THE T. & R. BULLETIN

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CONTENTS.

YOUR JOURNAL

THE commencement of a new autumn-winter season seems an appropriate time to make some comments about YOUR Journal. We use the term in its most individual sense because the BULLETIN should be regarded as the property of each and every member.

The outlook for an amateur radio journal is vastly different to that of an ordinary weekly or monthly magazine, for the reason that it depends entirely upon the voluntary contributions of its members for subject matter. Further the intimate and personal touch, which is established through such a publication, places it in a sphere remote from profit-making undertakings. On several occasions it has been suggested that the BULLETIN should be placed on sale at bookstalls, but we have rebuffed these suggestions by pointing out that one of the greatest privileges of membership is to be found in the fact that each member receives a monthly journal which is private to himself and his colleagues. For our part we hope this policy will always continue, as we believe it would seriously affect the status of the Society if its journal became available to non-members.

The task of preparing succeeding issues does not become any easier from an Editorial point of view, even if the final details such as proof-checking, making-up the dummy copy and checking page proofs goes through a little quicker than hitherto. We have continually to be on the watch for new developments, many of which seem to spring up over night, and our aim at all times is to keep our readers in the closest possible touch with all that is new in amateur radio circles. Fortunately our appeals for more technical articles seldom fail, but when this occurs we are faced with the problem of filling space.

One of the reasons for writing this Editorial is to impress upon every member that the quality of the material published, and the size of each issue depends entirely upon the type and number of articles received. The old expression, " Leave it to George," has a peculiar significance when applied to amateur radio in general, and Editorial work thereof in particular. For years we have been dependent (we should, perhaps, have said, " you have been dependent ") upon a few Georges who have helped to make the BULLETIN what it is to-day, but the time will come, and it may not be far distant, when our fictitious friend George and his colleagues will tell your humble Editor that it is time for Tom, Dick and Harry to do their share.

We appreciate that many of our readers do not have the same flair for writing as they possess for constructing new transmitters or receivers, but there are, without doubt, many who *could* contribute at least one useful article each year. Our many visits to the provinces and to London meetings have convinced us that ideas are not lacking among British amateurs, the

(*Continued on page* 160.)

ULTRA HIGH FREQUENCY OSCILLATIONS WITH TRIODES

By C. G. Lemon, F.Ph.Soc.

SATISFACTORY communication over relatively long distances seems to have been achieved on wavelengths as low as 5 metres. Transmission on shorter wavelengths, however, has produced several difficulties which will have to be overcome before satisfactory duplex communication is obtained.

Types of Oscillators.

Production of wavelengths below 5 metres and down to 0.75 metre can be obtained by the use of a single valve with anode-grid coupled circuits or push-pull self-excited oscillators, circuit No. 1. The generated power is, however, not of a very large order. A satisfactory method of producing these ultra high frequencies at fairly high power is by means of an electron oscillator, or by the magnetron oscillator. This latter is shown in circuit No. 2. It will be observed that a powerful field magnet is required.

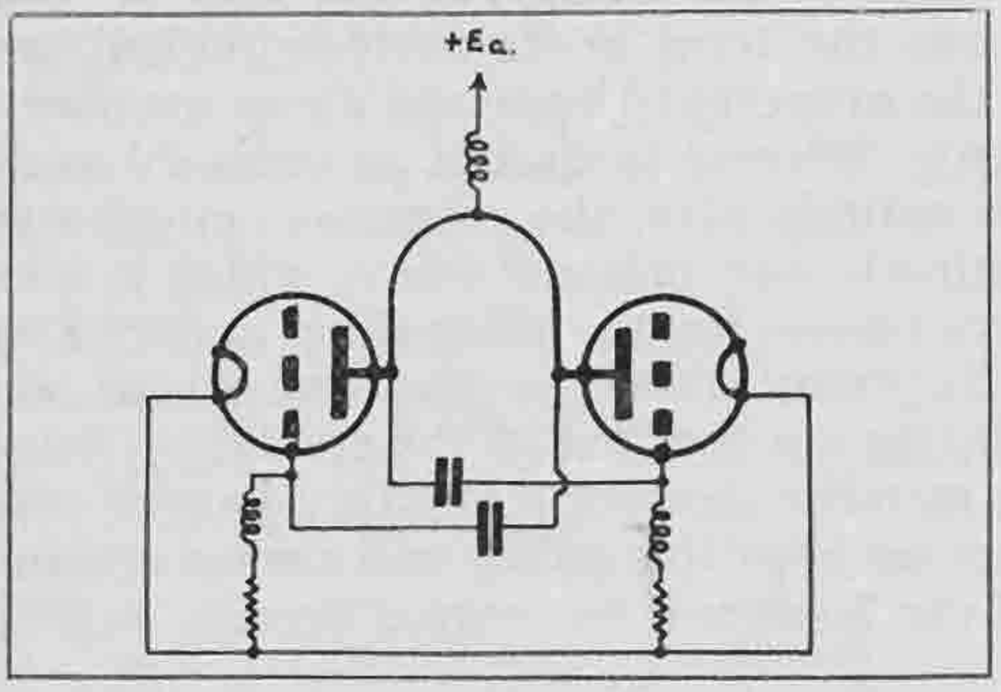

Fig. 1.

Push-pull self-excited oscillators capable of producing wavelengths below 5 metres and down to 0.75 metres. The generated power is, however, small.

An electron oscillator in its simplest form consists of a triode whose grid is at a high positive potential and its anode at zero or negative potential with respect to the filament. Electrons leaving the filament at a high velocity are attracted by the positively biassed grid—a percentage of these electrons pass through the grid interstices and enter the negatively charged region of the anode and are thereby repelled and return to the grid; again, a percentage pass through the interstices, are eventually caught up in the filament stream, and continue to the grid. This sudden reversal of direction of the electron stream in the grid-anode and grid-filament regions constitutes an oscillating current and if the external circuits are correctly designed, an appreciable oscillating current of high frequency can be obtained.

Oscillation Frequency.

The frequency of oscillation of the electrons in the region filament-anode is obtained from the expression $f=(\frac{1}{2}\ X_0)\ (2e\ Eg\ M)^{\frac{1}{2}}$, where e is the electronic charge, M the electronic mass, Eg the grid voltage, and X_0 the distance between grid and anode. e/M has the usual physical measurements and the other two factors can easily be measured. X_0 is, of course, a valve constant, and Eg the operating condition of the valve. The generated frequency can, therefore, be approximately determined for constructional purposes. The usual well-known method of frequency measurement will give the actual frequency.

A Special Push-Pull Oscillator.

In circuit No. 3 is shown a special push-pull oscillator having symmetrical anode-grid Lecher wires. The oscillating current is confined to the Lecher system by placing suitable high-frequency choke coils in the supply leads. A high-frequency ammeter "A" is connected in the midpoint of the anode Lecher system, to determine the oscillating current.

Upon test it was found that the H.F. potential of the filament and anode varied with large amplitude, while the H.F. potential of the grid was zero. This suggested that the Lecher system be connected to the filament and anode to keep the grid at zero H.F. potential. The evolved circuit is shown in Fig. 4. The anode and filament are still isolated by means of H.F. chokes, the filament Lecher wire being connected to the filament via small fixed condensers. Very satisfactory results were obtained from this circuit.

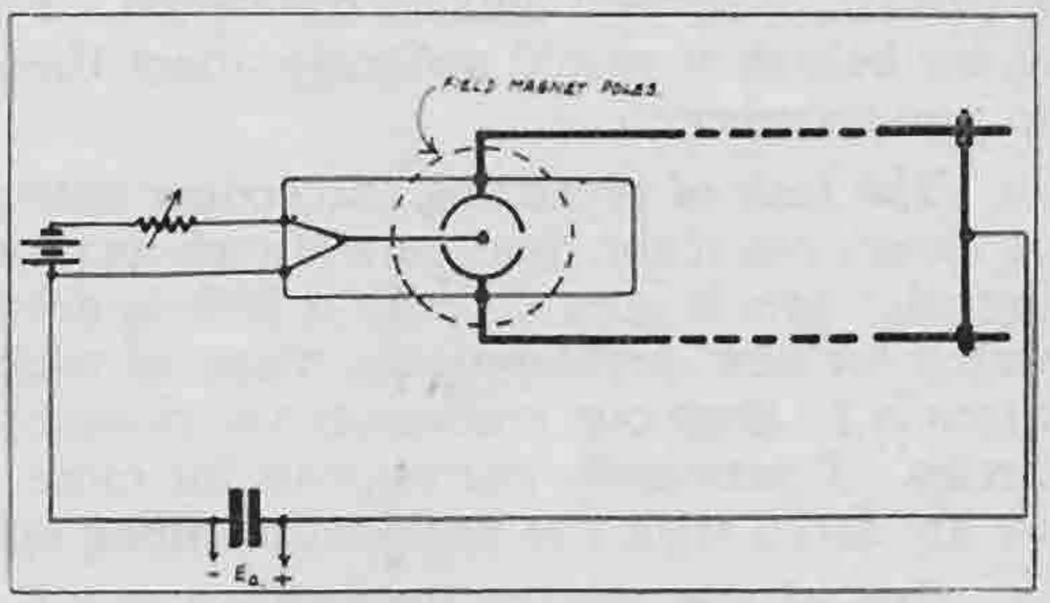

Fig. 2.

More power can be obtained by the use of the Magnetron oscillator.

Valves and Adjustments.

Two specially designed valves were constructed with fairly low inherent capacity, and using an anode Lecher wire of 65 cm., an oscillating current of 2.1 amps. was obtained, Eg being approximately +500 volts and Ea about —115 volts. It was observed that the anode current was not at maximum when maximum oscillating current occurred. As an example: using an anode Lecher wire of 75 cm. and maximum anode current of 2 mA, the oscillating current was 1.8 amps. Adjusting the

circuit constants to obtain the maximum oscillating current of 2.3 amps., the anode current fell to 1.5 mA

Adjusting the anode Lecher wire to 68 cm. and applying Eg=+500 volts and Ea=—115 volts, the maximum oscillating current occurred when the filament Lecher wire had a length of 53 cm. The oscillating current was then 2.5 amps., and the propagated wave was 68 cm. long. Reducing the length of filament Lecher wire to 55 cm. increased the anode current to 6.2 mA, but reduced the oscillating current to 1.6 amps. When maximum oscillating current occurred, the grid current was in the region of 420 mA.

It would be assumed from the foregoing that the reason the maximum oscillating current occurs when the anode current is not maximum, is that the anode current represents a power loss. The H.F. output must not be measured in terms of anode current for this reason. It may be stated that the anode current is an indication of a lack of efficiency.

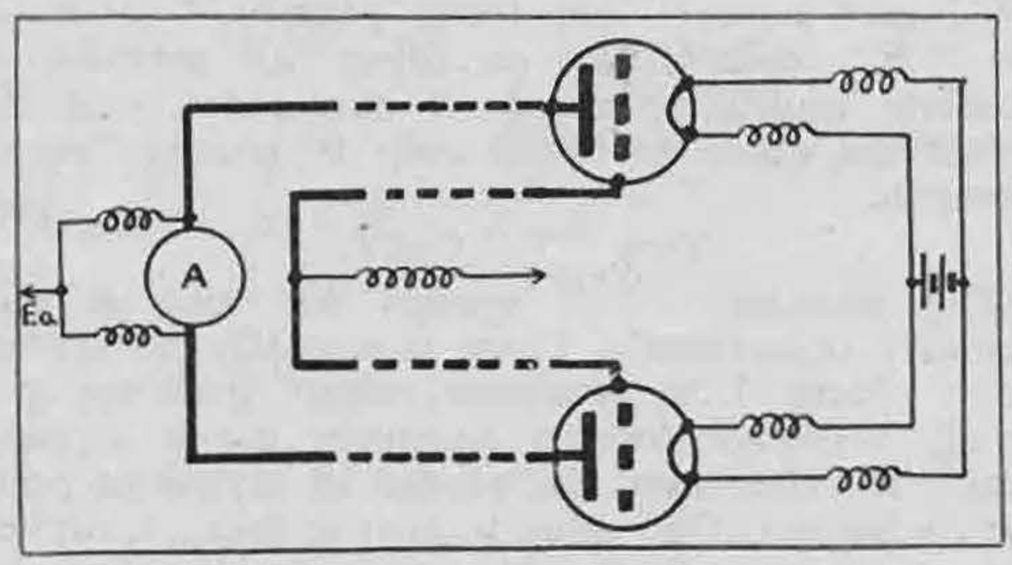

Fig. 3.

A special push-pull oscillator having symmetrical anode-grid Lecher wires. High-frequency chokes in the supply leads confine the oscillating current to the Lecher systems.

Lecher Wire Tests.

In circuit No. 4, the anode Lecher wire appears to determine the length of the propagated wave. Previously it was assumed that the wavelength of the electron oscillator was determined by the accelerating voltage on the grid, but from many experiments this does not occur. The anode and filament Lecher system in circuit No. 4 was adjusted for maximum H.F. output (about 2.6 amps.). Varying the length of the anode Lecher wire brought about the following changes: Reduction of anode Lecher wire—H.F. output decreased, anode current increased slightly. Extension of anode Lecher wire—H.F. output slightly decreased, anode current greatly increased. The wavelength of the propagated wave varied in almost direct proportion to the length of the anode Lecher wire, and was accurate over quite a wide range, this measurement being carried out with an independent Lecher wire system.

Carrying the experiments further, the anode Lecher wire was fixed at 68 cm. and the filament Lecher wire was varied. As observed before, the maximum H.F. output occurred before the maximum anode current was reached. Varying the length of filament Lecher wire by ±7.5 cm., only changed the propagated wave by 1.8 cm., but the H.F. energy fell on either side of the optimum length. From this it may be observed that the anode Lecher wire controls the wavelength and the filament Lecher wire determines the output of H.F. energy.

The theory of electron cloud oscillation assumes that the wavelength is determined by Eg, but the wavelength change with the variation of the anode Lecher wire is apparently against this theory. As a test the circuit No. 4 was adjusted for maximum H.F. output, and Eg varied from 250-650 volts. The Lecher system remained constant, but an adjustment was made in each test to keep the grid dissipation constant. The H.F. output varied considerably but the wavelength did not change. At Eg + 500, the maximum H.F. energy was obtained. Eg alone does not therefore determine the wavelength.

The assumption against the correctness of the electron cloud theory may be explained that there probably exists a condition for oscillation over a range of wavelengths and that a resonance condition of the anode circuit selects the wavelength. The amount of H.F. energy produced is a compromise between the natural wavelength of the anode circuit and the frequency at which the electrons oscillate as determined by Eg. It would appear that there is a coupling between the two wavelength determining factors owing to a second order change in the wavelength with Eg, the resulting wavelength being again a compromise, the anode circuit resonance condition having the greater effect. The H.F. power output then depends on the difference between the anode resonance condition and the natural wavelength determined by Eg.

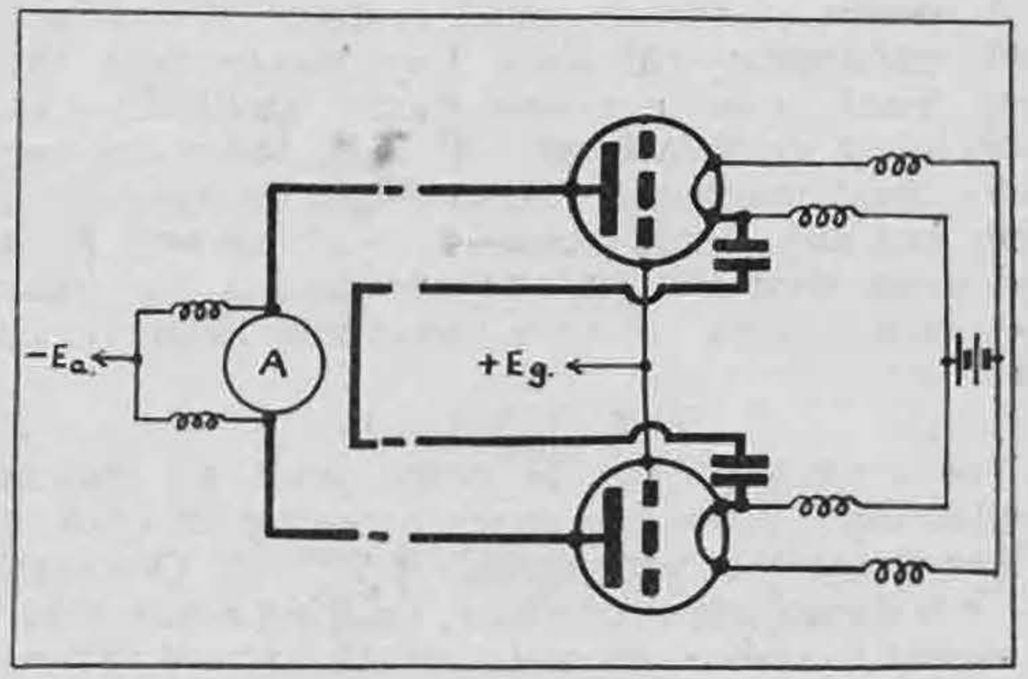

Fig. 4.

Form of circuit evolved by Dr. Lemon. In this arrangement the Lecher system is connected to the filament and anode. Very satisfactory results were obtained with this circuit using specially-designed valves.

Wavelength and Temperature

The wavelength does not vary much with changes in the temperature of the filament, but causes a change in the H.F. output—Ig being used for measuring the filament temperature of emission.

It was found that a relation occurred between Ig and Ia except for high values of Ig, when Ia is somewhat less than would be expected.

The H.F. output varied considerably with —Ea, maximum oscillating current occurred at Ea —100/120; at Ea —100, Ia was 4.5 mA. At Ea-50, Ia rose to 7 mA. Minimum Ia occurred at 72 and 29 volts.

(*Continued on page* 160.)

A STANDARD SYSTEM OF REPORTING SIGNALS.

By Arthur Braaten (W2BSR). *

From the earliest days of Amateur Radio difficulty has been experienced in devising a Signal Report Code of such a type as to enable an operator to convey in an accurate manner his impressions of the received signals.
The suggestions contained in Mr. Braaten's article deserve more than passing attention.

"QSA3 R7 T5."

THE above report, translated literally, means "The strength of your signals is fairly good, readable, but with difficulty; good strong signals, copiable through QRM and QRN; nearly d-c tone, good filter, but has key thumps, or back wave, etc." Very concise and definite, isn't it?

It is obvious that the method now used by amateurs for reporting or describing signals is little better than worthless. It is a makeshift arrangement, handed on unchanged from year to year, and the only possible reason for its continued use is that no one has taken the trouble to work out a better one. I should like to point out the inconsistencies and the limitations of the present method, which I feel should be abandoned immediately. In its stead I propose a new system, which, in addition to being simple, will furnish the sender with a report on his signals which will have some meaning.

Present Systems.

A glance at the so-called systems of audibility and readability will show how inconsistent they are. Each one contains both audibility and readability qualifications. If both codes are used there must necessarily be conflicts between them. How can any signal possibly be QSA3 and R7 at the same time? The one contradicts the other. Yet such reports are very commonly heard on the air.

The QSA Code.

The "QSA" code is being used to indicate readability. Now the exact meaning of QSA is: "The strength of your signals is . . . ." Obviously there is something wrong here, twisting a code which is meant to indicate signal strength around to mean readability. There is no doubt that very little judgment was used in drawing up the "QSA" code when readability was injected into it.

The QRK Code.

The "R" code of audibility was introduced in QST in 1925. It is supposed to be concerned only with the strength of the signal. However, it will be noticed that it is hopelessly tied up with readability also. Before the advent of the "QSA" code it was fairly satisfactory, but when the latter was introduced the trouble began. The "QSA" code was supposed to take the place of the older "R" code. However, someone conceived the bright idea of using both, forgetting, of course, to revise them, and we have been struggling along with them ever since. One of the main objections to the "R" code is that it really indicates audibility and not received signal strength. The sender is not concerned with how much amplification you are using to receive him. He wants to know how his signals are coming in, not how loud they are after coming out of your particular receiver. He should expect to receive the same report from a listener using a one-valve set as from one using a powerful superheterodyne. This is obviously impossible under the present definitions of the code. With sufficient amplification almost any signal that can be detected can be brought up to at least R8 (heard several feet from 'phones). To make the "R" code mean anything all mention of absolute audibility must be eliminated and the definitions made to apply only to received signal strength.

