made up of one fixed and one moving vane. The distance from the ebonite panel to the moving vane is ⅜ in., and the space between the moving and fixed vanes is 9/16 in. Fig. 5 shows the actual size of the vanes used. Two condensers in series and in parallel have been tried, but it was found preferable to use only one very small variable condenser in order to reduce

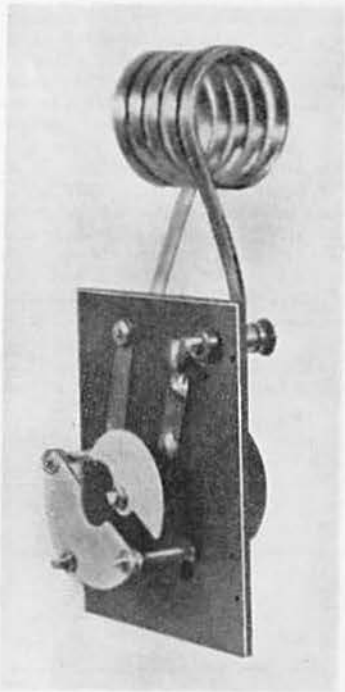


Fig. 4.
Rear view of standard check meter showing method of mounting.

See Flash on page 392.

capacity effects in the wiring, even so body capacity affects this meter. A geared dial was fitted which can easily be rotated by means of an extension handle; the dial at present in use, although reliable, is somewhat old, and therefore a *Utility* or *Igranic* dial would probably be more suitable for this instrument, which, by the way, could be used for 112 mc. work by merely changing the coil.

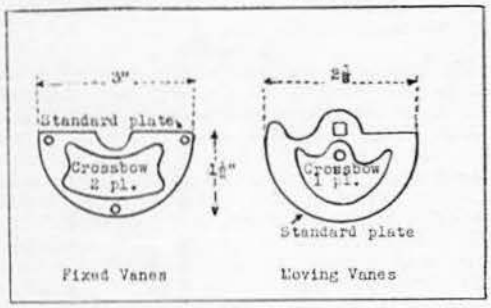


Fig. 5.
The condenser vanes used in the two meters.

The "Crossbow" Meter.

This is so called because it is used to "shoot" the ultra-high frequencies. It consists of a ¾-in. square stick 2 ft. 3 in. in length with a condenser, coil and bulb holder (stripped of its trimmings) mounted at one end. This meter is shown to the right of Fig. 2. A dial made of three-ply wood and calibrated in divisions of 0.05 of a meter is fitted in the position illustrated. A metal extension rod split into three sections to create series capacities, and thereby reduce capacity effects to nil, runs the entire length of the stick. Owing to the absence of capacity effects this meter is ideal for use in experimental and research work, the only difficulty in connection with its use being the fact that it is liable to become damaged unless handled with care. If for any reason this should happen the standard check meter is always available. For those who are especially interested in research work both meters are strongly recommended. The size of the condenser vanes used in this meter can be judged from Fig. 5; these are marked "crossbow" in the diagram and are spaced 15 mm. between fixed vanes. The construction of the meter is shown in greater detail in Fig. 6.

The Lecher-Wire System.

This consists of a pair of No. 12 s.w.g. (or heavier) wires 36 ft. long, spaced 3 in. apart. Spacers of good ebonite should be used to keep the wires parallel. It is desirable to drill the holes in the spacers somewhat larger that the actual gauge of wire used, as it becomes necessary to slide them up or down the lecher system in certain places (dependent, of course, on the frequency being used), whilst measurements are being taken. Not more than 10 spacers should be used, and a lesser number could be used with advantage providing the wires are kept taut. A typical system is illustrated in Fig. 7. The lecher system must be kept in a horizontal position and the oscillator placed so that one end of the wires connects directly to the coupling coil. It is also desirable that the wires be kept away from nearby objects. From experiments it has been found that the best point for operating the system is 4 ft. from the ground.

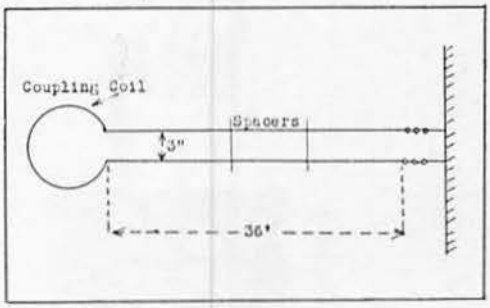


Fig. 7.
A typical Lecher-wire system for 56-mc. work. It is recommended that as few spacers as possible be employed.

Frequency Measurement.

Before this is commenced it is essential that we should know a little about what goes on in a half-wave voltage fed aerial with quarter-wave feeders, Fig. 8. When such an aerial is radiating there is a standing wave in the feeders, and being quarter wave this is a current anti-node, therefore a lamp connected to a single turn loop will light when held near them, and also at the point C because this is another quarter wave or current anti-node. There will be no light at the voltage anti-nodes A and B, as these are the points of maximum voltage and minimum current. A Neon tube will, of course, strike at points A and B because it is a voltage-operated device. With the lecher system it will follow that the same principles apply, and in practice the current anti-nodes are the ones we make use of. These are found by placing a bridge or shorting

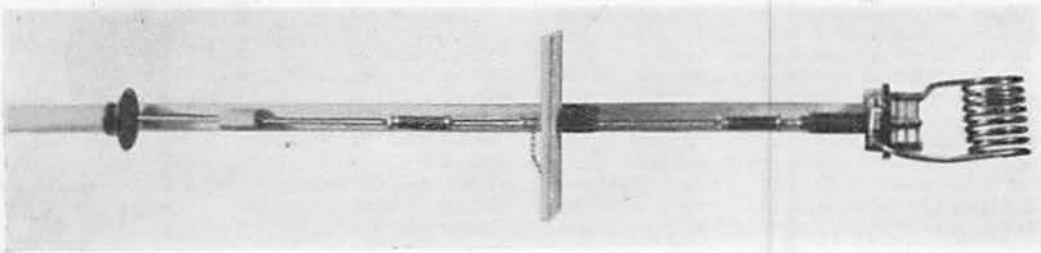


Fig. 6.
Crossbow meter for "shooting" ultra-high frequencies. Dial calibrated by hand in steps of .025 of a metre. Spread equals approximately 140° and waveband covered is from 5.00 to 5.40 metres. Coil 8 turns 1 ½-in diameter No. 8 s.w.g., spaced diameter of wire.

strip across the wires at certain points. The shorting strip can consist of a small fixed condenser, a hot wire ammeter, a thermo-couple, a lamp or merely a length of wire, but for the purposes of description we shall use a length of wire on a stick (previously referred to as the " magic wand ") in conjunction with a milliammeter in the anode circuit of the oscillator.

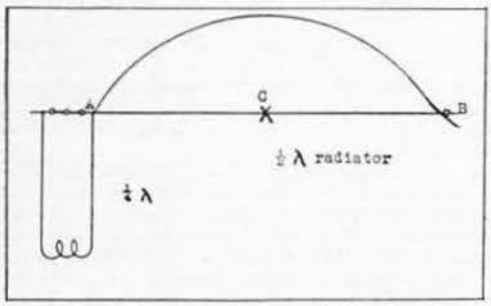


Fig. 8.
A theoretical illustration of a half-wave, voltage-fed aerial.

Operation.

Having set the oscillator to a given frequency it will be readily seen that the coupling coil, plus a certain length of the lecher system, will be an exact quarter wave of the wavelength to which the oscillator is tuned (Fig. 9). In order to find this nodal point we take the bridge and slide it down the wires *towards* the oscillator until a position is reached when the anode current starts to increase. Having noted this fact we can keep in mind that we are approaching the nodal point. We then continue down the wires, and the current will reach a maximum value and then quickly drop back to its normal reading. The point on the lecher wires when the anode current is at a maximum value indicates an exact quarter of the wavelength to which the oscillator is tuned. Before removing the bridge from the wires, clips should be placed directly beneath it, an operation which should be carried out accurately as this is the first measuring point.

Although the nodal points vary according to the degree of coupling, and also upon the length of the lecher system used, it is advisable to state here that the first quarter wave occurs roughly about 3 ft. from the coupling coil. It is advisable to mark this position first and then carry on down the wires to the other nodal points. Four positions will be found, but care must be taken to move the bridge in the same direction, that is *towards the oscillator*. If it is moved towards the free end the measurements will be incorrect, due, the writer thinks, to the fact that the free end assumes the position of oscillator, and the quarter-wave nodal points then start from the free end. Incidentally the bridge must be held at right angles to the system, and at all times a square and firm contact must be maintained. Fig. 9 illustrates the quarter-wave current anti-node with the bridge across the system. The bridge thus forms a quarter-wave loop, which is indicated by heavy lines in the diagrams. The rest of the system does not radiate, being shorted out from the bridge, and therefore an odd length, out of resonance.

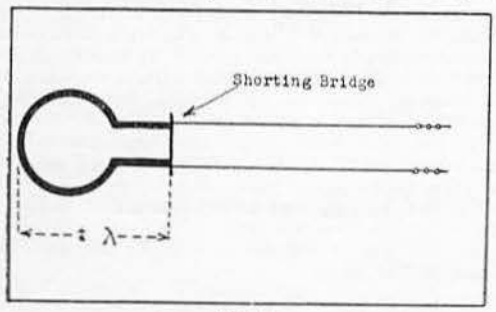


Fig. 9.
A Lecher-wire system in use. The heavy lines indicate the first quarter-wave position, which is a closed loop and in an oscillating condition. The rest of the Lecher-wire system does not oscillate as it is out of phase.

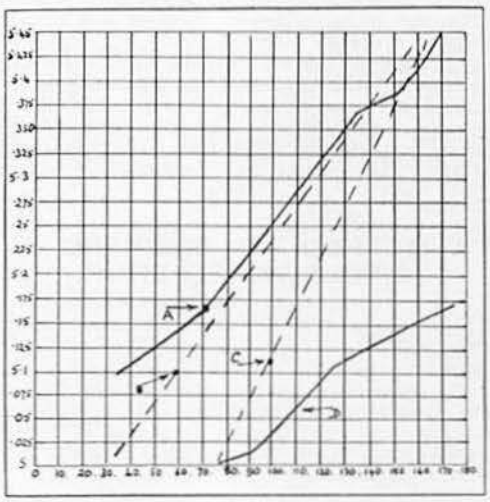


Fig. 10.
Calibration curves of various absorption meters described by the author. Curve A, Standard check meter with 2½-in. leg. Curve B, Crossbow meter. Curve C, Earlier type, using 8 turns 1-in. diameter No. 12 s.w.g. Curve D, Standard check meter with 2-in. leg.

Other clips should be used to mark the 2nd, 3rd, and 4th positions, and by measuring the length of wire between the clips the quarter, half and full wave points can be found in inches. When taking half-wave measurements it is, of course, necessary to multiply the figure obtained by two, in order to bring it to a full-wave figure, and then to divide by 39.37 inches to convert to metres. As many measurements as possible should be taken and a graph prepared, as per Fig. 10. If a suitable scale is selected the range of wavelength values may be set out on the ordinant and the dial readings on the abscissa. Corresponding points are noted and a curve drawn linking up the readings. It is suggested that the final curve be mounted under celluloid, and providing the bulb is not changed in the wavemeter any measurements within its range may be made without reference to the lecher-wire system.

Observations.

In order to obtain the most accurate results the following remarks should be studied, as they are the results of practical experience.

It is absolutely essential to balance the lecher wires; these should be treated as neutralised feeders and the oscillator tuned correctly. If this is not done measurements between the nodal points may vary.

When calibrating a meter it should be so placed that as it comes into resonance with the oscillator there is but the faintest glow from the bulb. If this point is adhered to it will ensure the greatest accuracy of measurement.

Be careful of, and avoid, hand capacity effects when tuning the wavemeter.

When taking the nodal points keep as far away as possible from the lecher wires. Check each nodal point two or three times in order to make quite certain that you are on it exactly. A wavemeter can be calibrated to three or four decimal points if necessary.

The readings below 25 degrees on the standard check meter will be found to be somewhat erratic, and cannot be relied upon, due, it is believed, to the very small capacities involved. Because of this fact it is absolutely essential that the coils should be particularly robust, for any alteration in their self capacity will affect the calibration. Final calibrations can be made by altering the position of the fixed vane in relation to the moving vane.

Those who use this method of calibration for the first time are advised to take two or three trial readings, and then start from one end of the band and work up to the other, although it is best to commence at the H.F. end. If the lechers are 36 ft. in length it is possible to obtain three half-wave or two full-wave measurements, each half or full wave measuring exactly the same as the other.

Wavemeter bulbs should be treated with care as a broken bulb may necessitate re-calibration. Experiments to determine whether this is the case with the same class of bulb are being carried out by the author.

It is not suggested that the two meters described in this article are the last word in measuring devices, but they are cheap, efficient and easily calibrated, and provided they are carefully constructed they should prove of considerable value to the average amateur working on ultra-high frequencies.

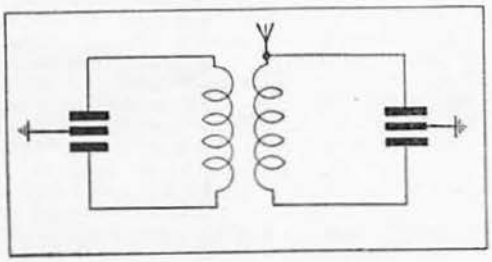
The writer's thanks are due to the unselfish co-operation and help, to say nothing of patience, extended to him by Mr. T. Vickery (G5VY), Manager, 56 mc. Groups, and to 2BII, 2AXB, BRS1511, who have gone over the checks in very inclement weather.

A METHOD OF COUPLING A SINGLE-WIRE AERIAL

By R. H. Jackson (G6ZU).

There are several difficulties which are, apparently, inseparable from the use of a single-wire aerial. One of them is that a directly tapped aerial of this kind often has the effect of damping the tank circuit to such an extent that it refuses to oscillate until the tapping is placed in such a position that there is insufficient "draw" for efficient radiation.

There appears, from conversations I have had with other amateurs to be a widespread belief that loose coupling reduces the efficiency of the single-wire aerial. I must admit that I believed that to be true for a considerable time, until, being compelled owing to interference with B.C.L.'s to use loose coupling, I found that the efficiency of the transmitter was increased.



Loose coupling has the advantage of a certain amount of elasticity in operation, and it is possible to use two crystals, of different frequencies with equally good results, which is hardly possible with a directly tapped single-wire which must be cut for one frequency. Another advantage is that it apparently gives a cleaner tone and, of course, it reduces local interference.

However, there is often some difficulty in finding the optimum coupling point and if the high tension supply is not very steady, it is found that the variations of supply have the effect of causing the tank circuit oscillations to be damped. In my own case I found it difficult to adjust the coupling to a point where there was sufficient energy transferred to the aerial, as my H.T. supply frequently varies.

By using the circuit shown in the diagram, it was found that there was considerably more R.F. current in the aerial; that the coupling was not so critical and that oscillations persisted whatever the variations of the supply voltage.

The split stator condenser in the coupling should be .0003 or .0005 mfd.

A Helpful Suggestion.

Mr. W. W. Smith (W6BCX), Associate Editor of *R9*, recommends that the power crystal oscillator shown on page 47 of the second edition of *A Guide to Amateur Radio* be modified in the following manner to obtain a greater R.F. output.

(1) The lead from the by-pass condenser 0.001 mfd should be connected to the left-hand side of the HFC choke in the plate circuit.

(2) The by-pass condensers should be larger, preferably about 0.004 mfd.

(3) The grid resistance should be reduced to about 10,000 ohms.

Reports Wanted.

G5ZJ, on his 1801 kc. transmissions.
G5JI, on his 7 mc. transmissions.
VS6AQ, on his 7 mc. transmissions.
G2NJ, on his 7 mc. telephony transmissions.

Technical Tips Wanted.

AERIAL MATCHING NETWORKS AS APPLIED TO AMATEUR TRANSMITTERS.

By G. McLean Wilford, G2WD.

THE purpose of aerial matching networks is to couple the aerial to the transmitter in such a way as to properly match the input impedance of the aerial to the output impedance of the transmitter. A secondary purpose is to reduce, or eliminate entirely, radiation on the harmonics of the transmitter frequency.

The first mention of aerial matching networks suitable for amateur use, appeared in the February, 1934, issue of *QST*, and as a result of perusing the article in question, the writer was impressed by their possibilities for use at his own station, especially as local conditions were such that large aerials and high masts were out of the question. Accordingly a network was constructed and put on test in March, 1934, using a Zepp aerial with a 66 ft. 6 in. top and 34 ft. feeders. An improvement was noticed immediately, both in regard to the stability of the transmitted wave and aerial output, the latter showing an increase of some 50 per cent. on 7 mc.

Prior to using the coupling unit signal strength reports were rather erratic, but after installing the coupler, consistent R6 and often R8 reports were received. Incidentally, the writer's first contact with New Zealand was established with this system.

On changing over to 14 mc. some trouble was experienced, which led the writer to communicate with Mr. A. A. Collins, W9CXX, who has developed the system commercially. Mr. Collins provided much useful information which, so far as is known, has never been published in this country.

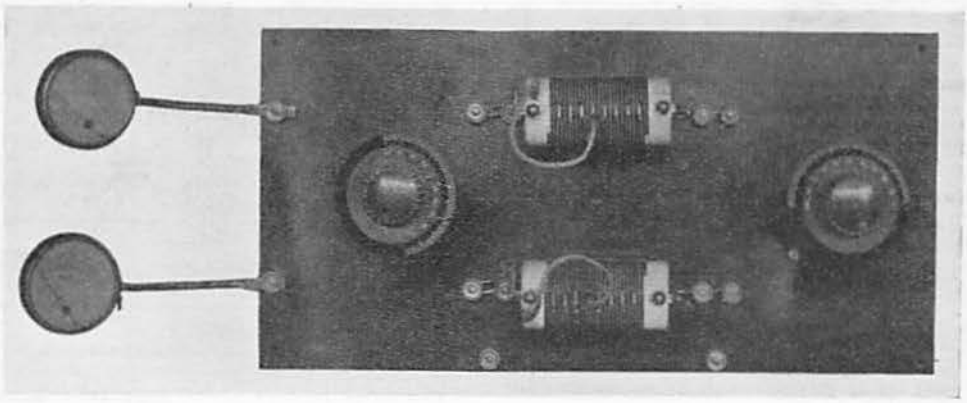
At about this time two inductances were purchased from the *Collins Company* similar to those used with their own transmitting equipments.

The network has been employed successfully with Windom, Zeppelin, centre-fed Hertz, and end-fed aerials, but as will be mentioned later certain aerials are recommended as better than others.

Since the original inductances were purchased a new coupler has been constructed and excellent results obtained on 7 and 14 mc. The transmitter used during the latter part of the tests was that described by the author in the November, 1934, T. & R. Bulletin, except that a single-ended final amplifier was substituted for the push-pull arrangement. Using a 4211E in this stage it was noticed that the plate current was less for a given output, that the valve ran cooler, and that the note appeared sharper and cleaner. The aerial used being a 66 ft. Zepp with 40 ft. feeders, transposed every two feet with *Eddystone* cross feeder blocks.

Construction.

For inputs up to 100 watts it is recommended that No. 16 s.w.g. enamelled wire be used for the coils which should be wound on threaded Isolantite formers 1½ ins. diameter 3 ins. long, the threads being so arranged as to space the wire approximately its own diameter. A total of 27 turns are required on each coil, but to facilitate ease of adjustment and use on several bands, the winding should be tapped every three turns. This can be best accomplished by soldering small pieces of No. 16 s.w.g. to the tapped turns and arranging for them to project from the coil at right angles.



Front View of the Aerial Matching Network used by the author. The tapping points along the two coils can be clearly seen.

Tuning.

The network is tuned by means of two .0003 mfd. double-spaced transmitting condensers, and the units so arranged that various combinations of coils and condensers may be obtained for coupling the different types of aerial systems. The methods of connection adopted by the author are illustrated in Fig. 1 and in the photograph.

Plug-in Coils.

For high power work where the cost of double-spaced .0003 mfd. condensers becomes a factor for

consideration, it is suggested that separate plug-in coils be used; these can be tuned by .00015 mfd. condensers capable of standing up to the voltages or currents likely to be developed. The sizes of the suggested coils are as follows:—

Band.	*Turns.*	*Diameter.*	*Length.*	*Wire gauge.*
3.5 mc.	34	1¾"	1¼"	No. 18 s.w.g
7 mc.	12	2"	1½"	No. 18 ,,
14 mc.	16	2"	1½"	No. 16 ,,
28 mc.	3	1¾"	1½"	No. 12 ,,

Either one or two coils will be required for the coupler according to the type of aerial to which it is desired to couple the transmitter.

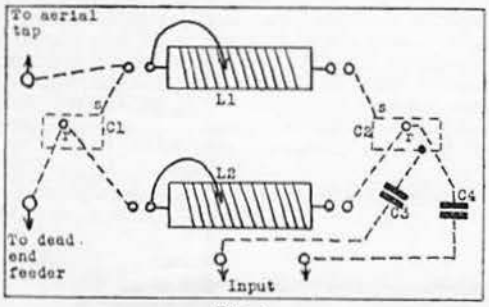


Fig. 1.
Arrangement of aerial matching network used by the Author.
C1, C2, .0003 mfd. variable condensers.
L1, L2, Inductances.
C3, C4, .006 mfd. mica condensers.
r, Rotor vanes.
s, Stator vanes.
All wiring behind 16 ins. by 8 ins. by 3/16-in. ebonite panel. By shorting out the lower inductance a single wire aerial may be used.

The Coupler Used with Receiving Aerials.

An application of the system which has been tested successfully is that of using the coupler inverted, for tuning a twisted pair line from a receiving aerial; in this case the values of coils and condensers are slightly different, as will be seen on reference to Fig. 2.

The coils are wound on Paxolin formers, the internal diameter of which is just large enough to allow a tight fit on old valve bases. Tuning is affected by setting the input condenser from the feeder about mid-way in, the .0005 mfd. variable condenser is then adjusted to give optimum signal strength. Two coils are used in this arrangement.

