AN EXPERIMENTAL TRANSMITTER LAYOUT

THE T. & R.

BULLETIN

THE INC. RADIO SOCIETY OF GT. BRITAIN

AND THE BRITISH EMPIRE RADIO UNION

Vol. 11 No. 8 FEBRUARY, 1936 (Copyright) Price 1/6

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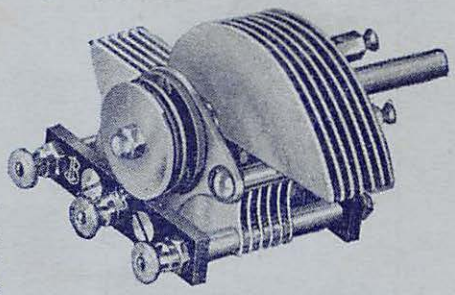

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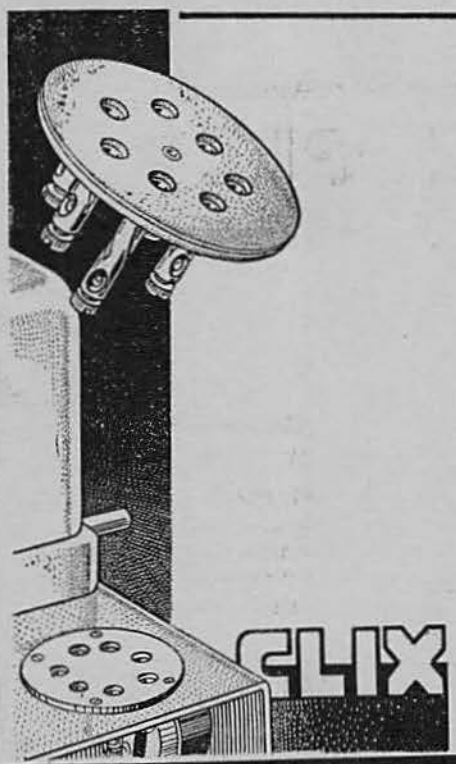

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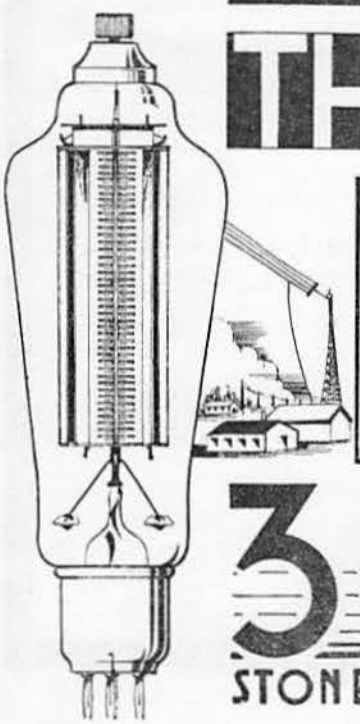

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The following message was forwarded to H.M. King Edward VIII by our President, Mr. Arthur Watts :—

January 24, 1936.

To the King's Most Excellent Majesty,
Buckingham Palace,
*London, S.W.*1.

The President, Council and Members of The Incorporated Radio Society of Great Britain and The British Empire Union respectfully beg to tender to your Majesty their deepest sympathy and sincere condolences in the death of your august Father our beloved Sovereign His Majesty King George V.

As a tribute to his memory all Members throughout the British Empire will observe Sunday, January 26, 1936, *as a day of silence by the cessation of all radio transmission from Amateur Stations.*

ARTHUR E. WATTS,
President.

THE T. & R. BULLETIN

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Vol. 11

No. 8

A CHANCE FOR THE RADIO AMATEUR

UNDER the R.E.S. notes appearing in this issue will be found a short article written by the Manager of the Sections entitled "A Chance for the Amateur." Not for the reason that we think the article in question will be passed over are we herein referring to the same subject, but because we wish to focus attention upon a task which we regard as a golden opportunity for our members to show that they are experimenters first and hobbyists second.

The enormous strides which have recently been made in the development of frequencies above 30 megacycles has resulted in their practical application for such widely different services as television and aircraft radio beacons. We ourselves, as amateurs, have contributed in no small measure to the present knowledge of the behaviour of these frequencies, but it will be generally admitted that very little information has been published concerning many of the features governing transmissions in that part of the spectrum.

The specific problems upon which data is required are listed under R.E.S. notes, and it will require but little imagination to see that most of them are of a type which can be investigated by radio experimenters.

Fortunately our Research and Experimental Sections are well equipped to give a lead in this direction, but in order that the results shall be as complete as it is possible to make them, the organisers require the co-operation of every member who has at any time carried out serious work in connection with very high frequency radio communication. That a good deal of invaluable information already exists in the log books and note books of our members goes without saying, for hundreds of us have at different times carried out tests on 28 or 56 Mc. The difficulty we foresee is that of persuading our members to let us have the benefit of their experience, however unimportant it may seem at first sight. There is another feature which demands attention when considering the task in hand; we refer to the published accounts of past experiments. There have undoubtedly been many such articles published, and if these can be unearthed and a précis prepared of each, we believe the information thus available will prove of considerable value to those who have the task of placing before the technical secretariat of the British Government a full account of past as well as contemporary achievement.

The advantages likely to accrue to the amateur movement if we are able to obtain worthwhile information are too obvious to mention, but ignoring this angle completely it will, we think, be apparent that the task is one which we as radio amateurs should be willing, nay glad, to undertake.

(*Continued on Page* 336.)

A TRANSMITTING LAYOUT FOR EXPERIMENTAL WORK.

By G. McLean Wilford (G2WD).*

THE experimental layout to be described has been developed primarily for use in connection with R.E.S. work, and is published at the request of the Section Manager, and others who have been impressed with its usefulness to members generally. The layout has been arranged in such a manner as to enable any circuit to be wired up and tested at short notice; for example, a crystal oscillator stage can be tested as a separate unit, or a c.o. plus frequency doubler, or a c.o. plus buffer stage, or a c.o. followed by a f.d. and power amplifier. The advantages of such a system will be obvious to the merest tyro.

In the layout under discussion sufficient condensers, valve holders, coil sockets, meters, etc., have been included to permit of a wide range of circuit experiments, but readers to whom the idea appeals will, no doubt, modify the components to meet their own requirements. Although several meters are used in the layout illustrated, it should be emphasised that the number can be considerably reduced by the use of a plug and jack system.

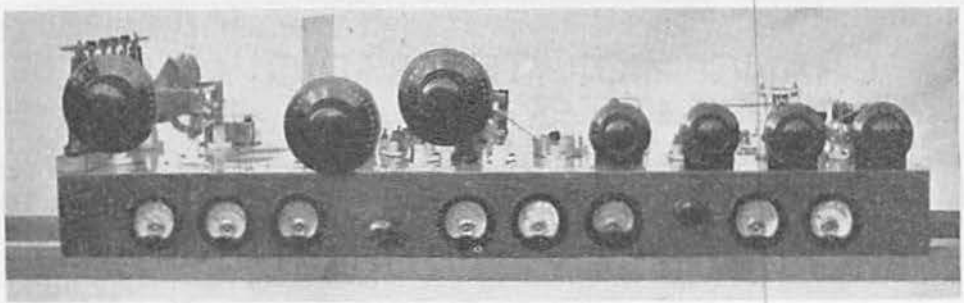


Fig. 1.—Front View of the Experimental Transmitter Layout.

Construction.

The unit is constructed of wood, the top being ¾" plywood, the meter panel ¼" ply-wood, the ends and back ½" white pine. The dimensions are 36" long, 10" wide, 3½" deep. The top is covered with a sheet of No. 24 s.w.g. aluminium, which is earthed.

For the sake of convenience, the layout of apparatus will be described reading from left to right, *i.e.*, from the final amplifier to the crystal oscillator. Looking at Fig. 1, the meters are as follows: (1) P.A. plate, (2) P.A. screen, (3) P.A. grid, (4) Buffer plate, (5) Buffer screen, (6) Buffer grid, (7) Oscillator plate No. 1, (8) Oscillator plate No. 2. The last-mentioned meter is used when a twin triode is under test in the crystal driver stage.

On the extreme left of Fig. 2 will be seen a Paxolin bridge mounted on 3½" stand-off insulators. To the bridge are assembled four sockets, the top and bottom pairs being paralleled to permit different sizes of coils being used. The outside sockets are used for a 3.5 Mc. band coil, whilst the inside pair are used for 7, 14, and 28 Mc. coils. When the layout is in use the P.A. coil is series fed from the main high tension supply through two *Eddystone* R.F. chokes; this arrangement removes the necessity for centre-tapping the P.A. coil in push-pull circuits. When single-ended circuits are under test, one choke may be disconnected.

Next to the coil bridge will be seen a *Cyldon* split stator condenser (100 $\mu\mu$F per section), which is used for tuning the P.A. coil. We next have two valve holders sunk below the baseboard to give a screening effect when the plate terminal of the output valve, or valves, is at the top as in the case of the new RFP.362's or RK20's. To the right of the sockets is mounted an aluminium screen of sufficient height to screen the intense R.F. field around the plate terminals of the pentodes.

We now come to a *Polar* type E split stator condenser (160 $\mu\mu$F per section), which is used for tuning the grid tank circuit of the final stage. It should be mentioned that this condenser, and also the *Cyldon* split stator, are mounted 1" clear of the baseboard, the former on small stand-off insulators, and the latter on brass distance pieces. Next is the plate tank coil bridge for the buffer or doubler stage, constructed similarly to the P.A. coil bridge. To the left of the bridge is the coil socket for the grid coil of the P.A. stage. The buffer plate tank circuit is tuned by the third condenser, a *Cyldon* 50 $\mu\mu$F transmitting type, which is also mounted on 1" insulators. Next come two valve holders, that to the front being for a valve of the 802 class, and the other for a 7-pin British pentode.

The next coil socket with condenser in front are used for link coupling the exciter to the buffer grid. When capacity coupling is employed the variable condenser, which in this case is an *Eddystone* 50 $\mu\mu$F, is used instead of the customary fixed condenser, because it has been found an advantage to use variable grid excitation between c.o. and buffer. In front of the American valve holder is a small stand-off insulator which carries the H.T. lead either to the plate of the 802 (which is brought out to the top of the valve) or through the baseboard to the plate pin of the 7-pin socket.

The next coil holder and condenser (another *Eddystone* 50 $\mu\mu$F) are used when a twin-triode is being tested, or when a crystal circuit is used in

* Transmitter Designs Section Manager, R.E.S.

which the fundamental and harmonic are taken from the same valve. We now come to a coil holder and condenser which are being used in a special triple-link circuit at present under test. This condenser can also be used as a vernier to the other two by removing the 50 μμF and substituting one of smaller capacity. Behind this condenser, the centre one in the group of three, are mounted two additional valve holders, the one to the front being for an American, and that at the rear for a British valve. These can be used in a similar manner to those in the buffer stage.

The last condenser, which also has a capacity of 50 μμF, tunes the crystal stage, or one half of a twin-triode or cathode-grid circuit of a tri-tet. In the latter case the condenser shown would normally be substituted for one with a capacity around 250 μμF, because it is essential that a grid-cathode tank circuit shall have a "High C" ratio for tri-tet operation.

At the right rear will be seen a triple crystal holder and a three-point selector switch. The flex lead and its plug are mounted on a tiny stand-off insulator, and a wire is taken through the baseboard to a similar insulator when the grid terminal of the valve in use is on the socket itself. If the grid terminal is at the top, a lead is attached from the top stand-off to the grid cap.

Close to each valve socket are fitted a pair of small stand-off insulators, one on the rotor side and the other on the stator side of the condenser. In addition, a third stand-off is fitted to both the buffer and P.A. grid tank sockets for use when the bias feed is used with a centre-tapped coil. Through these insulators and the baseboard, rubber-covered flex wires are taken to the small white twin-terminal holders; these wires carry the H.T. or bias through the meter and coil, back to the appropriate pin on the valve socket.

Referring now to Fig. 3, which shows the underside of the panel, it will be seen that every connection can be made with the greatest possible ease. When the photograph was taken, the layout was completely wired up for a push-pull output arrangement, using c.w. or suppressor grid modulation.

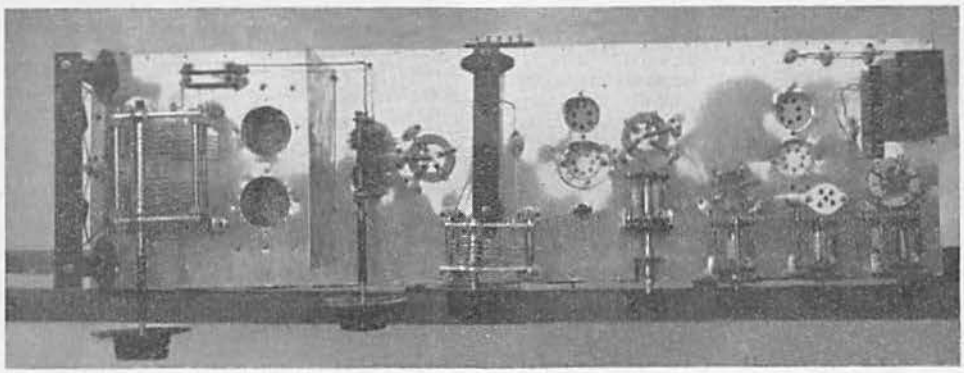


Fig. 2.—Plan View of the Layout, showing the arrangement of the Components on the Top Side.

A description of the apparatus shown in the photograph follows. Just behind the left-hand meter is a steatite twin terminal strip which carries the H.T. to the anodes on one side, and the screen H.T. on the other. The aluminium box containing the valve holders has already been mentioned in the earlier part of the article. On either side of this box are mounted two bakelite bridges fitted with five terminals. The wires from each pin of the valve holder are wired to the bridges, and then the feed wires to each valve element are attached to the correct terminal. This will be described more fully later. The resistance between the third and fourth meters provides variable bias for the P.A. valves.

To the right of the right-hand terminal bridge, near the screen, will be seen two more twin terminal strips, to which are attached the wires leading down

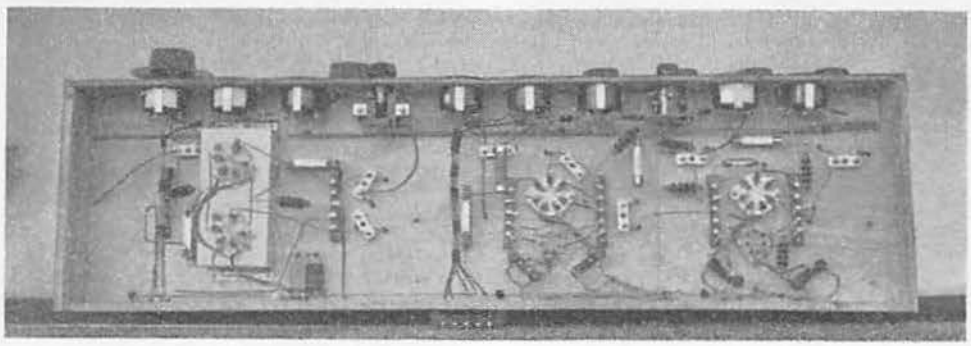


Fig. 3.—An Under-Baseboard View of the Layout wired for Push-pull Operation.

through the baseboard from the grid coil socket, and also the wire from the centre-tap of the grid coil.

The buffer doubler section will now be described. The bases of the two valve holders mentioned previously are clearly shown, and on each side of these are mounted two more 5-terminal bridges. Wires will be seen going from each socket on the valve holders to a separate terminal. If it is required to change a valve holder, all that is necessary is to undo the terminals and screws to the valve holder, and lift the socket clear.

At the end of each bridge, away from the meters, are diagonally placed 2 two-terminal bakelite bridges which carry the filament wires to the valve sockets, so that two different filament or heater voltages are always available. Just in front of the left-hand terminal bridge is a steatite two-terminal bridge from which the plate and screen connections are made. The next bridge lying diagonally carries the connection for the plate supply from the top of the baseboard, so that H.T. to the plate pin of the valve may be obtained if the plate pin is on the socket and not at the top of the valve bulb. The second terminal on this bridge carries a lead to the grid bias potentiometer shown between the sixth and seventh meters.

To the right of the right-hand five-terminal bridge is another two-terminal bridge used for the bias supply leads when a tuned or link-coupled grid circuit either bottom fed or centre tapped is used, depending on whether the buffer amplifier is single-ended or push-pull. Link coupling from the crystal stage is employed with this type of connection. The wires from this bridge, as in the previous case of the grid circuit of the P.A., are taken up through the baseboard to the small stand-offs mounted alongside the grid circuit valve holder.

The last two sockets with their two five-terminal bridges on either side, and the two filament or heater supply bridges are used in the crystal stage in exactly the same manner as those in the buffer amplifier stage. The two two-terminal bridges near the back of the last two meters take the H.T. supply up through the baseboard, through the coils, and back to the plate pin of the valve socket. It will thus be seen that an American and an English valve socket may be wired up in parallel in both the crystal and the buffer stages, and it is only a matter of minutes to change the filament voltage, remove either one valve or the other, and make direct comparisons between the valves on test.

Power and Filament Connections.

At the left-hand side of Fig. 3 is a 5-pin chassis mounting valve socket which carries a cable containing the supplies to the P.A. plate, screen, suppressor grid, and also a ground connection. Next is a two-pin socket for filament supply to the P.A. valves. In the middle is a five-terminal bridge with a five-wire cable carrying leads to the buffer plate, buffer screen, and earth, and also two H.T. leads to the seventh and eighth meters at the oscillator end of the layout.

The filament supplies to the buffer and oscillator stages are connected to two pins of each of two chassis mounting valve sockets, and the correct voltages are obtained by inserting plugs into the two pins for the filament supply required.

It will thus be seen that the whole unit is absolutely flexible for any voltage supply to any element of any valve. No diagram of connections can be given as this depends upon the circuit being tested.

The 28 Mc. Band.

CONDITIONS during January were about the same as in December, except that more has been heard of the elusive Asians. North American stations have come through regularly in the afternoon every day.

Two new countries have been contacted, G6DH working VO1N for the first VO-G contact and G2YL working CP1AC for the first CP-G contact. G6LK worked VO4Y, so there are two more stations active for those out for W.B.E.

Congratulations to G6DH, who is now W.A.C. and W.B.E. on 28 Mc. He heard VU2BL on January 18, but did not manage to hook up with him until January 28. This month 6DH has worked, apart from numerous W's, VE 1, 2 and 3, VP5, ZS1 and 2, EA, OH, ON, SU, LU, ZE1 and VK1, 2, 3, 4, 5 and 6, and has heard VU2BV and VU2BG. He has now been QSO W every day for two months.

At 09.30 G.M.T. on January 30, G6DH worked U9AV (Omsk, Siberia); this is probably the first 28 Mc. contact between England and Asiatic Russia. W6DTB was worked by G6DH at 15.10 G.M.T. on January 29.

G6WN worked VU2BD and now requires VK or ZL for W.A.C. and W.B.E. He finds that he cannot hear VK's well, although good signals come in from other parts.

BRS1847 heard OA4B, CP1AC, W6CNE (fone) and W6DIO. BRS2021 (Scotland) heard W1, 2, 3, 4, 5, 8, 9, VP5PZ, ZS1H, ZS2A, ZE1JU, and VE2EE. HB9J reports having heard VU2BG on January 5 and worked W1, 2, 3, 4, 8, 9 and ZT.

56 Mc. hardly comes within the scope of these notes, but a few items are worthy of mention. W6DOB has heard all W districts on that band. W9NY and W9GHN, of Milwaukee, will be working shortly on frequencies between 56,000 and 56,100 kc. Superheterodyne receivers will be used, and they are anxious for skeds with C.W. stations in any part of the world. Stations known to be building C.W. transmitters for this band include X1AY, VK3YP, VP5PZ, EI8B, W2TP, W3FAR, W3IS, W6RH, W6DOB, W6JJU.

Please note that reports for this month should reach G2YL by February 26.

Further claims for first G contacts on 28 Mc. have been received, and a list of corrections and additions will be given each month.

Corrections to last month's list:—
G5VB worked FM8RIT on 2/2/30.
G6LL worked VQ2BH on 2/3/30.

Additions to last month's list:—
G6LL worked VE2AC on 3/3/29.
G6HP worked SU8RS on 2/2/30.
G6LL worked EU2ACK on 2/11/30.
G5BY worked CX1CG on 26/9/35.
G6DH worked VO4Y on 8/1/36.
G2YL worked CP1AC on 12/1/36.

RANDOM NOTES ON ALL-MAINS RECEIVERS

By S. W. Cutler (G2OL).

IN continuing these notes, the writer wishes to emphasise that they are based on actual experience, and are only given as a guide. When dealing with pick-up hum, especially on the higher frequencies, no hard and fast rules can be laid down, but it is hoped that these few points may provide clues to the clearing up of some of the more remote difficulties.

It is again pointed out that some of these notes apply equally well to battery sets, where hum is always of the pick-up variety.

Starting then, with hum. The house wiring system may be one of the chief offenders. Some switches and their associated circuits tend to radiate 50 cycle A.C., due mainly to earth leaks. If the leak is a bad one, it will manifest itself, not as a hum, but as an intermittent noise something between a "grinder" type of QRN and a spark station. If the leak is not so bad, something in the region of hundreds of ohms, for instance, a loud hum will result. Short of rewiring that particular section, or replacing the switch, ceiling rose, or point with new ones, there is no remedy so far as the writer is aware, except to keep the receiver as far away from the source of trouble as possible.

Certain electric light bulbs also produce hum, usually toward the end of their lives, and the cure is obvious. I refer, of course, to night-time,when the bulb is alight. Remove the lamp and scrap it, or at least transfer it to some little used room, such as the bathroom, or larder. These lamps make themselves heard wherever they are situated as a rule. The trouble is thought to be due to the carbon deposit on the glass envelope.

Wiring contractors have a habit of using the "push-in" type of conduit in some houses. According to I.E.E. rules, this is incorrect, electrically, and most certainly incorrect as far as the short wave radio amateur is concerned. When wiring is carried out in conduit, or metal sheathing, a continuous earth is required on the sheathing. Screwed conduit, or conduit connected at T junctions, and right angle bends with grub screw connectors satisfy this rule. Where the push-in type of conduit is used, it is necessary to go over the whole system and "bond" each joint in the conduit or sheathing with wire. Special clips are available at any electrical stores for the purpose. Bonding may be done by soldering, but as this is rather difficult where iron is concerned, it is not recommended. If a leak to earth is present, and the sheathing is not a continuous earth throughout, bad noises will most certainly be picked up by the receiver, be it battery driven or all-mains. The same applies to lead covered wiring where non-metallic junction boxes are used. The whole sheathing or conduit should be finally earthed to the nearest *rising* water main, and NOT to the receiver earth.

Much may be done in clearing up leaks, by cleaning all fuse and junction boxes, main switches and switch-fuses, etc. Leaks, however slight, have a nasty habit of appearing in the receiver.

If a power circuit is laid on, a check-up may be conducted by running the receiver temporarily on the "light" circuit, while the power is disconnected at the main switch. Conversely, run the receiver on the power circuit and switch off the light at the main. This simple test will indicate which system is at fault. If the same fault is heard on both sources of supply, or if the fault is audible in a battery driven receiver with both supplies switched off, then the trouble lies externally to the house.

