THE T. & R. BULLETIN

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AND

BRITISH EMPIRE RADIO UNION

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AMATEUR RADIO WITHIN THE BRITISH EMPIRE

TWO events which focus attention on Amateur Radio within the British Empire are reported upon in this issue—the Loyal Relay and the B.E.R.U. Contest. Until last year, birthday messages for the then Prince of Wales were directed into this country mainly through our official Link Stations, but realising that many other members were anxious to share in the honour of handling these greetings we decided to invite all members to concentrate upon their reception. Our post bag last month fully convinced us of the wisdom of this decision, for without exception every one of those who sent in his first Loyal Relay message accompanied it with a letter expressing his pleasure at being thus honoured.

The sentiments expressed in the messages themselves provide, once again, conclusive evidence of the loyalty and affection with which our new Sovereign is held. We as amateurs feel that through the Relay we are doing our small share to bind together more closely the Empire which has been described as " one great family."

The B.E.R.U. Contest affords yet a further example of that same family spirit—right through the four week-ends in February the British Empire is in our thoughts, and it is a matter in which we can feel proud that 300 or more Empire amateurs located in every continent of the world are striving during that period to uphold their country and local Society or Group.

This year our warmest congratulations are offered to the Wireless Institute of Australia whose members, Mr. Ivan Millar (VK3EG), Mr. D. M. Adams (VK2AE) and Mr. E. Trebilcock (BERS195) have lifted Australian Amateur Radio to the pinnacle of success.

An announcement which appears in this issue concerning our new Heard the British Empire certificate comes at an appropriate time. For many years we have felt that some recognition should be given for reception of amateur signals within the Empire, but the method of applying the suggestion could not be devised. It is gratifying to record that our President, who has so often been referred to as " the Father of the B.E.R.U.," was responsible for the germ of the idea which has enabled us to present rules governing this award.

* * *

Long life to our healthy B.E.R.U. Section.

THE DX TWO

Here is a description of the Transmitter used at G5BOP during National Field Day. Its record is outstanding—450 points for the week-end; 52 U.S.A. stations worked in eight hours. W.A.C. and W.B.E. in 24 hours; input less than 25 watts. A two-valve job that can be built for a few pounds.

Introduction.

IT has been the aim of those responsible for the construction of this transmitter to produce a piece of equipment which is modern in design, comparatively simple to construct, and economical to produce.

With the many new components available to-day, it has not been an easy task to decide upon the most suitable for each specific portion of the circuit, but, in preparing the specification (see Fig. 1), the constructors have selected material which can be guaranteed to produce good results.

It is usual in describing an amateur transmitter to plunge straight into a discussion on the circuit proper, but it has been considered desirable first to mention the reasons for the choice of circuit. Those who have had experience with earlier types of such apparatus need not be told that a serious disadvantage lies in the use of numerous doubler stages, if the transmitter is to be used on more than one amateur band. Until quite recently one frequency doubler stage was necessary for each step-up from the crystal fundamental, which, in the case of 14 Mc. transmissions, meant that at least one and often two such stages were essential. With the advent of suitable valves and components, circuits which combine in one stage the functions of oscillator and frequency multiplier have been developed. In fact, it is now possible to operate a valve as a crystal oscillator on 3.5 Mc. and obtain sufficient output on 28 Mc. to drive a final amplifier to 25 watts input.

Circuits which will accomplish this have been described in detail by Mr. G. McLean Wilford (G2WD), whose articles on Transmitter Design were published in the April, May and June, 1936, issues of this Journal. In the case of the "DX Two" the designers have employed the Tri-Tet circuit and they have been able to produce a transmitter using only two valves which will operate efficiently on the 7 and 14 Mc. bands. By careful tuning, the 28 Mc. harmonic can be extracted but the newcomer is urged to "walk before he runs." 28 Mc. operation will be the subject of a short article in a later issue.

A further development in quartz crystal manufacture has proved of great value to amateurs in general; we refer to the production of the extremely robust "thick-cut" 7 Mc. crystal which can be "managed" more easily than the old type. These modern crystals cost no more than the earlier type and they have been used with great success in the transmitter being described. Examination of the operating data will disclose the fact that the output from the oscillator on fundamental and harmonic is practically the same, a fact which speaks for itself.

Contructed by

S. BUCKINGHAM (G5QF).

Described by

J. CLARRICOATS (G6CL)

and

A. BOA (G5BO).

Circuit Description.

Considering first the crystal oscillator portion of V1, it will be seen from Fig. 1 that a 25,000-ohm. *Dubilier* metalised resistance is connected in series with a *B.T.S.* Short Wave RF choke. This is a normal CO grid-filament circuit and the value of the grid leak has been selected to give the correct value of bias voltage. The choke prevents loss of RF excitation and should be included. Certain designers omit this component, but it is better practice to use one. The crystal, as mentioned in the Introduction, is a *Q.C.C.* 7 Mc. "thick-cut" type, mounted in one of their dust-proof holders.

The cathode tuned circuit consists of a *Q.C.C.* coil, wound as described in the Coil Table, and a 250 μμF *Polar* Pondero condenser with standard slow-motion dial mounted on a *B.T.S.* insulated bracket. When operating on the fundamental frequency of the crystal the cathode tuned circuit is not required. By bending one of the fixed vanes of the condenser slightly inwards the cathode coil can be shorted out when the condenser is fully in mesh.

The heater of V1 is by-passed on both sides with *Dubilier* type 670 condensers; these have a mica dielectric and the value is .01 μF. By-passing prevents RF feed-back into the filament circuit because when operating the valve as a Tri-Tet the cathode is at an RF potential.

The valve used is a *Tungsram* APP4C, which is a 4-volt indirectly-heated pentode with the suppressor grid brought out to a separate pin. As the mutual conductance of this valve is 9m/A per volt, it requires very little excitation from the crystal to produce a large RF output. The holder is a *Clix* type V7 chosen on account of its suitability for use on high frequencies. These holders are mounted on ebonite legs which reduce capacity loss, and on

this score are used throughout for both coils and valves.

It will be noticed that in this circuit the suppressor grid is not strapped externally to the "screen" but is connected directly to earth, thereby giving better screening between cathode and anode circuit. By adopting this method, the danger of excessive feed-back from the load to the oscillator circuit is minimised and consequently the risk of crystal heating and resultant fracture is lessened. When testing this transmitter, and others employing the same oscillator circuit, both cathode and anode circuits have been tuned to crystal fundamental and in no case has fracture resulted. However, no increased output is obtained by employing this method and in consequence it should be left severely alone. The ideal Tri-Tet circuit should employ a purely electron-coupled load circuit; that is to say, there should be no capacity between the control grid and the anode of the valve. When the suppressor is directly earthed the ideal condition is more nearly approached.

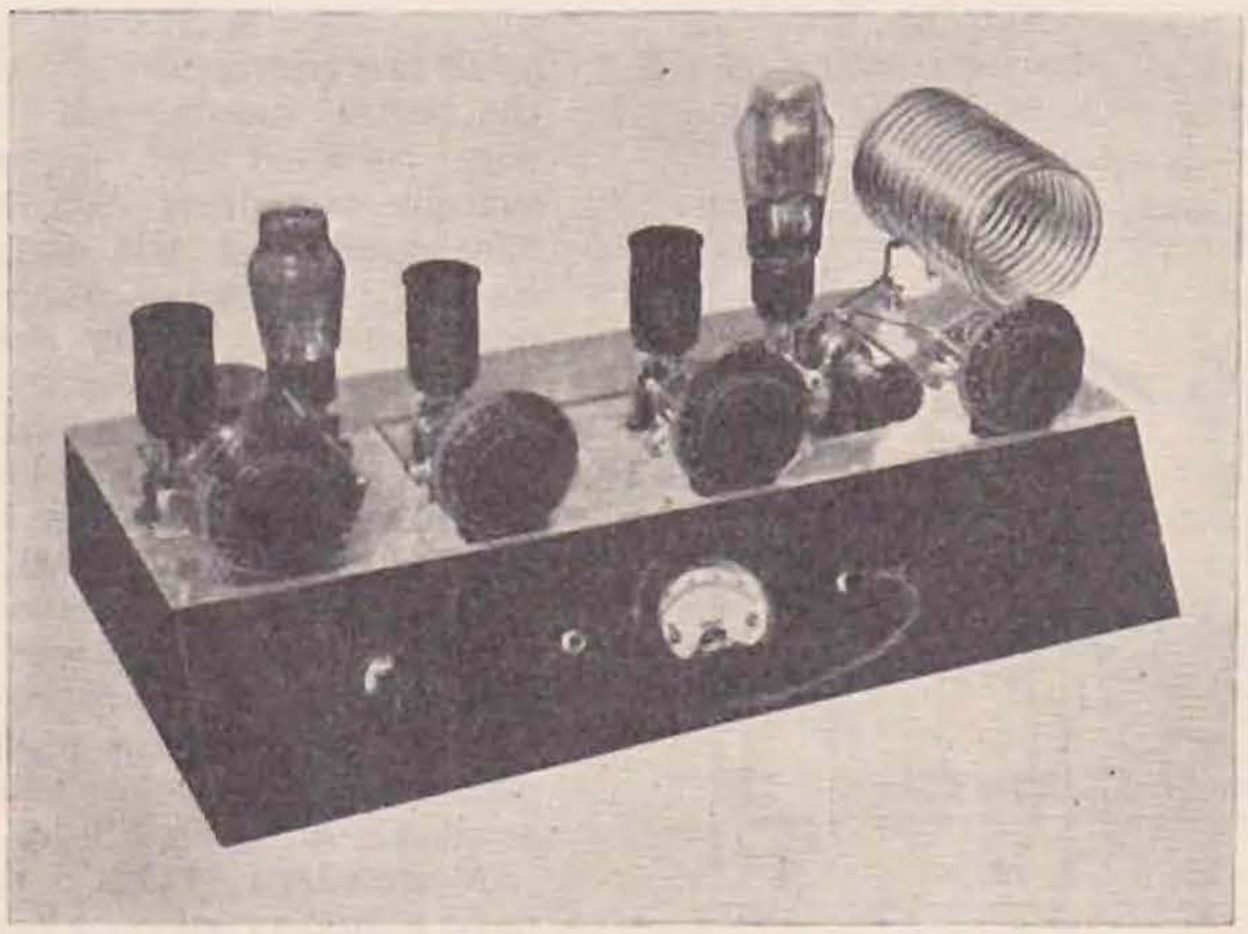
The "screen" is fed from a *Varley* 30,000 ohms Power Potentiometer, which is connected across the H.T. supply feeding the Tri-Tet stage. A potentiometer is used in preference to a fixed resistance in order to provide a more constant voltage for this electrode. Furthermore, the power output of the stage may be controlled within fine limits by adjustment of what is actually the plate voltage of the crystal oscillator. We have, therefore, a very useful means of regulating the grid excitation of the following stage and consequently the final RF output. The designers recommend that keying should be effected by breaking the "screen" supply, and here again the benefit of the use of a potentiometer is manifest. The current flowing in the key circuit is of the order of 5m/A, and in the absence of any surge voltages the risk of key click is reduced. When it is found necessary, a standard filter may be incorporated. The condenser C10, a *Dubilier* type 620 .001 μF, acts as a by-pass of RF and keeps the "screen" at earth potential with respect to RF.

The plate (load) circuit is tuned by means of a *Polar* Poplex 100 μμF condenser with slow-motion dial. The coil L2 is wound with No. 20 S.W.G. enamelled wire on a *Q.C.C.* former. This type of coil has been made standard for the cathode and plate of the Tri-Tet and the grid of the power amplifier. From experience with the design of this and similar transmitters no apparent advantage is obtained by using heavier gauge wire. The No. 20 gauge is readily obtained and is easy to handle.

The by-pass condenser C11, another *Dubilier* 620 .001 μF, holds one end of the coil L2 at earth RF potential and enables the H.T. supply to be fed at this point. It would be better practice to feed the H.T. to the centre of the coil and connect the by-pass condenser in that position, but this would leave both stator and rotor of the variable condenser at RF, and hand-capacity troubles would be experienced. No RF choke was found to be necessary in the H.T. supply lead.

In order to reduce expense only one meter is included in the specification, *Bulgin* J7 short-circuiting jacks for transferring the meter being connected in the H.T. leads of both Tri-Tet and PA. The meter is a *Ferranti* 0/150mA flush mounting type which is joined to a *Bulgin* jack-plug type P38.

We now come to the link between the stages, which consists of a single turn of No. 20 S.W.G. wound on the H.T. end of the Tri-Tet plate coil, L2, and spaced one turn from the main winding. This link turn is brought out to the "filament" pins of the former, the anode coil being terminated on the "anode" and "grid" pins. The "grid" pin is the H.T. or "cold" end of the coil.



Front View of the Transmitter. Note the pleasing lines obtained by the use of a sloping front panel.

A similar arrangement is adopted when winding the grid coil of the PA. To complete the link the "filament" pins of the two coil holders are joined by a pair of No. 14 S.W.G. *bare copper wires spaced* ¼in. The link method of coupling stages has been dealt with very fully in articles appearing in *A Guide to Amateur Radio* and the T. & R. Bulletin, therefore further discussion would be superfluous here.

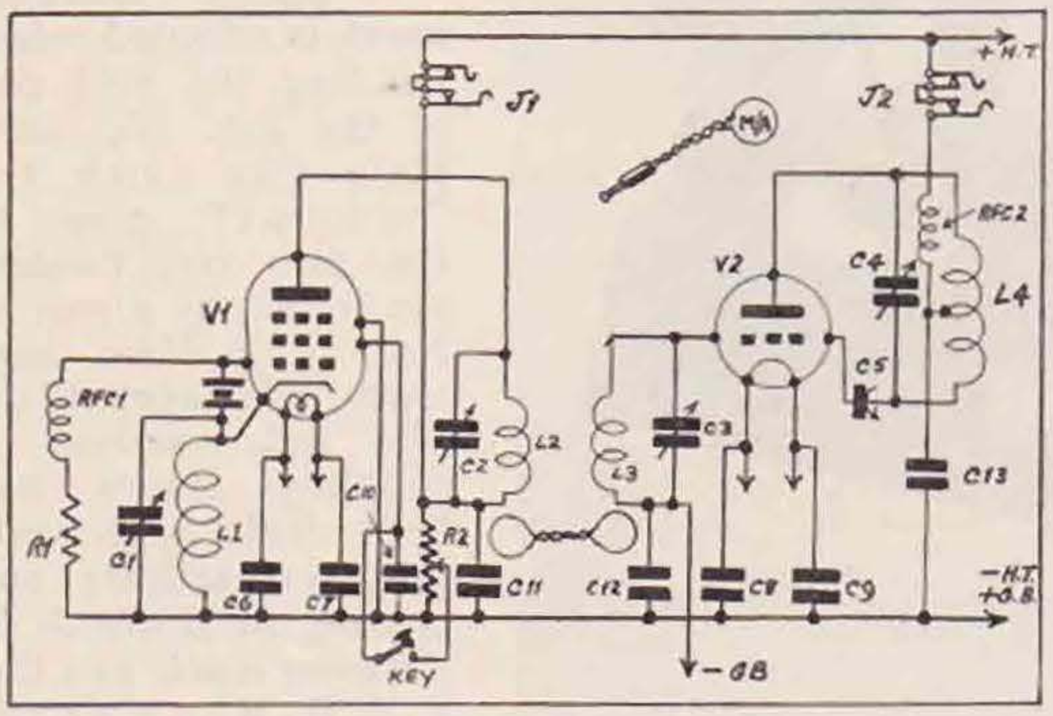
The grid circuit of the PA valve, which is a *Mullard* TZO5/20 (redesigned T25D), is tuned by a *Polar* Poples 100 μμF condenser, and the coil wound in accordance with the table. Both C3 and C2 are mounted on *I.B.T.S.* insulated brackets as the H.T. and grid bias supplies are fed to the rotors of these condensers. Another *Dubilier* 620 .001 μF. condenser is joined between one end of L3 and earth. This end of L3 must be connected to the rotor of C3 and grid bias is fed at this point. The filament by-pass condensers of the PA are the same as for the Tri-Tet stage. If it is intended to supply the filament of the PA from a transformer without a centre-tap then a centre-tapped resistance of the order of 30 ohms must be connected across the leads which go to the valve-holder and the centre point earthed.

The moving plates of C1, C2 and C3 must all be at earth RF potential, and if such is the case it will render the transmitter much more stable and easy to control owing to complete freedom from hand-capacity effects.

As the PA valve is a triode, neutralisation is

necessary and for this purpose an *Eddystone* 20 μμF microdenser mounted on a *B.T.S.* insulated bracket is used. The condenser is connected between the grid of the valve and the end of the coil remote from the plate, care being taken to locate the condenser and position the leads as shown in the photograph. This is important in order to preserve circuit balance. An *Eddystone* extension rod is fitted to the condenser and cut to the correct length to bring the knob in line with the other controls.

The PA tank circuit consists of a *Polar* Poplex 100 μμF condenser on an insulated bracket, and a *Q.C.C.* copper tube inductance mounted on two of the manufacturers' midget stand-off insulators. The H.T. supply is fed to the centre of this coil through a *B.T.S.* RF choke and by-passed with a *Dubilier* 620 .001 μF condenser. The connection is made to the centre of L4 by means of a lead which is attached to the coil with a *Q.C.C.* coil clip and connected to a midget stand-off insulator carrying the H.T. from the underside of the metal base. This method was adopted to eliminate any danger of a crocodile clip touching the aluminium chassis and short-circuiting the H.T. The connection of a jack in the H.T. lead has been mentioned previously.



Circuit diagram of the two valve tri-tet Transmitter.

C1,	*250 μμF Variable, Polar Pondero.*
C2, 3, 4	*100 ,, ,, ,, Poples.*
C5,	*20 ,, ,, type 900, Eddystone.*
C6, 7, 8, 9	*.01 μF, Fixed, type 670, Dubilier.*
C10, 11, 12, 13,	*.001 ,, ,, ,, 620 ,,*
L4,	*14 turns 3/16 in. Copper Tube Q.C.C. (for 7 Mc.).*
	8 turns ditto (for 14 Mc.).
R1,	*25,000 ohms, 1 watt, Dubilier.*
R2,	*30,000 ,, Power Potentiometer, type CP65, Varley.*
RFC1, 2,	*Short wave chokes, type 103, B.T.S.*
J1, 2,	*Jacks, type J7, Bulgin.*

Other Components.

1	*Plug, type P38, Bulgin.*
1	*7-pin valve holder, type V7, Clix.*
4	*4-pin valve holders ,, ,, ,, B.T.S.*
5	*Condenser Brackets, type UB, B.T.S.*
3	*Stand-off Insulators, midget type, Q.C.C.*
5	*4-pin Coil Formers, Q.C.C.*
1	*Enclosed crystal-holder and crystal, Q.C.C.*
1	*0-150 milliammeter, flush pattern, type 29, Ferranti.*
1	*Extension Handle, Eddystone, type 1008.*
1	*Coil clip, Q.C.C.*

Terminals.

	2 HT+ ; 1 HT— ; GB+ ; GB— ; 2 LT+; 2 LT—; 2 plain type 1001, Belling Lee.
V1,	*APP4C, Tungsram.*
V2,	*PX25, 362, or TZ05/20, Mullard.*

Chassis.

1	*21" by 9", 16 gauge, Aluminium. Paroussi.*

Constructional Details.

The chassis consists of No. 16 S.W.G. aluminium sheet supplied by *Paroussi*, the dimensions of which are 9" × 21". The sides are made from 5-ply wood cellulosed black, the joints being reinforced with small wooden battens. The depth of the " tray " is 4", and the back and front panels slope at an angle of 60 degrees to the horizontal ; this improves the appearance of the finished instrument and facilitates easy connections to the power pack terminals on the rear panel. All holes in the wooden portion of the chassis should be drilled before assembly ; the holes in the metal baseboard can conveniently be made later. Metal was chosen in preference to an insulating medium in order to keep RF currents from DC components.

The terminals, *Belling-Lee* type 1001 (type " B "), are arranged in the following order (reading from left to right looking at the back panel) :—

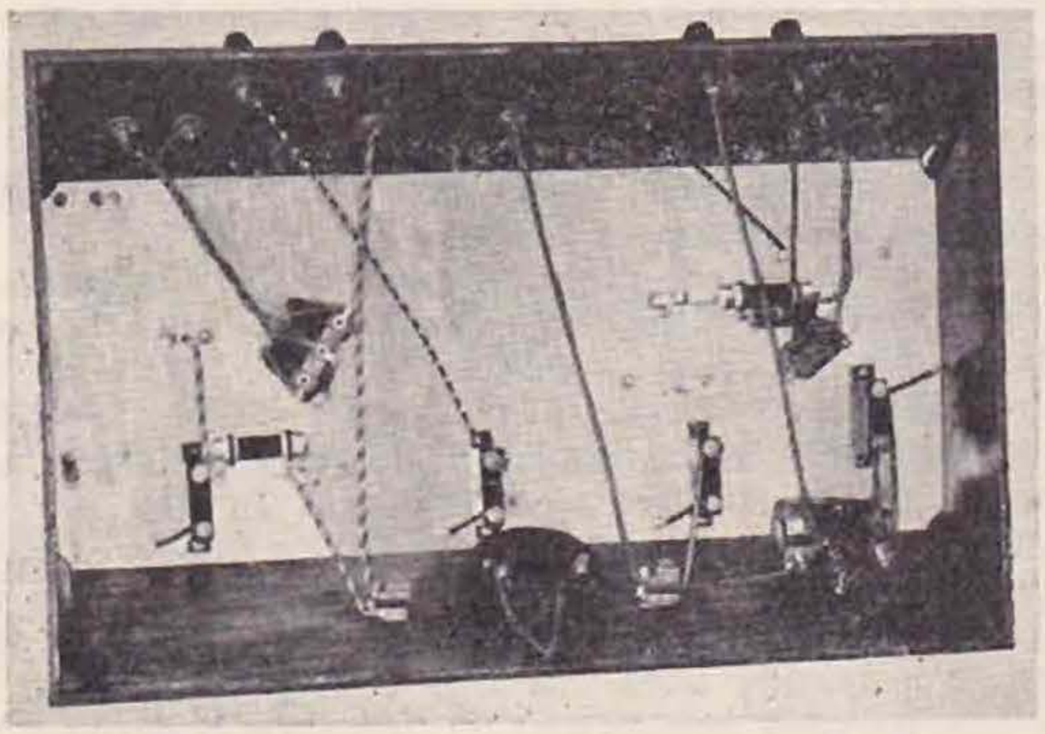
LT+ LT–HT+1 HT+ HT–LT+ LT–
GB– GB+ KEY KEY

An examination of the plan and front view photographs will show quite clearly the position of all the components. Wiring is carried out above the metal chassis with No. 14 S.W.G. bare copper wire, polished and lacquered. The " right-angle " system of wiring has been adopted above the baseboard and the finished appearance justifies its use. No loss of efficiency has resulted from the practice, but, if any doubt is expressed on this score, we would refer the reader to the portion of the article entitled " Practical Results."

Below the baseboard systoflex covered 18 S.W.G. tinned copper wire has been used for connections and all leads carrying H.T. are coloured red.

It will be remembered that an enclosed plug-in type of crystal holder was specified, which, of course, necessitates a separate holder for each crystal. On occasions when rapid frequency changing is needed and a number of dust-proof holders are not available an open holder provides a solution.

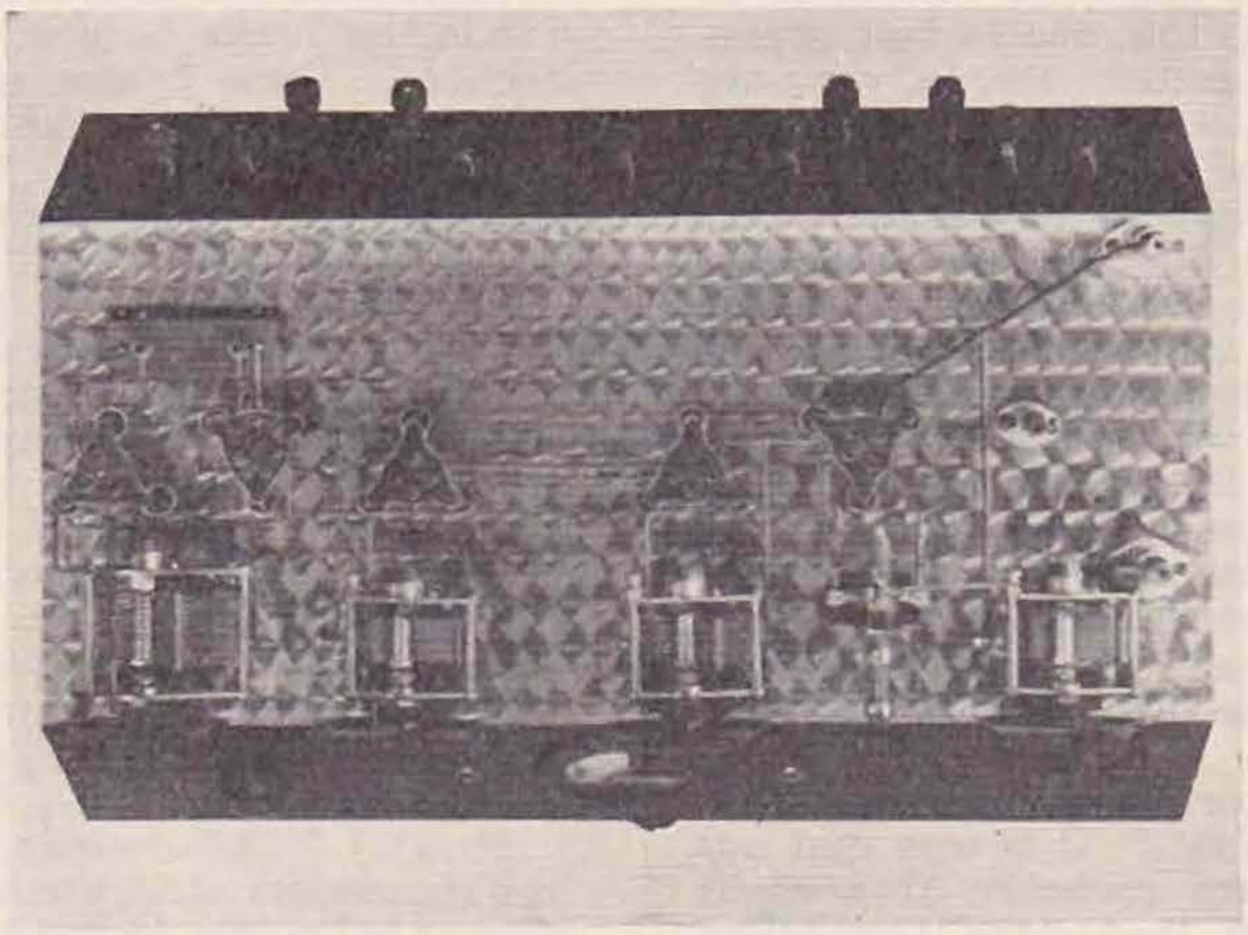
A standard *Q.C.C.* open type can be modified to fit a dust-proof type base in the following manner. Drill two holes the same distance apart as the sockets of the dust-proof base in the base of the open holder. Fit these holes with valve pins and join wires from the tops of the pins to the normal terminals. We now have available a crystal which is mounted permanently in an enclosed holder, and this can be used in an open type holder as required.



Under baseboard view showing wiring.

Operation.

We will first consider operation on the crystal fundamental frequency, which in this case is 7 Mc. For greatest efficiency an RF amplifier must be operated Class C; that is to say, the value of negative bias applied to the grid of the valve must be between twice and three times the cut-off value. Therefore, our first task is to ascertain the cut-off value at the particular anode potential used and to apply three times this voltage. For the TZ05/20 a value of about 60 volts will suffice for initial tests. Now apply anode voltage and decrease the bias until the meter in the plate circuit begins to show current. Before making any alteration in bias always cut off the H.T. In the case of a 500-volt power pack and the specified PA valve cut-off is about 40 v., and thus a 120-volt H.T. battery will serve for bias supply. Next remove the H.T. from the last valve and plug the meter into the Tri-Tet plate circuit and switch on the H.T. to this stage. Check that the cathode coil is shorted out, i.e., the condenser is full in. Now turn up the potentiometer until the arrow on the knob is about vertical and depress the key, when a reading of about 30 mA will be indicated. Swing the anode condenser until a dip is observed, and tune to minimum current; rotate the grid condenser of the PA until this minimum is seen to rise, and tune for the peak of the rise. We now have the condition of the PA being driven and a meter connected in the bias lead to this stage would show current.



Plan View of the Transmitter showing clearly the position of components and method of arranging link-coupling.

The next step is neutralisation of the amplifier which is accomplished as follows: swing the tank condenser until a rise in plate current is noted in the anode circuit of the Tri-Tet. This shows that power is being drawn from the grid circuit to the plate circuit of the PA through the small coupling condenser formed by the valve electrodes. By adjusting the value of the neutralising condenser, this coupling is balanced out and no pull will be evident between the two circuits. The procedure is simple and all that is necessary is to swing the tank condenser through resonance until uo fluctuation is observed on the meter. The neutralising condenser may be altered with one hand while the other varies the tank tuning. If a grid-meter is available the neutralising condenser can be varied until no alteration is observed in the grid current meter when tuning through resonance. Having neutralised successfully (and it is advisable to take great care in this operation), turn down the potentiometer to zero. Apply volts to the PA and plug the meter into its plate circuit. Turn up the potentiometer until a current of about 40 mA is indicated. Care should be taken when performing this operation, as only a small movement of the potentiometer is required to obtain full drive. Now tune the PA to minimum current and turn down the potentiometer as a safety measure. All that remains now is to couple the aerial and readjust the value of the potentiometer until the required input is obtained. It will not be found necessary to turn the knob of the potentiometer more than half-way round its travel.

On 14 Mc. the procedure is identical up to the point of applying voltage to the Tri-Tet plate circuit, and then continues as follows. Swing the cathode condenser until a dip in current is seen (say to about about 5 mA) then tune the anode circuit to cause a further small dip. Now swing the cathode condenser about 30 degrees further out—do not hesitate as the tuning is very flat on this condenser. Now retune the anode circuit slightly until a minimum plate current reading is again obtained. A lamp-loop is very useful at this juncture, to determine when the best position of the cathode condenser has been found. Now proceed exactly as before for the 7 Mc. output of the oscillator.

Approximate readings are given below showing how the transmitter functions when operated on 7 and 14 Mc. with inputs of 10, 25 and 50 watts.

Both valves operated rom 350*v.* 60 *mA power pack.*

(1) 10 watt operation—
Tri-Tet 15 mA, PA 30 mA.
Class C bias 60 volts.

Tri-Tet from 350*v. pack, PA from* 500*v.* 120 *mA pack.*

(2) 25 watt operation—
Tri-Tet 23 mA, PA 45 mA.
Class C bias 120 volts.

(3) 50 watt operation—
Tri-Tet 35 mA, PA 100 mA.
Class C bias 120 volts.

The above data applies for both 7 and 14 Mc. operation, as the difference between readings on the two bands was negligible.

Coil Data.

Band Mc.	*L1.*	*L2.*	*L3.*	*L4.*
7	Shorted	17½	10½	14 turns copper tube
14	7½	8½	5½	8 turns copper tube

(*Continued on page* 50)

THE SIXTH ANNUAL B.E.R.U. CONTESTS, 1936

IT is unfortunate that some means cannot be devised for making the results of International Contests known shortly after they close, because at that moment enthusiasm is at a peak, and the thoughts of what might have been are uppermost in the minds of all who have entered. That ideal can never be realised, for obvious reasons, but we trust that all who read this account of our Sixth Annual B.E.R.U. Contests will endeavour to recapture for a few moments something of the atmosphere which makes the week-ends of each succeeding February so intensely interesting.

In presenting the results of this year's event, we are conscious of the fact that it has not been possible to record all that has been written to us concerning it, but we take this, the earliest opportunity, of expressing our grateful thanks, not only to the actual competitors, but also to the many non-entrants who have by word or deed helped to make the Contests the best supported to date. Our acknowledgments are also due to those responsible for giving publicity to the event, and in particular we thank the editors of amateur and professional radio journals alike for the courtesies extended.