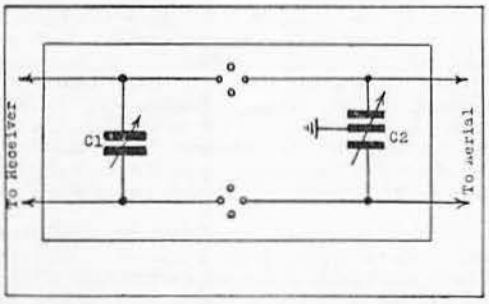


Fig. 2.
Theoretical arrangement of the coupler used for reception purposes.
C1, .0005 mfd. variable condenser.
C2, .00035 mfd. each section.
Coils in pairs, 2 turns, 5 turns. 9 turns, 14 turns 28 s.w.g. enamel. spaced wire diameter.

It should be mentioned that when using the double coil network the earth connection must be removed from the receiver, being taken instead to the rotating vanes of the series-gap or split-stator input condenser.

When a single wire aerial is used the earth should be joined to the receiver and to the tuning unit in a similar manner to that shown when the coupler is connected to a single wire transmitting aerial; only one coil is used in this arrangement, the other being short-circuited.

Collins Aerial Tuning Units.

We are indebted to the *Collins Radio Company* for the information which follows.

The connections of a typical aerial matching network are illustrated in Fig. 3, in which CB. are fixed condensers designed to isolate the aerial from the high voltage D.C. circuits of the transmitter.

Doublet or Two Wire Systems

For use with doublet or two wire systems one aerial or feeder wire is connected to the meter AA and the other to the rotating vanes of C2. When R.F. meters are used in both feeders the two wires are connected one to each side of the meters.

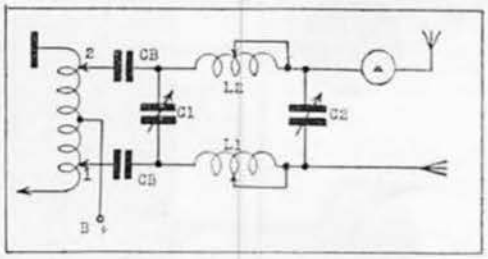


Fig. 3.
A typical aerial matching network.

The input leads 1 and 2 may be connected to tapping points equally spaced from the ends of a split stator or push pull amplifier tank coil, or of any tank coil in which the point of ground potential is located at the centre of the coil. If the tank coil of the transmitter has a neutralising or plate voltage tap which is at earth potential or by-passed to earth, and is not at the centre of the coil, the input leads should be connected to taps on the coil which are spaced an equal number of turns from the earth tap.

Single Wire Systems.

For single wire or Marconi aerials which are operated against earth, the meter AA should be connected to the aerial or feeder wire and the rotating vanes of both C1 and C2 should be earthed, as shown in Fig. 4. This figure shows coils L2 and L1 connected in series, which arrangement is generally necessary only for operation in the 1.7 mc. band where the inductance of both coils is required. On the higher frequencies L2 may be left out of the circuit or short circuited. For single wire operation the input lead 1 is connected to the filament centre tap or earth connection of the transmitter, and lead 2 to the plate end of the output amplifier plate coil.

Don't Hide Your Light Under a Bushel.

Tuning Methods.

1. Disconnect the input terminals of the coupling unit from the transmitter and tune the latter in the normal way so that the power amplifier tank condenser is adjusted to exact resonance, i.e., to the point of minimum power amplifier plate current. *After this adjustment is made the power amplifier tank condenser should not be touched again.*

2. Switch off the power amplifier and reconnect the input leads of the network to the transmitter.

3. Set the condenser connected on the aerial side of the unit to approximately mid position, also set the tap on the inductance to a point where

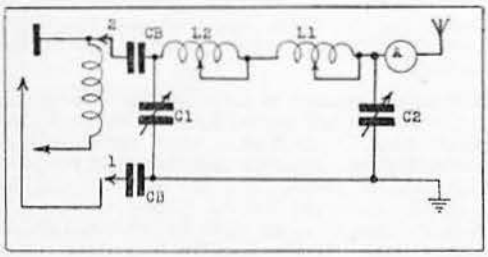


Fig. 4.
A network arranged for use with single wire or Marconi aerials.

resonance is likely to be obtained on the frequency at which the transmitter is operated; that is, use maximum inductance for 1.7 and 3.5 mc. about one-half inductance for 7 mc., and one quarter for 14 mc.

4. Switch on the power amplifier and rapidly rotate the condenser on the transmitter side of the unit, until resonance is restored in the power amplifier. The minimum plate current at resonance may be too high or too low for the proper operation of the final amplifier. If the plate current is not correct, rotate C2 slightly and then readjust C1 to resonance. This procedure can be repeated using C2 to adjust the degree of coupling, and C1 to restore the circuit to resonance, until the correct plate current is drawn in the power amplifier.

5. The inductance of the coils need not be adjusted critically, but approximately the maximum inductance should be used at which it is possible to make the amplifier draw its full plate current at resonance by adjusting C1 and C2. When the network is used with a two wire feeder system as shown in Fig. 3 it is important that an equal number of turns be used on L1 and L2.

The aerial ammeter or ammeters will indicate maximum aerial current when C1 is adjusted to resonance. If the network with two meters is used with a doublet aerial or two wire feeders the meters should indicate approximately equal current. If this is not the case, and L1 and L2 have an equal number of turns, and the input leads L1 and L2 are connected equally distant from the earth potential part of the coil, this indicates that the aerial system is not balanced. This is particularly likely to happen with Zeppelin feeders not an odd number of quarter waves long. The result is that the neutralisation of the final amplifier may be disturbed. With balanced aerial systems such as the doublet or Y type this difficulty is not experienced.

1.7 mc. Operation.

When working on the 1.7 mc. band, it is sometimes impossible to match certain aerials with the network in its original form without using extremely large variable condensers. If the connections of Fig. 4 do not produce the desired result it is necessary to resort to the arrangements shown in Figs. 5 or 6, in which an L network is employed. Both the coils are connected in series and both condensers in parallel, although neither the full inductance of both coils, nor the full capacity of both condensers may be required.

In general the connections to be used with aerials over one quarter wave long are shown in Fig. 5 and those for aerials one quarter wave long or less in Fig. 6. In each case the input lead 1 is connected to the grid or filament centre tap of the condenser and lead 2 to the plate end of the power amplifier tank coil.

The tuning procedure for the networks shown in Figs. 5 and 6 is as follows :—

1. Tune the power amplifier plate circuit to resonance as indicated by a minimum of power amplifier plate current, with the input leads from the network disconnected.

2. Switch off the power amplifier and reconnect the input leads of the unit to the transmitter.

3. Include approximately the full inductance of one coil in the circuit. Switch on the power amplifier and rapidly vary the condensers C1 and C2 until resonance is restored in the amplifier. If the minimum plate current obtained is not correct, change the number of turns included in the inductance and try again. The condensers C1 and C2 which are in parallel will be used to restore the circuit to resonance, and the setting of the taps on the coils will adjust the degree of coupling, or the plate current drawn by the power amplifier at resonance.

Aerials Recommended.

The particular aerial to be used will depend on local conditions, but any single wire fed aerial, Marconi or end-fed Hertz, constructed according to the usual principles of good aerial design is, of course, satisfactory. For 1.7 mc. operation a quarter wave aerial operated against earth is usually the most desirable.

When a Hertz aerial is used with a two-wire feeder system the most satisfactory arrangement is the Y type, in which a feeder is connected to a tap on each side of the centre of the aerial. This system is very satisfactory on the frequency for which it is designed.

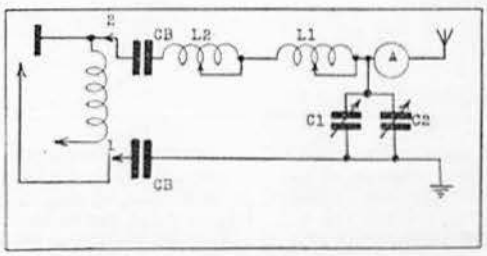


Fig. 5.
An arrangement suitable for operation in the 1.7 mc. band, with aerials over one-quarter wavelength long.

If a more flexible system is desired to operate on several harmonically related frequency bands the doublet aerial, consisting of two parallel feeders connected to the two halves of a Hertz aerial which are separate by an insulator, is desirable. The aerial is made one half-wave long at the lowest operating frequency, and the feeders tuned by the tuning unit.

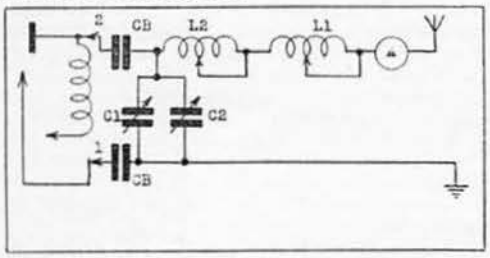


Fig. 6.
An arrangement suitable for operation in the 1.7 mc. band, with aerials one-quarter wavelength long or less.

The units may also be used with Zeppelin feeders, in this case, however, unless the feeders are exactly an odd number of quarter waves long, and the aerial exactly an equal number of quarter waves long, unbalanced reactances to earth will disturb the neutralisation of the final amplifier stage. It is strongly recommended that when a Zeppelin aerial is to be used with the form of networks shown in Figs. 3 and 4, the feeders be made exactly one quarter wave long, even though this necessitates bending the feeders or deviating considerably from the most direct line between transmitter and aerial.

In cases where an unbalanced load or reactance might be applied to a transmitting circuit, as when Zeppelin feeders are to be used on a frequency other than that for which they were designed, or when a Marconi or single wire fed aerial is to be used with a push-pull transmitter, the best system is to use an inductive pick-up coil with the unit. This is done by using a coil concentric with the tank coil such that if a 600 ohm resistance were connected across its terminals, the amplifier stage would draw the proper plate current at resonance.

The pick-up coil may be placed inside or outside the tank coil but should be spaced from it no further than is necessary to provide insulation between the two coils, and it should be placed near the centre turn or low potential part of the tank coil.

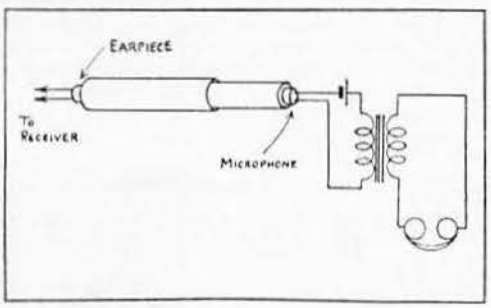
The proper number of turns for the pick-up coil may be determined by experiment, but it is not critical. Usually one-third as many turns are used in the pick-up coil as in the tank coil. If a 600 ohm termination is assumed for the pick-up coil the impedance presented to the plates of the r.f. amplifier valves is about right for the usual triode amplifier stage. If the amplifier stage uses screen grid valves somewhat fewer turns may be used.

The two ends of the pick-up coil are then simply connected to the input leads 1 and 2 of the tuning unit in every case. No further connection of the transmitter is required and the tuning of the unit is exactly the same as though it were connected to the transmitter directly.

In conclusion, the writer would like to acknowledge his thanks to W9CXX for sending this information for which permission has been obtained for publication in the BULLETIN.

A NOVEL L.F. FILTER

Details of a novel L.F. filter have been forwarded by G2CF. This consists of two cardboard tubes which slide within one another as shown in the sketch below. At one end of one tube a telephone



earpiece is fitted and this is connected to the output of the receiver in use. A microphone is fitted at the other end of the other tube, and by adjusting the position of the inner tube, a point can be found where signals are at a maximum in relation to noise level. It is claimed that if phones or loud speaker are connected in the microphone circuit, a much better signal-to-noise ratio will be obtained than if connected directly to the receiver.

Ten Metre News.

Mention has already been made in this Journal of the fine results obtained during the past winter by Mr. Mahieu, ON4AU, whose signals have been heard in VK, VE, W3, W8, and W9. Unfortunately British amateurs seem to be less fortunate than their confrères in other parts of the world, for to date only one G station has been heard at DX. The report in question concerns a 14 mc. transmission made on January 20 by Mr. Brown, G2WQ, of Manchester. On that day Mr. Brown sent several test calls and worked at least one New Zealander. It was during one of these calls that his signals were received on 28 mc. by a listening station in Wellington. At the time the input was about 50 watts, and the aerial a 66-ft. bent Zepp.

ZL2BG is again working on this band, and will call " CQ 10 " at midday, New Zealand time, during April. This station was heard by F8GW and F8PQ, on March 29, 1931, and he is hoping to repeat this success in the near future.

From South America we learn that PY1AW is listening daily at 13.30 G.M.T.

Conditions in England appear to be improving for the summer season, and commercial harmonics are breaking through at intervals. LCB has been heard as late as 20.45 G.M.T., whilst the harmonic of FF8MQ was heard at 14.05 G.M.T., March 16.

E. H. S.

Latest 28 MC. News on page 392.

Announcing the **NEW**

PETROLEUM JELLY—IMPREGNATED PAPER CONDENSERS

for HIGH VOLTAGES

THESE new T.C.C. Condensers are specially designed for the high voltages common in Cathode Ray Television and modern Radio and L.F. Amplifiers. With working voltages up to 2,000 D.C. they are built on entirely new principles. The multiple-wound di-electric is of pure linen rag tissue—impregnated with petroleum jelly.

NO FREE LIQUID. Jelly gives all the advantages of oil filling without risk of leakage or "creeping" since no free liquid is employed.

Wherever high voltages or temperatures are involved—in quality R.C. amplifiers, for reservoir, decoupling or smoothing, or in tropical climates these condensers fill every exacting need.

LONGER LIFE NO "CREEPING"

●

SAFER AGAINST BREAK-DOWN NO FREE LIQUID

●

NO LEAKAGE SMALL SIZE

●

TEMPERATURES UP TO 140°F. PERMISSIBLE

●

Capacity	Type 111 1,000 V.D.C. Working	Type 121B 1,500 V.D.C. Working	Type 131 2,000 V.D.C. Working
	s. d.	s. d.	s. d.
0·1	3 6	4 3	5 0
0·25	4 0	6 3	7 6
0·5	4 6	6 9	8 0
1	6 0	8 6	10 0
2	8 3	12 0	15 0
4	14 6	18 6	21 0
5	18 0	24 0	— —
6	21 0	29 6	33 0
8	32 0	39 0	43 0
10	40 0	48 0	54 0

T.C.C.

ALL-BRITISH

CONDENSERS

The Telegraph Condenser Co., Ltd., Wales Farm Rd., N. Acton, W.3

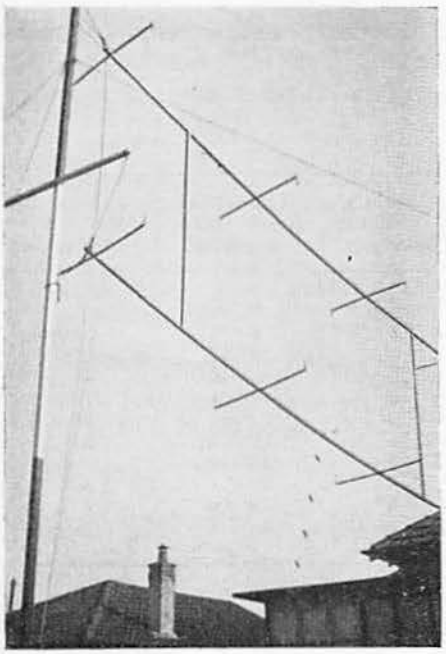
RECENT 56 MC. WORK IN AUSTRALIA.

By Don B. Knock, VK2NO.

THOSE readers of this journal who are interested in 56 megacycle work, will perhaps like to hear something of the recent fairly successful work carried out by a group of Sydney amateurs. During 1934 several VK2's investigated, in a half-hearty fashion, the possibilities of employing this frequency for cross-city contacts, and a fair measure of success attended their efforts, but owing to the diversities of individual locations results were spasmodic and not at all reliable. Three of the stations who were able to almost look at each other across the intervening stretch, did fairly well, and carried out regular schedules for some months; these stations were VK2CG, 2MW and 2WD.

Encouraged by reports published in *QST* the writer decided to emulate the example of Mr. Ross Hull, and erect a directive aerial system. In passing it should be mentioned that our American friends contend that a humid atmosphere contributes considerably to DX work on these frequencies; that being the case Australia should be a 5 metre paradise, for we have humidity and then some during our summer!

At VK2NO a directive array similar to the one used at W1AL was erected, and this is illustrated in the photograph. Because of the position of two handy poles this had to go up facing west of Sydney, but the only amateur interested in 56 mc. work in that direction happens to be VK2BP, located 2,000 ft. up in the Blue Mountains at Hazelbrook, 52 miles, air line, from Sydney. Enlisting the aid of the three amateurs mentioned in an early paragraph, a car was equipped with a small two-valve receiver and a few feet of wire under the hood, and VK2NO put into action. Along the Western road signals varied from R6 to R3, the distance being approximately 30 miles, but immediately the car began to climb the mountain road the strength of the signals increased to R7. On reaching Hazelbrook they found that they could leave the 'phones on the car seat, go some distance away and follow every word. Unfortunately VK2BP was away at the time, but within two days the operator put in a call to Sydney advising the author that he was ready to begin work with a beam aerial. Two-way communication was eventually set up between the two stations on February 10, 1935, when signals were reported a good R8 at both ends. VK2BP also reported hearing stations 2CG and 2WD at R7.



Directional 56 mc. Aerial used by VK2NO.

During contacts between Hazelbrook and Sydney terrific thunderstorms have on several occasions been raging over the metropolitan area, and it has been an uncanny experience to sit back and run the schedules uninterrupted by static charges even when lightning has been flashing to earth in close proximity.

It is hoped to very shortly link up Sydney with more distant places such as, for example, Newcastle, New South Wales, which is approximately 100 miles from the former town. It is anticipated that with the aid of directive aerial systems the screening effects of the mountain barrier lying between the two towns, will be overcome.

In addition to VK2NO; 2CG and 2WD are using directive arrays, and at the writer's shack it is hoped to make the system rotatable with a reversible motor drive controlled from a point near the transmitter.

The writer wishes to thank Mr. C. D. Price, G6PC, for his help and co-operation in these tests. Mr. Price has on many occasions braved the weather with his car, to take signal observations during stormy weather. G6PC looks like becoming a permanent VK amateur and a very enthusiastic one at that.

Believe It or Not

The following is an extract from a letter received by a well-known "G" from an American amateur transmitter living in Massachusetts:—

"I surely must have seemed somewhat stupid to you when you sent the number 123456. I did not have any idea just what that referred to, and was wondering if I should send you one or repeat yours. I do not know yet just what they mean, although I hear all the stations over here using it. Is it a code of some sort?"

The original of this letter will be donated to the leading R.S.G.B. member in the recent "playing numbers" contest!

STRAY

BRS73 (N. London) will be pleased to carry out tests on 1.7 and 3.5 mc.

FIVE-METRE WORK IN WINTER.

By Harry K. Bourne (G2KB).

UP to the present the 56 mc. band has generally been considered to be a band suitable chiefly for portable work, which is usually confined to the summer time. A striking example of the use of this waveband in mid-winter in the U.S.A. has been shown recently, and it was the good fortune of the writer to have had an invitation to take a part in this work. The Schenectady Winter Sports Club had arranged a trip up into the Adirondack Mountains in order to hold various events, such as ski and toboggan races, etc. Previously in this type of event the accurate timing of the races had always presented a difficult problem, and so a suggestion was put forward that radio should be used for the purpose on this occasion. In order to ascertain the possibilities of this, some preliminary experiments were carried out on the ski trails on the Rotterdam hills a few miles from Schenectady.

These tests were conducted on Saturday, January 19, by W2ACB, W2ALP, W2FMR and G2KB. W2ACB, with a portable transmitter and receiver, was stationed in an automobile on the road at the foot of the hills. The outfits used by the other three were simple transceivers, those operated by W2ALP and G2KB being of a portable type which could be carried easily. The transceiver belonging to W2FMR was installed in his automobile. W2ALP and G2KB set out to climb the hill by different routes, and during the journey they were in touch with one another and also with the other two stations. Good contacts were made at a distance of about two miles. In addition, W2ACB made a contact with W2DVC, situated in Scotia, about five miles distant. The temperature at the time of these tests was below zero, but the exercise gained by climbing the hill and toiling through deep snow with radio apparatus on our backs soon made us warm. After spending some time effecting contacts, we were satisfied that the apparatus would be quite satisfactory for the purpose required, and so we returned to Schenectady to make a few last-minute alterations to the outfits to make them a little easier to carry and to operate.

The following morning, at 8 a.m., the "snow train" left Schenectady with some 700 people on board, bound for North Creek, a little village in the heart of the Adirondack Mountains. W2ACB, W2ALP and G2KB were on the train with the radio apparatus and during the three-hour journey to North Creek we passed the time by trying out the apparatus on the train. We found that we were able to maintain good contacts from one end of the train to the other in spite of the high noise level. The train consisted of fourteen coaches.

On arriving at our destination we were met by a party with a sled in order to transport the equipment of W2ACB, consisting of transmitter, receiver and batteries. We towed the sled over about a mile of rather deep snow to the finishing point of the ski race at the foot of Gore Mountain. There we left W2ACB to set up his gear, and in the company of a guide W2ALP and G2KB proceeded to climb the ski trail which ran, with many twists and turns, through woods up the side of the mountain. Owing to the snow being several feet deep we soon found it necessary to stop in order to put on our snow-shoes. With the aid of these we found it much easier to make progress, and after a climb of about three-quarters of an hour we reached the starting point of the race. As soon as we arrived we called W2ACB and obtained a reply immediately, together with a report of QSA5 R9.

W2ALP remained at this point in order to transmit the starting times of the competitors to W2ACB at the finishing point. G2KB returned some distance down the trail and stationed himself at a sharp bend at the foot of a steep descent. From this position fine views of the descending skiers were obtained, and here many came to grief due to their inability to make the turn owing to the high speed they had gained during the descent of the steep slope. G2KB was in touch with the stations at both the start and finish of the trail from this location.

As each competitor started his name was announced by W2ALP and the starting signal, "GO," was picked up by the microphone and was thus heard by the timer at the finishing point of the race. He was then able to determine accurately the time taken by each competitor to come down the trail. So radio proved itself an ideal method for timing such events, in fact it was the *only* method by which the race could have been timed accurately.

Valves for Work on 100 mc.