Man-Made Static.

Man-made static, generated inside the house by vacuum cleaners and the like, may be treated in the usual way by connecting a capacity across the brushes; .002 μF., or over, is generally sufficient. A filter circuit, as described in Part I*, consisting of RF chokes and condensers preceding the receiver or power pack, and in the mains leads, will sometimes effect a cure if the trouble comes from that direction. If picked up by the aerial, it may be dealt with in one of the several ways described in this Journal from time to time.

If the trouble is located outside the house, the same cure will be effective for all-mains receivers. It, however, assumes formidable proportions, in the case of a battery-driven receiver, where it is picked up from the house mains. A cure, in this case, may be effected in an expensive manner by inserting chokes and condensers, forming a filter circuit, in the mains at the point of entry to the house. These have to be large enough to carry the entire current used in the house, both for power and light, and be without serious voltage drop, which obviously will be a continuous loss of energy and money. They have to be properly shielded and guarded, and inspected by the supply company, before they can be inserted. Before this extremity is deemed worth while, one has to be quite certain that a cure will be effected, and that the trouble is not coming in *via* the aerial, or the earth.

Where a long earth lead is unavoidable, it may itself pick up hum, especially if it runs parallel with, and close to, any form of mains wiring. The only remedy known to the writer in this case is to remove either the earth lead, or the mains wiring, whichever is the easier!

Modulation Hum.

In battery sets, a form of modulation hum is sometimes encountered, due to clear glass valves. These valves appear to pick up the slightest trace of A.C. A piece of copper foil, or other suitable metal wrapped around the valve and earthed, generally effects a cure, or the receiver may be placed on a sheet of metal which is earthed. Another alternative is to use metallised valves.

Hand Capacity Due to Long Leads.

Whilst on the subject of long earth leads, reference may be made to hand capacity effects, usually very troublesome when the earth lead trails all round the room. Improvement can be effected by making this lead a half or full wavelength long, and treating it as an aerial. The earthed end will be a voltage node. Node is deliberate, the current distribution being the reverse of a Hertz aerial. This means that the receiver end will be at the same potential as that of earth proper. The aerial may effect this distribution a little.

Reverting to mains-receivers, the 'phones, especially those with metal headbands, should be

* Page 324, March, 1935, T. & R. Bulletin.

isolated from the receiver, either by means of an output transformer, choke, or resistance capacity coupling, with a condenser of 0.1 μF or more in *each* lead. The 'phones should on no account be earthed direct, of which more anon.

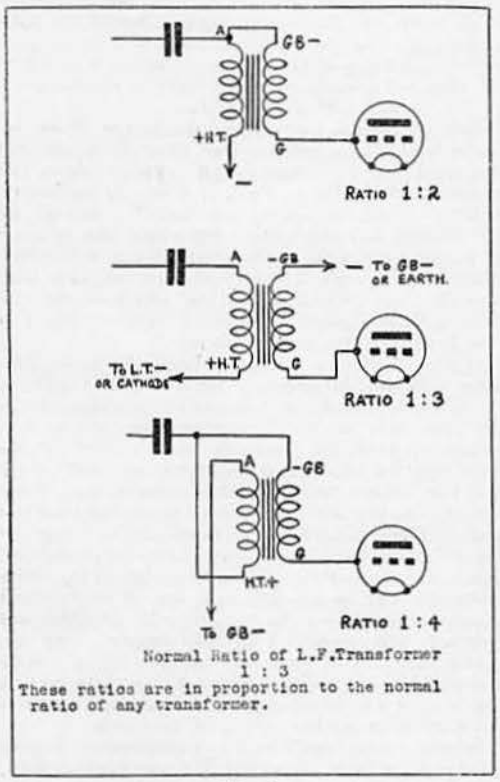


Fig. 1.

Decreasing Ratios of Transformers.

Previously, an example of a method of increasing the step-up ratio of an L.F. transformer was given. It may not be generally known, that it is possible to decrease the normal ratio as well, thereby giving a variety of three different ratios. In the case of a normal 1 : 3, this gives a range of 1 : 2, 1 : 3, and 1 : 4. The principle underlying this is that of the auto transformer, with the secondary connected in opposition to the primary; as normal; and assisting the primary. Fig. 1 gives the three methods.

High Voltage Dangers.

A recent editorial and a member's contribution referred to high voltage dangers, and in this connection the author would mention that he had an almost similar experience to G6QX, though the result was not quite so severe. Merely one finger burnt through to the bone (accompanied by the same unconsciousness), a fat doctor's bill and shattered nerves remained as a legacy.

Attention is drawn to the fact that the I.E.E. have produced a book of regulations for the guidance of wiremen and others, with a section devoted to radio apparatus. Both the electrical and radio sections are applicable. Its cost is hardly prohibitive, being 1s. in paper cover or 1s. 6d. for the luxury of cloth binding.

It behoves every amateur to buy a copy and to do his best to follow the regulations where possible. Some of the rules appear unnecessary, but common sense should be used in their application.

It should be a pride and a joy to every amateur worthy of the name to be able to boast that a child may enter his den, with no chance of suffering injury or damage, however many switches may be touched.

CHECK YOUR VALVES BY EMISSION TESTS

IT is often useful in experimental work to be able to say whether any particular valve is or is not going soft or losing its emission. The test described here is simple to conduct and is quite conclusive as an indication of the condition of the valve. To be generally useful, the test should be made first when the valve is new, and then at intervals as required. If the initial test is omitted, a single test made subsequently at any time when the valve's emission is suspected will not be very helpful.

To make the test, provide the valve with a D.C. anode supply of about half the rated maximum voltage of the valve and note this test voltage. No resistance should be included in the anode circuit except a milliammeter (and a suitable fuse if desired). Connect the grid to the cathode, the negative filament lead or the centre-tap, as the case may be. Then light up the filament, starting at a low voltage and increasing slowly until the anode current reaches some definite value, say 10% of the maximum working anode current Note the filament voltage, *accurately*, at which this anode current is reached. This filament voltage is really the test figure: it will probably be somewhere near half the rated filament voltage.

If this test is repeated at some later date after the valve has "sown its wild oats," the test filament voltage (which is required to give the same anode current with the same H.T. supply and in all ways under the same conditions) will probably have a different value. If the test filament voltage has increased, then the valve has softened and the emission has diminished, due to poisoning of the emissive surface of the cathode by the liberated gas. If the test figure has decreased, the emission has improved, and this is quite possible with certain valves, either because the vacuum is improving or because the cathode itself is becoming more emissive.

Such a simple test as this may well be made a routine measurement to keep a check on the condition of the various valves in use. The method is applicable to all types, oscillators, power amplifiers or diode rectifiers. In the case of multi-grid valves, all the grids should be connected to the cathode lead.

This test suggests a useful line of experiment. What is the effect on emission of operating a valve at 56 Mc., or as a frequency-doubler, or as a driven amplifier at high efficiency? The answers might show up some unexpected dangers in apparently harmless practices. G6LJ.

THE W3EDP ANTENNA

By Yardley Beers (W3AWH.)

THEORY has given the amateur a large number of antenna systems, but unfortunately many of them, though theoretically nearly perfect, have the weakness of radiating at angles often not effective for communication. In addition, theory cannot provide sufficiently for the presence of objects such as metal roofs, gutter pipes, BCL antennæ and the like, which usually exist on or near the premises of most amateurs. Hence an antenna which is designed from experiment rather than theory would seem justified.

Such an antenna has been evolved by Mr. H. J. Siegel (W3EDP). On first coming on the air two years ago (though he consumed over a thousand feet of wire in experimenting with antennæ of the usual types), W3EDP failed to get satisfactory results. His goal was an antenna which could be operated efficiently on all bands with a minimum of changes. He seemed to think that most amateurs, in their haste to design and build transmitters for rapid band-change, had sorrowfully neglected the antenna system. Thereupon he set about to design a new antenna, with which he tried to find the best compromise between radiating angle and theoretical efficiency. The radiating angle of an antenna depends not only on the height above ground and the orientation with respect to the horizontal but also on the length. Being unable to alter the first two factors, W3EDP varied the third.

A coil of wire one-hundred feet long was hung up to his mast and tried out for several weeks on 7 Mc. The results were carefully tabulated, with due allowance being made for adverse conditions. Four feet of wire was then cut off and similarly tried on 7 Mc. This process was repeated until almost every reasonable antenna length was tried, and then the entire process was repeated several times. When all the tabulations were complete, *a length of* 84 *ft.* seemed to stand out as being the best of all the combinations tried. It may be apropos here to state that the antenna in all cases was inductively coupled to the final P.A. by a parallel-tuned tank circuit on all bands. This parallel-tuned circuit was arranged to give variable coupling with the final P.A. tank coil so that it could be adjusted for maximum efficiency and so that the load on the final amplifier could be controlled. It is important to mention that low C in the antenna circuit gave by far the best efficiency. High C caused a high circulating current and looked very nice on the thermocouple ammeter, but was nil for results.

Not liking entirely the idea of an end-fed single-wire antenna, W3EDP set about to find a counterpoise for the best results with his 84-ft. antenna. Going through a process similar to that of the antenna itself, produced a *counterpoise length of* 17 *ft.* as the one working best in combination with the antenna. * This combination seemed to work excellently on 1.7, 3.5, 7 and 28 Mc. but on 14 Mc. a *counterpoise length of* 6½ *feet* seemed to outshine all others. The parallel tuning arrangement remains untouched for operation on all bands. W3EDP was a bit sceptical about the operation of this system on 28 Mc., so he put his transmitter down there to find out. Results were about equal when operating either with the 17 ft. counterpoise or with no counterpoise at all. The antenna is about 20 feet from the ground and the counterpoises are strung in the room near the ceiling of the first floor of the house. No lead-in arrangement was found necessary, the antenna and counterpoise both being brought directly to the antenna-coil. The antenna and counterpoise are at *right angles to each other.*

Like most antennæ, this one has its directional properties, though it is difficult to say just what they are, for at most times it gives excellent results in all directions. Recently we have been getting VK, ZL and ZS stations twice daily on 14 Mc., and apparently by different paths; VK and ZL have been worked in the early and late mornings, early afternoon and evening and again at midnight; ZS stations at early afternoon and again just before midnight. Roughly speaking, the antenna seems to give best results in a direction at right angles to its length. It also has the unusual property of emitting a very weak ground wave. On 7 Mc. W3EDP's signals have been barely audible across town, when at the same time he was QSO the west coast and getting R8-9 reports.

Though this antenna may seem unorthodox to many, the results obtained should justify it fully. Using a pair of 46's with 50 watts input to the final P.A., W3EDP has consistently received R7-8 reports on 7 and 14 Mc. from five continents. He can raise VK, ZL on 7 Mc. more consistently than many of the higher-power stations known to the writer. In addition he has worked 75 countries in all continents within two years from an average DX location, a record not duplicated by many using higher powers. W3EDP has used his antenna system at two different locations with equal results. In addition the writer has used the system in a badly screened location, between two houses and under several trees, yet without altering the dimensions from those given him by W3EDP he has obtained excellent results on 3.5 Mc., having worked Europe several times with a pair of '10's.

This antenna is not offered as a cure for all antenna troubles, and to discover its true value it will have to be tested at more and variant locations. The dimensions may have to be slightly altered in some locations for maximum efficiency, but it is the writer's belief that the principles underlying its design are sound and perhaps may be the basis of further experiments on antennæ.

* As the antenna and counterpoise are of unequal lengths, the Collins antennæ matching networks will probably not work with this system.

Stray.

U.S.A. stations were worked on four bands in ten hours on January 18 by G6WY. His contacts were made on 3.5, 7, 14 and 28 Mc.

BRIGHT IDEAS.—No. 4.

Probably the amateur's most useful accessory is the one-turn coil and pea-lamp; for tuning-neutralising and for comparative tests it serves its purpose well.

The writer has recently come by a very effective replacement for the pea-lamp, viz., a *Ferranti* thermal radio frequency milliammeter registering 0-50 ma.

With a single turn across its terminals one can carry out all the above processes with very much greater accuracy; for example, a transmitter neutralised with the aid of a pea-lamp gave a 7 ma. reading when the meter was coupled to P.A. tank coil with H.T. off P.A.!

Hung on the shack wall a convenient distance from the transmitter the milli-ammeter enables one to maintain the adjustments of the transmitter at its maximum efficiency. It is also ideal for feeder line experiments, as standing waves are readily detected by the meter and loop.

G2LR.

* * *

A simple use of series band spreading on, say, 14 Mc. only, can be made by the insertion of a small-capacity fixed condenser in series with the tuning condenser, using a switch to short-circuit the fixed condenser when using the remaining amateur bands. The condenser used in this case consisted of two stiff copper plates 5½ cm. by 3½ cm., mounted in a vertical position on the ebonite base-board, and spaced about 3 mm. apart. One centimetre of the plates was bent at right angles for mounting purposes, when the effective area is 4½ cm. by 3½ cm. The amount of spreading can be varied by bending the plates together or apart, and the position of the band on the tuning condenser can be fixed by means of a small variable aerial coupling condenser. The tuning condenser used has a capacity of 37½ μμF. and the fixed condenser described is of about 5 μμF.

2BVO.

* * *

When rewinding relay magnets for a different voltage, it is not always an easy matter to determine the gauge of wire required to give the correct number of ampere-turns. A reliable method suggested itself to the writer when rewinding the magnets on a post-office "hedge-hog" relay.

Since on any given bobbin the mean length of a turn is constant, whatever the wire gauge, the ampere-turns multiplied by this length, converted to yards, will give another constant, namely ampere-yards. By a simple application of Ohm's Law, it can be seen that the voltage available divided by the number of ampere-yards will give the resistance per yard of the wire required, when the nearest suitable gauge can be found from wire tables. The tables should also give the number of turns per inch, or, if one is fortunate, the number of turns per square inch of cross-section, and since the area of the bobbin to be filled can be measured, the quantity of wire required is easily calculated.

As a cross-check, to ensure that the calculations have not gone astray, the current to be taken at the new voltage can be calculated from the resistance of the wire as given in the tables, and the number of ampere-turns due to the new winding should agree very closely with that of the original winding.

An example follows:—

Original Coils (two bobbins):

Voltage required	30
Resistance	75 ω.
Current	0.4 amps.
Turns	5,000
Ampere-turns	2,000
Total length of wire ...	246 yards
(Mean length of turn ...	2.06 inches)
Ampere-yards	114.4
Gauge of wire	32 enamelled
Turns per sq. in.	6,889
Area per bobbin	0.363 sq. in.

New Winding:

Voltage to be used	6
Resistance per yard of wire required	6
	114.4
	=0.0525 ω.
Nearest gauge	23 (.05313 ω/yd)
Turns per sq. in.	1,505
∴ Turns per bobbin ...	1,505 × .363
	=546
Required length of wire ...	546 × 2.06 × 2 / 36
	=62.5 yards
Total resistance	3.32 ω.
Current	1.81 amps.
Ampere-turns	1.81 × 546 × 2
	=1,976
Yards per lb.	191.6
Wire required	5¼ oz. (i.e., 8-oz. reel)

The number of ampere-turns obtained in this manner agrees very well with that of the original winding.

2BVO.

* * *

An ordinary 5-watt mains lamp can be put to good use in testing mains transformers which are suspected of having shorted turns. The lamp is wired in series with the primary of the transformer, which should have all secondaries disconnected. If the transformer is really efficient, the glow should be so small as to hardly be visible, while should there be any internal trouble in the transformer, the lamp will glow brightly.

The same test can be usefully applied to testing the losses in a home-made transformer, since if this has been badly designed or put together, the lamp will glow more or less brightly.

G5JU.

* * *

G5ZN finds that a *Delco-Remy* motor-car dynamo cut-out makes a good keying relay, which will follow the key at high speeds. These cut-outs can often be picked up quite cheaply at motor garages. All that is necessary is to re-mount the cut-out on to an ebonite base and to remove the fine wire from the bobbin and rewind it with No. 30 s.w.g. d.c.c. The relay operates perfectly on 4 volts and takes about ½ amp. It is in use at his station for remote control.

SOME 28 Mc. THEORIES AND FACTS

By A. C. Embrechts (ON4AC).

IN view of the fine DX communication which has been, and is still being, obtained on 28 Mc., the following notes may, perhaps, prove of interest.

From 1924-25 to Spring, 1929, the A.T.T., together with the Bell Laboratories, conducted experiments on waves even lower than 10 metres on the New York-New Southgate (London) and New York-Buenos Aires routes. The results, which have been published in the *Proceedings of the I.R.E.* during 1930 and 1933, show that 10-metre communication, up to a certain standard, of course, is possible the whole year round in the N.-S. direction, whereas E.-W. communication (at our latitude) can only be achieved during the winter months.

Developing this in the light of recent experience, we can probably say, without being too far off the mark, that :—

(1) True N.-S. communication on 28 Mc. should be possible during the whole year, with slight increases in average signal strength and extension of favourable communication period during the day around the equinoxes, and corresponding decreases around the solstices. On certain favourable occasions signals will probably be heard up to midnight when the whole direct route is already in the dark zone (see later).

(2) True E.-W. communication should be possible during the winter season between the equinoxes, with a probable reduction in average signal strength around the winter solstice. Here communication will be limited to the periods when daylight still covers the entire direct route (see later).

(3) Any intermediate directions will be favoured during intermediate periods, these being extended when the direct route between stations moves from true E.-W. (or true W.-E.) to true N.-S. The same applies to the southern hemisphere.

Moreover, in either hemisphere, the nearer a station is to the equator the longer will be the average favourable periods of communication, all other conditions being equal, and *vice versa*.

This explains why stations situated at our latitudes and N. of 50° have such great difficulty in contacting the U.S.A. West Coast or Japan. In this case the most favourable period is theoretically during the winter season, when the short great circle route is entirely in the dark. Although J and W6 10-metre stations have been heard and contacted, it is suggested that the signals did not follow the short great circle route nor the long one, but some intermediate route, sometimes of a very erratic and varying position.

This statement is based on the following observations. The author uses two more or less directional antenna systems, one in a N.-S. direction, and the other in an E.-W. (and W.-E.) direction. By feeding these singly or simultaneously, and, in the latter case, by varying the phase in both, almost any direction between E.-W. and N.-S., or between W.-E. and N.-S., can be favoured.

During observations on transmissions from ZS1H, who is situated in an almost true N.-S. direction, it was found that, normal conditions prevailing, ZS1H came through at a good R6 on the antenna favouring the S., while at the same time not a trace of his signals could be heard on the antenna favouring the E. and W.

Later on, and usually after a more or less lengthy fading period, it was found that his signals could be heard at almost the same strength on both antennas ; and by combining them with a phase difference so as to obtain the most favourable direction it was usually possible to increase the signal strength very appreciably—namely, from R3 on each antenna separately to R6/7 on the combined antennas. It was further noted that if in the late afternoon ZS1H's signals seemed to come from an approximate S.W. direction, in the early morning the direction was approximately S.E.

These observations have been repeated on U.S.A. East Coast signals, and in the case of W4AUU it was found that the most favourable direction was swinging to the N. and S. of the great circle route without any apparent reason, though any change in direction usually came after a more or less long fade out. Sometimes a fading signal could be brought in again by changing the "directivity" of the receiving antenna.

Similar results have been observed when the antennas were used for transmitting. In this case, however, it has been found that usually the optimum direction for transmitting to a certain station is different from the optimum direction for receiving its signals. This, of course, may be due to local conditions at the distant station.

Coming back to an earlier statement, the author would put forward as a tentative suggestion that 28 Mc. waves being sent out into space in almost any direction by the usual amateur transmitting antenna hit small or large, as the case may be, ionised reflecting clouds, and are sent back to earth at any angle depending on the relative positions of the transmitting antenna and the reflecting cloud. Of course, this state of affairs has been known for some time (fading), but the case as applied to 28 Mc. is slightly different, due to the relatively small size and the extreme mobility of the reflecting clouds.

When studying 28 Mc. propagation care should be taken to note weather conditions, especially at the transmitting end, and particularly it is desired to stress the great influence on long-distance communication of the degree of air dampness, together with cloud formation. One should not forget that 28 Mc. waves, just as those at lower frequencies, are refracted when passing through layers of varying density, and the degree of refraction increases with the thickness of the damp layer and with the nature and density of it. Interesting observations have been made in this respect, but space does not permit of detailing them here.

A form of Luxembourg effect has also been noted on 28 Mc., resulting in the production of distortion, and consequently harmonics, in the Ionosphere. Observations, however, have been too short and too erratic to arrive at definite conclusions. This is quite an interesting study for those who have time on hand.

AN INTERNATIONAL 56 Mc. WEEK-END?

By Douglas Walters (G5CV).*

A FEW extra spots on the sun, 93,000,000 miles away, has been the cause of much DX and still more talk in the ultra short wave world. Phenomenal DX contacts have been made on 28 Mc., simple sets are regularly tuning in American speed cops "calling all cars" on 9 metres, television transmissions from Berlin have skipped the Atlantic on 7 metres, but what has happened to 5 metres?

Except for a few amateurs who have remained faithful to this band, most activity is confined to 28 Mc., obviously because it offers DX. But if solar activity has been responsible for affecting wave-lengths down to 7 metres, is it not reasonable to expect a somewhat similar effect upon 5? But very few individuals, there are noteworthy exceptions, have attempted *real* DX on this band; that is why it is hoped to arrange an International 56 Mc. week-end.

Several weeks ago the writer whilst in Switzerland attempted to listen for HB9T on a 56 Mc. receiver near the summit of the Jungfraujoch at an altitude of 11,000 feet, but failed, due to abnormal snow conditions.

It was decided to arrange, if sufficient co-operation is assured, an International 56 Mc. week-end when stations all over Europe would be given a chance of achieving QSO's.

The writer has carefully considered the project, and is sure that, provided adequate co-operation is forthcoming from transmitting and receiving stations in this country and abroad, some very interesting results would be obtained, results which may quite possibly throw further light upon the vagaries and characteristics of the ultra high frequencies.

No date has yet been fixed, but the last week-end in June has been suggested, for this closely follows National Field Day. Directly full particulars have been arranged copies and schedules will be available to those who apply for them.

Preliminary details include :—

(*a*) Tests to take place on the Saturday and Sunday of the week-end which will be chosen later.

(*b*) Silent periods during which stations in only one country or group of countries will be on the air. This will provide opportunities for DX reception.

(*c*) A special European "silent period" for listening for transmission from the U.S.A. and other distant countries.

In view of the difficulty in substantiating and verifying DX reports which arrive several days late, it is suggested that credit be given only to reports which have been posted or telegraphed *within* 12 *hours of the time of reception*. This would ensure that the DX reports are genuine.

If all 56 Mc. stations in Europe make a determined effort to be on the air during this week-end we can be assured of a lively time on the band, even better than the Crystal Palace and Snowdon experiments.

The writer plans to take 56 Mc. transmitting and receiving equipment by air to Switzerland for this occasion and, subject to permission being obtained from the Swiss authorities, to attempt communication with England from some high mountain, probably the Jungfraujoch (11,000 feet) or the Gornergratt.

By making observations on signals received from stations farther away than the optical distance much useful data will be contributed to our present scanty knowledge of the behaviour and properties of frequencies above 28 Mc.