This series of Contests will be especially remembered for the reason that the 14 Mc. band was used almost exclusively by many competitors. The neglect of 7 Mc. is attributed to a marked falling off in DX conditions, coupled with the fact that intensive local QRM made listening a difficult operation for all but those possessing highly selective receivers.

The new method of scoring can be summed up in the one word "successful." It is true that our Australian colleagues were probably at a slight advantage, a fact which they have emphasised themselves, but the fact remains that the system seems to have removed many of the anomalies discovered in past years. There were many who felt that the new scheme would cause confusion because of the sliding scale for scoring points, but a careful examination of the entries shows that the majority of entrants understood the rules, and made good use of the special analysis form, which was provided to check the final score. There were, however, instances where the form was *not* used, and almost without exception the judges had to adjust the score claimed. On the assumption that the Council will agree to persevere with this method of scoring, the Tests and Awards Committee intend to urge strongly that the analysis form be filled in by all competitors in future contests.

The special declaration which had to be signed by non-financial members of the R.S.G.B. brought to light the fact that a fair response is being given to the Contests by such persons; this is all to the good. We hope, however, that in future years an even greater number will co-operate in our Empire Contest.

Several entries were received long after closing date. Why this should happen, we fail to understand, because ample time was allowed for entries to be received from any part of the world. The chief offenders were Australian competitors, one in particular had a score which would have placed him second in the world. His entry was not posted until April 18, but even then it might have been in time if resort to air mail had been considered. We very much regret having had to disqualify these late entries, but we feel sure the majority of our readers will support our decision to abide by the rules.

The particular entrant mentioned above did not sign the declaration that he was a member of W.I.A., therefore, even if his entry had arrived in time, it would have been disqualified as he is not a member of R.S.G.B. In one or two other cases the Committee had to disqualify entries for this reason.

The Entries.

There were 148 competitors in the Senior Section, 123 in the Junior Section, and 37 in the Receiving Section. These figures represent a 50 per cent. increase over last year, and although the Receiving event does not seem to have been supported as well as it might have been, we are well aware that many of our newer B.R.S. and A.A. men have not as yet had experience in contests of this type.

The Winners.

Three cheers for Australian Amateur Radio—and in particular for Ivan Millar, VK3EG, D. J. M. Adams, VK2AE, and Eric Trebilcock, BERS195, who are the winners of the Senior, Junior, and Receiving Contests respectively.

Ivan Millar needs no introduction—B.E.R.U. Representative for his country, leader in the 1935 VK/ZL Contest, leader in this Contest, and that his name and call sign are known wherever amateur radio is discussed. Well done, Ivan!

Mr. D. J. M. Adams is an unkown quantity as far as the chroniclers of this record are concerned, but by scoring 547 points he has demonstrated to us all that an efficient 25 watt station can achieve results almost as good as those obtained with much higher power. Only four operators in the Senior event exceeded his Junior score. Unfortunately Mr. Adams is a non-member of R.S.G.B., and therefore cannot hold the Junior Trophy, but we offer him our heartiest congratulations upon his achievement. By hard work, our old friend Mr. J. S. Nicholson (Nic of VU2JP), the present Junior Trophy holder, managed to run up the highly creditable score of 527, and thereby for the second year retains the Cup.

Those who have entered past Contests will have noticed the name of Eric Trebilcock amongst the leaders in the Receiving event. For the past two years G. C. Allen, BRS250 has managed to "pip" him of the chief honours, but this year Mr. Trebilcock, of Tennants Creek, North Australia, takes pride of place as the leading receiving station in the Empire. As a point of interest it should be mentioned that the present holder of the Trophy only entered for one weekend, but even under this handicap he scored only 204 points less than the winner.

Another well-known Australian, Mr. Max Campbell, VK3MR, finished second in the Senior, to be followed by Mr. John Hunter, G2ZQ, of London. John put up a magnificent fight, as all of us who listened in were aware, and he deserves the award which is to be his, namely, the new "Col. Thomas

TABLE 1.—SENIOR TRANSMITTING CONTEST.

Position.	Name.	Call.	Input Power in Watts.	Points.
1	I. V. Millar	VK3EG	100	757
2	M. R. Campbell	VK3MR	100	648
3	J. Hunter	G2ZQ	7 Mc. 165 14 Mc. 225	645
4	A. H. Mackenzie ...	VK4GK	70	582
5	F. Charman	G6CJ	50	517
6	H. A. M. Whyte	G6WY	200	512
*7	R. T. Manuel	VK5RT	25	502
8	R. J. Beatson	VK4BB	60/70	501
*8	F. E. Frame	ZL4BQ	80/100	501
10	P. Pennell	G2PL	50	490
11	L. A. Deane	VK5LD	44	481
12	E. H. L. Mazery	VQ8AB	30	469
13	A. G. Lapworth ...	G6DL	50	464
14	G. Merriman	VS6AH	50	460
15	A. E. Dyson	G6NJ	100	451
16	O. G. Chapman	VK2OC	150	450
17	A. Guildford	VK4AP	75 & 16	445
18	L. M. Mellars	ZL1AR	60/96	439
19	R. T. Stanton	ZL3AZ	100	426
20	L. R. Arnott	ZE1JO	30	417

* Non-Member, R.S.G.B.-B.E.R.U.

TABLE 2.—JUNIOR TRANSMITTING CONTEST.

Position.	Name.	Call.	Input Power in Watts.	Points.
*1	D. J. M. Adams	VK2AE	24	547
2	J. S. Nicholson	VU2JP	25	527
*3	C. Vernon	VK6KZ	22	483
*4	A. H. Heath	VK5ZX	25	481
5	R. J. Beatson	VK4BB	25	473
6	W. E. Lane	VQ4CRH	20/25	467
7	E. J. Dunkley	VU2LZ	25	463
	Miss M. Mackenzie ...	VK4YL	25	463
9	M. Campbell	VK3MR	7 Mc. 20 14 Mc. 25	443
*10	A. F. Frame	ZL4BQ	24	431
11	E. H. L. Mazery	VQ8AB	25	425
12	L. A. Deane	VK5LD	20/25	421
13	J. P. Thomas	SU5NK	25	398
14	F. Charman	G6CJ	25	397
*15	J. Mead	VK6LJ	23.4	389
16	O. A. F. Spindler ...	VU7FY	10	387
	C. R. Emary	VS6AX	20	387
18	L. R. Arnott	ZE1JO	25	386
*19	R. Bosman	ZS2X	20	364
20	A. G. Lapworth ...	G6DL	25	359

* Non-Member, R.S.G.B.-B.E.R.U.

TABLE 3.—RECEIVING CONTEST.

Position.	Name.	Call.	Points.
1	E. W. Trebilcock	BERS195	1,250
2	R. J. Lee	BRS1173	1,123
3	H. J. Houlding	BRS720	1,117
4	J. Alexander	2AXX	1,058
5	G. C. Allen	BRS250	1,046

Challenge Trophy." This trophy is awarded to the leading British Isles station in the Senior Section of the Contest.

Mr. A. H. Mackenzie, VK4GK, our Queensland representative, keeping up his traditional good work, was fourth, to be followed by "Dud" Charman, G6CJ, and "Ham" Whyte, G6WY. How those two scrapped during the concluding hours of the Contest!

Third and fourth places in the Junior were taken by non-members, Mr. C. Vernon, VK6KZ, and Mr. A. H. Heath, VK5ZX. Yet another Australian, Mr. Beatson, VK4BB (of 28 Mc. fame) finished fifth, whilst our old reliable Mr. "Bill" Lane, VQ4CRH, of Nairobi, put Kenya on the map by scoring 467 points to be sixth.

Mr. R. T. Lee, BRS1173, of Heathfield, Sussex, gave Great Britain a look-in amongst the leaders by finishing second in the Receiving Section, followed by Mr. H. J. Houlding, BRS720, of Bristol. Close behind came Mr. J. Alexander, 2AXX, of Birmingham, Mr. G. Allen, BRS250, of London, and Mr. S. H. Ledbrooke, BRS1581, of Dawlish.

Equipment Used.

We give below a summarised account of the equipment used at the leading stations in each section of the Contests.

Senior Contest.

(1) VK3EG — Transmitter: CO., FD., FD., B.A., PA., 100 watts.
Receiver: O-V-2, D.C. operated.
Aerials: "V" Beam ¼-wave matched 600ohm line 7 Mc. 330 ft. flat top Zepp, 7 Mc., and 132 ft. Zepp on 14 Mc.

(2) VK3MR ... Transmitter: CO., FD., BA., FD., PA., 100 watts.
Receiver: All A.C. TRF 1-V-1.
Aerial: Full wave 7 Mc. Zepp.

(3) G2ZQ ... Transmitter: CO., FD., FD., locked T.P.T.G., 165 and 225 watts.
Receiver: Hammarlund Comet Pro.
Aerial: 134 ft. end-fed Hertz.

(4) VK4GK ... Transmitter: CO., BA., PA., 70 watts.
Receiver: O-V-1.
Aerial: 66 ft. flat top with 50 ft. Zepp feeders.

(5) G6CJ ... Transmitter: CO., BA., FD., FD., PA., 50 watts.
Receiver: Home-built Crystal Gate Super-heterodyne.
Aerial: As R.E.S. Notes, December, 1935.

(6) G6WY ... Transmitter: CO., FD., FD., locked P.A., 200 watts.
Receiver: S.S. Super-heterodyne.
Aerial: 134 ft. Straight tapped for both bands.

(7) VK5RT ... Transmitter: CO., PA., 25 watts.
Receiver: 7-valve Superhet.
Aerial: 66 ft. Zepp.

(8) VK4BB ... Transmitter: Multi-stage to push-pull P.A., 60-70 watts.
Receiver: 1-V-1.
Aerial: 133 ft. Zepp.

(8) ZL4BQ ... Transmitter: Tritet BA., BA., PA., 80-100 watts.
Receiver: 6-valve S.S. Superhet.
Aerial: ¼-wave 7 Mc. Zepp.

(10) G2PL ... Transmitter: Tritet FD., B.A., PA., 50 watts.
Receiver: 1-V-1.
Aerial: 66 ft. Windom.

Junior Contest.

(1) VK2AE ... Transmitter: CO (53), BA., FD. (46), link-coupled to PA (45).
Receiver: 1-V-1, A.C. (58-58-56).
Aerial: 66 ft. Matched Impedance, 90 ft. to 70 ft. high.

(2) VU2JP ... Transmitter: CO., FD., PA.
Receiver: Eddystone Ham Band Two (1932).
Aerial: ½-wave V.F. Hertz.

(3) VK6KZ ... Transmitter: CO (47), FD. (46), PA (46).
Receiver: Reinartz O-V-1.
Aerial: ½-watt Hertz for 7 Mc.

(4) VK5ZX ... Transmitter: Tritet CO. (802), PP., PA (246).
Receiver: 7 valves Crystal S.S.S.
Aerial: Full-wave on 7 Mc., Vertical 50 ft. Zepp feed.

(5) VK4BB ... As for Senior.

(6) VQ4CRH ... Transmitter: T.P.F.G., Valve, PX2100.
Receiver: Eddystone Ham Band Two.
Aerial: 66 ft. Windom.

(7) VU2LZ ... Transmitter: Tritet (59), PA (RK20).
Receiver: H.F. Pen-H.F. Pen-Pen.
Aerials: Horizontal and Vertical ½-wave V.F. Zepp.

(7) VK4YL ... Transmitter: 47 CO., TC04/10 Buffer, RCA 800, PA.
Receiver: O-V-1, 2 Philips E424's.
Aerial: Zepp 66 ft. Flat Top, 50 ft. Feeders.

(9) VK3MR ... Transmitter: CO. (47), FD. (47), BA. or FD. (800), PA. (852).
Receiver: AC-TRF, 78-78-42.
Aerial: Full-wave 7 Mc. Zepp, 102 ft. down to 41 ft. high.

(10) ZL4BQ — Transmitter: Tritet CO (59), BA (46), BA (210), PA. (210).
Receiver: 6-valve S.S.S.
Aerial: ½-wave 7 Mc. Zepp.

Receiving Contest.

(1)	BERS195	O-V-1	(6)	BRS1581	O-V-1
(2)	BRS1173	O-V-Pen	(7)	BERS297	O-V-2
(3)	BRS720	O-V-1	(8)	BERS265	SG-V-2
(4)	2AXX	O-V-Pen	(9)	BRS1535	1-Vo-1
(5)	BRS250	5 Band 2	(10)	BERS25	SG-V-Pen

The Final Positions.

SENIOR CONTEST.

The positions of the first 20 stations are set out in Table 1, the following is a list of all other entrants in order of merit with their scores:

21, G. E. King, ZE1JF, 413; *22*, W. G. Huppartz,* VK5GW, 403; *22*, J. P. Thomas, SU5NK, 403; *24*, J. T. Cotton, Jnr.,* VS6AF, 400; *25*,

V. E. Marshall,* VK3UK, 393 ; *26*, Lieut. E. S. Cole, G5IW, 392 ; *27*, W. P. Andrew, VE3WA, 390 ; *28*, J. H. Pullin, ZS5Z, 383 ; *29*, F. C. Clark, ZE1JS, 376 ; *30*, R. F. Cohen,* VK2TF, 368 ; *31*, D. A. Richardson, ZS1B, 364 ; *31*, D. H. Duff,* VK2EO, 364 ; *33*, W. H. Tittley, ZT6V, 363 ; *34*, W. G. Ryan, VK2TI, 361 ; *35*, J. Wilmott,* VK6JW, 360 ; *36*, V. de Robillard, VQ8AF, 354 ; *36*, J. Wyllie, G5YG, 354 ; *38*, A. D. Gay, G6NF, 349 ; *39*, R. J. Bee, VS2AG, 347 ; *40*, C. R. Emary, VS6AX, 341 ; *41*, B. M. Scudamore, G6BS, 340 ; *42*, S. B. Gibbs,* ZL1DV, 339 ; *43*, J. J. Curnow, G6CW, 337 ; *44*, J. G. McIntosh, VU2LJ, 336 ; *45*, W. E. Marsh, SU1WM, 334 ; *45*, R. A. Bartlett, G6RB, 334 ; *47*, F. L. Hawthorn,* ZL1GX, 330 ; *47*, W. E. Lane, VQ4CRH, 330 ; *49*, W. Milne, ZE1JY, 326 ; *50*, J. S. Nicholson, VU2JP, 321 ; *51*, W. F. Self,* ZL4CK, 315 ; *52*, R. Innes Walker, VQ4SNB, 306 ; *53*, C. Serle,* VK3RX, 298 ; *54*, R. D. Elliott,* VK5RD, 296 ; *55*, R. Bosman,* ZS2X, 285 ; *56*, A. J. Perkins, G6KP, 277 ; *57*, R. A. Jubb, ZE1JN, 274 ; *58*, J. C. Batchler, VK7JB, 273 ; *59*, R. Ohrbom, VK3OC, 271 ; *60*, F. E. Gilfillan, VQ4CRO, 269 ; *61*, J. A. Burrage,* VK3UW, 257 ; *62*, E. J. Lake, VK4EI, 242 ; *63*, E. J. Dunkley, VU2LZ, 241 ; *63*, J. W. Mavis, ZE1JE, 241 ; *65*, E. M. Gauci, ZB1H, 238 ; *66*, L. C. Evans,* ZL3AB, 225 ; *67*, J. Clarricoats, G6CL, 217 ; *68*, H. Biltcliffe, G5HB, 211 ; *69*, R. E. Sankey,* VK3XP, 210 ; *70*, H. L. Howes,* ZS1AL, 207 ; 71, A. O. Milne, G2MI, 204 ; 72, F. A. Alexander,* ZU6B, 203 ; 73, W. L. Harston, VK4RY, 198 ; 74, A. M. Thackeray,* VK2TA, 195 ; *75*, R. G. F. Blake, ZL3AJ, 194 ; 76, R. W. Ross*, VK2IG, 193 ; *77*, J. Lees, G2IO, 190 ; *78*, A. R. Stansfield, VO4Y, 188 ; *79*, G. B. Butler,* ZL2FA, 187 ; *80*, L. A. Moxon, G6XN, 182 ; 81, S. J. Madden,* VK6MN, 181 ; *81*, H. Yule,* ZU5B, 181 ; 83, A. J. Hilkie,* ZL2QT, 180 ; *84*, S. Riesen, G5SR, 179 ; *85*, K. Wellington,* ZL1LM, 175 ; *86*, E. G. Elliott, G5LI, 170 ; *87*, R. Anderson,* VK3WY, 161 ; *88*, S. E. James, G5JX, 160 ; *89*, J. L. Bates,* VK4UR, 156 ; *89*, P. H. Dutton, VU2EQ, 156 ; *91*, R. H. Rowe,* ZL3GR, 150 ; *92*, R. E. Jones,* VK3RJ, 149 ; *93*, J. K. Tutton, VK3ZC, 148 ; *94*, E. A. Dedman, G2NH, 147 ; *95*, C. Davies, VU2EP, 136 ; *96*, F. W. Garnett, G6XL, 134 ; *97*, R. H. Jackson, G6ZU, 132 ; *97*, H. J. Buckley, ZS5U, 132 ; *99*, S. C. Pleass,* ZT6K, 131 ; *100*, D. W. Leonard,* VO1C, 130 ; *101*, F. H. Cooper, G2QT, 130 ; *102*, J. N. Walker, G5JU, 129 ; *103*, W. A. Williams,* ZL1KW, 126 ; *104*, W. G. Leyland, ZE1JM, 118 ; *105*, L. O. Rogers, G2HX, 116 ; *106*, W. A. Clark, G5FV, 115 ; *106*, B. M. Orr, ZE1JT, 115 ; *108*, R. E. M. de la Pole, VS7RP, 114 ; *109*, J. Drudge-Coates, G2DC, 112 ; *110*, J. R. Ower,* VE4IZ, 106 ; *111*, A. C. Simons, G5BD, 105 ; *111*, I. C. I. Lamb, G6LD, 105 ; *111*, J. D. Chisholm, G2CX, 105 ; *114*, F. J. U. Ritson, G5RI, 104 ; *115*, J. B. Corbin, VK2YC, 100 ; *116*, A. Brown, G2WQ, 99 ; *116*, J. Mead,* VK6LJ, 99 ; *118*, E. R. Radford, G2IM, 98 ; *118*, E. S. Holden, VO1H, 98 ; *120*, W. A. W. Stevens,* ZL2HR, 94 ; *121*, D. C. McDonald, VK3DM, 85 ; *122*, L. Hill, G5WI, 80 ; *123*, H. W. D. Bailey, G5BP, 79 ; *124*, F. T. Hine,* VK2QL, 78 ; *125*, R. Barr, Gi5UR, 76 ; *126*, R. F. Galea, ZB1E, 71 ; *127*, R. E. Davies, VE3UG, 70 ; *128*, G. P. Anderson, G2QY, 69 ; *129*, G. Wigglesworth, G2BH, 68 ; *130*, F. J. Wadman, G2GK, 67 ; *131*, J. Lategan, ZS4U, 65 ; *132*, G. G. Stopani-Thomson, VS6AS, 60 ; *133*, R. L. Cunningham, VE1AS, 60 ; *134*, B. J. Nyenhuis,* ZS2S, 59 ; *135*, F. H. Pettitt, SU1SG, 58 ; *136*, R. L. Belstead, VK4EI, 57 ; *137*, L. Grech, ZB1C, 56 ; *137*, W. S. Walker,* VK5WW, 56 ; *139*, M. F. Long, G2CL, 49 ; *140*, B. Scallan,* ZU6M, 46 ; *141*, J. N. Roe, G2VV, 40 ; *142*, H. T. Brunsden,* VK2BX, 38 ; *143*, K. G. Allan,* VK3UH, 37 ; *144*, C. E. Jefferies, G5JF, 30 ; *144*, V. R. Morin, VQ8AG, 30 ; *144*, C. W. Parton, ZL3CP, 30 ; *147*, H. V. Wilkins, G6WN, 20 ; *148*, J. C. Callander, ZL4BT, 10.

* Indicates Non-Member, R.S.G.B.

Junior Contest.

The positions of the first 20 stations are set out in Table 2 ; the following is a list of all other entrants in order of merit with their scores :

21, J. Wilmott,* VK6JW, 335 ; *22*, W. H. Tittley, ZT5V, 346 ; *23*, R. W. Elliott,* VK5RD, 344 ; *24*, J. H. Pullin,* ZS5Z, 332 ; *24*, W. M. Moore, VK2HZ, 332 ; *26*, J. B. Corbin, VK2YC, 330 ; *27*, G. W. Slack, G5KG, 291 ; *28*, C. H. Castle,* VK5KL, 286 ; *29*, F. C. Clark, ZE1JS, 266 ; *30*, E. G. Elliott, G5LI, 258 ; *31*, J. G. McIntosh, VU2LJ, 254 ; *32*, C. Davies, VU2EP, 253 ; *32*, S. Riesen, G5SR, 253 ; *34*, F. A. Alexander,* ZU6B, 246 ; *35*, W. G. Leyland, ZE1JM, 234 ; *35*, W. E. Marsh, SU1WM, 234 ; *37*, F. H. Cooper, G2QT, 228 ; *37*, D. H. Duff,* VK2EO, 228 ; *39*, J. C. Batchler, VK7JB, 226 ; *40*, P. Keene,* ZT6AL, 210 ; *41*, W. G. Pyke, G6PK, 209 ; *42*, J. A. Faithful, VS8AA 197 ; *43*, L. A. Moxon, G6XN, 193 ; *44*, S. E. James, G5JX, 191 ; *44*, F. J. Towell, VU2AU, 191 ; *46*, L. O. Rogers, G2HX, 185 ; *47*, J. F. Irvine,* VK3TU, 184 ; *48*, B. M. Scudamore, G6BS, 183 ; *49*, H. J. Buckley, ZS5U, 179 ; *50*, J. N. Walker, G5JU, 174 ; *50*, R. H. Rowe,* ZL3GR, 174 ; *52*, L. C. Evans*, ZL3AB, 170 ; *53*, B. M. Orr, ZE1JT, 167 ; *54*, A. E. Walz,* VK4AW, 162 ; *55*, S. Schofield,* ZL3CU, 161 ; *55*, R. F. Galea, ZB1E, 161 ; *57*, J. T. Cotton,* VS6AF, 156 ; *57*, P. H. Dutton, VU2EQ, 156 ; *59*, T. O. Cadell, VU2EB, 153 ; *60*, C. Woodward, VK3YO, 152 ; *60*, H. J. M. Box, G6BQ, 152 ; *62*, A. Eade,* ZL2AP, 149 ; *63*, J. L. Bates,* VK4UR, 148 ; *64*, E. R. Cook, ZT6AQ, 145 ; *65*, H. T. Brunsden,* VK2BX, 144 ; *66*, H. L. Howes,* ZS1AL, 142 ; *67*, J. H. Laurence,* VK5MZ, 138 ; *68*, R. C. Barnes, G6DS, 133 ; *68*, R. M. Hall, VU2EM, 133 ; *70*, E. T. Pethers, G6QC, 124 ; *70*, D. Harrower, G6NX, 124 ; *70*, J. Drudge-Coates, G2DC, 124 ; *73*, A. Eburne, G2DK, 122 ; *74*, H. N. D. Bailey, G5BP, 120 ; *75*, R. W. Ross,* VK2IG, 116 ; *75*, W. H. Robertson, G6WR, 116 ; *75*, R. A. Jubb, ZE1JN, 116 ; *78*, H. C. Turner, G5OJ, 115 ; *79*, R. E. M. de la Pole, VS7RP, 114 ; *80*, C. R. Plant, G5CP, 112 ; *81*, A. H. Yule,* ZU5B, 110 ; *82*, S. E. Smith, G2LA, 105 ; *82*, B. Scallan,* ZU6M, 105 ; *84*, W. A. W. Stevens,* ZL2HR, 102 ; *85*, J. F. Lategan, ZS5U, 95 ; *86*, Dr. J. Lunt, ZT1Q, 94 ; *86*, L. Hill, G5WI, 94 ; *88*, R. Barr, Gi5UR, 93 ; *88*, D. C. McDonald, VK3DM, 93 ; *90*, C. R. Elsbury,* VK6JE, 91 ; *90*, E. M. Gauci, ZB1H, 91 ; *92*, C. E. Jefferies, G5JF, 88 ; *93*, W. F. Self,* ZL4CK, 85 ; *94*, E. Hine,* VK2QL, 82 ; *95*, L. M. Mellars, ZL1AR, 80 ; *96*, G. P. Anderson, G2QY, 79 ; *97*, J. H. Payton, G2JB, 74 ; *97*, S. A. C. Howell, G5FN, 74 ; *99*, G. Hutson, G6GH, 73 ; *100*, C. W. Parton, ZL3CP, 71 ; *101*, A. A. Hammond, G6AH, 70 ; *102*, J. W. Mavis, ZE1JE, 62 ; *103*, J. N. Roe, G2VV, 59 ;

103, J. T. Brown, G5TB, 59 ; *105*, H. Mee, G5MY, 58 ; *105*, T. H. Streeter, G5CM, 58 ; *107*, L. Grech, ZB1C, 52 ; *108*, E. R. A. Henman, G6HM, 48 ; *109*, J. F. Isaac, G5JI, 44 ; *110*, A. H. Ridley, ZE1JV, 40 ; *110*, B. J. Nyenhuis,* ZS2S, 40 ; *112*, F. Wiseman, G6TM, 39 ; *112*, F. W. Garnett, G6XL, 39 ; *112*, H. J. Merriman, G6GM, 39 ; *115*, J. M. Kirk, G6ZO, 38 ; *116*, B. Turner, G6ZT, 29 ; *116*, A. G. Parker, G6QZ, 29 ; *118*, R. L. Cunningham, VE1AS, 27 ; *119*, W. N. McDonald,* VK2ZT, 20 ; *119*, G. F. Wakefield, G5WG, 20 ; *121*, J. K. Tutton, VK3ZC, 19 ; *121*, R. L. Castle, G6CB, 19 ; *123*, J. R. Adams, G5KF, 10.

* Non-Member, R.S.G.B.-B.E.R.U.

Receiving Contest.

The positions of the first five stations are set out in Table 3, the following is a list of all other entrants in order of merit, with their scores :

6, S. H. Ledbrooke, BRS1581, 1,013 ; *7*, S. P. Ray, BERS297, 972 ; *8*, H. S. Brown, BERS265, 910 ; *9*, W. L. Ely, BRS1535, 908 ; *10*, P. Seymour, BERS25, 890 ; *11*, J. B. Walker, 2BVU, 787 ; *12*, D. Willis, BERS161, 739 ; *13*, H. B. Sumner, 2ASH, 729 ; *14*, H. S. Chadwick, 2BIC, 679 ; *15*, D. M. Adams, BRS1371, 671 ; *16*, J. S. Jewers, BRS1674, 640 ; *17*, M. G. Bourke, BRS1784, 629 ; *18*, C. L. Herbert,* 608 ; *19*, F. J. Barrett, 2BRF, 575 ; *20*, F. E. Wingfield, 2BIU, 518 ; *21*, H. J. Barlow, BRS1643, 462 ; *22*, E. A. Luckhurst BERS331, 427 ; *23*, E. Hargrave Pawson, 2ATU, 419 ; *24*, H. Leishman, 2BMP, 418 ; *25*, A. Taylor, BRS1558, 413 ; *26*, S. C. Isaacs, BRS2178, 371 ; *27*, R. Chadbone, BRS1873, 367 ; *28*, H. de L. Banting, 2AUB, 360 ; *29*, R. G. Street, BERS300, 338 ; *30*, C. A. Corbin, BRS1675, 310 ; *30*, D. A. Squire, BRS1729, 310 ; *32*, J. A. Hay, BRS1948, 306 ; *33*, K. C. Moss, BRS1839, 263 ; *34*, F. Capes, 2BFC, 208 ; *35*, G. A. Bryan, 2AFV, 207 ; *36*, G. A. Hook, BRS1914, 206 ; *37*, J. Wylde, 2BHA, 205 ; *38*, D. Ross, 2ARZ, 104 ; *39*, A. T. Soper, BRS1676, 102.

* Non-Member, R.S.G.B.-B.E.R.U.

General Comments.

"High endeavour—well rewarded," admirably sums up our views of these Contests, for if preparedness and concentration had not been among the virtues of the 300 odd competitors, this story could not have been written.

It is an interesting point to note that Mr. Millar, VK3EG, in spite of the scoring system being a little in favour of VK, made no less than 118 contacts in 22 zones.

The usual support was given to the contests by the larger Dominions (excepting Canada), but we had a pleasant and gratifying experience when we judged the contest to find that no less than 8 Southern Rhodesian amateurs had entered. As there are only about a dozen licensed ZE stations, the percentage of support was remarkable.

On the other side of the picture, it was most disappointing to find only *five* Canadian entries. Why our VE friends should be so reluctant to support an event which is of special interest to them passes our understanding. We hope that these remarks will be read by our Canadian members, and also by the secretaries of the several Clubs which are affiliated to the B.E.R.U. of Societies.

Another surprising feature was the complete absence of Irish Free State entrants, this in spite of the fact that our Representative, Capt. Noblett, EI9D, had offered a trophy for the leading I.F.S. station.

Conditions on the whole, as far as 14 Mc. was concerned, were considered generally good. Eloquent proof of what may be achieved when a large number of stations are active simultaneously was demonstrated by the numerous contacts between Southern Rhodesia and Australia, and also between Canada and New Zealand and Australia. The ZE's have finally disposed of the idea that contacts with VK are particularly difficult.

One of the most interesting features noticed by the judges was the entire absence of multi-valve receivers at the stations which led the Receiving Contest. A detailed analysis of the reception logs shows that 312 British Empire stations were heard working in 30 zones. Six stations were logged on 28 Mc. and one on 3.5 Mc. One or two entrants in the Receiving Section claimed the 50 bonus points twice for a particular zone, once on 7 and once on 14 Mc. This mistake has brought down their original scores by as many as 200 points.

The Zone Winners.

In accordance with the rules, Zone Awards will be issued to the following :

Senior Contest.

Australia	I. V. Millar ...	VK3EG
Australia	A. H. Mackenzie	VK4GK
Australia	J. H. Wilmot ...	VK6JW
Egypt	J. P. Thomas ...	SU5NK
Great Britain ...	J. Hunter ...	G2ZQ
Hong Kong ...	G. Merriman ...	VS6AH
India, N. ...	J. G. McIntosh	VU2LJ
Kenya	W. E. Lane ...	VQ4CRH
Malta	E. M. Gauci ...	ZB1H
Mauritius ...	L. Mazery ...	VQ8AB
Newfoundland ...	A. R. Stansfield	VO4Y
New Zealand ...	L. M. Mellars ...	ZL1AR
New Zealand ...	F. E. Frame ...	ZL4BQ
Southern Rhodesia	L. R. Arnott ...	ZE1JO
South Africa ...	D. G. Richardson	ZS1B
South Africa ...	J. H. Pullin ...	ZS5Z

The Council have also agreed to award a Zone Certificate to Mr. W. P. Andrew, VE3WA, the leading Canadian station.

Junior Contest.

Australia	D. J. M. Adams	VK2AE
Australia	A. H. Heath ...	VK5ZX
Australia	C. Vernon ...	VK6KZ
Great Britain ...	F. Charman ...	G6CJ
India, N. ...	J. G. McIntosh...	VU2LJ
India, S.	J. S. Nicholson...	VU2JP
Malta	R. F. Galea ...	ZB1E
New Zealand ...	A. Eade	ZL2AP
New Zealand ...	A. F. Frame ...	ZL4BQ
Rhodesia	L. R. Arnott ...	ZE1JO
South Africa ...	R. Bosman ...	ZS2X
South Africa ...	W. H. Tittley ...	ZT5V

Receiving Contest.

Great Britain ...	R. J. Lee	BRS1173
Malta	S. P. Ray	BERS297

Check Logs.

The Committee desire to thank all those who furnished check logs. These tokens of interest were very much appreciated.

AN HARMONIC CHECKER

THIS instrument, as its name implies, provides a means of ascertaining without any possible doubt just which harmonic is being produced by the frequency doubler or similar frequency multiplying stage in use. For the sake of clarity only the harmonics which fall in the amateur bands are shown, as only these are of use. In these days when a frequency doubler may well be a tripler, or even a quadrupler, or when a " Tri-tet " is used, it is fatally easy to make a mistake as to the frequency of the output of the stage used to excite the power amplifier.