The "T" Code.

The so-called "T" system for tone is particularly obnoxious. There is actually no system to it. Many U.S. amateurs refrain from using it at all, although foreign amateurs use it a great deal. No time need be wasted in trying to point out its faults. One thing to bear in mind, however, is that a tone code should concern itself with tone, and tone only. No mention should be made of key clicks, back wave, etc. Also, no definite figures for frequency of modulation should be given, since amateurs have greatly different opinions on what the frequency of any given tone is.

The Traffic Frame Code.

About eight years ago the R.C.A. originated a system known as the "Traffic Frame Code." This code is now the standard for fixed, point-to-point commercial stations and is used in practically all countries of the world. The reports are always sent in a given order, which is determined by the letters of the word "FRAME." These letters stand for the following:—

F ... Frequency
R ... Relative strength
A ... Amplitude variation
M ... Musicality of note
E ... Estimated readability

Each of these characteristics is divided into a scale increasing from 1 (poorest) to 9 (best). The definitions, while satisfactory for commercial work, are not at all suited to amateur practice. The system is of interest to us in that it shows the desirability of following a definite scheme in reporting signals. After several months of study of all available methods and codes a new system has been evolved especially for universal amateur use.

Requirements.

In amateur work the main characteristic of a signal in which we are interested is READABILITY. Next, in order, come SIGNAL STRENGTH and TONE. Frequency and amplitude variation

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(fading) are not so important. By far the greater majority of stations on the air have stable signals, and we may expect further improvement as time goes on. There is no need for a code for frequency. The reporting procedure should be as simple as possible consistent with accuracy. It is much easier to tell five senders that their frequency is bad than to tell ninety-five others that theirs is good. Also, since there are so many ways in which a frequency might vary, it is simpler and more accurate to say what the trouble actually is than to make up a code that adequately covers all possible types. Simply say "swinging," "chirps," "idle radiation" (back wave), "clicks," etc. Fading is something over which the sender has no control. It is generally of minor importance and can be taken care of in the readability part of the report, if necessary to do so.

The Proposed System.

In the new system codes are proposed for readability, signal strength, and tone. This is exactly what we have been accustomed to report. However, the new codes are thoroughly revised ones for greater accuracy. First we shall start with *Readability*. What we have been using for this characteristic appears fairly satisfactory. We shall not call it "QSA," however. Such things as QRM, QRN, fading, etc., are taken care of in the readability part of the report.

Readability.

1. Unreadable.
2. Barely readable—occasional words distinguishable.
3. Readable with considerable difficulty.
4. Readable with practically no difficulty.
5. Perfectly readable.

Next we take up *Signal Strength*. This takes the place of what we now call audibility. Care has been taken to avoid any mention of absolute audibility in this code such as "heard several feet from 'phones." This is to make the report independent of the kind of receiver used. Since the method of estimating is aural it is neither necessary nor advisable to have more than five classifications. Any more would make for confusion. A listener can soon determine how the strongest signals sound in his particular receiver. This will fix the top level of his scale. Signal strengths below this best value are then easily estimated by him. By this arrangement a sender is more likely to receive identical reports on his strength at a given place regardless of the type of receiver used by the reporter.

Signal Strength.

1. Faint—signals barely perceptible.
2. Weak signals.
3. Fairly good signals.
4. Good signals.
5. Very strong signals.

A perfect tone code is almost impossible to devise; there are so many widely different types of notes to be heard. Most of them, however, can be satisfactorily grouped into one of nine classes. To be of any value the tone code must concern itself with tone only. No absolute values of frequency of modulation are given, because it is rare that several observers agree on the frequency of a given tone. It is believed that the following code will satisfactorily meet most amateur requirements. It is the corresponding part of the "Traffic Frame Code" revised for amateur practice.

Tone.

1. Extremely rough, hissing note
2. Very rough a-c note—no trace of musicality.
3. Rough, low-pitched a-c note—slightly musical.
4. Rather rough a-c note—moderately musical.
5. Musically modulated note.
6. Modulated note—slight trace of whistle.
7. Near d-c note—smooth ripple.
8. Good d-c note—just trace of ripple.
9. Purest d-c note.

If the note appears to be crystal controlled simply add an X after the appropriate number.

Application.

The method of using the "RST" system is simplicity itself. The letters R-S-T determine the order of sending the report. In order that the system may become standard this sequence should never be deviated from. When desiring a report the sender should say "QRK?" or "RST?" The answer may be somewhat like this: "Ur RST 347X QRM." This means: "You're readable with difficulty; signal strength good; crystal controlled, near d-c note—smooth ripple; interference." Now look back at the report at the beginning of this paper. Which gives the better description? Another example might be, "RST 251 QRN." This shows that although the signals are very strong they are barely readable, because the extremely rough, hissing note is hard to copy through atmospherics. If fading is bad a report can be sent thus, "Ur RST 35/28." This shows that the signal fades from "very strong" down to "weak," making reading difficult despite a good d-c note. After the system has become well established the sending of "RST" before the numerals can be dispensed with if desired. However, until such time the sending of "RST" before the numerals is strongly urged so that the listener may know what system is being used, and also to firmly establish the proper sequence in the sender's mind.

From the expressed opinions of many radio men and from experience gained in contacts with over six hundred different foreign amateur stations it is my belief and hope that this new system will be favourably received by amateurs all over the world as a standard method of reporting signals. I wish to acknowledge appreciation to Mr. G. S. Wickizer (W2DOG) for many helpful suggestions during the preparation of this article.

Hum, Ham, Hong!

Ham Balancer Metra R-301, Metra R-300A, Ham Balancer.

It avoids all Hams,

Centre tap is located at the exact centre to give a perfect result,

You will notice there is no longer Hams after you use these Metra Ham Balancer,

These Ham Balancer are for grid resistances or grid by pass and etc.

We understand from Mr. P. Johnson, G5IS, that the above advertisement appeared in a Japanese Radio Manufacturers' Catalogue!!

TACKLING THE LOW-POWER PROBLEM.

By J. Paddon (G2IS).

THE only power available at G2IS is from a 50-volt bank of storage batteries normally used for house lighting, consequently various problems were encountered when transmission experiments were contemplated. As a start, a Westinghouse dynamotor, giving 80 milliamps at a maximum of 500 volts output, was obtained, and a heavy resistance was designed to cut down the voltage applied to the 27.5-v. motor.

writer does not favour a "high" feed to the grid with the usual coupling capacity, as he considers that it tends to encounter parasitic oscillations. The crystal mounting comprises two copper discs ground smooth; the upper disc being smaller "floats" on the crystal, while the lower has a machine-screw soldered to its underside and is mounted on a hard rubber strip.

The DC2Pen was chosen with some misgivings,

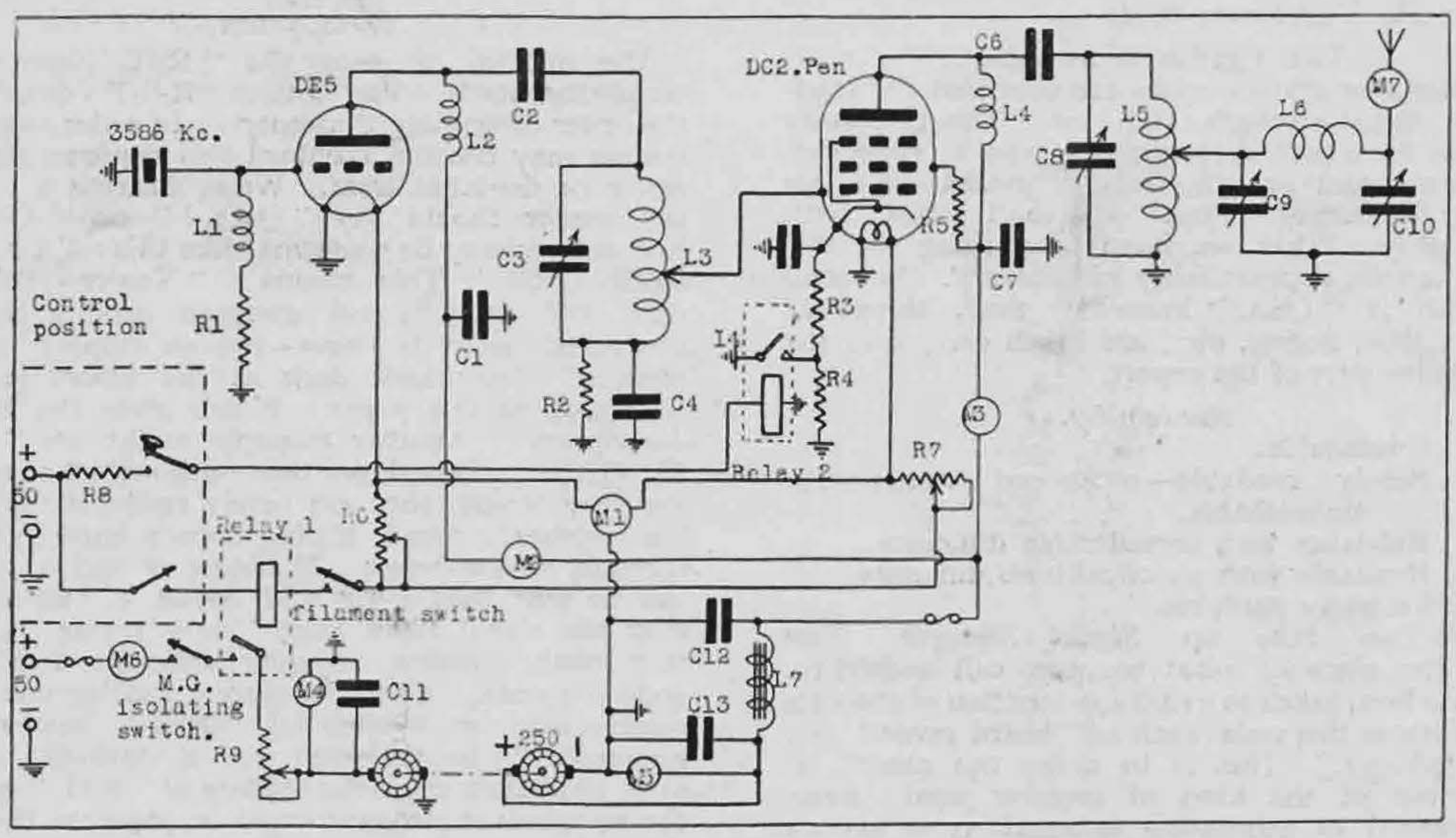


Fig. 1.
Circuit Used by Mr. Paddon.

C1, C4, C5, C7, C14	*.01 mica.*	*R2*	*10,000 Ω 1 watt.*
C2, C6	*.0005 mica.*	*R3*	*300 Ω 1 watt.*
C3	*.00035 Polar "C"*	*R7*	*50,000 Ω 1 watt.*
C8	*.00015 Polar "C."*	*R5*	*1,000 Ω 10 watt.*
C9, C10	*.00035 Polar "C."*	*R6*	*200 Ω to pass 1 amp.*
C11, C12, C13	*2 mfd. paper.*	*R7*	*350 Ω to pass .3 amp.*
L1, L2, L7	*Eddystone section wound R.F. chokes.*	*R8*	*300 Ω to pass .5 amp.*
L3	*18 turns No. 14 wire, 2-ins. dia., 3 ins. long on former.*	*R9*	*20 Ω to pass 5 amps.*
L5	*10 turns No. 10 wire, 2 ins. dia., 3 ins. long, self-supporting.*	*M1*	*V.D.C. double reading, 0-5v. and 0-110v.*
L6	*10 turns No. 10 wire, 2 ins. dia., 2½ ins. long, self-supporting.*	*M2*	*M.D.C., 0-100 mils.*
R1	*50,000 w. 1 watt.*	*M3*	*M.D.C., 0-000 mils.*
		M4	*V.D.C., 0-50v.*
		M5	*V.D.C., 0-500v.*
		M6	*A.D.C., 0-10 amps.*
		M7	*H.W.A., 0-.5 amps.*
		L7	*50 henry choke*

Circuit Description.

Valves with low filament consumption were chosen; these include a DE4, which works perfectly as a crystal oscillator, and a DC2 Pen as doubler, the filaments being run from the 50-volt mains through dropping resistors.

The crystal oscillator circuit is perfectly straightforward, with anode parallel-fed to permit the doubler-grid to be tapped directly on to L3. The

but has performed well. Grid bias is obtained from resistance R3, which is series-connected to earth through R4, of high value. Keying is effected by shorting out R4, and no trouble has been experienced from key clicks. The grid return for the DC2Pen is through R2, which acts as an isolating resistor, whilst C4 shunts R2 and serves to pass RF to earth from the crystal oscillator tank. R5 is a non-inductive graphite type resistor,

which limits the screen-grid potential of the Pentode.

Antenna-coupling is obtained by means of an impedance-matching network, acting as a low-pass filter. Tuning is simple; with the network disconnected, the doubler tank is tuned normally, the network is then clipped on about halfway down L5 and C10 set at an arbitrary value. If the antenna is cut to somewhere near a harmonic of the frequency used, the capacity of C10 will be high. C9 is rotated rapidly until a dip in the anode current to the output valve is reached; at this point M7 (the radiation meter) should show a reading and the current to the doubler shown on M3 should be normal for load. If it does not seem correct another setting of C10 should be tried. When high power is used it will be necessary to employ a well-insulated condenser at C10, as high voltages will be developed across it, especially if the antenna has a high impedance.

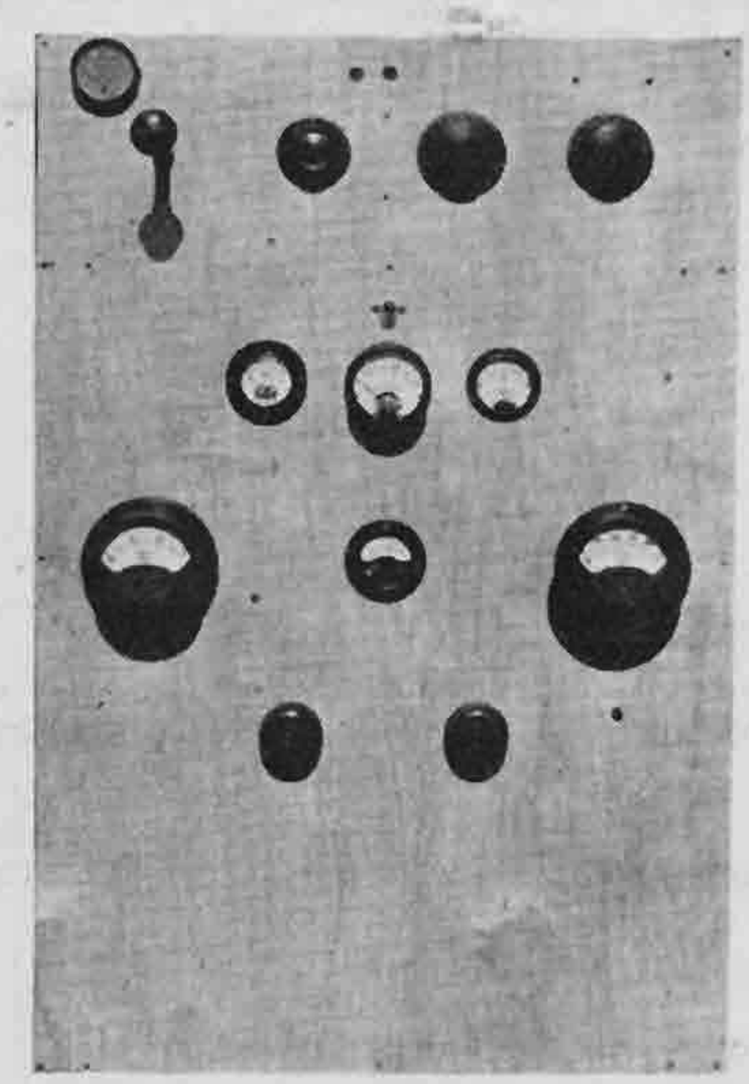


Fig. 2.
Front view of Mr. Paddon's Low-power Transmitter.

Construction.

The transmitter is mounted on a 1 in. by 1 in. pine frame and all panels are ¼ in. 3-ply. Fig. 2 shows the front view of the equipment. In the upper left-hand corner is the antenna radiation meter, and the row below, reading from left to right, are the tuning controls for C10, C9, C8 and C3, in that order.

Just above the centre of the top row of meters is a flashlamp which is used as an H.T. fuse. The meters are (L to R) M3, M2 and M6. The second row of meters from left to right are M4, M1 and M5. The bottom row of switches are left, filament switch, and right, motor switch.

Fig. 3 is a rear view; the wiring is a little untidy because of the experimental nature of the job. The dynamotor is at base and the vertical cylinder partly obscured by the left-hand upright is the filament resistor for the DE5. To the left of the generator are chokes, condensers and the multiplier for the voltmeter. The box on the right-hand side houses the relays and the terminal block.

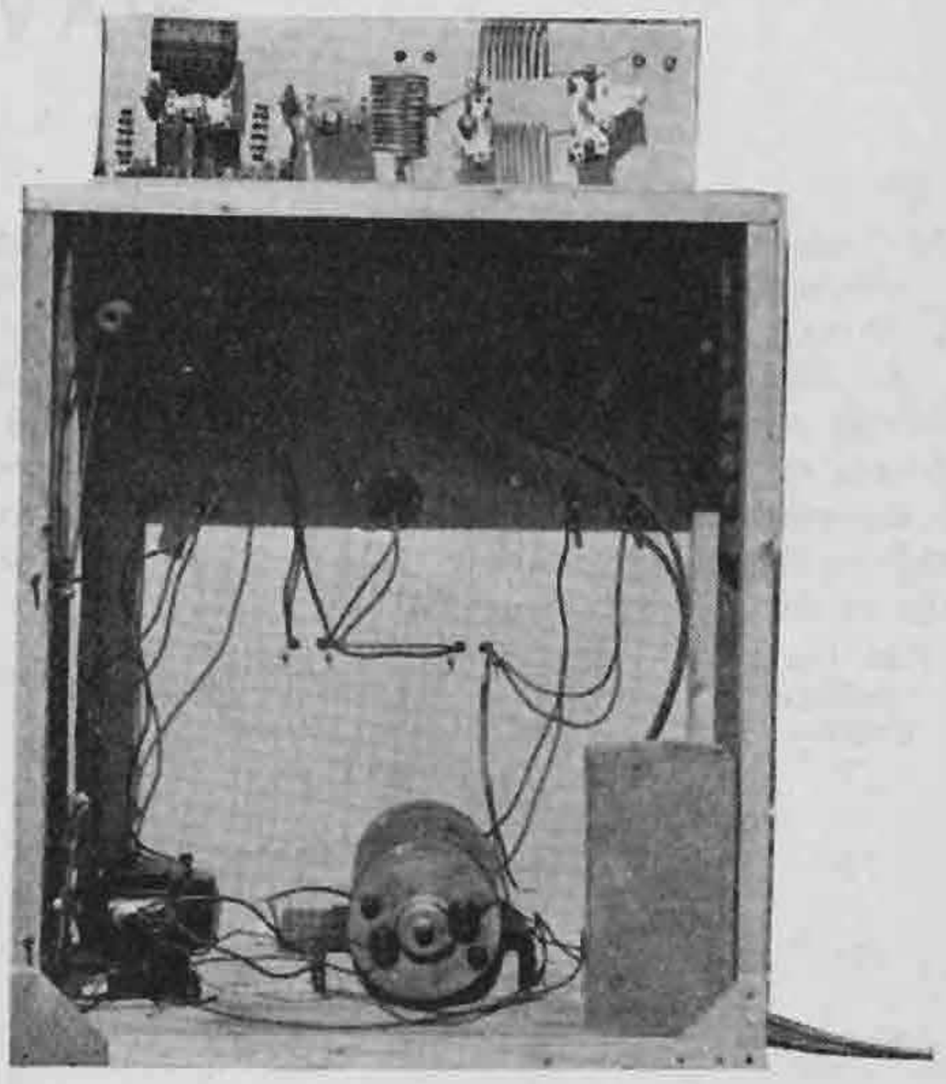


Fig. 3.
Rear view showing dynamotor.