It is also suggested that the 56 Mc. band be roughly divided into two halves, one shared by Continental stations and the other by British stations so that less QRM is experienced on distant signals.

It is hoped to obtain accurate data regarding sunspot activity during the tests and if anyone can help in furnishing this information it will be much appreciated. The writer would be glad to have the call signs and addresses of all interested members, particularly from the Continent. HB9T has kindly consented to help with Continental organisation.

* 45, Fairfax Road, London, W.4.

Leonard Trophy Contest.

Eighty-one stations entered for the Leonard Trophy Contest arranged by the Radio Society of Northern Ireland. The premier award—a silver trophy presented by Mr. R. V. Leonard, the Society's President, was won by Mr. J. N. Smith (Gi5QX), with a total of 73 points. Mr. R. Barr (Gi5UR), with 70 points, finished second.

A gold medal was offered to the English or foreign station effecting the highest number of contacts with Northern Ireland or Irish Free State stations during the contest period. This was won by Mr. R. J. Bradley (G2FO), of Stockton-on-Tees. A silver medal was won by Mr. R. W. Rogers (G6YR), of Southport, who finished second amongst the English and foreign competitors.

The Secretary of the R.S.N.I. thanks all members who supported this event.

DX Telephony Contacts

What are believed to be first 14 Mc. phone contacts between Australia and Maine, U.S.A., took place last month when W1DUJ worked VK2RB on the 25th and VK5LB on the 26th. W1DUJ will be listening for VK/ZL phone stations from 16.00 to 20.00 G.M.T. each night.

Short Wave Club in Cheshire.

Mr. B. O'Brien, BRS2160, informs us that an amateur short-wave club is being formed in the Hoylake, West Kirby, Grange and Heswall District. Support from R.S.G.B. members is solicited. Communications should be addressed to Mr. O'Brien, "Caldy," Irby Road, Heswall, Cheshire.

Support "Bulletin" Advertisers

THE 1935 3.5 Mc. CONTEST

Low Power Wins Again

By T. A. St. Johnston (G6UT).

IT is pleasing to record that a 10-watt station again won the 3.5 Mc. contest and that the station concerned, G5KG, contacted VK during the event. Two Australian stations and a W8 were worked by G6RB using 50 watts; G6RV, using 50 watts, contacted W8, and both G5KG and G5JO worked FM. G6RV, G5JO and G6NJ were also heard in Australia.

The Leading Stations.

The winner of the contest (G5KG), Mr. G. W. Slack, of Mansfield, Notts, will have the congratulations of all. Mr. Slack made his first acquaintance with radio in 1921 at about the time 2MT commenced to broadcast from Writtle. His first receiver was of the crystal variety, and in 1922 he made his first valve receiver. KDKA on 100 metres urged him on, and in 1932 he became a member of the I.S.W.C. of America and started short-wave listening in earnest, the lure of Q.S.L. cards urging him further. After meeting G6MN, of Worksop, he was advised by the latter that the first step in obtaining a transmitting licence was to join the R.S.G.B.—very good advice. Mr. Slack joined the Society in May, 1933, and soon obtained the A.A. call 2BFF. In February, 1934, the sign G5KG was allotted and permission to use the 7 and 14 Mc. bands given. Later 28 and 56 Mc. were added, then followed 1.7 Mc. and in April, 1935, permission to use 3.5 Mc. was obtained through the auspices of the Society. Later W.B.E. and W.A.C. were won, and Mr. Slack considers that at this stage an amateur transmitter has served his apprenticeship and can settle down to more serious experimental work. He has been co-operating with various R.E.S. groups. Aerials and propagation are his main interests as he considers them of extreme importance.

The transmitter employed during the contest was a unity-coupled oscillator, frequency doubler, power amplifier. The valves were LS5, P625 and T25D. The aerial system was a half-wave zepp, 50 ft. high with 45-ft. feeders, direction due north and south, fed from south, and maximum lines of radiation due east and west. The receiver used a tuned S.G. as pre-selector, S.G. detector and pentode as audio amplifier. Mr. Slack considered the rules very fair and hard to improve on, also that more publicity should have been given in continental publications and deplores the fact that so few members took part.

The runner-up was Mr. L. W. Jones (G5JO), of Cambridge, only 9 points behind. The transmitter used, C.O. Pen 4VB, followed by TZ05-20 sub-amplifier, TZ05-20 and P.A. TY02-60. An inverted "L" type aerial, half-wave single wire feed type, probably acting as a reflector, was used. The receiver was 1-v-1 untuned H.F. and reaction AC2 pentode output with noise filter. As an amendment to the rules, Mr. Jones offers the suggestion that a compulsory break between 02.00 and 05.00 G.M.T. be made and that a limit on the number of stations of one particular country be imposed, pointing out that the latter will greatly reduce Q.R.M.

Position.	Name.	Call.	Power input used (watts).	Countries worked.	Stations worked.	Total points.
1	G. W. Slack	G5KG	10	15	30	204
2	L. W. Jones	G5JO	50	14	54	195
3	A. N. Le Cheminant	G6AC	10	14	53	193
4	W. B. Stirling	G6RV	50	15	30	183
5	R. A. Bartlett	G6RB	50	14	30	181
6	H. Jones	G5ZT	24	13	44	174
7	A. E. Dyson	G6NJ	48	13	23	153
8	N. E. Read	G6US	50	11	22	132
9	H. Beaumont	G5YV	9	10	23	123
10	J. H. Hargreaves	G5VO	42	10	17	117
11	C. I. Orr-Ewing	G5OG	50	10	12	112
12	J. W. Mathews	G6LL	50	9	18	108
13	J. N. Walker	G5JU	25	8	12	92
14	W. J. H. Brown	G5BK	10	6	9	69
15	K. T. Harvey	G5KT	10	2	3	23
16	A. O. Milne	G2MI	50	1	3	13

Third place was gained by Mr. A. N. Le Cheminant (G6AC), of Cranwell, who used Cossor 240BA's C.O. and F.D. driving a link-coupled push-pull P.A., using two Mazda P650's. The aerial was half-wave zepp, with 60-ft. feeders and Collins coupler, the receiver being S.G. detector and pentode.

Mr. W. B. Stirling (G6RV), of Mossgrove, Bridge of Allan, was fourth. His gear consisted of crystal stage 247, buffer stage T25D, final T61D—all stages link coupled. For receiver T.R.F. triode detector and pentode.

Mr. Bartlett (G6RB), of Bristol, was fifth, using C.O. and locked P.A. and a 14 Mc. zepp aerial in conjunction with a counterpoise. The receiver an 0-v-1.

Mr. Jones (G5ZT), of Preston, sixth in order of merit, used CO-BA-PA as transmitter and a 1932 ham-band two receiver.

(*Continued on page* 336).

A 56 Mc. INTERNATIONAL DX CONTEST

The A.R.R.L. announce that a 56 Mc. international DX contest will be run throughout 1936. The winner will be awarded a gold loving cup (16-inch) offered by the Milwaukee Radio Amateurs' Club, Inc., which has been engraved "The Milwaukee Radio Amateurs' Club, Inc. 56 Mc. Achievement. Won by ——." The rules are as follows :—

1. The contest is open to all licensed radio amateurs in any country in the world.

2. The contest begins at 0001 G.M.T., January 1, 1936, and ends at 2400 G.M.T., December 31, 1936. All contacts for score must be within this period.

3. Transmissions must be in accordance with Government regulations in all respects as regards power, frequency, log-keeping, etc.

4. Proof of contacts in writing may be required by the contest committee.

5. All contestants must submit entries consisting of a summary showing the number of weekly reports sent to A.R.R.L. Headquarters,* and the points scored based on completed contacts in accordance with these Rules, this to reach A.R.R.L., West Hartford, on or before January 31, 1937, in the case of North American participants, or on or before March 15, 1937, in the case of all other continents.

6. (*a*) One point will be scored for each completed 100 miles of contact with a specific station (e.g., a contact with a station 99 miles away scores no points; contact with a station 658 miles away scores six points). All distances will be measured by a Great Circle line between stations.

(*b*) In computing his final score a competitor may claim points for each different station worked once during each calendar month.

7. An A.R.R.L. Awards Committee shall consider the file of reports and data submitted by competitors, to the A.R.R.L. Its decision will be based on (*a*) the number of weekly reports to A.R.R.L. on 56 Mc. work, 50 per cent.; and (*b*) the number of points in accordance with Rule 6, 50 per cent. Examination of all reports with ratings weighted on these factors will determine the 1936 56 Mc. Achievement Award.

8. Decisions of the Award Committee shall be final, and the right is reserved to declare no competition if less than two entries of sufficient merit are received.

Rules 5, 6 and 7 are important. It should be noted that, as well as QSO points counting for the winner, the matter of weekly reporting on band conditions with respect to DX heard, experimental developments—receiver design (new features for tone or CW reception), antenna research, results of tests, etc.—and any correlation of DX and variations in the signal strength of certain stations selected to test with, the relative humidity, barometric conditions, temperature, sun spot and magnetic data is given *equal* importance to the DX worked. In the absence of outstanding DX it is conceivable that the award might be based on the number and value of weekly observations reported. This factor is important in that it will help to keep the band populated as well as afford a check on conditions with operating information that can be passed along to other 56 Mc. workers.

A generous offer comes from W9HRM and W9RH, of the M.R.A.C., who state that "we also intend to ship a case of that famous Milwaukee Beer to the first operator that WAC's on 56 Mc." !

*Home members of the R.S.G.B. may send their reports to Headquarters each *month*.

Book Review.

WIRELESS TRANSMISSION AND RECEPTION. Post Office Engineering Department Technical Pamphlets, C.1. 75 pages, and 52 illustrations. Published by H.M. Stationery Office, London. Price 6d., postage extra.

This is a new edition of one of the many little booklets published by the Department. Quite a considerable number of these booklets are of general interest, and deserve to be better known.

The object of the pamphlet is to supply elementary information on radio technique to the engineering workmen of the Department, and in doing so it deals rather with principles than practice. It is written simply and interestingly, and for the man with at least a practical working knowledge of simple electrical circuits; and it is well illustrated with diagrams and circuits.

The subject matter is divided into four main sections: General Principles, Systems of Generation and Transmission, Reception of Wireless Signals, and Direction Finding and Directive Reception.

In the first section the elementary ideas of propagation, coupling of circuits, and types of waves are treated. The second section, after a brief mention of spark and arc transmitters, deals with valves and valve oscillator circuits; then valve, mercury vapour, and metal rectifiers. After these come ICW transmitters, keying, telephony methods, and short-wave propagation.

The third section describes detector methods and multi-electrode valves at some length, and then a very good explanation of heterodyne reception leads on to the "superhet" and super-regenerative receivers. Automatic gain controls and limiters, and wavemeters, conclude this section.

The last section deals with the fundamental principles of direction-finding, describing the simple loop, "sense" finding, the Bellini-Tosi system, and the use of arrays in the directive reception of short-wave signals.

Apart from the general interest which this booklet should create, it will prove a very satisfactory little text-book at a few pence for those who are interested in the elementary side of wireless education: scoutmasters, teachers, members of R.N.W.A.R., to mention only a few!

Copies may be obtained through any bookseller, or from H.M. Stationery Office at any of the following addresses: Adastral House, Kingsway, W.C.2; 120, George Street, Edinburgh, 2; 1, St. Andrew's Crescent, Cardiff; York Street, Manchester, 1; 80, Chichester Street, Belfast.

T. P. A.

SOLILOQUIES FROM THE SHACK

By Uncle Tom.

In which the possessor of the Mailed Fist of amateur radio talks about other fists, left-footed and otherwise.

I HAD intended to be oh! so nice to you this month. But two grouses have arrived, both of which claim my earnest attention, and I must cast off my geniality and get my frown out of my dressing-gown pocket once more.

The first relates to the "high-powered screamers with their gramophones" who make hay of the 7 Mc. band. The writer contends that the only way to get rid of them is to prohibit fone on that band, in which case they would be relegated to the place to which they ought to go. He writes, "I have spoken to some of these gentlemen and have not the least doubt that the majority of them could not send a Morse message decently at 10 w.p.m. to save their lives."

Speaking absolutely *personally*, I should be all in favour of a complete ban on 7 Mc. fone; but I haven't the slightest doubt that it would raise Cain among the song-birds.

The next nephew asks whether I realise that the spitch and moospitch merchants are more clever than I give them credit for? They are members of an international organisation, thinks he, unlawfully putting out secret transmissions on the amateur bands. Beer-barons, anarchists, bookie-beaters, and racketeers of all sorts have evolved a method of unscrambling what I have always called "spitch" and with suitable receivers they are receiving intelligible transmissions.

This nephew is working on a "spitch-unscrewing machine," and suggests that I do the same. We'll see.

My learned thesis this month is on the subject of signals and their owners. Those who have made a study of the subject claim to be able to read a man's character from his handwriting. I claim that it should be possible to do it from the signal he puts out. There are several factors—the fist, the note, the type of signal, the stuff that he sends.

Anyone who has penetrated my veil of anonymity will agree that my signal sounds exactly like me (or does it?). Now let's have a look at a few "Test" calls round the band, and see what we can deduce about their owners.

Here's a plain, straightforward, honest-to-goodness John Bull type—"Dah, dit, dit-dit-dit, dah." Owner, typical British ham with a certain regard for the law and for the feelings of others. No trouble with B.C.L.'s, obviously, for it isn't primary keying.

Ah, here's one that *is*! Primary keying and a huge filter ("Nah, nin, nin-nin-nin nah"). He daren't send fast with that ballooning effect; probably owing to a next-door neighbour with a Det. and L.F.

Here's one of my pet aversions; the man who says that an efficient self-excited rig is as good as C.C. All very well in theory, but in practice he's never been heard without a chirp ("Twah, twit, twit-twit-twit twah"). All over the shop, and with a fist like a cold slab of cod. I'll bet he's got knock knees and a receding chin—all owners of chirpy signals have.

And here's the super-chirp, covering about 100 kc. in all ("Chwah, chwitch, chwit-chwit-chwitch chwah"). Oh, boy, what a snorter! Can't you see him? Think of a flower in your herbaceous border, beginning with P, and you've got it.

Then there's the honest-to-goodness rock-crusher, using far more power than is good for him, and rather less filter, but getting there all the same, and knowing enough about good operating not to cause half the QRM that the P . . . with the chirp is doing. "Brrrrr, bip, bip-bip-bip, brrrrr," he goes, and his sigs. go winging away over the seven seas. Real he-man—his wife probably calls him Tarzan.

You know what W6 signals sound like about 5 p.m. on 14 Mc.? Some people call them "watery." Personally, I think it's beer. ("Beeeer, bim, bim-bim-bim, beeeeer"). You can only form a distorted picture of their owners from that—like television mixed up with atmospherics.

Of course, the good old local presents an equally distorted picture. All I get from him is "Bonk, b.. b.b.b., bonk," or sometimes "Clank, clk, clk-clk-clk clank." If *he* uses primary keying, all is well from the key-clicks point of view, but the resulting "Swish, sh, sh-sh-sh, swish" is a little hard to read. Turn him upside down and get the "Mah, mah-mah-mi-mi-mah, mah" (Chinese Morse) part of him, and all is clear.

But what about the astonishing variety of fists that are superimposed upon these signals? At one extreme we have nothing but dashes, and at the other nothing but dots. Some people still think that the length of a dash is about one-and-a-quarter dots, and they're pretty trying to read.

And then we have the swank-merchant, who believes in "individuality" in one's sending, and proceeds to lengthen certain dashes and clip others short. He's all right with his call-sign, because he always sends it the same way, but once he gets on to text, he obviously doesn't know quite what to do.

Now and then you hear a fist that makes you stop and listen, and you will generally find that it is as nearly automatic as possible. One dash equals three dots; space between letters equals one dash; space between words three (or sometimes two) dashes. You can copy him in your head for half an hour without tiring. Try that on some of the "individualists" and see how you get on.

I think there ought to be a cup for the *best-operated* British station, to be awarded as the result of a ballot over a period of one year. Were I a rich man instead of an old hermit, I would present one to the Society myself. Volunteers, forward

Reports Wanted.

G2LK (Gatley), on his 7,060 and 14,120 kc. transmissions. All reports will be acknowledged.

THE SCIENCE MUSEUM'S RADIO GALLERY

Those of our members who remember G5CS, Mr. G. R. M. Garratt, who was an active transmitter eight or ten years ago, will be interested to learn that he has recently been appointed an Assistant Keeper of the Science Museum, and is now in charge of the Radio Gallery, where a somewhat heterogeneous collection of historic radio apparatus is preserved.

A large portion of the Science Museum was rebuilt some years ago. It is now a magnificent building, and the large, well-lighted galleries contain some remarkable collections illustrating the history and development of almost every conceivable science and industry. Unfortunately, the radio collection is still housed in the old part of the Museum in a somewhat drab and unsuitable gallery, where a really good layout of the collection is impossible. This part of the Museum is to be rebuilt as soon as the state of the National Exchequer permits.

Although the present gallery is admittedly unsuitable, we may perhaps be excused for criticising the actual collection in the hope that Mr. Garratt may be able to remedy the many deficiencies which now exist, for even to a casual observer it is obvious that no serious attempt has been made to acquire systematic exhibits illustrative of radio developments during the past 15 years.

To take only one example, the development of receiver design from 1920 is very badly shown, and only one or two odd examples of no special significance are included. It should be possible to illustrate all the important inventions and development stages by models, circuits and complete receivers. To name only a few developments, there are the improvements in H.F. amplifiers, neutrodyne circuits, Reinartz circuits, the invention of super-heterodynes and super-regenerative receivers, the screened-grid and pentode circuits, and the development of Broadcast receivers.

These criticisms apply almost equally to many of the "sub-sections"; for example, the various developments of tuning coils, condensers, valves, to say nothing of such applications as radio direction finding, beacon and beam stations. The present collection is excellent in many ways, but there are serious gaps which ought to be filled. If the deficiencies are to to remedied and the collection remodelled in the manner which the importance of radio fully justifies, the work must be done before it is too late.

Many of our members probably possess components, valves, receivers and other apparatus which have some historic importance, or which illustrate some important stage in development,

(*Continued on page* 336.)

RESEARCH AND EXPERIMENTAL SECTIONS

MANAGER :

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

ASSISTANT MANAGER :

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

SECTIONS :

No. 1 : TRANSMITTER DESIGN

S.M. : G. McLean Wilford (G2WD), 33, Bibury Road, Hall Green, Birmingham.

G.M. : 7 and 14 Mc.

S. Buckingham (G5QF), 9, Brunswick Park Road, New Southgate, N.11.

G.M. : 28 Mc.

G. McLean Wilford (G2WD).

G.M. : 56 Mc.

J. N. Walker (G5JU), 4, Frenchay Road, Downend, Bristol, Glos.

G.M. : Artificial Aerials

G. McLean Wilford (G2WD)

No. 2 : RECEIVER DESIGN

S.M. : R. W. Newton (G5NQ), 94, Parkhill Road, Hampstead, N.W.3.

G.M. : General

G. D. Baggs, (G6BD), Fresh Woods, Tonbridge, Kent.

G.M. : 56 Mc.

J. N. Walker (G5JU)

No. 3 : AERIAL DESIGN

S.M. : F. Charman (G6CJ), Orchard Cottage, Stoke Poges, Bucks.

G.M. : General

F. Wilson (G2XX), 85, Risca Road, Newport, Mon.

G.M. : 28 Mc.

L. O. Rogers (G2HX), "Audwen," Estcourt Road, Gloucester.

G.M. : 56 Mc.

A. J. E. Forsyth (G6FO), "Westview," Appledore, near Bideford, Devon.

G.M. : Joint Group with Propagation

G. A. H. Eckles (G5GC), 57, Sutton Road, Beverley High Road, Hull.

No. 4 : PROPAGATION

S.M. : J. C. Elmer (G2GD), "Aethelmar," Seabrook Road, Hythe, Kent.

G.M. : 28 Mc.

E. H. Swain (G2HG), 31, Woodbastwick Road, Sydenham, S.E.26.

G.M. : 56 Mc.

A. J. E. Forsyth (G6FO).

G.M. : Conditions

J. Haigh (G6HA), 2, Greenock Terrace, Leeds, 12.

G.M. : Literature

A. T. Mathews (G5AM), 24, Woodside Park Road, North Finchley, N.12.

G.M. : Joint Group with Aerial Design

G. A. H. Eckles (G5GC).

No. 5 : VALVE DESIGN

S.M. : D. N. Corfield (G5CD), 10, Holders Hill Gardens, Hendon, N.W.4.

No. 6 : AUXILIARY APPARATUS

S.M. : A. O. Milne (G2MI), "Southcot," Larkfield, Kent.

G.M. :

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

No. 7 : MICRO-WAVES

S.M. : Dr. C. G. Lemon (G5GL), 19, Lena Road, Hammersmith, W.6

WE are unable on this occasion to adhere to our previously expressed intention of publishing some information concerning 56 Mc. design or operation each month. There are several developments under way, but research work cannot be carried out to order, consequently much more time is often required to complete an undertaking than was originally expected.

It is hoped in the near future to describe a straight receiver for 56 Mc. work which will be suitable for the reception of C.W. signals, and in which no quenching system is used. A crystal-controlled transmitter of low power rating is also under construction, and preliminary tests show an R.F. output in the neighbourhood of 3½ watts radio frequency output for a power input of 10 watts. This transmitter is being developed to demonstrate that, provided suitable apparatus and stable circuits are employed, there are very few difficulties in the way of crystal control on 56 Mc. This set will be very suitable for the low-power transmitting amateur.

In addition to these two items, work is being carried out on the design of a three-valve 56 Mc. C.C. transmitter, the final valve to be a power amplifier. The use of multi-electrode valves is being carefully studied in this direction.

There are several small details, in regard to the new organisation of the Sections, to which the Assistant Manager wishes to draw attention. Will any member who finds that a mistake has been made in allotting him to a wrong group communicate with G2GD? It is inevitable that in a large reorganisation such as has just been completed a few errors will occur, but we wish to rectify them as quickly as possible. The Assistant Manager also asks that members will notify him immediately of any change of address or call sign, for it is only by these means that we are able to keep and maintain accurate records.

At the end of these notes will be found a list of the call signs of those members who have joined as Individual Members. Whilst we are at all times desirous of being of service to these members, we must point out that it is for them to make the first move if they require assistance or information from the Sections.

We regret to announce the resignation of Mr. L. E. H. Scholefield, our Artificial Aerial Group Manager. Until another Manager is appointed A.A. group members are requested to report direct to their Section Manager, Mr. G. McL. Wilford (G2WD).

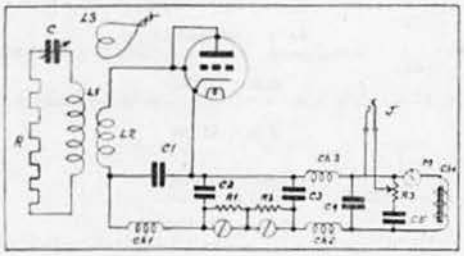
Artificial Aerials.