This instrument is quite simple to build, and, providing the instructions contained herein are followed carefully, there will be no need to have the meter calibrated, unless great accuracy is required.

The Chassis.

The construction of this part is quite a simple matter. A piece of 1-16th aluminium 3½" wide and 10" long should be obtained, which should be marked off at 3½" from one end and 3" from the other, leaving a length in the middle of 3½". A small hole should be drilled exactly in the middle of the end section of 3½". This hole should be enlarged by the use of a big drill, or by other means, to take the single hole fixing nut of the *Eddystone* " Scientific " 180 μμF tuning condenser. The 3" section at the other end of aluminium sheet should be drilled to take the *Eddystone* Frequentite valveholder, which acts as the coil holder. Besides the holes drilled for mounting the actual valveholder, it is necessary to drill a hole opposite each terminal of the holder to take the appropriate wires.

The drilling of the two holes to mount the *Bulgin* F5 single fuseholder is done on the centre portion of the chassis, towards the 3" end section. When all drilling has been accomplished the two end sections must be bent up towards one another until they are at right angles to the centre portion. The tuning condenser may now be placed in position, and the dial mounted by tightening up the nut of the condenser. The knob and cursor may then be fixed in position.

Wiring.

This should be carried out with No. 16 gauge tinned copper wire covered with sistoflex sleeving. The actual wiring is very simple, for all that is required is to connect the condenser terminals to the two terminals on the valveholder which correspond with the grid winding on the *Eddystone* four-pin coils. The two terminals which correspond to the reaction winding are connected across the fuseholder, in which should be screwed a 60 mA fusebulb.

Calibration.

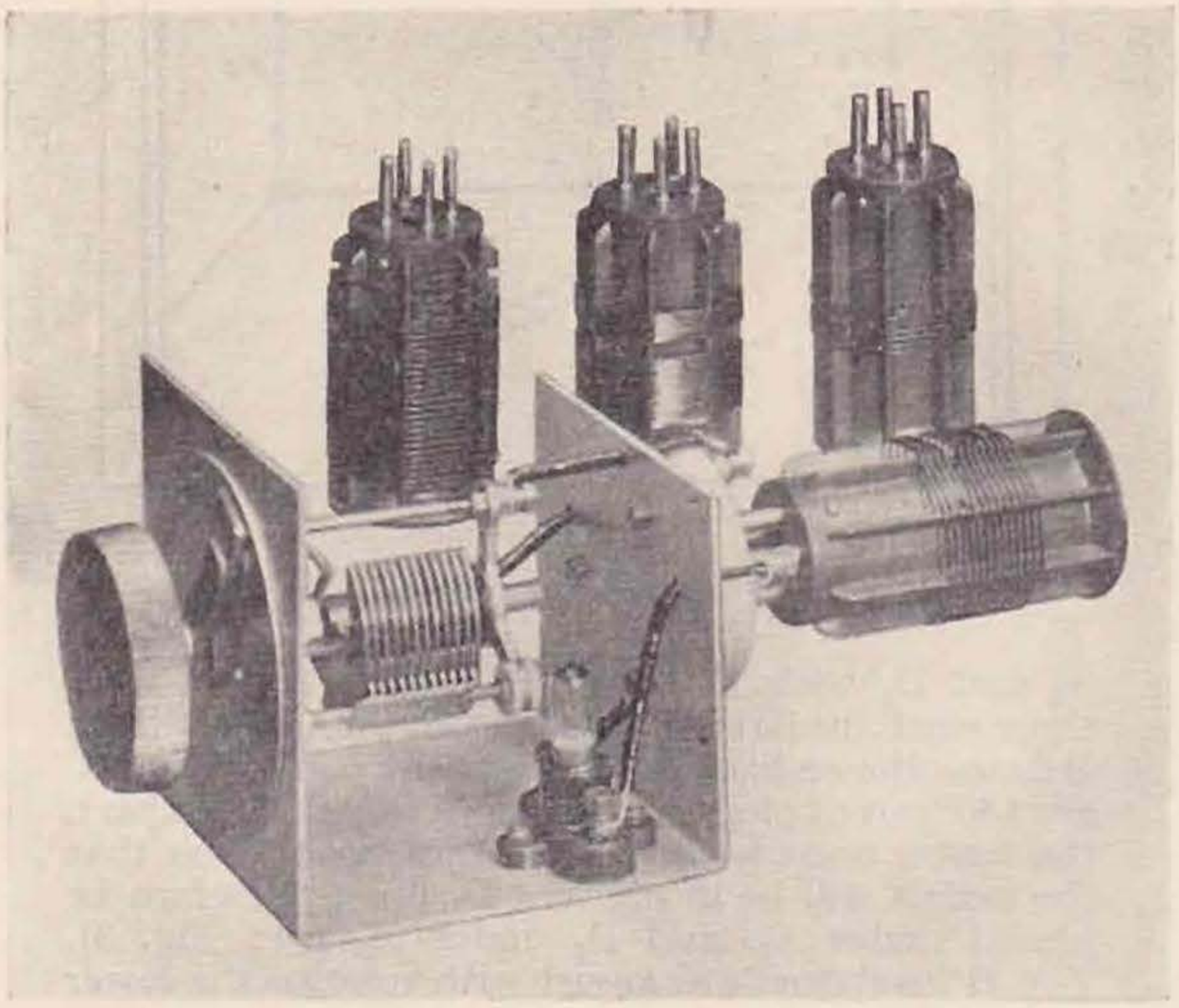
If the instrument is to be used only as a harmonic checker, no calibration whatever is necessary, providing the parts specified are used exclusively. The table shown below will apply for all instruments so built. However, should closer calibration be required, this may be effected by the usual methods. Owing to the fact that the fusebulb is not in series with the tuned circuit, resonance is very sharp, and quite accurate calibration is possible. *At the same time it must be distinctly understood that such an instrument is not accurate enough to act as a frequency meter, and it should never be used as such to adjust a transmitter for actual transmission on any band.*

In the table given below the calibration on an actual transmitter is shown. For other frequencies in the bands the difference will not be great, as the condenser is fairly large.

Calibration Table.

Eddystone 4-pin coils Cat. No. 932.

Frequency.	Type LB.	Y.	R.	W.
1,800 Kc.				81.5
3,535 ,,			63.5	14.0
7,070 ,,		78.5	11.0	
14,140 ,,	58.5	15.0		
28,280 ,,	8.0			



The Harmonic Checker.

1 LB Coil, Eddystone Type ACBE (12-26 metres).
1 Y ,, ,, ,, ACYE (22-47 ,,)
1 R ,, ,, ,, ACRO (41-94 ,,)
1 W ,, ,, ,, ACWO (76-170 ,,)
1 180 μμF Scientific S.W. Condenser, Eddystone.
1 4-pin Frequentite Valve Holder, type 949, Eddystone.
1 Knob Dial and Cursor, type 1026.
1 Single Fuseholder, type F5, Bulgin.
1 Piece 1/16th aluminium, size 10 in. by 3½in.

Belgium

By ON4AU.

Several amateurs have constructed 56 Mc. transmitters in preparation for the next season's DX. A group has been formed at Ghent, but QSO's have been made over a distance of only 40 miles.

ON4HM and 4JB had a visit from OE3AH, the Archduke of Habsburg and his wife.

ON4VK has obtained his fone W.A.C. on 14 Mc. ON4AU worked HS1PJ on 14,200 kc.

THE 28 Mc. BEAMS AT W3AIR*

By Frank C. South.

AT the beginning of 1936 we gave thought to increasing power or building a radiator that would give a decided gain. The conclusion was the opposite of that reached by most—we chose the aerial. A four-in-phase system was decided upon and, with the space, wire, ambition and help of W3FMK, we started out.

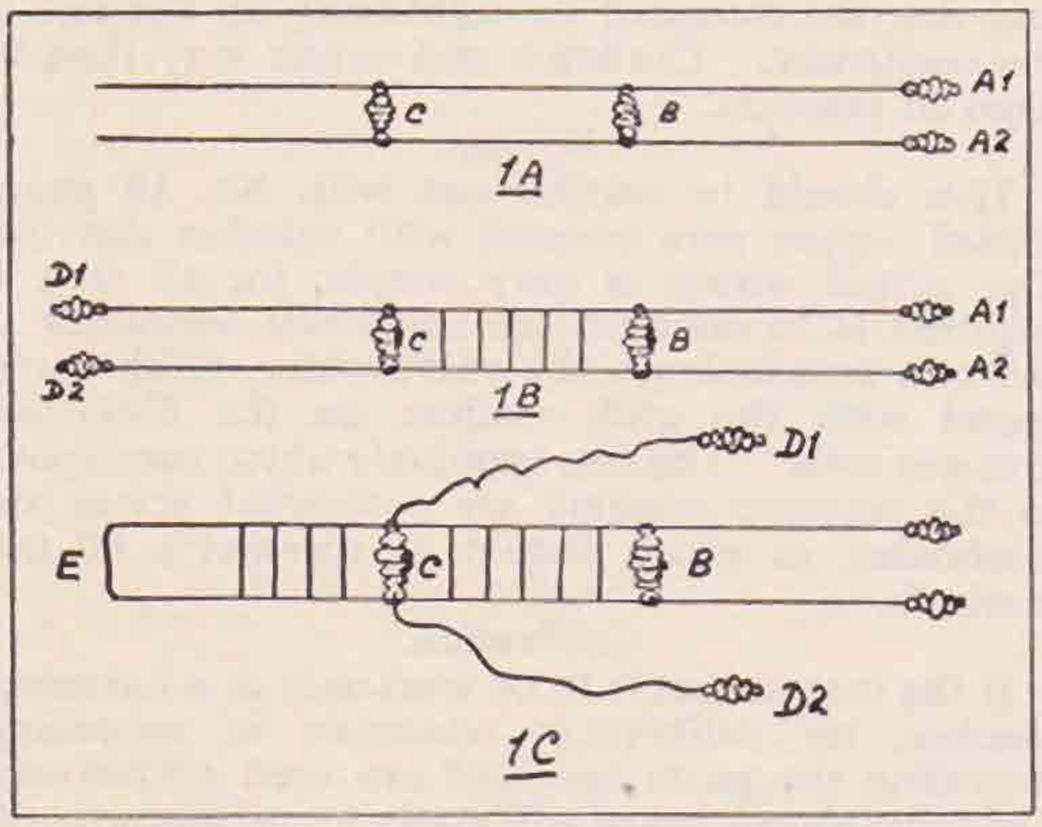


Fig. 1.

Laying out a 4-element broadside array.

The Fixed Array.

The first array was to be suspended between two light masts made of three lengths of 2×2. A 100-foot length of No. 12 enamelled copper was fastened between a large steam pipe and a motor-car, and stretched enough to provide two 51-foot lengths. Six-inch insulators were fastened to one end of each wire and the wire was suspended waist-high for convenience. Let us designate these insulators as A_1 and A_2 (see Fig. 1a). Next, two more insulators were threaded through the wires, designated B and C. B was moved to a position 16 ft. 8 in. from A, while C was placed 17 ft. from B. To the open ends of the wire were attached two more insulators, D_1 and D_2, placed 16 ft. 8 in. from C. Separator bars of six-inch steatite were inserted between B and C. Five will do the trick nicely (see Fig. 1b). BC now represents the feeder, while AB and CD become the four aerials, a pair of "double-zepps," when stretched out.

Next, a 17 ft. 2 in. piece of wire for the quarter-wave matching transformer was cut. This was folded into an elongated "U" and the ends soldered to each wire at the ends of the insulator C. D_1 and D_2 were folded back so that the "U" section could be drawn out and four separators fastened to it. A fifth one could be used at its closed end E, though it is not a necessity (see Fig. 1c). This is a low potential point and can actually be earthed if there is no unbalance in the array, affording lightning protection. At W3AIR it is fastened to wood without insulation, to hold it in place.

The completed array was then removed to the base of the poles, the halyards fastened to A_1 and A_2 and hauled up. While D_2 and D_1 could have been fastened to the masts so as to be directly under A_1 and A_2, we decided to connect A_1 and D_2, also

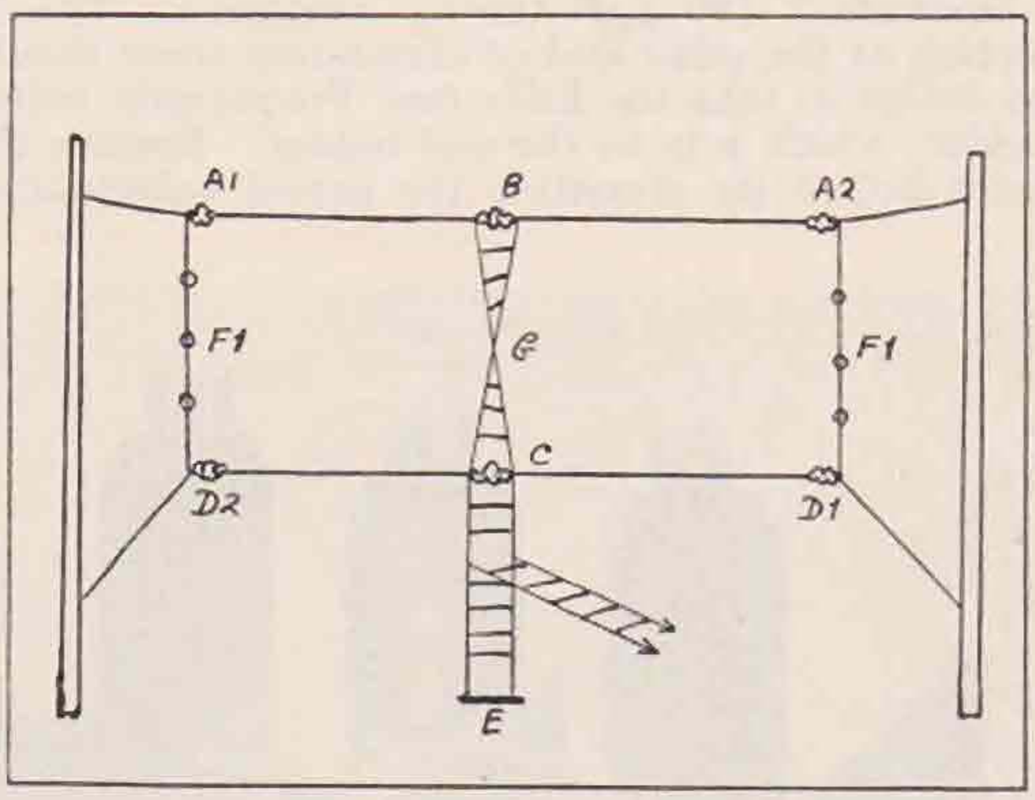


Fig. 3.

The completed array.

A_2 and D_1 with 17 foot wires, each broken with three small insulators, shown as F_1 and F_2 in Fig. 2. Because the ends of the feeder G at points B and C are 180° out of phase, being a half wavelength apart, the feeder must be given one transposition so that the aerials will be in phase. D_1 must therefore be placed under A_1, and D_2 under A_1 (see Fig. 3). The D insulators are guyed with rope to the lower part of the masts.

The transmission line is attached with clips to the stub. Tuning is similar to the "J" or any similar stub-matched aerial. The line is then soldered permanently. See the handbooks for adjustment details. Tuning the stub itself was dispensed with. This unit is supported on 35-foot

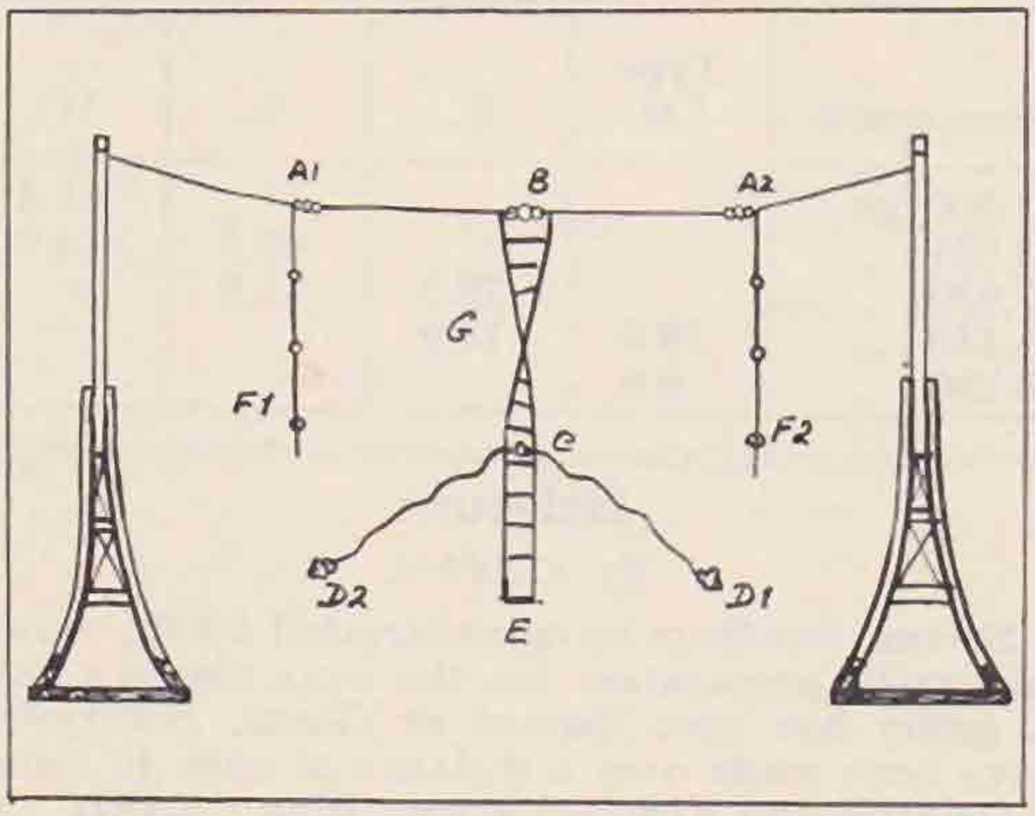


Fig. 2.

First stage of assembly. The jumper wire G must be reversed.

* We are indebted to the Editors of *Radio* for permission to publish this article.

masts above a garage roof. A taller support would be desirable if used above ground. The gain is 6 db (2), as it stands, and another 3 db can be had by using a duplicate system as a reflecting curtain, making the system uni-directional rather than bi-directional as it is at present. (3).

The Rotating Array.

For Asian signals—and for South America off the other side—another unit was constructed. It has only one mast, the upper two aerials being supported on a long bamboo spreader. This rig can be moved in an arc of 90 degrees. (See Fig. 4.)

The non-resonant lines are coupled directly to the transmitter through a double-pole-double-

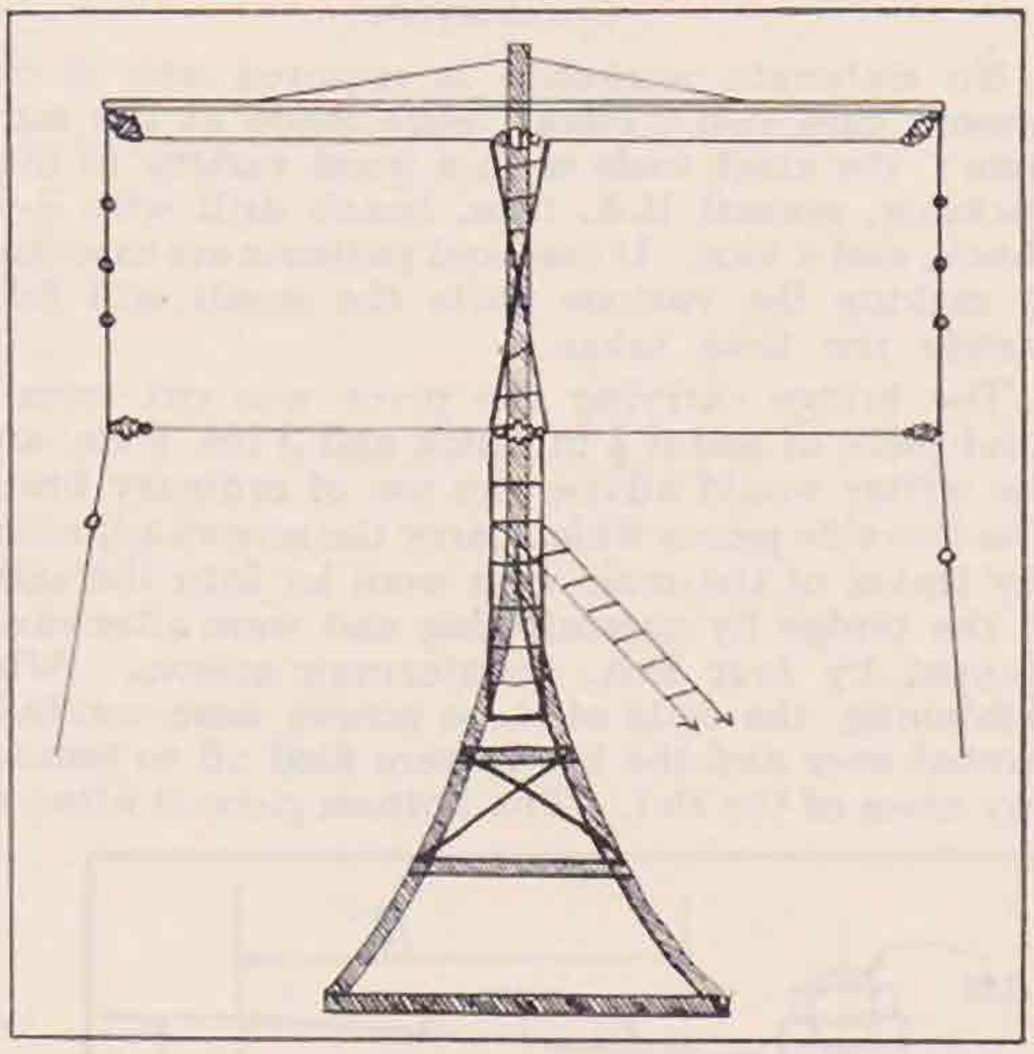


Fig. 4.

The array of Fig. 3 on rotating suspension.

throw relay which throws the aerial in use in position for receiving. The old adage holds true, " If you can hear 'em, you can work 'em."

Notes by W9FM.

(1) In this method of feeding, first one pair of aerials and then the other, any error in spacing or phase slightly disturbs the vertical directivity. Where the feeder or line can conveniently be guyed, the stub or feeder could be coupled to G, at the mid-point between B and C. The feeder G should not, then, be transposed. The stub could be replaced in either case by a tuned feeder, with some loss in efficiency. If such a feeder were connected at the centre of G, the antenna could also be used on 14 Mc. The horizontal pattern on 14 Mc. would be the same as for a half-wave horizontal aerial, but the radiation would be lower, particularly helpful at long distances : theoretical gain on 14 Mc. 3 db or double the power.

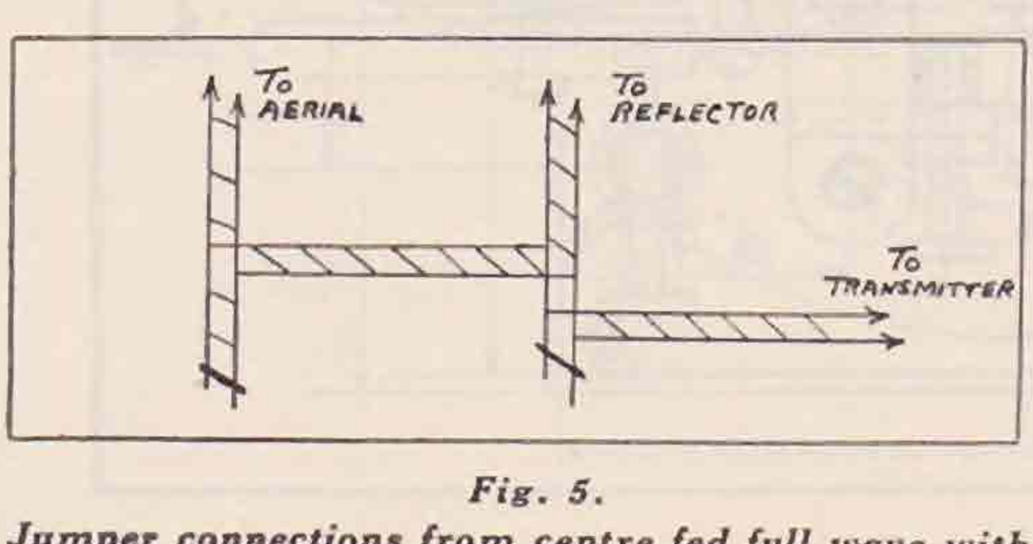


Fig. 5.

Jumper connections from centre fed full wave with reflector.

(2) Power gain of four times. Makes 250 watts sound like a kilowatt. The theoretical gain is 2 db for the " double-zepp " pairs, plus 3 db for the second pair broadside to the first. Total, 5 db. The measured gain in the horizontal plane could be greater because of the concentration of power nearer the horizontal—particularly useful above 14 Mc. Southworth (Proceedings I.R.E., September, 1930), found measured gains 1 db better than calculated, for simple beams of a similar type. A reflecting curtain would add another 3 db, making the theoretical gain 8 db. If the feeder or stub connects to the centre of G, some additional gain can be secured by making G about $\frac{3}{4}$ wavelengths long, 25½ feet, and supporting the upper aerials that distance above the lower ones. The familiar half wavelength separation for broadside aerials is a convenience not producing maximum gain.

(3) The pattern from W3AIR's array in the horizontal plane is relatively broad and bi-directional, identical with that of a double-zepp. A reflecting curtain, if used, could be supported by being connected, together with insulators A_1 and A_2 to 8½ foot spreaders so that the whole reflecting system would be $\frac{1}{4}$ wavelength from the aerials. The reflectors might not be driven, in which case there are no feeders.

EDITORIAL NOTE.

We are quite sure this type of aerial will substantiate the claims made for it. We are of the opinion that the power gain of 5 db which results from its local polar diagram is secondary to the gain which is obtained by lower angle radiation, thereby saving " hops " in long distances. An improvement of QRK of two points is predicted for really long distances.

The most generally suitable direction for G is facing E—W ; this will cover most of the globe except Africa.

(G6CJ.)

An Ode.

We could not resist the temptation to crib the following ode from the June issue of District 15 Magazine :—

" The curfew tolls the knell of passing day,
The lowing herd wind slowly o'er the lea,
And when you hear a G de VK,
You know the " Country Churchyard's " on the key."

If the meaning is obscure to any of our readers we would recommend them to listen in to the next VK DX contest !

Incidentally, the source from which the above was culled is one of the brightest efforts in " Hamdom." More than a letter budget, it gives each month in pithy paragraphs all that is worth recording in the West London and Middlesex District. A line to the Editor, Mr. J. Maling, G5JL, 15, Windsor Gardens, Hayes, Middlesex, with a P.O. for 3s., will ensure you 12 months' pleasure.

A HOME-MADE "BUG" KEY

By J. T. Wimbush * (BRS1680).

Principle of Operation.

A DESCRIPTION of how a "bug" works is no doubt the most suitable preface to an article describing the construction of such a key. The writer therefore craves the indulgence of those members of the fraternity who possess one, for it is certain that before a successful instrument can be made, a thorough understanding of the working of the key is essential.

Referring to the Fig. 1, the whole of the moving part is pivoted at P. D are the contacts for making "dashes," and it will be seen that by a movement of the handle in the direction X, the arm carrying one of the dash points pivots without moving the rest of the assembly, since the main arm is on the stop S. When the handle is released, it is returned to its normal position by the spring C. So much for the "dashes." The "dots" are made on the A contacts. If the handle is moved in the direction Y, the main arm is moved slightly and is brought into contact with stop T. Now the tendency is for the weighted bar to continue moving in this direction and the sudden stop of V at T causes the weighted bar to vibrate on the main spring Z. Thus by careful adjustment of T and A a "dot" is made every time W swings, and if the handle is held over "dots" will be made until the weight bar ceases to swing. The speed at which the weight arm vibrates is adjustable by the position of W on the bar—if W is at the far end the vibrations will be slowest, while if the weight is moved in the direction of the main spring, the rate of vibration will be increased. When the handle is released the spring B pushes V back against the stop S, and R (which is a rubber buffer) damps the swinging of the bar. The two adjusting screws at A and D are connected together and taken to one terminal and a point on the bridge is taken to the second terminal.

Construction.

No elaborate workshop is required and in the present case two "bugs" were made at the same time: the chief tools were a good variety of files, hacksaw, several B.A. taps, bench drill with $\frac{3}{8}$-in. chuck, and a vice. If care and patience are exercised in making the various parts the result will fully justify the time taken.

The bridge carrying the pivot was cut from a solid piece of metal $\frac{1}{2}$ in. thick and 3 ins. wide, and the writer would advise the use of ordinary brass. The two side pieces which carry the screws adjusting the travel of the main arm were let into the sides of the bridge by careful filing and were afterwards secured by four B.A. countersunk screws. After tightening, the ends of these screws were carefully riveted over and the heads were filed off to remove any trace of the slot. The bottom piece is fitted as

* *Auxiliary Apparatus Group.*—R.E.S.