Fig. 4 shows the top deck with the R.F. layout. The vertical coil in the centre is L5 and was mounted by drilling out two *Eddystone* hard rubber pillars to fit the wire of which the coil is wound. The pillars are screwed to the panel and the ends of the coil are simply forced into the drilled out ends. The antenna inductance L6 is mounted on the stator terminals of the condensers C9 and C10. (Valves were removed when the photograph was taken, as they obscured some of the apparatus.)

Remote Control Arrangements.

Mainly owing to noise from the dynamotor the apparatus could not be located in the writer's bedroom, as had been originally intended. The only suitable place, therefore, was the harness room, which is about 100 ft. from the "control position," but as said room is bleak and cold one had no desire to sit about there o' nights.

(*Continued on page* 160.)

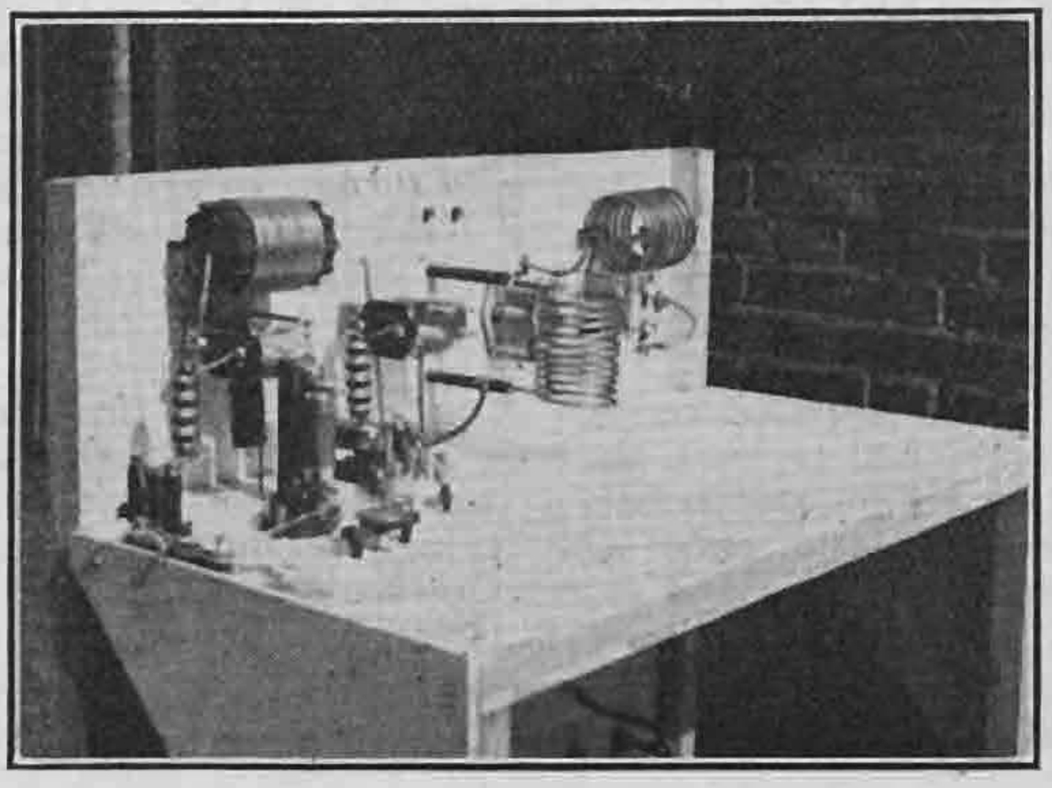


Fig. 4.
Shows the top deck of the transmitter.

A METHOD OF DETERMINING ULTRA-SHORT WAVELENGTHS.

By A. S. Clacy (G6CY).

In connection with the writer's notes under the above heading in the April, 1934, issue of the Bulletin, it has been pointed out by Dr. N. L. Yates-Fish (G5CA) that taking the arithmetical mean of the "Differences" in the last column of tabulated results (reproduced herewith for convenience) as suggested, does not necessarily produce the most accurate result which the observed data is capable of providing.

F.M. Dial Reading. Degrees.	F.M. Frequency. K/C/Sec.	F.M. Wavelength. Meters.	Differences.
27	2015	148.9	
			... 5.3
72	1945	154.2	
			... 5.0
99	1885	159.2	
			... 5.2
119.5	1825	164.4	
			... 5.1
136	1770	169.5	
			... 5.4
149.5	1715	174.9	
			... 5.3
162	1665	180.2	
			... 5.6
173.5	1615	185.8	

Thus let the terms in the third column be a, b, c, d, e, f, g and h. Then the last column becomes (b−a), (c−b).....(h−g).

Taking the arithmetical mean of these terms, we have :

$$\frac{b-a+c-b+d-c+e-d+f-e+g-f+h-g}{7} = \frac{h-a}{7}$$

The result obtained by the suggested method is therefore identical with that obtained by taking the first and last terms of the series and dividing their difference by the number of terms, the intermediate terms in no way contributing to the accuracy of the result. There is no particular virtue in the first and last terms and an equally, or more, accurate result might be obtained by taking the difference between any two consecutive terms.

Following this the writer consulted a mathematically-minded friend with a view to arriving at some simple method of determining the most probable result from the data given and the latter suggested the "Method of least Squares," due to Legendre.

This is based on the assumption that the true figure will be such that the sum of the squares of the differences between the true figure and the experimental ones will be a minimum and the manner of working is as follows :—

Let "t" be the W/L to be determined.

Then the F/M W/L's are given by an expression of the form

$$a + nt$$

where "a" is a constant and "n" has values 1, 2, 3.....8

Let $a + t = 148.9$ (the first observed result)

Then,

$$\left.\begin{aligned} a + 2t &= 154.2 \\ a + 3t &= 159.2 \\ a + 4t &= 164.4 \\ a + 5t &= 169.5 \\ a + 6t &= 174.9 \\ a + 7t &= 180.2 \\ a + 8t &= 185.8 \end{aligned}\right\} \text{A.}$$

Adding, $8a + 36t = 1337.1$ .....(1)

In point of fact each equation in "A" is multiplied by the coefficient of "a" but this being 1 in each case the result is the same and the equations "A" can be summed as they stand.

Multiply each equation by the coefficient of its "t" term,

Then,

$$\begin{aligned} a + t &= 148.9 \\ 2a + 4t &= 308.4 \\ 3a + 9t &= 477.6 \\ 4a + 16t &= 657.6 \\ 5a + 25t &= 847.5 \\ 6a + 36t &= 1049.4 \\ 7a + 49t &= 1261.4 \\ 8a + 64t &= 1486.4 \end{aligned}$$

Adding, $36a + 204t = 6237.2$ ..... (2)

It now remains to solve (1) and (2) for "t."

Multiplying (1) by 9 and (2) by 2, we have :

$$72a + 324t = 12033.9 \quad \text{..... (3)}$$
$$72a + 408t = 12474.4 \quad \text{..... (4)}$$

Subtracting (3) from (4) to eliminate the "a" term,

$$84t = 440.5$$

whence

$$t = \frac{440.5}{84} = 5.24 \quad \text{..... (5)}$$

The method of working is readily understandable from the foregoing and, of course, can be applied to any series of observed results in similar form but to appreciate the theory a good knowledge of mathematics is necessary and is beyond the writer's ability. Those interested are referred to the *Calculus of Observations* by Whitaker and Robinson—Chapter 9, "The Method of Least Squares."

Empire Calls Heard.

August and September.

G6YL, Felton, Northumberland :—

7 mc. band : ve1bv (5.5.9), vp4tc (4.4.9), vkz (4.4.9), xzn2b (4.3.9).

14 mc. band : ve1ep (3.4.9), ve2bb (4.4.9), ve2ee (3.5/4.9), ve2ew (4.4.9), ve3go (3.4.9), vk2hy (3/2.4.9), vk2lz (4.4.6), vk2wj (3.4.9), vk5wg (3.4.6), vq4crp (4.4.9), vs6aq (3.4.9), vu2bm (5/3, 5/4, 7/4), vu2ja (3.4. mod. dc.), zc6ff (4.4.5), ze1jj (4/3.4.9), zs1h (4.5/4.9), zs4u (3.4.6), zt6w (3.4.9), vpy7 (5.5.8).

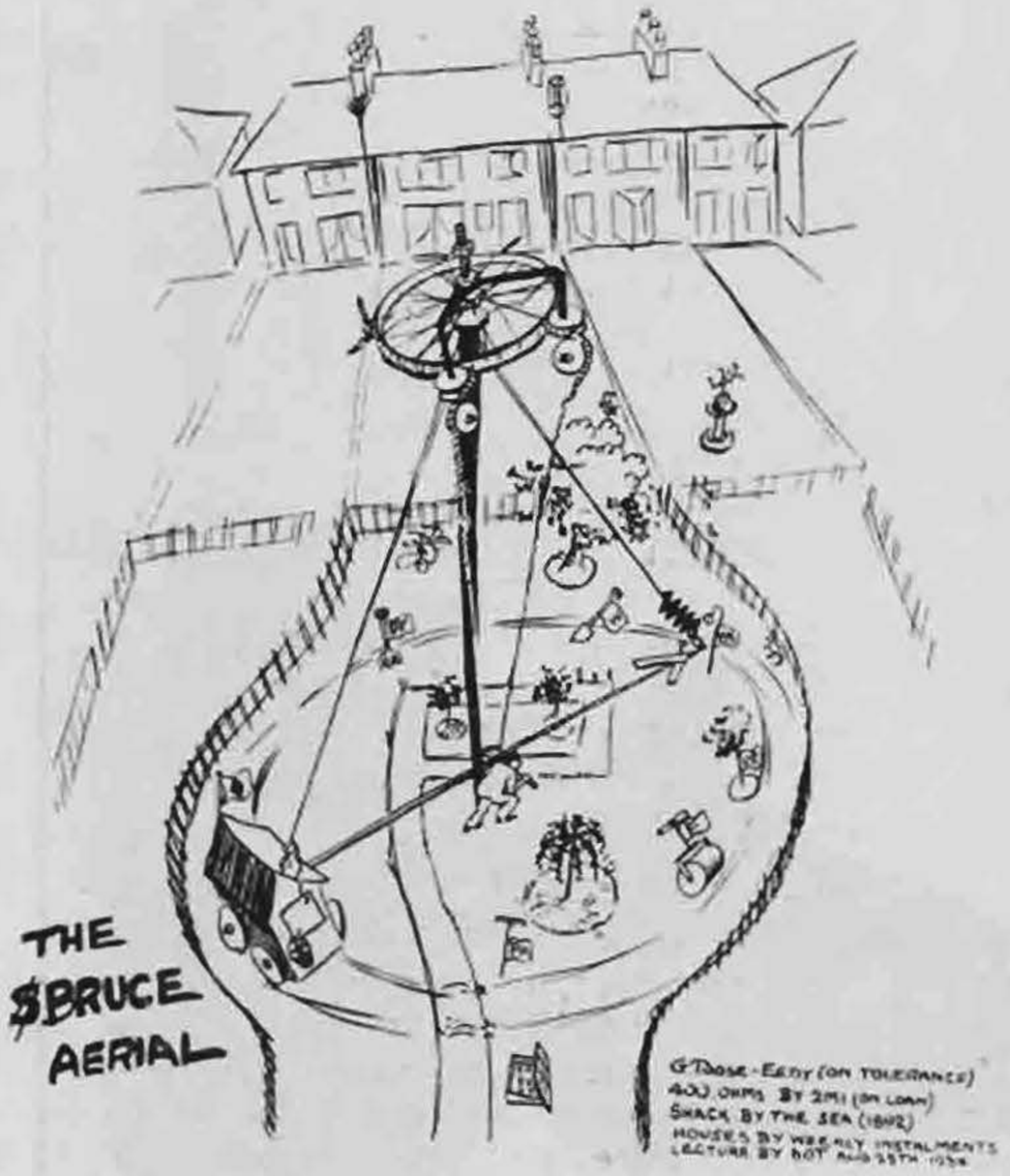
THE "BRUCE" AERIAL.

By Little Willie.

AS this is my first technical article I shall have to be very careful, more especially because at least one member of Council thoroughly dislikes me, and I don t want another war.

Getting all fired up about the "Bruce" aerial after listening to Mr. Clark's (G6OT) lecture at Convention I can now give you the benefit of my experiences.

Over a period of time and very late at night persistently, deliberately, but slowly move back the posts of the fence on either side of your back garden—I hope you "get" me; one post per night and only short distances at a time, so that your neighbours do not notice the intrusion—till you are able to describe a circle of just over 1 λ (must put that in to be technical) in diameter. Your mast must be in the center (Yank) of this circle, and if not you must continue the positively peaceful penetration previously prescribed.



Having hooked (stop !—Ed.) up the clothes post or your previous mast (now too short) as per illustration you can examine my own idea of a slow-motion drive.

As I have given up cycling I took a cycle wheel, but if you have a pram and have given up "kids" that will do as well. A pram wheel, or one ex the mangle, will act as a pulley at ground (not Yank) level, and as you turn this the "Bruce" revolves (see illustration).

Please do not write in and say that the rope is going to break. I know, but I hadn't time to repair it prior to going to press; besides, Mr. Heath Robinson started that racket a long time ago.

Next put all the garden impedimenta at suitable distances, between the flora, around the periphery of the circle (I like my style now, don't you?) to enable you to, say, "dig up a W," although it's not correct to say that you "fork you heard a PY," and it's no use trying to get VK unless you've got a hoe, any more than it's any use trying to work an F unless you've got a roller. The cold frame has gone back to its original job; it was no good to the "Bruce" as it would not pull in CE—to save you searching your call books CE is Chile.

(A note to my friend on Council: I am not a Cockney, although I have the idiom, and I have been to Cambridge.)

Don't forget the 400 ohms, but don't try to borrow one from G2MI; he wants them all for the circuits in the "Bull."

Your "shack" now becomes a semi-portable one—a use for your old roller skates—so you must make provision for a portable earth, which must be kept wet. In the juicy parts of the country one might collect the normal precipitation in a gutter which drains into the bucket of earth, but those near the sea might arrange for an anchor which can be weighed (or should it be slung out?) at the back door.

That's all I know about it, so far, and any information required should be got from G6OT, and not me. It's no use dragging us in if, having "won" two gardens on either side of you, you come up against an irrational householder three doors away who persists in spoiling your chances of trying out the "Bruce" on 160 m.

Warning.—Don't forget to send a P.C. to the P.M.G. (joke, copyright G6OT) if your aerial looks like exceeding the 100 ft.

Finally, my anonymity does not cover the personality of "Uncle Tom": his kink is for 1-valve RX's which work without the "Bruce"—you will be nearer the truth if you discover that it is some idiot who has been fooling you for some months past. 73 es Cul es mni tnx fr fb QSO Dr OB's es nw QRU ere QRT es nw Gb Dit-Dit-Dit-Dar-Dit-Dar GB.

Strays.

Mr. R. J. Lee, BRS1739, Theobalds Green, Heathfield, Sussex, wishes to get in touch with ZL, VK and VE amateurs.

* * *

The Kentish Town and District Radio Society meets every Tuesday evening at Holmes Road School, Kentish Town. Interested members are invited to write to Mr. E. A. C. Jones, 46, Lady Margaret Road, N.W.5.

A Correction.

Mr. R. E. Dabbs, 2BUS, draws our attention to a circuit diagram error on page 49 of the new Guide. The left-hand condenser C4 should be joined to L.T.—and not to the bottom end of the C.O. plate coil. The circuit as shown in the June Bulletin is correct.

RECENT WORK ON 28 MC.

By Captain F. Rodman (G2FN).

We have pleasure in publishing the third series of notes dealing with 28 mc. work, contributed by Captain Rodman. His comments will interest all members who are taking part in the International 28 mc. Contest.

As a result of periodical observations made during the winter of 1933-34, it was not anticipated that the ensuing summer would provide any further information regarding the probabilities and possibilities of the 28 mc. band. Commercial harmonics were heard occasionally during the winter months, and more frequently during April, but the tone of the band was so consistently dead that more than an occasional burst of activity during the summer months was not expected. It was thought, however, that there might be a few occasions when the average skip distance, which has obtained for the past two summers, might lengthen.

A consideration of the performance of 28 mc. since 1928, and drawing an inference of the possible performance of this band during the years 1924-1927, makes it possible to assume that, in 1934, a change in the character of 28 mc. performance might be expected, that is to say, a decline ir activity with a short skip distance and an occasional break into a longer skip distance, the general effectiveness of the band being poor. A guide to the possible performance of the band during the years 1924-1927 may be taken from the 14 mc. band, and the known fact that, at certain times of the year, the effectiveness of the 28 mc. band closely follows the trace of the 14 mc. band.

In practice the assumption for 1934 has been reasonably accurate as far as the general effectiveness of the band is concerned, the results for May being greatly in excess of expectations, and those of June and July below. The anticipated increase in skip distance did not, with one exception, materialise up to the end of July. The very short skip distance, so frequently experienced during the summer of 1933, was a comparatively rare occurrence during the months of May, June and July.

A consideration of local conditions, such as weather, barometric pressure, temperature, etc., has strengthened the belief that, although these conditions may affect signals, they do not render the 28 mc. band generally effective or ineffective.

On many occasions it was noted that it could be said that there was a critical frequency for the reflection of signals, signals of a lower frequency than the supposed critical frequency were reflected, whilst those of a higher frequency were not. The greater the difference (within limits) between the lower and transmitted frequency and the higher supposed critical frequency, the more steady the transmitted signal. The supposed critical frequency was very subject to variation.

On other occasions the 27-31 mc. band became progressively active from the lower frequency end, reached a state of maximum activity, and then declined in activity from the higher frequency end, the general effect being the raising and lowering of a screen.

On most occasions the behaviour of the band was most irregular, and frequencies stood not on the order of their appearance or disappearance. At the same time frequencies (within limits) below what might be called an apparent critical frequency behaved in a reasonably steady and regular manner.

It would appear that the required degree of ionisation of the F layer, for the effective reflection back to earth of 28 mc. signals, is rarely attained, and that the E layer, being nearer the earth and more subject to the effects of local conditions, is irregularly ionised. The lack of ionisation of the F layer is responsible for the inactivity of the band, whilst irregular ionisation of the E layer is responsible for the variation of performance when the band is active. Any irregularity in the ionisation of the F layer accentuates the variation of performance caused by an irregularly ionised E layer.

An Australian 56 mc. Station.

Our photograph illustrates Mr. D. B. Knock's station, VK2NO. A Pickard aerial is used and the transmitter consists of a unity-coupled oscillator, using type 71A valves modulated by Cossor 625P valves.

Unfortunately for the amateur, the degree of ionisation of the E and F layers cannot be controlled, and the amateur will have to be content with an unstable band of frequencies, full of possibilities which rarely materialise.

The practical side of the period under review can be considered fairly successful from the writer's standpoint. Observation of the 28 mc. band has been less than in previous years, but, judging by information received from other stations, the days on which observations have not been made have, on the whole, caused but little loss in experience or results.

The period, May 6 until the end of July, can be divided into four sections : (*a*) May 6-20, (*b*) May 21-June 2, (*c*) June 8-July 6, and (*d*) July 7-July 30. During these periods the performance of 28 mc. may be summarised as follows :—

(*a*) Commercial harmonic activity increased, but conditions were unsteady.

(*b*) During the evening hours conditions were good, with some unsteady periods.

(*c*) Conditions were generally poor, bad or very unsteady, with occasional steady periods of varying length from a few minutes up to an hour.

(*d*) Conditions were bad, with a few good periods of short duration.

In certain respects commercial harmonic activity showed an increase over 1933. The number of stations heard increased ; many of them were heard very infrequently and their performance as a whole can be classed as unsteady. On June 28, the harmonics of WIK and WQP, and possibly another W station, were heard for 40 minutes, varying in strength from R5 to R2. The following harmonics were logged : CUC, CUT2, EAM, EAJ, EAZ, FYQ, FTE, FSE, FLE, FZH, HAS2, HBJ, HVJ?, HBC, HBE, HJO, IRM, IBF, LCB, LCP, PCP, PCR, PCT, RIR, RST, SPW, WIK and WQP. The telephony station harmonics were rarely audible.