We have been asked by Mr. J. K. Todd (G2KV), to correct certain statements made in the article dealing with Artificial Aerials published in our last issue. Referring to Fig. 4 on page 272, Mr. Todd states :—

"R. maintains its resistance nearly constant, and is probably under 15 ohms even at 14 Mc. Therefore, 4 amperes at 3.5 Mc. corresponds to 160 watts (250-watt transmitter) and if C is 100 $\mu\mu$F then 1,760 volts will be dropped across it, the reactance of 100 $\mu\mu$F condenser being about 440 ohms at 3.5 Mc. If L1 is adjusted so that for resonance C is 500 $\mu\mu$F, only 350 volts will be dropped across R, and any good make of receiving condenser will stand up to that figure. When using telephony, peak voltages of nearly 1,000 volts will be developed (as RF voltage is both doubled, for phone, and multiplied by $\sqrt{2}$ for peak values), and a special condenser would be necessary.

"The resistance described runs nearly colourless at 150 watts, and appears to work quite well at yellow heat, so that 500 watts would probably be within its capability.

"R1 and R2 change the range of the meter section. The exact multiplier value depends on the valve used, but 5,000 ohms about halves the meter reading (watts quadrupled)."



An Artificial Aerial Circuit for use at high-power Transmitting Stations.

C. 500 μμF.
C1, 2, 3, 4. 1,000 μμF.
C5. 2 μF.
CH1, 2, 3. Efficient short wave R.F. Chokes.
CH4. 20H 300 ohm Choke to carry 10 m.a.
M. Milliammeter 0-5 m.a.
R. Special resistance, see January, 1936, Bulletin, page 272.
R1, 2. About 5,000 ohms.
R3. 10,000 ohm Potentiometer.

Individual Members.

In response to several requests we have decided to publish a list of the call-signs of all R.E.S. individual members on our books as at December 31 last.

In cases where addresses are not known they may be obtained on application to the Assistant R.E.S. Manager, Mr. J. D. Elmer, G2GD.

Individual members are requested to report at frequent intervals to their Section Manager.

No. 1. Transmitter Design.

G2—GB, IC, IF, IZ, NH, NK.
G5—LB, TL, XT, ZR.
G6—LF, LI, LQ, OK.
GI6—TB, YW.
SV1PL, ZE1JH, J2HJ,
2—AJT, AJV, AMQ, AWG, BHR, BIW, BMR, BNL, BTZ, BAA, BCQ.
BRS—1753, 2075, 2122, 2019.
BERS—268.

No. 2. Receiver Design.

G2—GB, NK.
G5—TL, XT.
G6—WJ, Gi5NJ.
SV1PL, ZE1JH, J2HJ.
2—ACA, AJT, AJV, AMQ, AWG, AZM, BHR, BIW, BNL, BTZ, BZX, BAA, BCQ.
BRS—981, 1038, 1048, 1788, 1790, 1872, 2027, 2140, 2143, 2154, 2163.

No. 3. Aerial Design.

G2—GB, NH, OP.
G5—CS, FI, VT, ZN, ZR.
G6—CY, GA, KR, RS, Gi5NJ, Gi6YW.
EI8G, SV1PL, ZE1JH, ZL3CP, J2HJ, BERS268.
2—AFZ, API., BHR, BXQ.
BRS—1872, 1902, 2027, 2122, 2143.

No. 4. Propagation.

G2—GB, HJ, NJ.
G5—CS, XF, ZR.
G6—CY, FU, KR, LQ, NA, OK, RS.
HB9T, SV1PL, ZE1JH, J2HJ.
2—AAV, AFZ, AJT, ASC, AZM, BSR, BZX, AZJ, BAA.
BRS—1048, 1872, 1902, 2075, 981, 2156.

No. 5. Valve Design.

G2AF, G6JP.

No. 6. Auxiliary Apparatus.

G2—AF, IZ, ZC. 2AAV, ACA, AIH, AWG, BAA.

Unattached to any Section.

G2KT, G5HF, KU, TL. 2AAM, 2AHK.

Individual members are asked to report direct to the Manager of the Section concerned.

A CHANCE FOR THE AMATEUR

Amateur and professional radio engineers alike are interested in the development of the very high-frequency bands, but before extensive commercial application becomes possible a considerable amount of research and experimental work is necessary.

Members will be interested to learn that the Society has the opportunity of assisting in the correlation of information concerning the behaviour of frequencies above 30 Mc.

This has come about because Great Britain has undertaken to act as the Centralising Bureau for the collection of data on Question 4 left over from the C.C.I.R. meeting held two years ago in Lisbon. When the next C.C.I.R. meeting takes place in Bucharest a year hence, it is expected that much useful data will be available. A study of the particular question in which we are interested will show that it is one upon which the radio amateur can bring his knowledge and powers of observation to bear.

THE QUESTION.

What is the influence on the form of the waves and the field intensity of the following?—

(1) The special conditions of the installation of the transmitter and receiver.
(2) The ground (form and nature) over which propagation takes place.
(3) Distance.
(4) Direction.
(5) Atmospherics.
(6) Magnetic storms.
(7) Ionization.
(8) Direct and indirect propagation.
(9) Echoes.
(10) Zones of silence.
(11) Fading.

What is the influence of these different elements on daily, seasonal and annual variations, and even in variations which appear over a period of several years?

* * *

A brief study of the above should make it clear that most of the questions are problems which are at present being studied by our own Research and Experimental Section. All information bearing upon the question enumerated above will be collected by the R.E.S. Assistant Manager, who will be pleased to hear from anyone who is willing to help. He will also be glad to elucidate any points not quite clear. G6PA.

A SINGLE-VALVE TRI-TET TRANSMITTER FOR TELEPHONY OR C.W.

WITH the advent of a British R.F. Pentode, the " R.F.P. 362," the R.E.S. Transmitter Design section have concentrated on a transmitter for use on 3.5, 7, 14 and occasionally 28 Mc.

The circuit as shown in Fig. 1 is that originally given in *Q.S.T.* for April, 1935.

The transmitter was made up in an experimental form and tested with 3.5, 7 and 14 Mc. crystals :—

With the 3.5 Mc. crystal, outputs were obtained on 3.5 and 7 Mc.

With the 7 Mc. crystal, outputs were obtained on 7 and 14 Mc.

With the 14 Mc. crystal, outputs were obtained on 14 and 28 Mc.

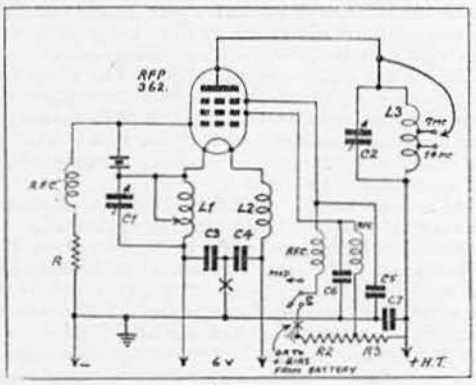


FIG. 1.
Circuit of a Single Valve Tri-Tet Transmitter.
C1. 350 μμf Receiving type.
C2. 100 μμf Transmitting type.
C3, 4. .005 μf. Mica.
C5, 6. .002 μf. Mica.
C7. .002 μf. High Voltage Mica.
R.F.C. R.F. Chokes.
R1. 20,000 ohms 2 watt.
R2. 10,000 ohms 50 watt or less.
R3. 20,000 ohms 50 watt or less.
S. S.P.D.T. switch.
L1. 10 turns 16 S.W.G. D.C.C. 2 in. diam. close wound, tap at five turns from lower end (filament input) for 7 Mc. and tap at eight turns from lower (filament input) end for 14 Mc.
L2. Same as L1 but wound directly under L1, e.g., L2 wound first and then L1 wound directly on top of L2.
L3. See text.

Except on 3.5 Mc., only the 2nd harmonic was used to any extent, because, as is well known, working the Tritet on the fundamental is apt to cause crystal fracture. However, as power type crystals are available, experiments were made, and operation on four bands with three crystals was obtained in a most satisfactory manner.

Fig. 2 is a plan view of the layout, but this need not necessarily be followed, and the set may be built in accordance with individual ideas. It does, however, give a transmitter with one valve with inputs up to 70 watts on full-rated voltages or from 10 watts upwards with reduced voltage.

Keying was effected in the centre-tap of the filament transformer, and with an efficient " click filter " no interference was noted. Another feature is the absolute minimum of parts required.

A transmitter of this type would appear to be useful for N.F.D. work, for with a machine capable of delivering 400 volts at 100 milliamps, the necessary 25 watts should be easily obtained while the filament consumption of 6 volts 2 amps. is well within the rating of a 6-volt car battery.

For 3.5, 7 and 14 Mc. working, the same inductance is used with a clip to short out turns not required, but for 28 Mc. work a copper inductance of three turns ¼-in. tubing 2 ins. in diameter would be more satisfactory.

The inductance used for 3.5, 7 and 14 Mc. was that used in a previous transmitter and made by *Q.C.C.* This consists of 30 turns 3 ins. diam. No. 14 S.W.G. tinned copper wire, spaced wire diameter, wound on an ebonite former, the taps being at 12 turns from the plate end of the coil for 7 Mc., and 20 turns for 14 Mc., the whole inductance being used for 3.5 Mc.

The method of aerial coupling cannot be laid down definitely as individual constructors have their own ideas on the subject, but as a suggestion an inductively coupled coil at the cold end of the plate tank is very satisfactory. An end-fed Hertz also worked well, tapped directly on to the plate tank at different points for the different bands being used.

Construction.

The transmitter is made up on a bottomless box 18 ins. long by 10 ins. wide and 1½ ins. deep, the top being covered with No. 24 gauge aluminium. The plate tank is mounted on two stand-off insulators, and both cathode-grid and plate tuning condensers are mounted on insulated supports with *Ormond* insulating couplings between the rotor shaft and panel, which is 16 S.W.G. aluminium.

At the left-hand end is a 16 S.W.G. aluminium screen which supports the valve holder; the plate terminal is supported by a stand-off insulator the same height as the screen.

To the left of this screen are mounted the cathode tank coils L1 and L2, the crystal holder and cathode tuning condenser. The suppressor terminal is brought through its choke and by-pass condenser to the mid-point of an S.P.D.T. switch which either puts the suppressor grid to earth at zero bias for

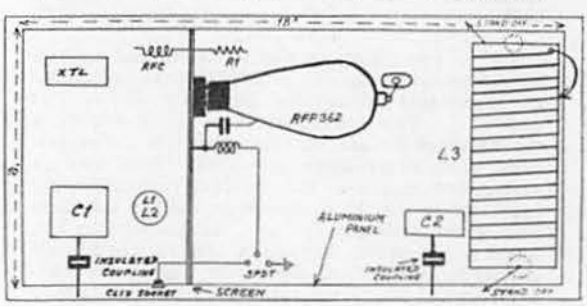


FIG. 2.
Suggested lay-out of a Single Valve Tri-Tet Transmitter using an R.F. Pentode.

C.W., or connects to a *Clix* insulated socket on the panel into which is inserted a plug to feed the output from the speech amplifier into the suppressor for telephony, so the change over from phone to C.W. can be made in an instant.

The cathode coils are wound on a piece of ebonite 2 ins. in diameter which is screwed to the baseboard through two ½-in. Meccano brackets attached to the bottom of the former by 6B.A. screws, thus holding it quite rigid. The tapping clip is a "crocodile" clip.

The grid choke and leak are mounted as shown in Fig. 2, while the screen choke, the by-pass condenser and the filament by-pass condensers are mounted on the underside of the box. All power leads are brought into the unit with a five-pin chassis mounting valve-holder, and the filament supply by a two-pin plug and socket.

The two condensers have 4-in. *Ormond* dials. There are only two major controls, and once the cathode tank has been adjusted for the band being used, the only other control is the plate tank tuning condenser.

It will be seen that a most efficient single-valve

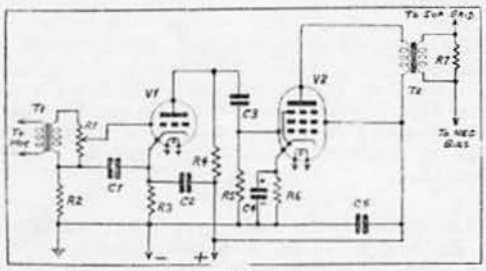


FIG. 3.
Circuit of suitable speech equipment for use with Single Valve Tri-Tet Transmitter.

T1. Microphone Transformer.
T2. 1/1 Output Transformer.
C1. .1 μF Tubular Condenser.
C2. 2 μF.
C3. .1 μF Tubular Condenser.
C4. 10 μF 50 volt Electrolytic Condenser.
C5. 2 μF.
R1. .5M. Potentiometer.
R2. 100,000 ohms 1 watt Resistor.
R3. 5,000 ohms 1 watt Resistor.
R4. 50,000 ohms 1 watt Resistor.
R5. .5M. Resistor.
R6. 400 ohms 2 watt.
R7. 10,000 ohms 2 watt.
V1. Indirectly heated Triode.
V2. Indirectly heated Pentode.

transmitter can be constructed at a reasonable cost.

Operation.

Before proceeding to the actual tuning up and adjustment, it should be pointed out that the value of screen grid voltage for the R.F.P. 362 is *most important*. The best method is by means of a fixed voltage divider, and values used in the experiment were 20,000 ohms. and 10,000 ohms. 50-watt rating, the supply to the different elements being as shown in Fig. 1. However, so long as the plate and screen voltages are kept in proportion, i.e., 1,000 volts plate, 400 volts screen, no trouble should be experienced with either high or low voltages, and of course the rating of the resistors may be decreased with the lower voltages.

The R.F.P. 362's seem to work equally well on either low or high power, for when using only 9 watts input on phone (two valves in push-pull), HB9AA and HB9BB were worked with QSA5 R7 reports.

For the initial tuning up on C.W. the following is the procedure :—

Starting with a 3.5 Mc. crystal, the whole of the plate inductance is put in circuit, and the cathode coil shorting clip is fixed to the lead from the condenser stator to the top of the coil, thus putting the whole of the cathode coil in circuit. The filament being switched on and the valve allowed to warm up, the H.T. to the plate and screen is switched on with the plate tank condenser half-meshed, the cathode condenser being at *full capacity*. This condenser is the first to be adjusted, and is reduced in capacity until the plate current falls appreciably, which is an indication that the crystal is oscillating. The cathode condenser is reduced further until the plate current again rises to a maximum. When this point is reached the plate tank condenser is at once adjusted until the plate tank resonates and the current value again falls to minimum, which value will vary according to the plate voltage being used.

For 7 Mc. operation the clip on the plate tank is adjusted to the 12th turn from the plate end, and the plate condenser varied until the resonance dip is again obtained ; but in this case it may *not* be quite as pronounced as when working on the fundamental of the crystal.

If a 7 or 14 Mc. crystal is used, the same procedure is adopted, with the exception that the cathode coil clips and plate tank are put on their correct taps ; the same method of tuning is adopted as described above. The output on 7 and 14 Mc. will not be quite as large with a 7 Mc. crystal. For 28 Mc. work the fundamental frequency on 14 Mc. should *not* be larger than is necessary to get resonance in the cathode circuit, owing to the thinness of such crystals. However, if the new 14 Mc. "thick-cut" crystals become available in England, this precaution should be unnecessary.

With regard to the taps on the plate inductance, while those given are correct for the inductance mentioned, experiment will be necessary for coils which may be constructed to a different specification.

It is possible to key in the suppressor grid circuit, but this is rather complicated, and the C.T. keying is the easier method.

Telephony.

The amount of modulator power required to suppressor grid modulate this transmitter is very small indeed, and a "362" ACME4c Pentode is quite satisfactory, or any other valve giving about 2½ to 3 watts output. Fig. 3 shows a suggested modulator unit, but whether or not a speech amplifier before the modulator valve is required rather depends upon whether a high or low output microphone is being used. The modulator shown is only a suggestion for use with a P.O. type microphone. A crystal or Reitz type would of course require a much higher gain. The carrier output obtained will, as with C.W., depend on the voltages being used.

R. E. S. is of the opinion that this transmitter will have great popularity either as a low or high-power set up to 50 watts, and is a valuable stand-by for any station which has a large permanent transmitter, or for quick band-changing in, say, the B.E.R.U. Contest.

THE PROPAGATION SECTION

Its Aims, Organisation and Methods

By J. C. Elmer (G2GD). *

THE Propagation Section of R.E.S. is the natural development of many different groups, first in C.B. and later in R.E.S.; such groups being the old "Fading" groups, "Atmosphere" groups, and the combined "Atmosphere and Fading" groups. As its title now implies, it is the section which deals with every aspect of radio from the moment when the signal leaves the source of origin, whether man-made or static, up to the arrival of the signal at the receiver. Some of the many subjects which come under the review of the section include the effects on the propagation of radio waves of sunspots, weather, magnetic disturbances, intervening terrain, the moon, atmospheric electricity, etc. The aims of the section, as indeed they are of all the sections, are therefore two-fold—the passing on to, and re-discovery by, beginners of knowledge already known, as represented by the experimental side of the section; and the acquisition of new knowledge by research.

Organisation.

To accomplish this purpose, the section is divided into "Conditions," 28 Mc. and 56 Mc. groups. There is also a group of members common to both this section and the Aerials Section. Each branch of groups is under the charge of a Group Manager, who subdivides the members into groups of six under the care of a Group Centre. There is also a G.M. for contemporary literature, whose duties are to keep the section *au fait* with all developments in other related spheres of activity. Moreover, there are a number of individual members within the section, who are carrying out experiments by themselves, but pool their knowledge into the common "stock pot" of the section.

Methods.

Before describing the work of the section in detail, it might be well to review briefly the method by which the knowledge is circulated among members. Each member of a group has his allotted job to do, by recording the strength of signals heard from day to day, together with any other phenomena he has noticed. These records are sent monthly to the group centre concerned, who reports in due course to his group manager, and later to his section manager. Further, these reports circulate by a system of "Letter Budgets," in such a way that there is a continual flow of knowledge both up and down the line between the latest-joined member and the section manager.

The "Conditions" Groups.

These groups have undertaken a very ambitious task of compiling a daily, and, as much as possible, hourly record of radio "conditions" and other natural phenomena. For this purpose, the group is divided into five sub-groups. Members all contribute to the record of radio conditions by returning monthly their log of stations heard or worked. In addition to this, Group A contributes information of weather, both general and local; "B" contributes figures relating to the change of barometric pressure along the path of the wave. This change is known as Atmospheric Pressure Gradient, and for convenience is expressed in millibars per 100 miles, a + sign indicating a rise of pressure along the direction of propagation and a — sign indicating a fall. Group "C" contributes information concerning thunderstorms, magnetic storms and atmospheric electricity. "D" contributes data relating to the moon. It is hoped that an article will shortly appear on the work of this group, but in the meantime the author would like to stress the point that the phase of the moon alone has little or no effect on radio conditions. The group is more concentrating on its position in the sky. But more about this in the future. Group "E" contributes all the official information on sunspot activity. It is hoped that by study of this combined "Conditions Log," information of value as to the propagation of waves will emerge.

The 28 Mc. and 56 Mc. Groups.

As their titles imply, these are groups which are specialising in the particular frequency concerned. They are collecting material on their side, and receiving information from the "Conditions" groups, via the medium of the Group Managers' Letter Budget; thereby is their work co-ordinated with that of others operating in different bands.

There is a great deal of important work waiting to be done on the subject of 56 Mc. propagation. Members will probably be taking up 56 Mc. work with renewed enthusiasm once the winter is over, and all are most cordially invited to carry out research on the lines mentioned in the article entitled "A Chance for the Amateur."

Joint Aerial and Propagation Group.

In a future issue we shall publish an article dealing with experiments conducted by the Aerials Section last autumn. It is hoped that the group will continue this work and endeavour to answer various problems which arise from it.

Codes.

In order to facilitate the work of the section, especially the "Conditions" groups, various codes have been developed on the principle of the Meteorological Office codes as used in their synoptic reports. It is not suggested that they should be taken into general use for reporting over the air, though there is no reason why those who wish should not do so. But this article would not be complete without them, so they are given below.

"*Conditions Code.*" This merely consists of the five abbreviations: VP, Very Poor; P, Poor; F, Fair; G, Good; VG, Very Good.

It should be pointed out that "conditions" must be specified as either "Local conditions" or "DX conditions."

A.P.G. Code.—The Atmospheric Pressure Gradient has already been explained. As an example,

* Manager R.E.S. Propagation Section.

APG=N+2.4, means that the APG from the north towards a station more south is rising by 2.4 millibars per hundred miles.

Fading Code.

0.—Steady.
1.—Mostly steady, occasional fading.
2.—Slow slight.
3.—Rapid slight.
4.—Slow moderately deep.
5.—Rapid moderately deep.
6.—Slow very deep.
7.—Rapid very deep.
8.—Hollow echo.
9.—Shimmering.
+=fading increases from normal.
—=fading decreases from normal.

Example: DX, G5— means "DX conditions are good, with fading rapid and moderately deep, reducing signal."

If used over the air, this example might be given:—CONDS DX G QSB 5 minus.

Atmospherics Code.

0.—Nil.
1.—Very slight mush.
2.—Continuous mush.
3.—Very strong continuous mush.
4.—Quiet with soft intermittent cracks as of distant lightning.
5.—Quiet with loud intermittent cracks as of near lightning.
6.—Soft continuous atmospheric with soft intermittent cracks.
7.—Moderate continuous atmospheric with strong intermittent cracks.
8.—Very loud continuous atmospheric as with near summer thunderstorm.
9.—Loud continuous crackles as from charged rain on the aerial.

It is the hope of the author that this article will stimulate the spirit of research, for there is much still to be done, but, above all, he asks those who have knowledge or experience of the subject work of the section to come forward and offer help to the Propagation Section Manager. He will always undertake to acknowledge such letters, which will subsequently be circulated in the Group Managers' Letter Budget.

Bright Ideas.

Mr. Holden (VO1H) finds that ordinary glass-covered push-pins as used for hanging pictures are very useful for insulating indoor aerials. An aerial can be practically concealed and still have good insulating properties. Mr. Holden has erected a 14 Mc. doublet using coloured twisted lamp flex which harmonises with the walls of his radio room.

Southend Society Affiliation

We are pleased to announce that the Southend and District Radio and Scientific Society have been granted affiliation with the R.S.G.B.

The Secretary (Mr. F. S. Adams) will be glad to hear from R.S.G.B. members living in the Southend district, with a view to inviting them to attend meetings of the local Society. His address is "Chippenham," Eastern Avenue, Southend-on-Sea.

AMATEUR RADIO IN THE DRAWING ROOM

IN these days of maisonettes, service flats, etc. where one has to preserve the amenities and yet contrive to maintain an efficient station in company with the grand piano, it is necessary that the gear be both neat and compact.

The writer laboured under these difficulties and also thought it would be a good idea to be in the warmth of the living room and yet cause no caustic comments from the "Powers that be"! The piece of furniture, seen in the photograph, was the result.

The transmitter is in the top shelf, with its aerial clipped on to the plate coil when the lid is open. The receiver compartment has accommodation at the sides for pads, coils, etc., and the key is screwed to the desk lid. At the bottom the transmitter supply units are housed, and above are the master switchboard, frequency meter, receiver mains unit and accumulator. The back, of ¼-in. plywood, is removable in one piece for easy access.

The dimensions are as follows: height 4 ft. 6 ins., breadth 2 ft. 8 ins., depth 16 ins., and the desk lid height 2 ft. 4 ins. Lighting of the transmitter and receiver is by "Striplite," the bottom cupboards using 15-watt sign lamps. Separate fuses are fitted for power and lighting and cab-tyre flex is taken through the back for connection to the nearest wall socket, so that to get going "Plug in—that's all."