Mr. E. J. Simmonds (G2OD) advises us that the March issue of the *Proceedings of the Institute of Radio Engineers* contains an important article dealing with valves suitable for generating frequencies above 100 mc.

STRAY

G5SO reports having contacted OK2AK, using an input of .06 watt, an R7 report was received. We understand this is equivalent to a distance of 16,000 miles per watt.

B.C.L. Interference.

It is encouraging to read in *QST* that such an eminent authority as Mr. C. B. Jolliffe, Chief Engineer of the F.C.C., gives it as his opinion that interference with broadcast reception in the States seldom comes from amateur stations, and when it does it is almost always due to faulty receiver design. Curiously enough, we have been nursing a similar thought in our minds for some time!

Illicit Transmissions.

Mr. R. H. Rolings, G6WM, and Mr. A. S. Clacy, G6CY, report that their calls have been misused.

And Send Us Your Results

SOLILOQUIES FROM THE SHACK.

By Uncle Tom.

(Further musings on the futility of life, by our tame but irrepressible optimist.)

The season of contests is nearly over. Cries of "Shame" come from the pot-hunting brigade, and almost equally QSA cries of "Thank 'Eaven for that" from those to whom Ham Radio means a little more than cut-throat competitions.

National Field Day is the next big noise in view, but that's different; in fact, it's one of the few contests that I thoroughly approve of. There seems reason to believe that *every* district will have a station, or two stations, on the air this year.

The general opinion seems to be that 14 mc. was hardly worth the candle in last year's N.F.D., and if all the "B" stations had kept on 7 mc. the whole time, they would have knocked up a few more points. Let's see how many of them can raise Yanks on 14 this year. Conditions *should* be better.

Hiking and Ultra-Shorts.

Hiking has always been proverbially associated with shorts, but ultra-shorts seem to be very much in the news this year. So many people are blessed with locations that are no good at all for 56 mc. that it is becoming an outdoor pastime only comparable with bug-hunting and fishing. The apparatus is somewhat reminiscent of both the latter pursuits.

Symptoms of a bite from the ultra-short wave bug seem to be a marked preference for high places and a desire to carry 16-foot lengths of wire about.

I'm being rather less frivolous this month (partly because I don't feel like it), so it's opportune to mention that the North Kent gang are doing great things on 56 mc. G2AW, 2GB, 5LB, 5OJ and Co. will, doubtless, tell their own story elsewhere, but they certainly are keeping our Calibration Manager, and one or two other South Londoners, pretty busy.

Literary Lapses.

Incidentally, while we're on the North Kent subject, let's talk about Ham Magazines. Some of them positively scintillate with wit, but the N.K. crowd, with "*The Ham*," surely take the bun. Here are one or two spicy bits from the February number, reprinted without the Editor's permission :—

"Helpful Hints: To prevent a valve from overheating, remove it from its socket. A piece of stout copper wire connected in parallel with a feed resistance will prevent it from being over-run. A heavy-capacity resistance of low value, shunted across the P.A. anode-supply meter, will enable good DX to be worked on 10 watts or even less."

Parody, by "Airy Nix":

He floats thru' the air with the greatest of ease,
The daring young man with T. Sixty-One D's,
All stations he contacts and points he does seize
My score he has stolen away.

Finally, a cold-weather contest suggestion: Brrrrrrrr-oooo!

Perpetrators of other local ham-magazines are asked to forward copies to Uncle Tom, c/o Box 852,222, R.S.G.B. Headquarters, and Pse QSL, foto fer foto.

An Interesting Find.

Browsing round just off the 1.7 mc. band the other day, I heard an all-too-familiar sound. Could it be? It was! What? Why? Why, Gramophonis Grinderensis in full bloom, complete with herbaceous border and raspberry-bed. One record followed another, with no announcement of call-sign, but just "Ullo-ullo" in between, and, for the good of the amateur movement, I did a bit of D-F'ing on the D-F, and finally located him.

I won't quote the gentleman's name, but he is still transmitting gramophone records on the same wavelength that he used for the same nefarious purpose in the year dot, and is firmly convinced that he is the one sole surviving amateur transmitter, because he never hears any others.

His receiver, a beautiful sloping-cabinet type with "R" valves sticking out in a neat row, seems to cover a range of approximately 175-200 metres. The general effect is reminiscent of some thing in H. G. Wells' "Time Machine"—one has just slipped back into 1922 or 1923.

This whole beautiful exhibition-piece, complete with operator, is offered for sale to the lowest bidder. This includes one QSL card, the only one ever received by the station, reporting his transmission at a time when he was on his summer holiday some distance away.

(No, he isn't a "G" station—so now figure that out.)

Spitchitis Spreading.

I note with grave alarm the tendency for "spitch" to appear on 14 mc. It was bad enough on 7 to make me leave that band alone for good but if it turns up on 14, it's me for the ultra-shorts for evermore. And with spitch I categorically include raw A.C. like the stuff EA7AO is turning out. I've only once previously black-listed a call-sign on this page, but it's time that station was mentioned.

What a lot of unnecessary mess there is in our bands! And how is it that, with one country at any rate, we're quite powerless to raise a protest? They just go up in the air and won't speak to us for weeks if we dare to hint that the quality of certain transmissions from the said country is *lousy*.

What a perfect paradise for pirates it must be. And there's no prize for guessing which country I mean, either, cher O.M.'s.

The growth of the great commercial-receiver era continues, but I am anxiously awaiting news of the first ham to install a complete commercial amateur-band transmitter. I promise to greet the said news with the ringing of welkins and the hunting of haggis. (I *think* my old cabbage-patch is big enough for a haggis-hunt, anyway.)

Don't fail to let me know, please. The first "G" to install a commercial transmitter is asked to write to me at once, as he will hear of nothing to his advantage.

BOOK REVIEWS

ELECTRIC CIRCUITS AND WAVE FILTERS. By A. T. Starr, M.A., B.Sc., A.M.I.R.E. 375 pages and 335 illustrations. Published by Sir Isaac Pitman & Sons, Ltd., London. Price 21s. net.

Analytical consideration of electrical circuits and networks of necessity demands a sound knowledge of mathematics and fundamental electrical conceptions. This book will appeal to the more technical of our members, and will prove invaluable to those whose work or study is concerned with networks and filters.

The first chapter gives a survey of the various mathematical processes, dealing with complex numbers and the trigonometrical functions of complex numbers in some detail.

Chapter II deals with electrostatics, electromagnetism, and the fundamentals of A.C. theory, including a useful description of vectorial and algebraic methods in A.C. work.

The next chapter proceeds with the theory of electric circuits. The treatment here covers coupled circuits, general ladder network, and the fundamental theorems; the chapter concludes with a consideration of mechanical and acoustic analogies, so important in gramophone work, and a brief section on negative resistance.

The design of resistances, coils and condensers is given full and practical treatment. Here are copious data on skin effects, inductances of both air-cored and iron-cored types, screening, transformers and their equivalent networks, electrolytic and other condensers, and the quartz crystal.

Chapter V deals with two-terminal impedances of many types, describes equivalent network methods, and concludes with the general reactance theorem and a statement of the general theorem on impedance.

Chapter VI is concerned with four-terminal networks. Linear, image and iterative parameters of networks are explained, and then the question of termination and loss factors and the three systems of transmission loss units. Then follow sections dealing with the T section, II section, attenuating pads, lattice, and bridged T sections.

The foregoing chapters occupy 200 pages, and the remainder of the book, with the exception of 5 appendices, is devoted to wave-filters. General conditions for filter work and the various networks are first considered in a special chapter which includes many curves to assist quantitative work.

Low-pass, high-pass and band-pass filters receive a chapter each. Specimen designs add immensely to the value of these sections, and everywhere is an abundance of practical detail.

The concluding chapters cover the calculation and measurement of performance, and transients in networks.

This book is quite outstanding, as it places in the hands of the electrical engineer the theory of the subject, starting from first principles, and gives a very full and detailed survey with a wealth of design data.

T. P. A.

THE SUPERHETERODYNE RECEIVER. By Alfred T. Witts, A.M.I.E.E. 128 pages and 75 diagrams. Published by Sir Isaac Pitman & Sons, Ltd., London. Price 3s. 6d. net.

The superheterodyne receiver of to-day is a very different thing to the types often described in textbooks, and service men and amateurs will welcome a book which is up-to-date and deals with the theory of modern circuits rather than with practical design or operation.

This book has a "broadcast" bias, and the special types such as "single signal" are not included.

The superheterodyne principle is no new thing, and the account of the early efforts to produce successful receivers makes very fascinating reading. Nor is it that such accounts are merely of interest historically: a knowledge of the teething troubles must give a fuller appreciation of the "why and wherefore" of modern design. The early work of Fessenden, Levy, Schottky and Armstrong is described in the first chapter, while Chapter 2 deals with the many post-war developments and circuits.

The general principles are explained at some length and in a very clear way. In the diagram depicting the various types of current in different portions of the receiver it would appear that the audio-frequency amplifier handled an intermediate frequency, but the diagram in question is a very helpful way to place the operation before the reader.

A long chapter deals with the "problems" of the superheterodyne receiver, and treats each trouble very fully: the author does not appear to have neglected any type, and this is no mean feat in itself.

"Single-valve frequency changers" takes us from the early bi-grid valve to the heptode, octode and triode-hexode.

Automatic volume control is a subject upon which most of us require more detailed information, even though we know the principles. This is not strictly a "super-het" question, but a book on this subject would be incomplete without a very full treatment of the many and often complex circuits employed. The author gives a very comprehensive survey of A.V.C., with many circuit diagrams.

The book concludes with descriptions of several up-to-date receivers, including the W.W. "Single Span," the Telefunken "Beyreuth," and several well-known makes.

The book is attractively produced, and very good value.

T. P. A.

Stray.

G6PF informs us that W8IXS is working at the L.F. end of the 28 mc. band and will appreciate co-operation from British stations.

Unauthorised Transmissions

The following report that their call-signs are being used by unauthorised persons:—E. P. Oscroft (G5OS), M. E. Tapson (G6IF), L. H. Shersby (G2GZ) and H. V. Wilkins (G6WN).

TRADE NOTICES.

THE FERRANTI CONSTRUCTOR'S A.C. SHORT-WAVE SUPER-HET FIVE.

The entry into the short-wave receiver market by *Messrs. Ferranti, Ltd.*, has been noted with interest by all who have had practical experience of the excellent meters, radio components and broadcast receivers produced at their Hollinwood factory. High quality workmanship has for long identified *Ferranti* products, consequently, it came as no surprise when we examined one of their new short-wave super-hets to find that this same high standard had been well maintained. With the introduction of cheap short-wave receivers, this feature has to some extent been neglected, and the tendency has been to assemble together a mass of small components in such a manner as to make fault correcting a task for all but highly-skilled engineers. The outstanding constructional feature of the *Ferranti* set is the fact that all parts are easily assembled, and as easily removed.

As its name implies, the receiver is sold as a complete kit of parts, but the average purchaser should experience no difficulty in assembling it within a few hours.

The data chart and blue print supplied with each kit leaves nothing to be desired. The five diagrams illustrate (1) the front panel; (2) the baseboard and battens; (3) the theoretical circuit; (4) the wiring above the baseboard; (5) the wiring below the baseboard.

The Circuit.

A rather unusual form of superhet circuit is employed, built up around four well-known *Ferranti* valves. An aperiodic aerial system is fed directly on to the control grid of a Heptode combined oscillator modulator VHT4, the output from which is amplified through one I.F. stage, using a Variable Mu Pentode VPT4, and rectified by a double diode triode H4D, the audio signal from which is amplified by a resistance-condenser fed audio frequency transformer of the Ferranti AF4 type. The output from this stage is fed to a super-power triode of the 2½-watt class, type LP4. A tapped output transformer is provided to enable the loud-speaker in use to be correctly matched. Common with most modern superhets delayed A.V.C. is employed.

Only three controls are provided, these are: tuning control, combined volume control and on-off switch, and wave-change switch. The tuning control operates the oscillator condenser only, thus the necessity for ganging disappears. There are no tuned R.F. circuits, and as a consequence second channel interference cannot be avoided. This point may present a little difficulty at first, but when it is remembered that the receiver has been designed essentially for *short-wave broadcasting*, it should be a simple matter once a station has been located to tabulate its two dial settings. It will often be found that one setting is more free from interference than the other.

In order to permit the set to be used in the 3.5 mc. band arrangements have been made to extend the coverage to 85 metres, but it should be clearly understood that the receiver is not designed for amateur band work. During tests, numerous British and foreign amateur telephony stations were received at excellent loud-speaker strength, but by virtue of the small dial width around 80 metres (due to the absence of a band-spreading condenser), it would become a tedious task to employ such a receiver for ordinary amateur work. Once the knack of tuning across such a small dial width has been mastered, we have no doubt that many users would obtain enjoyment from listening to amateur transmissions on this band.

Operation.

The receiver was tested on an average outdoor aerial system, and operated from 240 volts a.c. mains, a good earth was also employed. The fact that a very large number of foreign broadcast stations were received almost goes without saying, but the feature which impressed most was the extremely high quality of production. We are now accustomed to listening to high fidelity transmissions on the medium and long-wave broadcast bands, but invariably quality is sacrificed for sensitivity, when short-wave broadcasting is considered. We can only assume that this gratifying feature has been achieved by the use of the most efficient components and by careful design, but whatever the reasons the results obtained leave little to be desired. Most of the European short-wave stations were received at excellent strength, whilst American broadcasting was, as is usual at this time of the year, subject to high-speed fading. We were, however, pleasantly surprised to receive Sydney, Australia, at good volume during a Sunday evening transmission. It is safe to assume that world-wide reception is assured under good conditions.

Our only criticism centres around the absence of a pre-selector stage; as a result, rather serious interference from commercial stations was experienced. The entire absence of mains hum, due to the very careful screening employed for all wiring to, or likely to be affected by, the rectifier circuit was noted with pleasure.

Our tests proved conclusively that the receiver is one which we can strongly recommend to readers of this Journal. The price of the receiver in kit form is £15 12s. 6d., including valves. An A.C. short-wave converter is also available at £7 11s. 10½d., and a battery converter at £4 1s. 5d.

Lectrolinx, Ltd., have forwarded for examination a sample of their new 7-pin Clix "Airspring" Chassis Mounting Valve-holder.

This is of the anti-microphonic type, and should fulfil the needs of those wishing to instal Pentagrid valves. The retail price of the model with terminals is 1s. 4d., and without terminals 1s. 1d.

The High Vacuum Valve Co. send us advance details of their new midget valves, which have been developed for portable receivers. These valves should appeal to members interested in field day and general portable work.

The valves which are little thicker than a fountain pen and less than 2½ ins. high, bear a striking external resemblance to the peanut valves marketed in this country some 10 or 12 years ago. Three types are at present available. The XD and XL are triodes suitable for detector and L.F. work, respectively, whilst the XSG type is a screen-grid valve suitable as an H.F. amplifier.

We hope in an early issue to review samples of these interesting valves.

NEW VALVES REVIEWED.

Mazda ESW50.

A sample Mazda ESW50 valve has been submitted by *Messrs. The Edison Swan Electric Co., Ltd.*, and below is a report of tests made to date.

The valve is a 50-watt triode employing a graphite anode, having the grid and anode brought out through the bulb to short tungsten rods at the top. The valve is fitted with a 4-pin base but only the two filament pins are used.

Characteristics.	*Makers.*	*Measured Sample.*
Filament volts	6.0	6.0
Filament amps.	4.	4.
Anode volts (max.) ...	1500	——
Mutual Conductance ...	1.5	1.35†
Amplification factor ...	15	15†
Impedance (ohms)	10,000	11,000†
Total emission	1 amp. approx.	Not measured

† Measured at anode volts 1000 grid volts —40. An accurate check was not made to ascertain if the characteristic curves, were in agreement with the published curves, as for the purpose of the valve close agreement was not essential.

The following are the estimated operating conditions for use as a P.A. derived partly by measurement and partly from the curves.

Anode Volts.	*Grid Bias. Class B*	*Class C*	*Drive Volts (R.M.S.) Class B*	*Class C*	*Grid Current (ma.)*
1500	— 120	— 240	90	180	10
1200	— 100	— 200	75	150	8
1000	— 80	— 160	60	120	6
800	— 60	— 120	45	90	4

The above figures are approximate and the grid current figures assume anode modulation only or C.W., and may be varied to suit circuit conditions. The valve has so far only been tested as a P.A. on the 3.5 mc. band and the following figures were obtained using an anode voltage of 1000, grid volts — 150 driven from an LS5B consuming 18 ma. at 700 volts. Coupling between LS5B and ESW50 1.4 — 1 step down transformer. The valve was found very easy to neutralise and the percentage neutralisation was 4 per cent., *i.e.*, per cent. R.F. voltage on aerial with and without applied anode volts. With the conditions as above the anode current was 58 ma. representing 58 watts input and the power measured in the aerial circuit was 24 watts, giving an efficiency of 40 per cent. The actual watts in the aerial were probably more than those measured, as difficulties arose in dissipating the power at the correct impedance so it is safe to say that the efficiency is at least 40 per cent.

It is hoped in our next issue to give further figures at a higher frequency and also measurements of inter-electrode capacity.

So far tests show that the valve behaves very satisfactorily. Due to the type of construction employed the valve is not very mechanically robust so that users should bear this point in mind.

D. N. C.

Editor's Note.

We understand from the Edison Swan Electric Co. that this valve is being re-rated to dissipate 65 *watts, and that the title is being changed to ESW* 501.

Tungsram LP220

This is a battery output triode fitted with a four-pin base. The valve has high slope and low impedance, giving an approximate output of 200 milliwatts.

Characteristics.	*Makers.*	*Measured Sample.*
Filament volts	2.0	2.0
Filament current (amps)...	0.2	0.255
Anode volts (max.) ...	150	150
Amplification Factor (M)	14	14†
Mutual Conductance (ma/v)	3.5	2.3†
Impedance (ohms) ...	3,900	6000†
Optimum Load (ohms) ...	7,500	not measured
Anode current (ma.) ...	8.0	7.5†
Grid Bias (volts)	—6	—6

† Measured at 150 volts and —4.5 volts.

No test conditions were quoted on makers' figures.

The filament current appeared considerably higher than the makers' figure. The electrode assembly has a top steady mica which should render the valve non-microphonic.

The valve would be quite satisfactory for any battery receiver as an output stage or could be used as a low-power oscillator for a 5-metre transmitter as the interelectrode capacities do not seem high.

Tungsram PP222

This valve is a battery output pentode fitted with a 5-pin base, having quite a high mutual conductance and an output of approximately 600 milliwatts.

Characteristics.	*Makers.*	*Measured Sample.*
Filament volts	2.0	2.0
Filament current (amp)...	0.22	0.255
Anode volts (max.) ...	150	150
Screen volts (max.) ...	150	150
Mutual Conductance (Ma/v)	3.0*	2.4†
Amplification Factor (M)	300*	not measured
Impedance (ohms) ...	100,000*	not measured
Inner M	—	19†
Grid Bias volts	—6	—6
Optimum Load (ohms) ...	14,000*	not measured
Power Output (watts) ...	0.6	not measured
Anode current (ma.) ...	12.0†	7.2†
Screen current (ma.) ...	—	1.3†

* Conditions not stated.

† Measured at anode and screen volts 150, grid volts —4.5

The characteristic curves were checked and found to agree closely with the published curves except that the cut-off occurs at —10 instead of —12 volts, with 120 volts on the anode and screen. But for the purpose they are intended this is not material.

The valves seem in every way suitable for an economical output stage for a battery receiver, as the suppressor grid is strapped internally to the grid they have no other uses.

D. N. C.

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.

MORE ABOUT RST

To the Editor, T. & R. BULLETIN.

DEAR SIR,—Mr Braaten, in his last letter in the February issue, gives the impression that the RST code has been generally adopted by the amateur fraternity. Sir, I must tearfully implore you to let Uncle Tom, of the soft and gentle tongue, break the sad news. During the International Contest only 5 per cent. of the 460 stations worked by ZL4AI used the code. Furthermore, could the gentle-tongued one pass on the lamentable fact that all RST code reports here had four for the second figure, whereas the signals of ZL4AI were recorded as varying from R5—9.

Perhaps you, Sir, would point out to Mr. Braaten that the British amateur is not only an amateur radio operator, but an amateur " radio engineer and physicist," and consequently any reporting system used by him must allow for that fact.

Mr. Braaten and several other correspondents take exception to my views on the tone code. Mr. Braaten, in particular, questions " The ability of a signal to lose completely its modulation somewhere in the transmitting medium." He is quite correct, but a signal, unless 100 per cent. modulated, *apparently* loses modulation as the intensity of the signal becomes less. Consider 5 per cent. modulation (heavy modulation for an amateur CW signal) superimposed on a carrier of constant frequency. If we consider the carrier and modulation components separately, we find that the modulation is approximately 13 db down on carrier intensity.

If the carrier is 50 db above minimum audible level at the receiver, the modulation will be 37 db above audible level, and so the apparent percentage of modulation " to the ear " will be 74 per cent., i.e., T6 or less, by Mr. Braaten's code.

If the gain of the receiver is now reduced 25 db, the carrier will be up 25 db, while the modulation is up only 12 db, so that the apparent percentage modulation is now 48 per cent., say T7. If gain is reduced until carrier intensity is 15 db above minimum level, the modulation will be at zero level, so that the apparent percentage modulation is now zero, or T9. It should be noted that it makes no difference to the final result whether the applied modulation is obtained from the croak of an asthmatic frog, the melodious notes of a famous Cathedral organ, or the plaintive " baa " of the lambs gambolling in Canterbury's fair Elysian fields.

Mr. Braaten, in defence of the tone code, then plunges into a rather irrelevant discourse on " phase modulation," and also states that frequency modulation which, after all, is only instability, must also be considered. In his original article there is no mention of " phase modulation," and frequency instability is dismissed with a wave of the hand, after the statement, " By far the greater majority of stations on the air have stable signals—there is no need for a frequency code." One would naturally conclude that his tone code applied only to the audio frequency qualities of a stable signal, and as is explained above, this varies with signal intensity.

Judging by Mr. Braaten's letter, it now seems that we are to take his tone code to include " frequency stability," which is an R.F. property of the signal, and " phase modulation," which depends upon propagation conditions. It is inconceivable that anyone should endeavour to formulate a code to cover their widely diversant factors.