A number of amateur harmonics were heard, they were usually very weak, and faded badly. EA harmonics were poor in comparison with 1933. The area of distribution was greater than in the previous year, stations in the following countries being logged : G, SU, SP, OK, D, OZ, I, HB, ON, OE, HAF, PA, CT, F and EA.

On May 19 a W station was heard calling CQ, but whether a harmonic or a fundamental was not ascertained, as the letter portion of the call was lost. The station was in the 2nd District. OK1AW reported that he heard a W station in the 28 mc. band, also the harmonic of a W commercial station.

Conditions for fundamentals appeared to be approximately the same in various European countries ; a very close agreement existed between the conditions obtaining in G, D and OK. During the early part of the active period FM appeared to enjoy the best conditions, but they were generally similar to those obtaining in G, D and OK. Judging by third hand reports, F and ON stations experienced slightly inferior conditions, except where FM was concerned.

Conditions were reasonably steady during the early part of the May-July period, and a fair number of reliable contacts were made. As the active period progressed, conditions became more unreliable, until a good contact was a rarity and most contacts failed owing to the disappearance of signals. The most consistent stations were FM8CR (up to mid-June), OK1AW and D4BMJ. Only one G station was logged (G2TM). Nearly all stations heard were worked, the exceptions being PA (two), HAF (one) and F (three), most of these stations being heard once only during the period under consideration. The average strength of stations was much below the standard attained in 1933.

Some 70 contacts good, bad and indifferent were made with 25 stations situated in G, OK, D, SM, ON, F, OE, HB and FM.

It is considered that the forthcoming 28 mc. Tests will not be subject to favourable conditions during the winter months, but the ensuing summer will be very similar in character to the past summer. It can only be hoped that 28 mc. will endeavour to confound the prophets.

RADIO IN GLIDERS (*continued from page* 134)

Power was obtained from a small 2-volt accumulator and two H.T. (medium capacity) batteries, but the maximum voltage used was only 160 volts.

The two rubber ropes used for catapulting the glider into the air were manned ; instruction given, " Walk—Run," and in a few minutes the huge machine was noiselessly soaring over our heads.

The writer spoke to the pilot—told him he was the first person to listen in whilst gliding, and then, to test the efficiency of the equipment, asked him to " bank " to the left. To everyone's intense relief the huge wooden " bird " immediately dipped its left wing-tip. This action proved to all on the ground that the pilot was hearing the ground station.

When the glider landed the pilot said that throughout the flight reception had been perfect and every word was easily followed. The writer believes that this is the first time that radio has been fitted to a British glider, although it is not new on the Continent. It should have been mentioned that the tuning of the receiver was initially adjusted prior to the flight so that the pilot had no controls or switches to operate.

It later transpired that one of the transmissions from the car—telling 6JP to " jam a piece of cardboard under the tuning dial to ensure that the receiver would not be de-tuned by any vibration " —was picked up by a member of the Golders Green and Hendon Radio Society during their 5-metre field day, which was held at Ivinghoe.

The transmitting aerial consisted of a horizontal half-wave current-fed system suspended between two 6-ft. rods attached to the car fore and aft.

Special apparatus of a very light and simple nature is now being developed for further experiments which the writer hopes to conduct in the very near future, for the absence of an engine and the resulting QRM from the ignition system enables many interesting tests to be undertaken in conjunction with gliders.

In conclusion, may I pay tribute to the help and advice given by Mr. G. Jessop, to whom is largely due the success of this and previous experiments conducted with 56 mc. " in the air."

RADIO IN GLIDERS.

By Douglas Walters (G5CV).

Once again Mr. Douglas Walters has demonstrated in a highly practical manner that amateur built apparatus is capable of providing a ground to air link. We have no doubt that these experiments will eventually lead to the installation of small transmitters and receivers in all gliders.

AFTER spending a most pleasant afternoon on Dunstable Downs watching members of the London Gliding Club soaring above and others making a series of " ground hops " under the direction of an instructor, the writer was convinced that radio materially could assist gliding.

Pilots attempting long distance or duration flights could obtain the latest meteorological information from ground stations, and instructors would be able to correct faults and supply helpful advice to pupils during their first solo flights.

It must also be admitted that the opportunity was welcomed of once again proving the efficiency and simplicity of 56 mc. apparatus for reliable local communication.

Photo courtesy " Daily Herald "

Handing to the Pilot of the Glider the leather case containing receiver, batteries, and aerial.

Accordingly, Mr. G. Jessop (G6JP) and the writer found themselves at Dunstable one fine Sunday afternoon in September complete with a carload of 56 mc. apparatus. Part of this consisted of a midget 5-metre receiver, specially made by G6JP, which deserves special mention, for without it it is doubtful whether the experiment would have been successful. The receiver is of the popular super-regenerative 3-valve type, detector oscillator and triode output, and the overall dimensions of the solid aluminium case are only $2\frac{1}{2}'' \times 5'' \times 6''$.

This receiver, together with a 60-volt Oldham H.T. battery and a small unspillable Exide 2-volt accumulator, were contained in a small leather suitcase, which was placed in a recess behind the seat of the glider used for the tests.

Preliminary tests with the glider on the ground showed that excellent volume was obtainable with no aerial—even though the set was totally screened, but to provide a certain margin of safety 3 ft. of wire were used inside the leather case.

The glider was towed by car across the Downs to the rather primitive but effective device used to haul machines to the summit. This Heath-Robinson machine consists of a chassis of a derelict motor car, the engine of which is used to circulate an endless rope to which the glider is attached.

Whilst the glider was being towed up the hill, the writer tested out his transmitter (G5CV), for which a special permit was obtained to operate in the vicinity of Dunstable through the courtesy of the Post Office.

The transmitter, which was also totally enclosed in an aluminium cabinet, incorporated a push-pull circuit with two Osram LP2 valves. These were modulated by two Osram PT2's in parallel.

(*Continued on page* 133)

Our photograph shows the receiver and aerial used at the ground station G5CV during the Glider tests. The transmitter is in the aluminium case immediately below the feeder line.

The New Guide is Ready

SOLILOQUIES FROM THE SHACK.

By Uncle Tom.

[There are times when we think our pet chimpanzee's mental powers are failing; and yet . . . . there is generally a certain grain of truth in what he says.]

BON matin, mes enfants, which, translated into English, means "Gertcher, you big stiffs." And that being a polite salutation, compared with the way hams behave towards each other over the air, is all the change you'll get from your pore old Unc. this month.

I think it's about time the Minister of Transport stopped mucking about with his Jacob's Ladders across the roads; nobody uses them, and the motorists can't see them. (Hi! You're not writing for a motoring paper now!—Ed.) Furthermore, why should it always be the motorist who gets the blame? Isn't the jay-walker responsible sometimes? (Hi! What d'you think you're doing?—Ed.)

There will come a time when all the motorists will rise in fury and proceed to drive along the streets, four deep, at 10 m.p.h. (Look here, Uncle, you're rambling this month!—Ed.) Never mind old Ed. He's a good chap at heart, but he will keep butting in.

If only the said Minister of Transport, Mr. Horn-Abolisha, would realise that *most* motorists are decent, well-behaved folk, whose one desire is to cut down the toll of the roads, and that the people *he* ought to shoot are the few—2 per cent., perhaps—reckless, inconsiderate hogs, he'd have an easier time.

(Look here, Uncle dear, we all like you very much, but this is a bit thick, really. This is the Bulletin, a paper for hams. Come along now, there's a good chap. Collect together those scattered wits of yours, and get on with the washing.—Ed.)

(Ha, ha! Poor old Ed. He can't see what I'm driving at, as the drunken motorist said when the bobby came up.) Well, then! Here you are. Every parable has a point to it, and here's this one—and it's pretty prickly, too.

Just as the whole motoring community is being badgered, pestered, and persecuted for the sins of the few, so is the ham community going to suffer if it doesn't look out. We're all right with the authorities at the moment—we've been good boys, kept in our bands, and so forth, and we've had another sixteenth of an inch tacked on to all of them as a reward. For which we're duly grateful, especially the crystal manufacturers.

BUT! Have a talk with anyone in the radio trade—journalists, set-designers, sales managers—anyone you like—and ask him what he thinks or knows about the amateur transmitter. You'll get a shock.

And this time it's not so much the sins of the few, as the ordinary behaviour of the many. The amateur transmitter used to be one 'elluva feller—a cut above the mere B.C.L. *Now* he's looked upon as a rather childish person who spends far more money than he can really afford on building a transmitter, complete from somebody else's wiring diagrams, so that he can just push the key and talk to people.

Possibly, when he gets to be a really big noise, he will enter for a competition and go about swanking that he got twenty points more than someone else. Who knows?

Cut it out, brother hams. Forget it! This blessed, beastly, childish, snobbish craze for working DX! Who's DX, anyway? And what good does it all do? Go back to your artificial aerials and do something worth doing, for the love of Mike, or you'll be responsible for killing off amateur transmission within the next ten years.

If the total amount of time wasted by some 500 hams calling "test" during one year were all added up, it would reach from here into the middle of 1940. 7 mc. gives me the cold shivers, and has done for years—to hear all the little children rattling their rattlers (most of them not in this country, I admit.) 14 mc. is getting jolly nearly as bad. Is there a single ham in the country doing any real experimental work on 14 mc., or have they all left their transmitters on what they found was the best adjustment during B.E.R.U. tests?

Wake up, hams, and leave DX alone for a bit. He'll still be there when you go back to look for him.

After the powder, the jam. Here's the poetry department, supplied by my tame correspondent in Weston-super-het.

An amateur living in Drogheda
Remarked "I have often emplogheda
Proper neuted P.A.,
But I really must sa
The best circuit of all is a Gogheda."

Furthermore, one of the hams that recently went to Poland reported that, without exception, the worst G notes heard over there came from users of neuted P.A.'s! But what's this about a Goyder-lock-neuted-P.A. controversy? There were never two opinions about the matter, were there?

Your Uncle recently took a holiday. Strange, but true. And he was struck by several facts. Firstly, that hams who live in out-of-the-way places have not yet been bitten by this awful DX bug, but are content to carry on in their own way. Their work is worth more than all the DX-scrapers put together.

Secondly, that Londoners haven't got the worst of the QRM by a long way.

Thirdly, the spark bugbear isn't a thing of the past, by a long way. Go and listen somewhere near the English Channel, and you'll believe me. But most of that is better operated than the average ham station.

With these kind words I leave you until next month.

Stray.

We are advised by Mr. O. Spindler, of Orgaum, South India, that the call VU7FY has been allotted to him by the Mysore State authorities. He will use this call when operating in Mysore State, but when in British India he will revert to the call VU2FY.

RESEARCH AND EXPERIMENTAL SECTION

MANAGER:

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

GROUP MANAGERS:

No. 1: 1.7 and 3.5 MC. WORK
J. H. Hum (G5UM), 68, Bridge Road East, Welwyn Garden City, Herts.

No. 2: 56 MC. WORK
E. A. Dedman (G2NH), 63a, Kingston Road, New Malden, Surrey.

No. 3: ARTIFICIAL AERIALS
J. K. Todd (G2KV), Orchard Place, Wannock, Polegate, Sussex.

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

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

No. 6: CONTEMPORARY LITERATURE
R. A. Fereday (PAOFY), Reinkenstr, 40, The Hague, Holland.

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

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

No. 9: AERIAL DESIGN
F. Charman (G6CJ), The Cottage, Park Way, Hillingdon, Middlesex

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

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

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

THE continuance of fine weather seems to have resulted in a general slackness on the part of certain R.E.S. members. Furthermore, some of the Group Managers complain that no replies have been received to letters sent. Members must appreciate that these managers have undertaken tasks which call for a good deal of voluntary work, and therefore it is up to everyone to make their lot as easy as possible.

The 28 mc. groups are now under way and two groups have already been formed. A third should have started its activities, but several of those who intimated their interest in this work have not replied to the invitation sent to them by the Group Manager. It is proposed to delete the names of these members from the Section roll unless replies are received immediately. Such members will, of course, be required to surrender their R.E.S. certificates.

This opportunity is taken of acknowledging receipt of letters from several individual members of the Section. Owing to the fact that correspondence is generally heavy, I am unable to answer each letter individually unless some point calls for a reply. I would ask all individual members to note these remarks as I do not wish them to think that their reports have been ignored.

G6PA.

1.75 and 3.5. MC. Group (No. 1).

Group 1*A*.—Discussion has centred around the use of aerial impedance matching units. G5WU gives some valuable practical information, and though we do not propose to reproduce it in detail (as the system must by now be known to most amateurs), one or two points are worthy of mention.

The two coils of the unit used by G5WU have 30 turns of 8-gauge tinned copper wire on a 2¾-in. former, while the variable condensers are of .0005 mfd., not .0003 as usually recommended. The system is found to be extremely critical in adjustment, and the need for patience is emphasised.

G5WU adds: "The critical adjustment is the tapping on the tank coil. In my case I find on a 30-turn tank coil that the most efficient point is the seventh turn from the H.T. centre tap on either side. The farther away from this point that you tap, the less R.F. you get, and the nearer the centre, the more R.F., but then the system does not pull so well, and all the time the most efficient point must be aimed at."

Group 1*C*.—What is an overtone? That is the question being debated by this Group. G.C. G5WW maintains that a harmonic has a higher frequency than the fundamental and an overtone a lower frequency. G5VT thinks both terms are synonymously used. He does not see how a transmitter can emit signals of a frequency lower than the fundamental, and says that he has always understood that overtones were caused by the receiver. 2AZX is inclined to agree, for during N.F.D. he logged numerous 3.5 mc. stations on 1.7 mc.

What do other amateurs think?

G5WW has been experimenting with a 96-ft. Marconi against a 100-ft. VF Hertz, the former so far appearing to be superior.

Group 1*D*.—The G.C. G6BS has been circulating a very interesting letter budget, and although no definite experimental work has been decided upon, members are exchanging information about individual equipments, and suggesting avenues for future research.

Group 1*F*.—Again routine work is at present occupying attention. BRS250 has been making long-period checks on 3.5 mc. signals, and reports a distinct lack of them between 200 and 300 miles from South London.

G5UM.

56 MC. Group (No. 2)

The 56 mc. Field Day held on Convention Sunday must be written down as a failure on the whole. Perhaps it was asking too much to expect the London stations to run 56 mc. stations and entertain provincial visitors at the same time. All the more honour to those who succeeded.

The best DX reported was by BRS157, who was on holiday and took his receiver to the top of Chanctonbury Ring, Sussex, and heard G6CJ (50 miles W5 R4), G2YL (27 miles W5 R6-7), G6NF (27 miles W5 R4), G5NF (30 miles W5 R6-7). His site was 780 ft. above sea-level.

Several stations were in operation at G2YL QRA all day, and the resultant interference (and croquet QRM!) somewhat interfered with results, but G2CX was worked. G2CX worked G6QB and G5MA, and heard a number of other local stations. G6WQ worked G5QF and heard G6JI and G6NF from his QRA at Goodmayes, Esssex. G2XP heard G6JI, G6NF, and worked G5QF. G2RR and G6AH heard G5VY.

No other positive reports are to hand, but a number of contributors to the letter budgets report negative results.

I must apologise for an error in drawing the Picard aerial, as shown on page 29 of the July BULLETIN. The second diagram given on page 30 is correct however. The best method of winding the Picard coupling transformer, using a length of 16-gauge or 18-gauge V.I.R. electric light cable, is to start from the inside, wind a three-turn spiral, then take a tap; continue from this tap and, winding inwards, make another three-turn coil, taking a second tap from the inside of this coil. Continue again from this point, winding outwards in the same direction and make the third spiral. The coils should be assembled side by side, and should be approximately ½ in. inside and 2¼ ins. outside diameter. The feeders are connected to the two outers, and the aerials are connected to the two taps. This aerial is causing considerable controversy amongst group members. Several report very successful results, while others suggest that it is not so efficient as more normal Hertz aerials. I have found it very satisfactory and easy to adjust. Another subject of controversy is the relative efficiencies of single-ended and push-pull oscillators on 56 mc. Again, opinions seem to be fairly evenly divided, but I am of the opinion that the valves used have a considerable bearing on this subject, and, providing suitable valves are used, the efficiency figures are about the same.

G5MG requires co-operation from BRS members in South London. He is testing aerials and requires listeners for two periods (10.00-10.10) (22.30-22.40) on six consecutive Sundays. Will those willing to co-operate please write to him direct at 34, Morton Way, N.14. Three budgets only have arrived this month, so I have decided to clear out all redundant members; the groups will then be re-formed to ensure activity throughout the winter season. If you do not wish to remain a member please let me have a postcard to that effect.

G2NH.

Atmosphere and Fading Group (No. 4).

Work during August has naturally been largely interrupted by holidays, but in spite of this five groups have managed to report.

4*A* continue observations, and are hoping soon to be in a position to deduce some results.

4*B* have received another interesting report from BRS209 in Malta. He says: "It seems that when the pressure is uniform over distances of 900 miles (approx.) east and west, in this case it is all over sea, conditions on both 7 and 14 mc. are very good with nil QRN. When low-pressure areas move from east to west and *vice versa*, heavy QRN seems to result. Shallow 'lows' give slight QRN. I have noticed that most DX countries heard by G's are also heard here with one exception, and that is Australia. This is a very rare country heard here."

4*C* are continuing observations on thunderstorms, but at present evidence seems conflicting. Good work is, however, being done by this group, inasmuch as they are collecting records of thunderstorms which may prove useful in future.

4*D* have continued observation on the Isobar theory. On 7 mc. the logs of the GC, G5OQ, G6HA and 2AIG show good evidence of confirmation, while on 14 mc. the evidence from 2BDA and G6HA is not so positive. The latter contributes extracts from *World Radio*, August 17, 1934, by Prof. Appleton, who states that Lewer has found that best conditions across the Atlantic were obtained when pressure was uniform and up to a certain level. It is an interesting article.

4*E* are under way and are hoping to get on the track of sunspots before long.

G2GD.

Directional Aerials for 56 MC. Tests.

At the London meeting held on September 28, Mr. E. A. Dedman (G2NH) outlined the experiments he has recently conducted with directional aerial systems on 56 mc. It is hoped to publish an account of these tests in our next issue.

By a coincidence the October issue of "QST" contains an account of almost similar tests conducted by Mr. Ross Hull, of the A.R.R.L. Technical Staff. In his article, Mr. Hull records that consistent R8 signals have been received in Boston, Mass., a distance of 100 miles from his station at West Hartford, using a directional array. Signals from Boston have been received at similarly high strengths at Mr. Hull's station, using the directional array for reception.

Television Group (No. 5).

G5VO reports this month on the Mirror Screw that he has now built, but owing to business has not had very much time for experimenting. He finds that direct light is absolutely necessary, instead of reflected light, as there is so little light at any time that one must make the most of it.

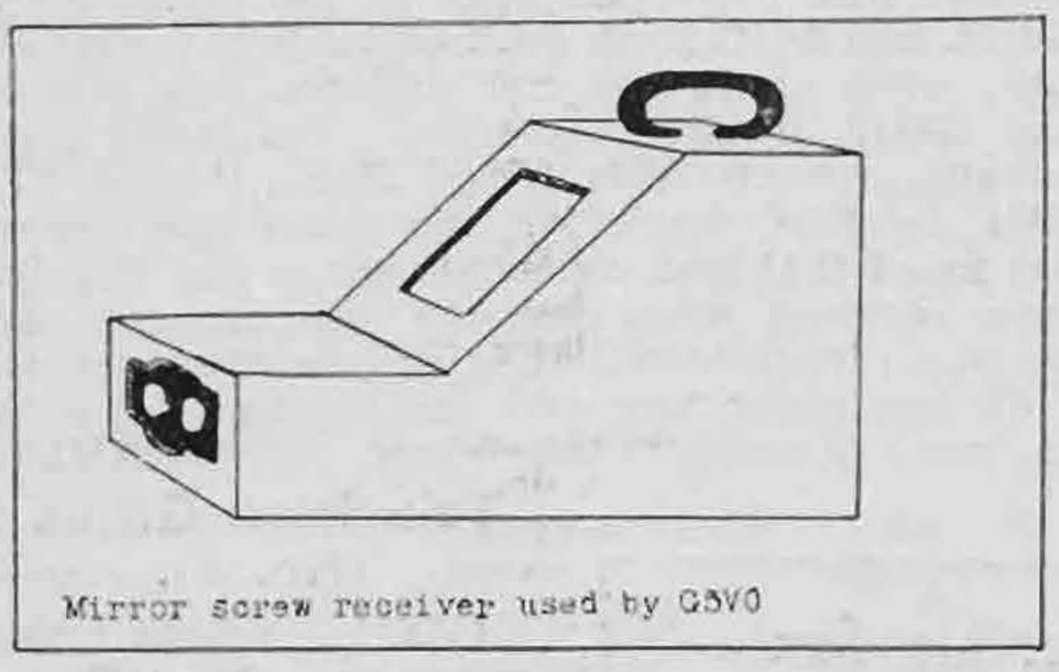
"The receiver is of a semi-portable type, made for convenience of transport. The mirror screw has two shields, back and front. These are of cardboard painted with lamp black, making the mirrors stand out better, besides cutting out extraneous light. With regard to reception, there is much to be desired. To start with, the screw is very difficult to keep steady, and the setting of the mirrors is of extreme importance, the smallest fraction out of place the picture is spoilt. It is very difficult to obtain a straight scanning line or frame. Usually the edges are very jagged. The formation of the picture seems altogether different as compared with the disc. You get the usual lines sloping up to the left or right according to speed, but when you get nearer the true speed the lines merely slope less, and finally straighten out altogether, but by the time one has obtained sufficient speed to straighten them out, and before you can cut the speed down, they are over the other way!"