G6MS.

NEWS AND VIEWS FROM 53.

London Meetings.

At the next London meeting, to be held at the Institution of Electrical Engineers on Friday, February 21, Mr. Clark, of The Mullard Valve Co., will lecture on "H.F. Pentodes and Modern Transmitting Valves." At the March meeting, to be held on Wednesday, March 25, Mr. P. G. A. Voigt will give a lecture and demonstration in the Main Lecture Theatre on "Sound Reproduction." Both meetings will commence at 6.15 p.m. and tea will be served from 5.30 p.m.

Our New Vice-President.

The name of Colonel Dennis and his call sign, E12B, are known throughout the world of amateur radio, and we feel sure that we shall be expressing the wishes of his many friends when we extend to him our heartiest congratulations upon his election as a Vice-President of the R.S.G.B. For more years than we care to remember, Colonel Dennis has acted as our official Irish Free State Representative, but long before he took office he was in close touch with the Headquarters executive, giving advice and offering many suggestions of practical value.

Colonel Dennis has the distinction of being the senior radio amateur in the British Isles, his first station being constructed in 1898. Many of our members will remember having seen a photograph or lantern slide of this pioneer station.

Colonel Dennis recently decided to relinquish his position as our I.F.S. Representative, and to mark their appreciation of his past services, Council elected him a Vice-President.

Good luck and good health, E12B!

Sectional Committees, 1936.

The following members have been appointed by Council to serve on Sectional Committees for the current year:—

Technical Committee.

Messrs. A. D. Gay (G6NF) (Chairman), F. Charman (G6CJ), H. A. M. Clark (G6OT), D. N. Corfield (G5CD), E. A. Dedman (G2NH), R. W. Newton (G5NQ), H. C. Page (G6PA).

Editorial Committee.

Messrs. H. Bevan Swift (G2TI) (Hon. Editor), F. Charman (G6CJ), and A. O. Milne (G2MI).

QSL Committee.

Messrs. J. D. Chisholm (G2CX) (Manager), E. A. Dedman (G2NH), J. B. Kershaw (G2WV) and D. A. Weale (G6DZ).

Tests and Awards Committee.

Messrs. T. A. St. Johnston (G6UT) (Chairman), L. C. Greenaway (G2LC) and A. O. Milne (G2MI).

The following individual appointments were approved:—

QRA Manager: Mr. M. Williams (G6PP).
Calibration Manager: Mr. A. D. Gay (G6NF).
R.E.S. Manager: Mr. H. C. Page (G6PA).
Assistant R.E.S. Manager: Mr. J. C. Elmer (G2GD).
Commercial Checks Organiser: Mr. A. O. Milne (G2MI).
Band Occupancy & Checks Organiser: Mr. L. Hill (G5WI).
Band Monitoring Supervisor: Mr. A. D. Gay (G6NF).

Provincial District Meetings.

Due to a clerical error the dates for these meetings as published in the BULLETIN last October were incorrect.

A revised list follows:—

Date.	Venue.	Districts.
March 22	York	2 & 18
April 26	Newport	5 & 10
May 24	Nottingham	3 & 4
June 28	Cambridge	8, 9, 12 & 14
October 11	Liverpool	1 & 11

It is hoped to arrange Conventionettes in Districts 6, 7, 13, 15, 16 and 17.

Town Representatives, 1936

DISTRICT 1.	
Blackpool	A. Adams (G5AD).
Rochdale	T. A. Whiteley (G6QA).
DISTRICT 3.	
Burton-on-Trent	A. E. Dyson (G6NJ).
Coventry	L. W. Gardner (G5GR).
Oswestry & District	N. E. Read (G6US).
Stoke and District	A. H. Wilson (G2WN).
Warwick and Leamington	A. W. Field (BRS1554).
DISTRICT 5.	
Swindon	E. W. Mortimer (BRS1804).
DISTRICT 16.	
Brighton and Hove	J. Dickson (G2HV).
Bromley and District	S. Pollard (G2GB).
SCOTLAND "A" DISTRICT.	
Stirling	W. B. Stirling (G6RV).

It will be noted that Mr. Whiteley is the T.R. for Rochdale and not Mr. Clare (G6AX) as stated last month.

Headquarters—Office Hours.

Members are reminded that the normal hours of business in operation at headquarters are as follows:—

Mondays to Fridays: 9.30 a.m. to 5.30 p.m.
Saturdays: 9.30 a.m. to 12 noon.

It would be very much appreciated by the Council if members who desire to meet the Secretary would make an appointment whenever possible or call after 4 p.m.

For Disposal.

Headquarters have for disposal 18 bound volumes of *Wireless World* from Vol. 10, April, 1922, to Vol. 27, December, 1930. Best offer received by February 29 will secure.

We have also a number of back issues of *QST* for disposal commencing with Vol. 9 (1925). These will be cleared at 6d. per copy post free. A full list of issues available follows:—

1925,	Vol.	9,	Nos. 1, 7, 8, 9, 11, 12.
1926,	,,	10,	,, 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.
1927,	,,	11,	,, 1 to 12.
1928,	,,	12,	,, 3, 4, 5, 6, 7, 9, 10, 11, 12.
1929,	,,	13,	,, 1 to 12.
1930,	,,	14,	,, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11.
1933,	,,	17,	,, 1.
1934,	,,	18,	,, 5, 6, 6, 7, 7, 8, 9, 10, 12.
1935,	,,	19,	,, 1, 2, 3, 4, 5, 6, 7.

Licence Facilities.

The attention of all home members is drawn to the following points :—

1. All applications made to the Society for increased power or for the use of the 3.5 Mc. band must be based upon technical grounds.

2. Such applications must be forwarded to headquarters via a member's District representative, who is required to comment on the application. D.R.'s have no authority to reject an application.

3. All applicants for increased power must give a guarantee in writing that they will use crystal control or some other form of frequency stabilisation during high power tests.

4. No application for high power facilities can be considered (except under special circumstances) until a member has been licensed for 12 months. The exception to this condition applies in the case of those members who desire to be recommended for a 25 watt permit. In these cases a recommendation will be considered after a period of six months has elapsed.

5. Members desirous of applying for extra power are advised to study the statement published in pages 97, 97 and 99 of the September, 1934, BULLETIN.

6. The Council of the Society cannot recommend members for the use of frequency bands other than 3.5 Mc. Applications for permission to use the other bands must be made direct to the G.P.O.

7. The Council of the Society cannot undertake to obtain portable facilities for members except for National Field Day.

8. Authority to use aerials longer than 100 feet must be obtained direct from the G.P.O. Such applications must be based on technical grounds.

9. The charge for a high power licence is £2 per year plus an initial licensing fee of 10s. payable when each increase is granted. These charges apply to all licences above ten watts.

A careful perusal of the points enumerated above will prevent disappointment and assist headquarters.

W.B.E. Claims.

Although frequent reference has been made in recent issues to the fact that a set of rules govern the issuance of W.B.E. Certificates, we continue to receive numerous claims from members which do not satisfy the conditions laid down in the rules.

Members desiring to make a claim are requested to study the rules which appeared on page 368 of the May, 1934, issue of this Journal. Special attention is drawn to the rule which requires a member to give a guarantee that his licensed power was not exceeded in making the contacts upon which the claim is based. A minimum report of QSA 3 is also necessary before a card can be accepted.

Overseas members are again reminded that they can forward their cards to their B.E.R.U. representative for approval, the latter will then send a certification to headquarters and the certificate will be dispatched without delay.

Holders of these certificates are advised to add the letters (C.H.) when mentioning on correspondence that they have obtained a W.B.E. Numerous instances have occurred of non-members claiming to be authorised to use the letters "W.B.E." The term W.B.E. (C.H.) will serve to indicate that the member concerned is legitimately entitled to claim that he has been awarded the certificate.

Sales Department Notice.

Certain readers of this journal seem to have the happy knack of misreading statements made herein. Last December, when referring to the price of the new A.R.R.L. Handbook, we stated that a reduction of sixpence from the quoted price would be made when copies are purchased *direct* from headquarters. We imagined that everyone would read into that remark that as personal collection was made no postal charges would be incurred. One or two members have written in for handbooks sending a P.O. for 4s. 6d. under the illusion that "direct" meant "by post!"

To prevent any further confusion we repeat that if Call Books or Hand Books are obtained direct (i.e., personal collection) from 53, Victoria Street, the normal selling prices will be reduced by sixpence.

Due to an unprecedented rush for the new A.R.R.L. Handbook, we were unable to meet all orders sent in during the early part of January. A fresh consignment has now been received and delivery can be effected from stock.

New B.E.R.U. Representatives.

Acting on a recommendation from our retiring Representative; Captain George Noblett, M.C., of station EI9D, has been appointed B.E.R.U. Representative for the Irish Free State. Captain Noblett was present at our Convention last August, and during his visit many useful discussions took place between himself and members of Headquarters staff.

The I.R.T.S., through their Secretary, Mr. Sadlier, have informed us that they agree to Captain Noblett's appointment; for our part we desire to thank EI9D for agreeing to act on our behalf.

* * *

Mr. Emary, VS6AX, has informed us that in consequence of his impending return to England, it has been necessary to appoint a new B.E.R.U. representative for Hong Kong. Mr. George Merriman, VS6AH, the President of H.A.R.T.S., has been nominated, and has accepted this position. Mr. Barlow, VS6BD, is the new E.L.S. in place of Mr. Conway, VS6AQ, who has resigned.

QSL Section

Manager: J. D. CHISHOLM (G2CX).

Those who have been members for several years must be tired of the monotonous exhortations which appear in these notes from time to time and doubtless put the QSL Manager down as a very cantankerous fellow.

To such as these we ask for indulgence, as our remarks are not primarily intended for them. With a growing Society such as ours there are always recruits coming into the ranks, and it is with a view to making them familiar with the working of the Bureau that we seem to repeat ourselves so regularly.

The particular burden on the managerial mind this month is the question of the size of QSL cards.

Periodically a fashion seems to spring up for cards of fantastic dimensions and, happily for the Section, this craze usually dies out fairly quickly, but while it lasts it is a source of great discomfort. The offenders soon find that their posters are so crumpled and folded by the time they have been through two QSL agencies that they are unworthy of any wall.

Examples from our post this month will show to what lengths, literally, some will go. One card measuring 12½ by 5 inches and another 10 by 8¼ inches (bigger than this page) were received. The size of any ordinary postcard is 5½ by 3½ inches.

Calibration Section

Manager: A. D. Gay (G6NF).

We are reproducing herewith a copy of our Calibration Certificate for crystals which is issued to members. There are several points about these certificates which we should like to make clear to those who have, or propose to make use of this Section.

The most important point concerns the accuracy with which the crystals are calibrated. The

RADIO SOCIETY OF G E R U GREAT BRITAIN

CALIBRATION SECTION.

49, Thornlaw Road, West Norwood, London, S.E. 27.

Telephone: Streatham 2154.

Calibration Manager: A. D. GAY.
Standard Frequency Station G 6 N F.

Feb. 1, 1936.

Dear Sir,

The frequency of the 3.5 Mc. nominal crystal has been found to be 3589.0 kc within 0.1% under the following calibration conditions.

Valve	-	DE5B
Fil. Volts	-	5.5
H.T. Volts	-	200
Grid Leak	-	1 meg.
Holder	-	Q. C. Co. Type A.
Circuit	-	Grid to filament.
Coil	-	Igranic 9 turn.
Capacity	-	100 $\mu\mu$F.
Temperature	-	15°C.

Yours faithfully, A. D. GAY,

Calibration Section Manager.

certificate states 0.1 per cent. and this figure represents the *maximum* divergence from the frequency given on the certificate expected under different conditions from those printed on the certificate. This does not include the use of air-gap holders or any form of regeneration on the crystal, but simply the effect produced by changing the type of oscillator valve, say from an LS5B to a 59 Pentode or varying the LC ratio. Increasing the H.T. voltage will slightly affect the frequency of a crystal, so that all these values must be recorded and reproduced again if the crystal is to be used as a frequency standard.

The effect of temperature on crystals is too well-known to need further discussion and may be disregarded for ordinary purposes with the AT-cut, but frequency creep with Y-cut crystals when used in transmitters is still a serious problem to those using crystal-gate receivers, as the station receiving such a transmission through QRM will find that the crystal-gate is of little use with the beat note continually altering and gradually coming into phase with the signal it is desirable to eliminate.

It can be taken for granted that if the crystal is used under the identical conditions printed on the certificate; its frequency may be relied upon to within 0.01 per cent., as our measurements are made within one hundred cycles of those stated conditions. This only applies to crystals with true parallel faces such as our advertisers supply, as unevenness in the faces of a crystal will, with movement of the top-plate, at times produce a change in frequency amounting to 0.03 per cent.

QRA Section

Manager: M. Williams (G6PP).

NEW QRA's

G2CP.—H. P. Wiggins, 1, Tindall Street, Scarborough, Yorks.
G2FG.—L. McMichael, "Everest," Ashley Lane, London, N.W.4.
G2FV.—W. Scott Hay, 54, St. Benet's Road, Prittlewell, Essex.
G2IT.—E. P. Brown, Chinthurst, Shinfield Green, Reading, Berks.
G2LK.—S. H. Leech, 54, Hawthorn Road, Gatley, Cheshire.
G2OK.—E. A. C. Jones, 62, Lincoln Road, London, N.2.
G2RS.—H. D. Bramwell, 53, Druid Cross Gardens, Liverpool, 18.
G2SO.—M. Geddes, 44, Lindisfarne Avenue, Leigh-on-Sea, Essex.
G2SV.—L. V. Bridge, "Garton," Somerset Avenue, Westcliff-on-Sea, Essex.
G2UU.—A. D. Lamb, 29, George Street, Stranraer, Wigtown, Scotland.
G2XM.—R. H. Davies, 8, Tysiaf Road, Pentre, Rhondda, S. Wales.
G5FK.—F. W. Cable, 10, Mansel Street, Swansea, Glam.
G5IJ.—I. J. P. James, 61, Cecil Road, Chadwell Heath, Romford, Essex.
G5IQ.—R. F. Speake, "Strathcona," Merridale Road, Wolverhampton.
G5IU.—M. W. Chitty, Lawrence House, Alma Road, Windsor, Berks.
G5JD.—J. Dalton, 33, Kempton Road, Anlaby Road, Hull, Yorks.
G5NP.—Lt. E. C. Baildon, 69, Southlands Road, Weymouth, Dorset.
G5OB.—G. H. Johns, 11, Radway Road, Southampton.
G5ST.—Dr. R. R. Morrison, Barmufflock, Bridge of Weir, Renfrew, Scotland.
G5TU.—J. C. H. Tucker, Brentwood, Solihull, Warwickshire.
G5WG.—G. F. Wakefield, 67, Southwark Park Road, London, S.E.16.
G5XA.—H. Ranson, 313, High Road, Wood Green, London, N.22.
G5XY.—J. Davis, 95, High Street, Hampton Hill, Hampton, Middlesex.
G5ZB.—H. Beardwood, 105, Cemetery Road, Heckmondwike, Yorks.
G6AO.—Dewsbury Short-wave Society (Sec., E. Spencer), G6SP), Queensway Chambers, Northgate, Dewsbury, Yorks.
G6BT.—C. A. Jamblin, 71, Clarence Road, Kings Heath, Birmingham.
G6DC.—L. T. Eden, 131, Addison Road, Coventry, Warwickshire.
G6FQ.—W. O. Wright, 341, Beverly Road, Hull, Yorks.
G6GX.—C. Reynolds, 28, The Crescent, Fallowfield, Manchester, 14.
G6HL.—I. E. Hill, 101 (B) Squadron, R.A.F., Bicester, Oxon. (Station at Market Square, Bicester.)
G6HY.—R. Healey, 37, Broomhill Road, Bulwell, Notts.
G6JD.—J. B. Duncan, 379, Mosspark Drive, Mosspark, Glasgow, S.W.2.
G6KR.—E. R. Westlake, "Ardlui," Wenlock Road, Shrewsbury, Salop.
G6NL.—C. R. Thomas, 77, Nicolas Road, Chorlton-cum-Hardy, Manchester.
G6SP.—E. Spencer, 18, Fairfield Terrace, Old Bank Road, Earlsheaton, Dewsbury.
GI6XS.—W. Sullivan, "Gillhall," Croomsport Road, Bangor, Ulster, N. Ireland.

G6ZO.—J. M. Kirk, 205, Gt. Northway, London, N.W.4.
2ADJ.—D. H. Jones, 14a, Fore Street, Northam, N. Devon.
2AFU.—E. H. Pawson, c/o Mrs. Elwood, 11, Market Place, Brigg, Lincs.
2AGM.—G. M. Reston, Woodlands, Airdrie, Scotland.
2AHW.—J. H. Worrall, 37, Margravine Gardens, London, W.6.
2APC.—H. Percy, "Lynhurst," Blackwell Avenue, Newcastle-on-Tyne, 6.
2APX.—J. W. B. Evans, The Apiary, Conway, N. Wales.
2AXA.—D. J. Macdonald, "Aberturret," Hiltonbank Street, Hamilton, Lanark.
2AYX.—W. B. Green, 26, Allendale Road, Barnsley, Yorks.
2AZI.—J. M. Lowden, Ballywooley House, Crawfordsburn, Co. Down, N. Ireland.
2BDB.—The Deptford Men's Institute Wireless Club (G. Edwards (G2UX), Op.), Clyde Street, Deptford, London, S.E.8.
2BFW.—T. E. Wilkie, "Rosegarth," Mython Road, Lytham St. Anns, Lancs.
2BGN.—G. B. Neale, 18, Vainor Road, Sheffield, 6, Yorks.
2BHO.—H. Benson, Church Lane, Prestwich, Lancs.
2BJN.—R. Jennings, "Jenmour," Westmeads Road, Whitstable, Kent.
2BMV.—D. F. Waddington, 398, Filton Avenue, Horfield, Bristol, 7.
2BNV.—N. E. Baker, 112, Gloucester Road, Cheltenham, Glos.
2BOW.—W. W. Burrowes, 153, Sandgate Road, Folkestone, Kent.
2BPB.—C. J. Penberthy, "Whitecross," Ludgvan, Longrock, Cornwall.
2BQF.—C. E. Williams, Hortham Cottage, Almondsbury, Glos.
2BSO.—R. C. Bishop, 32, Craig Street, Rosyth, Scotland.
2BVF.—W. Beattie, 35, Huntley Street, Aberdeen, Scotland.
2BWV.—E. R. Ward, 54, Bentley Street, Cleethorpes, Lincs.
2BXG.—M. C. Bunting, 40, Clarendon Square, Leamington Spa, Warwickshire.

The following are cancelled:—2AHU, 2AIF, 2AJG, 2AKA, 2ALF, 2ARP, 2ATX, 2AWZ, 2AXI, 2BLK, 2BOC, 2BUO, 2BVA, 2BWG.

NEW MEMBERS.

HOME CORPORATES.

E. P. Brown (G2IT), "Chinthurst," Shinfield Green, Reading, Berks.
C. J. Rockall (G2ZV), "Aubretia," Seafield Road, Rustington, Sussex.
C. R. Pill (G5CX), 16, Saint Ann's Green, Leeds 4, Yorks.
R. Stokes (G5NZ), 156, Broomfield Road, Coventry, Warwicks.
L. T. Eden (G6DC), 131, Addison Road, Coventry, Warwicks.
J. A. W. Bate (G6WB), Lyneal Lodge, Ellesmere, Shropshire.
H. C. Douse (G6ZI), 33, Myddelton Square, London, E.C.1.
A. W. Wright (2AIW), Sonning Dairy, Sonning, Berks.
A. Reid (2ARR), 27, Great Western Road, Aberdeen, Scotland.
T. W. Carney (2AZV), 3, Cooper Lane, Aigburth, Liverpool, 19.
J. Taylor (2BJT), "Hollinwood," Ridge End, Marple, Cheshire.
Dr. B. G. Thompson (ZL1BG), at 11, Stanfield Road, Bournemouth.
E. J. Greenwood (BRS2198), 23, Raymond Street, Chester.
H. B. Jefferies (BRS2199), 91, Crofthill Road, Glasgow, S.4, Scotland.
A. C. Weatherston (BRS2200), Thistle Cottage, Walkerburn, Scotland.
J. Hall (BRS2201), 201, Back Hilton Road, Aberdeen, Scotland.
C. Jones (BRS2202), 43, Westbrooke Road, Welling, Kent.
E. J. Robertson (BRS2203), "Viewfield," Milltimber, Aberdeenshire.
J. A. Atkins (BRS2204), 22, Pitt Street, Glasgow, C.2, Scotland.
A. Anderson (BRS2205), 45, Shawburn Road, Selkirk, Scotland.
R. D. Tucker (BRS2206), Shoulders, Wivelsfield Green, Haywards Heath, Sussex.
G. Oxton (BRS2207), 9, Rosedale Road, Tranmere, Birkenhead, Cheshire.
Dr. E. S. G. K. Vance (BRS2208), "Sunrise," 76, Sutton Road, Huthwaite, near Mansfield, Notts.
J. Aikman (BRS2209), 66, Ormonde Avenue, Muirend, Glasgow, S.4, Scotland.
J. Russell (BRS2210), 7, Church Place, Redding, Falkirk, Scotland.
J. R. Slatter (BRS2211), 83, Groundwell Road, Swindon, Wilts.
P. Bevan (BRS2212), "Kandahar," Broadway, Sketty, Swansea.
F. H. Wright (BRS2213), 214, Battersea Bridge Road, London, S.W.11.
W. S. Bagley (BRS2214), 17, Hubert Road, Clacton-on-Sea, Essex.
W. J. Hussey (BRS2215), 147, Kenmare Road, Knowle, West Bristol, 4.
G. E. Hobson (BRS2216), Wrea Cottage, Wrea Lane, Scarborough, Yorkshire.
A. E. Ford (BRS2217), 13, Hood Street, Morpeth, Northumberland.
B. F. Hutton (BRS2218), 91, Topsham Road, Upper Tooting, S.W.17.
G. W. Wotherspoon (BRS2219), 55, Culzeam Crescent, Kilmarnock, Ayrshire, Scotland.
Mrs. C. H. Myler (BRS2220), Knowle, near Braunton, N. Devon.
D. W. Greenwood (BRS2221), 42, Carr Road, Nelson, Lancs.
T. Shanks (BRS2222), Great Norman Street Farm, Ide Hill, Sevenoaks, Kent.
R. Logan (BRS2223), Croft Lodge, Beckermet, Cumberland.
C. H. C. Stinchcombe (BRS2224), Herward, Yatton, near Bristol.
R. Gilbert (BRS2225), 31, Monmouth Road, Bristol, 7.
N. W. West (BRS2226), "Rostrevor," St. Clement's Hill, Norwich.
D. J. Darnton (BRS2227), "Olrig," Tinshill Lane, Cookridge, near Leeds, Yorks.
R. J. Ager (BRS2228), 34, Parkhurst Road, Holloway, N.7.
J. T. Sawyer (BRS2229), 40, College Avenue, Gillingham, Kent.
E. V. Neal (BRS2230), 55, Angus Street, New Cross, London, S.E.14.
R. J. Grimshaw (BRS2231), 193, Donegall Road, Belfast, N. Ireland.
C. W. Matheson (BRS2232), 969, Hedon Road, Hull, Yorks.
A. K. Cardwell (BRS2233), "Christleton," Meliden Road, Prestatyn, N. Wales.
W. E. Bell (BRS2234), 10, Bernard Road, Gorleston-on-Sea, Norfolk.
T. V. McDonald (BRS2235), 79, Loopland Park, Castlereagh, Belfast, N. Ireland.
F. H. Watts (BRS2236), "Brenta," 73, Leckhampton Road, Cheltenham, Glos.
L. F. Woodhams (BRS2237), 90, Railway Terrace, Rugby, Warwickshire.
J. J. Henney (BRS2238), 48, St. Mary's Street, Kirkcudbright, Scotland.
G. A. W. Tibbits (BRS2239), 6, Cactus Walk, Shepherds Bush, W.12.
G. B. Lloyd (BRS2240), 45, Romney Road, Willesborough, near Ashford, Kent.
R. H. Newham (BRS2241), "Trofts," Byworth, Petworth, Sussex.
C. A. J. Plant (BRS2242), 9, Hilton Road, Harpfields, Stoke-on-Trent, Staffs.
W. R. Felts (BRS2243), Donington Radio Supplies, Donington, near Spalding, Lincs.
H. de L. Banting (BRS2244), 39, Lime Grove, Shepherds Bush, W.12.
S. C. Radcliffe (BRS2245), "Revelstoke," Bovey Tracey, Devon.
G. L. Benbow (BRS2246), "The Hollies," Market Street, Ruzeley, Staffs.
J. Twatt (BRS2247), c/o Moss, 15, St. Quintin Avenue, London, W.10.
J. Reid (BRS2248), 5, Holmfield Avenue, South Shields, Co. Durham.
R. A. Napper (BRS2249), White Lion Inn, Blagdon Hill, Taunton.
M. Evans (BRS2250), "Homeleigh," Portsmouth Road, Ripley, Woking, Surrey.
P. W. Gaze (BRS2251), St. Mary's, Teingrace, near Newton Abbot, S. Devon.
J. H. Phillips (BRS2252), "Villandrucia," Stithians, Perranwell Station, Cornwall.
D. I. Morgan (BRS2253), Chapel House, Aberffrwd, Capel-Bangor, near Aberystwyth, Wales.
F. S. Southwick (BRS2254), 6, Brentwood Villas, Flemingate, Beverley, E. Yorks.
P. E. M. Leggat (BRS2255), 16, Fothringham Road, Ayr, Scotland.
E. Rice (BRS2256), "Penlan," Skewan, Neath, Glam.
J. C. Gallagher (BRS2257), 69, Atlantic Avenue, Antrim Road, Belfast, N. Ireland.
H. D. Donaldson (BRS2258), 15, Sharphill Road, Saltcoats, Ayrshire, Scotland.