I agree with Mr. Braaten that " phase modulation " and other propagation effects deserve consideration. In New Zealand we have overcome this difficulty by the use of the word " woofly." Anyone getting a " woofly " report knows immediately that his signals are being distorted by some such effect, and can then ask for further particulars.

In his original article, Mr. Braaten said " it is much easier to tell five senders that their frequency is bad, than to tell 95 others that theirs is good," and yet he favours the retention of the tone code, partly because of frequency modulation ! Would it not be reasonable to describe a stability fault by a stability code ? If frequency modulation is eliminated from the tone code, of what use is such a code, seeing that, to the ear, percentage amplitude modulation varies with signal intensity ?

Talking of ears, I can assure Mr. Braaten that even in New Zealand the shell-like variety believed in by Ruby M. Ayres ; and the cauliflower specimens of our prominent " matmen " are quite capable of detecting a 1db change in intensity when comparison is made against a standard. Mr. Braaten then says " it is not possible to detect so small a difference when the ear has no reference level to start from." Exactly, and that is why in modern design work it is assumed that 3db is the smallest change that can be detected by the ear. Mr. Braaten claims that " the ordinary person " would be able to guess a signal intensity to within only 10db. Agreed ; but the amateur is by no means an " ordinary person."

I could not engrave " The Lord's Prayer " on a threepenny piece, but a skilled engraver can. Is it not highly probable, therefore, that the ear of a radio operator should be, by comparison, more sensitive to intensity changes than either the shell-like or cauliflower varieties ?—Yours sincerely,

G. SAMSON (ZL4AI).

Copied by G6WY, on March 24, 25 and 27, 1935.

EDITORIAL NOTE.

We regret that we cannot publish further contributions to this discussion. Our own observations made during the International Dx Contest certainly agree closely with those reported by Mr. Samson, except that on two occasions we were given QSA 8 reports. We presumed these to be a new method of describing both audibility and readability !

TELEPHONY TRANSMISSIONS ON 7 MC.

To the Editor, T. & R. BULLETIN.

DEAR SIR,—Although I have been a member of the Society for some years this is the first time I

have dipped pen in ink to encroach on your valuable space, but there are two points which I feel require attention.

First, the question of 'phone on 7 mc., which has always been the cause of much controversy. We know only too well that QRM on this band has reached a deplorable state, but I think much can be done to lessen it if certain stations, particularly some in the London area, would desist from the practice of rending the ether with numerous gramophone records repeated one after another.

I wonder how many of these stations think about "Performing Rights" when broadcasting these records? I also note that the new licence regulations state that only one record (which, I admit, can be repeated several times) may be transmitted per day.

Secondly, although I much admire the technique and vocabulary of our good amateur friends in America, why must we slavishly follow them? Let us try to cut out some of these slang amateur expressions and use instead some good, wholesome all-British words. Such expressions as "cans" and "jump in, please" sound strangely out of place from British stations, who make a very poor attempt to imitate American phraseology.

Yours faithfully,
DOUGLAS WALTERS (G5CV).

45, Fairfax Road,
Bedford Park, W.4.
March 1, 1935.

TEST CALLS.

The Editor, T. & R. BULLETIN.

DEAR SIR,—During transoceanic contests the word TEST is heard more often than CQ, and particularly during B.E.R.U., when the whole Empire uses the word. Most amateurs know how to operate intelligently, they send TEST three times, and perhaps B.E.R.U. or DX, and then their own call-signs three times.

Unfortunately, much time of sending stations is wasted by a few thoughtless young operators (and at times one is inclined to describe them more drastically), who send TEST about thirty times before signing their call signs. This type of operating was not practised by any of our distant Empire stations, but seemed to emanate chiefly from one or two stations in England.

Such procedure is contrary to the operating code, and sheer selfishness or thoughtlessness on the part of the individual concerned. It does not increase the chance of making contacts; on the contrary, most operators tune away in disgust from a station of that sort. The abuse of CQ in foreign countries is a similar problem, but let us try and set an example to others.—Yours faithfully,

"USQUE AD NAUSEAM."

Strays.

Mr. R. M. Naylor, VE3AEE, 45, Rosemount Avenue, Toronto, is anxious to arrange schedules with British amateurs working with low power.

ZC6FF informs us via G2OP that he leaves for England on April 22. He hopes to start up soon at 70, Edmund Road, Southsea.

RESEARCH AND EXPERIMENTAL SECTION

MANAGER :

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

ASSISTANT MANAGER :

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

GROUP MANAGERS :

No. 1 : 1.7 and 3.5 MC. WORK
J. H. Hum (G5UM), "Byeways," The Drive, Welwyn, Herts.

No. 2 : 56 MC. WORK
T. Vickery (G5VY), 274, Mount Pleasant Road, Tottenham, N.17

No. 3 : ARTIFICIAL AERIALS

No. 4 : ATMOSPHERE AND FADING
J. C. Elmer (G2GD), Aethelmar, Seabrook Road, Hythe, Kent.

No. 5 : TELEVISION
C. W. Sands (G5JZ), Springfield, Heathfield, Sussex.

No. 6 : CONTEMPORARY LITERATURE
R. A. Ferreday (PAOFY), Abrikozenstraat, 87, The Hague, Holland.

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

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

No. 9 : AERIAL DESIGN
F. Charman (G6CJ), Orchard Cottage, Stoke Poges, Bucks.

No. 10 : VALVE RESEARCH
D. N. Corfield (G5CD), 10, Holders Hill Gardens, Hendon, N.W.4.

No. 11 : 28 MC. WORK
W. A. Clark (G5FV), "Lynton," Hull Road, Keyingham, Hull.

No. 12 : AUXILIARY EQUIPMENT
A. O. Milne (G2MI), "Southcot," Larkfield, Kent.

DOUBTLESS, most of those who read these notes each month are aware that Dr. Bloomfield has been responsible for the editorial work entailed, whilst I, as R.E.S. Manager, have been sitting back in my armchair, viewing them from a distance. When a person does the same job for a long period he is apt to become very accustomed to it, and does not see things which are quite striking to a man fresh to the work. That has been my experience for the last two months, and a very useful one it has been.

The chief point that has struck me about them is their extreme similarity in many respects to "Notes and News from the British Isles." Those notes exist for the purpose of informing members about the more or less social side of the Society, whilst our R.E.S. Notes exist for the purpose of recording useful and interesting Research and Experimental work. Now the D.R.'s can be expected to make a contribution each month, for everyone does something, but on the Scientific side this is not to be expected. It is fairly apparent from a perusal of our Notes that many of the contributors are under a misapprehension on this point, and try to provide regular material each month, with the result that the notes contain an enormous amount of material of no real scientific value. I do not think that this is the fault of any one rank of the Section ; it is just one of those misunderstandings that arise from time to time. The fault is, perhaps, mine more than anyone else's, as I should have pointed it out before, but my excuse, if one is needed, lies in the first paragraph of this Editorial.

Now let us see how we can best remedy this state of affairs. Firstly, we must deal with the source of the material, *i.e.*, the member supplying it. In future, when you take up your pen to write to your G.C., ask yourself whether you really have something *new* to write about. If not, just send him a line saying so. He will not blame you if your report is only of a routine nature. Of course, if you cannot produce anything of value after some months, he may ask you to try and turn in something, but by that time you will probably have told him you could not do anything on the subject under consideration, and ask him to release you from the group.

Secondly, a word to the men at the head. When you send in your reports, it is not desirable to include a report from each member of a group just because he reports. If he has nothing of real value his report need not be commented upon. No really keen man will mind this exclusion if he understands the reason for it, and the foregoing paragraphs should have made this plain.

I must crave your indulgence for taking up so much space on this subject, but I feel that the matter is of great importance. G6PA.

1.7 and 3.5 mc. Group (No. 1)

Following the sending of a circular letter, outlining Transatlantic schedules, to leading 1.7 mc. amateurs, we are glad to report that G2II worked W1DBM on February 10, being reported R3. On March 10, we believe, he added Canada to his list of DX. He uses a 264-ft. aerial, and a counterpoise of similar length, which no doubt account for his remarkable achievement.

BRS1295 confirms G5MP's query in the last issue regarding 'phone stations heard on 1.7 mc. in the Canary Islands. The stations heard on January 28 were G5NW and G6AU ; that heard on February 2 was G2JG, of London.

G5JH describes some tests he has made to determine whether emissions are harmonic, overtone or fundamental, and reports the reception of 3.5 mc. and 14 mc. stations on 1.7 mc. *when using a tuned S.G. receiver*. He suggests that overtones and harmonics are actually generated by the transmitter—an opinion also shared by G6NA, who, writing on the same subject, submits that overbiassing can increase their strength.

Group 1C.—Experiments with modulators continue to occupy the attention of the telephony group. G5BK, a new member, uses a *Western Electric* microphone of the double-button pattern, with a three-stage amplifier and push-pull modulators. He has found push-pull to be definitely preferable to single-ended systems for good speech quality.

G.C. G5WW has replaced his 4211E with a Cossor 660T which, he claims, gives 10 watts output at 500 volts on the plate, when used as a modulator. He has substituted R.C. coupling with transformer coupling in the first stages of his microphone amplifier, the former method having been found unsatisfactory with an *Epoch* moving-coil microphone. He recommends a valve of the P220 class as being adequate to swing a 660T fully.

G5WW, using 500 volts from the local D.C mains, of which neither side is at earth potential, experienced considerable trouble with D.C. hum, which was ultimately removed by (1) using a loose-coupled Marconi aerial instead of a direct-coupled Hertz and (2) connecting a compression type condenser between H.T. negative and earth, enabling the hum to be tuned out.

G6AU has gone over to a P.A. output stage, as a TPTG was found to be unsatisfactory for telephony, its adjustment being very critical, often resulting in decrement modulation.

R.E.S. REPORTS.

In future monthly reports from Group Managers should be addressed to Headquarters, and must arrive not later than the 20th of the month. Reports received after that date cannot be published. Diagrams should be submitted on separate sheets and the reports drawn up on the special forms provided. H. C. P.

New members of the group are G6GO (Rugby), 2BPK (Hornsey), and Mr. Binning, of Bury, all of whom are keenly interested in telephony work.

Group 1*E*.—Mr. Seymour (2AZX), with commendable enthusiasm, has launched a full group of receiving members, consisting of BRS207, 1173, 822, 1209, 2AOI and himself. As examples of the methodical nature of the work now being done, it should be stated that the group is studying the 1.7 mc. and 3.5 mc. Contest entries, and is also observing on the 1.7 and 3.5 mc. sections of the R.S.G.B. Reception Tests.

Regular schedules on either band, C.W. or telephony, are required at once with any transmitter in the British Isles. As this group is anxious to be of every possible service to people using the two top bands, transmitters willing to fix schedules or requiring regular reports are requested to get into touch with Mr. P. Seymour (2AZX), No. 32, Married Quarters, R.A.F. Base, Gosport, Hants.

Group 1*F*.—Duplex work continues, but there is nothing of outstanding interest to report.

G5UM.

56 mc. Group (No. 2.)

Most districts are now becoming active as members realise the enormous scope for experimental and research work on the higher frequencies. Frequency stability and efficiency are attracting general interest, and it is gratifying to note that at least one member in each district has undertaken the onerous task of checking calibrations in his area, so that it is now safe to assume that all members' transmissions are within the limits of the band.

All stations are requested to co-operate in organised tests on April 21 and 28, May 12 and 16, at 10.00 to 11.00 and 14.00 to 15.30 B.S.T.: all members reporting should state type of receiver in use and the number of valves used.

G5VY.

Atmosphere and Fading Group (No. 4)

Group 4*A*.—Observations on the effect of "Fronts" are now finished, and it is hoped that the conclusions arrived at by the group will be ready for publication in the near future.

Group 4*B*.—ZB1F contributes his usual monthly report, in which he notes that on both 7 and 14 mc. conditions have been generally poor, with a few exceptions, notably on February 10. Humidity and static, especially "mush," have been high. Is there a connection?

Group 4*C*.—This group has been active and the monthly list of thunderstorms is recorded. G6LM has received reports suggesting fading on his 14 mc. signals at a distance of only 6 miles; more information about this will be awaited with interest. The G.C. has been measuring the wave-lengths of the static caused by lightning flashes.

Group 4*D*.—Reports from members incline to support the Isobar Theory, especially on 7 mc. It is hoped that with the approach of summer the 14 mc. band will produce more material for investigation. The effect of the moon is also being studied.

The G.M. wishes to thank several members for reports on his test signals. These reports are being circulated in the G.C.'s Letter Budget, and no doubt G.C.'s will be making arrangements to include the information in their own Letter Budgets. It must be several months before any conclusions can be published, but it is hoped that these tests may go on throughout the year.

G2GD.

Television Group (No. 5)

G2UF reports on his station this month. The television transmitter comprises 30 and 60-line mirror drums; a 100-watt light source is used for the 30-line system, and a 300-watt arc lamp for the 60-line system. Six photo-cells are banked and nine stages of amplification are used. When using the 60-line system, extra H.F. stages can be added if desired.

On the receiving side, G2UF again uses a mirror drum. The 30-line system is straightforward, except for the lens for projection onto the drum; this gives an image 28 ins. × 14 ins. with remarkable definition.

The 60-line light modulator has caused G2UF some little worry. Finding that the Kerr Cell gave too great a loss of light, he is at present using borosicillicate of lead glass, wound with a coil with calcite blocks. With the 60-line system it is possible to obtain an image 5 ft. × 4 ft. 6 ins. The drum is 15 ins. diameter and is driven with an 8-h.p. motor. G2UF has recently completely screened the transmitter, because it was found that the signal was collecting mush. G2UF has received

his own 10-metre television transmissions, using a disc receiver, at a range of 6 miles.

2AOT is at present using a Dr. Lemon lamp with good results; he states that, although the lamp is difficult to " strike," it gives much better pictures than the neon.

BRS1098 has the baseboard already for the televisor, 3 ft. long, it has room for the all-wave receiver, power pack, etc.; BRS1098 is also interested in cathode-ray reception.

G5JZ has been attempting contact with G2AO on 10 metres for television tests, but although G2AO is just audible at G5JZ, it will be hard work achieving satisfactory results.

G5JZ.

Aerial Group (No. 9)

The section appears to have recovered from its lapse of a short while ago, and, I am pleased to say, is now running much better.

The BERU contest has given some members a chance to obtain results on their latest system quickly, particularly in the case of G2HX. This appears to be a point in favour of having a number of annual contests.

G2HX, on 7 and 14 mc., put up a very good score with a system comprising two 33-ft. wires, one horizontal and the other rising, but neither very high. The wires ran in opposite directions from the transmitter, and were series-tuned for 7 mc., and joined to the opposite ends of a push-pull tank circuit on 14 mc. It should be noted that the arrangement for 14 mc. is not the usual full-wave aerial, but is equivalent to a full-wave with a phasing coil in the centre, and so gives good low-angle radiation in the broadside direction.

G2ML is unfortunate in having a location in which the aerial must point E-W, and is finding, as is usually the case, that it does not radiate that way (*i.e.*, end-on), though it is possible to work South Africa. In order to overcome the difficulty he hopes to erect a vertical aerial, but is also unfortunate in the matter of available height, and wants suggestions as to how to make the top 33 ft. stand up.

G5ZT is still obtaining good results on 1.7 and 3.5 mc., with the system described in last month's notes. 2AAM is building up his gear for the experiments he has planned to do in connection with propagation through the earth to the bottom of a mine. Assistance and advice from anybody who has had experience in this direction would be invaluable, as there is still doubt as to the amount of gain required in the receiver and very little is known about the subject generally.

The Group Manager has put up three aerials with predetermined characteristics, and in each case the radiation goes where it is wanted, and the blind spots, which must inevitably appear, are where expected. Fortunately, it was possible to plan the layout in advance. Discussion of the design will be reserved until sufficient results have been obtained to prepare a short article on the subject of aerial planning.

G6CJ.

28 MC. Group (No. 11)

The following is a summary of the various reports received from members engaged in 28 mc. work :—

Group 11*A*.—G2YL sends in two most interesting reports in which she gives information recently received from W6CAL and OK1AW regarding their work and views of ten-metre working. G2YL had two QSO's during the month, these being with G2HG and G5OJ.

G2HG reports experiments with locked and driven amplifiers using various methods of coupling; he finds that the neutralised T.P.T.G., using series feed for the H.T. and with grid coil centre tapped to be the best arrangement, very little driving being needed to obtain a good output. He has also been making tests with " Midget " directional aerials. An improvement in conditions is mentioned in his report, two harmonics, LCB and FF8MQ being received during the month.

BRS25 has been at the receiver a reasonable amount of time, but only reports local stations. In his report he gives instances of DX heard at his station during the past and thinks the most likely time for the reception of South African stations is from December to March; Iraq and India, after March; and Egypt any time between 10.00 and 17.00 G.M.T. during March and April.

Group 11*B*.—G6ZV is conducting two-way tests with G2HG.

G5GC heard an harmonic of EAM on March 13 at 14.00 G.M.T.

G5FV has found conditions very poor. A tri-tet arrangement is now in use, making 7 mc. crystal operation possible without additional stages. The system is most efficient, using a '59 in the tritet stage.

During the month a very pleasant piece of news was received from G2WQ of Manchester. Mr. Brown, when working ZL3HK on January 20, using the 14 mc. band, had his Harmonic on 28 mc. received by a listener, who reports the strength and readability as 493.

Further details of this encouraging news will be found in a separate article in the BULLETIN.

ON4AU forwards a report of his recent work on 28 mc. and gives details of his parabolic antenna system in use at his station.

G6YL was successful in receiving a harmonic from Malabar Jara (PLL) on March 11, between 11.00 and 12.00 G.M.T. Strength R6. Miss Dunn also heard other unidentified commercial harmonics that day and comments on the fact that several well-known 28 mc. amateurs were heard on 14 mc. working DX, when, according to their schedules, they should have been transmitting on 28 mc.!

SCHEDULES.

OK1AW calls CQ ten from 12.30-12.40 and 16.00-16.10 G.M.T. every Saturday and 12.30 to 12.40 G.M.T. every Sunday. Commencing March 4 until further notice.

ON4AU will call the following with automatic sending: CQ CQ ten de ON4AU ON4AU at these times :—
07.15-17.30(°), 12.15-12.25(°), 13.30-13.45, 18.30-18.45 20.30-20.45(°).
(10.30-10.45 Sundays only) G.M.T.
(°) Starting May 1.
A period of 10 minutes listening follows transmission. The above times are daily until July or further notice.

PY1AW listening daily at 13.30 G.M.T.

ZL2BG transmits on 28 mc. at 24.00 G.M.T. every Saturday. This station was heard by F8GW and F8PQ at this time on March 29, 1931.

G5FV.

HIC ET UBIQUE.

Headquarters' Notices—Calibration—Q.R.A. and Q.S.L. Sections—Slow Morse—New Members.

I.E.E. Lecture.

We have pleasure in announcing that Mr. G. Parr, of Edison Swan Electric Co., will deliver a lecture on " The Cathode Ray Tube and its application to Television and Radio Research " at the I.E.E. meeting on Wednesday, April 24. Mr. Parr has arranged to demonstrate new types of cathode ray tubes, and the lecture will be illustrated with lantern slides. Tea will be served at 5.30 p.m. and the meeting will commence promptly at 6.15 p.m.

COUNTY REPRESENTATIVES

The following modifications and additions should be made to the list of C.R.'s published in the February issue of this Journal :—

Suffolk : Mr. A. G. Wood, G6TI, 33, Lattice Avenue, Ipswich.

Pembroke : Capt. G. C. Price, G2OP, The Mount, Pembroke Dock.

Northumberland and North Durham : Mr. H. F. M. Baker, G2LD, 4, Priors Terrace, Tynemouth, N. Shields.

B.E.R.U. Representation in Egypt

We are advised by Lt. E. S. Cole (SU1EC) that he is returning to England this month. As a consequence he has been compelled to relinquish his position as B.E.R.U. Representative.

Mr. F. H. Pettitt (SU1SG), has been invited to take over the duties and has accepted.

Radio Exhibition

We are informed that the Radio Manufacturers' Association Exhibition will be held at Olympia during the period August 14 to 24.

Bulletin Binders

Council have decided not to maintain stocks of binders for completed volumes of T. & R. BULLETINS, but we understand that Barnes & Humby, Nottingham, are in a position to supply binders at a reasonable price.

Brussels Visit

Mr. M. Buckwell (G5UK) informs us that he is arranging a visit to Brussels during the period Friday, August 2, to Tuesday, August 6. This tour will coincide with the Reseau Belge Convention and the Brussels Exhibition.

The cost will be £3 12s. 6d. for 3rd class British rail, 2nd class steamer, 2nd class Belgiun rail, and hotel accommodation in Brussels.

Ladies are cordially invited to join the party. Full particulars can be obtained from G5UK, 19, Meadway, Westcliff-on-Sea, Essex.

Radio Trade Vacancies.

Occasionally Headquarters receive information regarding vacancies in radio and electrical undertakings. Members out of employment may register the fact with the Secretary. All such communications should be accompanied by a stamped and addressed envelope.

Calibration Section.

Manager : A. D. GAY, G6NF.

Apparatus for Calibration

Crystals.

(1) Transverse oscillators of the plate type are accepted for calibration in the following frequency ranges :—1700-2000 kcs., 3500-4000 kcs., and 7000-7300 kcs. Calibration fee, 1s. 6d., postage extra.

(2) Longitudinal oscillators of the bar type, 50 kc. or 100 kc. Calibration fee 2s. 6d., postage extra.

Frequency Meters.

(1) Frequency meters of the heterodyne type, covering the frequency ranges allotted for amateur transmission, are accepted for calibration.

(2) Absorption frequency meters of wide range are unsuitable for calibration, as are buzzer frequency meters of obsolete types. Properly constructed absorption frequency meters of limited range may be accepted, but an enquiry describing the instrument and enclosing a stamped addressed envelope should first be addressed to the Calibration Manager. Calibration fee, 2s. 6d. for 5 points, additional points, 6d. per point at any required interval. Postage extra.

Members should be careful to ensure that apparatus is in proper working order and that it covers the frequency ranges specified. Faulty apparatus will be returned to the sender as unsuitable for calibration.

The calibration section will endeavour to accommodate members as far as possible, and apparatus with frequency ranges other than those already specified may be accepted provided an enquiry is first addressed to the Calibration Manager.