G5VO is using non synchronising apparatus at the moment, and is driving the television receiver with a 6-valve super-het., but hopes to soon change over to a Stenode receiver. He has obtained permission to transmit television, using an artificial antenna, and to apply at a later date for permission to radiate.

2AGZ reports that he had rebuilt the television

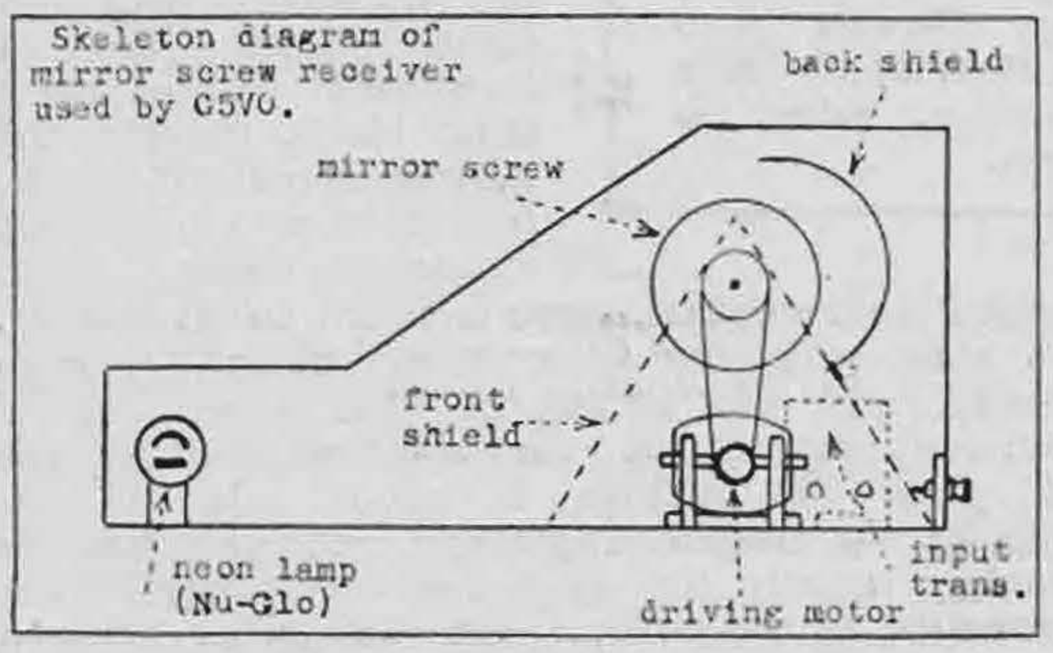
transmitter and is using a 3-valve A.C. mains amplifier using a C.M.G.8 photo-cell and an 8-in. reflector. 2AGZ was like the rest of us, very disappointed with the amount of television apparatus on view at Olympia.

G5JZ and G2AO have been inactive of late owing to the new regulations, also to G2AO being QRT before moving into a new shack. BRS1472 still reports receiving excellent pictures from B.B.C., he is using a 4-valve battery receiver.



Mirror screw receiver used by G5VO

BRS1098 is keen to start a small television circular for distribution among amateurs; anyone interested should get in touch either with him or G5JZ. BRS1098 also reports on the new TI lamp, with which it is possible to work a mirror drum, he has seen a demonstration in Leeds and was very impressed with the result. It consists of a coiled glass tube fitted with tubular electrodes. The filling is a mixture of neon and mercury. The approximate efficiency is .33 watt per candle-power. The lamp is used with the tube convolution at right-angles to the plane of vision, and an intense and even plane of light is obtained. It can be obtained from 323, City Road, London, E.C.1, price 25s.



BRS1510 is shortly building a disc receiver, coupled to a SG, detector and pentode, and is hoping for good results.

G5JZ.

28 MC. Group (No. 11).

The 28 mc. group has been divided up into two sub-groups, 11A and 11B.

The following is the present arrangement:—

Group 11*A*: G2HG, G2NM, G2XS, G5SY, 2BIW, BRS25. Group Centre to be appointed.

Group 11*B*: G5FV, G5GC, G5KG, G6OY, G6ZV, BRS1515. This group will be under the leadership of the G.M.

Immediately after the G.M. took over all those who had signified their intention of supporting the 28 mc. group were sent a circular letter dealing with the subject; the above members have replied, but there are still some who have failed to reply.

The group will, for the present time, deal mainly with receiver and transmitter design, but antenna systems will, of course, receive the closest attention, as in the G.M.'s opinion an efficient antenna is one of the secrets of successful ten-metre communication.

By the time these notes appear, the R.S.G.B. International contest will have commenced, and it is hoped that all members of the Society, both at home and abroad, will give it every possible support; 28 mc. enthusiasts in the Empire and foreign countries are particularly asked to assist for it is only with their help that any success can be achieved. Any regular 28 mc. schedules that any interested amateur may have should be sent to the G.M., either by mail or amateur radio.

G5FV would like to hear from amateurs in South America and all parts of Africa, as it is from these parts that successful communication is most likely to be made with this country.

Next month I hope to publish reports from both the groups, and also an account of the work done by various stations during the past summer season.

G5FV.

BOOK REVIEW

RADIO COMMUNICATION (Part I, History and Development). Price 2s. 6d., from H.M. Stationery Office.

Before the war, National Museums were regarded by many as dismal places to which country cousins and maiden aunts should be taken on wet afternoons, but even in those days the Science Museum in London held an appeal for boys and men of all ages. During the Directorship of Sir Henry Lyons, who has recently retired, the Museum took upon its shoulders the task of building up an exceptionally fine collection of historical radio apparatus, which, on inspection, leaves a lasting impression of the progress made in the development of radio communications during the past thirty years.

After our last visit, we well remember wishing that a manual was available, setting out in print and picture all that we had seen. Our wish has been fulfilled, for we have just received from the Director of the Museum a handbook entitled "Radio Communication, History and Development."

Seemingly, it is the intention of the Museum authorities to prepare a series of similar handbooks covering the whole of the electrical exhibits, a decision which we, as electrically-minded members of the public, welcome.

The book under review is most freely illustrated, and within its hundred odd pages a clear and concise description is given of every item of historical interest exhibited in the Radio Section. Fifty-eight half-tone blocks and diagrams illustrate the letterpress, which has been edited by Mr. W. T. O'Dea, B.Sc., A.M.I.E.E. The book makes most entertaining reading, and we have no hesitation in recommending it to all who have an interest in the historical development of radio. J. C.

CORRESPONDENCE

The Editor does not hold himself responsible for opinions expressed by correspondents. All correspondence must be accompanied by the writer's name and address, though not necessarily for publication.

UNLICENSED SUDAN TRANSMITTERS.

The Editor, T. & R. Bulletin.

Dear Sir,—On page 46, of the July 1934, T. & R. Bulletin, I note amongst the Empire Calls heard, that of ST1AV. No licence for this station has been granted by me. This is not the first time that I have noticed that calls have been heard from unlicensed "ST" stations. Knowing the views that your Society hold on the subject of illegal transmissions, I should be grateful for any assistance that you can give in stopping them.

Perhaps you would be good enough to draw the attention of any of your members living in the Sudan, or whom you know to be coming here, to the fact that the Posts and Telegraphs Ordinance provides for a penalty of £E.50 *per day* for the operation of an unlicensed transmitter.

Properly qualified amateur transmitters are encouraged and given all possible assistance by this Department. No charge is made for a transmitting licence, but applicants must be in possession of a receiving licence, which costs 25 Piastres (about 5s.) annually. No standard conditions are laid down for the granting of a transmitting licence, as each case is considered on its merits. I enclose a typical licence for your information. Clause No. 7 would be varied in suitable cases to allow other kinds of transmission, and clause No. 8 might be restricted to lower powers, or varied to allow higher powers in special cases.

At the moment the only licensed amateur station in the country is ST2WF.—Yours faithfully,

R. M. Summerfield,
Acting Director of Posts and Telegraphs.

(Members are invited to apply to Headquarters for copies of the "Guide" for disposal on a sale or return basis. Special rates are offered to the trade.—Ed.)

A VALUABLE SUGGESTION.

The Editor, T. & R. Bulletin.

Dear Sir,—May I beg a few lines of your correspondence column to put the following suggestion before the membership?

I have had considerable success in bringing the "Guide" to the notice of many of my friends and colleagues at my work, as a valuable book of reference to those taking Polytechnic classes, etc., and who intend to take the City and Guilds and other examinations in radio Communication.

In my own case the "Guide" has proved something of a best seller and I have disposed of over five dozen copies to date.

May I appeal to those members whose work lies in technical spheres to bring the "Guide" to the notice of their employers and colleagues? I think they will be surprised at the number they will sell.

Many telephone contractors and electrical companies, together with the Post Office, encourage their staff to obtain City and Guilds certificates, and in many cases pay a bonus to the holders of same. I feel certain that the "Guide" can be raised to the level of a "standard work" if members will exert themselves to popularise it wherever possible.

With 73,

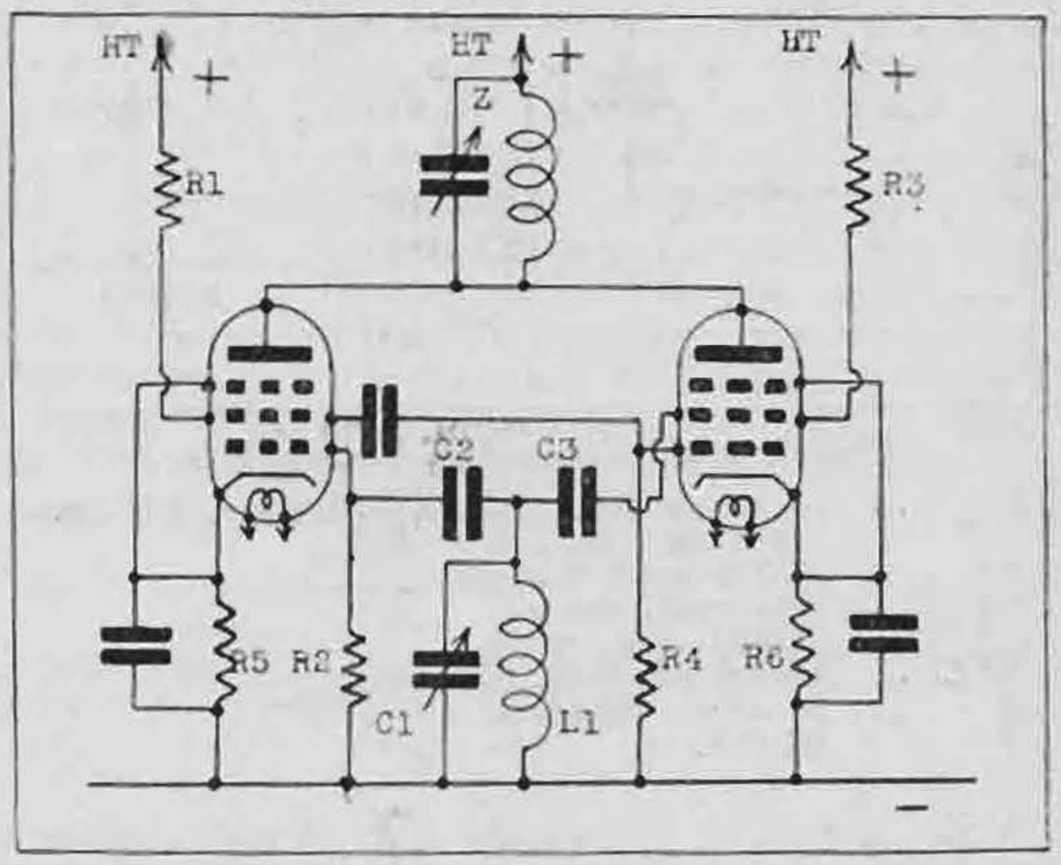
Arthur O. Milne, G2MI.

MORE ABOUT MASTER OSCILLATORS.

The Editor, T. & R. Bulletin.

Dear Sir,—In the June issue of the Bulletin there appeared an article, "Some New Ideas on Master Oscillators," by G5YK and G6PA. In this article it stated "that experiments with the Franklin type of oscillator were tried, but gave a low power output."

A method of overcoming this difficulty and at the same time of retaining the high stability and constancy of the Franklin drive has occurred to me, but the possibility of finding time to experiment with it within the next year is so remote that I am taking this opportunity of publishing the circuit in the Bulletin with a view to others explaining its possibilities.



Circuit Suggested by Mr. Pinkerton. Condensers C2 and C3 are very small, of the order of 1 mmfd. Resistances R1, R2, R3 and R4 must be non-reactive.

On reference to the diagram it will be seen that what is suggested is really an electron-coupled Franklin oscillator-doubler using two pentodes, Catkin MPT4 valves would seem suitable. The control grids and accelerator grids of the two pentodes are coupled as the grids and anodes of a conventional Franklin oscillator, and are screened from the pentode anodes by the suppressor grids.

The anodes thus isolated from the oscillator circuit are joined together, and so the voltage appearing across Z is twice the frequency of that appearing across L_1 C_1. Z can be either a H.F. choke or a circuit tuned to twice the frequency of L_1C_1. Perhaps there might even be sufficient fourth harmonic content to make a circuit tuned to four times the frequency of L_1C_1 worth while.

If anyone thinks it worth while to investigate along the lines suggested I should be glad to hear from them.

Yours truly,

John L. Pinkerton, 2BNL.

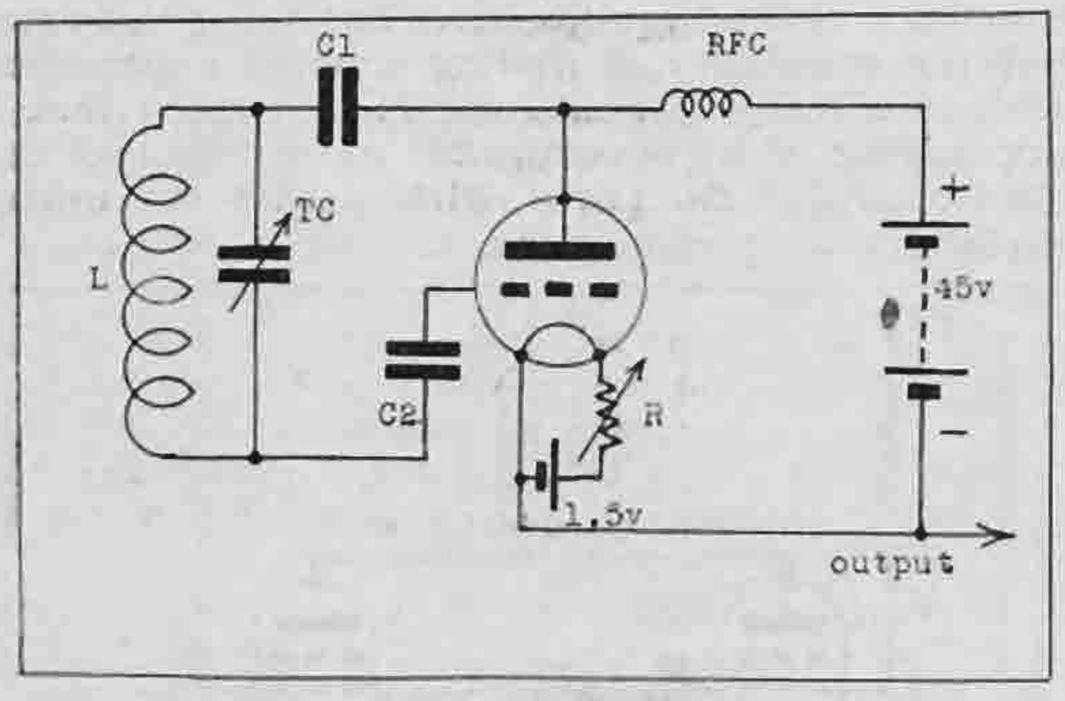
A MODULATED H.F. OSCILLATOR

By T. A. Archer (VP6YB).

THE purpose of this article is to describe a simple and efficient modulated high frequency oscillator, having excellent frequency stability and producing extremely powerful harmonics. It is an indispensable and ideal piece of apparatus for alignment of the H.F. stages of the modern S.W. superheterodyne.

A glance at the diagram will show that the circuit is almost identical to the "Hartley," with the exception that no grid leak or filament tapping are included.

No difficulty whatsoever has been experienced in getting it to oscillate, and several different types of valves have been used with equal success.



Circuit of Modulated H.F. Oscillator.

L	...	*14 turns No. 10 S.W.G. copper, self-supported 1 in. inside dia.*
TC	...	*.00025 mfd. Variable.*
C1	...	*.001 mfd. mica.*
C2	...	*.00025 mfd. mica.*
RFC	...	*Standard S.W. Choke.*
R	...	*10-ohm. Rheostat.*
V	...	*HL210.*

With regard to the production of modulation of the carrier, four points must be carefully observed for proper performance :

(1) The inductance L must be self-supported and mounted either directly across the terminals of the variable condenser TC, or upon porcelain stand-off insulators.
(2) The valve should not be placed less than two inches from the coil L.
(3) The rheostat R should be about 10 ohms, and advanced to the point where the steady carrier gradually becomes modulated. Quite a variation in the pitch of the tone can be obtained by adjustment of this.
(4) The condenser TC must be insulated from the aluminium panel and cabinet.

It will be noted that no form of attenuator has been included for adjusting the input to the receiver, but experience has shown that even with some types of expensive manufactured oscillators, this control becomes useless at the higher frequencies, due, no doubt, to the small capacity coupling of the attenuator itself.

In practice, it has been found most convenient to set up the oscillator in proximity to the receiver under test, and by placing the lead from the oscillator near to the antenna connection of the receiver, a perfectly satisfactory degree of coupling is easily obtained.

The coverage of the oscillator is from roughly 52 to 20 metres, but by using the second harmonic, the range is extended down to 10 metres, this harmonic being much more powerful than is ever required in practice.

The complete apparatus is built into an aluminium can 10 ins. by 7 ins. by 6 ins., which also carries the batteries. These latter consist of a single $1\frac{1}{2}$ volt unit cell as used in pocket flash torches for the filament, and five 9-volt grid bias batteries in series for the anode supply. Any small size battery would be suitable, but in my case it was impossible to secure anything between the type used and the super capacity which latter would, of course, be too large. The anode current is approximately 0.4 milliampere, but varies slightly with the setting of "R." It never exceeds 0.75 m.a., however.

The tone of the modulation is very high pitched and pleasing in sound, and assists materially in securing the exact peak of the various circuits.

FLASHES

Cane=Triatic.

We understand from G2NH that when a 6-ft. cane is used for 56 mc. work, said cane becomes a triatic. Assuming this to be true, what is the correct definition for two bean sticks in series when used for supporting a 14 mc. aerial !

Co-Operation Wanted.