DOMINION AND FOREIGN.

K. Nagase (J2LB), 1848, Kichijoji, Musashino-machi, Tokyo, Japan.
C. H. Grattan (LU9BV), Montevideo 1680, Buenos Aires, Argentine Republic.
A. C. Embrechts (ON4AC), 18, Wapenhaghe, Berchem-Antwerp.
P. Girard (SU1PG), Sugar Factory, Kom Ombo, Upper Egypt.
R. D. Causse (W3EVW), P.O. Box 6688, Lester, Penna, U.S.A.
G. Srirangachary, B.E. (BERS334), Assistant Engineer, District Board, Vizagapatam, South India.
M. P. Noble (BERS335), 10, Lawley Road, Bulawayo, S. Rhodesia.
T. Kyle (BERS336), P.O., St. Michaels-on-Sea, So. Coast, Natal, South Africa.
R. W. Paterson (BERS337), 24, Azalea Street, Prospect, South Australia.
Staff-Sergt. Pritchard (BERS338), Sergeants' Mess, 13/18th Hussars, Sialkot, India.
A. J. Karklin (FRS39), 2, Lenca, dz 8, Riga, Latvia.

Stray.

Mr. S. G. Button (G6KL) has recently constructed a new 14 and 28 Mc. transmitter and is anxious to receive reports on his transmissions.

R.S.G.B. Slow Morse Practices

A list containing dates, times and frequencies of the stations sending slow morse for the benefit of those members wishing to learn or improve their code will be found below. As usual, test matter will be taken from recent issues of the T. & R. BULLETIN. The page number and month of issue will be given at the end of each test—by telephony. It is emphasised that reports will be appreciated and are desired in order to ascertain range of transmission and numbers using the service. If, however, replies are desired, stamps should be sent. The sending stations are complaining that reports are few and far between; an appeal is therefore made to those members utilising the service to report periodically in order to encourage those who are giving up valuable time for their benefit. Stations willing to assist, particularly from those districts without a service, are invited to communicate with Mr. T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4 (Telephone: Silverthorn 2285). A new station (G5JL, Mr. J. J. Maling, 15, Windsor Gardens, Hayes, Middlesex) commences a service, as shown in the schedule below.

SCHEDULE OF SLOW MORSE TRANSMISSIONS.

Date, 1936.		G.M.T.	Kcs.	Station.
Feb. 20	Thursday	2300	1990	G6AU
,, 23	Sunday	0000	1769	G5GC
,, 23	,,	0900	1860	G6QM
,, 23	,,	0930	1785	G5BK
,, 23	,,	1100	7233	G5JL
,, 23	,,	1115	1810	G6GC
,, 27	Thursday	2300	1990	G6AU
Mar. 1	Sunday	0000	1769	G5GC
,, 1	,,	0900	1860	G6QM
,, 1	,,	0930	1785	G5BK
,, 1	,,	1100	7233	G5JL
,, 1	,,	1115	1810	G6GC
,, 5	Thursday	2300	1990	G6AU
,, 8	Sunday	0000	1769	G5GC
,, 8	,,	0900	1860	G6QM
,, 8	,,	0930	1785	G5BK
,, 8	,,	1100	7233	G5JL
,, 8	,,	1115	1810	G6GC
,, 12	Thursday	2300	1990	G6AU
,, 15	Sunday	0000	1769	G5GC
,, 15	,,	0900	1860	G6QM
,, 15	,,	0930	1785	G5BK
,, 15	,,	1100	7233	G5JL
,, 15	,,	1115	1810	G6GC
,, 19	Thursday	2300	1990	G6AU

TRADE NOTICES.

Ferranti, Ltd., have sent us a copy of their new pamphlets describing the various all-wave receivers they are now producing. These range in type from a 9½-guinea 3-valve A.C. consolette to a 17-guinea A.C. radiogram.

Stratton & Co., Ltd., inform us that they have been favoured with an order for the wireless equipment to be used on the forthcoming Mount Everest Expedition led by Mr. Hugh Ruttledge.

The equipment consists of two short wave C.W. transmitters with the necessary receiving equipment to maintain contact between the Base Camp and the outside world.

There are also six Eddystone 56 Mc. transceivers for inter-communication between the advance parties, and it is worth noting that this is the first occasion on which radio is to be used for communications between the various camps.

It is hoped to keep the leader in constant touch with the climbing parties. He will then be enabled to direct the attempt more easily than in previous efforts when speedy communication has necessarily been restricted owing to the time taken by messengers passing on foot to and from the camps.

HIGH VOLTAGE

DANGER

DO NOT TOUCH

Messrs. Barnes & Humby, the well-known QSL card printers of Nottingham, have recently produced a card worded as above for display at amateur transmitting stations. The card is 12 ins. long by 10 ins. wide, printed in black and red.

Headquarters can supply copies at 8d. each; two for 1s. 2d. post free.

DX Forecasts (No. 3.)

FEBRUARY 15—MARCH 15.

G.M.T.	14 Mc.	7 Mc.	3.5 Mc.
0800	ZL; VK; J	ZL	
0900	ZL; VK; J; CX1		
1000	ZL; VK; fading out up to noon		
1300	VE1; W1; K4; VP5; PK; XU		
1400	VE1; W1; K5; PK		
1500	VE1; W1, 6; PK; VP5; ZB1; ZS	KA1; VK; ZL	
1600	VE1, 5; W1, 5, 6; VQ3; ZC6; ZS	VK	
1700	VE1, 5; W1, 6, 7; VP5; VU; VQ4; ZS	VK; ZD	
1800	VE1, 4; W1, 6; K5; ZS; V8	VK; ZD	
1900	VE1; W1; VS6; K4, 5; VQ4; ZS		
2000	VE1; W1, 6, 7; CX; LU; PY; VP4	W1; VE1; ZS; ZU	SU
2100	VE1; W1; CX; LU; PY; VP2, 4; VQ4	W1; VE1	SU
2200	VE1; W1; CX; LU; PY; K4	W1; VE1; PK	W1
2300	CX; PY; LU	W1; VE1; PK	W1
2400		W1; VE1	W1

SILENT KEYS

ALAN HOLMES, G2VO

It is with very deep regret that we have to record the passing on January 18, at the age of 39, of Mr. Alan Holmes, G2VO. One of the oldest transmitting amateurs in the North of England, and one of the most likeable of men, Mr. Holmes will be missed by a very large number of fellow-members of the Society who cherished his friendship.

He had been associated with Messrs. Horace Green & Co., Ltd., dynamo and motor manufacturers, Cononley, Yorkshire, for 25 years, and for the past few years was employed as their designer. The call G2VO was heard as far back as 1921, when Mr. Holmes conducted numerous tests on the old 440-metre band, but his activities on the reception side went back to the years before the war. He received his first transmitting licence in 1919.

At his funeral the Society was represented by Messrs. Riddiough (G5SZ), Rayner (G5TQ), Bateman (G6BX), Clough (G5YW), English (G6AZ), Whiteoak (G2WU) and Platt (2AGK), all of whom acted as bearers.

Our deepest sympathies are extended to his relatives and friends, and in particular to Mrs. Alan Holmes, his widow, and his three children, the eldest of whom is only nine years of age.

ALEX JAMISON GI6JA.

Yet another well-known call has to be written off as a silent key. Alex Jamison (GI6JA) was one of the earliest of the Northern Ireland transmitters, being licensed in 1926, and up to a few years ago was very active on the high-frequency bands.

His death just before Christmas, at an early age, will be mourned by his many relatives and friends, to whom we offer our condolences.

Thames Valley Society.

We are pleased to announce that this very active Society are now affiliated with the R.S.G.B. Their Secretary, Mr. J. N. Roe, G2VV, 27, Baronsfield Road, St. Margarets-on-Thames, will be glad to hear from intending members.

The Society have been successful in obtaining the services of Mr. F. Addey, B.Sc., Assistant Inspector of Wireless Telegraphy, General Post Office, as their lecturer on March 18, when he will repeat the address he delivered at our Annual General Meeting last December, on the subject of "British Wireless Services." The lecture will take place in the Lecture Hall, Twickenham Public Library, commencing at 8.30 p.m.

The 1.7 Mc. DX Tests.

During the first series of tests it was noticed that several stations started transmitting before the end of their silent periods. This was believed to be due to incorrect clocks, and in order that all participants shall, in future, know the correct time, a time-signal service has been arranged for the commencement of each test day.

G6OK, on 1730 kc., will call "QTR de G6OK" at 04.57 G.M.T. Just before the hour a pause will be made, then five spaced dots will be sent, the last of these indicating the hour. While not intended to rival Greenwich, this signal will be accurate to within 15 secs., and will enable all operators to correct their clocks.

After the tests each Sunday morning it is suggested that the period from 07.00 to 09.00 G.M.T. should be devoted to inter-G QSO's in order to enable results to be exchanged. At this time conditions are excellent for such work, and QRM is at a minimum. G2II.

DX on 1.7 Mc

G2II, G2DQ and G2IN were amongst those who succeeded in contacting North American stations during a good spell on the morning of February 1. G2II worked W1BB, 1GBD, 2UK and 8BDV, receiving these stations at QSA 5 R4/8. QSA 4/5 reports were received from the other side. G2IN contacted W2UK, whilst G2DQ raised W1BB and 2UK.

Duplex Telephony

Mr. F. W. Miles, G5ML, informs us that he has had many fine duplex telephony contacts recently and on several occasions as many as six stations have been hooked up at one time. The best work so far achieved was when VO1I, W1CMD, H15X, W3LP and W1CME were linked up simultaneously with his station. Mr. Miles used an input of 100 watts for this work.

An Opportunity.

Herr Paul Weisz (DEM 2409F), aged 17, is desirous of spending a few weeks in London during July in company with a friend, DE2709F. In exchange for hospitality they offer to board two London amateurs during the Olympic Games, which are to be held in Berlin next August. Members interested are requested to write to Herr Weisz, Berlin W35, Kluckstr. 31.

H.A.R.T.S.

We have been advised by Mr. Emary, VS6AX *via* G6WR, that our old friend Mr. George Merriman (VS6AH) is now the President of the Hong-Kong Amateur Radio Transmitters' Society. Mr. A. N. Braude (VS6AL), the Past-President, becomes Vice-President and Honorary Secretary.

Reports Wanted

VU2AU (Kirkee) on his 14 Mc. transmissions. Reports will be appreciated from England, as directional aerials are being tested.

X1AY, X1CZ, and X1AA (Mexico) on their 28 Mc. transmissions.

G2SO (Leigh-on-Sea) on his 7,110 and 14,220 kc. transmissions.

Stray

The Mexican Radio Society, L.M.R.E., will be pleased to correspond in English with members of the Research and Experimental Sections.

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MR. L. W. PARRY (G6PY), 13, Huddersfield Road, Barnsley, Yorks.

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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.

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DISTRICT 18 (East Yorkshire).
(East Riding and part of North Riding.)

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

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

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

DISTRICT 1 (North-Western)

LIVERPOOL.

NOTWITHSTANDING the new scheme of Town Representation, which it was feared might cause some reduction in the number of members attending the Liverpool monthly meetings through the organising of separate meetings in the different towns, a group of 24 members attended the January meeting. G2RF again brought up the subject of N.F.D. and asked for suggestions as to a suitable site for the station in this district. After discussing sites at Parbold (Ashurst Beacon), near Ormskirk, Overton near Frodsham, and Heswall in Wirral, the majority of those present were in favour of Ashurst Beacon, and as this would be a good centre for both the Liverpool and the Southport Groups, it is probable that this site will finally be selected. The Town Representative mentioned that this station would operate on the 7 and 14 Mc. band, and on putting the question of crystal control or self-excited TX to the meeting, it was unanimously decided that the transmitter should be crystal controlled. Offers of gear were made by various members, including a receiver and power supply. The transmitter is to be built by the Committee and the details will be discussed at a future meeting.

The rest of the evening was devoted to a talk by Sergeant Menzies (G5MQ) on the subject of Police Wireless and in particular with reference to the operation of the police wireless service in Liverpool. The speaker gave some brief particulars of the early experiments with a 50-watt transmitter stationed in the centre of the town working on CW; the range of this station to patrol cars was about two miles, a very high signal strength being required to allow for noise, interference troubles and absorption. Later a 100-watt transmitter was built and erected on the outskirts of the city, the range of this transmitter to patrol cars being about seven miles. Further improvements were then carried out both to the transmitter and to the apparatus installed in the cars and transmitters were constructed for use in the cars so that two-way working could be established. CW was superseded by speech both at the fixed station and in the cars, the car transmitters being crystal-controlled. It was explained that the adoption of speech in place of CW increased the efficiency of the service and made it unnecessary to have operators trained to read morse. The

apparatus is used to maintain a full 24-hour service, and the introduction of a very compact self-contained super-regenerative receiver on the pedal cycles used by the police has put even the cycle police in touch with the main station over a radius of 15 miles. It is believed that no other city, either in Great Britain or abroad, has yet accomplished this.

The District Scribe (G6CX) would like to call attention to the question of reports for inclusion in these notes.

When the only meetings in the district were held at Manchester and Liverpool, it was only necessary for him to collect a report from each centre; but now that the T.R. scheme is in force the position is not quite so simple. He suggests, therefore, that each T.R. should be responsible for making a monthly report giving brief particulars of any meetings held or outstanding work done in his own town, together with such individual reports as he may receive from his local members, and that these monthly reports should be sent directly to him (6CX) to reach him not later than the 22nd day of the month. Those members who cannot conveniently report to a T.R. should send their reports direct to G6CX, whose address is "Sandleas," Eddisbury Road, West Kirby, Cheshire, and he can then include them in the final list.

Reports.—G2RF has had an interesting QSO with OS1BR, located in Hedjaz, Arabia, and would like to know if any other members have had a similar contact. G2OA and G6TT are working most W districts on 28 Mc., using neutralised P.A. with success. G6DP is working break-in on 'phone and CW on 7 and 14 Mc. G6CX is now active again, mainly on 7 Mc., using new current-fed antenna (66 ft. top, centre fed), coupled to Collins filter, and is anxious for reports on this arrangement. G6SX and 2AAI are active on 56 Mc. and also have new TX under construction.

MANCHESTER.

The January meeting was attended by 32 members and it was agreed by vote of the members to keep the meetings going even though other meetings were being arranged in towns outside Manchester through the inauguration of the new T.R. Scheme. A junk sale was held and resulted in a further contribution to the N.F.D. fund.

Members will see on referring to the District Calendar that a lecture will be given at the meeting in March by a representative of Messrs. Stratton and Co. (Eddystone), the subject being "Short-Wave Radio Communication." It is hoped that as many members as possible will attend to hear this talk; visitors will also be welcomed.

G5XC, 2RB and 5ZN are forming a local branch of the Society in Burnley, and already have about 30 members. Will those interested please write to 5XC?

Reports.—2ACP is to be congratulated on obtaining his full call—G2HW. G2DH reports that he is working W6 and W7 districts with ease, using an entirely new aerial system; G2WP is preparing for 28 Mc., using a 14 Mc. crystal in his transmitter. BRS2051 is awaiting his AA call and 2AYB and 2BZX are rebuilding. Numerous other stations report activity on the different bands.

SOUTHPORT.

G2IN calls attention to the fact that there is very little local activity on 1.7 and 3.5 Mc., and suggests that more stations should operate in these bands. Will those members who are prepared to carry out tests on either of these bands write to G2IN?

Reports.—BRS2140 has applied for AA licence, whilst BRS1929 is thinking of following his example. 2AMQ is to be congratulated on his promotion to G5NV. The latter station is now better able to co-operate in the tests with G5ZR on 56 and 120 Mc. G6YR is working break-in with E18M daily on 7 Mc., G5OP and G6ZR are both active on 1.7 Mc., 5ZI continues to radiate daily tests on 56 Mc. G2IN, 2OI, 5PX, 2LK, 6KS and 5RX all took part in the 1.7 Mc. tests.

ROCHDALE.

Will local members please get in touch with G6QA, of 82, Molyneux Street, Rochdale? He is at home every Sunday between 10 a.m. and 12.30 p.m., and is active on 1.7 and 56 Mc. with G6AX and BRS1152.

WHITEHAVEN.

The first meeting held in this district took place on January 21, and it is hoped to continue these meetings. A number of stations seem to be active on 7 Mc., using 'phone, including G5CJ, 6WR and 2HT—the latter reports that 13.30 G.M.T., on week-days is quite good and enables him to have some 100 per cent. QSO's. G5CJ is also working duplex phone on 1.7 Mc. and obtaining very good results.

LEYLAND.

G5SO reports fair activity in this area. He has built a new TX for B.E.R.U. and has just worked VK for WAC and WBE. BRS1743 has passed morse test and expects full call shortly. BRS2078 is forming radio club in Blackpool. G6PO has left Blackpool.

BURNLEY AND DISTRICT.

G5XC is busily engaged with work on behalf of the local club which has recently been formed. BRS1933, 1934, 2067, and 2154 (the last two are father and son) are learning morse preparatory to applying for A.A. licences. G5XC, 5ZN, and 2RB are on 7 Mc.

DISTRICT 2 (North Eastern).

The Bradford area activity is up to standard and most stations are operating fairly regularly. Good work was put in recently by G6XL, who received from VK3EG the details of the arrangements for the silent period in memory of our late King, which he at once passed on to our President. Congrats XL. Several stations have entered for B.E.R.U., and our best wishes are with them.

The last meeting of the Tynemouth area was held at the QRA of Mr. O'Hagen, Heaton, and was attended by many members in spite of bad weather. BRS1865 becomes 2APC, and is building his station. G6YL has been doing good 28 Mc. DX with low power, but has had the misfortune to have her aerial blown down in a gale. We are pleased to hear G2XT on the air again. Notices of the next meeting will be sent to members.

The Stockton area is doing well. G6ZT made 52 contacts in the recent Polish contest, and G2FO won a gold medal in the Irish contest. G5XT and G6CV are testing out a wireless telephone between their homes. G6ZT recently worked two VU's and a K7, using a temporary aerial, after losing his mast in a storm, and now awaits cards to claim WAC and WBE. He wonders if VU2CQ

FORTHCOMING EVENTS

Feb. 19.—District 1 (Liverpool Section), 7.30 p.m., at 38, Mason Street, Liverpool.
.. 20.—District 6 (Plymouth Section), venue to be arranged.
.. 20.—District 10 (Cardiff Section), 8 p.m., at Barry's Hotel, St. Mary's Street, Cardiff.
.. 20.*—District 13, 8 p.m., at Brotherhood Hall, West Norwood.
.. 21.—London Meeting at I.E.E., 6.15 p.m., tea 5.30 p.m. Lecture, "R.F. Pentodes and other Modern Valves," by Mullard Wireless Co.
.. 21.—Scotland "B" District, 7.30 p.m., at The Empress Café, Union Street, Aberdeen.
.. 23.—District 11, 6 p.m., at G2II, The Flagstaff, Colwyn Bay.
.. 24.—District 14 (Southend Section), 8 p.m., at G2SO, 44, Lindisfarne Avenue, Leigh-on-Sea.
.. 25.—District 14 (East London Section), 8 p.m., at 2AYB, 16, Station Road, St. James Street, Walthamstow.
.. 26.*—District 15, 7.30 p.m., at G6VP, 12, Ferrars Avenue, West Drayton. Talk by G5CV, "Some Unusual Radio Topics."
.. 26.—Scotland "A" District, 7.30 p.m., at Institute of Engineers and Shipbuilders, 39, Elmbank Crescent, Glasgow.
.. 27.—District 6 (Exeter Section), 7.30 p.m., at G5WY, 95, Fore Street, Exeter.
Mar. 1.—District 4 (Notts and Derby Section), 3.30 p.m., at King's Head, Loughborough.
.. 4.—District 1 (Manchester Section), 7 p.m., at Brookes Café, 1, Hilton Street, Manchester. Lantern Lecture by Stratton and Co.
.. 4.—District 13, S.L.D.R.T.S., 8 p.m., at Brotherhood Hall, W. Norwood.
.. 5.—District 4 (Leicester Section), 7 p.m., at G6IM, 2, Wigston Road, Oadby, near Leicester.
.. 5.—District 6 (Torquay Section), 7.30 p.m., at G5SY, Sherrington, Cleveland Road, Torquay.
.. 6.—Scotland "B" District, 7.30 p.m., at The Empress Café, Union Street, Aberdeen.
.. 8.—District 9, Hamfest. Meet at G.P.O., Norwich, 2.30 p.m.
.. 10.—District 12, 7.30 p.m., at Wander Inn Café, Church End, Finchley.
.. 18.—District 10, 7.30 p.m., at Queen's Hotel, Newport.
.. 19.—District 13, 8 p.m., at Brotherhood Hall, West Norwood. Display of N.F.D. 1935 Films.