Care should be taken that articles sent for calibration (particularly crystals) are securely packed as they are only accepted for calibration at owner's risk. *Return postage on crystals and frequency meters must be remitted separately.*

Accuracy of Calibration.

All measurements are made with an accuracy better than 0.01 per cent., but whether the articles sent for calibration can reproduce such accuracy depends upon the conditions under which they are used and their inherent stability. For precision work the section can give calibrations within one part in 10^3, but special arrangements must be made for this service.

QSL Section.

Manager: J. D. Chisholm, G2CX.

The result of the appeal published in the February issue is negative—apparently only two members read it.

In the light of past experience we cannot say that we are surprised at the response—or lack of it, but in case anyone still wishes to be added to the list of those who do not wish us to accept report cards for them we shall be glad to have names.

The Polish QSL Bureau asks us to say that owing to a dispute with the Postal Authorities it is possible that cards from SP will be delayed somewhat in the near future. In any case recent cards are being retained for the purpose of judging the contest of last December.

We have just received a returned parcel recently sent to the Iraq QSL Bureau so that it appears the address is no longer a good one. Will any member in that country offer to carry on the work?

R.S.G.B. Slow Morse Practices

A schedule below contains the April-May list of stations taking part in the slow morse practices and, as usual, test matter will be taken from recent issues of The T. & R. Bulletin. The page number and month of issue will be given at the end of each test. More reports will be appreciated and are desired in order to ascertain range of transmission and numbers utilising the services. Should a reply be needed, please enclose a stamped addressed envelope or postcard. Mr. Collin (G2DQ) will no longer be assisting in these practices, a fact which will be regretted by many members in the London and Home Counties districts. This opportunity is taken of thanking G2DQ for his past help, and in saying this, we speak on behalf of those who have, and those who have not, written him a line of appreciation after past practices. A new station (G6PJ, of Sheffield), it will be noticed, will be on the 7 mc. band, and it is hoped that these transmissions will reach the districts at present not served, and especially Ireland, where service has been requested. Stations willing to assist on the 1.7 mc. band—particularly from those districts at present without a service—are invited to communicate with Mr. T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4. Telephone: Silverthorn 2285.

Schedule of Slow Morse Transmissions.

Date, 1935.		B.S.T.	kcs.	Station
April 21	Sunday	0000	1761.5	G2WO
,, 21	,,	0930	1785	G5BK
,, 21	,,	1030	1911	G2JL
,, 21	,,	1100	7104	G6PJ
,, 21	,,	1130	1761.5	G2WO
,, 28	,,	0000	1761.5	G2WO
,, 28	,,	0930	1785	G5BK
,, 28	,,	1030	1911	G2JL
,, 28	,,	1100	7104	G6PJ
,, 28	,,	1130	1761.5	G2WO
May 5	,,	0000	1761.5	G2WO
,, 5	,,	0930	1785	G5BK
,, 5	,,	1030	1911	G2JL
,, 5	,,	1100	7104	G6PJ
May 5	Sunday	1130	1761.5	G2WO
,, 12	,,	0000	1761.5	G2WO
,, 12	,,	0930	1785	G5BK
,, 12	,,	1030	1911	G2JL
,, 12	,,	1100	7104	G6PJ
,, 12	,,	1130	1761.5	G2WO

QRA Section.

Manager: M. W. Pilpel (G6PP).

NEW QRA's.

G2FS.—L. K. Winsor, 202, Hither Green Lane, Lewisham, London, S.E.13.
G2HX.—L. O. Rogers, "Audwen," Estcourt Road, Gloucester.
G2IM.—E. R. Radford, 14, Fitzwarren Gardens, London, N.19.
G2OZ.—J. W. Norton, "Berwyn," Wellington Road, Taunton, Somerset.
G2SJ.—K. N. Franklin, "Granta," Beltinge Road, Herne Bay, Kent.
G2WR.—J. V. Warner, 41, Blyth Road, Worksop, Notts.
G5CG.—C. Gregg, Police Lodge, 46, Highbury Road, Bulwell, Nottingham.
G5GD.—D. G. Sainsbury, Venn Farm, Teignmouth.
G5HN.—E. Handcocks, "The Naides," Woodcote Road, Caversham, Reading.
G5HS.—P. G. Hester, 19, Southern Road, Thame, Oxfordshire.
G5IL.—E. Ingleton, "The Haven," Chalk, near Gravesend, Kent.
G5JD.—J. Dalton, 10, White Point Avenue, Whitby, Yorkshire.
G5PP.—R. Palmer, 22, Sherlock Road, Coventry, Warwickshire.
G5QZ.—J. S. Hobson, 33, Crossman Street, Sherwood, Nottingham.
G5TB.—T. J. Brown, Manor House, Nettlebed, Henley-on-Thames, Oxfordshire.
G5TS.—T. B. Smith, 115, Novar Drive, Hyndland, Glasgow, W.
G5TY.—D. M. J. Tyre, 71, Waverley Street, Glasgow, S.1.
G5YW.—J. Clough, 1017, Leeds Road, Bradford, Yorkshire.
G6BT.—C. A. Jamblin, "Trelawny," Westley Road, Bury St. Edmunds, Suffolk.
G6DR.—D. Richards, "St. Aubyn," Stanley Park Road, Carshalton, Surrey.
G6FJ.—W. Griffin, 16, Alma Place, North Shields, Northumberland.
G6II.—J. G. Tisling, 37, Ashcombe Road, Weston-super-Mare.
G6MF.—M. H. Munroe, 40, Park Lane, Darlington.
G6MU.—W. J. Munt, junr., 11, Bailey Road, Colliers Wood, London, S.W.19.
G6QC.—E. T. Pethers, 23, Chester Road, Gillingham, Kent.
G6XW.—C. Winton, 56, Balfour Crescent, Larbert, Stirlingshire, Scotland.
G6YO.—G. Evans, 7, Moorlands, Birkenshaw, Bradford, Yorkshire.
2ABS.—A. H. S. Scott, 5, King's Court, King's Road, London, S.W.19.
2AFA.—B. Lythaby, 14, Rose Street, Peterhead, Scotland.
2AJT.—J. H. Wood, "Deepdale," Marine Road, Prestatyn, Flintshire.
2AOJ.—M. G. Church, "Gogmore House," Chertsey, Surrey.
2AQB.—H. Wright, 95, Helston Road, Penryn, Cornwall.
2ATL.—F. W. Cable, 43, St. George's Terrace, Swansea, Glamorgan.
2AXH.—R. S. Robinson, 23, Clifton Road, Flixton, near Manchester.
2AYX.—C. E. Willingham, 6, Hale Road, Tottenham, London, N.17.
2BCM.—D. A. Hogg, 74, Hawthorn Crescent, Highbury Estate, Cosham, Portsmouth, Hampshire.
2BJY.—A. Oughton, 51, Fydell Street, Boston, Lincs.
2BOW.—A. B. Wright, 106, Knowsley Road, St. Helen's, Lancashire.
2BRM.—S. G. Lewis, 49, Clifton Road, Tuebrook, Liverpool, 6.
2BVF.—H. G. Hunt, 29, Newcastle Road, Reading, Berkshire.
2BXU.—R. W. Charnock, 61, Liverpool Road, Burscough Bridge, Lancashire.

The following are cancelled: 2AJC, 2ALA, 2AMY, 2AXM, 2BGL, 2BHZ, 2BIT, 2BXC, 2BYC.

NEW MEMBERS.

HOME CORPORATES.

L. V. Bridge (G2SV), 19, Royal Terrace, Southend-on-Sea, Essex.
H. Lovering (G5LV), 61, Tirpenry Street, Morriston, Swansea.
A. W. L. Summers (G5SS), 35, Royal Mint Street, E.1.
R. G. W. Page (G5TP), Roland Cottage, Stoke Row, near Henley-on-Thames.
A. F. Hembury (G6AY), 5, Rosewood Gardens, Sheriff Hill, Gateshead, Durham.

H. J. M. Box (G6BQ), 52, Cobham Street, Gravesend, Kent.
J. E. Simmonds (G6SI), 12, Royal Albert Buildings, Cartwright Street, E.1.
G. Haworth (2AQA), "Merova," Wheatley Lane Road, Barrowford, Lancs.
D. M. K. Harrower (2AVC), Forthbank Cottage, Stirling, Scotland.
F. A. Tucker (2AZC), 17, Warberry Road West, Ellacombe, Torquay.
T. L. Peterson, Jun. (2AZU), 7, Belle Vue Crescent, South Shields, Durham.
F. B. Hervey (2BBA), 60, Granville Avenue, Stoke, Coventry.
R. S. G. Bartle (2BPJ), 46, Goods Station Road, Tunbridge Wells, Kent.
H. A. G. Shepherd (2BWC), 8, Council Cottages, The Chart, New Oxted, Surrey.
D. Rougvie (BRS1732), "The Sheiling," David First Street, Kinghorn, Fife, Scotland.
C. W. Farrell (BRS1733), "The Holt," Queen's Road, Knaphill, Woking, Surrey.
F. T. Bennett (BRS1734), 13, Commercial Arcade, Guernsey, C.I.
B. H. Stubbs (BRS1735), Brookwood Farm, Knaphill, Woking.
M. K. Williamson (BRS1736), 6, Rossend Gardens, Burntisland, Scotland.
F. W. Cable (BRS1737), 43, St. George's Terrace, Swansea, Glam.
J. W. Knight (BRS1738), 116, Napier Street, Laisterdyke, Bradford.
W. H. Abraham (BRS1739), 9, Bridge Street, Abercarn, Mon.
E. P. Wethey (BRS1740), Gwentlands, Bittell Road, Barnt Green, Birmingham.
R. H. Leach (BRS1741), Cyldon, Nab Wood Crescent, Shipley, Yorks.
D. F. Waddington (BRS1742), 9, East Shrubbery, Redland, Bristol, 6.
J. Etherington (BRS1743), Daisy Bank, Leyland Lane, Leyland, near Preston, Lancs.
G. J. Small (BRS1744), 53, Station Road, Taunton, Somerset.
S. F. L. Coney (BRS1745), 32, Wellington Road, Bournemouth.
C. Brown (BRS1746), Alvestor Lodge, Westbury Park, Bristol, 6.
L. P. Elmer (BRS1747), 55, The Drive Mansions, Fulham Road, S.W.6.
D. E. Herbert (BRS1748), 19, Seaton Avenue, Mutley, Plymouth.
W. Layton, Jun. (BRS1749), 138, Gravelly Hill, Erdington, Birmingham.
W. C. E. Allen (BRS1750), 1, George Road, Guildford, Surrey.
J. A. Burrows (BRS1751), 22, Silkmore Crescent, Stafford.
F. E. Atkins (BRS1752), 14, Smith Street, Guernsey, C.I.
L. E. Drake (BRS1753), Markleigh, Oxford Road, Stratton, Swindon, Wilts.
H. V. Dyer (BRS1754), 52, Glenloch Road, Belsize Park, N.W.3.
T. Halpin (BRS1755), Ballysheedy, Limerick, I.F.S.
S. Stephenson (BRS1756), 21, North Marine Road, Scarborough.
W. Holford (BRS1757), "Pencoys," 8, Avenue Road, Staines, Middlesex.
J. Murdoch (BRS1758), 70, Broad Street, Denny, Scotland.
R. L. Coombes (BRS1759), "Faraway," Otterton, Devon.
Mrs. Mabel Pinder (BRS1760), 20, Barmouth Road, Wallasey.
J. Ferguson (BRS1761), 2041, Great Western Road, Glasgow, W.3.
D. Dunleavy (BRS1762), 6, Heugh Street, South Shields, Co. Durham.
E. T. Carter (BRS1763), "Redcot," 44, Oak Street, Romford, Essex.
W. H. C. Adams (BRS1764), 39, High Street, Taunton, Somerset.
A. J. Beaumont (BRS1765), Church Street, Willingham, Cambridgeshire.
D. K. D. Shaw (BRS1766), 56, Sandy Lane, Stretford, Manchester.
J. Grant (BRS1767), 12, Lour Road, Forfar, Angus.
L. E. Lee (BRS1768), "Hope Cove," Meyrick Road, Babbacombe, Torquay.
C. G. Herring (BRS1769), 40, Salisbury Road, Plymouth.
C. F. Laidig, Jun. (BRS1770), 2, Hawkhead Crescent, Liberton, Edinburgh.
F. H. Babcock (BRS1771), Gledhow Wood, The Chase, Tadworth, Surrey.
H. H. Lugg (BRS1772), 82, Charlemont Road, West Bromwich, Staffs.
R. Jennings (BRS1773), 9, Wheatley Road, Whitstable, Kent.
R. S. Meakin (BRS1774), c/o Mr. Burrows, School Lane, Leyland, Lancs.
G. T. Parker (BRS1775), 8, Hurst Road, Sidcup, Kent.
K. E. Aris (BRS1776), 9, Oak Avenue, Hornsey, N.8.
H. W. Scott (BRS1777), 132, Cherryhinton Road, Cambridge.
O. K. Dawes (BRS1778), 320, Cherryhinton Road, Cambridge.
F. S. Gell (BRS1779), "Glen Rise," Oadby, near Leicester.
L. F. Finbow (BRS1780), 13, Orchardfield Road, Farncombe, near Godalming, Surrey.
G. A. Mennie (BRS1781), 655, Pollokshaws Road, Glasgow, S.1.
A. E. Barnes (A), Harroby, Farcet Road, Peterborough.
W. G. Irwin (A), 64, Hamilton Road, Highbury, N.5.

DOMINION AND FOREIGN.

W. Rach (D4CFF), Rupprechtstr 24, Berlin-Rummelsburg, Germany.
J. R. Fraser (VE1FT), 89, Upper Prince Street, Charlottetown, Prince Edward Island, Canada.
E. S. C. McCredie (VK2EV), 219, Burwood Road, Burwood, New South Wales.
R. I. Walker (VQ4SNB), P.O. Timboroa, Kenya Colony, British East Africa.
F. J. Towell (VU2AU), The Arsenal, Kirklee, India.
H. H. Brown (VU2BW), Indian Military Hospital, Karachi, India.
Col. C. Foster (W6HM), Carmel, California, U.S.A.
O. W. Gillion (ZL2BZ), 71, Church Street, Palmerston, North, New Zealand.
W. A. Wilson (ZL2CI), Milne Terrace, Island Bay, Wellington, New Zealand.
A. J. Emes (ZU5AF), 843, Sarnia Road, Bellair, Natal, South Africa.
J. Friend (BERS276), No. 1 Section, No. 1 Armoured Car Co., R.A.F., Mosul, Iraq.
E. M. Gauci (BERS277), 28, Sda Nuova, Floriana, Malta.

D.S.M.

The D.A.S.D. has instituted a certificate, similar in nature to the W.B.E. and W.A.C. certificates. It will be awarded to amateurs of any nationality who have attained the following qualifications.

1. Two-way communication with all six Continents (according to I.A.R.U. regulations) on two amateur frequency bands.
2. Ten two-way contacts with foreign countries on a third amateur band.
3. Communication with at least three different countries in each Continent.
4. Applicants must submit a paper dealing with a technical or scientific subject for publication in the D.A.S.D. magazine, "*CQ-MB*." The D.A.S.D. retains sole copyright of the paper, which may be written in any language. Papers must be typewritten in Roman characters. The D.A.S.D. has the right to refuse papers which do not conform to a certain standard.

The certificate D.S.M. (German Transmitting Master) is tenable for one year, but may be applied for again subsequent to that period. Applications for renewals need not be accompanied by a paper according to paragraph 4.

European amateurs residing outside Germany must have worked at least 20 different German stations in order to be eligible for the award, and in addition must have worked at least one West Coast American station (W6, W7, K7, VE4 or 5). Not more than one card will be accepted from Near East (YI, ZC, AR, TA) or North African (SU, FM, EAS-9, CT3, CN) stations.

Applications for the certificate should be addressed to D.A.S.D., DSM Dept., Berlin-Dahlem, Schweinfurthstr. 78, Germany. Members of affiliated I.A.R.U. societies may send their cards to their own headquarters, which will notify the D.A.S.D.

Silent Keys

We have again to record the death of two well-known members, Mr. McCornick, G2MC, of Bexhill, and Mr. Dixon, G6PD, of Frinton-on-Sea.

Both of these gentlemen had a long association with the amateur movement, and their passing will be mourned by many amateurs at home and abroad, who had the pleasure of contacts with them.

Our deepest sympathies are extended to their families and friends.

DX CHART—No. 5

DX CONDITIONS: FEBRUARY 15 TO MARCH 15, 1935.

G.M.T.	14 mc.	7 mc.	3.5 mc.
0100		W1	W1.2
0200		W1	W1.2
0300		W1	DX conditions appear to be
0400		W1	gradually falling off.
0500		W1	
0600		W1 ; ZL	
0700	ZL	W1.5.6 ; ZL	
0800	**ZL ; VK ; J**	**ZL ;** W1.5.6	
0900	**ZL ; ET8 ; CX1 ;** J	W5	
1000	**ZL ; VK ;** J		
1100	W1 ; VE ; K4 ; ZL ; KA ; XU ; VK		
1200	**W1 ; VE1 ; K4 ; VP5 ;** VU ; VS6 ; ZL ; VK		
1300	**W1 ; VE1 ; K4 ; VP5 ;** PK ; XU ; VK		
1400	**W1 ; VE1 ; PK2 ; K5 ;** VK		
1500	**W1.6 ; VE1 ; PK ; VP5 ; ZB1 ; ZS1 ;** ZC6 ; ZE ; VK	KA1 ; VK ; ZL	
1600	**W1.5.6 ; VE1 ; ZB1 ; VQ3 ; ZC6 ; ZS ; TF**	VK	
1700	**W1.6.7 ; VE1.5 ; VP5 ; VU2 ; VQ4 ; ZS ; TF**	VK	
1800	**W1.6 ; VE1.4 ; ZE ; K5; ZS ; ZT ; ZU ; V8**	**VK ; ZD**	
1900	**W1 ; VE1 ; VS6 ; K4.5 ; VQ4 ; ZS ; ZT ; FC4**		
2000	**W1.6.7 ; VE1 ; CX ; LU; PY ; VP4**	W1 ; VE1 ; ZS6 ; XU	SU
2100	**W1 ; VE ; CX ; LU ; PY ; VP2.4 ; VQ4 ; K4.5**	W1 ; VE1 ; LU ; ZD ; PK	W1.2.4 ; SU
2200	W1 ; VE ; **CX ; LU ; PY ; K4**	W1 ; VE1 ; **K4 ; PK**	W1.2.4
2300	**CX ; LU ; PY**	**W1 ; VE1 ; PK**	W1.2.4
2400		**W1 ; VE1**	W1.2.4

(A) Bold type signifies strong signals.

(B) W1 and VE1 in 14 mc. column signify East Coast areas when conditions are good.

Conditions on 14 mc. have not been normal on many nights recently as the band is generally expected to be "dead" after 2100 G.M.T. at this time of the year.

Empire Calls Heard.

*BERS*265 (*Hong Kong*), *during February* :—

7 mc.: g5cw (5.8), 5xg (3.6), ve5eg (3.6), 5eo (4.7), vk3dm (3.5), 2el (4.7), 6fo (4.6), 4gk (4.6), 3gq (4.6), 3mr (4.6), 2ns (3.5), 5su (4.6), 3uh (3.6), vp3am (3.4), vq4crl (4.7), vu7a (3.5), 7rx (3.5), 7fy (4.7), 21j (4.7), 21z (5.7), ze1yn (3.5), zl4ai (5.8), 3an (4.8), 3bj (4.7), 2bn (4.7), 2bz (3.5), 2ci (5.7), 4ck (3.5), 1dv (3.5), 3fg (4.7), 1ft (4.6), 2lb (3.5), 2qt (3.6).

14 mc.: g6xq (3.6), ve2ax (3.5), vk4bb (4.7), 2bk (4.6), 3bw (4.5), 5cl (3.5), 3cp (3.5), 4ei (3.6), 2er (3.6), 2es (3.5), 3gc (3.5), 5gw (3.5), 2lc (3.6), 3li (3.6), 3kx (3.4), 4le (3.5), 3mr (3.5), 3ow (3.5), 2px (3.5), 5rb (3.4), 7rc (3.5), 6sa (3.5), 2ww (w.4), 3yp (3.6), vu7fy (3.5), 2lj (4.7), zl2ak (3.6), 2bz (3.5), 4ck (3.5), 3gm (4.6).

A. Pollard (*G2PN*), 31, *Donkin Terrace, North Shields, Northumberland, March* 3-24, 1935, *on* 14 *mc.* :—

ve1bh, 1bv, 1dr, 1dz, 1ea, 1et, 1ey, 1ge, 1gz, 2ax, 2ay, 2cx, 2ee, 2ge, 5no, vk2bw, 2el, 2xm, 3yp, 4ol, 4vj, 6mn, vs6ah, 6aq, 7aa, vq4crl, vp2cd, 4ta, 5pz, 9r, zl4ck, zd1d, 2c, zt6k, ze1jm, 1jn.

*Heard in B.E.R.U. Contest by BERS*195, *Postal Staff, St. Peters, South Australia* :—

7 mc.: g2dv, 2ic, 2mi, 2nm, 2oa, 2qt, 5la, 5wp, 6dl, 6kp, 6wy, 6xq, su1ec, v8af, ve5bi, vk6cp, 6fl, 6fm, 6fo, 6jw, 6ko, 6pk, vq4crl, vs6ah, 6aq, 6ag, 6ax, vu2cq, 2jp, 2jt, 2lz, 7fy, vs7gt, 7ra, zl1ar, idv, 1ft, 1gx, 1hd, 1jq, 1qt, 2bz, 2cw, 2jw, 2ju, 2lt, 2nw, 3aj, 3an, 3fg, 3gm, 3gn, 3ja, 4ai, 4bq, 4ck, 4cg.

14 mc.: g6xq, vk6fo, 6jw, 6sa, vs6ah, 6aq, 6ax, vu2cd, 2lz, 2jp, 7fy, vs8ab, su1ec, zl1ak, 1ar, 1dv, 1ft, 1fv, 1gc, 1gx, 1hy, 2ap, 2ci, 2bz, 2cw, 2ja, 2kk, 2lb, 3aj, 3gm, 3gn, 3fg, 4ai, 4bq, 4ck, zsih, 5a.