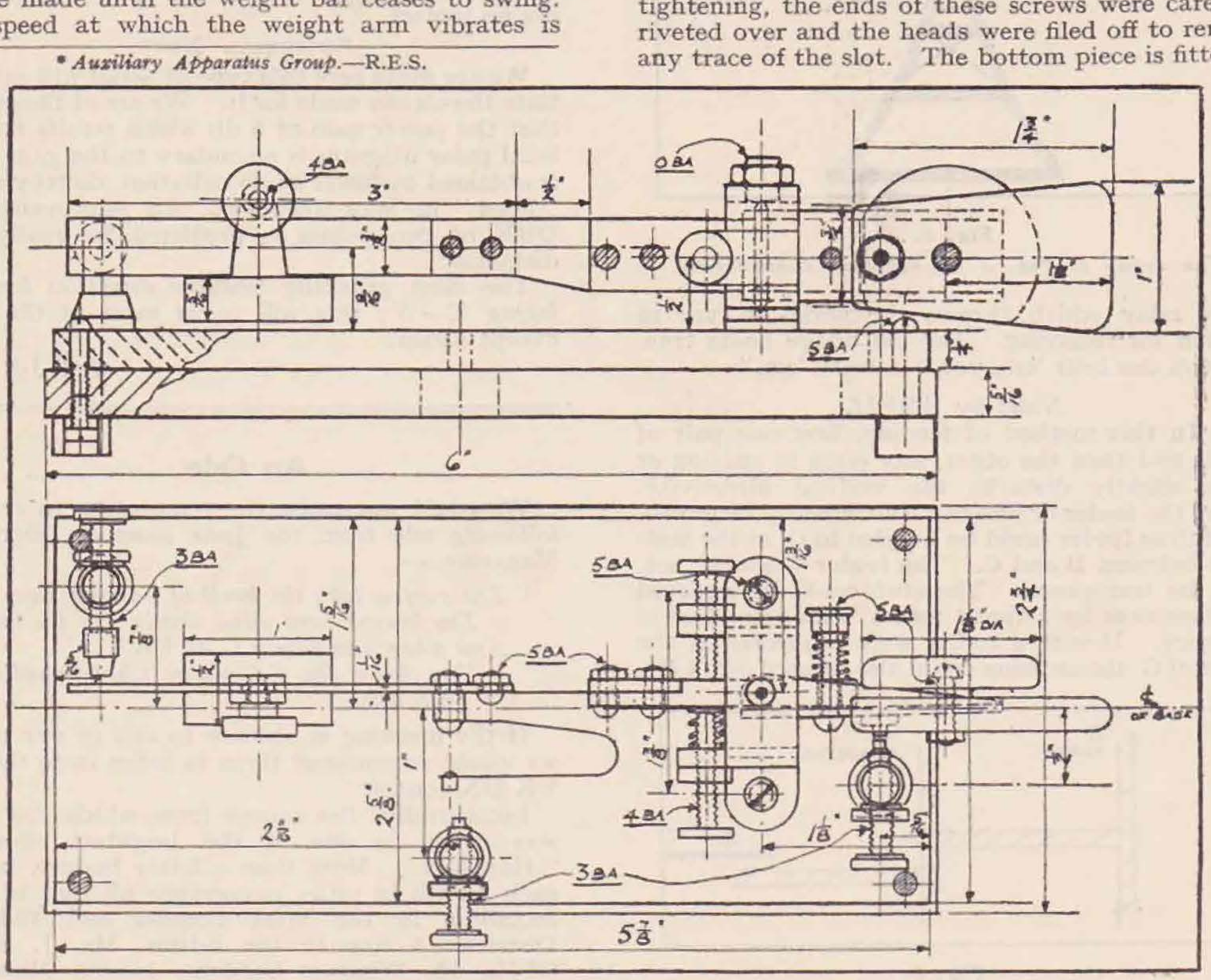
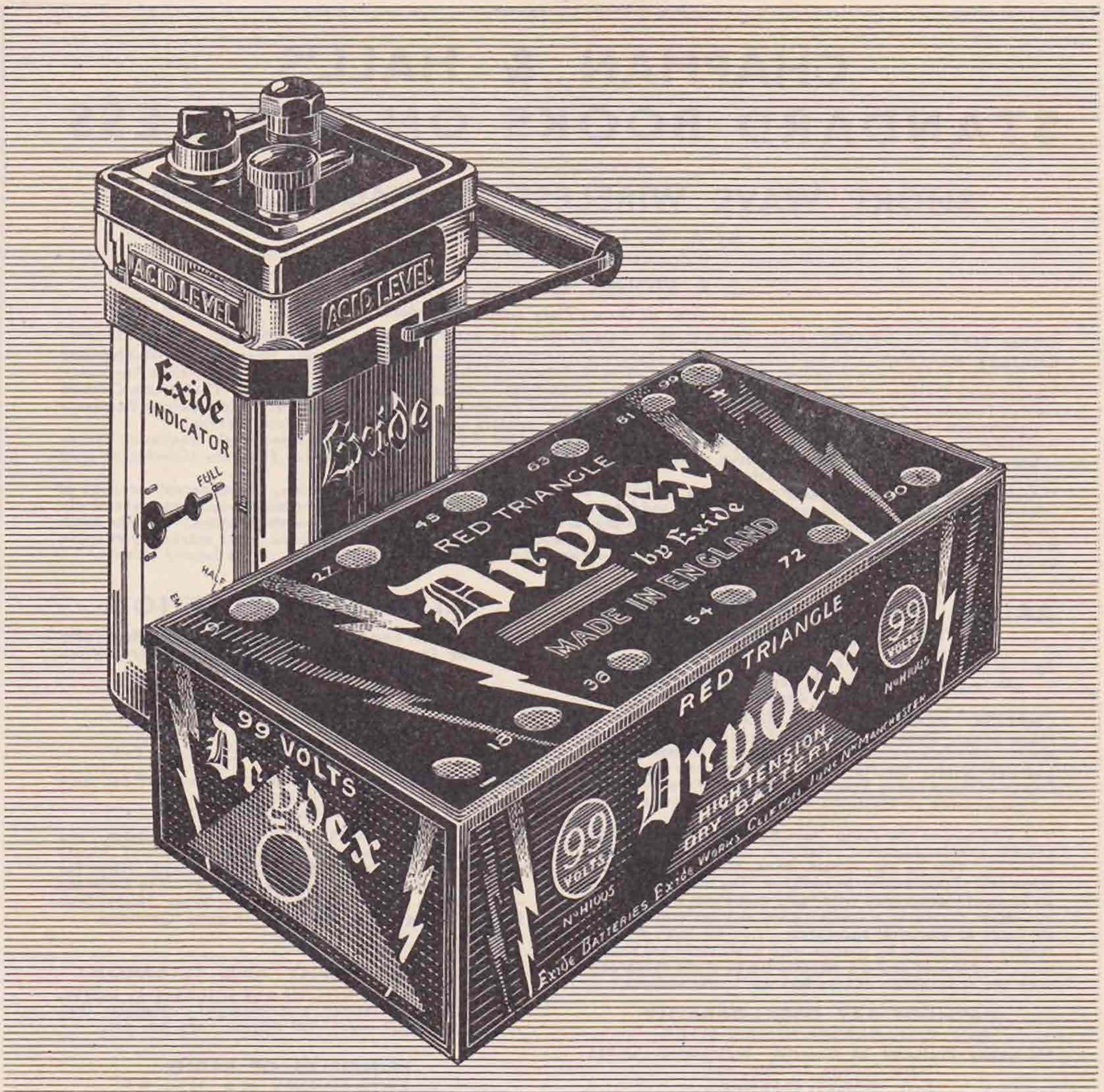


Fig. 2.
A dimensional drawing of the key.



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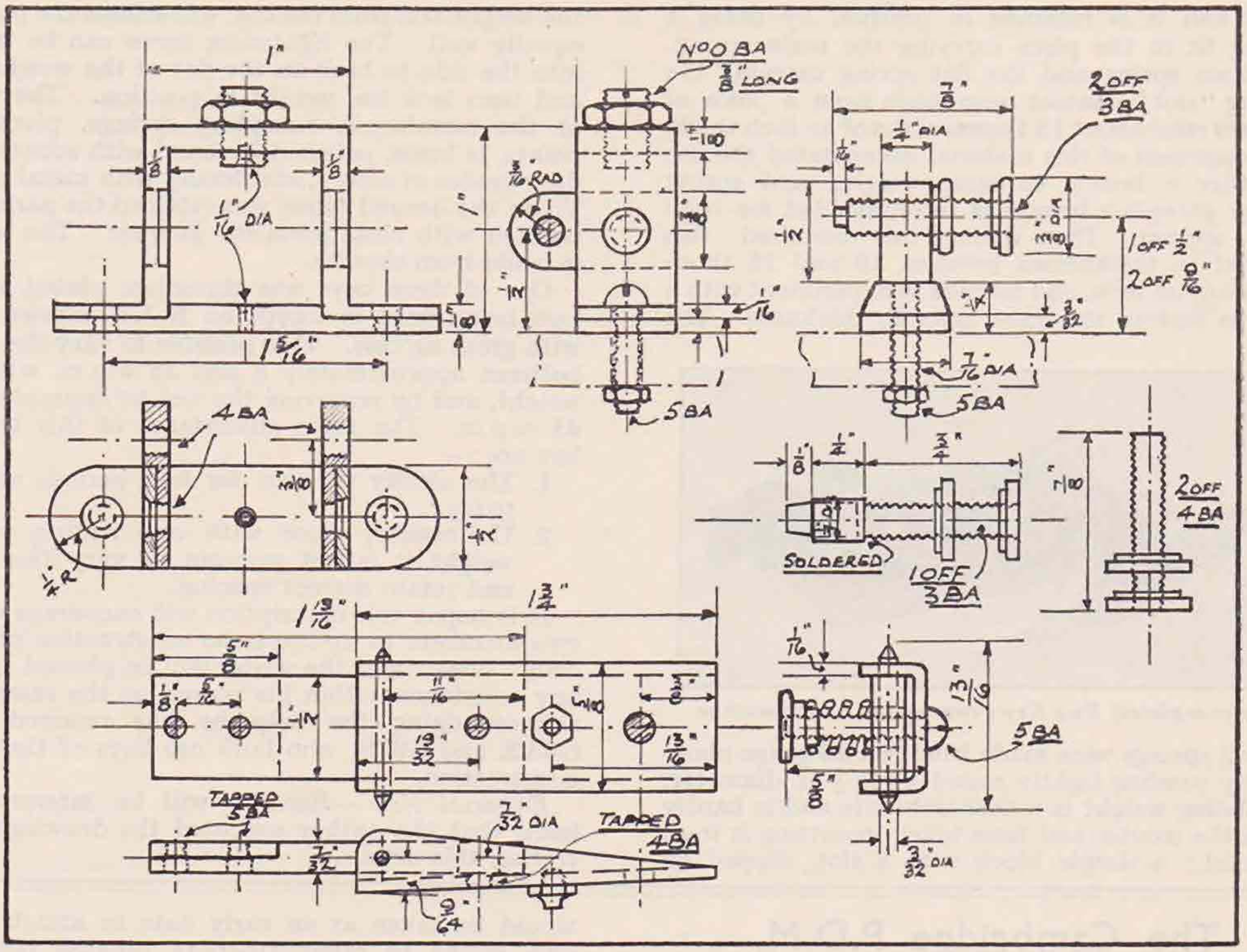


Fig. 3.

Detailed drawing of the parts used in the construction of the key described.

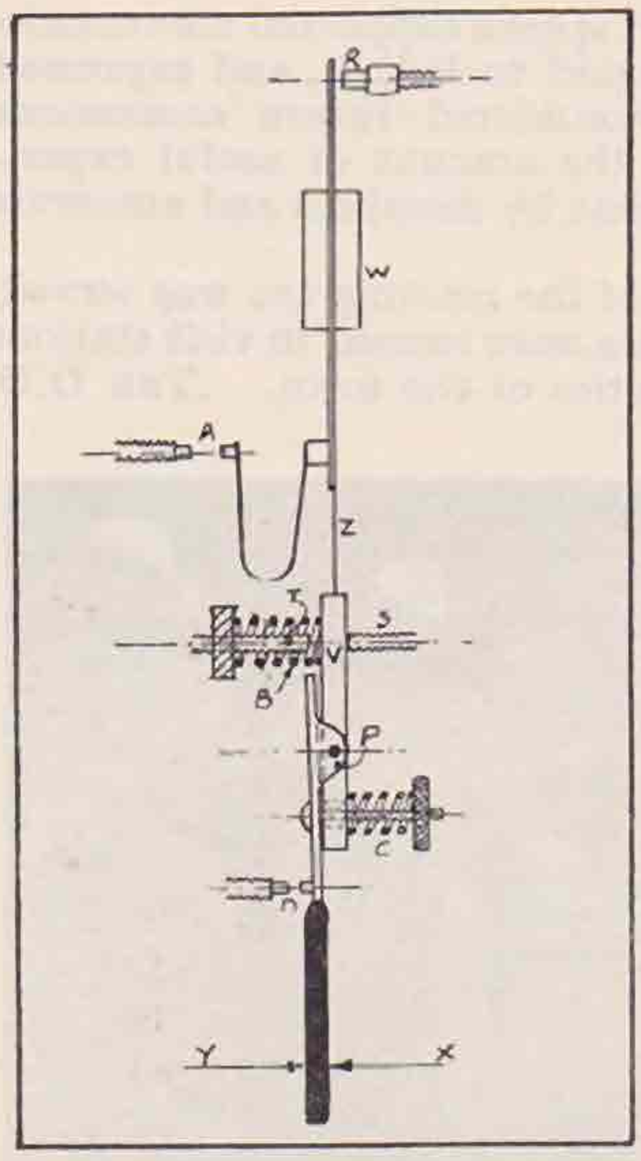


Fig. 1.

The moving arm shown in diagrammatic form.

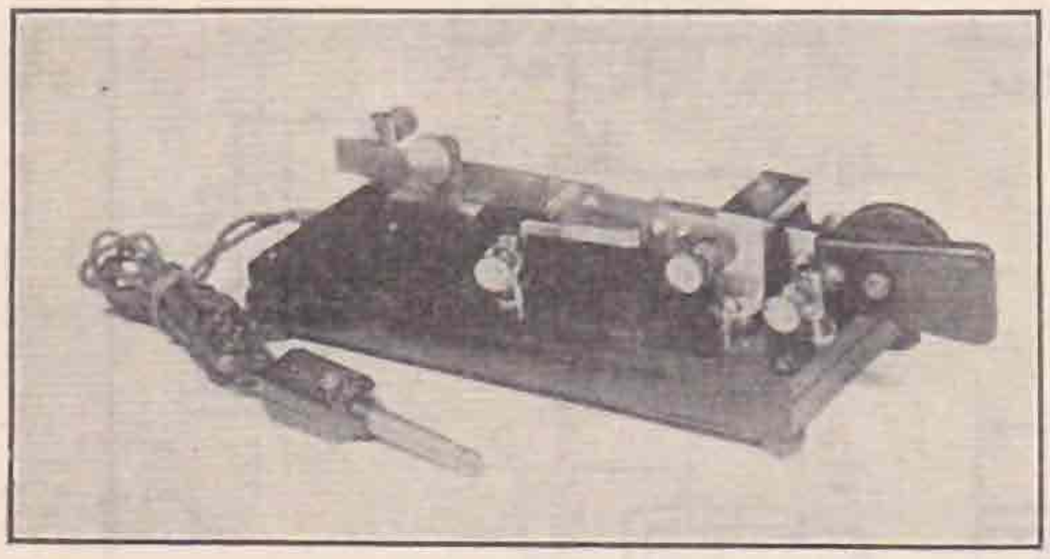
shown on the drawing. After it has been screwed on firmly the $\frac{1}{16}$-in. diameter hole may be drilled, care being taken to ensure that this hole is absolutely square with the base of the bridge both ways. The writer drilled this hole straight through from the top, afterwards opening the top hole out and tapping No. 0 B.A. The hole in the base is slightly countersunk to take one end of the pivot. The No. 0 B.A. adjusting screw is drilled $\frac{1}{16}$-in. diameter for about $\frac{3}{16}$ in. up, and also slightly countersunk to take the top end of the pivot.

It is believed that the distance between the centre line of the pivot to the centre of the adjusting screws in the side pieces could with advantage be increased to $\frac{1}{2}$ in.

All the adjusting screws and those carrying the points were made from B.A. brass rod, cut to length, one end being burred up and then a brass terminal screwed on from the undamaged end and locked onto the burred part of the thread. The junk box proved a very prolific source of material and the pillars consist of brass studs taken from a large stud switch. The bases of the pillars are plain terminal screws which were found to fit admirably. The points are made from $\frac{3}{32}$-in. diameter silver wire. The ends of the screws were drilled and a small piece of the wire was soldered in. The rear stop screw has a small thimble soldered on the end into which is forced a small piece of rubber. The pillars and the bridge are bolted on to the ebonite base, the underside of which is grooved to take the wiring. The writer preferred to have a heavy base and therefore mounted the ebonite on a piece of wrought iron $\frac{5}{16}$ in. thick fitted with rubber feet.

Consider now the swinging part, the good construction of which is most important. The piece carrying the back contact was carefully bent from $\frac{1}{16}$-in. brass. It is also important that the top and bottom flanges of this part should be a good fit on the piece which works between them. The pivot, made from the shank of a $\frac{3}{32}$-in. diameter drill, should be a good working fit in the outside

pieces and it is retained in position by being a driving fit in the piece carrying the main spring. The main spring and the flat spring carrying the moving "dot" contact were made from a piece of stainless steel about 15 thousandths of an inch thick. The toughness of this material necessitated the use of rather a heavy swinging weight, and spring temper phosphor bronze is recommended for both these springs. The writer has acquired this material in thicknesses between 10 and 15 thousandths of an inch, and intends to experiment with a view to finding the most suitable thickness. The



The completed Bug Key constructed by the author

two coil springs were made from No. 26 gauge piano steel by winding tightly round a bar ⅛-in. diameter. The sliding weight is rather elaborate and is hardly worth the trouble and time taken in cutting it from the solid; a simple block with a slot, slipped on the weight arm from the top, will answer the purpose equally well. The tightening screw can be tapped into the side to bear on the flat of the weight arm and thus lock the weight in position. The whole of the metalwork, excepting springs, pivot and points, is brass, polished by hand with successively finer grades of emery, and finally with metal polish. When the desired finish was attained the parts were painted with clear jewellers' lacquer. The handle is made from ebonite.

One of these keys was chromium plated and is now being used in Egypt on R.A.F. service work with great success. It is possible to vary the speed between approximately 8 and 35 w.p.m. with the weight, and by removing the weight approximately 45 w.p.m. The main advantages of this type of key are:—

1. The ability to send for long periods without tiring.
2. Uniformity, since with one setting of the weight it is not possible to vary the speed and retain correct spacing.

It is hoped this description will encourage one or two members to attempt the construction of their own "bugs" and the writer will be pleased to offer any assistance within his power, at the same time acknowledging the help he has received from G6AX and G6ZS, who both use keys of their own construction.

Editorial Note.—Readers will be interested to learn that the author executed the drawings illustrating this article.

The Cambridge P.D.M.

Gerald Jeapes, G2XV, our new District representative for the Home Counties, must have had a shock on Sunday, June 30, when he ran his eye over the company who had assembled at The Red Lion, Cambridge, to support his first official District meeting, for not only did he see his own District well represented but also present were our President, Arthur Watts, G6UN, Leslie Parry, D.R. North-Eastern England, John Curnow, G6CW, D.R. East Midlands, Ernie Dedman, G2NH, D.R. Southern England, T. A. St. Johnston, G6UT, Eastern D.R., and H. W. Sadler, G2XS, D.R. for East Anglia.

Among other visitors were Jack Callendar, ZL4BT, and Herr Schulzst, D4CSA. Ham Whyte, G6WY, with our President and Secretary, represented Headquarters Council.

A very enjoyable visit to the Pye Radio Works, arranged by Mr. L. Jones, G5JO, preceded the luncheon, presided over by G6UN.

During the business meeting the ladies of the party were shown the sights of the 'Varsity by Mrs. G2XV, whilst their men folk suffered in silence a 78½ minutes' speech by the only person in the Society who could be induced to hold the fort between lunch and tea. By the aid of his "little black book," famous over many years, "Clarry" put over his usual collection of facts and figures.

As no one appeared to doze off it can only be assumed that most of the information given was of interest. He drew particular attention to the new G.P.O. concessions and impressed upon everyone the urgent need to support R.E.S. Mention was made of the arrangement of counties comprising the District and an assurance given that steps would be taken at an early date to attach Herts and Bucks to other Districts because both are considerable distances from the main centre of activity in District 8.

Congratulations were offered to Messrs. Jeapes and Sadler, the D.R.'s responsible for arranging the meeting.

Mr. Watts in a short speech supported the remarks made by G6CL in regard to R.E.S., and expressed the view that he considered future concessions would depend upon the amount of useful experimental work being done by members and amateurs generally.

At the conclusion of the meeting tea was served, following which parties were formed to visit stations and inspect the beauties of the town. The O.B.

Cambridge P.D.M. June 28, 1936.
They, who put up with so much! Mrs. G6CL, Mrs. G6NJ, Mrs. G2NH, Mrs. G6LL and Miss G6NJ. Betty Curnow, of G6CW, in front.

THE LOYAL RELAY, 1936

FOR the first time since his accession to the Throne, radio amateurs throughout the Empire had the high honour of sending loyal greetings to His Majesty King Edward VIII on the occasion of his 42nd birthday.

Tremendous enthusiasm was shown for a task which at times tested the capabilities of our members to the utmost. Poor conditions coupled with severe electrical storms during the week-end of June 20-21 made reception intensely difficult, but with the determination which characterises the amateur movement we were successful in accepting messages from all major parts of the Empire with the exception of Newfoundland and South Africa. In both places we are confident that efforts were made to pass messages—poor conditions alone being responsible for the failure.

We were particularly impressed with the work carried out by numerous Home members who had little or no previous experience of relay work. Several members furnished us with a check on messages already received—a service most highly appreciated.

In one or two parts of the Empire unofficial messages were initiated, but we regret it was not possible to substitute them for the official message sent by the local society or B.E.R.U. representative.

In publishing the text of all messages we should like to explain that the routing in several instances was through different channels—in all cases the call sign of the Home station first reporting the message to our President has been given.

We take this opportunity of thanking everyone who assisted in making this Loyal Relay so successful.

The text of all messages as sent to His Majesty follows :—

BUCKINGHAM PALACE

24th. June, 1936.

Sir,

I am commanded by The King to convey to you, the Council and Members of the Incorporated Radio Society of Great Britain, His Majesty's sincere thanks for the congratulations addressed to him on the occasion of his birthday.

The King also appreciated the many loyal greetings from Radio Amateurs in all parts of the Empire, which were transmitted in your letter of June 23rd.

Yours truly,

Godfrey Thomas

The President,
Radio Society of Great Britain
53 Victoria Street, S.W.1.

MAY IT PLEASE YOUR MAJESTY.

The President, Council and Members of The Incorporated Radio Society of Great Britain wish to convey their loyal greetings and heartiest congratulations on the anniversary of Your Majesty's Birthday.

(Signed) ARTHUR E. WATTS,
President.

Antigua. From VP2AT *via* G6NJ.
June 12, 1936.

Radio Amateurs in the Colony of the Leeward Islands send loyal and devoted Birthday wishes to Your Majesty.

(Signed) TIBBITS, VP2AT.

Ascension. From ZD8A *via* G2ZQ.
June 7, 1936.

Please add the only amateur station in Ascension Island to your loyal and hearty greetings to His Majesty the King.

(Signed) MOORES, ZD8A.

Tallangatta, Victoria, Australia. From VK3EG *via* G6GO and G5VL.
June 14, 1936.

On behalf of all the Australian members of our Home Society may I convey heartiest birthday greetings to our most beloved King and an assurance of loyalty and devotion.

(Signed) MILLER, VK3EG.

Victoria, Australia. From VK3OC *via* VK3MR and G6UJ.
June 18, 1936.

The President, Council and Members of the Wireless Institute of Australia, Victoria Division, send loyal and sincere greetings to His Majesty King Edward the Eighth on the occasion of his 42nd birthday.

(Signed) OHRBOM, VK3OC.

Wynnum, Brisbane, Australia. From VK4GK *via* G6XN.
June 17, 1936.
The Radio Amateurs of Queensland send loyal greetings and sincere good wishes for a long and happy reign.
(Signed) MACKENZIE, VK4GK.

Hobart, Tasmania. From VK7JB *via* G6CL.
Loyal Birthday greetings to His Majesty King Edward the Eighth from Tasmanian Division, Wireless Institue of Australia.
(Signed) BATCHLER, VK7JB.

Trinidad, British West Indies. From VP4TA *via* G5MS.
June 13, 1936.
The Members of The British Empire Radio Union in Bahamas, Barbados, British Guiana, Trinidad, Leeward and Windward Islands extend Loyal Birthday Greeting to His Majesty.
(Signed) TRASLER, VP4TA.

Akyab, Burma. From VU2JB *via* FB8AD and G6HB.
June 22, 1936.
Kindly convey to His Majesty Loyal Greetings on the occasion of his Birthday from The British Empire Radio Union Members in Burma.
(Signed) WEDDERSPOON, VU2JB.

Glace Bay, Nova Scotia. From VE1ED *via* G5YH.
June 16, 1936.
Greetings via Amateur Radio from Nova Scotia.
(Signed) WOOD, VE1ED.

St. Lambert, Province of Quebec, Canada. From VE2CA *via* G5VL.
June 15, 1936.

On behalf of the transmitting amateurs in Quebec Province I wish to tender most loyal and sincere greetings on the occasion of your birthday.
(Signed) TURNER, VE2CA.

Ontario, Canada. From VE3AEM.
June 23, 1936.
Loyal Greetings, every happiness and good wishes from Ontario.
(Signed) BARRATT, VE3AEM.

Edmonton, Alberta, Canada. From The North Alberta Radio Club *via* VE4IZ and G2ZQ.
June 17, 1936.
The North Alberta Radio Club wish to extend to His Majesty loyal greetings on his Birthday.
(Signed) OWER, VE4IZ.

Vancouver, British Columbia. From the British Columbia Radio Association *via* VE5GI, EI5F and G6NJ.
June 18, 1936.

MAY IT PLEASE YOUR MAJESTY.
The Members of The British Columbia Radio Association wish to tender congratulations on the occasion of your forty-second Birthday, and convey their expressions of loyalty and devotion. This message is carried by way of amateur radio within the British Empire from Your Majesty's loyal subjects The British Columbia Amateur Radio Association.
(Signed) TAYLOR, VE5GI.

Govinna, Ceylon. From VS7GJ *via* G6CJ.
June 13, 1936.
The Radio Club of Ceylon and South India, and The British Empire Radio Union members in Ceylon extend sincere and loyal greetings to His Majesty King Edward the Eighth on the occasion of his 42nd birthday, and wish him a long and happy reign.
(Signed) JOLLIFFE, VS7GJ.

Alexandria, Egypt. From SU1SG *via* G5JX.
June 11, 1936.
On behalf of members of The British Empire Radio Union in Egypt, Palestine, Sudan and Transjordania I respectfully beg to tender Your Majesty loyal and hearty greetings on this your 42nd birthday, and sincere wishes for a long and happy reign.
(Signed) PETTITT, SU1SG.

Hong Kong. From VS6AH *via* VS1AF, VS7RF and G5YH.
June 22, 1936.
Loyal Greetings and Birthday wishes from the Radio Amateurs of Hong Kong.
(Signed) MERRIMAN, VS6AH.

Westport, Irish Free State. From EI9D *via* G2SO.
June 19, 1936.
Please convey to His Majesty, King Edward VIII loyal and sincere birthday greetings from Members of The Radio Society of Great Britain and The British Empire Radio Union in the Irish Free State.
(Signed) NOBLETT, EI9D.

Kingston, Jamaica, British West Indies. From VP5PZ *via* G6CL.
June 18, 1936.
Jamaica and Dependencies and British Honduras members of the British Empire Radio Union respectively tender loyal and affectionate birthday greetings.
(Signed) GRINAN, VP5PZ.

Nairobi, Kenya Colony. From VQ4CRH *via* G6KP.
June 14, 1936.
The Members of The Radio Society of East Africa and The British Empire Radio Union in Kenya, Uganda and Tanganyika desire to convey to Your Majesty loyal greetings and heartiest congratulations on the anniversary of your birthday.

(Signed) LANE, VQ4CRH.

Penang. From VS1AA *via* G2ZQ.
June 7, 1936.
The Malayan Group of the British Empire Radio Union sends loyal birthday greetings to Your Majesty and wishes you many happy returns of the day.

(Signed) MACINTOSH, VS1AA.

Zeitun, Malta. From ZB1C *via* ZB1E and G5JI.
June 12, 1936.
All Members of The British Empire Radio Union in Malta join in offering Your Majesty loyal and sincere Birthday Greetings with best wishes for a long and happy reign.

(Signed) GRECH, ZB1C.

Rose Hill, Mauritius. From VQ8AC *via* G5YH and G2ZQ.
June 15, 1936.
Transmitting amateurs of Mauritius convey loyal birthday greetings to H.M. King Edward VIII.

(Signed) KOENIG, VQ8AC.

Dunedin, New Zealand. From N.Z.A.R.T. *via* ZL4BQ and G6WY.
June 17, 1936.
The Radio Amateurs of New Zealand extend loyal and sincere Birthday greetings to Your Majesty on this happy occasion.

(Signed) PETRIE, New Zealand Amateur
Radio Transmitters.

Bulawayo, S. Rhodesia. From ZE1JB *via* G5WP.
June 18, 1936.
The Rhodesian Empire Radio Union Members desire to convey their loyal good wishes on the occasion of Your Majesty's 42nd birthday.

(Signed) HILL, ZE1JB,
Official Representative.

Assam, Northern India. From VU2LJ *via* VS1AA and G5BP.
June 16, 1936.
Members of the British Empire Radio Union in Northern India join in sending their sincere and loyal birthday greetings to Your Majesty.

(Signed) MCINTOSH, VU2LJ.

Munnar, Travancore, South India. From VU2JP.
June 8, 1936.
Members of the British Empire Radio Union in South India unite in sending Your Majesty their loyal Birthday Greetings and sincere wishes for many years of health and happiness.

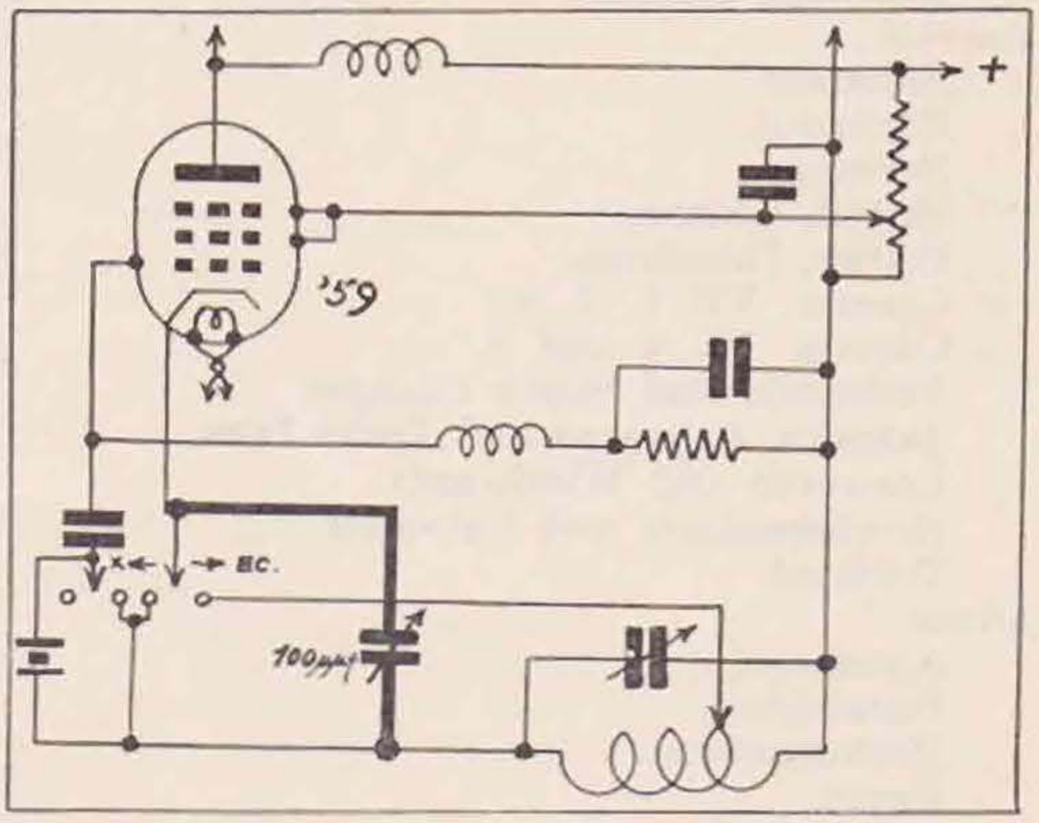
(Signed) NICHOLSON, VU2JP.

Tri-Tet to E.C.O.

PERHAPS the following will interest those who use a type 59 valve or its equivalent as a Tri-tet oscillator, and who occasionally change to electron-coupled control, either to QSY or to give the crystal a breather.

The change from Tri-tet to electron-coupled control as effected at the writer's station, is carried out by using the same circuit as shown and described by G2WD in the November, 1934, BULLETIN with one addition. A further variable condenser of 100$\mu\mu$F. capacity is incorporated, as shown in the diagram, and this is switched across the grid portion of the cathode coil, as the double-pole double-throw switch is operated to change from crystal to electron-coupled control. A greater value of capacity is required in the cathode grid circuit when the valve is operated as an electron-coupled oscillator, and the extra variable condenser is set to give the required amount of extra capacity.

The change from crystal to electron-coupled control is thus accomplished by the turn of a switch, no further tuning being necessary. The frequency can be pre-set to the crystal frequency to compare the tone during a QSO, or slightly higher or lower so as to be able to QSY from under QRM. Any further comments on the merits of this type of valve and circuit would be superfluous, suffice



it to say that during a number of QSO's no difference in the tone of signals has been reported when switching from CC to EC.

SU2TW.

THE H.B.E. CERTIFICATE

The Council have much pleasure in announcing that a new certificate, known as the H.B.E., is to be awarded to members who have received British Empire amateur transmitting stations in 25 different parts of the British Empire.

Members will appreciate that no useful purpose would be served if the award was given for the reception of signals from only one country in each continent.

The rules governing the award are as follows:

(1) The H.B.E. certificate will be issued to fully-paid up members of the R.S.G.B. who have received signals from amateur transmitting stations in not less than 25 different countries within the British Empire or territories mandated to the British Empire.

(2) A minimum of three countries in each continent must be heard to qualify for the award.

(3) To effect a claim, members are required to produce QSL cards, or similar evidence, from each station heard. The evidence submitted must definitely confirm the reception claimed.

(4) In the case of transmitting members, confirmation of two-way contacts will be accepted as evidence of the reception claimed.

(5) Cards and similar evidence must be submitted to the Secretary, R.S.G.B., 53, Victoria Street, S.W.1.