*Sale of disused apparatus at these meetings.

has a receiver, as he cannot QSO him. G2FO is testing a 1.7 Mc. transmitter, a S.W. superhet, a MO-PA and a CO-FD-FD-PA on 56 Mc. with a 14 Mc. crystal. Good progress is being made by 2BQO in his Morse practice.

Meetings are now arranged in Sheffield on alternate Thursdays at 7.30 p.m. at the Angel Hotel, the next being on February 20. Every local member is asked to make an effort to attend.

G5TO is active on 7 and 14 Mc., and hopes to be on 1.7 Mc. soon. G6LF entered for 1.7 Mc. contest, and is testing a small aerial on this band and rebuilding for higher frequencies.

G2AS is operating on 14 Mc., the second op. is recovering from a serious illness, and hopes to have her own TX soon for 28 Mc. work.

Reports of activity come from G6PJ, 2GN, 2XH, 2DJ and 2JY. BRS1409 is now 2BGN, while BRS1944 and 2124 are learning Morse.

DISTRICT 4 (East Midlands)

A good attendance was recorded at the last Notts and Derby Section meeting held at St. James's Restaurant, Derby, on January 26, when G2SD delivered an interesting talk on S.S. Supers. Two sets, amateur and commercial, were shown and instructions on building were given.

The winner of the monthly contest on 28 Mc. was G5VU with over 50 contacts with 13 different prefixes to his credit; the runner-up was G2IO with 30 contacts. The receiving section was won by 2AFX. Trophies were duly awarded by the donors.

Judging by the reports of the last month at least 90 per cent. of the members in this section are entering for the Senior and Junior B.E.R.U. Good luck to all!

The two District tankards are being awarded to the station with the highest points scored in No. 4 District for both contests. Claims to reach the D.R. before March 1.

The next meeting will be held at the King's Head Hotel, Loughborough, at 3.30 on Sunday, March 1, at which we hope to welcome as many of the Leicestershire members as possible.

Reports from Leicester are few, but interest seems to be reviving. Our sympathies are extended to G6GO during his illness and we hope he will soon be fit again to continue his activities on the lower frequencies. G6VD entered the 1.7 Mc. contest with good results and wishes more members would take interest in this band.

Congratulations to 2AVG on receiving his full licence with call G5QQ.

The next meeting of this section will be held on March 5 at G6IM, 2, Wigston Road, Oadby, Leicester.

The Peterborough Group, whose numbers are rapidly increasing, all report active. G5NX, the president of the new Short-wave Society, has moved into the country and makes 2NJ, who experiences local QRM, very envious. G6LX was home for the vacation and worked much G fone on 7 Mc. He has returned to Cambridge University and is operating the University station. G6PD, home from Nottingham University, has worked VK. G5LP, through the aid of the local Press, is starting a Radio Society at Wellingborough. Good luck, O.M.

The Kettering Group are very quiet, but 5YF is now on 56 Mc.

Report Your Activity—Regularly

DISTRICT 5 (Western).

Most areas in the district report fair activity at present, and local meetings are now being held in Gloucester, Bristol, Swindon, and Oxford. A short-wave club has recently been formed in Salisbury by BRS2109, who hopes that everyone in the district will give it their support.

The 28 Mc. band seems to be coming into favour, and several stations are now regularly working on this frequency. G2HX has again done some good work, and G5JU has also been meeting with success. Arrangements have been made to hold regular monthly meetings at the Talbot Inn, Southgate Street, Gloucester, and it is hoped everyone in the district will give G2HX their support.

The usual well-attended monthly meeting was held in Bristol, at which the Assistant T.R. and Minute Secretary were re-elected. An interesting talk on 28 Mc. work was given by G5JU, who dealt with both the transmitting and receiving point of view. Discussion followed on aerials and types of transmitters for this class of work.

The Wilts Letter Budget is going strong, and provides some very interesting and helpful information.

By the time these notes appear, B.E.R.U. tests will be in full swing, and if the rumours prove true, District 5 stations will be well in the running.

DISTRICT 6 (South-Western).

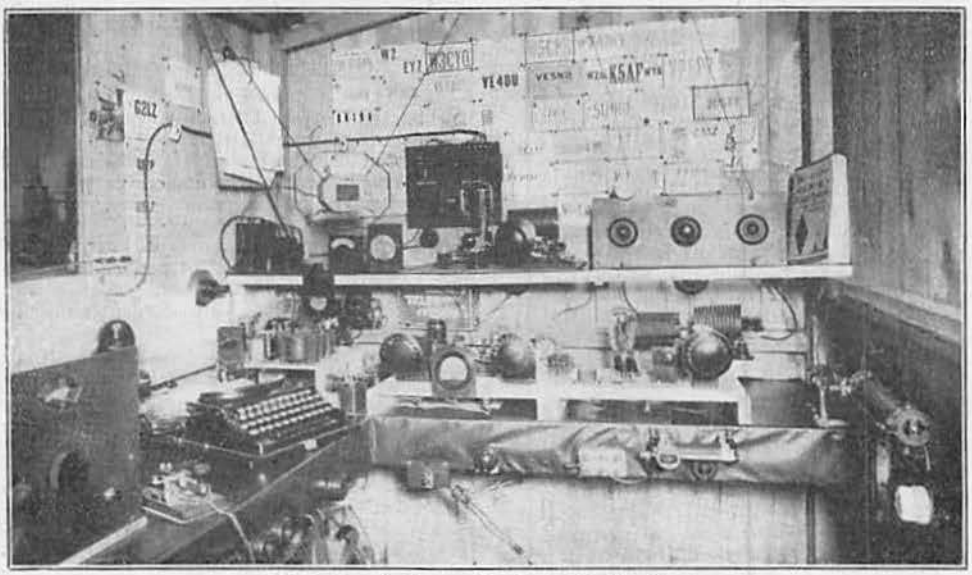
We are happy to be able to produce further evidence of the interest and enthusiasm of members in the South-west.

First of all we record the fact that all the more important towns have now appointed T.R.'s. This is very gratifying, and should considerably lighten the work of the D.R., who thanks all who have taken on these jobs.

The meetings at Torquay, Plymouth and Exeter have been well attended. The Torquay meeting took place on Thursday, January 2, and therefore there were added thereto festivities more or less appropriate to the New Year!

Plymouth held an excellent first meeting at 2ALA. Members present were 2ALA, 2AMO, BRS's 1769, 2020, 2153, 2183, G5WY from Exeter, and G5SY from Torquay. All members proved very keen, and much is expected of Plymouth in the future. 2AMO and 2ALA are to be congratulated on setting the ball rolling so well.

The meeting at Exeter was much better attended. A proposal to visit some of the members in N. Devon was discussed, and it is hoped that if G6FO can arrange a convenient meeting, this will take place soon. NFD was also discussed, and tentative arrangements made to have the A station in North Devon under G6FO. An interesting exhibit by



G5KG, the winning station in the 3.5 Mc. Contest.

BRS1711 was a QSL card from ETB, the Abyssinian B.C. station.

The T.R. for Taunton, BRS190, arranged a meeting for February 9, and if this has taken place the D.R. will at last have achieved a great ambition, in that meetings are being held in all the larger centres of the District, namely, Falmouth and Truro, Taunton, Exeter, Torquay and Plymouth. Many thanks to all those who have helped to achieve this success.

Meetings will be held at Plymouth, February 20; Exeter, February 27; and Torquay, March 5.

DISTRICT 7 (Southern.)

A number of new T.R.'s were appointed at the January meeting held at Farnborough. They are as follows:—R. Pottinger (2BNS), 1, Aldridge Rise, New Malden—T.R. for Kingston-on-Thames; 2BAU, P.O. Lower Froyle, Alton Hants.—T.R. for Alton and Farnham; J. Butcher (G5XG)—T.R. for Horley and Reigate. The number of individual reports this month constitutes a record, and augurs well for the success of the T.R. scheme.

From G5XG (Reigate district):—G5LK contacts FT4AG (Tunis) on 7 Mc. fone, 4 watts input

G6KD and G5PR are now licensed for 3.5 Mc., the latter rebuilding. G2JO rebuilding power supply for increased power. G5XG contacted K7UA on 14 Mc. with 8 watts input.

From G6GS (Guildford) :—G2GK has worked over 50 ZL and VK stations during the past few months, and, in addition, has found time to overhaul the main TX and build a portable for 7 Mc., and also a transverse current mike. G6GS has continued operation on 28 Mc., with the usual East Coast W contacts and also another W5. Both G6GS and G6LK report LU9AX on 28 Mc. quite consistently about 13.30 G.M.T., but have been unable to raise him. G5RS is now on 28 Mc., and has had good results. He contemplates rebuilding RX on the lines of GS's receiver. BRS1847 is home again, and celebrated his homecoming by hearing K4 on 28 Mc.

From G5AO (Reading and district) :—The German log books and general discussion occupied the time at the last local meeting. Welcome to two new members. G2IT, of Reading, and G5OT (ex VP9O), of Thatcham, Berks. G5TP reports good fone contacts on 7 Mc. G6WO rebuilding. G5OT has erected separate doublet aerials for 7 and 14 Mc. He has already contacted ZS, VK and ZL from his new QRA, and also has good fone going. G2GG reports preparation for work on 50 cms. G6GT experimenting with aerials. G5RT and 2BIS at present inactive, while the following are active on one or more bands :—G2WK, 2YB, 5HH, 5HN and 5AO. The next local meeting will be on Wednesday, February 19, when a lantern lecture by a P.O. official is expected. The D.R. wishes to apologise for an error in reading G5AO's last report. G5HH was reported as being on 10 meters and receiving a report from Guildford. The transmission was actually on 7 Mc., and the BRS station reporting was using 10 valves ! G5HH is not licensed for 28 Mc.

BRS2169 reports from Farnham, and has been receiving good DX on 28, 14 and 7 Mc., and hopes to have his A.A. licence shortly.

2BNS (Kingston and district) :—2BNS says that individual reports to him have not arrived yet, but hopes for better luck this month now that his address has been given. (See above.) 2YL is away on a cruise. G6DW is busy with Arctic expedition work on 3.5 Mc.

The March District meeting will be at Pitcher's Café, High Street, Guildford, on Sunday, March 1, at 2.30 p.m.

Please report to your T.R. this week.

DISTRICT 8 (Home Counties).

For some months G5FB has been unable to devote very much time to society work, due to personal business. In consultation with the secretary, he decided to invite a well-known member, in Mr. G. Jeapes, G2XV, of Cambridge, to take over his duties as D.R. Mr. Jeapes has tentatively accepted, subject to confirmation by Council at their March meeting. We feel sure that Mr. Jeapes, with his long experience of R.S.G.B. work, will make an excellent D.R., and we wish him every success.

District 9 will be very glad to see members from Cambridge, St. Ives, etc., at the Hamfest, particulars of which are given below.

Will members going please get in touch with G5JO.

DISTRICT 9 (East Anglia)

A Hamfest has been arranged to take place in Norwich on Sunday, March 8. A visit to the local electricity works will be a feature of the early afternoon, and parties will meet outside the General Post Office at 2.30 p.m. If any of the long distant visitors wish to lunch in the town, G2XS will be pleased to join them if they will let him know.

Parties will leave for the power station at 2.40 p.m. sharp, so will members please arrive in good time ?

No further notice of this meeting will be given. Will all members, therefore, make a note of date and inform G2MN or G2XS of their intentions, by March 1 ?

We are glad to receive a few more reports this month, and to know that the District is very active.

The outstanding feature would appear to be G6FB's VK contact with 8 watts on a 1-valve Hartley. Incidentally, G6FB is now on H.M.S. "Frobisher," visiting sunny climes, and keeping a good look-out for No. 9 District stations on 14 Mc.

G6QZ has also been successful with a VK contact on QRP, and is now busy with suppressor grid modulation.

G5UD is building a new TX for 3.5 and 7 Mc. G6TI reports that ex-SU8RS is to rejoin the Society and we hope he will soon be on the air.

G2XS, who has recently visited the Cambridge stations, hopes to renew acquaintances at the Norwich Hamfest.

DISTRICT 10 (South Wales and Monmouth).

The District Scribe wishes to point out that he is not a thought reader, and asks for more individual reports, especially from the Swansea Group.

The Blackwood Hamfest was well attended, and everyone had a pleasant evening, thanks to the efforts of Mr. Pond (Chairman) and Mr. Mudford (Secretary).

Members present included G2IP, 2JL, 2NG, 2XM, X2X, 5BI, 5XV, 6BK, 6GW, 6PF, 2ABI (ex-BRS1739), 2BAQ, 2BHZ, 2BPG, 2BSN, BRS 1127 and 1949.

The recently-formed Cardiff and District Short-Wave Club held a very successful meeting at Barry's Hotel on January 23, at which 40 attended, including the following members : G2IP, 2NG, 2XM, 5BI, 5XV, 6GW, 2ASL, 2BBO, 2BHZ, 2BSN, BRS1128, and 1949. The next meeting of the club will be held on February 20, and every fortnight thereafter.

Annual Dinner of the Blackwood Radio Club, January 9, 1936.

Something on the same lines is now being contemplated for Newport, to run in conjunction with R.S.G.B. monthly meetings.

Reports on individual activity are scarce this month, but our old Rhondda friend 2AWZ is now G2XM, and has been heard stirring up the ether on 7 Mc. with a fine C.C. note, and some very nice fone. BRS1739 is now 2ABI. Mr. Rosser (Blackwood Radio Club) is now 2BAQ. 2NG has completed his CO-PA, and is using fone and CW on 1.7 and 7 Mc.

Unfortunately our D.R. (G2OP) will be unable to take part in the B.E.R.U. tests, as his QRA is out of bounds to him, owing to scarlet fever in the family. He has our deepest sympathy.

The D.S. was pleased to welcome at his QRA on Sunday, January 26, G6BK, 2BHZ, 2BSN, and X-G5NS, the latter's ship being laid up for a short time, allowing him a week's leave.

Members known to be active are G2JL, 2NG, 2SN, 2UL, 2WO, 2XM, 2XX, 5BI, 5FI, 5OC, 6BK, 6PF, 2ABI, 2ASL, 2BAQ, 2BBO, 2BHZ, 2BPG (56 Mc.), 2BSN, BRS1128, and 1949.

Reports by the 25th of the month, please.

DISTRICT 11 (North Wales).

At the January meeting there was an attendance of five members. No more will be said, as the D.R. is tired of complaining.

We are glad to welcome as a new member BRS2163, of Conway, who is now 2APX.

In order to encourage members to attend the February meeting, which takes place at G2II, G6OK has very kindly offered to meet any member at Colwyn Bay Station, take him up the hill to the meeting, and afterwards transport him back to catch his train or 'bus. Will those wishing to avail themselves of this service kindly let the D.R. or 6OK know in advance? If trains or 'buses are inconvenient, please come early rather than late. At the meeting cider and other refreshments will be provided free of charge! G6OK's single signal super-het. will be on view, and possibly other apparatus. The discussion concerning N.F.D. has been again postponed until this meeting.

If, after having arranged all these attractions, there is not a good attendance at this meeting, the D.R. will stop trying!

DISTRICT 13 (London South).

The January District meeting was very well supported. One of the items on the agenda was N.F.D., 1936. Several points were discussed, including that of the two sites; there was discussion as to where these should be fixed, but it is expected that the matter will be settled before the next meeting. As was mentioned in the January BULLETIN, a junk sale will be held on February 20. A percentage of the receipts will be placed to the credit of district funds, and it is hoped that as many members as possible will support the sale by bringing along articles of gear for disposal. It is essential that a success should be achieved, so please do your bit.

Now for individual reports. G2JB is still active on 7 and 14 Mc. G5IS is running a Sunday morning schedule with G2NH and G6CW, duplex 'phone being used. Tests on 28 Mc. are being carried out, using an R.K.20 as final F.D., but only American stations have been worked. A multi-vibrator with 100 kc. bar is being constructed for frequency checking. G5OX is active on 56 Mc., but has not yet completed his superhet. G6CB reports experiments with suppressor grid modulation, whilst G6LR is building a Tri-tet oscillator and is very pleased with the results obtained when using a Collins coupler. G6QN, on the other hand, reports no success with a Collins coupler. BRS2146 has rebuilt his receiver and is getting good results. 2AOP reports no activity owing to sickness; we hope you are fit again now, O.M., and are looking forward to seeing you at the next meeting. G2ND is active as usual, but is disappointed with his low score in the 1.7 Mc. contest. He is at present having a great deal of worry with his neighbours.

G5JW has now completed the rebuild of his push-pull P.A., with the result that a great increase in efficiency has been effected on 28 Mc. A considerable amount of work has been done on this band and he is now turning his attention to C.C. on 56 Mc. G5JW would like to get into touch with any member in South London who can receive CW on this band, with a view to conducting some experiments. 2BUO has now received the call G5WG, whilst 2BKT has received the call G2VB. Good luck to you, OM's. Incidentallly, we believe that G5WG is the district's youngest operator. His age is 17 years. G2TR reports having received confirmation of a 7 Mc. QSO with China. He adds that seven people were needed to erect his new mast. G6GK is busy overhauling his gear.

It has been arranged to show the films of N.F.D., 1935, at the District meeting to be held on March 19, in view of the many requests received from members who were unable to be present at Convention. Details of future meetings in South London will be found elsewhere in this issue.

DISTRICT 14 (Eastern).

The attendance at the January meeting of the Southend Section, held at BRS1946, was 12, and included G5RW, of Danbury, and G6LB, of Chelmsford. It was decided to organise a QRP contest among the Southend members, and details will be announced at the next meeting (see "Forthcoming Events"). G5UK, the T.R. for Southend, has just returned from a six-months' stay abroad, and will resume his former rôle, which has been so ably performed by G2LC in his absence. Congratulations to 2AKA, of Leigh-on-Sea, who is now G2SO.

It is with great satisfaction we are able to announce that the Southend and District Radio Society have become affiliated with the R.S.G.B. Both G5VQ and G6IF will be on 28 Mc. shortly.

At the East London Section meeting at G6UT, Chingford, the attendance was very small. Congratulations to 2BDF, of Poplar, who now owns the call G2ZZ. Dates for Morse classes at 2AYB, 16, Station Road, St. James Street, Walthamstow, E.17, are February 26, March 2, 11, 16, and 25.

DISTRICT 15 (London West and Middlesex).

Twenty-four members took a very great interest in the talk given by G6CJ on his directional aerial systems at the January meeting.

The first issue of the District Magazine has been very well received, but we should like a few more members to take out subscriptions. If there are any who have not seen a copy and are thinking of subscribing, will they write the D.R.?

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G2NN, the T.R. for Twickenham, sends a list of those who are active within and just outside his area. G6GB, testing new driver stage, G2VV contemplating CC on 56 Mc. and straight receiver, G2KI designing new VH/F receiver and has heard WI-9, ZS and LU on 28 Mc., G2LA rebuilt station and worked four continents first day, also now on 28 Mc., G2YK still active, BRS1388 busy with morse, G5XY (ex 2ALF) using Tri-tet on 7 and 14 Mc. had seventeen QSO's since January 14. Congrats, OM. G2NN using "Heath Robinson" aerial comprising one apple tree, one punt pole and one bamboo pole, which gives low-angle radiation, VK5 and 6, ZE1, ZD8, ZS1, 2 4, and VS7 worked recently. Other reports: G6WN has now worked five continents on 28 Mc., 2AJX, 2AWG, 2BAI and 2ADA all busy with morse BRS2073 hopes, for AA soon and is adapting his receiver for 1.7 Mc. in readiness for N.F.D., BRS2178 enjoyed his first area meeting, after hearing results of others is not satisfied with his own receiver. G5FG intends trying Windom or 2BI type.

The Thames Valley Amateur Radio and Television Society held their monthly meeting on January 22, when Mr. J. N. Roe (G2VV) gave an interesting talk on "Radio, Then and Now." Details of the new Experimental Section were given by the Section Manager, Mr. G. H. Billison (G6GB), followed by a description and demonstration of a Signal Generator by Mr. W. R. Emery (G6LW).

DISTRICT 16 (South-Eastern).

Congratulations to the Brighton and Hove group, who held their inaugural meeting at Hove College on January 10. There were 15 members present, and Mr. C. W. K. Sands, the former C.R. for Sussex, was in the chair. Encouraging letters from "Clarry" and the D.R. were read at the meeting. It was decided that meetings should be held every second Friday in the month at Hove College and a programme was arranged. Mr. Dickson (G2HV), the convener of the meeting, was unanimously elected T.R. for the Group.

G2HV has started well by sending in a report from which it is apparent that most stations in the district are active and regular 56 Mc. working times are being arranged.

G5JZ also sends in a report stating that he is active on 3.5 and 14 Mc. and is testing a TZO5.20 valve. 2AFX is awaiting his Morse test. 5YA has worked nearly all Europe on phone on 3.5 Mc. and hopes soon to QRO. BRS1173, took part in the 1.7 Mc. receiving contest, and states that conditions were very good.

BRS1914 and 2BIU also report active. The former has built a new receiver which gives a very good signal to noise ratio. G2KV has worked VE on 3.5 Mc. and is about to rebuild. 2AO has been trying series modulation and has kept a duplex sked with 5KJ, of South Wales. He has also worked stations on 28 Mc., but finds car QRM very bad. 2BIU is rebuilding.

We welcome G2IZ, the T.R. for Gravesend, who sends in his first report. All in the group are active, and it is proposed to organise a local society to run jointly with the M.A.T.S. 2BPQ has passed his Morse test. 6BQ and 5IL both took part in the 1.7 Mc. contest, these two with 5SI visited the D.R.; 5SI returned full of enthusiasm for remote control.

G2GB sends in his usual report for North-west Kent. 6WY, who is active on 28 Mc. and 3.5 Mc., has just built an S.S. super which works! He has contacted all continents on 28 Mc. and VK, ZL, and W on 3.5 Mc. 2AW uses C.W. and phone on 56 Mc., the transmitter being MO-FD-FD, with a locked oscillator from the same job on 120 Mc. 2XB is a new station at Sevenoaks. 2NK is turning his attention to portable work on 5, 2½ and 1¼ metres. 5LB is building a PA unit for his 56 Mc. CC outfit. 2GB will shortly reappear on 7, 14 and 56 Mc., with locked oscillators from the appropriate stages of a CO-FD-FD-FD exciter unit.

G5FN, T.R. of the Medway Towns, reports QST fashion as follows (Suggest other T.R.'s follow suit—D.R.):—6NU raised a Jap on 7 Mc., 5FN 50 watts icw. and 20 phone on 56 Mc. 6VV looks forward to Junior B.E.R.U. 2 CM on 56 Mc. transmissions. 2VA co-ops with BRS2058 on 56 Mc. with phone rig. 6QC completed 56 Mc. transmitter (long lines) and Rx. 2IG QRL. 6BA super rig being built for all bands. 6QG QRL. BRS745 commenced 56 Mc. superhet. BRS2058 co-ops with 2VA. Capt. Leonard Plugge, the patron of the Medway Society, has presented a silver challenge cup for the highest score obtained by any M.A.T.S. member in that area in Junior B.E.R.U.