MIDLAND PROVINCIAL MEETING

The largest gathering of British radio amateurs outside London was recorded on March 24, when the first of the new provincial meetings took place at the Hope and Anchor Hotel, Birmingham.

An official attendance of 106 was returned, a figure which included representatives from most of the English districts.

The function proper opened at midday, when acquaintanceships were renewed for an hour in the lounge of the hotel. Dinner was served under the supervision of our host, Councillor Eli Fletcher. The amateur movement in Birmingham owes much to Mr. Fletcher, whose cordiality and genial smile has welcomed us on every visit to that town for the past five or six years.

Mr. Desmond's announcement that no speeches were to be made during or after the dinner was received with applause!

In opening the business meeting, Mr. Desmond referred to the new method of running District Conventions and on behalf of his own district extended a welcome to all who had attended from other parts of the country. He expressed his personal thanks to Mr. Arthur Watts (President) for attending in company with Mr. Ostermeyer.

Mr. Clarricoats (Secretary) was then asked to address the meeting. In a talk lasting about 50 minutes, he explained various points of general interest, among which were licence matters, the progress of R.E.S., technical development, the T. & R. Bulletin, Society contests, membership, etc., etc. In the subsequent discussion several members made useful suggestions regarding contests and contest rules.

Mr. Watts, in a short speech, made an appeal for greater support of the Research and Experimental Section, pointing out that the future of the amateur movement in this country depends to a large extent upon our ability to prove that British amateurs are conducting useful experimental work. He paid a tribute to the work of the original E.L.S. and explained why recent changes had been found necessary. Emphasis was given to the work being dealt with by Headquarters Staff.

Following tea, visits were made to various amateur stations in the town and also to the Birmingham studios of the B.B.C.

During the week-end, Headquarters' representatives had the pleasure of visiting several local stations, including G2WD, 5BJ, 5NI, 5VM and 6XQ and were also fortunate to be given an opportunity of viewing the main control room of the Central Electricity Board at the invitation of G2WD.

Informal discussions took place between G5VM, 2VQ, 6NJ, 5AR and 6CL both before and after the meeting, and much interesting information was gleaned regarding the progress being made in the Midland Districts.

An opportunity was also taken of discussing matters of general interest to the Society with Mr. G. S. Laughton, Managing Director of Messrs. Stratton, and with Mr. W. Nightingale (G5NI), of Radio Mart.

In concluding this brief account of a most pleasant week-end, the writer wishes to record his thanks, and the thanks of all others who attended, to Mr. V. M. Desmond (G5VM). It was almost entirely due to his untiring efforts that this, our first Provincial Convention, passes into history as a great success.

J. C.

STATION G6HP FOR DISPOSAL

The whole of the radio gear owned by the late Don Price (G6HP), is being put up for disposal, and it includes some really excellent apparatus, as might be expected from a station holding such a record.

The big transmitter will not be dismantled at once, in case there should be a chance of selling it in its complete form. The following is a brief description :—

There are two large units with mahogany panels and framework, and glass sides. The units are roughly 30 in. in height, 18 in. wide and 18 in. deep. The first houses the 2,000-volt power supply and the TP-TG final stage, the second a 400-volt supply, crystal oscillator and three doubler stages. The TP-TG is suitable for use on 3.5, 7, 14 or 28 mc. with inputs up to 250 watts, and is locked from the crystal unit.

The main apparatus included in the first unit is as follows: Power transformer, 2,000-0-2,000, tapped at 1,500 and 1,000 volts; filament transformer for rectifiers; filament transformer for T.61D. Large smoothing choke and filter condensers. TP-TG stage with T.61D. and two special low-loss 50 mmf. tuning condensers. All mains wiring brought out to sockets at rear, with fuses; 0-500 milliammeter and 0-10 A.C. voltmeter (Ferranti).

The second unit comprises the 400-volt power supply and smoothing, four LS5b's, special holder for two crystals (enclosed). Low-loss condensers and coils, three 0-100 milliammeters and one 0-50 (Ferranti).

The whole transmitter is quite a handsome piece of furniture, the workmanship being more comparable with a commercial job than with the average amateur transmitter.

If no suitable offers are received for the complete transmitter, it will be dismantled and the parts sold separately. In addition there is a large amount of miscellaneous gear, including several valves (LS5B and mains receiving valves), variable and fixed condensers, coils, H.F. and L.F. chokes and transformers, as well as a lot of gear less directly connected with radio—plugs and sockets, relays, switches, etc.

Most of the latter was put up for auction at a meeting of the South London and District R.T.S. on April 3, but anyone interested is asked to get into touch with G6QB, L. H. Thomas, 66, Ingram Road, Thornton Heath, who is in charge of the whole of the arrangements for disposing of the gear.

Please state as nearly as possible the kind of apparatus you are interested in, as it will be impossible to circulate lists. It will however be possible to arrange with G6QB to visit the station and select any components specially required, but not until it has been ascertained whether the main transmitter can be sold complete.

NOTES and NEWS from the BRITISH ISLES

DISTRICT REPRESENTATIVES.

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

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

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

DISTRICT 4 (East Midlands).
(Derby, Leicester, Northants, Notts.)
MR. H. B. OLD (G2VQ), 3, St. Judes Avenue, Mapperley, Nottingham.

DISTRICT 5 (Western).
(Hereford, Oxford, Wiltshire, Gloucester.)
MR. W. B. WEBER (G6QW), 2, Balmoral Road, St. Andrews, Bristol.

DISTRICT 6 (South-Western).
(Cornwall, Devon, Dorset, Somerset.)
MR. W. B. SYDENHAM (G5SY), "Sherrington," Cleveland Road, Torquay.

DISTRICT 7 (Southern).
(Berkshire, Hampshire, Surrey.)
MR. E. A. DEDMAN (G2NH), 63a, Kingston Rd., New Malden, Surrey.

DISTRICT 8 (Home Counties).
(Beds., Bucks., Cambs., Herts. and Hunts.)
MR. G. FEATHERBY (G5FB), 30 Lindsey Road, Bishops Stortford, Herts.

DISTRICT 9 (East Anglia).
(Norfolk and Suffolk.)
MR. H. W. SADLER (G2XS), Redways, Wootton Road, Gaywood, King's Lynn, Norfolk.

DISTRICT 10 (South Wales and Monmouth).
MR. D. LOW (G5WU), "Nantissa," Westbourne Road, Penarth, Glamorgan.

DISTRICT 11 (North Wales).
(Anglesey, Carnarvon, Denbighshire, Flintshire, Merioneth, Montgomery, Radnorshire.)
MR. T. Vaughan Williams (G6IW), "Malincourt," Grosvenor Ave., Rhyl, Flintshire.

DISTRICT 12 (London North).
MR. S. BUCKINGHAM (G5QF), 9, Brunswick Park Road, New Southgate, N.11.

DISTRICT 13 (London South).
MR. J. B. KERSHAW (G2WV), 13, Montpelier Row, Blackheath, S.E.3.

DISTRICT 14 (Eastern)
(East London and Essex.)
MR. T. A. ST. JOHNSTON (G6UT), 28, Douglas Road, Chingford, E.4.

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

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

DISTRICT 17 (Mid-East).
(Lincolnshire and Rutland.)
MR. A. E. LIVESEY (G6LI), Stourton Hall, Horncastle, Lincs.

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

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

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

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

DISTRICT 1 (North-Western).

THE C.R. was unable to attend the March meeting in Liverpool owing to the ravages of the fashionable influenza, and wishes to thank Mr. Jackson (G2KZ) for the material from which these notes were prepared.

The meeting was again well attended, but as no set talk had been arranged, it developed into an informal rag-chew under the chairmanship of G2OA. Several of the regular attenders were unfortunately absent (no doubt through illness), and little progress was made with N.F.D. arrangements. It is hoped that the details will be finally settled at the next meeting.

Local activities are as follows :—

BRS1652 (now 2ASO), building C.O.P.A. ; BRS 1589 progressing slowly with morse ; 2BHA given up triode CO, and trying pentodes ; 2BWG (now G2JT) testing on 7 and 14 mcs. ; G2RF trying to get a 59 to work as E.C.O. ; G2OA on 14 mc. with new rig, also S.S. McMurdo 5B receiver ; 2BMA experimenting with high-consumption pentodes ; BRS1395 building new 56 mc. receiver ; G2KZ and 2AVK cured key clicks by using a valve keying system.

Two new stations report active. G6KY, who is QRP, and obtaining very satisfactory results ; and G5OP, who is to be congratulated on the very efficient construction of his station, and on the high quality of his transmissions.

G5RY has succeeded in clearing up "BCL" interference, and is able to work CW or fone on 1.75 mc. during broadcast hours. G2FD on 1.7 mc., CW and fone. G6TT awaiting delivery "HRO."

It is recorded with satisfaction that the number of members reporting and attending the Manchester meetings is steadily increasing. The March meeting was held on the 6th and 27 were logged as present. G2OI was unable to attend on account of illness.

The members send their heartiest congratulations to G5YD and YF on the arrival of a junior op.

Will all members in this section please drop G2OI a QSL card or an ordinary postcard with full address, as he would like to check his present list of addresses for future mailing purposes ? This request applies to *all* local members.

Return the Questionnaire

A visit to G2UF, of Denton, took place on April 4, when a demonstration of television transmission and reception was given. This visit was arranged too late to be included in the March BULLETIN. No meeting was held in April, this being cancelled in favour of the visit to G2UF. Thanks are due to Mr. Bailey for his kindness in arranging the demonstration.

Regarding N.F.D., this section will be in charge of Station B, operating on the 7 and 14 mc. bands.

DISTRICT CALENDAR
April/May, 1935

*April 16.—District 6 (Exeter Section), 8 p.m., at Globe Hotel, Cathedral Yard, Exeter.
*April 16.—District 12, 7.30 p.m., at Wander Inn Café, Church End, Finchley.
April 17.—District 14 (Essex Section), 7.30 p.m., at G2KT, Newsonia, Bull Lane, Rayleigh.
April 18.—District 13, 8.30 p.m., at Brotherhood Hall, West Norwood.
*April 24.—District 15, 7.30 p.m., at G5KU, 108, The Fairway, North Wembley.
April 25.—District 14 (East London Section), 7.30 p.m., at BRS1605, Treetop, 35, Priory Road, Loughton (near Cinema).
April 27-28.—District 14, Field Days at Rookwood Hall, Abbess Roothing, near Ongar.
April 28.—District 10, Conventionette at Mackworth Hotel, Swansea. Assemble 12 noon.
May 1.—District 13, South London and District Transmitters' Society at Brotherhood Hall, West Norwood. Lecture by G2NK, "Some Aspects of Commercial Apparatus Construction."
May 1.—District 1 (Manchester Section), 7.30 p.m., at Brookes Café, 1, Hilton Street, Manchester.
May 7.—District 7, Conventionette, at the Great Western Hotel, Winchester. Assemble 12 noon.
May 12.—South-Western Provincial Meeting at the Victoria and Albert Hotel, Torquay.

* Sale of disposed apparatus at these meetings.

It is proposed to use the location chosen last year when members operated Station A, at Haslams Farm, Smithhill, near Bolton, but definite details will be given later, both through the BULLETIN and at the meetings. The C.R. will be pleased to hear from anyone willing to take part in this event—also for any suggestions, especially from those who are unable to attend the meetings.

The following stations report: G5OZ, QRT rebuilding; G5CP active, 1.7, 7 and 14 mc.; G2WQ reports good conditions on 14 mc; G6ZU trying new antenna, active 14 mc.; G5ZT testing mobile transmitter, also built new 1.7 mc. Tx.; G2JC active, 7 mc.; 2BZX now finished rebuilding; G5PX active on all bands; G5CH busy on 1.75; 2AXA modulation testing; G2BC waiting for ma's; G6GV had a visit from W4AII, this being his last visit tried to make it interesting for him; W4AII also visited G2WQ, G2DH and G2OI, the latter being unable to entertain him owing to indisposition, and hopes W4AII, if he reads this, will accept his apologies; G2DH still rebuilding; 2BVP on triode PP, TPTG circuit; 2ACP testing grid modulation; G5YD burnt out speech amplifier; G5WR active, 1.7, 7 and 14 mc.; BRS1643 busy with aerials and SG detectors; BRS1579 working on SW adaptors; BRS1589 busy with morse; BRS1389 awaiting AA permit; BRS1504 and 1614 on morse; G5SO also sends a report, but his letter has been misplaced. The following also report active on various bands: G5ZN, 6ZS, 6GX, 2BK, 5VN, BRS1681, 1114 and 2BUB.

STANDARD FREQUENCY TRANSMISSIONS.

SUNDAY,
April 28th, 1935

0930 B.S.T.	3525 KC.
0940 B.S.T.	3625 KC.
0950 B.S.T.	3725 KC.

Accuracy within 0.01 per cent.

DISTRICT 2 (North-Eastern).

Considerable activity is now being shown in the Newcastle area, particularly on 56 mc., under the management of G6GC, who is now the R.E.S. Representative for this group. He has enlisted the following stations to help in this work: G5WZ, 6AY, 5QY, 2XT, 2PN, 6FJ, and BRS1470, and will be pleased to have the support of any further members.

A welcome is extended to G6FJ, who has come to the district from London; he has lost no time in getting on the air on 1.7 and 56 mc. Experiments with tri-tets and double doublers are being made by G5QY and G6MK, and give very satisfactory H.F. drive. G6IR is active again after trouble with grid bias.

Some good DX has been worked by G2PN, including an R4 QSA4 contact with VK5SU, when using fone and he claims to be the first G station to VE5NO, of Resolution Island, who is apparently the only amateur station there. A 50-watt permit has been obtained by G2LD, who hopes that business will allow more time to be spent on the air than has been the case lately.

In order to save expenses, and to meet the convenience of members, an arrangement has been made between the members of the local trans-

mitting society and the R.S.G.B. members whereby the meetings are run in conjunction. It was thought that one meeting each month would be sufficient, and the next one will be held on Sunday, May 5, 6.30 p.m., at 14a, Pilgrim Street, Newcastle.

Reports on signals from G2YY on 1.7, 7 and 14 mc., and those from G6ZM on 7 and 14 mc. would be appreciated as these are two recently licensed stations.

The last meeting of the Sheffield area was a little disappointing, only five members attending, but this was, perhaps, due to the fact that the recently formed Short Wave Club is booming. A CO-FD-PA transmitter has been built by 2ARZ in preparation for a full licence, whilst fone equipment is occupying G5HK, and a Collins coupler is to be installed by G6PJ.

We trust that the illness in the family of G2JY will soon pass, and thus enable him to resume activity.

will be missed by many here who were his personal friends.

DISTRICT 3 (West Midlands).

The outstanding event in the district during the month was the First Provincial Meeting, which was held at Birmingham on March 24. The President and Executive Vice-President honoured the gathering, which totalled to 106, by their presence. This attendance, a record for a meeting held in the provinces, promises well for the new scheme of Provincial Meetings inaugurated by Council. In addition to those mentioned, G2NH and G2VQ represented Council at the meeting whilst visitors from Bristol, Nottingham, Manchester, Liverpool, King's Lynn, were among the many from outside No. 3 District who were welcomed.

Altogether a very successful inauguration of the new scheme. No. 3 District, as hosts, are conscious of the compliment paid to them in the number of the visitors.

INTERNATIONAL 28 mc. CONTEST

Flash—

VK2LZ has worked W2TP and W9NY, J2HJ has been worked by VK2HY and VK2LZ, VK2HC has worked W6VQ.

Rules appeared in June, 1934, "T. & R. Bulletin"

The next meeting is on April 19, at 8 p.m., Angel Hotel, High Street, when a better attendance is desired.

The Bradford area reports its usual increase of amateur stations; this month there are three new calls on the air, and it is hoped to make R.S.G.B. members of them all soon.

Contacts with VU and VS6 have at last enabled G6XL to claim WAC and WBE. Tests with a 1/2 wave vertical Zepp are being made, using a Collins coupler, and reports will be made later.

A report of better signals is sent by G2QM, who is using the coupler in his newly rebuilt transmitter, which includes a rectified AC, grid bias system.

After a period of inactivity, G2PK has started up again on 1.7 mc. in tests with G6PY and G5TQ.

The winter session of the local radio society is drawing to a close, but meetings of members will be held at intervals.

Most of the licensed stations have been heard on 1.75 mc. on Sundays, which now almost resembles 7 mcs. The BRS and AA stations are keeping up their interest on various bands, with BRS1151 specialising in 56 mc.

The members in this District wish to express their very deep sympathy with the relatives of G6HP, who was all that a British amateur stands for, and was honoured and respected by all. He

The District is proud to know that BRS1066 is again among the honours list, this time in the 1.75 mc. Contest.

Our congratulations are accorded to G5PP, who recently assumed the rôle of Benedict.

G5ML reports some 60 DX fone QSO's on 14mc. during the month, using Class B modulation. Amongst them, the following are outstanding: VQ8A (R8), HI7G (R8), ZE1 (R7), and VP6YB (R7). G5NI, having got his push-pull outfit going, is building a Class B modulator with 203A's.

G5TL and G5JF are preparing for the QRP Contest. G6DL continues his experiments with link-coupling, having now discarded the pick-up coil from the driver tank as he finds that by clipping leads on this tank makes for accuracy in matching.

G2LU, 2ZT, 2BGS, 2AJT, and 2AWT are in process of altering transmitters and the last-named would welcome assistance or advice on the Tritet oscillator.

G2AV, 5GR and 6TD are experimenting with aerials. G2YS confesses to trying hard for WAC on 8 watts (one of our contemporaries recently gave good advice on this subject, om). 2AVY and BRS 1543 are rebuilding receivers.

The following are active in various spheres:— G5PP, 5VM, 6NJ, 2BBA, 2BLT. Welcome to BRS1554, 1607 and 1639.

Only Five Months Left

DISTRICT 5 (Western).

The Bristol section held their March meeting at the Merchant Venturers' College, when a very instructive lecture and demonstration was given by Mr. W. A. Andrews. There were 42 members present. Following the lecture a business meeting was held, during which times and dates were fixed for forthcoming visits to places of interest. The Crystal frequency register was discussed. Mr. A. N. Porter (G2ZX) is kindly sponsoring this, so will all members who have not yet done so please let him have their crystal frequencies as soon as possible?

For the benefit of BRS and A.A. members it was decided to put out a trial slow morse practice transmission, those interested to report to the C.R. (G6VK). Mr. R. E. Griffin (G5UH) has kindly offered to act as Hon. Treasurer for the District

SOUTH WESTERN PROVINCIAL MEETING

SUNDAY, MAY 12th 1935

at

Victoria and Albert Hotel, Belgrave Rd., TORQUAY

Luncheon - - -	1 p.m.
Business Meeting - -	2.30 p.m.
Tea - - - -	4.30 p.m.

Followed by station visits and demonstrations

Tickets 5/- inclusive, or Lunch 4/-, Tea 1/-

Reservations to Mr. W. B. Sydenham, G5SY, "Sherrington," Cleveland Road, Torquay, not later than May 9.

fund, and Mr. A. Radford (G6YA) has taken over the disused apparatus section.

Station reports this month are as follows:— G2CJ building a "Super" receiver. G2HN trying out various types of aerial and counterpoise arrangements on 1.75 mc. G2HX building modulation panels for 7 mc. fone and later 1.75 mc. G5BK busy with slow morse practice transmissions for Gloucester. G5JH testing remote control and working BK on 1.75 mc. G5JU completed his portable 56 mc. receiver, and would be glad to arrange skeds with locals on this band; has cured instability on 1.75 mc. TX, but has not yet QSO'd U.S.A. on this band, although several attempts on Saturday nights have been made; still spends a good deal of time on 28 mc., but can only hear commercial harmonics. G5KT experimenting with background filters, and co-operating with G6LM on very QRP Tests. G5UH has installed a 400-volt generator to work his new MO.PA.TX on 1.75 and 3.5 mc. and CO.PA.TX on 7 mc., obtaining good fone reports on 3.5 and 7 mc. Hopes to obtain a bigger generator shortly, also start work on 14 mc. G5WI, although very busy preparing BOC for April and checking commercial frequency channels, has found time to construct and erect a 45 ft. mast and a 66 ft. Windom clear of screening. G6DJ has succeeded in eliminating a very troublesome split carrier on 1.75 mc., and has started rebuilding. G6FO has improved his radiating system by the addition of a new counterpoise; is experimenting with aerial matching networks for each frequency being used. Skeds still maintained on 1.75 mc. and 3.5. mc. with G5WU, G2BI, G2YU. G6LM is using .054 watt CO. for QRP tests being received on 1.75 at G5KT at QSA 1-2, R1. G6RB is spending most of his time on 3.5 mc., working W7's, which he reports have been coming in like locals. 2AYP is busy with C.C. work and modulation on 7 mc. 2BHI is busy with aerial work and C.C. oscillators. 2BLZ experimenting with relays. 2BVL building a S.W. Superhet converter, and will be putting in for full ticket soon. BRS1032 has applied for his A.A. BRS1718 busy getting things fixed up at his new QRA, at present is using an adaptor on the BCL. set. Congratulations to 2AYP on obtaining his A.A. call. We welcome G5BK to the district.

If any member in the Bristol Section (including Keynsham and Bath) fails to receive an agenda of the monthly meeting not later than the first Wednesday in the month, please let G6VK know at once. It is no use complaining *after* the meeting, as was done recently.

The Oxfordshire C.R. reports activity well maintained. Two new calls are G5HS and G5TB, to whom we offer congratulations. G5TB is experimenting with television and obtaining good results. G5HS is already on the air with a QRP outfit.

DISTRICT 6 (South-Western)

The past month has seen great activity on the part of nearly every member in the district, and a great deal of useful work has been done.

The local meetings are evidently going to be a wonderful success, judging by the keen interest shown in them already. As was predicted, the first regular monthly meeting has been held in Torquay. This was on Thursday, March 7, at the QRA of the D.R. Nine members turned up, and a very enjoyable time was spent. It was fine to exchange yarns with such old hams as 6WT and 2CI.

A good meeting was also held at Exeter on March 19, when there was an attendance of twelve. The new budget arrangements were started, but the D.R. hopes that the members will do better at their next meeting on April 16, when the central feature will be a junk sale. For the purpose of these meetings it was decided to hire a room each month at the Globe Hotel, Exeter.