Mr. J. Mahieu, ON4AU, is anxious to get in touch with any member who is in a position to carry out tests from an aeroplane. Mr. Mahieu can operate his plane transmitter on any wavelength between 16 and 85 metres. His address is Le Manoir, Peruwelz, Belgium.

More Piracy.

Mr. H. C. Page, G6PA, intends to make frequent use of the 7 mc. band during the coming winter, and will be much obliged if the "gentleman" who is at present making use of his call sign will think of another, and so avoid unnecessary confusion.

* * *

Mr. S. Kember, G6KM, also complains that his call is being used by an unauthorised person working on 3.5 mc. As he is not licensed for this frequency he requests members to ignore calls from the "pirate."

Are You a Member of R.E.S.?

HIC ET UBIQUE.

Next I.E.E. Lecture—Future Contests—Autumn Edition of the Call Book—English and Welsh County Representative Elections, 1935.

Next I.E.E. Lecture.

We are pleased to announce that Mr. B. J. Axten, a member of the Radio Department of Standard Telephones & Cables, Ltd., and a late member of the Society, will lecture at the next London meeting, to be held on the evening of October 26.

Mr. Axten has chosen as his subject "Police Radio Communications."

Tea will be served at 5.30 p.m. Dates of other meetings appeared in the September issue.

Future Contests.

The following dates have been fixed for forthcoming Society contests :—

1934.

NOVEMBER 24 AND 25.—3.5 mc. Transmitting Contest.

1935.

JANUARY 12 AND 13.—1.7. mc. Transmitting Contest.

FEBRUARY 2 AND 3, 16 AND 17.—B.E.R.U. Senior Transmitting Contest.

FEBRUARY 2 AND 3, 9 AND 10.—B.E.R.U. Receiving Contest.

FEBRUARY 9 AND 10, 23 AND 24.—B.E.R.U. Junior Transmitting Contest.

MARCH 30 AND 31.—Low-power Contest.

JUNE 8 AND 9.—National Field Day.

The rules for all contests, with the exception of N.F.D., will be published in the November issue of this journal.

It is the intention of the Awards Committee to organise a reception contest extending over the periods of the 3.5 and 1.7 mc. transmitting contests, providing not less than 20 members advise the Secretary in writing prior to November 1 next of their intention to compete.

Autumn Edition of the Call Book.

We wish to apologise to those members who have been inconvenienced through the non-delivery of the autumn issue of the "Radio Amateur Call Book." It was anticipated that our usual supplies would be delivered to headquarters towards the latter part of September, but for some reason these were not to hand until md-October.

"Five-Metre Radiotelephony."

We have just received a small first consignment of the above book published by the American journal *Radio*. The book contains 48 pages of up-to-date information, and is fully illustrated. Orders should be sent to Sales Department, R.S.G.B., 53, Victoria Street, S.W.1. The price is 1s. 6d. post free.

Convention Accommodation.

We wish to thank all London members who offered accommodation to their provincial and overseas colleagues who attended Convention. Their kindness we know has been appreciated by their guests.

English and Welsh County Representative Elections, 1935.

In accordance with the notice printed in the June, 1933, T. & R. BULLETIN nomination forms for County Representatives are published below.

All corporate members are entitled to nominate other members to serve as C.R.s for the year 1935, providing the person nominated is agreeable to his name being submitted.

Members nominating others must be resident in the county in which the nominee normally resides.

Nominations must reach Headquarters not later than November 1, 1934. In the event of more than one person being nominated in any one county an election will be held. Ballot forms for this purpose will be published in the November issue of this journal.

For the purposes of these elections the main London postal areas will rank as counties. These are as follows: N., N.W., S.W., S.E., W. and E. Middlesex will be considered as a separate county, as will the East Riding of Yorkshire.

In the event of no nomination being received from the members in a particular county Council will appoint a member to the position.

English and Welsh County Representative Elections, 1935.

To The Secretary,
R.S.G.B., 53, Victoria Street,
London, S.W.1.

I wish to nominate Mr.....

Call Sign....., of.....

to serve as Representative for the County of ..... during the year 1935, and have obtained his permission to put forward this nomination.

Signed .....

Call Sign .....

Address .....

Date.....

N.B.—(*a*) All nominations must be received by November 1, 1934; (*b*) the nominated member must live in the nominee's county; (*c*) a corporate member may only nominate one other person.

Preparation of DX Charts.

During Convention Mr. H. W. Sadler, G2XS, made the suggestion that a chart should appear monthly in this journal showing the DX countries likely to be heard during the month following publication.

It was agreed that such a chart would be of great value to transmitting and receiving members.

The suggestion was acceptable to those present at Convention, and we now have pleasure in reporting that Mr. Sadler has agreed to organise the work.

In order that the forecasts may be as comprehensive as possible, a small group of members are required to co-operate with Mr. Sadler. It will be their duty to submit a list of times and dates at which they have heard or worked DX countries in the past.

Particularly is it desired to obtain assistance from one or two members who are able to be on the air during the day-time periods. It is realised that for the first year some forecasts may be incorrect, but eventually it should be possible to state fairly accurately the type of DX which may be expected during any given month.

Members willing to assist are invited to communicate with Mr. H. W. Sadler, G2XS, Redways, Wootton Road, Gaywood, King's Lynn, Norfolk. He will also appreciate any suggestions for improving on the above scheme.

The New Signal-Strength Code.

The simultaneous publication in this journal and in *QST* of Mr. Braaten's proposals for a new signal-strength code should ensure their favourable consideration by a very large proportion of the world's amateurs. We believe that the proposals are both practical and opportune, and would recommend that they be put into practice at an early date.

W.A.C. Boundaries.

For the past few years we have been aware that considerable differences of opinion exist as to the exact location of the continental boundaries upon which W.A.C. certificate claims may be approved. As far back as 1930 the then Council of the R.S.G.B. saw the possibility of similar difficulties arising in connection with claims for the W.B.E. certificate, and in order to prevent this occurring a map was approved and published in this journal.

We are pleased to announce that as a result of our representations to the I.A.R.U., it has been decided to publish a map defining the W.A.C. boundaries, and this will be reproduced immediately after a copy has been received from I.A.R.U. headquarters.

An Omission.

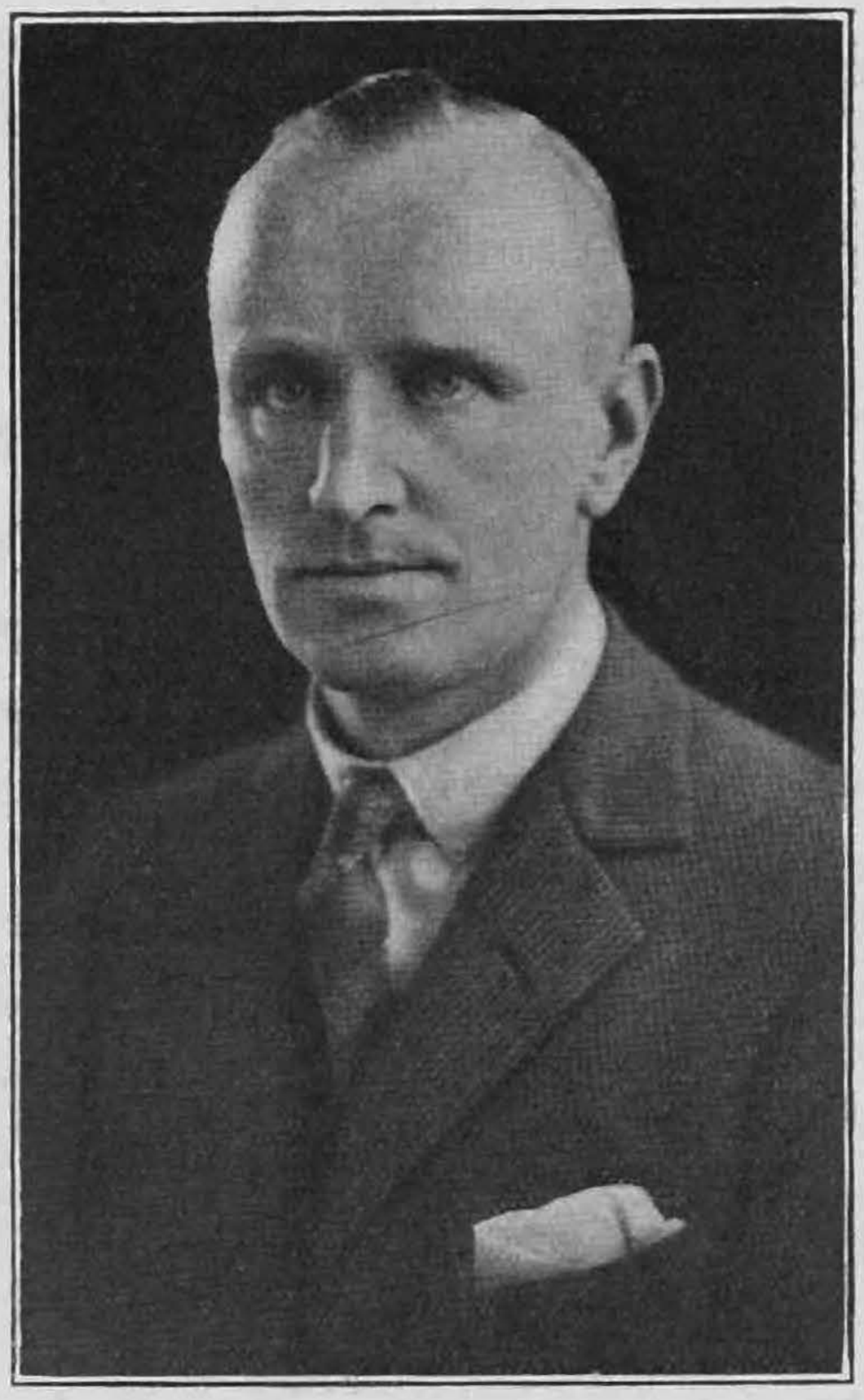
In our Convention report published last month we omitted to record our appreciations to Messrs. Adcock (G2DV), and Taylor (G5TL), the constructors of the single signal superheterodyne receiver. This receiver was one of the most important features of our stand.

An Honour for Scotland.

The President and Council have much pleasure in announcing that a Vice-Presidency has been offered to and accepted by Mr. J. Wyllie, G5YG.

Mr. Wyllie has just completed ten years as Honorary Scottish Manager, a term of official duty unapproached, with one exception, by any other member. During this time he has rendered most valuable service to the Society, and has had the satisfaction of seeing the membership in his country increase from a mere handful to nearly 200.

We are sure all members will join with us in congratulating him on the honour recently conferred.



MR. J. WYLLIE,
Honorary Scottish Manager.

W.B.E. Certificates.

The following W.B.E. Certificates have been awarded :—

Name.	Call Sign.	Date.
V. Bowman ...	VK5FM ...	Aug. 31, 1934.
Baron de la Roche	ON4HM ...	Sept. 4 ,,
L. Cooper	G5LC ...	,, 5 ,,
F. A. Adams ...	VK2ER ...	,, 5 ,,
E. J. Lake ...	VK4EL ...	,, 21 ,,
R. Stacey	VK2HY ...	,, 21 ,,
T. C. Freshwater ...	CT2AW ...	,, 26 ,,
G. H. Jolliffe ...	VS7GJ ...	,, 27 ,,

Technical Articles are Wanted

R.S.G.B. Reception Tests.

In publishing Series 29 of these tests it will be noted that they are again resumed, after closing last June for the summer period.

The tests are open to every member, whether an established transmitter or a B.R.S.; they enable a transmitting member to obtain simultaneous reports from many directions and distances; the B.R.S. member will find them invaluable as an aid to learning procedure and improving his knowledge of the Morse code.

Past series have been supported by members in all British Districts and by many European amateurs. Our member, PA0FB, handles the tests in Holland.

In order to obtain consistency in reporting participants are required to use quarto size paper, headed as follows:—

Series No.....

Name..... Call or B.R.S.....

QRA .....

Band.....mc. Test Letter.....

Aerial Details.....

Date.....

Other Information .....

Time. Call Sign. Calling. R. W. T. Remarks.

....

A separate sheet, quarto size, should be used for each period which is designated by a "Test Letter" (A to R). Should any period produce *nil* results, viz., 28 mc. or 56 mc., a separate Log sheet should be sent stating so.

At the conclusion of Series 29 all Logs should be sent to Mr. T. A. St. Johnston (G6UT), Honorary Organiser, 28, Douglas Road, Chingford, E.4.

The closing date for Series 29 is November 17th, 1934, and the Budget of Logs will then be circulated to all those participating.

SERIES 29.

Test Letter.		Date 1934.	Period G.M.T.	Band mc.
A	Sun.	Oct. 21	09.00-10.00	14
B	,,	,, 21	11.00-12.00	56
C	,,	,, 21	12.00-13.00	28
D	,,	,, 21	22.30-23.30	1.7
E	Wed.	,, 24	20.00-21.00	7
F	Thur.	,, 25	19.30-20.30	3.5
G	Sun.	,, 28	00.00-01.00	14
H	,,	,, 28	08.00-09.00	7
I	,,	,, 28	10.00-11.00	56
J	,,	,, 28	12.00-13.00	3.5
K	Wed.	,, 31	21.30-22.30	28
L	Sun.	Nov. 4	09.30-10.30	1.7
M	,,	,, 4	18.30-19.30	3.5
N	,,	,, 4	20.00-21.00	28
O	Sun.	,, 11	00.00-01.00	1.7
P	,,	,, 11	16.00-17.00	14
Q	,,	,, 11	18.30-19.30	56
R	,,	,, 11	22.30-23.30	7

R.S.G.B. Slow Morse Practice.

Slow Morse practice times for October-November will be found below. Test matter will be taken from recent issues of the T. & R. BULLETIN, and the page number and month of issue will be given at the end of each test. Reports will be appreciated and are desired in order to ascertain range of transmissions and numbers utilising the service. If a reply is desired please enclose stamped, addressed envelope or card. Stations willing to assist on 1.7 or 3.5 mc. (or both) bands should get in touch with Mr. T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4.

SCHEDULE OF SLOW MORSE TRANSMISSIONS.

Date, 1934.		G.M.T.	Frequency kcs.	Station.
Oct. 21	Sun.	00.30	1,820	G2OI
,, 21	,,	10.00	1,815	G2DQ
,, 21	,,	10.30	1,911	G2JL
,, 21	,,	11.00	1.7 mc.	G2UV
,, 28	,,	00.30	1,820	G2OI
,, 28	,,	10.00	3,630	G2DQ
,, 28	,,	10,30	1,911	G2JL
,, 28	,,	11.00	1.7 mc.	G2UV
Nov. 4	,,	00.30	1,820	G2OI
,, 4	,,	10.00	1,815	G2DQ
,, 4	,,	10.30	1,911	G2JL
,, 4	,,	11.00	1.7 mc.	G2UV
,, 11	,,	00.30	1,820	G2OI
,, 11	,,	10.00	3,630	G2DQ
,, 11	,,	10.30	1,911	G2JL
,, 11	,,	11.00	1.7 mc.	G2UV

QSL Section.

Manager: J. D. CHISHOLM (G2CX).

The Section has recently received correspondence from a listening member who was complaining of the scarcity of replies to his reports, and he seemed to think that the QSL Bureau was responsible for holding up his cards, and that QSL's addressed to BRS members did not receive the same attention as those of the transmitting membership. It cannot be too definitely stated that *all* cards are dealt with as speedily as possible, and that no discrimination is used against any section of the membership.

There is no doubt that owing to the greatly increased interest in short waves, there has been a corresponding increase in the number of report cards sent in recent years, and the result has been that transmitting members now receive a large number of valueless reports. The duty of exercising great care in the sending of reports lies with the listening membership, and they should be satisfied that their reports will be of use before sending QSL cards. An amateur constantly in touch with the Antipodes is obviously not interested to know that he has been heard working, and it would be folly to report the signals of any station with an International DX reputation. It is probably to the listener's advantage to QSL to the *weakest* signal on the band, and not, as appears from a glance at the outgoing cards, to the strongest.

The foregoing is stale news to the experienced BRS man, and we apologise for boring him with it again, but there seems to be a large number of the newer members who would do well to consider seriously the fundamental reasons for their lack of replies, and give a scheme such as the above a trial.

QRA Section.

Manager: M. W. Pilpel (G6PP).

NEW QRA's.

GI2KR.—W. R. Kerr, Corbiere, Eastleigh Drive, Knock, Belfast.
G2OT.—J. A. Smith, Site 54, Bolingbroke Road, Balkwell, North Shields, Northumberland.
G2QU.—D. Campbell, 49, Highcroft Avenue, Kings Park, Glasgow.
G2VI.—T. Vickery, Norvic, Broadfield Road, Folkestone, Kent.
G2WS.—W. A. Scarr, "Wharfedale," Heanor Road, Ilkeston, Derby.
G5IH.—G. C. Turner, Hillside, Sissinghurst, Kent.
G5JL.—J. J. Maling, 6, Mount Pleasant, Diss, Norfolk.
G5JU.—J. N. Walker, 4, Frenchay Road, Downend, Bristol, Somerset.
G5SD.—A. M. C. Christian, "Dhoon House," Promenade, Castletown, Isle of Man.
G5SF.—J. K. Wilkie, Ranfurly House, Liverpool, 19.
G6AG.—C. J. McClelland, Myrtle Cottage, Claverdon, near Warwick.
G6AM.—E. A. Mackay, 6, Lauriston Gardens, Edinburgh.
G6AO.—A. Oates, 190, Templefield, Huddersfield Road, Dewsbury, Yorkshire.
G6GB.—G. H. Billison, The Hollies, High Street, Hampton-on-Thames.
G6GH.—G. Hutson, 11, Wide Bargate, Boston, Lincolnshire.
G6GM.—H. J. Merriman, Featherlands, Holsworthy, Devon.
G6XR.—H. V. Cook, 78, Wyken Avenue, Wyken, Coventry, Warwickshire.
2AIG.—P. C. Mortimore, Burnworthy, South Nutfield, Surrey.
2ASH.—H. B. Sumner, Balmoral House, Moss Lane, Leyland, Lancashire.
2ATF.—H. C. Stone, 4, Leckford Road, Oxford.
2AWC.—K. Panton, 92, Victoria Avenue, Hull, Yorkshire.
2AWH.—H. J. Sherry, 26, Tonbridge Crescent, Kenton, Middlesex.
2BAW.—E. T. L. Hare, 17, Park Road, Southborough, Tunbridge Wells, Kent.
2BHM.—R. B. Foster, 62, Harlow Terrace, Cold Bath Road, Harrogate, Yorkshire.
2BJN.—J. E. Hunter, 10, Tasmania Gardens, Fairlop Road, Barkingside, Essex.
2BNS.—R. F. A. Pottinger, 1, Aldridge Rise, New Malden, Surrey.
2BQR.—G. Beckitt, 24, Alfred Street, Grimsby, Lincolnshire.
2BQX.—R. E. Friend, 74, Putney Road, Enfield Wash, Middlesex.
2BVL.—H. Deas, 116, Cromwell Road, St. Andrews, Bristol, Somerset.
2BXG.—T. H. Hall, "Fifteen," Morley Street, Kettering, Northampton.

The following are cancelled:—G6ML, G6VC, 2ASC, 2BDA, 2BJD, 2BTW, 2BWS.

Please send all new QRAs, changes of address, etc., to QRA Section, R.S.G.B., 53, Victoria Street, London, S.W.1. All QRAs received, in addition to being published in the Bulletin, are forwarded to the Radio Amateur Call Book, of Chicago.

NEW MEMBERS.

HOME CORPORATES.