(6) The official list of British Empire countries or divisions of countries upon which claims will be based forms an appendix to these rules.

(7) Members who have been awarded the certificate may use the abbreviation " H.B.E. (Cert.) " on correspondence.

(8) In the case of any dispute concerning a claim, the decision of the R.S.G.B. Council shall be final.

APPENDIX.

List of Countries for H.B.E. Certificates.

Europe :

Gibraltar.
Great Britain.
Irish Free State.
Malta.
Northern Ireland.

America :

Bahamas.
Barbados.
Bermuda.
British Guiana.
British Honduras.
Canada, VE 1, 2, 3.
Canada, VE 4 and 5.
Falklands and South Georgia.
Jamaica, Caymans and Turks Isles.
Leewards and Windwards.
Newfoundland and Labrador.
Trinidad.

Africa :

Ascension.
Basutoland.
Bechuanaland.
Egypt.
Gambia.
Gold Coast and Togoland under British Mandate.
Kenya.
Mauritius.
Nigeria and Cameroons under British Mandate.
Northern Rhodesia.
Nyasaland.
Seychelles.
Sierra Leone.
Somaliland.
South Africa.
South West Africa.
Southern Rhodesia.
Swaziland.
St. Helena.
Sudan.
Tanganyika.
Uganda.
Zanzibar.

Asia :

Aden, Perim, Karnara and Socotra.
Andaman and Nicobar.
Bahrein and Khuria Muria.
Ceylon.
Christmas Islands.
Cocos Islands.
Cyprus
F.M.S.
Hong Kong.
India and Burma.
Iraq.
Labuan and Brunei.
Lacadive Islands.
Maldive Islands.
Non-F.M.S.
Palestine.
Sarawak and North Borneo
Straits Settlements.
Transjordania.

Oceania :

Australia, VK 2, 3, and 5.
Australia, VK 4 and 6.
British Soloman Islands.
Chatham Islands.
Cook Islands.
Fanning Islands.
Fiji.
Gilbert and Ellice.
Nauru.
New Guinea and Papua.
New Zealand, ZL 1 and 2.
New Zealand, ZL 3 and 4.
Norfolk Islands.
Pitcairn Islands.
Samoa.
Tasmania.
Tonga.

W.B.E. Certificates.

During the past month we have received at least a dozen claims for W.B.E. certificates without a power guarantee being given. We have stressed this point in this Journal on numerous occasions in the past. In future, we shall retain all cards submitted by forgetful members until they remember that a guarantee should have been sent. Time and Society money is being wasted in drawing attention to matters with which all members should be fully acquainted.

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

A. W. Lister (G5LG), Royal Military Academy, Woolwich, S.E.

No. 2 : RECEIVER DESIGN

S.M. : J. Mawbey (BRS. 1300), 109, Clare Road, Tankerton, Kent.

G.M. : General

D. Gordon Bagg, (G6BD), Fresh Woods, Tonbridge, Kent.

G.M. : 56 Mc.

J. N. Walker (G5JU)

G.M. : Superhets

T. B. Smith (G5TS), 115, Novar Drive, Hyndland, Glasgow, W.2.

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. : 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.

Miss N. Corry (G2YL), "Redholm," Walton-on-the-Hill, Tadworth, Surrey.

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 : VALVES AND INSTRUMENTS

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

No. 6 : AUXILIARY APPARATUS

S.M. : A. O. Milne (G2MI), "Twemigh" Kechill, Gardens, Hayes, Kent.

G.M. :

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

No. 7 : MICRO-WAVES (112 Mc. and above)

S.M. : Dr. C. G. Lemon (G2GL), 19, Lena Gardens, Hammersmith, W.6.

No. 8 : CONTEMPORARY LITERATURE

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

NEWS OF THE MONTH

THIS month the chief item of interest is the report from our Propagation Section entitled "Cosmic Notes." The phenomena referred to therein appears to be of fairly recent occurrence. Whether this is due to the fact that the peculiar manifestations are something quite new, or whether it is merely due to the fact that we have not been in a position to observe them in the past we cannot be sure. In this connection we feel that any evidence of past events of a similar nature would be of considerable value, and we should be very grateful to anyone who may have any light to throw on the matter if they would inform us.

It has been suggested that the failure of the airship "Norge" to maintain radio communication during the Amundsen-Elsworth flight across the North Polar Sea may have been due to this phenomena. Possibly some of our readers can think of other examples.

A Correction and Apology.

In the April issue of The Bulletin there appeared a constructional article dealing with a 56-Mc. Exciter Unit. From correspondence which has appeared since, readers may have felt that perhaps there were some serious faults in the details given. In one respect they are correct. The diagram given on page 402 shows C8 as being connected from the plate of the final frequency doubler to H.T.—. A moment's consideration will show that this must be a mistake. Any condenser connected in that position would effectively decrease the 56 Mc. output of the unit, if it did not bypass it completely. Actually the condenser C8 should have been shown as being connected from the H.T. end of the coil L4. In this position it acts in a proper manner.

In every other respect the unit as shown is correct. Next month we propose to give details of the Power Amplifier unit which is designed to follow the Exciter Unit. This unit will use an R.F.P.15 valve. The R.F.P. 15 valve is easily driven to 25 watts by the Exciter Unit already described. This, we feel, is a complete answer to any suggestion of the inefficiency of the transmitter. We wish to take this opportunity of apologising to readers for any inconvenience the incorrect diagram may have caused them.

Eclipse of the Sun.

At the time of writing only one report has come to hand. We shall hope to publish the results of observations next month.

All those who have any reports on the subject are invited to forward them to the S.M. Propagation.

Individual Members.

Additions since April 25 :—

No. 1, Transmitter Design, ZB1E, BERS344.

No. 2, Receiver Design, BERS344, BRS2105, 2423, 2457.

No. 3, Aerial Design, BRS2105, 2398, 2457.

No. 4, Propagation, BRS2398, BERS341, 344.

G6PA/G2GD.

Cosmic Notes*

In previous issues of the BULLETIN, reference has been made to the " Dellinger Effect," and the hissing sound accompanying the fade-out. These phenomena have been observed on several occasions since, so that it may be well to set out in calendar form the latest information which has reached the Section. Elsewhere in this issue will be found detailed reference to " conditions " on 56 Mc. and 28 Mc., so we will not duplicate that here.

Briefly, then, the following table shows the more important events which have happened :

Date. 1936.	*Time.* G.M.T.	*Phenomena.*	*Observer.*
Mar. 14	1455-1525	Fade-out on 7 Mc.	G2NJ
		Two sunspots near CM	G5JH
Mar. 19	1000	Hissing on 28 Mc.	G6DH
Mar. 29	1500	Hissing on 28 Mc.	G5OJ and BRS25
	1745	Hissing on 28 Mc.	G6DH
April 30	Evening in U.S.A.	Good DX in U.S.A. on 56 Mc. ... ... Rapid fading	via W9FM and G2YL
May 5		Poor conditions on 28 Mc.	G2YL
May 6	1330 to 1635 ...	Very vigorous eruptive prominences on the sun	Mr. A. M. Newbegin
	1703	Hissing on 28 Mc.	G6DH
	1810	Hissing on 28 Mc.	G6DH
May 9	Evening in U.S.A.	Good DX in U.S.A. on 56 Mc. Rapid drop of 30° in temperature in evening	via W9FM and G2YL
May 12	0900-0930	Signals on 46 and 57 Mc. Commercials heard	G6DH
May 22		IBD heard on 50 Mc.	G6DH
May 24	1115-1130	EAN heard on 57.5 Mc.	G6DH
May 25	1335-1340	Fade-out of Continentals, South Americans, and the East	G2XG
		Prominence near CM on Sun	Mr. Newbegin
		IRU heard on 57.5 Mc.	G6DH
May 26	0335 to 0340 ...	Japan reported total fade-out	G2XG
	1129, 34, 49 ...	Hissing on 28 Mc. and 14 Mc.	G2YL
	1130 to 1135 ...	General fade-out	G2XG
		Bright eruption on Sun	*Wireless World*
		Prominence of May 25 dying out	Mr. Newbegin
May 28	0730 to 0740 ...	General fade-out	G2XG
	1206 to 1212 ...	Partial fade-out	*Wireless World*
	1237 to 1245 ...	Complete fade-out	*Wireless World*
	1507	Hissing on 28 Mc. ... ... 2YL working YT7MT gave him R8/4—R5—R0. Two seconds later hissing R8 for 1½ minutes. Then signals re-appeared R4.	G2YL
	1800 to 1826 ...	Nearly complete fade-out	*Wireless World*
May 29	1023 to 1043 ...	Complete fade-out	*Wireless World*
June 1	1818	EAM heard on 58 Mc.	G6DH
June 3	1644 to 1647 ...	Hissing on 28 Mc. The mush stopped at 11 metres	G2YL
	1646	The mush came in up to 13½ metres	G2YL

Now the first thing which seems obvious is that we must scrap the 54-day period. " Fade-out " phenomena are becoming much more frequent as the solar cycle advances, and we must expect to hear of them at any time—though it is equally reasonable to suppose that, once the necessary solar conditions are established, they would recur with the revolution of the sun.

We have previously suggested a theory to account for the effect, but it is too early to give any confirmation or the reverse. It does seem that the vital factor may be the eruptive prominences associated with solar activity. It appears that these prominences increase up to the time of sunspot maximum, when they vanish to appear again after the next minimum. It will, therefore, be interesting to see if the " fade-outs " vanish also at the time of maximum activity.

The hissing phenomena are certainly worth investigating. We have had evidence that at the time of a " fade-out," the F layer rises rapidly to an abnormal height, due to the thermal expansion of the gas, probably by bombardment of some sort from the sun. Can it be that this rapid movement of the electrified layer is the cause of the noise ?

The D. Layer.

Scientists in America and in this country have recently had evidence of another reflecting layer far below the Heaviside or E layer. They have received signals by vertical reflection from heights ranging from some 50 kms. to as low as 7 kms. above the ground. The existence of such a layer would seem to imply very high absorption, but at present very little is known about this subject. Here then, is a most interesting field for investigation.

56 *Mc. Reflection.*

Opinion, especially in America, seems to be coming round to the view that waves of frequency as high as 56 Mc. may be reflected from the ionosphere. It is very much to be hoped that all those

(*Continued on page* 50.)

* Compiled by Propagation Section.—R.E.S.

THE 56 Mc. BAND

By L. G. Blundell (G5LB).

CONDITIONS during the last month have, it seems, been below those recorded in May, and there is little to comment upon. The following reports, however, show that the band was not completely dead.

G2HG's log is as follows :—June 11 : unidentified commercial harmonic audible from 19.30-19.40 QRK R 5/3, W4. June 13 : an Italian commercial (either IRO or IRJ) audible 14.00-14.10 R6/1, W2. June 16 : at 19.00, the mush level suddenly rose and died out in a similar manner to that observed on May 23, but this time no DX was heard. June 22 : unidentified commercial harmonic audible for a few minutes at 18.55 sending figure code at R4/2, W3. A local commercial harmonic—GFA6—has been heard on several days, usually around 19.00 G.M.T.

G5LB heard the mush level rise at 19.00 on the 16th, but careful searching round the band failed to provide anything of interest.

G6DH reports as follows :—June 1 : EAM (harmonic) R5 at 18.15 G.M.T. on 58 Mc. June 12 : HAS2, R3-4, 13.00-13.10, 56 Mc. June 25 : unidentified telephony R5-6, QSB, 55.8 Mc., 09.05, FOX icw R6, QSB, 09.20. June 26 : T4 commercial R6, 55.9 Mc., unidentified telephony on 58 Mc., R5-0, 12.20-13.15.

EAN, R5-0, 58.3 Mc., 12.35, EAM and EAJ on 49 and 41 Mc. respectively, were also good signals at this time.

6DH learns from EA4AO that when EAW was heard by 2HG, 5LB and 6DH in May, this station (EAN) was operating on 15.38 metres.

EA4AO is transmitting every morning on 58 Mc. approximately, with 100 watts input and modulated tone code, and is also using a directional array trained on this country.

From W6GEI it is learned that VK4AP is on 56 Mc. with 100 watts C.C. and is looking for world DX!

From G2YL comes some authentic information regarding the DX contacts made in the States during early May (see last issue) ; details are as follows :—

April 30 : W5EHM heard eight W9 stations and one W8 on 'phone between 8 and 10 p.m. C.S.T. Bad fading and fast calling made positive identification difficult, however.

May 9 : W2BKW worked W9PKU, and also heard W9KUK, but was unable to contact. W8NSS heard 20 W1's between 8.55 and 10.12 p.m. C.S.T. W9LWI reported QSO with W1FHN, 2JCY and others, including a W4. W9PEI, UOV, and DTN were among the Chicago stations to work the Eastern stations.

Reference to the Call Book and an Atlas will show that some very considerable distances have been spanned. Owing to the fact that 'phone and ICW were used in every case, fading made real QSA 5 signals very few and far between, although stations " by the dozen " were heard in various districts at about QSA 3. It would have been indeed interesting if some CW stations had been active during these periods, as the 'phone contacts could possibly have been greatly bettered both as regards readability and distance spanned.

In connection with the " CQ DX " call heard by G2HG in May (see the last issue of these notes), G6YL reports hearing a French station with the call F9Y testing on about 20 metres. However, as this station was heard to call " CQ DX " the real nature of this transmission has yet to be settled.

Schedules.

No further transmissions are yet available, but with one or two slight amendments, last month's list is given again as a reminder to those interested that regular transmissions are available.

While on this subject, it must again be pointed out that co-operation from abroad is *very* necessary, and those who have made or are making schedules with DX stations are requested to forward full details of such arrangements for future publication under this heading.

Scheduled C.W. Transmissions.

Call.	*QRA.*	*Frequency (Mc.)*	*Days and Times (BST).*	*Remarks.*
G2GB ...	Shortlands, Kent	56.784	Wed. & Sat., 11.30-12.00	T9 note
G2HG ...	London, S.E.26	56.32	Sat., 14.30-17.00 Sun., 10.00-13.00 14.00-18.00	T9 note
G2VK ...	London, N.17	57	Sun., 11.00-11.30	—
G5FN ...	Gillingham, Kent	—	Sat., 15.00-17.00	Rotating beam aerial. 360° in 15 mins. CW and MCW
G5LB ...	Beckenham, Kent	56.72	Mon., Tues., Thurs. & Fri., 18.15-19.00 Mon., Tues., Fri., 22.30-23.00 Sat., 16.00-19.00 Sun., 12.00-13.00 14.00-17.00	T9 note
G5JU ...	Bristol	57.4	Sun., 11.00-12.00	T9 note

It is realised that schedules may be occasionally broken up by holidays, etc., but under normal circumstances they will be run to advertised times until band activity and conditions make revision desirable. At the same time, most stations are willing to increase their present working periods to cover additional transmissions for local receiver tests, etc., and anyone wishing to take advantage of such services should communicate with the station concerned *direct*.

Special Tests.

On August 2 and 3, a station will be operating between the hours of 10.00 and 13.00 with 'phone and ICW and possibly CW. QRA will be Whitstable, Kent, and both straight and super-regenerative receivers will be used. Call sign is withheld with a view to eliminating false reports and to add interest.

* * *

News of the tests from EI9G, on June 4 and 5, was received too late for inclusion in last month's notes, but it is known that details were otherwise made widely known, and it is hoped that these tests were productive of encouraging results. If *you* heard EI9G and have not yet reported—*DO IT NOW*.

* * *

G2HG puts forward a suggestion for improved local contacts in the following paragraph :—" Quite a number of stations using self-excited transmitters are stable enough to read on a straight receiver if they use MCW. If these stations would use straight receivers (without super-regeneration), QSO would be possible between them and the plain CW stations."

Comments on this suggestion are invited and any station local to G2HG likely to work on these lines are asked to get into touch with him.

* * *

F8NZ will be visiting London during the second fortnight in July and would be glad of an opportunity to look over some of the London 56 Mc. stations during his stay.

If any London members can oblige in this way, would they please advise G5LB as to the times convenient or, if possible, write to M. Renand Koechlin, 20 Rue des Ecoles, Paris V.

The 28 Mc. Band

By Nelly Corry (G2YL).

Conditions during June were disappointing, DX being scarce and Europeans surprisingly inconsistent. The best days were the 7th and 12th, when about a dozen different stations were logged, but these compare unfavourably with the 20 or more stations heard on June 14, 16 and 28 in 1935. On several days the band could best be described by the American expression—" Great gobs of silence."

No Asians were reported at all during the month, and apparently the only Australian signal heard was VK3CP, whom G6DH worked on June 7. As usual, ZS1H was by far the most consistent African station, his signals getting through on at least 15 days, though sometimes weak, and subject to fading. ZE1JJ was heard occasionally at the beginning of the month, and other Africans included FB8AB, FB8AG, ON4CJJ, SU1JT, FA8BG, CN8MQ, and harmonics of SU1KG, SU1TM and SU1A (N.F.D. portable).

South America was represented by LU9AX, heard on June 6, and PY1AW on the 6th and 17th. A weak W3 'phone was heard at the unusual hour of 01.05 B.S.T. on June 24, and judging from reports, this was the only North American heard during the month—possibly because no one has thought of listening regularly on 28 Mc. at about midnight !

G6DH worked ON4CJJ for the first time on May 30, and this was the first Europe-Belgian Congo QSO on 28 Mc. SM6WL qualified for the first Scandinavian 28 Mc WAC and WBE on April 25, when he worked VS6AH.

According to ZS1H, conditions have also deteriorated in the Southern Hemisphere, no Asian, North American or South American signals being heard during the first three weeks of June. The best day of the month was June 1, when he had 20 contacts with VK, J and Europe. The next good day was the 7th, when he worked 11 Europeans. Then came many blank days, till the week-end of June 20-21, when he had 12 contacts. On the 21st especially, " conditions were like old times—VK's were coming in, with plenty of Europeans, though there were periodical fades during the day."

Reports Wanted.

G8AA (Birkenhead) on his 7 Mc. C.W. transmissions.

G8AK (Blackpool) on his 7,055 and 14,100 kc. transmissions.

G2XY (Leeds) on his 14 Mc. C.W. transmissions.

The Theory of the Shunt.

By H. A. Stocks, (2BSR).

The inspiration for this article came from a radio man of some years' experience who confessed unblushingly that he had never really delved into the mysterious "whys and wherefors" of the shunt. To explain the action of a shunt lucidly is, perhaps, more difficult than would at first appear, and so the following method is offered for what it may be worth.

Let R*m* represent the internal resistance of a meter, and let R*s* represent the shunt which is placed across the meter.

Then, for resistances in parallel we have:

$$\frac{1}{R}=\frac{1}{Rm}+\frac{1}{Rs}$$

Therefore $\frac{1}{R}=\frac{Rs+Rm}{RmRs}$; and $R=\frac{RmRs}{Rs+Rm}$

Now, by Ohm's Law $E=I\times R$, therefore voltage in circuit $=E=\frac{RmRs}{Rs+Rm}\times I$ ..... (1)

and $I=\frac{E,}{R}$ therefore current through meter

$$=Im=\frac{E}{Rm}=E\times\frac{1}{Rm}\text{ ..... (2)}$$

Similarly, current through shunt

$$=Is=\frac{E}{Rs}=E\times\frac{1}{Rs}\text{ ..... (3)}$$

Converting these expressions into the same terms we get, from (1) and (2):

$$Im=\frac{RmRs}{Rs+Rm}\times\frac{1}{Rm}\times I=\frac{Rs}{Rs+Rm}\times I$$

And for the shunt, from (1) and (3):

$$Is=\frac{RmRs}{Rs+Rm}\times\frac{1}{Rs}\times I=\frac{Rm}{Rs+Rm}\times I$$

Hence, if the value of the shunt be made $\frac{1}{9}$ that of the meter, then $Rs=\frac{Rm,}{9}$ and substituting this value in the above expression for meter current (I*m*), we get:

$$\frac{\frac{Rm}{9}}{\frac{Rm}{9}+Rm}\times I=\frac{\frac{Rm}{9}}{\frac{Rm+9Rm}{9}}\times I=$$

$$\frac{Rm}{9}\times\frac{9}{Rm+9Rm}\times I=\frac{1}{10}\times I$$

which proves that, with the shunt in circuit, only one-tenth of the total current passes through the meter, the remainder passing through the shunt. Obviously under these conditions the meter reading would have to be multiplied by ten.

It will be noticed that for a range multiplication of ten the shunt resistance must be one-ninth of the meter resistance. For a range multiplication of three a shunt of one-half is required; for four, one-third; and so on. Thus, given the full scale deflection and resistance of any meter the shunt resistance required for any other range can be readily calculated.

We shall be glad to receive information from any valve manufacturer who has produced, or is willing to produce, straight filament cylindrical electrode valves for micro-wave reception and transmission.

Empire Calls Heard.

By J. Alexander, 2AXX, 63, Tennyson Road, Birmingham, 10, England. From February 20 to March 22:—

7 *Mc.:* ve1fy ((5.5.7), 1hj (5.6.9), 3hb (4.6.8.), 3mm (5.6.9), 3no (5.6.9), 3wa (5.7.9), vk2as (5.5.9), 2ae (5.6.9), vs6ax (5.7.9), zl3jd (4.5.9), 3kg (5.5.9).

14 *Mc.:* su1rh (5.6.7), ve1aa (5.8.9), 1bk (5.5.9), 1dc (5.8 fone), 1dz (4.6.8), 1gk (5.7.8), 1ir (5.8.8), 1iw (5.6.9), 4bq (5.7.7), 4ht (4.5.9), vk2as (5.7.9). 2cn (5.6.9), 2ks (5.5.9), 2ny (5.6.9), 2ud (5.4.8), 2xm (5.5.9), 3cd (5.7.9), 3cx (5.6.6), 3gd (5.7.9), 3jt (5.6.9), 3jz (5.5.9), 5gf (5.6.9), 5zx (5.7.9), vo1c (5.5.8), 4y (5.6.9), vp2rt (4.6.8), vq3far (5.8.9), 4snb (5.5.8), 8ab (5.6.7), vs6ah (5.6.9), 6bd (5.6.9), 8aa (5.7.7), vu2cp (5.6.9), zl2ds (5.6.9), 2dv (5.7.9), 2fy (5.7.9), 2kk (5.6.9), 2lh (4.6.9), zs1ah (5.6.9),

28 *Mc.:* su1tm (5.6.9), ve4bn (4.6.9).

P. Malvern 2AUS, Swindon, February 26 to March 21, 1936:—

14 *Mc.:* ve1cr (Fone 58), 1ex (844), 1ey (957), 2dr (946), 3dd (935), 3gi (944), 3hb (846), 3ij (933), 3sv (944), 3ta (834), 3wa (823), 4ph (934), 4ro (955), vk2hp (833), 2hz (823), 2va (823), 3ht (923), 3jk (933), 3mr (934), 3nw (934), 3tu (933), 3xp (945), 3zb (944), 4bb (945), 4lm (934), vp, 2cd (857), 5gm (956), 6yb (Fone 47), vb3far (945), vs6ax (822), zb1c (957), zd8a (934), ze1js (946), zl1dv (933), 1gx (944), 2bm (844), 2ci (956), 2mm (933), 2nn (833), 3dj (934), 3ja (944), 4ck (944), zs1ah (945), 1d (933), 6a (934), zt6q (945).

Eric W. Trebilcock (BERS195), Telegraph Station, Tennant Creek, North Australia, February 26 to April 4, 1936:—

7 Mc. (C.W.): g6gt (9.3.4), gi6xs (9.5.)5, vq4kta (9.5.5.), vq8af (9.4.5), zb1h (9.4.5), zs4e (9.5.5), zt2q (8.5.4).

14 Mc. (fone): vs6af (9.5.6), vs6ag (9.4.6), vu2bg (9.5.6).

14 Mc. (C.W.): ei6g (9.4.5), 8b (9.4.5), 9g (9.5.5), g2tm (9.4.4), 5kg (9.5.5), 5la (9.4.4), 5wy (9.4.5.), 5zg (4.4), 5zx (9.4.4), 6cl (9.5.4), 6if (9.4.5), 6ir (9.5.5), 6dx (9.4.4), 6nj (8.4.5), 6rl (9.4.3), 6uf (9.5.5), 6wr (9.5.4.), 6wy (9.5.5), 6xn (9.5.4), 6zu (9.5.4), su1ro (9.5.5), 1sg (9.4.4), 1wm (8.4.4), 5nk (9.5.6.), ve1co (9.5.5), 1dt (9.5.5), 1et (9.4.6), 1iw (9.5.5), 2ax (9.5.5), 2bd (9.5.4), 2be (9.5.5), 2jk (8.5.5), 2lq (8.4.4), 3ea (9.5.6), 3nf (8.4.3), 3ug (9.5.6), 4ae (8.4.4), 4aw (9.2.3/4), 4du (9.3.4), 4ro (9.5.6), 4tj (8.5.7), 5ha (9.5.6), 5kc (9.5.3), 5qp (9.4.5), vp1jr (5.5), 2at (4.4), 2bx (8.5.6), 2cd (9.5.6), 2tg (5.5.6), 4tj (8.5.6), 5ab (8.5.6), 5pz (9.5.5), 6mr (9.4.4), vq3far (9.5.7), 4cre (8.5.6), vr5ba (8.5.5), vs2ae (9.5.6), 2ag (9.5.8), 3ac (9.5.7), 6af (9.5.8), 6ah (9.5.6), 6ak (9.5.8), 6ao (9.5.6), 6aq (9.5.7), 6as (9.5.5), 6ax (9.5.7), 6az (9.5.6), 6bd (9.5.7), 7jw (9.5.6), 7ra (8.5.6), vu2au (8.5.5), 2eb (9.5.5), 2eq (9.5.5), 2hq (8.5.6), zb1h (9.4.5), ze1je (9.5.6), 1 jr (8.5.5), zs1al (8.5.6), 4u (8.3.3), 6m (9.3.2), zt5q (8.4.5), 6ak (9.3.5), 6aw (9.5.5), 6m (9.5.5), 6q (8.5.5), zu1t (8.5.8).

Figures in brackets denote tone, readability and strength respectively.

THE YOUNG SQUIRT HITS BACK

(Uncle Tom has vacated his platform this month, in order to give space to "The Young Squirt," who has favoured us with the following reply to some of the Old 'Uns knocks.)

I'M only a young squirt, but I'm all "het up" about this ham racket, and this is my feeble attempt to let off steam, if it gets past the censor. Of course, I've got a moan, but it's not the usual sort.

On my advent into ham radio I was greeted with "Ah, it ain't what it was." This seems to be a catch-phrase with the old-timers, and I'm still wondering why it is used. The only thing wrong with radio is the old crabs moaning about nothing in particular.

I've been told there isn't any ham spirit. Well, I've been in a few countries, mentioned my call, and received a fine welcome—"Come in the shack, etc." The old 'uns are all wrong there. Ham spirit is just as alive as it ever was. Go to a small place and see how the boys practise it—pretty efficiently, too. I think a lot of the bother is caused by that old cuss "Uncle Tom"—I wonder if he'll read this?

Unc.—you've written your page for many years (fb; few could !), but isn't it about time you changed the record, or turned it over? Oh, yes! I read your page, in the vain hope that it may include something useful and sensible.

Let's see! This "dr dr ob ob" stuff. You know, we youngsters aren't all that well educated that we make *no* mistakes. I often wonder if your French/German/Spanish, etc., is as good as their English. Anyway, when you old gents start speaking, it's invariably "My dear old chap."

QSL's. This is a sore point with many a youngster, and it's hardly fair for the old hands to say that QSL's are NDG. We aren't all WAC, 7, 14, 28, QRO, QRP, etc., and some of us can't afford ordinary wallpaper. Have a heart.

This *Spitch* business. You know, it isn't all *that* bad. When I muscled in on 7 Mc. in this country I was told "impossible—too much spitch," by the intrepid pioneers. Well, I listened on a Sunday morning, and was I surprised? I was. Most of the stuff was pretty vile, but not all that terrible. Can't you old timers read C.W. through that QRM?

Of course, all your 'phone rigs are perfect—100 per cent. modulation, crystal mike, aluminium panels, etc. Look at your licence—Unc. in particular—Experimental.

We've got to learn, same as you had way back when you had "all below 200 metres." Your vile spitch wasn't noticed because you had so much room for it. I notice you don't offer to help the learners. Not you! You're too tough, licensed 1066, and so on.

I do agree on a couple of things—bug keys, for instance. Are you 100 per cent. perfect, Unc.? I know of very few G's who send decently on a straight key.

Commercial receivers. Does it occur to you that some hams are *not* interested in receiver construction? I use a "snooper," home-built, because I had the time and the interest to play with it. But many haven't the time, so they buy one. They are generally more reliable, anyway.

I'm criticising, too. It *is* easy to pull things to pieces. So, Unc., dr dr ob ob, please give us some helpful stuff on your page. Tell us how to send decently on a bug key. It must be an art 'cos we youngsters can't use 'em—so you say. This seems frightfully tame, I meant so much, but I guess my ravings can't be forceful unless they're abusive, and, being only a young squirt, I'm not allowed bad language. Aw, turn it off!

* * *

(*Ed. Note*): We have shown the foregoing to "Uncle Tom," who writes as follows:—

DEAR ED.—Many thanks for showing me the document, and for giving me the opportunity of clearing my fair name on one or two points. I am much obliged to "The Young Squirt," for writing half my page for me, but I wish he had been content to stick more to facts.

In fairness to myself, I *must* point out one or two things. First of all, he makes it appear that I have a habit of playing off the young novice against the "old crab," with everything in favour of the latter. I have looked back for some years and can't find a case in which I have done this.

By my pet phrase, "Young Squirt," I have never implied the newcomer to amateur radio, to whom I always extend a hearty welcome *until* he starts misbehaving himself. I am up against bad operation, unintelligent use of the ether and violation of the many unwritten laws of ham radio, whether they are committed by the old hand or the novice.

There are many young newcomers on the air for whom I have the greatest admiration; just as there are quite a few "old hands" for whom I have nothing but contempt, because they have never learnt sense in all the years during which they have occupied their chunk of ether.

I maintain that "Spitch" is absolutely unforgivable, whoever perpetrates it. I have seldom heard a British station using it—even a "young squirt." Spitch, in case the writer of the foregoing doesn't know, is over-modulated telephony on an unstable carrier-wave. There never *has* been any excuse for its use, and no one can plead the excuse of inexperience.

As for the 'phone rigs of the "old crabs," with crystal mikes and so forth—I don't seem to know many of them. Most of my particular "old cronies," with whom I served my apprenticeship in amateur radio, use C.W., and *do* know something about operating (through QRM or anything else).

No, Sir, my grouse is against hams of *all* ages who suffer from arrested mental development (in other words, who haven't grown up). "Young Squirt" tends to be rather complacent about the condition of the ether, which makes me think that possibly *he* has a little to learn.

Still, I am glad that one of them has had the courage to say his little piece, and perhaps others who dislike me equally will come forward and support him.

UNCLE TOM.

R.S.G.B. SALES DEPT.

53, VICTORIA STREET, LONDON, S.W.1

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Convention Programme

Thursday, September 3rd, 1936

*1.30 p.m. **VISIT TO BROADCASTING HOUSE, LONDON** (Party limited to 15 members or wives of members). Meet outside Broadcasting House at 1.20 p.m.

*3.0 p.m. **VISIT TO DECCA GRAMOPHONE CO.,** New Malden and Recording Studios, Brixton (Party limited to 30 members). Meet at Headquarters at 2 p.m. Charge for Coach Trip 2/6 per head.

7.0 p.m. Gathering of members on R.S.G.B. Stand at Olympia.

Friday, September 4th, 1936

PARTY No. 1

*10.0 a.m. **VISIT TO GENERAL ELECTRIC CO., HAMMERSMITH** (Party limited to 30 members). Meet outside Hammersmith Broadway Underground Station at 9.45 a.m.

12 noon Meet Coach outside G.E.C. works.

12.30 p.m. Informal Lunch.

2.30 p.m. **VISIT TO CROYDON AIRPORT AND MITCHAM TRANSMITTING STATION.** Charge for Coach Trip, 2/6 per head.