The Somerset budget is going very well. Furthermore, there is every hope of replacing the present informal meetings by regular monthly ones.

The D.R. is also pleased to state that the C.R. for Devon, G6XD, of Plymouth, is setting about monthly meetings in that town, and when these latter two arrangements have been completed, the D.R. will really begin to think that amateur radio in the South-West has been put on a sound basis.

The Annual Conventionette of the South-West, which "Clarry" has promised to attend, will be held at the Victoria and Albert Hotel, Belgrave Road, Torquay, on Sunday, May 12. Members are

asked to first meet at G5SY at midday, or at the hotel. Luncheon will be at 1 p.m., followed by the meeting and a rag chew. A cordial invitation is extended to all members to attend, and make this function a great success.

We hope to see YOU on the 12th.

DISTRICT 7 (Southern).

The past month has broken the record for individual reports, so it is evident that some do read these notes!

G2NS and the other Bournemouth members are in the throes of 56 mc. organisation and are experiencing all the usual troubles. 6NZ has been busy rebuilding for 28 mc., and hopes to be on the air for Easter. 2XC is building E.C. Oscillator P.A., and is busy on 1.7 mc. 6SS, 5PB, 2NS, and 6WS are also active on this band. BRS1326 is now 2BCM, and is rebuilding in the intervals between his morse practice. 2DZ, 2MR, 5MA, 6QB, and the D.R. ,are active Monday evenings and at other odd periods on 56 mc.

District 7 Conventionette

Sunday, May 5th, 1935

at

THE GREAT WESTERN HOTEL
WINCHESTER

Assemble 12 noon.

Inclusive charge for Lunch and Tea, 4/6.

Reservations to G2NH not later than May 2.

The Reading and District Amateur T. & R. Club held their meeting on March 5. G2NM was in the chair, and fifteen members were given an interesting lecture on Modulation by Mr. D. Corfield, G5CD. The meeting concluded with a show of the N.F.D. films. Congratulations to G5TB ex-2BYC on obtaining his radiating licence. The following Berkshire members report active: G2GG, 2NM, 2WK, 2YB, 5AO, 5RT, 5TP, 6WO, 2AQU, 2BVF, and BRS1655.

Best of luck to 6NA, who has temporarily forsaken the district to take up a business appointment at Pye Radio, Cambridge. G6KD sends his first report and bemoans the fact that so few No. 7 stations seem to be on 1.7 mc. G5PR and 2JO are active on this frequency, as well as the higher frequency bands.

Our next meeting will be the Conventionette; this is the only notice that we shall be able to give, so please sit down at once and drop a card to the D.R. notifying him of your intention to be present. The Conventionette will be held at the Great Western Hotel, Winchester, on Sunday, May 5, 1935. Meet at the hotel from 12.00 onwards, lunch at 13.00, followed by business meeting and discussion. Tea at 16.30. Inclusive charge for lunch, tea and service 4s. 6d.

Preparations are well ahead for N.F.D., and the stations will be situated at the same sites as last year. Station "A" (1.7 mc. and 3.5 mc.), in charge of Mr. Neale, G6GZ, at Mr. Jones' Farm, Farnham Park, Farnham, Surrey; Station "B" (7 mc. and 14 mc.) in charge of Mr. Alliston, G5LA, Walton-on-the-Hill, Tadworth, Surrey. Offers of assistance at either station will be appreciated.

DISTRICT 8 (Home Counties).

In his letter this month one of the C.R.'s deals with local activity in six words and devotes the rest of the letter to gardening! No fault of his, but it just shows the state of things in this district, and no further comment is necessary.

The D.R. welcomes G6CJ and G6NA, newly arrived in the district, and hopes that their coming will instil a little enthusiasm for co-operative effort.

Field Day arrangements are taking shape. Cambridge and district taking on the "A" station again and Herts the "B."

This district is combining with the London area in a "summer outing" on the lines of last year's successful event. Remember the date, July 7; particulars in due course.

Will contributors to the letter budget run by G2HJ please note that the activities of this publication are being suspended for a few months?

DISTRICT 9 (East Anglia)

The next District meeting will be held at Norwich on Sunday, May 19, commencing at 3 p.m., followed by tea. Details as to place of meeting will be given in the May BULLETIN.

It is hoped that final plans for N.F.D. will be arranged at this meeting. Will all members endeavour to be present, advising either G2MN or G2XS by May 10.

We are glad to announce that Mr. A. G. Wood (G6TI), of 33, Lattice Avenue, Ipswich, has been appointed C.R. for Suffolk and we hope that members in that county will give him every support.

We regret to note that G2MN has been unfit of late and hope he is well again by now and that 3.5 mc. will soon be his address.

Congratulations to BRS1565 who becomes 2BBO. 2AWI is busy teaching Morse. G2UT has now fone working satisfactorily. G6QZ reports active as does our new Norwich member, Mr. Durrant.

A Letter Budget will be put into circulation before this report is in print, please endeavour to pass it along as specified.

G2JS and G2XS spent a very interesting time at the Birmingham Convention and thanks are due to G5VM for putting on such a good show. A visit to the Midland Regional Studios finished off an excellent programme.

DISTRICT 10 (South Wales and Monmouth).

Those present at the meeting held at Newport on March 14 were: G2XX, 5KK, 6PF, 2JL, 5BI, 6GW, 5WU, 2BPG, 1128, 1131 and 1628.

N.F.D. sites have now been selected; the "A" station will operate at Bryn Nodyn Field, Three Crosses, near Swansea, and the "B" station on Leckwith Hill, Cardiff.

The Conventionette has been finally arranged for Swansea, and all members are reminded that the success of the meeting depends wholly on their support, and arrangements can only be completed by prompt acknowledgment of the notices being sent direct throughout the District. A hearty

invitation is extended to all members within reach of Swansea.

G2WO, 2SN and 2UL are active on 1.75 mc., and the latter would like skeds with District 10 stations. G5PH, 6JW are using the higher frequencies; the latter, ex 2BLL, is to be congratulated on obtaining his two-letter call-sign.

We are pleased to hear that 2BYB is fully recovered from a recent illness and is preparing to obtain his final ticket. 2ATD is at present QRT and we wish him every success in the forthcoming examinations.

All the Monmouthshire and Cardiff area stations are known to be active, with 2JL and 2BPG devoting considerable time to preparing the transmitter for " B " station N.F.D.

Just a final reminder to all: please reserve April 28 for our Conventionette.

District 10 Conventionette

Sunday, April 28th, 1935

at

MACKWORTH HOTEL, SWANSEA

Assemble 12 noon.

Inclusive charge for Lunch and Tea, 4/6.

Reservations to G2SN not later than April 25

DISTRICT 12 (London North).

At the March meeting, a general discussion brought to light many interesting observations and proposals. Members who are interested in District meetings being arranged for Saturday evenings are requested to advise the D.R. by postcard immediately. If insufficient interest is shown in this suggestion, all future meetings will take place on the third Tuesday in each month. The April meeting will be held at the Wander Inn Café, Church End, Finchley, on the 16th.

Donations towards National Field Day expenses will be gratefully received by the D.R. In connection with this event G5BO is busily engaged in building a special portable transmitter.

G6PI, using grid bias modulation, reports better results than with plate control. G5CW is testing distant operation on valve relays. G2VD is active on 1.7 mc., using grid modulation. 2BYV is experimenting with 56 mc. super-heterodyne receivers. G5QF is rebuilding and redesigning his 28 mc. receiver and transmitter. G6CL has carried out tests with an aerial matching network, and has worked OM, W7, and VK.

The following list of crystal frequencies used by stations in District 12 may be useful to B.R.S. members:—G2AT, 3587 kc.; G2VD, 7060 kc.; G5YA, 7048 kc.; G6CL, 7020, 7030 and 7194 kc.

With regard to N.F.D. it is hoped to publish full details of the two sites in the next issue. These will be within a mile of one another and near to the Potters Bar Cross-roads. Our thanks are due to Mr. Goddard for assistance in this direction.

DISTRICT 13 (London South).

The March District Meeting was held at the Brotherhood Hall, West Norwood, and was, as usual, well supported. One of the most important items on the agenda was the question of whether future District Meetings should be continued on the lines of those already held. The matter was put to the vote and those present unanimously agreed that the existing Scheme should be continued. Negotiations with the secretary of the Institute having been satisfactorily concluded, it was decided to continue the meetings at the Brotherhood Hall. The next meeting will be held there on Thursday, April 18.

Arrangements for N.F.D. then came up for discussion and a committee was appointed to deal with the question of apparatus. With regard to the proposed sites of the stations, we should like to thank G2MI, D.R. for District 16, for his courtesy in allowing South London to fix these in Kent. It has been arranged to erect Station B at Biggin Hill, and it is hoped that a position at Ide Hill will be available for Station A. The D.R. expects to have some definite information on this point within the next few days.

In future the Letter Budget, which now has a very large number of contributors, will be split into two portions. Each portion will circulate to the same members in the same order, but one portion will commence its journey half-way down the list. Thus everyone will receive a Budget twice as often as at present.

The number of individual reports this month seem quite up to average. G2JH hopes to be active very shortly and has been feeding on biscuits for some time, the empty tins to be used to house the transmitter! Much time has been spent by 2BKT in moving his gear from an outhouse into the domestic premises. G5SH will probably be " off the air " for some time owing to pressure of business, likewise G2AI. G2PT will be obliged to cut down his activities somewhat, in view of an approaching examination. Good luck, om. He recently spent a very interesting few weeks in Oxford, during which time he made the acquaintance of G2CL, G6QQ and G5LO. The latter, being confined to his house, is always specially delighted to welcome visitors.

Congratulations to BRS997, who has now obtained his radiating licence and is on the air as G6TU. Activity at G6QB is mostly confined to 1.7 and 56 mc. The 1.7 mc. transmitter is being kept consistently on the air as it is to be used at the " A " Station on N.F.D. 56 mc. provides pleasant recreation in the way of erecting spidery aerials all over the room. Schedules are wanted on both bands. 2AJA is rebuilding as also is BRS1357, the latter with special attention to 56 mc. The rebuild at G2YG is almost complete and he is planning a portable D.F. receiver for experiments afloat in a motor cruiser during the Summer holiday.

G5JW wishes to get into touch with anyone using the " Tritet " and would welcome ideas for band spreading when using an electron coupled oscillator. A new 56 mc. outfit is in use employing LP2 valves in push-pull with a Pen 220 A as modulator, but so far results do not seem very encouraging. G2JB hopes to be active on 56 mc. in a few days. The chief interest at 2BUS and G5HF also

centres on this band. G6QN is active on 7 mc. Using 'phone with G5JW he notices peculiar fading, the distance between the two stations being only 2½ miles. BRS1675 would appreciate any dope on 56 mc. aerials and is anxious to co-operate with any transmitter on this band. G2ND and G2UW both report activity on 1.7 mc., whilst 2AZI is at present inactive owing to business. G2GZ has received a report from W8FGC, QSA4, R5, input 9 watts on 14 mc. He has also obtained a 1.7 mc. permit and will be working 'phone on the band in the future. G5OX has built a 56 mc. receiver and receives good signals from G6QB, 2AW, 6NF and 5IS. G2AW at Bromley is as strong as G6QB, who is only one mile distant. G5OX and G6QB find that the receiver is also somewhat of a transmitter! G2WV finds his entire time taken up with District matters.

We hope to see an even better attendance at the April meeting, but please do not forget to report to the D.R. by the 20th of the month. In conclusion, we should like to remind everyone that the S.L.D. R.T.S. heartily welcomes any visitor at their meetings, which are held on the first Wednesday in every month at the Brotherhood Hall.

DISTRICT 14 (Eastern).

At the Essex section meeting held at G5VQ the attendance was 13 and included G2KT, G2WG, and BRS1626. For N.F.D. BRS1447 will be responsible for the RX and G6CT the TX. BRS1447 is experimenting with television. G6IF has worked a W6, and on 1.7 mc. G5VQ reports reception of W1BB. Field strength measurements are being undertaken by G2WG. A new call, G5ZJ, is welcomed. Essex members are indebted to BRS1295 for his consistent reports. It is hoped to form a link of 56 mc. stations in Essex. G5VQ and G5UK are already active. 2BWP is concentrating on television but complains of transmissions being far too short.

At the East London section meeting held at G6LL, always a popular QRA, an attendance of 20 was recorded. A welcome visitor was G6FY (PA0FY) on a flying visit from Holland, and first attendances were made by 2BCX, 2AYB, 2BHW, G6SI, G5SS and 2BZI. A junk sale was held and a collection for N.F.D. taken. It is hoped that members unable to attend the District meetings will forward their contributions to the D.R. The postponed Field Day will now take place at Rookwood Hall, Abbess Roothing, on April 26 and 27, when a N.F.D. rehearsal will be staged.

DISTRICT 15 (London West and Middlesex).

More members attended the March meeting than has been the case during the preceding months. Details regarding the next meeting at G5KU will be found under the District Calendar, but for the benefit of those who are not familiar with his QRA, the following information will help in locating it: Nearest station, South Kenton, L.M.S., Bakerloo; or by No. 18 'bus to Carlton Avenue West, on the Watford road.

The chief topic discussed at the last meeting was N.F.D.; as a result, members are to be invited to subscribe any amount up to 5s. towards station expenses. Will members please send their subscriptions to either G2IY (the district treasurer) or to the D.R. The two C.R.s will probably take over the stations, and the sites are expected to be the same as last year. The cost of food will be borne by the station staffs and will not be taken from the general fund. Please do not delay in letting us know whether you will support the event.

The junk sale was again well patronised, but the D.R. would like to see better prices offered for some of the apparatus. It seems that those who do dispose of spare gear only collect enough to cover the cost of the trouble in bringing it along.

Only two members sent contributions for a B.R.S. letter budget; both were excellent efforts, and it is a great pity a few more did not arrive and thus make it possible to start up a budget.

G2BY, after a long absence, reports good DX in spite of being located in one of the lowest-lying districts around London; he has worked W6 and 7, FB8 and VS6. G6WN is again on 28 mc. and has worked VS6, ZT and FB8 on 14 mc. His call is at the moment being pirated on telephony on the 7 mc. band. Congratulations to BRS1624, who is now 2AWG. G5KU is now to be heard on 28 mc.

DISTRICT 16 (South-Eastern).

G2IC and 2VI attended the March meeting of the Ashford Group, when N.F.D. was discussed. Ashford are running the "A" station, which will be at Colliers Hill, near Broad Oak, Mersham, Ashford (call G6SY). The "B" station will be at Burham Downs, Chatham-Maidstone Road, Bluebell Hill (call G2MI).

In Tunbridge Wells 5OQ and 2UJ are active, BRS1715 is carrying out frequency measurements on 56 mc. North Kent have gone all 56 mc.

Folkestone is active. An interesting meeting was held at G2GD on March 25, when Mr. Fergusson gave a talk and demonstration on Audio D.F., used for locating aeroplanes up to 50 miles. Discussion on the respective merits of Audio and Radio D.F. seemed to point to the former being the more accurate. G6XB is on 56 mc. Will various local Group leaders advise 2IC when they are in a position to put on the air at least one reliable portable 56 mc. station? He proposes to arrange an all-Kent field day on this frequency band in the near future.

Several individual reports are to hand from Gravesend. 2KL has changed QRA, and finds himself next door to 6PG, with 2BDL's house backing on to his own! How about a shared aerial, oms! G2IZ is active, but wants some DX. 5SU is building a push-pull Tx. A snappy report from Chatham and Gillingham reads as follows: 6NU still works ZL's on 9 watts! 2OV operates a S.S. super; 6FV has worked VO8 on 3.5 mc. with 7 watts; 6QC is on the air again; 2CM nearly finished rebuilding; 6VV experimenting with doublet aerial; 2VA active on 14 mc.; 5FN has straws in his hair building a super Rx. and N.F.D. Tx.; 6RQ working on power supplies; 6TQ active on 1.7; 5JT working W's; 6WM has cured key clicks; 2MI still on the air; 5XB experimenting with Collins coupler.

In Sussex, 5JZ is rebuilding to CO. FD, BA, PA, and trying the Collins coupler; BRS1697 and 1704 from Brighton recently visited 5JZ. Other stations active are 5RO, 2AX, 2AO, 5BS, BRS1526, 1571 and 1173.

DISTRICT 17 (Mid-East).

A meeting of Cranwell and Lincoln members took place on March 3 at Lincoln, when preliminary

Field Day plans and the possibilities of 56 mc. tests were discussed. Members should note that the Boston transmitters are equipped with 56 mc. gear.

G5BD scored 3,700 points in the ARRL contest, working his first U.S.A. contact on the 80 metres band.

The D.R. will be pleased to hear how activity is progressing in the Grimsby area, as the C.R. does not seem to have many reports. Activity reports come from G5CY, 2ARR, 2BQR and 1487. 2BJY is the A.A. call of the recent 1044. In Boston, G6GH and G6LH are working on 14 and 7 mc.

The D.R. has now returned from a 15 weeks' voyage, after having listened through some 18,000 miles of oceans to the faint DX calls of many a lusty half-kilowatt in old England. Members would be horrified to hear how mangled and distorted their signals can become when they have travelled from 52 North to 52 South, and to be obliged to filter out some of the super QRM existing over the greater part of the American continent—North or South. Argentine "spitch" at close range would polish-off Uncle Tom in half-an-hour!

G6LI continues telephony experiments but is now using Linear Class B radio frequency amplification and sub-amplifier anode modulation. Apologies are offered to all who wrote during the absence of the D.R. and received no replies. This state will be rectified as soon as the wealth of correspondence can be answered.

DISTRICT 18 (East Yorkshire).

G5GI is active, after many rebuilds; G5AX is unfortunately still in hospital, we wish him a speedy recovery. G2TK is building a 50-watt outfit on a rack layout, and listens on 28 mc., but no fundamentals have been received. BRS1420 has been trying out directional receiving aerials. BRS1316 has finished the Scarborough Short Wave Club's new receiver, which has been tested and found satisfactory. An application for the Club's A.A. permit has been made by Mr. P. B. Briscombe. 2AMM, 2AUN, BRS1321, 1480 and 1710, of the Scarborough section, are active. G6UJ reports that he has worked a Russian station at Odessa, Black Sea, on 1.7 mc., with an input of 9 watts; this is a fine performance when one realises that the route is practically all overland. How does this compare with the recent contact which G2II made with a VE.1 on the same band?

G5VO has had disappointing results with his television gear, due to mains voltage fluctuation and other happenings beyond his control. High-quality telephony on 3.5 mc. is being transmitted. G6WP is active on 7 mc., and would welcome reports now that more time can be devoted to the work. 2APU is practically ready for his "open permit."

Most of the Hull members are active, but do not report anything of an unusual nature this month.

G6OO is concentrating on the two top bands, using telephony on 3569 kc.; he is also preparing gear for 56 mc. field days, and some 3.5 and 1.7 mc. gear in readiness for N.F.D. Incidentally the top bands seem to be coming into their own, judging by the news of G and W stations, who have been making long-distance contacts on 1.7 mc.

SCOTLAND.

This month the "drift south" continues, and we have to record the departure of G6MF, of Edinburgh, and BRS1300, of Glasgow. "MF" is now located in Darlington, while BRS1300 (who was our "S.S. Super" specialist) has settled in Whitstable. To both gentlemen, we extend our best wishes for success in their new spheres of activity.

The recent recruiting activity of our four D.O.'s has borne fruit in a very satisfactory manner, as the past few weeks have seen a large influx of new members. Good work, OMs!

We were pleased to welcome VS2AF to Scottish headquarters this month. Our only regret lay in the fact that the flying nature of his visit to Glasgow precluded his attendance at "A" District meeting.

There appears to be a fierce onset of what we can only describe as "matched impedantitis," and we have word of at least a dozen members struggling with weird units, some of which would make the worthy Mr. Collins have a blue fit.

G6ZX is resuming his 56 mc. work and is understood to be on the point of launching a posh new "high Q" transmitter. G5DK has been granted a QRO permit in connection with his field-strength measurement work.

The owner of the illicit station, recently "took" in *flagrante delicto* by the Edinburgh boys, was duly haled before the "beak" and fined three perfectly good "Peppiats." The Press was carefully coached so that there might be no subsequent "splurge" to lend an aura of romance to the offence, *and there was none!*

G6RV and G5YG took part in the A.R.R.L. "tip-and-run" contest, but neither cut much ice, as the second week-end was a complete washout. "YG's" chief grounds for satisfaction lay in the fact that he worked 24 W's on 3.5 mc., which was not too bad going. "RV" finished with 5,200 points and "YG" with 5,256.

A further illicit station made its appearance in Glasgow during the month, operating on the broadcast band. It proved, however, to be more the outcome of folly and ignorance than any wilful attempt to break the law, and the G.P.O. had no difficulty in putting an end to the performance.

In "A" District there seems to be something of a "phone" epidemic, and especially among the Glasgow group. The following are known to be making the etherial welkin ring:—G2MG, 6MD, 5TY, 5ZX, 6ZX, 5KF, "MG" operates on 14 mc., while the others "do things" to the 7 mc. ether. G2MG worked Canada on phone during the month.

Quite a few of the more recent men are, with the improved conditions, having their first real DX and are apparently enjoying the thrill of it.

Now listen! you district officers. Not one of you had his report in this month in time to furnish data for these notes. Please note again that the 20th of each month is the date by which your reports must reach Scottish headquarters. Thanks!

Northern Ireland.

Will those who desire to assist at N.F.D. please note that the last day for receiving offers is April 20, as the list will be closed on that date.

(*Continued on page* 404).

AROUND THE EMPIRE

Australia

By VK2HC, *via* VK3EG, ZL3AN and G6WY.

Activity on both 7 and 14 mc. has been considerably lessened since the B.E.R.U. Contest, but at the time of writing there is renewed interest in the W/VE contest, which again proved to be as interesting and exciting as ever. The best contacts were had from 04.00 to 07.00 G.M.T. on 14 mc., and on 7 mc. from 07.00 G.M.T.

The W.I.A. H.Q.'s held its first meeting of the year at Sydney last month. W. Moore was elected president; J. Pinnell, vice-president; H. W. S. Caldecott, secretary. VK2HC has returned from vacation in Sydney.