BRS1996 sends in the first report from the Whitstable district, where 2BJN, 1300, 2143 and he are all very active. He recently visited the Folkestone district and inspected the stations at 2FA, 2IC and 2GD.

Folkestone Radio Amateurs continue to make good progress and the meetings and Morse classes are well attended. Work at the Valiant Sailor is, however, being badly held up by the weather, where the recent severe gale did much damage to the beam aerial. 2IC has at last succeeded in getting crystal control of 56 Mc. from a 7 Mc. crystal, using only two valves, and is hoping shortly to complete a P.A. stage. Results show that a three-valve outfit, including a driven amplifier, is a practical proposition on this band and well within the means of the average amateur. It is intended that the completed transmitter shall eventually be operated from G2FA.

Will all T.R.'s please arrange for their notes to reach the Scribe by the 15th of each month? Tunbridge Wells report was received too late for inclusion.

DISTRICT 17 (Mid-East)

The Grimsby and District Short Wave Club held its first annual dinner at the Royal Oak Inn, Holton-le-Clay, on January 18. Despite the wintry conditions and the dangerous state of the roads for vehicular traffic, visitors arrived from Brigg, Cranwell, Mablethorpe and Sutton-on-Sea, and were warmly welcomed. After dinner several of the members were called upon to entertain the gathering, and some unexpected talent was discovered. G5GS was loudly applauded for his banjo solos and songs. Mr. Marlow and G6AK continued with mandoline and piano selections, and BRS 1021 also sang. Judging from all reports, everyone had a very good time, and were loth to go home!

Individual reports from the North announce that G5GS is making good progress with his "362" transmitter. G2VY has removed his station to a

new QRA and will soon be active again. G6AK has been trying to improve his receiver and is satisfied with the latest edition. 2BWV reports satisfaction with his home-made transverse current microphone. 2AZH's new transmitter is practically ready for its preliminary tests. Grave anxiety is felt for G6UG, who has disappeared, and even the Annual Dinner failed to bring him into resonance. What about it, O.M. ?

The Cranwell members had a meeting at G2LR's QRA on January 20, which was attended by G2LR, 2XK, 6AC, BRS1329, 1814, 2141 and two new members. They have obtained a shack for their own use which is to be fitted with a common power supply so that anyone may carry out tests. The membership at Cranwell is growing splendidly.

G5XL at Lincoln has been trying indirectly-heated valves, but is going back to the normal type. 2AFU at Brigg, is making the wooden rack for his Tx, and also a monitor, and learning Morse in the intervals.

G5BD has made up for the absence of 28 Mc. R.F. by twice working VK2LZ on 3.5 Mc. and VK, ZL, etc., on 14 Mc. He has now had over 160 contacts with W6GRX, but he reports that conditions are unreliable at present. G5CY is almost rebuilt and has traced his troubles to insufficient voltage on the filaments of his valves. His Comet-Pro and pre-selector is pulling in the DX and he hopes to be working it soon. G5LL continues to get out well on 7 Mc. but on 14 Mc. results are not so good. His old treadle converter is now in retirement in favour of a 6-volt converter, whih gives him a maximum output of 9.5 watts. Ex-G2AT is awaiting the issue of a new call and is ready to be active with a CO-FD-PA, using Type 53s and an LS5 as PA.

BRS 2095, 2155 are busy with their receivers. BRS2030 has finished his TRF-Det-Pentode receiver, which uses pentodes throughout. 2AUR is trying out audio-amplifiers, and it is rumoured that he is going in for public address work.

G6GH followed up his success last month by working ZT. Since then he has obtained a 50-watt licence, and a new CO-FD-PA is in course of construction, using a W.E. 4211E in the final stage. 2BJY can now listen on 28 Mc. The D.R.'s tests with a Tungsram APP4C in a tri-tet circuit were unsuccessful. He would be pleased to hear from anyone who has tried this valve. On 14 Mc. he has worked VE4 and an application for the use of the 28 Mc. band is in the hands of the G.P.O.

DISTRICT 18 (East Yorkshire).

From Scarborough we learn from G2CP that G2TK has begun tests with an R.F.P.362. G5MV is building a field strength measurement meter and preparing to use an R.F.P.362. G2CP himself during his first month on the air made 60 contacts in 12 countries.

(*Editorial Note :* It is anticipated that at the North-Eastern Provincial District meeting to be held in York on March 22, it will be possible to appoint a new D.R. for this District in succession to Mr. Woodcock. The arrangements for this meeting are being undertaken by Mr. L. W. Parry, G6PY, D.R. for No. 2 District, and in choosing York as the venue we hope that a good attendance will be recorded from both of the North-Eastern Districts).

Scotland.

The membership is increasing rapidly in Scotland and it has been decided that it would be desirable to have a representative in Stirling, which is becoming the centre of an active group of members. Mr. W. Stirling, G6RV, has therefore been appointed as Town Representative for Stirling, and we hope that the members in this area will give him their support by sending him regular reports.

Mr. Lamb, G6LD, " C " District Officer, reports that he has been trying to obtain the views of the A.A. and BRS members on the proposed scheme of holding " C " district meetings in Broughty Ferry and Forfar alternately. The response to this appeal is deplorable, one letter and one telephone call ! Now, O.M., your District Officer cannot arrange meetings, etc., without your support and you cannot, therefore, complain if nothing is done for you. We are pleased, however, to hear that the " C " district transmitters are very active and a large amount of rebuilding, etc., is in progress.

" C " District's visit to " B " District, on January 26, had to be postponed at the last minute, the roads being very bad and no suitable train service was available. It is hoped to visit " B " district some time in March.

In " B " district G2YA hopes to be on the air soon with a new transmitter on 7 and 14 Mc. and he will appreciate any reports.

The 1.7 Mc. contest has evidently had little support in Scotland this year. The only station definitely known to have competed is G5ZX, who finished with 56 points.

G6RV reports having worked XU on 7 Mc. and G6NX has already made WAC in spite of the very short time he has been on the air. Another newcomer, G6IJ, who was only licensed last month, has worked ZL2OV.

The number of changes to record this month is reduced somewhat from previous months. " A " district, Mr. A. D. Lamb, 2AXG, is now G2UU, and Mr. Reston, BRS2043, is now 2AGM, while " B " has one change, Mr. Thomson, BRS1557, having been issued the call 2ATH.

At the " A " district meeting on January 29, Mr. Mason, G6MS, delivered a very interesting lecture on television, which was very much appreciated by a large attendance of members.

No news of " D " district has been received this month.

We were very glad to note the almost unanimous response to our President's appeal that transmitting licence-holders should keep their stations closed throughout the whole of Sunday, January 26, in memory of our late Sovereign, H.M. King George V. The action of the few stations who saw fit to ignore this appeal is greatly resented by the membership.

Northern Ireland.

GI5UR reports having been QSO VO48 (H.M.S. *Scarborough*) when she was 500 miles from New York. The operator at VO48 was G5OT. 5UR has worked the following new districts :—W7, VK3, VK5, ZL4, LX1. GI6XS has rebuilt in readiness for a removal to a new QRA. His latest DX is VE5 and ZT. He finds a Comet Pro much to his liking. BRS2086, Mr. J. M. Lowden, has now obtained a non-radiating licence, and will in

(*Continued on page* 336).

Empire B.E.R.U. News.

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Ceylon.

By VS7GJ.

VS7RP, reports that January opened with a severe spell of QRN ; this made continuous listening on 7 Mc. difficult. Conditions on the 20, 21, 27 and 28 were particularly bad. The above dates are three days either side of the new moon.

VS7GJ, following a busy period with estate work, is hoping to be on the air more regularly. On 14 Mc., signals from the South-east and South-west of Ceylon have been good up to 1600 G.M.T. S. Africans have been coming over well, but QRN has at times been troublesome. The North-east Monsoon set in late this year.

Egypt, Sudan and Trans Jordania

By SU1SG, *via* G5JX.

Reports from Cairo this month show considerable activity on 28 Mc., from which town SU1JT has put up a splendid performance on this frequency. After overcoming considerable trouble during his initial tests, he worked 28 stations on January 12 in twelve countries in a matter of about five hours, receiving R7 reports from VK and R9 from W. It is regretted that SU1FS is now QRT for good ; this popular station will be badly missed by the SU group, who wish him success and happy days at his new QRA.

From Port Said comes information of television experiments to be carried out by SU1RK, who will shortly be transmitting 30-line pictures on 7 Mc. SU1CH and SU1SG propose to co-operate at the receiving end.

In Alexandria SU1WM has been trying to confound the people who theorize on antenna design and angle radiation by working at R7 VK's every afternoon on 14 Mc. using the R.C.A. special doublet receiving antenna. Increasing interest is being shown in 56 Mc. work, and it is anticipated that within the next month four SU stations will be active on this frequency.

From Palestine we have news that both transmitters are inactive at the moment.

It has been gathered from a reliable source that no further SU transmitting licences will be issued for the moment, the reason given being that the forms and conditions of the present licence are under review by the authorities. The total number of licences at present issued is nine only. By the time these notes are printed the B.E.R.U. contest will be practically over. It is anticipated that several SU stations will have attempted to emulate the fine performance put up by ex-SU1EC last

year, and it will be interesting to see how they have fared under the new scoring system.

Hong Kong.

By VS6AX, *via* VS6AQ, VS1AJ, VK5BD, ZL4BQ, ZL4BT and G6WY.

We welcome VS6AS from leave; he will be active soon. VS6AX is still on 30 watts, but is rebuilding. VS6AH has been experimenting with telephony, as have 6AQ and 6AZ. Conditions on 7 Mc. have improved and Europeans have been worked around 17.00 G.M.T. 14 Mc. still holds good for VK and ZL, and Europeans have been worked at good strength. Commercial activity checks keep BERS273 and 309 busy. BERS308 is still in hospital, whilst 282 has been away to a local volunteers' camp. The following stations are at present active:—VS6AH, 6AQ, 6AX, 6AZ, BERS273, 308, 309.

Irish Free State

By EI9D.

This is the first occasion that these Notes have been written by EI9D since being informed of his appointment as B.E.R.U. Representative. Col. Dennis (EI2B), who retires, has been appointed a vice-president of R.S.G.B. This recognition of his long and valued service gives great pleasure to us in EI, and we offer our sincere congratulations. EI2B has been in the game since the very start, and there are few of us here who have not to thank him for his help and interest in one way or another. It seems a small thing to say just "Thank you, OM, for all you have done for us," but we do so assuring you of our sincerity and keen appreciation.

EI9D appreciates his appointment and, with the help of the membership, will do his best to justify it.

A sub-committee of I.R.T.S. conferred recently with the Post Office authorities, as a result of which several concessions have been obtained. These include:

(1) Permission to use CQ call.
(2) Clause limiting aerial to 100 ft. has been removed.
(3) We are now classed as amateur stations and not private experimental stations. Hence new licence applications need no longer include precise particulars of experiments. A general outline is sufficient.

The subject of high power permits and of general interference was also discussed, when rulings satisfactory to the amateur were given.

A cup has now been presented to I.R.T.S. for annual competition in connection with B.E.R.U. tests. Rules have been drawn up and it is said that some South Dublin ops. have already cleared a space on the corner of the mantelpiece! Anyhow, OMs, please make it a good entry.

Reports are few. EI5F is doing his usual good work on 28 Mc. His DX to date seems to include all but the planets. BRS1645, BRS1932 and BERS329 have licence applications in and are collecting transmitting gear in the expectation of early permits.

In respect to the memory of our late Sovereign H.M. King George V, and as a mark of sympathy with the Royal family, all amateur transmissions in EI remained closed down on Sunday, January 26.

Malaya and Borneo

By VS1AA.

Two interesting DX achievements are to be recorded this month, VS1AJ worked a W1 and VS2AG a VE2; these are possibly first contacts from Malaya.

Mr. Cawood, BERS303, of British North Borneo, has received the call VS4CS. Good luck, o.m.

During January VS1AA was pleased to welcome Mr. Maxwell, ex G2RQ, Mr. Williams, VS2AE, and Mr. Spotswood, BERS244. The latter is now stationed in Penang.

The letter budget has at last arrived back, after considerable delay. In future, those who show no interest in this feature will not be circulated.

VS1AA received a cryptic message from VS6AQ via 1AJ regarding the salmon he caught whilst on leave! Quite true, o.m.—caught, not poached.

VS2AG has prepared some interesting DX charts, copies of which can be obtained from 1AA.

Malta.

By ZB1C *via* ZB1E and G2VV

Owing to the B.E.R.U. Contest the February meeting was held on January 26 at ZB1E's QRA, and proved a success.

ZB1C took part in the Transatlantic Tests on 1.7 Mc.; BERS25 is listening on this band every week-end and logging the tests heard. ZB1E and ZB1H report active on 14 Mc., and state that this band continues to be useful for DX work, this condition being exceptional for the time of the year compared with previous years. ZB1H reports a very unusual contact with W at 07.00 G.M.T. and ZB1E reports that although many W stations are being heard after 19.00 G.M.T., efforts to contact them prove fruitless. This one-way phenomenon existed also last year.

The 7 Mc. band is coming into its own and QRN is less troublesome. On 28 Mc. conditions appear to be falling off somewhat, and BERS25, who has joined the 28 Mc. group, states that conditions are the same as in G.

This month we welcome BERS324 and 331 and BRS1289 to our group. They report active and busy rebuilding RX's for the B.E.R.U. Contests. Our thanks are due to G6ZT, 6QS, 6IF and 6YR for the R.S.G.B. message regarding the Silence Day on January 26.

Members are notified that the March meetings will be held on the 8th and 22nd at ZB1E's QRA at 6.30 p.m.

Rhodesia

By ZE1JB.

There is nothing of particular interest this month, and the 28 Mc. band appears to be rather dead, as no reports of activity have been received. Several of the Bulawayo men are still on that frequency, however, and Mr. Lowth has logged over 150 North American stations this month. There are a lot of Americans to be heard, but it is difficult to say if it is the fundamental or a harmonic of the 14 Mc. band which is being heard. Certain things point to the latter fact, because ZE1JU has persistently called them, without success, even under good conditions.

Generally speaking, the present is a slack time, as everyone seems to be getting ready for the next

B.E.R.U. contest, for which, unfortunately, ZE1JB is likely to be away. However, there should be a good amount of competition this year, as there will be seven or eight participants. May conditions be good, and may the best man win.

I have had no reports on the 3.5 Mc. tests in December, except from ZE1JE, who states that on the first week-end he heard a good number of both British and American signals at good strength. After that, however, he says that they were inaudible. One would have thought that conditions on that frequency would have been fairly consistent, but, of course, at this time of year the local WX is such that it can never be relied upon in any way!

Bulawayo amateurs using superhets all complain that for the last three weeks—that is, since about December 20—they have been seriously troubled with interference from the Daventry Station towards the high-frequency end of the 14 Mc. amateur band. They have different types of sets, but, if my memory serves me correctly, none of them have a pre-detector H.F. stage or are fitted with pre-selectors. They wonder if it is the fault of the sets, and, if so, why the interference has only recently developed. Does anyone happen to know if Daventry has changed its frequency at all?

ZE1JM has worked all continents on telephony, using a system of grid modulation, and this is very good work, as he does not get a very high modulation percentage. His input is about 35 watts, with some 5 or 6 watts to the driver stage.

ZE1JS has also worked all continents on telephony using an input of only 20 watts to the final, with about the same input as JM to the driver. I feel that, in view of what was said in these notes last month, it is desirable to mention the driver input. JS uses plate modulation, but I am not sure if it is Class B or Heising. ZE1JN has received a card from VK3EG, confirming a QSO on telephony at R8, which is excellent.

ZE1JT has now worked all continents on telegraphy, and awaits the cards.

The peak conditions which appear to have been reached on all frequencies during December have now passed. This is about two months earlier than last year, when the peak was during February. ZE1JY, however, states that, after 19.00 G.M.T., it is still possible to work any VK district with ease, and that PK and KA are also easy. This is on the 7 Mc. band.

The outfits used by ZE1JU and ZE1JN for their 28 Mc. transmissions are a Split Colpitts and an E.C.O., feeding a couple of stages to the final, respectively. It is regretted that JU finds it necessary to use the Split Colpitts, as there appears to be considerable QRM caused by this, with its present power supply, to other local amateurs, even on the 14 and 7 Mc. bands when JU is operating on 28 Mc. JU's aerial is a copper tube 16 ft., vertical, with 12-ft. feeders, and suspended 8 ft. off the ground. JN's aerial is a 33-ft. vertical with 8-ft. feeders. Both are of the Zepp-fed type.

South India

By VU2JP, *via* VS1AJ, VK6FO and G2ZQ.

VU2BY has been on 14 Mc., but is now rebuilding. 2EB has overcome B.C.L. interference quite successfully. 2LS now on 7,138 kc. has been troubled with a spacer. 2AU is on 7,020 kc.

VU2CQ still causes needless QRM from overmodulated phone with wide band spread on a transmitter, with all stages frequently out of lock. With VU2CQ and a commercial who works around 7 Mc., the band is often unworkable.

Our old friend Beaumont, "Beau of VU2FP," is now in England, and is, we believe, likely to transfer from Army to Air Force. (VU2FP was a welcome visitor to Headquarters on January 27.)

VU2JP recently experienced grid bias trouble, but is now putting out transmissions on 7 and 14 Mc. He asks for more notes and articles for the VU Letter Budget.

EUROPEAN NOTES

Denmark

By OZ7Z.

OZ7T, the pioneer Danish 28 Mc. experimenter, is again active on this band, using an input of 150 watts c.c. to a push-pull amplifier. OZ7G is also on 28 Mc. with 75 watts c.c.

OZ7KG has recently been QSO the States on 3.5 Mc. OX2Z, whose QRA is Eskimonaes, East Greenland, is working on all bands, and would like QSO's with G stations. QSL's can be sent *via* E.D.R.

Empire Calls Heard

G6JN, Operator, s.s. Baron Dunmore, Vizagapatam (India), to Durban, October 23-*November* 7, 1935 :—

g2ax, db, gp, nm, pl, pn, qt, 5is, ja, ml, nd, ni, rv, uf, vm, wk, xg, g6cl, cv, jz, nb, nf, nj, qx, uj, vp, ww, wy, xn, yu.

Durban to Dakar, November 11-*December* 1 :—

g2zq, 5aa, ml, 6ag, ku, nj, xn.

J. Alexander (2*AXX*), 65, *Tennyson Road, Birmingham*, 10. *From December* 22, 1935, *to January* 22, 1936 :—

3.5 Mc. : ve1ab (5.6.8), 1dz (5.6.9), voic (5.5.8), 2z (5.6.8).

7 Mc. : su1sg (5.8.9), 5nk (5.7.9), ve1ap (5.6.9), 1ev (5.6.8), 1ep (5.7.9), 1hs (5.7.9), 1iw (5.6.9), 2cw (5.6.9), 2in (5.5.9), 3fu (5.6.9), 3gp (5.5.9), vk2ks (4.6.9), 2px (5.5.9), 2rf (5.6.9), vp2km (5.7.9), zl1cx (5.5.9), 3fz (5.6.9).

14 Mc. : ve1ar (5.8.7), 1dt (5.7.9), 1et (5.7.Fone), 1ge (5.5.6), 2dc (5.6.9), 2kf (5.7.6), 3iv (5.6.8), 3uf (5.5.9), 5gi (4.6.9), vo1n (5.7.8),. 3hm (5.6.8), vo4S (5.6.9), zd8ac (5.6.8), zs2a (5.5.Fone), 5z (5.5.9), zt6k (5.6.8), 6m (5.7.9), zu6p (5.6.9).

From August 19 *to September* 21.

7 M.c : vk3uy (4.5.9), zl2ja (4.5.9), 2mm (5.5.9.), 4fo (5.6.9).

14 Mc. : su1wm (5.7.9), ve1aa (5.6.9), 1fe (5.6 fone), 1hg (5.6.8), 2dm (5.6.9), 2ug (5.6.9), 3jz (5.5.9), 3uf (4.4.9), vk2ap (5.5.9), 2bk (5.6.9), 2eo (4.5.9), 2er (5.5.8), 2ge (5.6.9), 2hf (5.6.9), 2hp (4.5.9), 2ic (4.5.9), 2lz (4.5.8), 2rx (5.5.9), 2vg (5.5.8), 3cp (5.6.9), 3gg (4.4.9), 3kx (5.5.9), 3nw (5.5.9), 3ow (5.5.9), 3uj (5.6.9), 3yp (5.5.9), 5gr (4.4.8), 5hd (5.5.8), 5jb (4.5.9), 5jc (5.5.9), 5kl (4.5.9), 5lb (4.4.9), 5md (4.5.9), 5wr (5.5.7), 6mn (5.6.8), vo1i (5.8 fone), vs1cu (4.5.8), zl4bt (5.6.8), zt6m (4.5.9), zu6b (5.6.9), 6p (4.5.9).

0-V-pentode receiver used. Figures in brackets denote signal strength and tone.

EDITORIAL.—(*Continued from page* 295.)

We shall look forward to presenting at a later date a very comprehensive account of the work which has been carried out in conjunction with the study of the C.C.I.R. question No. 4, but to make this possible the co-operation of every keen experimenter is demanded. May we express the hope that this chance will not pass unheeded?

THE 1935 3.5 Mc. CONTEST.—(*Continued from page* 305.)

Awards Committee Comments.

The Awards Committee would mention that a number of entrants failed to give full details of their station as requested; further, that several entrants should have made a better job in filling up their claims for points. The Committee also note with regret that a number of members who were operating during the contest failed to send in their entries. It should be remembered that the Council judge the popularity of a contest by the number of entries received. It is hoped, therefore, that all members taking part in future events will send in their entries and thus give their support. The Committee, who desire to improve contests from year to year, invite suggestions which should be forwarded to H.Q. in order to assist them to this end. They take this opportunity of thanking those members who have already done so.

SCIENCE MUSEUM RADIO GALLERY.—(*Continued from page* 308.)

and Mr. Garratt asks us to say that he will be very glad to consider any suggestions or offers which our members may be able to make. Objects may be either loaned or presented to the Museum. In the latter case they become national property. Occasionally, but only in very exceptional circumstances, is an object purchased.

Anyone who has some object which may have some historic or technical importance is asked to send full details to Mr. G. R. M. Garratt, the Science Museum, South Kensington, S.W.7. The Director of the Museum will be very grateful for any offers which are accepted. It should be remembered that it is not only Historic (with a capital H) apparatus which is required, but modern components as well, provided that they illustrate some invention or technical achievement of importance. No object, at any rate, is too small at least for consideration.

In particular, we are asked to enquire whether any member has the first eight volumes of THE T. & R. BULLETIN complete, or the first nine volumes of *The Wireless World*. The Science Library, which forms part of the Science Museum, does not possess these early numbers, and would be most grateful to anyone who could present them.

NORTHERN IRELAND.—(*Cont. from page* 332).

future be known as 2AZI. He is building a frequency meter, which he hopes to have calibrated at headquarters. We have to welcome Mr. A. R. Irwin (GI5TK), who is a new member.

At the last R.T.U.N.I. meeting the N.F.D. film was shown and much appreciated.

We are pleased to state that the N.F.D. fund is reaching good proportions, and outstanding subscriptions will be welcome.

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