PARTY No. 2

*1.30 p.m. **VISIT TO BROADCASTING HOUSE, LONDON** (Party limited to 15 members or wives of members). Meet outside Broadcasting House at 1.20 p.m.

6.0 p.m. **ANNUAL CONVERSAZIONE AND RUNNING BUFFET** at The Florence Restaurant, Rupert Street, W.1 (near Piccadilly Circus). Charge, 1/6 per head.

8.0 p.m. Display of Society films.

Saturday, September 5th, 1936

9.0 a.m. **DELEGATES MEETING** at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, W.C.2.

11.0 a.m. **BUSINESS MEETING** at the I.E.E.

1.0 p.m. Informal Luncheon at Slater's Restaurant, Strand.

1.50 p.m. **CONVENTION PHOTOGRAPH** outside I.E.E.

2.0 p.m. **PRESIDENTIAL GREETINGS** and presentation of Society Trophies.

2.15 p.m. Short technical talks.

4.30 p.m. Tea.

6.15 p.m. **ANNUAL CONVENTION DINNER** at The Florence Restaurant, Rupert Street, W.1.

Tickets 5/- per head if paid before September 3rd, 6/- per head *after that date.*

EARLY RESERVATIONS FOR ALL FUNCTIONS REQUESTED.

* *Successful applicants for these visits will be notified from Headquarters.*

BETWEEN  OURSELVES

Society Trophies 1936-37.

Council have pleasure in announcing that Society trophies have been awarded to the following members for the year 1936-37 :—

Rotab.—To Capt. A. E. Dyson (G6NJ), in recognition of consistent and outstanding long-distance work extending over several years.

Wortley-Talbot.—To Mr. L. G. Blundell (G5LB), in recognition of important technical contributions to the T. & R. BULLETIN.

Courteney Price.—To Mr. J. C. Elmer (G2GD), in recognition of his valuable contributions and services to the Society's Research and Experimental Sections.

1930 *Committee.*—To Mr. G. W. Slack (G5KG), winner of the 1935 3.5 Mc. Contest.

Somerset.—To Mr. D. S. Mitchell (G6AA) (ex G2II), winner of the 1936 1.7 Mc. Contest.

The Powditch 28 Mc. Transmitting Trophy will be awarded in December.

Convention Questionnaire.

One hundred and twelve members took the trouble to give us their views concerning Convention arrangements. As the cost of printing the form was £2 8s. 6d., advice at 5½d. per head seems to have hardly justified the expenditure. However, we have at least a few definite facts to work upon and we thank all who gave us their views.

An analysis of the forms shows :—

1.—A slight majority vote in favour of a Morning Business Meeting (47 Morning, 40 Afternoon, 10 no vote, 9 against, 6 either session).

2.—An overwhelming majority vote in favour of a Conversazione.

3.—An overwhelming majority in favour of visits to places of interests.

4.—A majority vote in favour of technical lectures in the afternoon (69 for, 37 against, 6 no vote).

5.—79 acceptances for the Dinner.

The Convention programme is being arranged in accordance with the majority votes cast.

Small Advertisements.

As from our next issue all small advertisements for publication in this Journal must be sent direct to Parrs Advertising, Ltd., Craven House, 121, Kingsway, W.C.2, and not to the Headquarters of the Society.

Secretary's Vacation.

Our Secretary will be on vacation from July 18 to August 4, and from September 12 to September 21. Members are asked to keep correspondence down to a minimum during these periods. Normal routine matters will, of course, be handled as usual.

Technical Publications.

We are pleased to announce that in future we shall be able to supply direct from Headquarters all Technical books published by *Chapman & Hall, Pitmans* and *McGraw-Hill.*

The new 3rd Edition of Ladner & Stoner's " Short Wave Radio Communication " is now available, price 21s.

A full range of books will be displayed on our stand at Olympia.

A New Service.

On frequent occasions members require manufacturers' catalogues, but chiefly for the reason that that several separate applications are necessary, the requests are deferred.

We are pleased to announce that a new service is being introduced whereby members may apply direct to Headquarters for copies of British radio catalogues.

All applications must be accompanied by a 1½d. stamp and *extra* stamps included if a price is charged by the manufacturer for any particular catalogue. A list of the catalogues required must

be written clearly on a single sheet of paper and addressed to Catalogue Dept., R.S.G.B., 53, Victoria Street, S.W.1.

No other correspondence may be included with the application.

The Society will advise manufacturers monthly of their requirements.

The service will be tried out for three months, and if found to be successful it will be continued.

Scottish Districts—Reorganisation.

It has been recognised for some time that Scotland was inadequately partitioned from an administrative point of view, but so scattered was the membership that little could be done, apart from general geographic grouping.

The past year has seen the Scottish membership increase by approximately 25 per cent., a fact which, while creating new problems in administration, has at the same time rendered much more facile a regrouping of certain sections of the country. Accordingly, a scheme has been prepared and is outlined hereunder. This new arrangement will come into force as from Wednesday, July 15.

Only one division calls for special comment. Old "A" District has been divided into two sections, one consisting of the County of the City of Glasgow with its District Officer, and the other of the surrounding counties, also with a D.O. This latter new District is, of course, very scattered meantime, and consequently can only be regarded as a temporary group until such time as further increase in the membership warrants further sub-division.

As the focal point of the new sub-division of "A" District remains Glasgow, arrangement has been made whereby the new District will share with "A" District in the matter of meetings and all pertaining thereto. The two District Officers will co-operate in this connection, but will otherwise function normally.

The undernoted is the new organization by Counties :—

"A" District.
The County of the City of Glasgow.
District Officer : (G5TY), D. M. J. Tyre, 71, Waverley Street, Glasgow.

"B" District.
Aberdeen, Morayshire, Inverness, Ross and Cromarty, Sutherland, Caithness, Orkney and Shetland Islands, also the Western Isles.
District Officer : (G5TA), H. R. Taggart, Bruxlea, 33, Watson Street, Aberdeen.

"C" District.
Kincardine, Forfar and North Perthshire.*
District Officer : (G6RI), W. Robertson, 41, Lilybank Crescent, Forfar.

"D" District.
Linlithgow, Edinburgh and Haddington.
District Officer : (G6XI), J. Wilson, 36, Woodburn Terrace, Edinburgh, 10.

"E" District.
Argyll, Dumbarton, Lanark, Renfrew, Ayr, Dumfries, Wigtown, Kirkcudbright, Isles of Arran and Bute.
District Officer : (G5KF), J. R. Adams, 22, Wellhall Road, Hamilton.

"F" District.
Stirling and South Perthshire.*
District Officer : (G6NX), D. M. K. Harrower, Forthbank Cottage, Stirling.

"G" District.
Peebles, Selkirk, Roxburgh, Berwick, also the part of the town of Berwick-on-Tweed which lies to the North of the River Tweed.
District Officer : (G5FT), J. P. Blair, 35, Market Place, Selkirk.

"H" District.
Fife, Kinross and Clackmannan.
District Officer : (2ANL), A. W. Lawson, Makora, Kinghorn, Fife.

* Note.—N. and S. Perthshire will be defined roughly by a line passing along the courses of the Rivers Earn and Dochart.

G5YG.

Radio Amateur Call Book.

The publishers of the *Radio Amateur Call Book* would like to draw the attention of members to the fact that Mr. A. Bates, W9FO, is no longer connected with the Call Book. All communications should in future be addressed to *Radio Amateur Call Book*, 608, S. Dearborn Street, Chicago, Ill., U.S.A.

Mr. Harold Rensch (W9OKZ) has taken over the position of Editor, and he wishes to extend his thanks to the many G stations that have co-operated to make the G list as accurate as possible. Appreciations are extended also to Messrs. Williams (G6PP) and Postlethwaite (G5KA) for their work as representatives, and new QRA's or modifications will be forwarded to the Call Book by either of these gentlemen.

QSL Section

Manager : J. D. Chisholm (G2CX).

There are times when it seems that these notes are never read and the seed appears to be falling on stony ground. Frantic appeals for views, or criticisms of proposals put forward from time to time meet with an invariable deathly silence!

We have taken new hope, however, from the response to last month's notes. As the majority of members seem to have noticed, Canary Isles was classed as being in Asia in the June issue. Since the date of publication a stream of waggish letters has been received saying that the Canary Isles must have dragged anchor, etc. Some, I thought, showed rather a mean spirit in the way the error was pointed out, but the majority were good-tempered enough. What was most gratifying of all, of course, was the fact that they had read the notes.

Steps are now being taken to get the Canary Isles ceded from the U.S.S.R. and every endeavour made to prevent a recurrence of geographical errors in these columns.

Here's Another.

ZU1T informs us that he worked all Continents in 56 minutes between 17.55 and 18.45 G.M.T. on March 10, 1936, using an input of 40 watts on 14 Mc. W7DSZ, KA1DS, VU2EB, LU1AD, VQ8AF and G5RV were the stations worked. The QSO with G5RV terminated at 18.51 G.M.T.

QRA Section.

Manager: M. Williams (G6PP).

NEW QRA'S.

G2KU.—R. Herbert, 40, Hartley Old Road, Purley, Surrey.
G2VF.—F. G. Rylands, 5, Atherley Road, Southampton, Hants.
G2VO.—J. J. Platt, "Purlea," Ferncliffe Drive, Keighley, Yorks.
G2ZF.—D. S. Watson, 80, Manor Road, Rugby, Warwickshire.
G5DR.—H. W. Scott, 132, Cheeryhinton Road, Cambridge.
G5IA.—G. M. Whiteley, 32, Branksome Drive, Nab Wood, Shipley, Yorks.
G5ND.—H. G. Newland, 65, Elmer Gardens, Bridge Road, Hounslow, Middlesex.
G5QL—L. Herrington, 37, Tufton Road, Ashford, Kent.
G5WP.—W. E. Russell, Wych Dell, Oak End Waye, West Byfleet, Surrey. (The address of G5WP at Truro, Cornwall, published in the June Bulletin, is now cancelled.)
G6CD.—L. J. Davis, 223, Leigh Road, Leigh-on-Sea, Essex.
G6DR.—J. G. Crisp, 39, Beechwood Road, Eaglescliffe, Stockton-on-Tees, Durham.
G6HF.—H. H. Myers, 47, Belgrave Road, Bingley, Yorks.
G6HX.—H. C. Kenworthy, Withington, Chalmers Road, Banstead, Surrey.
G6JK.—H. J. Sherry, "Hartland," New Drive, Totteridge, High Wycombe, Bucks.
G6LS.—R. Bloxam, 15, Corstorphine Hill Road, Edinburgh, 12.
G6RG.—B. Groom, "The Hollies," Galashiels, Selkirk, Scotland.
G6TU.—D. C. Thurston, 57a, Oakmead Road, London, S.W.12.
G6XT.—F. Tillotson, 47, Watson Street, Morley, Leeds, Yorks.
G6YI.—C. Lister, 209, Portswood Road, Southampton, Hants.
G8AA.—N. C. Hobbs, 29, Upper Beckwith Street, Birkenhead, Cheshire.
G8AB.—J. M. Railton, 36, Priory Road, Loughton, Essex.
G8AC.—C. F. Barnard, 90, Coombe Road, Brighton 7, Sussex.
G8AD.—E. B. Vass, 5, Breck Side Park, Liverpool, 6.
G8AI.—D. Ross, 8, Victoria Place, Haverfordwest, Pembrokeshire, Wales.
G8AJ.—E. W. Brownjohn, P.O., Lower Froyle, Alton, Hants.
G8AK.—J. Kippax, 81, George Street, Blackpool, Lancs.
G8AN.—R. H. Banbrock, 37, Bixley Road, Ipswich, Suffolk.
2AAZ—J. W. Weaver, 29, Park Mansions, London, N.W.4.
2AGK.—A. G. Dunn, 10, Clifton Gardens, St. George's Road, Hull, Yorks.
2AGW.—J. L. Shattock, 25, Norton Way North, Letchworth, Herts.
2AHX.—C. G. Herring, 40, Salisbury Road, Plymouth, Devon.
2AII.—J. E. Ironmonger, 2, Jubilee Road, Retford, Notts.
2AIQ.—A. Mears, 34, Vine Road, East Molesey, Surrey.
2AKR.—F. W. D. Rouse, Rose Cottage, Willersey, Broadway, Worcs.
2AMD.—H. J. McFarlane, 15, Rotherfield Road, Enfield Wash, Middlesex.
2AMW.—W. H. Wentworth, 44, Farndale Crescent, Oldfield Lane, Greenford, Middlesex.
2ANY.—R. J. Newport, 22, Kewstoke Road, Stoke Bishop, Bristol, 9.
2APV.—L. I. Pye, 6, Palace Road, Aintree, Liverpool, 9.
2ARN.—A. H. Moss, 29, Forrest Avenue, Marsh, Huddersfield, Yorks.
2ASO.—E. Hayter Simmonds, 48, Roedean Crescent, Roehampton, London, S.W.15.
2ATB.—A. T. Milligan, 26, Sinclair Street, Clydebank, Scotland.
2AUH.—G. Skewis, 17, Princes Street, Tunbridge Wells, Kent.
2AUV.—J. Schefer, 9, Bowers Parade, Harpenden, Herts.
2AWX.—L. F. Woodhams, 90, Railway Terrace, Rugby, Warwickshire.
2AXH.—H. A. Woods, 3, Thirlmere Avenue, Preston, Lancs.
2AXL.—J. W. Mason, 14, Devonshire Road, Linthorpe, Middlesbrough, Yorks.
2AYM.—W. May, 6, Hazelwood Road, Chellow Grange, Bradford, Yorks.
2BAB.—H. Tee, 104, Rectory Road, Burnley, Lancs.
2BIF.—R. H. Robinson, Channel Head, Nether Kellet, near Carnforth, Lancs.
2BIY.—A. Parker, Ben-Eden, Ballymena, Co. Antrim, N. Ireland.
2BLT.—S. F. Geary, "Darnlea," Trent Gardens, London, N.14.
2BUB.—H. Duckworth, "Woodlands," Sandy Lane, Romiley, near Manchester.

The following are cancelled:—G6KB, 2AHV, 2AQY, 2AVD, 2AWH, 2AWV, 2AXS, 2BAU, 2BCQ, 2BGL.

NEW MEMBERS.

HOME CORPORATES

Capt. E. A. Hoghton (G2OJ), 5, King's Gardens, Hove, Sussex.
T. A. Wilson (G2WL), 20, Battlefield Gardens, Glasgow, S.2, Scotland.
J. E. Nayler (G5NY), 48, Coles Lane, Hill Top, West Bromwich, Staffs.
A. C. Dickson (G5QQ), 118, Calder Street, Glasgow, Scotland.
S. R. Tomes (G5TD), 170, Handside Lane, Welwyn Garden City, Herts.
H. W. E. Willis (G6OU), 9, Winchester Street, Basingstoke, Hants.
L. Tranmer (G6TG), "Wandsworth," Scalby Road, Burniston. Scarborough, Yorks.
E. B. Vass (G8AD), 5, Breckside Park, Liverpool, 6.
D. W. Carr (2ACZ), 244, Upper Fant Road, Maidstone, Kent.
W. O. S. Greener (2BIG), Newnham Hill, Henley, Oxon.
G. L. Turner (2BJV), 27, Mount Crescent, Brentwood, Essex.
A. H. Howarth (BRS2433), 38, Sunnyside Drive, Clarkston, Renfrewshire, Scotland.
T. Reay (Jnr.) (BRS2434), 52, Nesbitt Street, Dundee, Angus, Scotland.
J. Shaw (BRS2435), 46, St. Swithins Street, Aberdeen, Scotland.
E. F. Fowler (BRS2436), Roadside Cottage, Birse-by-Aboyne, Aberdeenshire, Scotland.
R. P. Genge (BRS2437), 21, Glenn Avenue, Purley, Surrey.
D. H. Barbrook (BRS2438), 37, Bixley Road, Ipswich, Suffolk.
W. Ripley (BRS2439), 7, Stonegate Terrace, Meanwood, Leeds, Yorks.
R. J. Leaman, B.Sc.(Eng.), (BRS2440), "Brimley," 208, Woodcote Road, Wallington, Surrey.
F. J. Bedson (BRS2441), "Tower House," 78, Westmoreland Road, Bromley, Kent.
D. J. Whitefield (BRS2442), 10, North View Avenue, Bideford, North Devon.
H. Eveleigh (BRS2443), High Street, Sidmouth, Devon.
H. M. Campbell (BRS2444), Ivy Cottage, Rivenhall End, Witham, Essex.
F. Leamon (BRS2445), 5, Wellington New Road, Taunton, Som.
R. A. Beaumont (BRS2446), 3, Elm Way, Ewell, Surrey.
G. D. Wray (BRS2447), 68, Scalby Road, Scarborough, Yorks.
G. F. Shute (BRS2448), Carre's Grammar School, Sleaford, Lincs.
L. S. King (BRS2449), Mountfield, Five Oak Green, Tonbridge, Kent.
R. Brand (BRS2450), 56, Meadow Road, Loughton, Essex.
T. D. H. Baber (BRS2451), 23, Newington Road, Sheffield, 11, Yorks.
K. Sperry (BRS2452), 85, Cromford Road, Langley Mill, Notts.
F. R. P. Seath (BRS2453), Wadham, Grimshill Road, Whitstable, Kent.
W. J. Cook (BRS2454), 35, Cowbridge Road, Bridgend, Glamorgan, South Wales.
F. R. Hepwood (BRS2455), 5, Welgarth Avenue, Coventry, Warwicks.
H. L. Hughes, B.Sc. (BRS2456), 162, Milner Road, Selly Park, Birmingham.
R. M. Young (BRS2457), 13, Woodfield Avenue, Shrewsbury, Shropshire.
R. L. Davidson (BRS2458), "Inverness," Balmerino Avenue, Thundersley, Essex.
G. Mortimer (BRS2459), 5, Boyndie Street West, Banff, Banffshire.
E. P. Campbell (BRS2460), Mount Merrion Works, Stillorgan Road, Blackrock, Co. Dublin, I.F.S.
E. Gant (BRS2461), The Rockery, Leasingham, Sleaford, Lincs.
L. P. Smith (BRS2462), 80, Roman Road, Ilford Lane, Ilford, Essex.
J. F. James (BRS2463), 1353b, London Road, Leigh-on-Sea, Essex.
R. J. Purser (BRS2464), Y3 Flight, "A" Squadron, E. & W. School, R.A.F., Cranwell, Lincs.
P. A. Congreve (BRS2465), Ilkeston Road, Bramcote, Notts.
R. Potter (BRS2466), The Croft, Morley, nr. Derby.
G. A. Stocker (BRS2467), 97, Killearn Road, Catford, London, S.E.6.

DOMINION AND FOREIGN.

F. F. Priest (W3EMM), 903, Hanover Avenue, Norfolk, Va., U.S.A.
C. F. L. Volney (BERS354), P.O. Box 107, St. Lucia, B.W.I.
R. F. Gaitskell (BERS355), Mess 16, H.M.S. *Furious*, c/o G.P.O., London.
K. L. Weir (BERS356), 22 (B) Squadron, Royal Air Force, Hal Far, Malta.
V. B. Evans (BERS357), Box 7151, Johannesburg, South Africa.
H. Wright (BERS358), 2nd Battn. The Rifle Brigade, St. Andrews Barracks, Malta.

NOTICE

Our next issue—a special Convention and Exhibition Number will be published on August 20th, 1936.

To The Editor

ATMOSPHERICS

DEAR SIR,—The short article on " Atmospherics," by Mr. Eyton, 2AZJ, in the current issue of the BULLETIN calls for some comment, in that it gives the impression that the theory of formation of thunderclouds is now quite clear. This, however, is not so, as will be found by reference to standard authorities on this subject (e.g., see the monograph " Atmospheric Electricity," by Dr. Schonland).

In point of fact, two very different theories of thundercloud formation are widely held at present, namely, that of C. T. R. Wilson on the one hand, and of Simpson on the other; the two theories have one thing in common, however, in that " it is generally agreed that the seat of the generation of the electricity of a thundercloud lies within the cloud itself " [Schonland].

Actually, the explanation given by 2AZJ bears some resemblance to the Wilson theory of thunderstorms, but is clearly at variance with the statement quoted above, in that charged particles ejected from the sun are stated to provide electricity for ordinary thunderstorms.

It is not, I believe, possible to give any useful account of the mechanism of thunderclouds within the compass of a short article, in view of the complexity of the subject, but perhaps I might be given a few lines in which to summarise the salient features of the two theories now holding the field.

According to Wilson, the accumulation of charges on a thundercloud is not due to any nett increase in the charge of the cloud at first, but is due to a redistribution of the positive and negative ions in the cloud, the latter being heavier and therefore falling more rapidly. The effect is cumulative, in that a large drop will also be subjected to a separation of charge in itself, positive charges congregating at its lower surface, and negative charges at its upper, on account of the permanent potential gradient in the atmosphere; in falling, the positive side of the drop, which is leading, will capture further negative charges.

On the other theory, that of Simpson, the separation of charge is supposed to be connected with the observed fact that when a large drop of water is broken up it becomes positively charged, giving a complementary negative charge to the air. It is supposed that, due to ascending air, abnormally large drops of water form; these then break up, giving a negative charge to the ascending air.

May I make the suggestion that contributors to the BULLETIN should, where possible, quote their source of reference, so that one may have the opportunity of consulting the originals, and thus be able to distinguish between personal views—which may well be correct, of course—and generally accepted theory.—Yours truly,

A. T. MATHEWS, B.Sc., (G5AM.)

24, Woodside Park Road,
Finchley, N.12.
June 17, 1936.

CRYSTAL CONTROL ON 56 Mc.

DEAR SIR,—May I be allowed space to reply to the points raised in Mr. Pollard's last letter in the June issue of the BULLETIN?

I agree that I misunderstood the first part of his letter with regard to the CO/FD stage. However, my remarks still hold good. After considerable experiment I found that the 7 Mc. tank coil should be relatively large, and the condenser small, while the 14 Mc. tank coil should be small and the condenser large, the reason for this being, that the harmonic output will be at its best under such conditions. If the 7 Mc. coil is made small the harmonic output will be very poor. That Mr. Pollard found the reverse conditions to be best only shows how careful we should be about stating that any one solution is the only correct one. No doubt Mr. Pollard was using different valves and components, which probably accounts for the discrepancy.

A glance at the diagram given on page 402 of the April issue of the BULLETIN will show that the condenser C8 is shown wrongly connected. No one in their senses would place a condenser of any size, even one of Mr. Pollard's favourite 300 $\mu\mu$F's, so that it was a direct pass to earth of the R.F. output. The correct position for C8 is from the other end of L4. In that position it will be found quite satisfactory. I am not sure how this error arose, but must ask anyone who has been inconvenienced by it to accept my apologies. I think the above remarks satisfy Mr. Pollard's query.

Mr. Pollard may be interested to learn that the Exciter Unit will drive an R.F.P. 15 to 25 watts on 56 Mc., and that a neon tube held near the plate coil of the power amplifier lights up nicely. This hardly bears out his contention that because the unit can be used on lower frequency bands it is not efficient. We are few of us blessed with too much spare cash, and if any unit can be made to perform more than one purpose without loss of efficiency, surely that is all to the good.

In conclusion, may I be allowed to extend to Mr. Pollard a cordial invitation to come and see for himself just how the complete transmitter works.

Yours faithfully,

H. CECIL PAGE (G6PA)

THE DELLINGER EFFECT.

DEAR SIR,—Having read a good deal about the Dellenger Effect in the " BULL," the following observations on a recent " fade out," which occurred here might be of interest to members and especially the R.E.S. The " fade out " occurred from about 5 p.m. to 5.20/5.25 p.m. local time (2100-2120 G.M.T.), on June 10.

I came on the air at about 4.50 p.m. on 14 Mc. The band was quite full of stations, though they were all weak. I thought perhaps as conditions on 14 Mc. were poor, that the 28 Mc. band might be good, but in searching over it not a single station could be heard. I, therefore, went back to 14 Mc., only to find the band almost dead. There were only about two stations that could be heard, and they were exceedingly weak. The time was then 5 p.m. I tuned over the band for some time, and then went to 7 Mc., only to find that band was

also dead. Returning to 14 Mc., I remained there for the rest of the "fade out," except for another brief period on 28 Mc.

Signals began to reappear around 5.15, and by 5.35 the band was normal—in fact, it was better than when I first tuned in at 4.50 p.m. Fading for the rest of the afternoon was unusually bad on all signals.

Mention should be made of the fact that the weather on the two days previous to the 10th was unusually hazy, in fact, I have never heard of or seen such a haze here before. On the 10th, however, it had greatly cleared.

The receiver used is a battery model Pilot Super Wasp, with the last stage removed and converted to use European valves.

I hope the above account will be of interest and use.

Yours faithfully,
ARTHUR L. TIBBITS,
(VP2AT.)

St. John's
Antigua, B.W.I.

TRANSMITTER DESIGN.

DEAR SIR,—With reference to G2WD's able summary on Amateur Transmitter Design in the June issue, I trust the following comments are not out of place.

The R.C.A.'s maximum recommended input for their 211 valve is around 200 watts—not 100, as stated on page 478. For 10 watts the article recommends the RFP15 or smaller (?) valves in push-pull. The two 210's, as stated, have a rated input of 72 watts, and will stand much more. Smaller ?

No. 14 or 16 s.w.g. tinned or enamelled copper wire is recommended for all coil stages up to 250 watts. Tinning positively increases R.F. resistance, although not greatly, and is therefore to be avoided by ardent seekers after efficiency. It is also stated that "copper tubing introduces losses due to capacity between the turns." Since the dielectric is air, true capacity losses cannot be lessened, losses being probably due to circulating currents and eddies in the copper itself. Since wire coils must usually be supported by lengthwise strips, it seems a very open question as to which type of coil is more efficient.

Copper tube coils will probably remain in most transmitters until quantitative results have shown something better, and I suggest the Design Section makes such measurements on various tank coils of equal inductance. Measurements might also be made to test claims made for unusual C.O.'s, F.D.'s, etc.

Such data, if accurate, will carry more weight than personal preferences or mere qualitative statements, and I feel sure many amateurs would welcome such information in the "BULL."—Yours faithfully,

"ENZED."

Tail Piece

A British amateur phone contact as reported by the wireless correspondent of a London newspaper :—

"Hullo hullo. I've my QST here" (I think it was QST). "She wants to hear that record again."

A copy of our "Guide to Amateur Radio" might help our reporter friend.

Trade Notes

Leslie Dixon & Co. inform us that they have a large stock of Wheatstone Transmitters for disposal in good condition at reasonable prices. We pass this information on for the benefit of members who are not at present receiving the frequent catalogues and special lists published by this old-established firm.

Electradix House, 218, Upper Thames Street, E.C.4, is always worth a visit.

* * *

How often do we amateurs have to say, "Sorry, O.M., could not receive your last transmission owing to local QRM"? *British Television Supplies* have endeavoured most successfully to alleviate this trouble by designing a special matched short wave aerial system which reduces local interference to a minimum.

The component parts forming the device, which is marketed at 25s. under the name Anti-Noise Aerial, consist of (1) an aerial transformer mounted in an aluminium can ; (2) a 50 ft. transmission line ; (3) a home-end transformer and wave-change switch ; (4) enamelled aerial wire ; (5) two strain insulators ; (6) one stand-off insulator ; and (7) a screw-in lead-in insulator.

An examination of the aerial transformer shows that it consists of three midget coils mounted on an insulated former and four fixed coupling condensers. As this transformer is exposed to the atmosphere the whole has been treated to avoid oxidisation and other deleterious effects.

The transformer installed at the home-end is mounted in a moulded container and consists of a series of small coils and condensers. By suitable arrangement of the coil and condenser combinations, a miniature matched aerial system is obtained.

When using this aerial it is highly important that short leads be taken from the set transformer to the receiver in order to reduce pick-up. A length of flex not exceeding 7 in. is recommended.

We are confident that this aerial system will definitely improve short-wave reception, particularly in areas where "man-made" static is troublesome.

A SILENT KEY

Senior members will be grieved to hear of the passing, on Whit Sunday, of Mr. G. W. Tripp (G5QG), at the early age of 30. G5QG was a well-known call on the old 440 metre band, the station having been licensed as far back as 1922.

Our condolences are offered to his cousin, Mr. K. Harvey (G5KT), of Bristol, and to his relatives and many friends.

NOTES and NEWS from the BRITISH ISLES

DISTRICT REPRESENTATIVES.

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

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

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

DISTRICT 4 (East Midlands).
(Derby, Leicester, Northants, Notts.)
Mr. J. J. CURNOW (G6CW), "St. Anns," Bramcote Lane, Wollaton Notts.

DISTRICT 5 (Western).
(Hereford, Oxford, Wiltshire, Gloucester.)
Mr. R. A. BARTLETT G6RB), 31, King's Drive, Bishopston, Bristol, Glos.

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

DISTRICT 7 (Southern).
(Berkshire, Hampshire, Surrey.)
Mr. E. A. DEDMAN (G2NH), 75, Woodlands Avenue, Coombe, New Malden, Surrey.

DISTRICT 8 (Home Counties).
(Beds., Bucks., Cambs., Herts. and Hunts.)
Mr. G. JEAPES (G2XV), 89, Perne Road, Cambridge.

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

DISTRICT 10 (South Wales and Monmouth).
Capt. G. C. PRICE (G2OP), The Mount, Pembroke Dock.

DISTRICT 11 (North Wales).
(Anglesey, Carnarvon, Denbighshire, Flintshire, Merioneth, Montgomery, Radnorshire.)
MR. D. S. MITCHELL (G6AA), "The Flagstaff," Colwyn Bay, Denbighshire.

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

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

DISTRICT 14 (Eas'ern)
(East London and Essex.)
MR. T. A. ST. JOHNSTON (G6UT), 28, Douglas Road, Chingford, E.4.

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

DISTRICT 16 (South-Eastern).
(Kent and Sussex).
MR. A. O. MILNE (G2MI), "Twemigh," Kechill Gardens, Hayes Kent.

DISTRICT 17 (Mid-East).
(Lincolnshire and Rutland.)
REV. L. C. HODGE (G6LH), The Bungalow, Skirbeck Road, Boston, Lincs.

DISTRICT 18 (East Yorkshire).
(East Riding and part of North Riding.)
Mr. W. A. CLARK (G5FV), "Lynton," Hull Road, Keyingham, E. Yorks.

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).

MANCHESTER—An attendance of 17 was recorded at the last Manchester meeting. Field Day talk again occupied the whole of the evening.

The group found a really fine location, and the apparatus was truly portable, everything being made in sections. The insulators were composed of bottle necks, while the chromium-plated operating table, transmitter and petrol driven generator were things to marvel at!

It is rumoured that 2HW still carries about with him an odour of petrol and oil to this day, that BRS2051 took a spanner to bed with him next night, that 6GV and 2DF are still looking for the contents of the bottles the insulators were made of, and that four of the members went back to childhood days during a spell off-duty by taking possession of the swings.

We pass on to all those districts worked, our thanks and hope to renew contact next field day. As many of the members are now on holiday, no list of active stations is given this month.

Nelson.—A fairly well-attended meeting was held in June, at which plans for a future 56 Mc. field day were discussed, but no definite arrangements have been arrived at as yet, due to the proximity of the local holidays. During a very interesting visit to the N.F.D. station at "Grants Tower," which about 12 of the local members made, G2RB got into conversation with 20I of Manchester, and proposals were made for a No. 1 District field day, on 56 Mc., early next September. It is hoped to be able to run either three or four stations in this district by that time, and the local members are getting quite enthusiastic about it.

The following members have reported active:—G5ZN, 5XC, 2RB, 2ATY, 2AVG, 2BWW, BRS1975, 2221, 2307 and BRS1934, who is now 2BZW.

Rochdale.—Nothing of interest seems to have happened this month, as holidays and summer conditions prevail, and Radio has been rather neglected. Active stations are G6AX, 6QA, BRS1152 and 1680.

Southport.—A meeting was held at BRS1947, in June, at which an attendance of eight was

recorded, namely: G5UT, 5ZR, BRS2140, 1947, 5NU, and two prospective members, who have since decided to join. BRS1947 gave a talk on Superhets, and then proceeded to show his latest receiver, which certainly seemed efficient.

The Blackpool and Fylde Short Wave Radio Society asked Southport stations to co-operate in their 5-metre Field Day on June 21. A Southport Field Day will probably be organised later.