Numerous VK G contacts were made around 08.00 G.M.T. on 14 mc. at the beginning of April, an usually early hour for this band.

British West Indies and Trinidad

By VP4TA.

VP6YB (Barbados), VP4TC (Trinidad) and VP2MR (British Guiana) were granted special permission to broadcast the results of, and commentaries on, the M.C.C. *v.* West Indies cricket matches. These broadcasts were highly successful and popular, and aroused considerable interest. VP4TC is now awaiting a commercial broadcasting licence.

A radio club has been formed with headquarters in Port of Spain, and in co-operation with the Government a commission has been set up to investigate the problem of "man-made" static. It is probable that spark-plug suppressors will be made compulsory on all cars.

VP6MR, 6CC, 4TG, 4TA, 4TC, 4TE, 2CD and 2BX are active.

Canada (First District).

By VE1BV, *via* G2PS.

Conditions here were good on all bands during March. VE1BV maintained daily schedules with ZC6FF and made initial Indian contacts with VU2BL and 2CD. VE1EA worked G on 1.7 mc. VS6AH has been heard on 14 mc.

Co-operation was given to G stations working in the QRP contest.

Canada (Second District)

By VE2CA, *via* G5YH.

News is scarce this month, due mainly to the fact that I have not yet had time to get in touch with Society members in this district. The local 20-metre phone group consists of VE2BE, 2BG, 2CA and 2HM. These stations operate from 23.00 G.M.T. weekdays and from 14.00 G.M.T. Sundays, and are most anxious to work British stations either on fone or C.W.

Canada (Fourth District).

By VE4CJ.

The B.E.R.U. Contests were not a success here in spite of super efforts on the part of many prominent DX men. The Edmonton "big guns," VE4IZ, 4HW and 4HT, spent one whole night on the air, but were unable to attract the attention of shoals of ZL's and VK's, who seemed to be busily engaged in either working one another or working G's. ZL4AI was noted calling VE and VP, but he failed to hear the frantic calls from the above-mentioned stations and VP4AA.

Canada (Fifth District).

By VE5HJ, *via* VE5HS, ZL3AN and G6WY.

I am pleased to report that this District is increasing in activity after a quiet period, and there is much traffic being handled on all amateur bands. Quite a number of VE5 stations are using the 1.75 mc. telephony band, and one at least, VE5AO, has received a report from ZL on his transmissions. VE5HJ is back on the air regularly on 14 mc. exclusively and would like to have schedules with E.L.S. in ZL and VK in the evening, about 02.00 to 04.00 G.M.T.

The New Westminster Amateur Radio Club is being reorganised after a period of quietness, and we are endeavouring to make our club the liveliest on the North-West Pacific coast.

The number of amateurs here in B.C. is increasing, and our call letters have reached the "VE5O" mark. VE5OA is located 50 miles south of the Arctic circle, on the east coast of Great Bear Lake, in the North-West Territory. The last time VE5HJ contacted him, the temperature was 38° below zero with him! We have several stations in outlying districts from whom we seldom have any news. VE5CA works ZL and VK on 3.5 mc. with 10 watts input; VE5HQ won first prize, a silver cup and a fifty watt tube, in the VE QSO Contest. VE5HS worked Greenland on 7 mc.

Ceylon.

By VS7GJ, *via* VU2LJ, VS6AQ, VK3EG, ZL3AN, and G6WY.

Noon thunderstorms, which put in an appearance on most days during the month, resulted in heavy QRN. At times reception was almost impossible on 7 mc. until during the later hours of the night. Stations are coming over now on 14 mc. from 13.00 G.M.T. onwards.

VS7RA has sailed for G and we all wished him a pleasant holiday. VS7GJ sails next month and BERS196, Mr. A. T. Kingston, P.O. Box 100, Colombo, will act as B.E.R.U. Representative during his absence.

Egypt

By SU1SG, *via* G6WY.

In Alexandria, SU8MA and SU1GP are working 7 mc. phone exclusively and receiving good reports from Europe. SU8MA is using 100 watts self-excited, class "B," modulated by four 46's in parallel push-pull. SU1GP is modulating 50 watts input to a '10 by class "A" prime method. Our new station operators, SU1KG and son, are doing well with their self-excited push-pull '45 rig; good DX has been worked with an input of 30 watts, America being the only continent required for

W.B.E. Starting off with a T4 note, this station quickly improved, and now radiates a fine T8 signal, often reported T9. SU1WEM has been troubled by bad mains regulation, and owing to large voltage variation, signals in the receiver were hard to hold, especially on 14 mc. This troublesome swinging has been cured by inserting a neon tube in series with the bleeder resistance of the power pack, the H.T. plus being taken off at the junction of the bleeder and neon. Details of the scheme will be found in *QST* for January. SU1SG has taken over E.I.S. duties from SU1EC, who, with SU6HL, will shortly be leaving for G. SU1SG is at present keying his three-stage crystal rig *via* the primary of H.T. transformer in C.O. stage; with this method duplex operation with G2RF was quite a success, and a most enjoyable triangular QSO between G5JX (ex-SU1SJ), G2RF and SU1SG lasted for three hours; it ended when G5JX decided he would like to finish the QSO on landline, so after passing over G2RF's telephone number, 1SG handed over duties to the P.O.

After having written these notes, I received a report from SU1RO in Cairo. "Conditions on 7 mc.," he says, "are punk, owing to the ever-increasing F 'spitch'; 14 mc. is fair for W and VE contacts between 18.00 and 20.00 G.M.T., after which they fade out." He competed in the A.R.R.L. DX Contest and worked 24 W-VE stations in six districts. (This score should bring him the SU zone award.) QSO's were far from easy and all made on 14 mc. within the narrow frequency range between 14,300 and 14,390 kc.; in this channel, ON4AU was heard going great guns, his signals being R9 in SU. The elusive VE has at last been hooked and confirmation awaited to claim W.B.E. Construction of a single-signal super has commenced, but is proceeding slowly owing to the difficulty of procuring suitable parts locally.

Hong Kong

By VS6AX, *via* VS6AQ, VK3EG, ZL3AN, ZL4AI and G6WY.

Conditions on the final week-end of the Junior B.E.R.U. Contest were very bad, plenty of DX being heard, but none contacted. During the American Contest 7 mc. was good, except during the 14th and 15th, which were bad days, but 14 mc. was useless, except on the last two days. Conditions on 14 mc. two days before the full moon were exceptional.

Mr. Thompson (VS6AS) leaves us in mid-April for vacation in England. VS6AX has been using a vertical Zepp with great success. The following are active: VS6AH, 6AS, 6AQ and BERS265.

Irish Free State

By EI2B

The following EI stations took part in the recent ARRL Contest with which was combined a special IRTS contest open to all Ireland; EI8D (8800), EI8B (8500), EI5F (3002 two week-ends only), EI6F (6060), EI9F (660) and EI5G. The figures represent the points scored in the *combined* contest, and are subject to confirmation.

EI5F sends a list of DX worked which includes all continents, although his time on the air has been limited. EI6F reports that during the ARRL contest his 3.5 mc. signals were heard R5 on 1.7 mc. by G2II. He was using the filter network described in *QST*, February, 1934, and by CT2BK in the BULLETIN of January, 1935, one of the claims for which is the attenuation of harmonic frequencies. In a recent test of this system, he actually found that the 14 mc. harmonic of his 7 mc. sigs. was reduced from R4 to R2 at EI8B's station some 4 miles distant. It seems fairly clear, therefore, that the freak reception at G2II was due to the receiver.

BERS246 is working at morse, and is building a single-signal superhet receiver. BRS1429 hopes to have a portable receiver ready in time to take part in N.F.D., and he also hopes to qualify for his licence at an early date. EI7F has moved to 1, Seaview Terrace, Donnybrook, Dublin, and the following new station has been licenced: EI5G, P. T. Daly, 11, Palmerston Road, Dublin. We all hope that IRTS will be able to take an active part in the forthcoming N.F.D.

Now O.M.'s I have felt for some time that, at my age, I am too much out of touch with many of you, and that it would be to the general advantage if some of the more intimate duties of B.E.R.U. Representative were undertaken by a younger man. EI9D, Capt. G. H. Noblett, Barley Hill House, Westport, Co. Mayo, has very kindly agreed to assist in this direction by taking over the writing of these notes and other routine matters, although I remain, for the present at all events, the official representative. In future, therefore, all reports for these notes should be sent direct to him by the 25th of each month.

Kenya, Uganda and Tanganyika

By VQ4CRH.

There is very little to report this month owing to the fact that only two reports are to hand. Members of this group are requested to note that unless news is forthcoming, it is absolutely impossible to maintain monthly notes in these columns.

In a very interesting report, VQ3BAL states that, not having a 30,000-ohm resister to put across the power outfit for wattage dissipation, he has made an excellent substitute with three jam jars filled with water and connected with glass tubing which passes approximately 10 m.a. The resistance can be varied by adding small quantities of common salt. This is best done with a milli-ammeter in circuit. VQ3BAL found that during January, 1900 G.M.T. was the most favourable time for obtaining W contacts.

We are glad to welcome a new member of the B.E.R.U. in VQ4SNA, and to note that his friend, VQ4SNB, has sent in his application.

Congratulations to VQ4CRL on the arrival of a second operator during the first week of the Senior Contest. This OM is now trying to unravel the mystery of working DX with an earthed aerial!!! CRL put up a very creditable score in the Senior despite the above-mentioned QRM.

VQ4CRP has had some very excellent fone reports from W and VE on the 14 mc. band with low power, and contemplates rebuilding to increase his power on phone. VQ4CRE has also been serving up some very good phone and has been keeping local skeds with neighbouring districts. VQ4CRO is now back on the air after a few weeks

of irritating spots of trouble with his transmitter. VQ4CRH has had business QRM, but managed to enter both contests. Plenty of CC dope has been seen lying about in his shack, so one never knows ! ! !

Activity seems to prevail at VQ4CRR with the indication that in the near future another VQ will make his appearance on the air.

VQ3BAL will shortly be proceeding to England on leave, where he hopes to have a few personal QSO's. Bon voyage, O.M. !

This group will co-operate with G in the National Field Day by putting one portable station in the field with VQ4CRH call.

It is with deep regret we read of the untimely death of G6HP, and we extend our deepest sympathy to the Society and to his family.

Malaya and Borneo.

By VS2AG.

No reports have been received from Malayan members this month, and it is to be feared that activity has been slight. During the second half of February things brightened up considerably on the 14 mc. band at times and good signals were heard from PA and OK stations working PK2DX.

VS8AJ has been heard regularly, but has not reported. Other VS members have been called at times by 2AG, but without result.

The activities of the KA's are remarkable, and, in fact, commendable. With the exception of a few outstanding instances, they are keen operators and have good notes. Unfortunately they appear to prefer working U.S.A. stations ; further, it is to be deplored that Sunday nights should be chosen for slow Morse practices by one of them !

Apart from OK, PA, W6, EA and some ZL's, very few DX stations have been heard, possibly because this is a report from one listener only. 2AG is testing with a TX and getting fair to good reports from PK and KA. The presence of a very new junior op. makes it necessary to move all the gear to an outside shack, where adequate provision for the final rig is being prepared.

V8AB has been heard putting out some excellent phone signals ; 3AE and 3AD are rebuilding and their tests are awaited with interest. 8AD has been experimenting on the ultra-shorts ; this fact and extra professional duties have rather cut down his available free time.

If each Malayan member would send a contribution to these notes, it would be much appreciated.

Malta

By ZB1C, *via* ZB1E and G6WY.

ZB1A has left for G and ZB1B is away on a cruise; ZB1C is experimenting with QRP and antennæ ; ZB1E end ZB1F are active ; BERS233 is now ZB1G and hopes to be on the air soon. BERS120 is busy with finishing touches to a new receiver for N.F.D.

The ZB1 Group in future will meet at least once a month, and it is hoped that every member will endeavour to attend. Time and place will be notified later, but probably meetings will take place at ZB1C's new QRA.

The QRA'S of the following members are requested :—BERS217, BERS219, BERS220 and BERS224.

On N.F.D. the portables used by ZB1 will use the normal call signs without any additional letter.

Northern and Southern Rhodesia

By ZE1JE.

All Southern Rhodesia amateurs have been officially notified by the Postmaster-General that operations on the 7 mc. band are prohibited forthwith owing to interference with reception at Government wireless stations. This drastic measure is greatly resented, and the Government has been asked for details of the interference alleged. All amateurs feel that, in view of their efforts not to cause interference, this prohibition from what is the most important band, is very unfair. The matter is undergoing investigation.

In consequence of the above, present activities are centred in the 14 mc. band, which continues to give good results.

It is understood five stations took part in the recent B.E.R.U. Contest, ZE1JF leading with just over 800 points and 1JO a good second with over 700.

ZE1JM is getting remarkable results on 14 mc. with 10 watts input, having contacted the following countries :—D, F8, G, LY, OE, OK, ON, OZ and ZC. He operates a three-stage crystal controlled outfit, the valves being co. 47, fd. 46 and pa. two 46's in parallel.

Other active stations, viz. : ZE1JB, 1JF, 1JJ, 1JN and 1JO all report good DX on 14 mc.

ZE1JJ has been experimenting with a 14 mc., beam aerial which appears to be very successful in radiating in a northerly direction, but does not improve reception as he has received advice that the whole of London was calling him one day recently, but unfortunately he heard no one ! Local tests in a direct line with the beam show a very appreciable increase in signal strength, and at the back of the beam signals were reduced more than 50 per cent. The beam consists of one director, aerial and reflector with a 450 impedance line coupled to a Collins tuning arrangement.

Northern India and Burma

By VU2LJ, *via* VS6AQ, VK3EG, ZL3AN and G6WY.

Owing to the B.E.R.U. Contest no reports have been received this month. Six transmitters from the northern sections entered the test, but judging from this part of the Empire, QRN was too heavy and conditions too erratic for the amassing of any decent scores. In Assam, N.E. India, the scarcity of G stations was the most noticeable feature of the contest. (*Note.*—G6WY heard VU2LJ in B.E.R.U.) N India will be putting a portable on the air for the Empire Field Day, under the call VU2AR, at Simla.

The ban on amateur transmitters in N.W.F.P. has now been lifted and licences are being issued.

South Africa

By ZT6X, *via* ZS1H, SU1EC, SU1SG and G6WY.

Conditions have been good during the past month, particularly so on 14 mc. Numerous Canadian and English amateurs have been heard on this band at good strength ; the most prominent and consistent being VE1ET, G6VP, and G5LA.

(*Continued on page* 404.)

EDITORIAL.—(*Continued from page* 363).

unfortunately the number of such contributions is small when compared with the membership of the Section.

The current issue of this Journal contains an outstanding example of the type of original experimental work which could be carried out by members of R.E.S. We refer here to the article dealing with the Measurement of Ultra-High Frequencies. This particular article has been produced at the special request of our President, as proof that members working on the 56 mc. band are capable of operating their stations on known frequencies.

There are numerous other problems of a similar nature which the Section could tackle, as an instance, we have in mind the description of an ultra-high frequency transmitter incorporating some method of ensuring frequency stability. We are aware that individuals are testing out crystal-controlled circuits, incorporating " tri-tet " oscillators, others are experimenting with short or long lines, but the season is fast approaching when 56 mc. enthusiasts will be coming into the open, therefore the time seems ripe for the publication of the results of such experiments.

Our R.E.S. Manager has pointed out on another page that we do not anticipate that members of the section will be in a position to continually produce original work, but, on the other hand, we feel sure that he will agree that greater co-operation between older members and newer enthusiasts will result in the Society giving to the world at large more regular additions to our knowledge than has been the case in recent years.

It has been a disappointment to those responsible for R.E.S. that many who have had years of practical experience in the amateur field have failed to join forces with the newcomer. The first anniversary of the foundation of the Section seems an excellent time to appeal to all who have an interest in the Society's progress to rally to that section which we at Headquarters consider to be the most vitally important of them all.

DISTRICT NOTES.—(*Continued from page* 398).

GI5UR reports active and sends a long list of stations worked, including the following :—FB8, VP5, ZD1, V8, NX, and PX. He is now WAC and WBE, VK2EO giving the last link in the chain. GI6YW is active and has been QSO four W7's this month. 2KR, 2CN, 5QX are also active, whilst 5HV is engaged on R.N.W.A.R. duties.

EMPIRE NEWS—(*Continued from page* 402).

14 mc., which during the past five months has been alive with Australian and occasional New Zealand signals, is almost completely dead in the evening, and atmospherics at times have been bad, but in the early mornings the band is congested with signals from the U.S.A.

ZS6AL, although he has been on the air only for a short time, has already qualified for his W.A.C. and W.B.E. certificates. ZU6P has the honour of being the first South African station to obtain W.A.C. on phone ; he also qualified for W.B.E.

Southern India.

By VU2JP, *via* VU2LZ and G2YL.

Conditions during the tests were excellent ; QRN was very prominent the first two week-ends, but QRM not nearly as bad as was expected. G was the most prominent country heard. VU7AB is still on the look-out for a good generator ; can anyone help him ? If this is available in time he will take part in the Empire Field Day. BERS241 awaits his licence. The Budget still goes strong, and if any others want a copy, please write to VU2JP.

EUROPEAN NOTES

Belgium

By ON4AU.

The A.R.R.L. Contest was well supported by Belgian amateurs ; the Reseau Belge trophy was also competed for during the period of this event. Common with British stations, a falling off in conditions for transatlantic work was noticed from March 12. VE5EA, HC and KZ were heard or worked during the early part of the contest. An outstanding achievement stands to the credit of ON4SD, who worked a W7 on 3.5 mc. ON4AU established contacts with North America on five bands, obtaining an R7 report on 1.7 mc. and R6 on 28 mc. He worked a total of 14 districts and obtained 22,000 points.

ON4UU has worked YJ2KY, New Hebrides : this is believed to be the first European contact with that country. ON4JB continues to maintain a daily schedule with ON4CJJ in the Belgian Congo, and over 100 contacts have now been established by these two stations. ON4JB has also rendered some useful assistance to the Belgian Congo air liners, working on 47 metres. ON4AU, 4JB, 4NC and 4SD are active on 28 mc., and the former is preparing for some high-power tests during the summer on 56 mc. Regular schedules on this band will commence on May 1 ; the first two schedules will be kept from 07.15 to 07.30 and from 12.15 to 12.25 G.M.T. daily, and during these times replies will be looked for on 28 mc. Other schedule periods will be from 13.30 to 13.45, from 18.30 to 18.45, and from 20.30 to 20.45. It is the intention of other Belgian stations working on 56 mc. to adhere to the above schedule periods.

Barometric curves taken by ON4AU during the A.R.R.L. Contest have been submitted to No. 2 Group R.E.S.

Belgian amateurs learnt with regret the passing of G6HP.

EXCHANGE AND MART.

BARGAINS IN SECOND-HAND COMPONENTS AND VALVES.—Valves from 2s. 6d.; Transformers, 2s.; Variable Condensers, 1s. 6d.; Resistances, Fixed Condensers, H.F. and L.F. Chokes, Coils, Eliminators, etc.—SUPERADIO, Rosemary Road, Clacton (G6DH).

ENCLOSED TYPE CRYSTAL HOLDERS, 4s., post free. Please state size and shape of crystal when ordering. Two hundred of these now in use British and Foreign stations. Special multiple holders to order.—G6WQ, 10, Aberdour Road, Goodmayes, Essex.

G.E.C. 6-VALVE OVERSEAS SUPER-HET A.C. MODEL. Coils to cover 14 to 550 metres (full coverage). Switch for C.W. reception. List 24 guineas. As new, £11 or near offer.—G6GH, 11, Wide Bargate, Boston, Lincs.

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

G6US for Ham requirements.
G6US for Aerial Wire: 68-ft. enamelled, 14 gauge, 2s. 6d.
G6US for Aerial Insulators.
G6US for best Stand-offs.
G6US for the best finished Inductances.
G6US for American Valves; only the best quality stocked.
G6US for Microphones.
G6US.—Try our Miniature Warning Lamps on the TX; 5 watts, 200-250 volts, 1s. each, post 3d.
G6US for EDDYSTONE Components.
When you want anything for Ham Radio, don't forget—
G6US. Send for Latest Price List.
G6US—the Ham who knows what Hams want.
THIS MONTH'S BARGAINS.—Weston 0-200 ma. Meter, 15s.; Ferranti 0-50 ma., 16s.; Standard Telephones' 4211E Valves, 15s. each.
N. E. READ, Willow Street, Oswestry, Shropshire.

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

HAMS!!!—THE SHORT-WAVE COIL YOU HAVE BEEN WAITING FOR.—No coil-changing from one band to another. Special low-loss Wave Change Switch incorporated with all models. Model 1, range 5-200 metres in six steps, 15s. 6d.; Model 2, range 15-200 metres in four steps, 13s. 6d.; Model 3, range 15-100 metres in three steps, 11s. 6d.—SUPERADIO, 60, Rosemary Road, Clacton (G6DH).

NEW ¼-in. DIAM. COPPER TUBING in 10-ft. lengths, 4s. 6d. post free. C.W.O.—BRS193, 50, Burton Avenue, Doncaster.

ORT.—Must sacrifice. Guaranteed as new:—T-25-D, 21s.; Westinghouse HT/II, 21s.; HT/II Transformer, 200/250 v. 50 c., 22s.; Choke, 20h/120 ma., 7s. 6d.; HT7 Transformer, plus 4v./3a., 7s. 6d.; sixteen Imfd., 800 test, for 8s.; Hunt's mc. 0/50 ma., 12s. 6d.; two 8 mf. Electrolytics, 400 v., for 3s. 6d.; P625, 4s 6d.; Adolf Microphone, with Transformer, 6s. 6d. Offers for the lot; all carriage paid.—G6BU, 64, Arthur Street, Ryde.

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

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

TRANSVERSE CURRENT MICROPHONES. Excellent frequency response; guaranteed; £2; Transformer 7s. 6d. extra; operates 6-12 volts; take approximately 25 m/a.; suitable for high-quality 'phone transmission and public address work.—SUPERADIO, Rosemary Road, Clacton (G6DH).

Patents and Trade Marks.

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

Printed for the Inc. Radio Society of Great Britain, 53, Victoria Street, London, S.W.1, by Loxley Brothers Ltd., 50, Southwark Bridge Road, London, S.E.1.