H. E. Pearson (G2AV), Pine View, Brandon Road, Binley, near Coventry.
H. Hillgrove (G6PO), 7, Dean Street, Blackpool, Lancs.
N. L. Stephens (2APF), Hollybank, Hereford Road, Monmouth.
A. H. Lunn (2ARR), Station House, Sutton-on-Sea, near Alford, Lincs.
A. J. Mourton (2BCV), 54, Chalfont Road, Holloway, N.7.
G. C. Proctor (2BJP), Great Flanchford Farm, Reigate, Surrey.
G. Evans (2BMV), 57, Broadgate Walk, Horsforth, Leeds.
A. G. French (BRS1526), 29, Framfield Road, The Limes, Uckfield, Sussex.
W. H. P. Minto (BRS1527), 142, Osborne Place, Aberdeen.
S. Powles (BRS1528), 7, Roaches Court, Elm Hill, Norwich.
W. K. Coupar (BRS1529), 12, Arklay Terrace, Dundee.
T. Paton (BRS1530), "Ackergill," Kelty, Fife, Scotland.
J. R. Dennis (BRS1531), 54, Fairfield Road, Bow, E.3.
E. W. G. Sainty (BRS1532), 23, Albert Road, Witham, Essex.
F. S. Wright (BRS1533), Queen's Head Hotel, Gt. Clacton, Essex.
W. J. Munro (BRS1534), 169, Lodge Avenue, Dagenham, Essex.
W. L. Ely (BRS1535), Cliftonville, Pembroke Road, Woking, Surrey.
H. E. Stacey (BRS1536), 121, Lansdowne Road, Aylestone Park, Leicester.
J. E. A. Smith (BRS1537), 39, Hossack Road, Ipswich, Suffolk.
J. H. Shankland (BRS1538), Coila, Thorn Drive, Bearsden, Glasgow.
N. D. Peerless (BRS1539), 247, High Road, Streatham, S.W.16.
F. Crabtree (BRS1540), Ashley House, Ashley Road, Epsom, Surrey.
V. C. Rayner (BRS1541), "Lezayre," Waterloo Park, Waterloo, Liverpool, 22.
J. L. Hills (BRS1542), 242, High Street, Bromley, Kent.
R. I. Clews (BRS1543), 88, Antrobus Road, Wylde Green, near Birmingham.
N. C. Hobbs (BRS1544), 29, Upper Beckwith Street, Birkenhead, Ches.
W. W. S. Wallace (BRS1545), 27, Kensington Park Road, North Kensington, W.11.
S. G. Marsh (BRS1546), 10, Vernham Grove, Odd Down, Bath, Som.
J. H. Carr (BRS1547), Keppel Chambers, Keppel Street, South Shields.
L. G. Pugh (BRS1548), 15, Nelson Street, Southend-on-Sea, Essex.
P. Johnson (BRS1549), 16, Poppythorn Lane, Prestwich, Manchester.
D. Sherley-Price (BRS1550), 39, Nelson Road, Bournemouth, W.
E. Mitchell (BRS1551), 78, Halifax Road, Todmorden, Lancs.
R. H. Clapp (BRS1552), 151, Stanwell Road, Penarth, S. Wales.
W. Caton (BRS1553), 84, Fishwick View, Preston, Lancs.
A. W. Field (BRS1554), 89, Wathen Road, Warwick.

DOMINION AND FOREIGN.

F. W. Skinner (SU1FS), Royal Tank Corps, Abbassia, Cairo.
R. W. Rose (VK4RQ), Box 84, Longreach, Queensland, Australia.
W. P. Burford (VK5PB), Box 209, Narracoorte, S. Australia.
E. B. Laing (VP5AB), Circulation Department, G.P.O., Kingston, Jamaica.
R. S. Smith (VQ8Z), c/o The Eastern Telegraph Company, St. Helena.
E. C. Yates (VS8AD), Post Box 564, Singapore, S.S.
Mrs. A. R. Bourke (W9DXX), 2560 East 72nd Place, Chicago, Ill., U.S.A.
L. R. Arnott (ZE1JO), Box 341, Salisbury, S. Rhodesia.
Dr. W. H. Kauntze (BERS247), Entebbe, Uganda.
C. C. R. Reynolds (BERS248), Cocanada, India.
K. N. Franklin (BERS249), m/v. *Bulysses*, Anglo-Saxon Petroleum Company, Ltd., St. Helen's Court, Leadenhall Street, E.C.3.
R. C. Baxter (BERS250), Residency Road, Nagpur, India.
R. Singh (BERS251), No. 1 Squadron, I.A.F., Drigh Road, Sind, India.
P. Bonnici, 49, Sda S. Giorgio, Hamrun, Malta.

First Contact Claims.

Mr. F. Charman, G6CJ, claims first British contact with Antigua. This was made with VP2RT on March 30, 1934. Addresses of the three active VP2 stations are as follows:—

VP2BX Eugene Vanies,
4, Tanner Street, St. John's.

VP2CD Clement E. de Silvia,
Box 62, St. John's.

VP2RT R. Tibbits,
Box 43, St. John's.

Mr. Charman mentions that the call FB8C is being used by F. P. Bour, Faravohainta, Tananarive, Madagascar.

Miles per Watt.

Mr. J. Davies (G2OA) advises us that on November 18, 1933, he was in contact with VK3PG, who was using an input of only 3.6 watts (180 volts at 20 ma.). This represents a distance of about 3,500 miles per watt, a figure well in excess of that put forward by Dr. Lunt.

Another claim has been received from G2DQ, who states that he was qso ZL4AO during the last Low-Power Contest, using an input of between 2 and 3 watts. Taking the latter figure, the miles per watt are in the neighbourhood of 4,000.

In connection with the original claim as set out by ZT1Q, we now learn that the power used for his contact with U9AF was 3.3 watts (158 volts at 21 mas), which represents a distance of 2,220 miles per watt.

TRADE NOTICES.

The autumn season, if we still have seasons in the radio world, has brought forth an unusually large crop of new lines, which are described in detail in the numerous catalogues recently received.

Wingrove & Rogers have produced a most attractive coloured poster for display in shops, copies of which will be sent gratis on request. Their 20-page handbook describes all that is new in the condenser field, including the electrolytics which are being made for them by *British N.S.F.*

* * *

Practical Television Handbook is the title of a useful 16-page pamphlet issued by *Bennett Television Co.*, Station Road, Redhill. The author is a member of the Television Society, and, as he explains in the introduction, he has written the book in easily understood language. A specification is given for a practical disc receiver and a mirror drum receiver. The book is a useful addition to the Television library.

* * *

If you have switching problems to solve the new *Crabtree* catalogue should prove useful. Details are also given of their moulded lampholders and a 2 amp flush switch socket which permits new methods of installation.

* * *

Lectrolinx have sent us samples of their new aerial and earth master plugs, which retail at 3d. each. This component has a standard $\frac{1}{8}$ in. plug portion and is supplied with a large wiring aperture suitable for thick flex, thus enabling aerial and earth leads to be taken direct to the set.

* * *

Patents Explained, written by Mr. H. J. Wildbore, of Wildbore & Gibbons, Leadenhall Street, E.C.3 (price 6d.), should interest those who have patent problems. The book gives a brief and simple summary of information useful to manufacturers and inventors.

The New Ferranti Loud-Speaker Cabinet.

Ferranti, Ltd., have sent details of a new speaker cabinet retailing at 32s. 6d. The dimensions are $11\frac{1}{2}$ ins. high by $15\frac{3}{4}$ ins. wide and $7\frac{1}{2}$ ins. deep; the cabinet is intended mainly for an extension speaker. The accompanying photograph illustrates the design.

* * *

The Telegraph Condenser Company, Ltd., advise us that the prices of low and medium voltage dry electrolytic condensers and tubular type paper condensers have been substantially reduced.

Several new dry electrolytic types have been introduced, including Type AT, with soldering tags for suspension in wiring if desired.

A full list of condensers made by this well-known firm will be sent on request.

* * *

W. F. Brown Radio Co., whose stand faced our own at Olympia, have sent us details of their many high precision test sets. These include their Audio Frequency Oscillator, Thermionic Voltmeter, and Portable Modulated Oscillator. Full particulars of the complete range of instruments can be obtained on application to Osillo Radio Works, Brierley Hill, Staffs.

* * *

A pamphlet entitled "The Automatic Telephone," prepared by Mr. W. T. O'Dea, B.Sc., of the Science Museum, has been published by H.M. Stationery Office. It is priced at 6d. (by post 7d.), and may be obtained from the Science Museum, South Kensington, London, S.W.7, or from any of the sale offices of H.M. Stationery Office.

The various ways in which a call can be made on the automatic telephone system of the British Post Office are described and illustrated by simple routing diagrams.

Other illustrations show the comprehensive demonstration equipment installed by the Post Office at the Science Museum, and detailed views of the apparatus.

CORRESPONDENCE.—(*Contd. from page* 139).

THE NEUTRALISED T.P.T.G. POWER AMPLIFIER.

The Editor, T. & R. Bulletin.

Dear Sir,—I read with much interest in the September issue of the Bulletin the article under the heading of "The Neutralised Tuned Plate Tuned Grid Power Amplifier."

It may interest you to know that the transmitter in use at this station has incorporated the neutralised tuned plate tuned grid circuit in two of its stages for a period of nearly three years. During that time the arrangement has given every satisfaction both in stability and drive ratio. I find neutralising most simple, and it is only on 28 mc. that a readjustment of the neutralising condensers is found necessary.

The present system consists of C.O. '47, Sub P.A. (or F.D.) T.250 and the push-pull output stage 2-211D's. The T.250 serving as a F.D. on 14 and 28 mc. The drive ratios are much the same as stated by G6OM, and the undersigned is in every way in agreement with all the advantages set out by the writer in his splendid article.

Yours faithfully,

W. A. Clark, Grad. I.E.E.,

G5FV.

STATION DESCRIPTION No. 43.

VQ3BAL

By George F. K. Ball.

VQ3BAL is the natural offspring of FK2MS. It was in the summer of 1927 that the writer was stung by a species of bug which so far as he is aware has no scientific name, but its manifestations have persisted ever since. The outcome of this bite was the birth of FK2MS, which disturbed the ether with a Baby Burgess transmitted, using a receiving valve with 150 volts on the plate from dry batteries and working on a wavelength of 30 metres. During the early part of 1928 a TVT unit was acquired, and the thrill of success came on the night of May 2, 1928, when FK2MS effected its first DX QSO with AI2KT. FK2MS, be it said, was situate in Mombasa.

Towards the latter part of 1929, FK2MS became VQ4MSB, and many pleasant QSO's were exchanged with fellow amateurs all over the world. The station graduated to a T.N.T. circuit and was operated entirely from the A.C. mains, but in April, 1931, a transfer to Kampala in Uganda, saw the closing down of VQ4MSB. In Uganda a new call-sign was allotted, viz., VQ5KAC, but owing to various circumstances and my short stay there it was not possible to put VQ5KAC on the air.

Then followed a lapse of two years, but in June, 1933, the insistent call of amateur radio made itself felt and another progeny of FK2MS came into being, namely, VQ4CRN, in Nairobi. This infant unfortunately was short-lived, but during its two months of activity many chummy ragchews were had and old-time friendships renewed. VQ4CRN possessed a marvellous aerial system, namely, a piece of wire slung between two trees only eight feet from the ground ! ! The main point is that it worked and worked well. I, am still of the opinion that high masts are not necessary, and my nomadic wanderings during the past few years have proved that so long as the transmitter is built with care and operated at its utmost efficiency and the aerial system designed with care, it matters little whether it is 50 feet or five feet from the ground.

This is a tale of VQ3BAL and I can imagine you saying, "Well, get on with it." So here goes. On arrival at Dodoma it was found that the mains were 220 volts, D.C. They are switched on at 6.45 p.m., and cut off at midnight. The question of H.T. supply was considered and eventually solved by ordering from England a *Nelco* rotary converter with an output of 100 watts. The output from this machine is fed into the original power pack, which gives 500 volts from each side of the centre tap of the *Varley* power transformer. Smoothing is effected by a *Heayberd* choke and 12 mfds. of condenser. Two half-wave rectifying valves are used. The actual transmitter is my old love the T.N.T. circuit, and I consider it is the best transmitter that has been evolved for the low power aspirant. A *Tungsram* PX2100 valve is used as the oscillator, its characteristics being very similar to the UX210. The transmitter is mounted on the usual "breadboard," which is supported on a piece of felt one inch thick. A double-throw switch changes the aerial from "send" to "receive." The aerial, as is my usual practice, is not supported by poles or masts, but is slung between a couple of convenient trees, and is about 15 feet from the ground. The top is 67 feet long, of No. 20 SWG copper, and the feeder is attached 10 feet 3 inches from the centre. The feeder is led in through a porcelain tube to the transmitter, and it is to be noted that the small shack is completely screened by mosquito gauze netting.

The station is equipped with an absorption wavemeter and other neon indicating devices. The monitor —built in a biscuit tin—stands on the operating table near the receiver and every transmission is continuously monitored. The receiver is the usual Det-LF arrangement, using home-made coils on valve bases with adequate band spreading facilities. When funds are in a better position it is proposed to modernise the receiver to a screened grid detector-pentode output. The H.T. for the receiver is derived from a *Milnes* unit and this has proved of great value. It is ideal for the man out in the "blue," providing he has facilities for charging low tension.

During testing and operation the transmitter gave a note very near to crystal, but when the aerial load was connected the note broke up. This was puzzling for some time, when it was found that so long as the weather was dead calm the note remained good but the slightest breeze spoiled the note completely. I suppose the moral is "Put up masts," and keep the aerial from swinging as much as possible. But the moment I do so, in all probability I shall be transferred to another location, and the demise of VQ3BAL will ensue.

VQ3BAL commenced operations on November 10, 1933, in the 14 mc. band, with an aerial 33 ft. long and about 7 feet from the ground, and the first QSO was with a PY station. This was an exciting moment as I have wanted a PY for years to secure the coveted W.A.C. The location of the aerial is not one which would be considered ideal, as it is completely surrounded on all sides by tall trees whose foliage is within a few feet of the actual aerial wire ! ! !

During the past few months conditions on 14 mc. have been very poor, but on 7 mc. many pleasant QSO's have been effected, although QRN has been very bad. Our rainy season is in full swing, which has brought in all kinds of game and other wild animals, and sitting in the shack o' nights I have occasionally taken off the phones to listen to the grunt of lion or to the weird howl of hyenas.

So ends the tale of VQ3BAL, and as I look back to the advent of FK2MS I recall many pleasant memories and friendships made which amateur radio has given me. It is a matter of conjecture what the next youngster out of FK2MS will be. *Quién Sabe ?*

INTERNATIONAL AMATEUR PREFICES.

IN response to numerous requests we have prepared a List of International Amateur Prefices, which as far as our present information allows, is up to date.

CE	Chile.
CM	Cuba.
CP	Bolivia.
CR, CT	Portugal and Colonies.
CX	Uruguay.
D	Germany.
EA1-7	Spain.
EA8	Canary Islands.
EA9	Spanish Morocco.
EI	Irish Free State.
EL	Liberia.
EP	Persia.
ES	Estonia.
EZ	Sarre.
F	France and Colonies.
G	Great Britain.
GI	Northern Ireland.
HAF	Hungary.
HB	Switzerland.
HC	Ecuador.
HH	Haiti.
HI	Dominica.
HJ	Colombia.
HP	Panama.
HR	Honduras.
HS	Siam.
HV	Vatican State.
HZ	Hedjâz.
I	Italy.
J	Japan.
KA	Philippine Islands.
K4	Porto Rico
K5	Canal Zone.
K6	Hawaii, Guam, Samoa.
K7	Alaska.
LA	Norway.
LU	Argentine.
LX	Luxemburg.
LY	Lithuania.
LZ	Bulgaria.
MX	Manchukuo.
NX	Greenland.
OA	Peru.
OE	Austria.
OH	Finland.
OK	Czecho-Slovakia.
ON	Belgium and Colonies.
OZ	Denmark and Faroe Islands.
PA	Holland.
PK	Dutch East Indies.
PJ	Curacao.
PY	Brazil.
PZ	Surinam.
SM	Sweden.
SP	Poland.
ST	Sudan.
SU	Egypt.
SV or SX	Greece.
TA	Turkey.
TF	Iceland.
TI	Costa Rica.
U, UE, UK, UX	U.S.S.R.
V8	Mauritius.
VE	Canada.
VK	Australia.
VO	Newfoundland and Labrador.
VP1	Fiji Islands and Zanzibar.
VP2	Antigua.
VP3	Malta.
VP4	British Honduras and Trinidad.
VP5	Jamaica.
VP6	Barbados.
VP7	Bahamas.
VP9	Bermuda.
VQ1	Fanning Island.
VQ2	Northern Rhodesia.
VQ3	Tanganyika.
VQ4	Kenya Colony.
VQ5	Uganda.
VQ8	Ascension.
VR1	British Guiana.
VS1 or 8	Straits Settlements.
VS2	Federated Malay States.
VS3	Non Federated Malay States.
VS5	Sarawak.
VS6	Hong Kong.
VS7	Ceylon.
VS9	Seychelles.
VU	India and Burma.
W	U.S.A.
X	Mexico.
XU (or AC) ...	China.
YI	Iraq.
YJ	New Hebrides.
YL	Latvia.
YM	Danzig.
YN	Nicaragua.
YP	Rumania.
YS	Salvador.
YT or YU	Jugo-Slavia.
YV	Venezuela.
ZA	Albania.
ZC1	Trans-Jordania.
ZC6	Palestine.
ZD	Nigeria.
ZE	Southern Rhodesia.
ZK	Cook Islands.
ZL	New Zealand.
ZM	Samoa.
ZP	Paraguay.
ZS, ZT, ZU	Union of South Africa.

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 (Middlesborough 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.)

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

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

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

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

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

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

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

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

DISTRICT 13 (London South).
MR. H. D. PRICE (G6HP) 12, Hillcrest Road, Sydenham, S.E.26

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

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

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

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

DISTRICT 18 (East Yorkshire).
(East Riding and part of North Riding.)
MR. T. WOODCOCK (G6OO), 8, George Street, Bridlington.

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

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

DISTRICT 1 (North-Western.)

CONTINUING our usual practice each of the C.R.s has produced a separate report covering the activities in his particular neighbourhood. This has many advantages, but as will be noticed duplication of the "surplus gear" idea leads one to the conclusion that the Notes from this District should follow on the lines of all other Districts. The suggestion was made at Convention that each District should appoint a "scribe" whose duty it would be to collect the reports on behalf of the D.R. and prepare a set of Notes for publication. The D.R. would then edit the Notes and forward to H.Q. A volunteer for this work in District 1 is required.

It is the D.R.'s intention to visit the October meeting of the Liverpool section with a view to discussing the question of a venue for the 1935 Joint Conventionette.

Twelve members attended the last Manchester section meeting, when it was decided to hold auctions of surplus gear at the conclusion of future meetings. A small percentage of the money taken at the sales will be handed over for District expenses. Already a good deal of useful gear has been received, therefore an appeal is made to all members in the section to support the meeting on November 7.

It having been decided to form a crystal register all interested are asked to forward particulars of their crystal frequencies to G2OI. This register will prevent local members purchasing crystals "on top" of their colleagues.

As only two members wrote in support of the suggestion to organise a visit to the Ferranti works the C.R. intends to call the project off unless a good response is received to this final notice.

The following stations are active :—G2DF, 2JC, 2OI, 2WQ, 5AL, 5OZ, 5LR, 5YD, 6AX, 6QA, 6ZU, 6ZS, 2ACP, 2BVP. Members who wish their calls included in these lists must advise G2OI, whose address is 64, Worsley Road, Winton, Patricroft, not later than the 20th of each month.

Owing to the fact that these Notes are due at Headquarters within a few days of the date of the monthly meetings in Liverpool it was suggested at the September meeting that in future the meetings should be held on the second Wednesday in

each month instead of on the third as at present. The next meeting will take place on the third Wednesday in October and a final decision will then be made as to the date for future meetings.

It was decided at the September meeting that a junk sale should be held at the next meeting, and as many members must have quite a lot of perfectly good components for which they have no further use the C.R. (G6CX) will be glad if all members will pack them up and bring them along to the next meeting for sale or exchange.

While on the subject of the next meeting the C.R. would also like to see many more members present than has been the case during the past few months. Many faces have been missing for some time and the owners are known to be active on the air so it is quite clear that they are not all away on holiday.

DISTRICT CALENDAR
October/November, 1934.

Oct. 17.— *District 1 (Liverpool Section), Talk by 2BWG, "The Effects of Atmosphere on Radio Transmissions."

Oct. 23.— *District 12, 7 p.m., at the Ark Café, Temple Fortune. Talk by G6OT, "The Bruce Antenna."

Oct. 23.—District 14 (East London Section), 8 p.m., at G6LL, 178, Evering Road, Clapton, E.5.