Individual activities: BRS2140, now 2AVP; BRS1947 still working on supers; G5YR after VK for WAC; 5UT gone to London; 5ZR testing Beam antenna on 112 Mc. 5ZR and 5NU went to NFD. 6SX is not heard of these days.

Blackpool.—Meetings of the local Club have been held weekly, and lectures have been given by G5MS, while gear has been demonstrated by various members.

A 56 Mc. Field Day is being organised for the near future, and if it proves a success, a series will be held during the summer.

2BFW is now G6VQ, and asks reports on 7 Mc. CW, using CO-PA. BRS1921 is waiting issue of full call, and building CO-PA for batteries.

G5AD is on 56 Mc. and 7 Mc. fone. 5MS working 14 Mc. DX. 6MI on 56 Mc. and starting to get gear together for 7 and 14 Mc. fone. 6YV working 7 Mc. CW when pressure of work allows. 2AMH on electron coupled oscillators and tri-tets, and co-operating with 6MI on 56 Mc. 2ARL is experimenting with CO. 2BSF is at wireless college, and looking for new receiver. BRS2269 and 2281 also report active.

Liverpool.—As many of the members are likely to be on holiday within the next two months, and others are devoting their time to outdoor pursuits, there is little to report this month, and no more meetings will take place until the third Wednesday in September next.

The last meeting was well attended in the circumstances, and was mainly devoted to a discussion of N.F.D. adventures. It is understood that the station run by the Manchester and District members obtained 147 points, and the station run by the Liverpool, Southport and District members, 119 points.

Several members are active, but no detailed reports have been received.

Cumberland.—The District Scribe is pleased to receive a report from this area sent by BRS2273, who has now received the call 2ABF. Several members appear to be active in this county. 2ABF has visited G6WR at Whitehaven, and intends to visit 2HT and 6JZ in the near future. It is hoped that local members will co-operate in holding meetings, and that further reports will be received from time to time.

DISTRICT 2 (North-Eastern)

Bradford.—Now that N.F.D. is over, the area seems to have become quieter, probably due to the spell of fine weather, and holidays. Trouble with the 14 Mc. transmitter on N.F.D. was caused by the late delivery of gear from the makers, but, in spite of this, a better score and more contacts were made than before. Best wishes are sent to 2AYM, who is a new member, and to G6KB, who has had his call changed to that of our late friend G2VO.

Leeds.—No report to hand, but G6HA, of 2, Greenock Terrace, Armley, Leeds, 12, would be glad to hear of anyone in his locality who would be willing to spend a few hours each month assisting him with R.E.S. work.

Huddersfield.—The monthly meeting held at 2ALU was attended by G5VD, 5QN, 2AHA, 2ARN and 2AUC. G5VD and 2ALU have superhets working on 56 Mc., and 5VD can make permanent recordings over the air. Reports are few, but the area is active. Members having 56 Mc. gear who can get over to Bradford are invited to take part in a Field Day at the latter end of July.

Dewsbury.—The area is active and the Short-Wave Club has been started up again, after being reorganised. Individual activities include G6PL, who has just worked his first W on QRP, 5ZB getting ready for A.C. mains, 5HB, 5MW, 6MY, 6XT, 5YV and 6SP on 7 and 14 Mc., the latter two using "break-in."

FORTHCOMING EVENTS

JULY 20.—District 14 (Southend Section), 8 p.m., at BRS1447, "St. Ives," Leicester Road, Laindon.

JULY 22.—District 1 (Nelson Section). 7.30 p.m., at the Club Room.

JULY 23.—District 13, 8 p.m., at Brotherhood Hall, West Norwood.

JULY 28.—District 14 (East London Section), 8 p.m., at G6UT, 28, Douglas Road, Chingford, E.4.

AUG. 5.—District 1 (Manchester Section). 7.30 p.m., at 1, Hilton Street, Manchester.

AUG. 5.—S.L.D.R.T.S., 8 p.m., at Brotherhood Hall, West Norwood.

AUG. 9.—District Annual Summer Outing to Wittering. Meet Chichester Station, 10.30 a.m.

AUG. 26.—R.M.A. Exhibition opens at Olympia.

SEPT. 3-5.—Eleventh Annual Convention in London.

Stockton-on-Tees.—The N.F.D. station worked fairly satisfactorily, though some trouble was experienced with the generator. Contacts were made with all G, GI and EI portables except one, and also with LA, D4, HB and PA stations. Activities include G5XT and 6CV on 7 Mc. fone, 6ZT on QRP, 2FO on 56 Mc., 2BQO on mains receiver, 2BHF trying 56 Mc. super-regen. receiver and tuned audio circuits. 2BPT trying series modulation.

Tynemouth.—The N.F.D. station was fairly satisfactory, but trouble was encountered owing to bad conditions, QRM and transmitter trouble. Thanks are offered to all the helpers. A visit to Cullercoats is planned in the near future, when an opportunity will be given to inspect the new gear in operation there.

DISTRICT 3 (West Midlands)

A few individual reports and one from a Town Representative constitutes the recorded activity of the District during the month. Our congratulations are accorded to 2AWX, who was BRS2237 formerly. His brother, who died in 1930, will, no doubt, be remembered as G6WO, who was first licensed in 1926. G2YV sends us the news that he and 6SW are again active in the Cannock area on 7180 and 7110 kc. respectively after rebuilding.

Coventry.—Apart from the activity in connection with N.F.D. things appear to have been comparatively quiet on this front in that there have been but 18 Stations reported active! Next door to them though, G5ML, at Kenilworth, has been working, so the quietness has been comparative only.

Burton-on-Trent.—G5JF and 6NJ made the journey to Cambridge for the District Meeting and thoroughly enjoyed the proceedings. Many personal QSO's were continued and further contacts made.

G2IOP, Southwell, Notts.
G6CW preparing for something whilst G2IO, on his left, looks on with trepidation.

DISTRICT 4 (East Midlands)

The monthly meeting on June 25 at Derby had the usual attendance. It was decided to hold no more meetings for three months.

The National Field Day results and suggestions for improving the district arrangements were discussed.

The next District meeting will be held in Nottingham on September 13, 1936, to make final arrangements for the Stand to be run by members of the District at the Nottingham Radio Show.

Small town meetings will be held to keep members together, and these will be arranged by each T.R. individually.

Leicester Group.—The T.R. wishes to thank all those who helped with and contributed gear for the N.F.D. "A" Station. Special thanks are due to Mrs. Ridgway (2BLR's YF), who, as cook, produced some very excellent meals for those present. Mrs. Ridgway has applied for membership of the Society and hopes to have her BRS number very soon.

2BYX has successfully applied for his "G" call and is awaiting his code test.

Most of the active stations in Leicester are at present working on 14 Mc. The only stations in District 4 who regularly use 1.7 Mc. are G6GO and 6VD, both of whom would like to see more local stations working on this band.

The next Leicester meeting is to be held at 2BLR, 12, Byway Road, Leicester, on Thursday, July 23, at 8 p.m.

DISTRICT 6 (South-Western).

The main item of interest during the past month has been, of course, N.F.D. This was even better supported than in previous years, and much thanks are due to all those who helped in any way. The D.R. would especially like to thank G5QA and G6GM, for it was through their good offices that really excellent sites were obtained for the working of the two stations.

At the B station there were just sufficient members to get things going on the Saturday, while several more members put in an appearance on the Sunday. The operators were 2SH, 5AQ, 5QA, 5QI, 5SY, 5YR, 6II, 6RF. Valuable help was given by the BRS members, especially 1580, 1581 and 2354. A total of 235 points was scored. This might have been greater had not a stray horse got mixed up with the ropes of our biggest mast, bringing the lot down in the middle of the night!

At the A station the operators were 5WY, 6GM and 6FO. These worked the 3.5 Mc. band most of the time, but succeeded in getting some points on the 1.7 Mc. band when the former went dead. Their total of 103 points may not sound very big to others, but it is remarkable that they worked every other N.F.D. station but one. Their transmitting and receiving gear must therefore have been above suspicion. The reasons why they could not work, in fact scarcely hear, the Europeans, must have been beyond their control. We in the south-west will therefore await with interest some record of the foreign stations worked by those further east. The question arises as to whether we, the most westerly station, are not at a disadvantage, certainly on 3.5 Mc., and possibly on 7 Mc. as well.

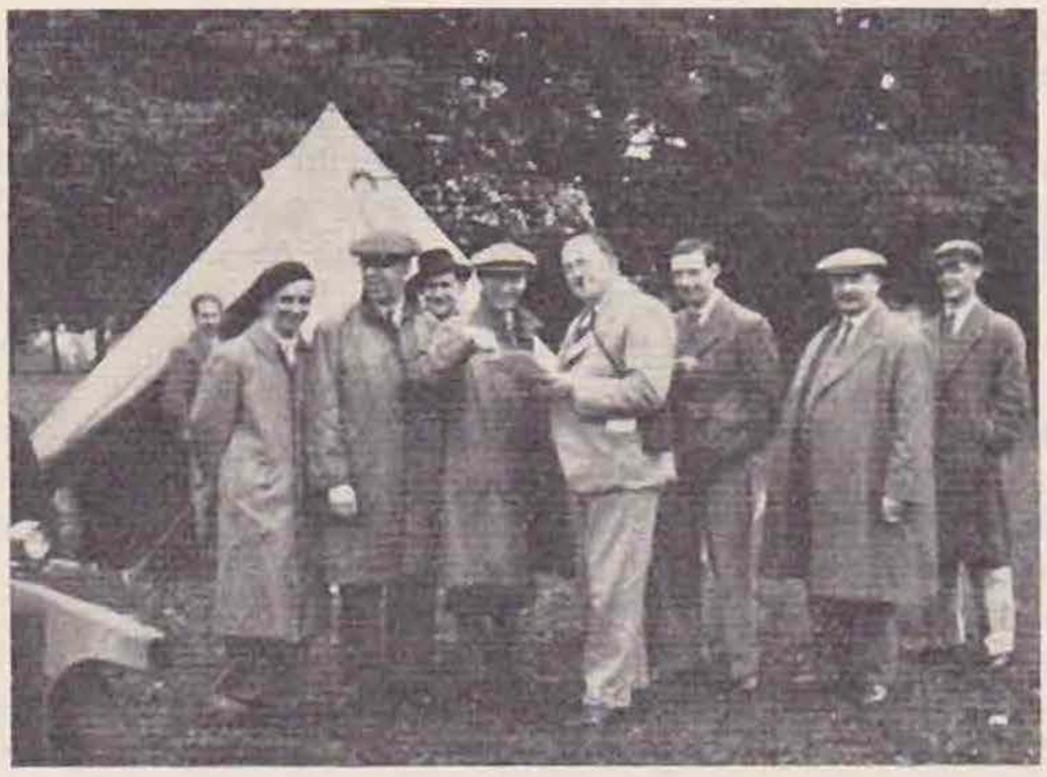
The D.R. is arranging for a 56 Mc. Field Day to take place on Sunday, August 9. Anyone interested, in addition to those already written to, should write to the D.R., who will let them know the final arrangements. It is hoped to have stations going at or near Wellington, Ottery St. Mary, Haldon, Little Haldon, Haytor, Brent Tor, and Bodmin Moor. BRS and AA members

Taunton Group 56Mc. Field Day. G2JM and G5AK in front, BRS2249 and 2245 second and fourth from left.

interested should take their 56 Mc. receivers on to the highest points they can find, and send in a log to the D.R.

An example of the possibilities is shown by the fact that on June 14 the Taunton group had a 56 Mc. Field Day at the Wellington Monument. The operators were 5AK, 6LO, and 2JM. The station was heard on the speaker at an average of R5 at a portable station on Haldon, 25 miles away, whilst on another receiver, also on Haldon, and only a hundred yards away from the first, they were inaudible!

The Penryn Group continue to hold their monthly meetings. At the last there was a record attendance of a dozen. The members present were 5BC, 5VL, 5QH, 2AHU, 2AQB, 2AMK, 2AZW, 2BXT, BRS2048 and 2252. The meeting was very pleased to see 5VL and to be entertained by him. 2AQB and 2AZW have passed the Morse test and are awaiting their two letter calls. Well done! 2BPB has now become G6BC. Congratulations!



G2NHP.
Walton-on-the-Hill, Surrey.
Our Secretary checks up the score card with G6GZ. G2NH is to the left with G6MN in the background. Others in the group are G5LA, G6NK, G5AR and G6GS.

DISTRICT 7 (Southern).

N.F.D. was thoroughly enjoyed by all who took part, and No. 7 District takes this opportunity of congratulating the winners. The August meeting will be our annual seaside party at Wittering. Meet in Chichester Station Yard at 10.30 a.m., Sunday, August 9. Please note the date carefully, as it is the second Sunday in the month, and not the first, as is usual.

Portsmouth.—This month's event was N.F.D. when G6NZP was in the field, a No. 7 station being in the South of the District for the first time. This was well supported by local members and friends, everyone enjoying the occasion and contributing to a very creditable score of 152. It is hoped to run another portable day on July 19 at Clanfield. Welcome to G5XY, who joins the City. Congratulations to 2BHR, who now awaits his two letter call. G2ZR continues good work, using accumulator supply. G6WS is planning a wholesale rebuild. G2XC does well on 3.5 Mc. BRS2105 visited G6NZ and also had mains cut off by lightning. G6SS, 2BCM, 2AIV, 2BBG, BRS1907, 1319, 1964, 2362 are all active.

Farnham.—G5NF takes unto himself a wife on July 4. Best wishes from all in No. 7 o.m. 2BAU has the first G8 call in the District, and is now G8AJ. Best DX to date is PY3CJ. G5NF, 8AJ, 2AQW visited G6NZP on N.F.D.

Reigate.—G5PR is now in Kent owing to business appointment, and hopes to be active again shortly. G6JF now WAC on 14 Mc. G5LK and 2AIG both active. G5XG now WAC Fone with 20 watts input. The T.R. complains of a lack of reports this month. (Please back the T.R.s up as they cannot make up reports when kept short of information. —D.R.)

Reading.—Permission was obtained to run a station during N.F.D., which was set up on Burghfield Common, some 8 miles S.W. of Reading, using the call G5AOP. A c.o./b.a. or f.d. P.A. transmitter was used with 66 ft. Zepp. aerial. Some 20 portables, located in Great Britain, I.F.S., Switzerland and Egypt were contacted, besides many fixed stations. The operators were G2YB, 5AO, 5HH, 6GT and 6WO. Many visitors arrived during the week-end. A great deal of experience was gained, and it was generally agreed to run Field Days as often as possible. Most local members are now licensed for 28 Mc., and several for 56 Mc., so that 56 Mc. Field Days are also being considered. All local members report active except G5HN, who unfortunately has been ill. The membership of the local club is increasing.

Kingston.—2AUB has applied for his full licence. 2BHU has built some very compact 56 Mc. gear. 2BIP is also getting going on 56 Mc. G2KX is building a new s.g. receiver. G6RS is working regularly on 56 Mc., using half-wave vertical aerial fed by 36 ft. feeders; is using the coupling device described in recent "*QST*" for receiver, and finds this very successful. Will be glad to supply details on request, and also would like to hear from any local members working regularly on 56 Mc. The Kingston and District A.R.S. put a portable station on the air during N.F.D., and "scored" 92 points, using 7 Mc. only. Most of the official stations were worked, and a log has been sent to H.Q. for checking purposes.

DISTRICT 8 (Home Counties).

At a meeting held at Cambridge on June 12, at which twenty members attended, the D.R. confined his opening remarks to the reading of news items in connection with the Society. The question of continuing monthly meetings throughout the summer was unanimously agreed upon—these will take place at the King's Parade Café, Cambridge, on the second Friday in each month at 7.30 p.m., and all are welcome.

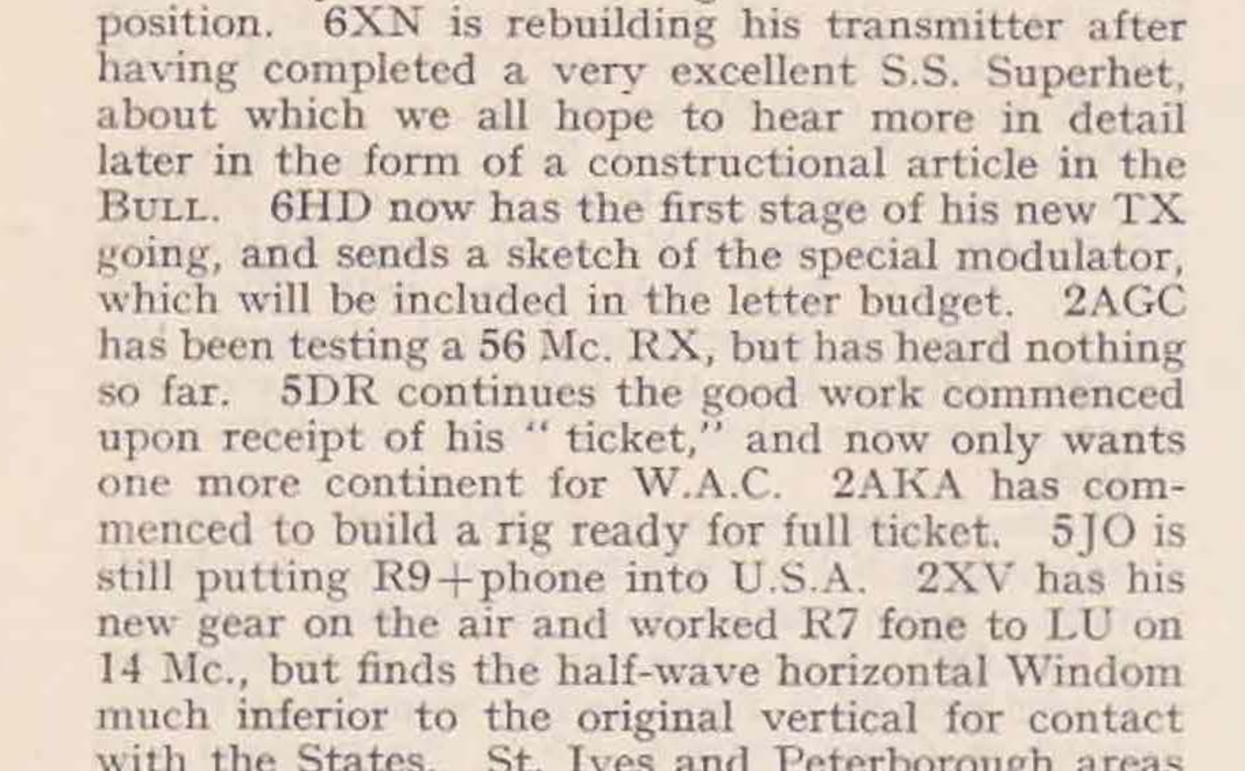
It was agreed, on the suggestion of the D.R., to collect a sum of money to purchase small presentations to the two gentlemen who so kindly provided the admirable sites for the field day stations.

An excellent talk on 56 Mc. was given by Mr. Moxon (G6XN), who explained the difficulties which have to be overcome, and produced an interesting transmitter actually built upon the cap of its own valve, with which he claims good work. (BULLETIN article, please.—ED.)

Reports this month are less than in the past. It is hoped that members will send in more reports in future of their interesting findings, but please keep them as brief as possible, and to the point.

G2PL reports further tests with a semi-vertical antenna which has given very poor results—this

identical system is now being tested in a horizontal position. 6XN is rebuilding his transmitter after having completed a very excellent S.S. Superhet, about which we all hope to hear more in detail later in the form of a constructional article in the BULL. 6HD now has the first stage of his new TX going, and sends a sketch of the special modulator, which will be included in the letter budget. 2AGC has been testing a 56 Mc. RX, but has heard nothing so far. 5DR continues the good work commenced upon receipt of his " ticket," and now only wants one more continent for W.A.C. 2AKA has commenced to build a rig ready for full ticket. 5JO is still putting R9+phone into U.S.A. 2XV has his new gear on the air and worked R7 fone to LU on 14 Mc., but finds the half-wave horizontal Windom much inferior to the original vertical for contact with the States. St. Ives and Peterborough areas have not reported.



Cambridge Provincial District Meeting.
G6LL, Mrs. G6CL, Mrs. G6CW, G2NH, G6CW, G6UN G6MN, Mrs. G2XV, G6UT, Mrs. G2XS. The Misses G6CW, 2XV and 2XS in front with G2XS and G2XV.

DISTRICT 9 (East Anglia).

Last month's appeal for more reports has resulted in only one being received! Please endeavour to send a few lines to the D.R. before the 20th of each month.

On the whole, our effort at N.F.D. was not so satisfactory as in the previous year. At G2XSP, unfortunately, the M.G. drained the L.T. batteries far more quickly than was expected; so that 2-volt valves and dry batteries had to be substituted early on Sunday. In spite of this, and using only 4 watts, an R9 signal was put into Scotland. Owing to this unforeseen happening, a meagre score of 70 points was made. The site and conditions at the " B " station, working under the call G6QZP, were an improvement compared to last year; but of the score of 116 points here, only 16 were obtained on 14 Mc., and those from the QSO with SU1A.

All those who were present at the Cambridge P.D.M. on June 28 will, we think, agree that it was an event well worth attending, as the gathering included members from quite a number of Districts and also two amateurs from overseas.

The Annual Convention is this year being held on September 3, 4, and 5. We hope to see District 9 there in force, if only on the Saturday.

DISTRICT 10 (South Wales and Monmouth).

There are no reports this month from the Newport T.R., so we must assume that there is nothing doing in that town. The Blackwood Club (6BK) held quite a successful field day on Sunday, June 21, and a T.P.T.G. was operated on 1.7 Mc. during the morning and on 7 Mc. during the afternoon. Special thanks are due to Mr. Mudford, who did all the work, as usual, also to 2BOQ and 2BG, who supplied the " eats " and " genny " respectively.

Cardiff.—A general meeting of the Short Wave Club was held on June 25 and new officers for the year were appointed. G8AM (ex-2BMA) was elected Chairman, 2BBQ re-elected Secretary, while 5BI now holds the bag!

The D.S. paid an unexpected visit to 5XN on June 24 and spent a very pleasant evening on the air renewing old acquaintances. 5XN is handicapped with D.C. mains, but puts out a very fine fone signal on 7 Mc. as his numerous reports show. He is using CO-PP-PA, choke modulated, and his total H.T. is only 200 volts. 5BI has dismantled his faithful A.O.G. and put up a 14 Mc. Windom, but DX has been elusive so far.

Swansea.—The main item of interest for the month was N.F.D., where poor aerial facilities, combined with plenty of rain, made conditions bad. Although the average height of the aerial was only 17 ft., four continents were contacted, and QRK's, were good, but contacts were scarce. The event was enthusiastically supported by the BRS and A.A. men, but the T.R. much regrets the apathy of the two-letter people in general, but thanks 5KJ, 6JW and 2BVV for their active co-operation.

5TW has scrapped his locked oscillator outfit and is rebuilding for link-coupled and driven P.A., using two '47s and a T25D. 5KJ continues his successful DX, and is now installing an Oscilloscope. 6JW and 2UL report good DX, as usual. 2WO only has time for skeds at the moment owing to business.

The D.S. asks all the old " lags " to wake up and tell him what they are doing or what they are trying to do! New members also please note.

DISTRICT 13 (London South).

The Monthly District Meeting was held on June 25 and we were pleased to welcome several new members. A suggestion was put forward that South London should run a District Field Day on the lines of that

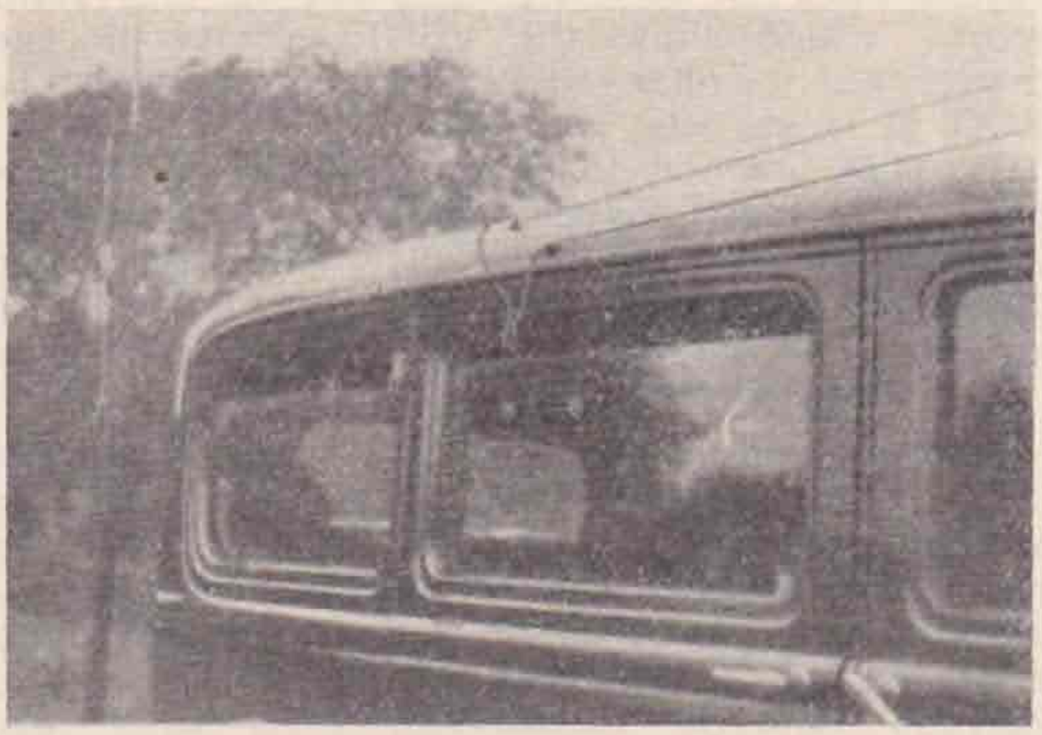
G2LJP, near Newport.
Left to right: G2XX, 5BI, 2BSN, G2NG and others watch 2BPG scoring " bulls " at the impromptu rifle range.

run in July, 1935, but in view of the difficulty in arranging a suitable date, the matter was postponed until the July meeting. A further suggestion put forward was that an Annual District Contest should be organised on the lines of the old QRP Contests, and that a prize should be provided out of the funds. Any ideas for such a contest should be forwarded to the D.R. without delay. Such an event would most probably take place in the early autumn.

G5QFP. Mill Hill, Middlesex.
G5AM and G5QF on show.

It should be mentioned here that the D.R. is especially grateful to Mr. Shanks (BRS2222), of Ide Hill, who very kindly lent his field for the erection of the "A" Station on N.F.D. Mr. Shanks proved himself a veritable tower of strength, and we voice the opinion of all members in asking him to accept a very hearty vote of thanks.

To the new members in South London we would offer a cordial welcome, and remind them that monthly District Meetings are held at West Norwood—details may be obtained by reference to "Forthcoming Events." The D.R. is still endeavouring to pay a personal call on each member, but owing to many outside matters over which he has no control, the task is somewhat lengthy. Any member is, however, always welcome at 13, Montpelier Row, Blackheath, if he will first phone Lee Green 1591.



The aerial lead-in at G2LWP, the 56 Mc. link between G2WVP and G2HGP.

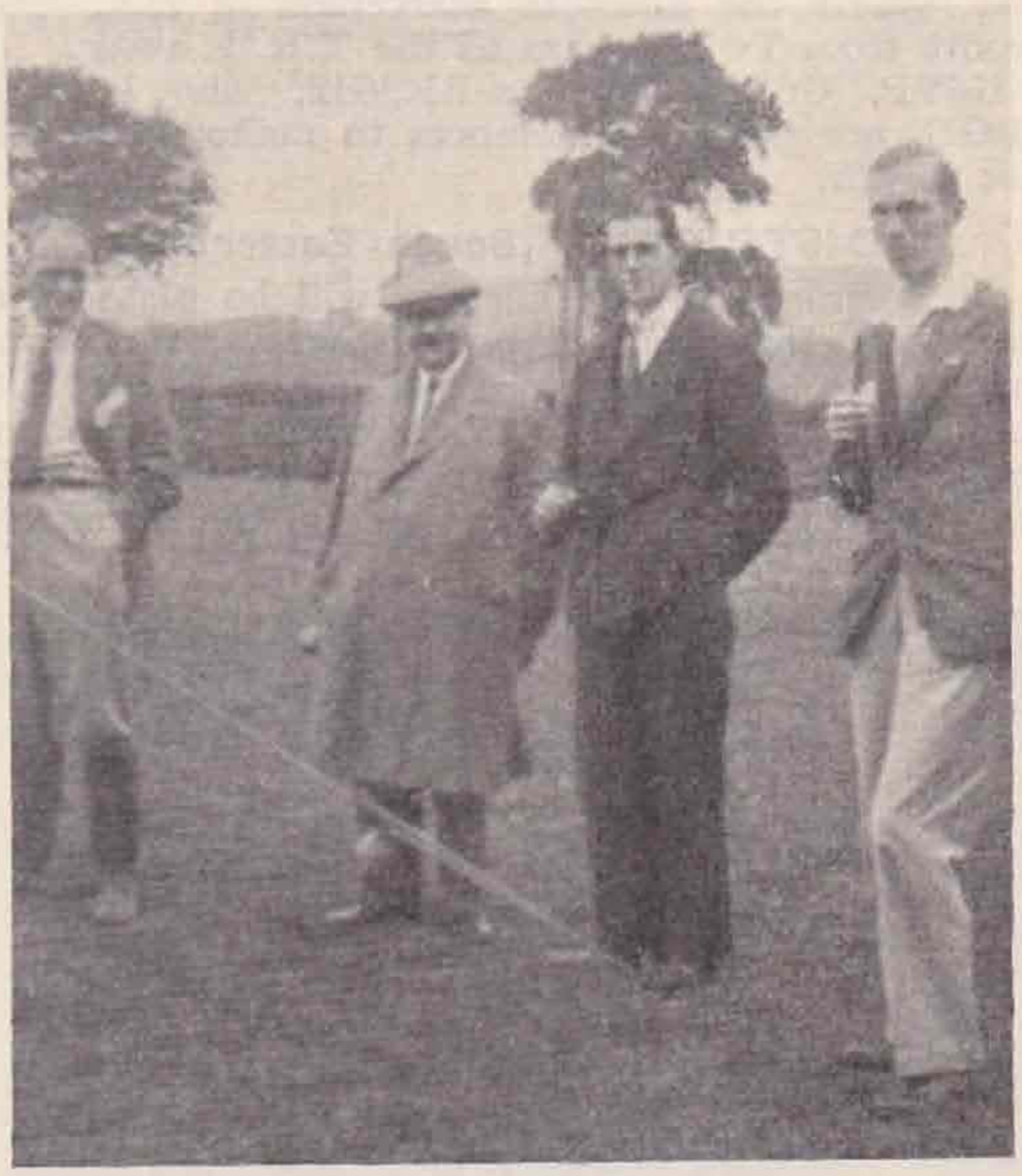
By the time these notes appear, the South London Conventionette, 1936, will be over, and we trust that everyone will have enjoyed himself. It is hoped to run an even better show next year, and any suggestions will be gratefully received.

No item of particular interest has been received this month, but the following stations are active: G2ND, 2RC, 2RD, 2UX, 2VB, 2WV, 5OX, 5WG, 6AQ, 6AN, 6CB, 6FU, 6HM, 6OD, 6QN, 2BFH, BRS1357, 2015.

It is hoped that a good attendance will be recorded at the next meeting, as several important matters appear on the agenda.

DISTRICT 14 (Eastern).

Southend-on-Sea.—At the last meeting held at G5UK the attendance was 20. Awards were given to the winners of the local Great Circle D.X. Contest. G5VQ was the winner of the transmitting contest and 2BGP of the receiving. Another item of interest was the showing of the N.F.D. films. Congratulations to 2AVD, of Leigh on-Sea, who is now G6CD.



G2HGP.
Ide Hill, Kent.
Left to right: BRS2222, G5AR, BRS250 and G6QB.

East London.—The attendance at 2BPY, Barkingside, where the June meeting was held, amounted to nine members. Meeting places are wanted for September and October meetings—offers, please. BRS2450, of Loughton, provided a tent for N.F.D. in which the "A" station (G6UTP) was located at Rookwood Hall, Abbess Roothing. The operators were G2XG, G8AB and G6UT. The following visited the station: G5AR, 2KT, 2YI, 6FY, 6SG, 6FJ, and BRS1410; films were taken by 2BZK and donated by him.

Thanks are due to Mr. Rowe for allowing the use of his meadow again and to the Misses Rowe for their many kindnesses. Transport was given by Messrs. Escott Bros., Ltd., of Wanstead, whose van was driven by G6SG. By now most of us have heard the district's youngest transmitter (formerly 2BGL) of Loughton.

DISTRICT 15 (London West and Middlesex)

The District put up a very creditable score at both stations during N.F.D., and the results will be awaited with interest. Those who experienced their first field week-end appeared to thoroughly enjoy themselves, in spite of the rather poor weather, but those who had been on previous occasions were perhaps a little disappointed. The D.R. appreciates the supreme effort made by all concerned to regain the trophy, and wishes his thanks to be conveyed to all.

It is unfortunate that 2AWH had to change his place of business, resulting in his resignation as printer of the District Magazine, and we take this opportunity to tender our thanks for his past work. We are pleased to announce that 2ANR has undertaken the task, and he would like to know if any member can help locate someone to do the stencils.

Hayes.—G5JL, 2ANR, 2BCN and 2142 all report active. G5JL and 2ANR stayed up for the eclipse and reports the absolute scarceness of DX. No report from Twickenham as the T.R. is away.

G6VP, G6WN and ex-BRS642, who is now 2BGD, are the only members to make the effort this month.

DISTRICT 16 (South-Eastern).

All members in the District will be pleased to learn that the Courteney-Price trophy has been awarded to Mr. J. C. Elmer (G2GD) for his work in connection with R.E.S. We offer him our sincere congratulations. Through reasons of health GD is unable to attend Convention, and the Secretary has "instructed" the scribe to arrange a suitable gathering of the Clans at Folkestone, at which the cup may be presented. The D.R. has accordingly consented to the District Conventionette being held at "The Valiant Sailor," Folkestone, the headquarters of the "Folkestone Radio Amateurs," on September 20, where everybody will be able to inspect 2FA and appreciate the meaning of "good QRA"! Book the date everyone and see that you are there. You have had good notice.

G2UJP.
Frant, Sussex.
Left to right: G6OB, G6BD, 2BTI, 2BII, G2UJ, 2AVN, G2RM, G6SU, G6CY and G5JZ.

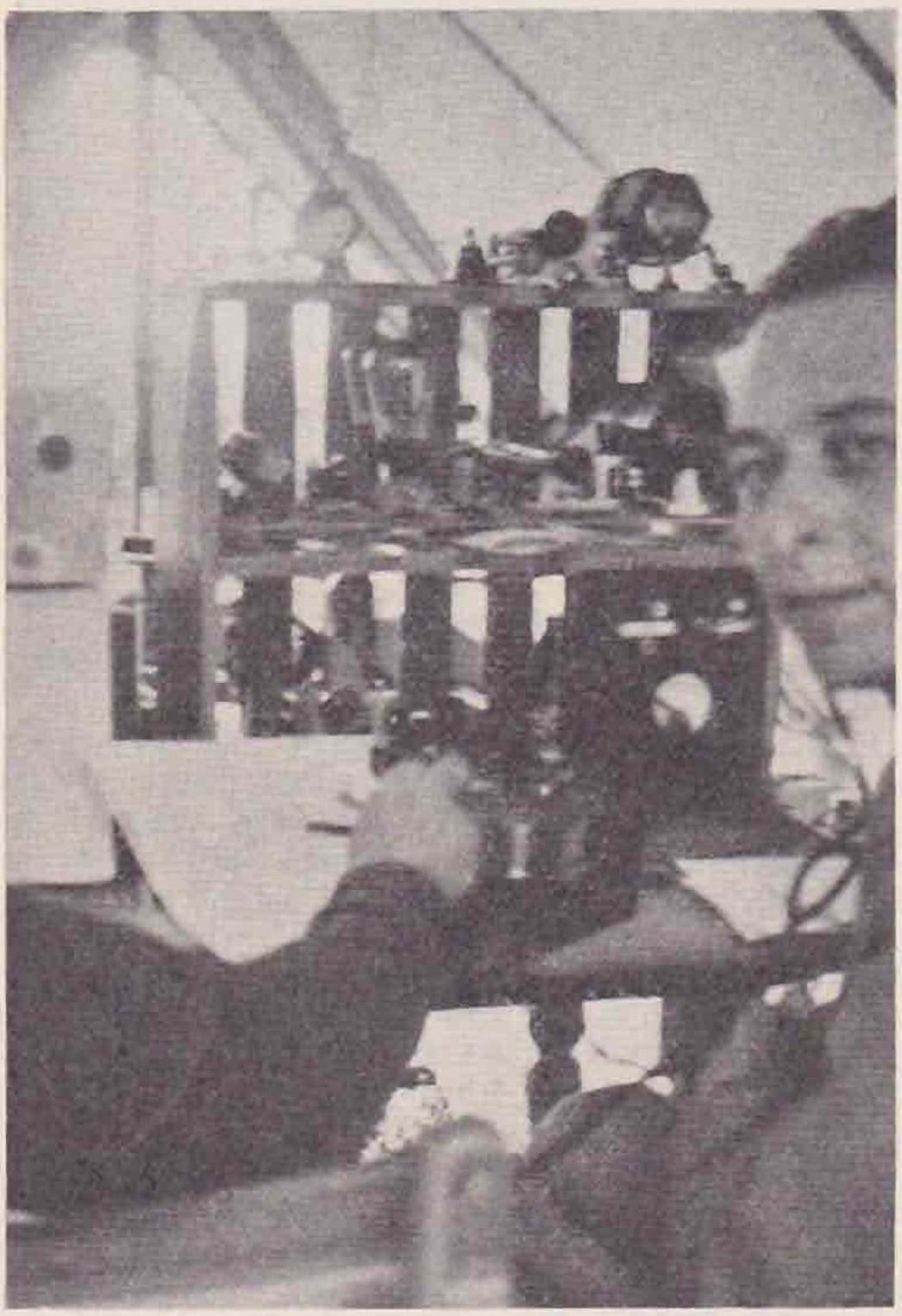
Although we know that we have not won the N.F.D. trophy, we put up a very good show, and the Tunbridge Wells and Gravesend groups are to be congratulated on the way they ran the stations.

At Gravesend 5IL was organiser, whilst 5SI and 6BQ built the gear and were chief operators with 5FN and 6VC. Their masts were a work of art and a cause of anxiety, but the summerhouse did keep the rain out.

The Tunbridge Wells "B" station score of 216 points is the best any station in our district has put up so far. The TR 2UJ was organiser, and his gear was used at the station. The group wish to record their appreciations to Mr. Hayden for the loan of the site; Mr. Laye, his bailiff; Mr. Mortley (2PQ), who produced an excellent rotary transformer for H.T.; and 5KV for his work as the cook!

Space does not permit setting out the individual reports, which show the usual activity in the District, but we offer our hearty congratulations to 2BCQ, of Hove, who is now G8AC.

The D.R. has now taken up residence at his new abode. The full postal address is "Twemigh," Kechill Gardens, Hayes, Kent. No prizes are offered for deciphering the meaning of the house name!



G6WNP.
Denham, Bucks.

DISTRICT 17 (Mid-East).

The main item of news this month concerns N.F.D. The D.R. much regretted that, owing to the nature of his profession, he was unable to be present, but judging from all reports a most enjoyable time was spent at both stations. Although we scored less points than in the previous year, everyone enjoyed themselves, and, after all, success in N.F.D. is not to be reckoned merely in the number of points gained. The experience gained will no doubt be of value next year.

A feature of the "B" station was the excellent lattice masts constructed by G6UG. They will be a most useful asset on future occasions. Likewise at the "A" station the aerial system is worthy of chief mention, as two 132-ft. aerials had been erected

at right angles to each other, with a switch enabling either to be used. This proved most effective.

The D.R. is writing these notes on holiday, and is having to rely on his memory, and therefore asks for forgiveness if he has omitted anything of importance. Congratulations to 2AFU, who has passed his Morse test and is awaiting his licence, and to 2BJY, whose application has been accepted conditional on his passing the Morse test. The membership has grown enormously during the past year, and it is hoped that more of the BRS and AA members will in time follow the example of these two gentlemen.

G2LRP.
Cranwell, Lincolnshire.
G2LR in centre, G6AC second from right in front, G6TV extreme left.

DISTRICT 18 (North-Eastern).

Hull.—The T.R. expresses his dissatisfaction in reports this month. Two reports have been received as against one last month, and this with a local membership of over twenty. One report for last month from BRS1948 was received on the 25th—much too late for publication. Reports by the 19th, and crystal frequencies, please. This was requested last month, but was obviously overlooked.

In fairness to some members, the D.S. would like to point out that owing to the belief that the T.R.'s business activities had carried him to Belfast, certain members gave their reports to the D.S.

Activities.—G6KN has recently changed his QRA, and is getting out better from there. His QRA is 267, Northgate, Cottingham. 6FQ is active, and his frequencies are 7039, 7040.5, 7180 kc.

5MN active on 14 Mc., and is building completely screened receiver with view to working duplex telephony. 5BP active on 14 Mc. 6OS getting SSS to his liking, and almost entirely eliminated images using a regenerative H.F. preselector stage together with iron cored regenerative I.F.'s. 2QO been in Ireland for nearly a month, so little amateur work has been done. Has installed a Comet " Pro," and very pleased with it, though there is a little trouble with images on 14 Mc. The crystal gate selectivity is amazing, and no loss of signal strength occurs.

6UV is making QRP tests; using 8 watts he has worked U.S.A. on 7 Mc. with somewhat inefficient aerial. He wishes to thank all members who assisted with transport of N.F.D. gear. 5HA starting up on 28 and 56 Mc., with c.c. on latter. 5GC rebuilding after N.F.D.

Congratulations to BRS1936 and 2366, who are now 2AGK and 2BRY. 2AGK has built T.P.T.G. on 7 Mc., using Mazda P220A. 2BRY perfecting L.F. amplifier to work on D.C. mains giving output of about 5 watts, which he will use on actual transmitter. 2AAX building C.O., F.D., P.A., and concentrating on power packs. BRS1948 been trying to get on 28 Mc., but not much luck. Added S.G. stage, and heard several new countries.

Scotland.

" A " District.—It is odd commentary that the District best in the position to afford news should be the one to present practically nothing, but we fear that it is always so. It is understood that two new full licences have been granted to 2AFY and 2ARS respectively. 2AFY'S call is understood to be G6WD, while 2ARS is believed to have been allotted the first " G8 " issued in Scotland, the call being G8AH. An " A.A." permit has also been granted to BRS1129 of Clydebank with the call 2ATB. 2AGM of Airdrie has been offered a full " ticket " subject to him satisfying the G.P.O. as to his morse qualifications. G6MS has asked us to state that he will be operating his station on the site of " A " District's N.F.D. stations, during the first fortnight of August, and will appreciate contacts and reports. He expects to work on 7, 14 and 56 Mc. G2UU joins the select band of proud possessors of *Hammarlund* Comet Super-Pros, and when he wants to feel really well-off he sits down and counts the " toobs." G5YG's station is now closed until September.

" B " District.—We are glad to note that G5IP, after a protracted illness, is once again active. 2BVF and 2AFA have passed their morse tests and await the issue of their full permits. N.F.D. was enjoyed, although a last minute change had to be made in the location of " B " station, which ultimately landed at Newmachar. Heavy rain on the Sunday somewhat marred things, but did not damp enthusiasm. The closing meeting for the season was held on June 12, when there was a full turnout. It is intended to resume in October. Comment is made on the increase of fully licensed stations in the District. Two years ago there were five; to-day there are twelve.

" C " District.—Upon the retiral of G6LD from the post of District Officer, G6RI was appointed. In regard to N.F.D. the " B " station of the district experienced trouble early on the Sunday, and had to close down permanently. " A " station did quite well, and appeared to be the only Scottish Station operating on the 1.7 Mc. band. A new licence is that of G5SC, Mr. Candow, Dundee. G5WT and G6LD are understood to be W.A.C. and W.B.E. G6RI has been carrying out a successful schedule with VK on 8 to 9 watts, and has also worked VS6 with the same power. G6KO has in use a vertical 33 ft. aerial with reflector, and appears to be getting wonderful results with it. Two new BRS members are reported. G6LD laments poor conditions, but produces a long list of DX worked nevertheless.

" D " District.—It was a source of regret to us all that almost at the last minute " D " District found it necessary to withdraw their stations from N.F.D. Unanticipated difficulties arose, however, which left them little alternative, much as we know they regretted the necessity. The writer was privileged to spend some little time in G6SR's shack lately, and was struck by the variety of apparatus on view. If one excludes an audio oscillator (and perhaps he had that also) he had everything on view

from a crystal mike to an oscillograph, which latter piece of apparatus was well worth inspection. Unforeseen circumstances have brought about the retiral of the D.O. G2TM, who was elected in January. He is succeeded by Mr. Jack Wilson (G6XI), whose address is, 36, Woodburn Terrace, Edinburgh 10. The District held its end-of-season supper on Wednesday, June 17, when there was a splendid turnout of members. There were numerous guests from other Districts, including the Records Officer, G5YG, G6NX, G2UD and G6RV, all of whom were made very welcome. In G5DO a new call appears in the district. This may be a new call, but it is the property of one of our oldest members in the person of Mr. Winkler, who was formerly G2TF. A further new call is G6JH, which has been issued to 2ANP of Linlithgow. Practically all of the " D " District stations are understood to be active, and we may have more to report regarding them next month.

Northern Ireland.

N.F.D. again brought its quota of hard work, but those who took part had the satisfaction of having once more made an excellent score. The total score was 451, of which Station " A " scored 122 and Station " B " 329.

Station " A " had initial difficulties and was 52 minutes late in getting on the air. There is no doubt that the GI " A " Station is under a considerable handicap compared with G " A " stations, for again we had to stand by while our G friends called and worked DX on 3.5 Mc. The feeling is that whilst the present method of scoring exists, GI cannot compete on equal terms with G " A " stations. " A " DX was PA, HB and D. In all, fifty-one contacts were made, of which 27 were G Portables, 14 fixed G Stations, 3 EI and 7 European Stations.

Station " B " is to be congratulated on its score. Last year it made the highest " B " score in N.F.D., and this year has again given its staff every satisfaction. In all 80 contacts were made, of which 29 were on 7 Mc. and 51 on 14 Mc. Points were obtained from all W districts except 7, other DX being SU, VE and VU.

The operators at Station " A " were GI6YW, 5HV, 2SP and 5GV (part time), while GI2CN, 5SQ, 6WG and 5UR did duty at Station " B." The following also took part: GI6TB, 2BNL, BRS Maxwell and Mr. Wilson. The D.R. desires to tender the District's best thanks to GI5SJ for his solution to the transport problem and to Mrs. Cleland, Mrs. Allen and Miss Ling for their very excellent culinary arrangements.

BRS2363 (A. Parker) has now received his A.A. licence, his call sign being 2BIY.

Empire Calls Heard.

E. R. Trebilcock (*BERS*195), *Tennant Creek, North Australia, from April* 9 *to April* 30 :—

7 Mc. (cw) : ve4gs (9.5.5), 5ir (7.5.6).

14 Mc. (fone) : vs6aq (4.5).

14 Mc. (cw) : g2pl (9.5.5), 2wq (9.5.6), 5pz (9.3.3), 6cj (9.5.5), 6dl (9.5.6), 6wy (9.5.5), 6xq (9.5.5), ve3fb (8.4.4), 3ig (9.4.4), 3ug (9.4.3), 4aw (9.5.5), 4rd (9.5.7), 4ru (9.5.6), 5jb (9.5.5), vp5ab (8.5.6), 5ad (6.4.4), 5ae (9.5.5), 5pz (9.5.7), vs6aq (9.5.6), 7jw (9.5.6), 7ra (9.4.5), 8aa (8.5.5), vu2jp (9.5.6), zb1h (9.5.5).

Golders Green Society Activities.

The 14th Open Direction Finding Competition organised by the Golders Green and Hendon Radio Scientific Society and directed by Col. H. Ashley Scarlett, D.S.O., was held near Harpenden.

The transmitting station was under the control of the President Mr. D. N. Corfield (G5CD). The 3.5 Mc. band was used, and the returns showed that the skill and the amateur constructed apparatus produced results of the same order of accuracy as when 1.7 Mc. was used.

Messrs. Maurice Child and Alex Black's groups, both of the Golders Green and Hendon Radio Society, were successful this year in winning from the Southall Radio Society the first two places. The results were very close, there being only 1 degree of error difference between the first three groups, and in one case the total error returned was less than 0.9 degree.

The judges were Group-Captain G. Struan Marshall, Mr. H. B. Dent, of *The Wireless World*, and Mr. E. J. Hubbard, A.M.I.E.E.

The objects were first to locate the direction of a transmitting station, and secondly, to actually discover its position. Four positions were taken up, each one having an entirely different characteristic.

Stability and accuracy combined with lightness in weight were essentials in the design of all apparatus used, as mobility and size were of the greatest importance. This meeting was followed by a 56 Mc. field event, held near St. Albans. The day's work was most interesting as every type of weather was experienced from extreme heat and sunshine until 1400, followed in succession by dullness, terrific thunderstorms, and torrential rain until 1700. Even under these tropical conditions, G5CD kept the transmitting station working to schedule.

It was noticed that there was a general falling off in signal strength between 1200 and 1400 B.S.T., also when a rain cloud passed over the aerial.

The country was of a very enclosed nature, and the relative height of positions was of the order of less than 100 ft., however, reliable reception was reported up to 9 miles.

The super-regenerative 3-valve receiver still seemed the most popular type, but with better stability of transmissions and valves suitable for high frequency amplification at these frequencies, the superheterodyne will eventually prove more suitable for this work and lead to possible real directional work.

Future 56 Mc. meetings will be held on July 12 and September 13, also a 3.5 Mc. D.F. meeting will be held at Bradwell-on-Sea, Essex, on July 26.

Readers interested are asked to write to the Hon. Secretary, Mr. A. G. Griffiths, Hornebeams, Bentley Priory, Stanmore.

H. A. S.

VU2DR.

We learn from Mr. T. Shanks, BRS2222, that his brother Mr. A. G. W. Shanks, has now been licensed in Assam under the call VU2DR.

Empire B.E.R.U. News.

B.E.R.U. REPRESENTATIVES.

Australia : I. V. Miller (VK3EG), P.O. Box 41, Tallangatta, Victoria ; Sub Representatives : J. B. Corbin (VK2YC), 39, Mitchell Street, McMahon's Point, Sydney, N.S.W. ; R. Ohrbom (VK3OC), 22, Gordon Street, Coburg, N.13, Victoria ; A. H. Mackenzie (VK4GK), Fire Station, Wynnum, Brisbane ; G. Ragless (VK5GR), South Road P.O., St. Mary's, S.A. ; J. C. Batchler (VK7JB), 21, Quarry Street, North Hobart, Tasmania.

Bahamas, Bermuda and the Eastern Part of the West Indies : P. H. B. Trasler (VP4TA), Point à Pierre, Trinidad, B.W.I.

Burma : W. G. F. Wedderspoon (VU2JB), Government High School, Akyab, Burma.

Canada : C. S. Taylor (VE1BV), Stewiacke, Nova Scotia ; Earle H. Turner (VE2CA), 267, Notre Dame Street, St. Lambert, P.Q. ; W. P. Andrew (VE3WA), 1337, Dougall Avenue, Windsor, Ont. ; A. E. Howard (VE4CJ), 2401, 25th Street West, Calgary, Alberta.

Ceylon : G. H. Jolliffe (VS7GJ), Frocester, Govinna.

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

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

Hong Kong : G. Merriman, (VS6AH), Box 414, Hong Kong.

Irish Free State : Captain G. Noblett, M.C. (EI9D) Barley Hill House, Westport, Co. Mayo.

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

Malaya and Borneo : J. MacIntosh (VS1AA), Posts and Telegraphs, Penang, S.S.

Malta : L. Grech (ZB1C), 18, Constitution Street, Zeitun, Malta.

Newfoundland : E. S. Holden (VO1H), Box 650, St. John's, Newfoundland.

New Zealand : C. W. Parton (ZL3CP), 69, Hackthorne Road, Cashmere Hills, Christchurch.

North and South Rhodesia : R. A. Hill (ZE1JB), P.O. Box 612, Salisbury, S. Rhodesia.

North India : J. G. McIntosh (VU2LJ), Baghjan T.E., Doom Dooma P.O., Assam.

South Africa : W. H. Heathcote (ZT6X), 3, North Avenue, Bezuidenhout Valley, Johannesburg.

South India : J. Shepherd Nicholson (VU2JP), c/o Kanan Devan Hills Produce Co., Ltd., Munnar P.O., Travancore.

Canada (Second District).

By VE2CA *via* G5BP.

The Second Canadian District amateurs held a very successful Convention on May 23 and 24 in Montreal. Over 200 sat down to the banquet, probably the biggest "hamfest" which has ever been held within the British Empire. Amateurs from Haiti, Manitoba, Sydney, and Nova Scotia were present.

Conditions for G contacts continue poor.

Canada (Third District).

By VE3WA, *via* G5RI.

Conditions on all bands seem to have been poor during the past month, and it has been impossible to keep schedules even with Europe. VE3WA has changed his QRA, and has been off the air for some time due to trouble in erecting an antenna. A temporary antenna installed in the shack has been giving good results, this consists of a centre-fed Zepp, 24 ft. long. VE3AFN is a new-comer, and would like to contact G on 7 Mc. ; he is also on 14 Mc., looking for Empire contacts. Southern Ontario amateurs supported National Field Day, but due to severe storms no success was obtained. A gas engine driving a generator was used for power, A 100-watt transmitter was set up, but only W and VE stations were contacted.

Ceylon.

By VS7GJ.

Following indifferent weather conditions, the South-West monsoon has definitely arrived, with 49 inches of rain recorded for May.

Thunderstorms of a most violent nature have been experienced, bungalow electric lighting damaged, and the CO and FD valves internally ripped clean out.

VS7JW reports a marked improvement on the 14 Mc. band, stations from all over the world coming in with terrific strength, but the 7 Mc. band is still marred by QRN and QRM.

VS7GJ has been busy and nothing has been attempted on the 7 Mc. band, but on 14 Mc. good QSO have been established. W9 gives FB reports. The Loyal Relay message was put over direct to G6CJ. Now that 7GJ has his transmitter working well on 28 Mc., reports will be welcomed.

Channel Islands.

G2UR has applied for membership and has been active on 7 Mc. BRS2130 is logging DX on 14 Mc., 1784 is now 2AOU. All three are members of the recently formed Jersey Short Wave Club, of which the latter is honorary secretary. It is hoped to affiliate to R.S.G.B. as soon as numbers increase. BRS2130 and 2AOU have been assisting G2UR, and both expect to be fully licensed at an early date.

G2ZC has relinquished his position as Channel Isles B.E.R.U. representative owing to the fact that he has left Jersey for England. We extend our grateful thanks to him for his past services, and wish him every success in the future. We hope, too, that Mrs. Fergus will continue to improve in health.

For the time being, Channel Isles reports should be sent to 2AOU.

Egypt, Sudan and Transjordania.

By SU1SG *via* G5JX.

By the time these notes are in print several of our members, including SU1WM, 1KG, 1TM, 1RH, 1RO and BERS351, will be away on leave. As all these members hope to be in or around London during August, we hope to have SU well represented at Convention this year.

During N.F.D. the Cairo Group were unfortunate in having most of the local members either away or busy, consequently the plans for the portable station had to be revised at the last moment, and SU2TW is to be congratulated on his good work in building a portable station at short notice and operating it under considerable difficulties. SU1RO wishes us to record his District's appreciation to Mr. Wimbush. In Alexandria, preparations and tests had been made some two months in advance, and on the day of the event the erection of the station and subsequent operation worked like clockwork. During a most pleasant week-end we contacted 23 stations, scoring 368 points.

SU1RO has qualified for his W.B.E. fone award, and is now looking for the elusive South Americans. SU1KG has successfully completed his crystal-controlled transmitter and received some very satisfactory reports. It is considered the time has arrived when a crystal register is necessary and all members are asked to send their D.R. a list of the fundamental frequencies of any crystals they have on hand. When the register is complete, a copy will be posted to all members.

Letters have been received from ZC6CN, SU1FS and BERS352. Under the present exceptional conditions amateur activities in Transjordania and Palestine are at a standstill.

Nothing has been heard from ST2WF for a considerable period, and it is thought that the operator of this station is too busy with his flying duties to put in much time on his amateur station.

All SU and ZC members changing their QRA are asked to forward the new address to Mr. M. Williams (G6PP), with a request that notification be published in the QRA section of the BULLETIN.

Irish Free State.

By EI9D.

N.F.D. is over once again. We did nothing very spectacular in the scoring line—our DX on 14 Mc. is being kept dark (!)—but everyone who took part thoroughly enjoyed themselves. Well organised by I.R.T.S., the event received splendid support and everybody co-operated energetically. Our special thanks are again due to Professor O'Farrell, who once more secured for us the use of Elmpark, where "A" Station was located. To Mr. C. B. Coombs, who generously provided "B" Station with an excellent bungalow at Brittas Bay, we also convey our very kind appreciation.

Mr. W. Watts (IR62) at "A" Station, and Miss O'Byrne (BRS1488) at "B" Station rendered yeoman service in getting things done. They contributed very largely to the success of the event and to both we say thank you.

The personnel at "B" Station greatly appreciated the visit from EI2B, who, with supplies of crystals sufficient to cover practically all amateur frequencies, drove over from Baltinglass early on Saturday and spent the greater part of the day with us.

During the month EI5F worked his usual DX on 7 and 14 Mc. He has had several daylight contacts with W6 and W7. On 28 Mc. he only requires contact with Asia for WAC. EI8G has been QSO Ceylon, California and Straits Settlements on 14 Mc. His telephony on this band is also getting out well. EI2J is doing his usual good work on 14 Mc. with duplex telephony, but a recent report has not been received. EI5J and EI7J are rebuilding. EI8J has worked EA2BH with low power fone on 7 Mc. EI4L is also putting out good quality fone on this band. EI5F, 6F and 8G are co-operating on 56 Mc. Located on the east coast, they are making a determined effort to work west coast G stations on this band.

Congratulations to the recipients of undernoted new licences: EI2L, Mr. T. F. Murphy, Cliff Bungalow, Greystones, Co. Wicklow; EI3L, Lt. A. Woods, Irish Army Air Force, Mount Merrion, Co. Dublin; EI4L, Mr. John E. Scanlon, 2, John's Gate Street, Wexford, I.F.S.

We are very pleased to welcome BRS1488, Miss E. O'Byrne; BRS2418, Mr. J. P. Comber; and BRS2426, Mr. R. E. Dicker, as new members.

Malaya and Borneo.

By VS1AA *via* G5BP.

VS1AF is working DX, although his power is limited to 20 watts at the moment. VS2AG reports with DX, and says the E.L.S. network is not functioning too well. VS2AE has moved his masts in order to shorten feeders. He has also made alterations to his transmitter. Good DX is being worked.

VS1AA has established a link with G5BP and messages have been handled from VU. He finds after his return to 14 Mc. that most crystal controlled stations have a ripple in their notes and that it is hard to obtain a truthful report on one's own note! G5BOP and G6YKP were heard on June 8 at good strength. We have to welcome BERS348 to the fold.

Malta

By ZB1C, *via* ZB1E and G2GI.

During May and June four formal meetings were held and many important items were discussed, the main topic being the question of licence facilities.

The local representative once more approached the authorities with the view that licences may be issued to the various applicants, but all efforts in this direction were unsuccessful. During the last twelve months only one licence was issued, and that under very special circumstances to ZB1J. The N.F.D. portable ZB1C had to close down early in the event owing to L.T. trouble. ZB1H operated as a fixed station. The formal meeting for the month of August will be held on the 22nd, at 6.30 p.m., at ZB1E.

Rhodesia.

By ZE1JB.

There is little activity at present, and according to a report from ZE1JJ, 28 Mc. is practically dead except for occasional European Contacts.

ZE1JB and 1JY have been doing some excellent duplex telephony on 7 Mc., using Super-het receivers. It is found quite easy to work duplex within 80 kc. of one's own frequency with standard receivers, and reports from Bulawayo show that both sides of the conversations are listened to through ZE1JB, as ZE1JY's transmissions are automatically re-broadcast *via* JB's outfit from Salisbury. This system of communication is, without doubt, both the pleasantest and most efficient as no time is wasted in any way, and if fading or interference becomes bad it is merely necessary to say so, and the other man waits until he is told to go ahead.

ZE1JD expects his telephony permit soon, and is to use grid leak modulation with a type 56 valve as the leak. ZE1JJ now intends to go up to 56 Mc., and has arranged schedules with European Stations. ZE1JO also has a 56 Mc. outfit, and schedules may be made between these two. ZE1JY is installing a pair of 801 tubes in his final in place of the 46 type used at present.

For the benefit of readers in England, we would mention that all frequency bands allotted to Amateurs by International Convention are open, without restriction, to Southern Rhodesian Amateurs.

South Africa

By ZT6X and ZU6V.

We are now beginning to experience our annual skip phenomena which results in a falling off in DX and an increase in local working. The skip usually lasts until mid-September, so the chances of European QSO's are small for the next two months.

Reception from Asia on 14 Mc. is very erratic at present, although phone from VU2CQ comes across well at times: American signals are up to R8 one minute and down to R3 the next.

Telephony transmissions from ZE have been well received within the last few weeks.

The following S.A. members of B.E.R.U. are active:—ZS1H, 2D, 6AN, ZT6AQ, 6X, 6Y, ZU1T, 5U, 5V, 6C, 6P.

Messrs. V. B. Evans, F. E. Burness, and W. L. Wileman have recently joined the B.E.R.U. Section.

All members are asked to report their activities to either ZU6V or ZT6X.

South India

By VU2JP.

During May very unusual and abnormal conditions existed, resulting in extremely heavy QRN, which made listening almost impossible. On May 22, cyclonic conditions existed, and in four days 40 ins. of rain fell. The monsoon to date (June 16) has not really broken, and conditions are still none too good. The 56 Mc. band has therefore claimed most attention. Reports from other stations are nil, due to inactivity and local leave. Complaints regarding 2CQ still continue, and now VU2BH is added as being one who broadcasts spitch. As a result of inactivity the Budget is suffering, but it is hoped that everyone will soon be active when conditions settle. Please send your reports for the BULLETIN to reach me by the 24th of each month. Reports for the Budget should reach me by the 4th of each month.

THE DX TWO.—(*Continued from page* 5.)

The link consists of 1 or 1½ turns spaced 1 turn from the bottom of the main winding. All coils except L4 are wound with No. 20 S.W.G. enamelled wire.

Practical Results.

This transmitter was used at the North London "B" station during National Field Day, 1936. For 7 Mc. operation a centre-fed full-wave Zepp was employed which was replaced by a matched impedance ½-wave antenna for 14 Mc., this latter being cut in accordance with standard practice. (See *A Guide to Amateur Radio.*) The power supply was obtained from a 500-volt *M.L.* Converter operated from 12-volt *Exide* accumulators. An input of 25 watts was obtained on both bands, and during the week-end 109 stations were worked, including 52 North Americans within the space of 8 hours, the average signal strength reported being R7.

The transmitter had previously been tested from a fixed station with 25 watts input, both Hertz and matched impedance aerials being used. All continents and all American districts were worked in less than 24 hours.

Conclusions.

The designers strongly recommend that a matched impedance type of aerial be used where possible with this type of transmitter. It is also advised that the specification should be closely followed if satisfactory results are to be obtained. The estimated cost of the complete transmitter is £11, excluding power supplies.

Thanks are recorded to those manaufacturers who have co-operated in the production of a transmitter which should appeal to all grades of amateurs licensed to use input powers up to 50 watts.

At a later date the designers hope to produce a further article describing how this transmitter may be operated on other amateur bands.

COSMIC NOTES.—(*Continued from page* 24.)

who now conduct experiments with stabilised transmitters and receivers will do so with a view to establishing real DX contacts, especially in the late autumn, when the F layer is likely to be at its richest value.