Oct. 24.—District 14 (Essex Section), 8 p.m., at G2KT, Newsonia, Bull Lane, Rayleigh.

Oct. 24.—District 15, 7.30 p.m., at G6VP, 12, Ferrers Avenue, West Drayton. Discussion, District Meetings.

Oct. 26.—London Meeting, at I.E.E., 6.15 p.m. Tea from 5.30 p.m. Lecture, "Police Radio Communications," by Mr. B. J. Axten, Radio Department, Standard Telephones and Cables, Ltd.

Nov. 7.— *District 1 (Manchester Section), 7.30 p.m., Brookes' Café, Hilton Street, Manchester. Talk by G2OI, "Constructing the Single Signal Super."

** Members' disused apparatus will be disposed of at these meetings.*

Mr. J. Davies (G2OA) and other members who attended Convention gave a full report of the proceedings, and the new arrangements regarding District Notes were received with pleasure by the majority of those present. If members do not see their individual activities reported in the Notes it will be because they do not report them to the C.R.

The meeting terminated with a discussion regarding a joint Conventionette and in view of the fact that the Conventionette for 1935 was provisionally arranged to take place in Liverpool some enquiries have already been made by G6TT regarding the possibility of holding the Conventionette on board a ship in one of the docks. It was felt that this scheme might commend itself to the members in the Manchester area and in the other districts concerned, and the C.R. was requested to ascertain the views of the other Districts on this proposal.

G2RF suggested that an informal meeting should be held each month (in addition to the usual official monthly meeting) at a transmitting member's QRA and the scheme is to be given a trial. G2RF kindly offered to take the first meeting on the first Saturday in October. G2OA will take the next on the first Saturday in November at 7 p.m. Those who wish to attend please send a card to the "host" a few days before the meeting.

There is fair activity in the Liverpool area in spite of poor conditions. G6TT and G2OA are using auto-operated transmissions and both are rebuilding. Is this the first auto transmission by amateurs in Europe? G2RF is active on 7 mc. and 14 mc. using a 46 as final amplifier with success. 2BNA is experimenting with high fidelity L.F. amplifiers. G6TT and G6CX are using American superhets for reception and G6CX is testing with fone on 14 mc. No further reports have been received but several members have been heard working.

DISTRICT 2 (North Eastern).

The Bradford area has experienced an unaccustomed quietness during the last few weeks, judging by the small number of stations heard, though it is known that in some cases this is due to alterations to gear, and preparations for the winter season.

The members who visited Convention had a fine time and they look forward to making contact again over the air with new and old friends met there. They thank the stations to which visits were made for the facilities extended.

Monthly meetings and station visits are now resumed, and it is hoped that the area will again display the same activity that it did during the last winter.

The Sheffield area held their first meeting of the season on September 21, at the Angel Hotel.

A discussion on 5 metres and television occupied most of the time at the meeting.

G6LF, 2XH, 2JY are inactive. G2AS and 6PJ are active, the latter having worked VK and W2 on 7 mcs. with just under 10 watts input, using locked P.P.T.P.R.G. and 69 ft. A.O.G. VF aerial.

The next meeting will be held at The Angel Hotel, on October 19, at 8 p.m.

DISTRICT 6 (South-Western).

The majority of members are at present engaged in preparing for winter activities, consequently things are very quiet in the south-west.

The D.R. was fortunate in being able once more to attend Convention, and, thanks to our good friend Mr. Mathews (G6LL), spent a very enjoyable week in town. The exchange of views and ideas with the many acquaintances met in London should prove beneficial to the District. As far as the business meetings were concerned the D.R. attended these, and, it is hoped, did all that was necessary on behalf of the District. One item of

importance, decided at the delegates' meeting (which District members should take note of), was to the effect that D.R.s, if they wish, may make up their notes more on the old lines, in which details of individual work were often given. The more recent idea of a general survey is not scrapped, but a judicious mixture of the two is aimed at. So if any of you at any time have anything special, you would like commented on, please write in well before the 25th of the month. The D.R. was also given the opportunity of observing how the Society's ship is steered by Council, and he can assure members that the job is a pretty big one.

It was also a pleasure to meet G5VL at Convention, and to be able to renew old slangings with him !

The Budget still carries on in Devon, but it is a pity that the same cannot be said for Somerset and Cornwall. In Devon the problem is becoming a big one, as there are several new BRS members who should be brought into the scheme as it would help them no end. At present there is no room for them, and it is therefore necessary to arrange something different. One way out would be to have two groups going in Devon. Are you prepared for this, OMs ?

The other method, rather favoured by the D.R., is for a supply of uniformly sized paper, each sheet punched with two holes for lacing, to be made available to each contributing member. He would be relied upon to send in his report by post before the 20th of each month, using this paper. All these reports would then be laced into a strong, but flexible loose-leaf cover and circulated through the post. If this method were agreed upon the whole District could be taken in and the County method scrapped. This would be possible as it would take much less time for the book to get round, since comments only would have to be written in it.

The D.R. has gone into this subject in some detail as he wants advice from everyone interested. He would like specially to hear from new members, so will those who would like to come into such a scheme please write to him as soon as they read these notes ?

An attempt was made to arrange a " tea ragchew " at Taunton for the benefit of the Somerset members, but apparently only a few could attend ; it will, therefore, be advisable to wait a bit. Will those Somerset, Exeter and District members who would like to attend such a meeting in Taunton at the end of October please write in to the D.R. as soon as possible ?

The D.R. adds his measure of thanks to the President and Council for succeeding in obtaining the very acceptable increase in band widths.

STANDARD FREQUENCY TRANSMISSIONS.

SUNDAY,
October 28, 1934

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

Accuracy within 0.01 per cent.

DISTRICT 7 (Southern).

The September meeting at Wittering was attended by just over a dozen members. We were sorry to see that this included very few of the local people, most of those present coming from a distance, including G2OA and G6MN, temporary visitors to the district. We all had a most enjoyable time, with bathing, and a base-ball match on the sands, the party breaking up at just after 6 p.m., in view of the fact that rain could be seen approaching from across the Channel. News is very scarce again this month, but we have heard rumours of considerable rebuilding activity all round, so we are looking forward to increased activity during the winter season.

The November meeting has been arranged for Sunday, November 4, at G2YL's home at Walton-on-the Hill, Surrey. For those coming by train, 2YL has arranged for the early afternoon trains to be met at Tadworth station.

A talk on valves will be given by a technical expert, and if there is any time left the D.R. will give a demonstration and a talk on S.S. receivers, using crystal filters.

At least four members in the Surrey area are experimenting with transmitting pentodes, and we hear glowing accounts of blowing into the grid at one end and getting 50 watts of 14 mc. telephony out of the other ! Let us have some more information, please.

DISTRICT 8 (Home Counties).

We nearly missed the boat with these Notes this month, having waited in vain for some Cambridge news. Other C.R.s all sent in reports but with little interest therein. An epidemic of receiver building seems to prevail everywhere, no doubt due to Uncle Tom's observations on that subject.

On several occasions the D.R. has been pleased to receive information about the Bedford area from G6HB. Unfortunately he confirms the view that members there are all inactive or indifferent.

VU2AB is returning to this country at Christmas and will be on the air at St. Ives with the call sign G6DX.

DISTRICT 9 (East Anglia).

We are still looking for the District Letter Budget. Evidently the person who has it knows no shame, for it has been with him for two months now !

Norwich is still going ahead, and we hear that G2UT was working U.S.A. on 7 mc. within a week of obtaining his licence ; the " old-timers " will have to look to their laurels.

G5UF and 2MN report active, and both are hoping to do a little work on 56 mc. in the near future.

2BSO and 2BGO are busy learning Morse, and expect to be on the air soon.

G5OD, it is understood, is covered with burns from his aerial, but he cannot make the meter show

the RF ! If anyone wants to know a thing or two about rebuilding just drop in and have a chat with 2JS.

G2XS is working on 3.5 mc. most Sunday mornings, and will be glad to have reports from within the District regarding the reliability of his signals ; he is generally on fone about midday.

DISTRICT 10 (South Wales and Monmouth).

In view of the excellent attendance at the monthly meeting held at Newport on September 13, it seems strange that your D.R. finds it necessary to mention that this is the first occasion for many months that reports to hand can be considered as practically nil. It is appreciated that there is considerable activity in rebuilding programmes throughout the district, but at the same time the recent facilities granted D.R.s in regard to District Notes can have no effect unless all members make a practice of reporting regularly to their C.R.s.

There is, however, activity in other directions, and we have pleasure in extending a welcome to two more members in Mr. N. L. Stephens (2APF), of Monmouth, and Mr. R. H. Clapp, of Penarth.

G2JL sends in an interesting report which indicates an extensive rebuilding programme, and it is understood that shortly this station will undertake slow-morse practise-transmissions which should prove of considerable help to new members in this area.

Congratulations to G6PF, who has now received his W.A.C. Certificate.

DISTRICT 11 (North Wales).

The D.R. wishes to apologise for the absence of notes during the last few months, but this has been unavoidable due to pressure of business.

G2II reports that he was fortunate in contacting the plane XXON4AU during the tests preceding and on the day of the third Stratosphere ascent. He mentions that during the latter period he heard an unknown station using the call of the balloon and giving false reports. It seems incredible that anyone could be such a lunatic as to indulge in work of this kind. G2II has also carried out some successful schedules on 14 mc. with a small motor-boat OZWG off the coast of Greenland belonging to the Koch Expedition.

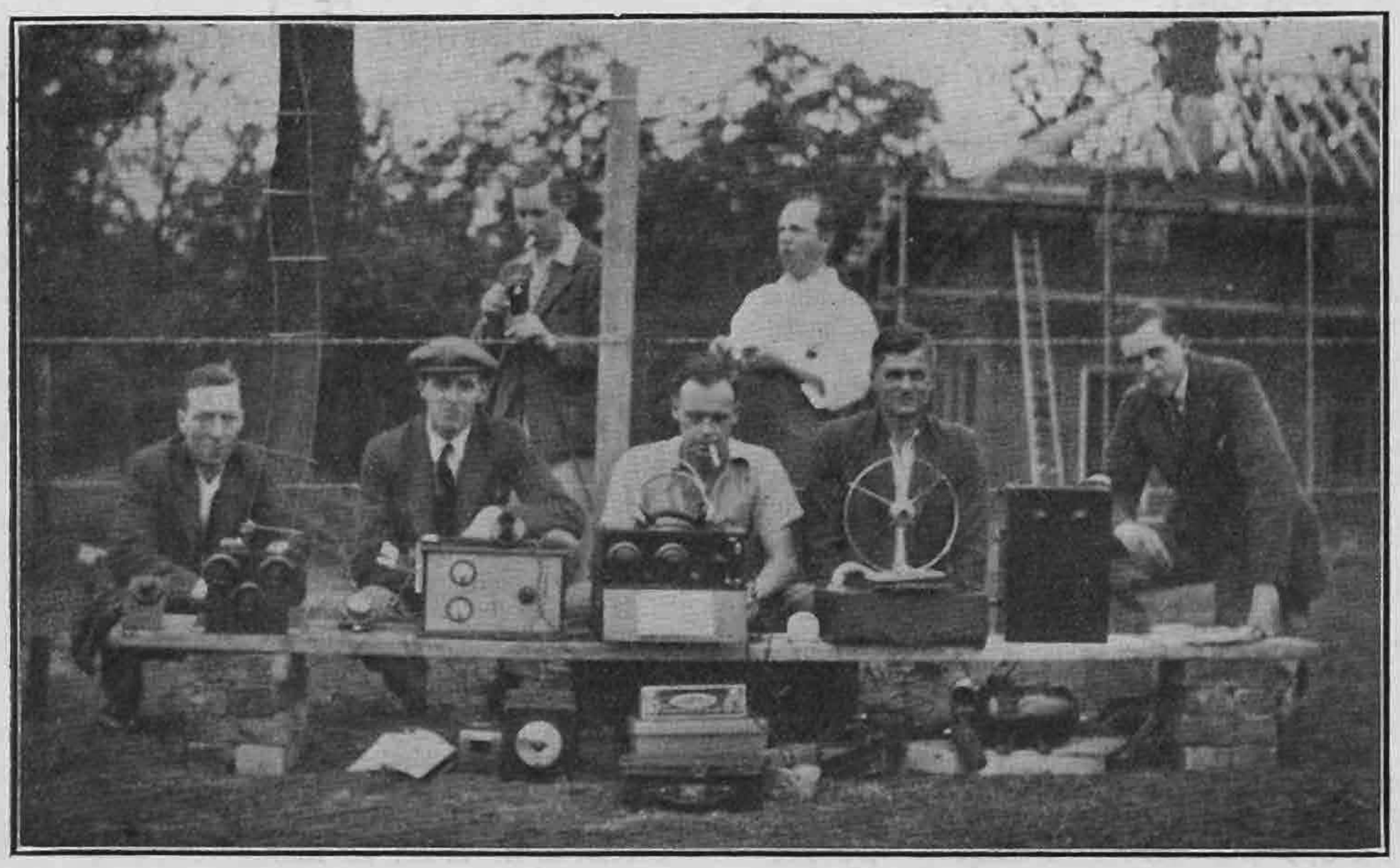
J. J. Maling (BRS1366) leaves the District, but is congratulated on obtaining his full licence. We wish him luck in District 9, and feel sure he will prove as useful a member there as he has been to us in North Wales. C. P. Elliott (2ALX) and A. M. Williams (2BRK) are welcomed as new members, and the former is preparing for extensive television research. He will be pleased to co-operate with interested members. K. L. Hoysted (BRS 1479) and W. T. Eyton (BRS1325) are also cordially welcomed into the District. Most of the other active members are rebuilding.

DISTRICT 12 (London North).

Now that Convention is over our thoughts turn once more to District meetings. This winter promises to be even better than last, which was a record for No. 12. Sales of good apparatus will be held at every monthly meeting, and visitors are cordially invited.

The next meeting will be held at The Ark, Temple Fortune, when Mr. H. Clark (G6OT) will give a talk on the " Bruce Aerial."

All the stations who promised to support the 56 mc. tests on Convention Sunday were active, but no startling DX was done over 20 miles.



Members of the Kentish Town and District Radio Society at a recent 56 mc. Field Day.

DISTRICT 13 (London South).

The usual South London stations are on the air, and in their usual manner fail to report.

G6HM is active, and suggests keeping a crystal register for the District. Will stations interested kindly send in their frequencies ?

G2GZ is also active, and is trying out 14 mc. phone. Interesting work is being carried out each week-end by our 56 mc. group.

Visitors are always welcomed by the D.R.

DISTRICT 14 (Eastern).

The attendance at the September meeting held at 2BWP, Leigh-on-Sea, was 11, and at a meeting held at QRA of G5AR, Woodford, the same number was registered. For October meeting see District Calendar elsewhere in this issue. The 56 mc. Convention Sunday Field Day, held on grounds of Woodlands Farm, Sewardstone, was poorly supported, three Dutch visitors, PA0UB, PA0GG and PA0FY, however, paid a visit. G6FJ has left the District for the time being, and is now at South Shields, where he hopes to be active shortly.

G6QK, during his trip recently, visited Belgium, Spain, Portugal and Gibraltar, and was made welcome by amateurs in these parts. CT1AA was visited. New members: BRS1531, of Bow; BRS1534, of Dagenham ; and G6JI, are welcomed. 2AWG is now G6LO, of Dalston. Mr. C. C. Algar, 2BVH, is running Morse practice at 63, Margery Park Road, Forest Gate, E.7 ; will those interested and able to attend get in touch with him. G2NU is now at The Round House, Havering, near Romford. Congratulations to BRS207 in bringing further contest honours to the District by winning third place in an international receiving contest arranged by HB9B (Radio Club, of Basel). There were over 100 entrants. Will Essex members please note that their county representative, Mr. M. B. Buckwell, G5UK, QRA is now living at " Newhaven," Meadway, Westcliff-on-Sea ?

DISTRICT 15 (London West, and Middlesex).

Only nine members attended the September meeting and of these, six were BRS. What happened to the transmitters on this night ? It was suggested that if a local society was formed within the area, it would encourage more members to take part in this side of the area's activities. Will members please drop the D.R. a line giving their views on the subject ?

The date and venue of the October meeting will be found under the calendar.

Only one report has come to hand, and that from G6VP, who has worked ZL on phone three times during the month, on one occasion getting an R7 report with 100 per cent. readability.

DISTRICT 16 (South-Eastern).

G2IC reports 100 per cent. activity in Folkestone.

Ashford have formed a local Society with G6SY as Secretary and G2JV Treasurer. Meetings are held on the first Monday of each month.

G2KJ is keeping a sked with 6GQ to observe atmospheric efforts.

G5OQ and the Tunbridge Wells group are going strong and we welcome two new members, Messrs. Leonard and Brayne.

North Kent held their local contest on September 30. The Medway district have their local contest on the first and third week-ends of this month, for a very handsome trophy presented by the *Chatham Observer*, a newspaper which has done much good work for amateur radio in Kent.

G2IC is doing a bit of " iron fighting " making an angle-iron rack for his gear. He estimated that he loses an equal amount of weight and cash (measured in pounds) each day !

Efforts are being made to form a local group in Herne Bay.

From Sussex we learn that G2AO is building a new shack. We welcome another BRS in the person of 1256 of Uckfield. BRS1450 is now 2AUH. BRS1472 is applying for full licence. Other stations active are G5UY, 2MC, 2AX, 6HH, BRS1173 and 1494.

DISTRICT 17 (Mid-East).

There have been no District notes for one or two issues on account of lack of material for composition.

We are pleased to welcome G2VY—the new call of 2BIH, and B2KF—the new call of 426.

The Cranwell Section personnel has changed, and G5AB has arrived, whilst we have lost G5FO and 1323.

In Grimsby District we have a new member—1515 at Cleethorpes.

A good representation appeared at Convention, with *all* the District officers. G5CY was amongst the fortunate ones !

For meetings of local sections the following information may be of use:—Grimsby district, apply to G6AK ; Boston District, apply to G6LH ; Lincoln District, apply to G5XL ; Cranwell District, apply to G2LR.

Members wishing to join the R.E.S. Transmitter Design Section should apply to the D.R. for particulars. There are three groups at present, and three Letter Budgets running.

General activity is evident, and all call signs are on the air from time to time.

DISTRICT 18 (East Yorkshire).

G2QO excelled himself by working VS5AC, Sarawak, N.W. Borneo, on September 7, 16.00 G.M.T., on 14 mc., getting an R5 report, and wonders if he can claim first G. contact. He has

also worked VK3EG three times a week for B.E.R.U. traffic. Testing low-impedance link for aerial coupling to plate tank coil, parallel tuning for both and 14 mc.

6OY again active on 14 mc. and has erected new Zepp. 60S active, but does not report. 5GC active on 28 mc. 2AVR is testing OZ7Z circuit recently described in the BULLETIN.

5FV active on 14 and 28 mc., testing out Collins matched impedance coupler recently described in QST with very good results. Had the pleasure of a post-Convention visit from the D.R. and 6OF.

The Hull short-wave Club has recommenced its fortnightly meetings, and hopes to have a successful season.

5VO settling down to rebuilt gear, using " Tritet." 2APU building super broadcast receiver. 6UJ working regularly on 1.7 mc. and 3.5 mc. testing aerial.

6OO quiet prior to removing whole station from summer quarters outside to winter roof quarters.

SCOTLAND

In resuming these notes after three months' cessation, one would naturally expect that there would be an abundance of " meaty " news available. Oddly enough, such is not the case, and we do not think we have ever known an autumn in which the Districts were so slow to get on the move. However, such news as we have is yours, and here it is.

We were well represented at the Convention by G6ZX, G5NW, G6SR, G6FN, G2TM, G2RQ, G6RV and BRS1297. Also, very much in evidence, was our lady member, Miss A. J. Burns (G2IA). From accounts, all of those folk had a fine time, and considered the visit very much a success.

The Glasgow Radio Show also provided a great attraction for our membership, and it was noted that all four Districts were well represented. The Eddystone exhibit appeared to appeal most to our members, this being no doubt due to the fact that Messrs. Stratton have laid themselves out to develop short-wave gear. Noting this fact, we were able, through the great kindness of Messrs. Stratton's representatives, to make the stand the R.S.G.B. H.Q., and one member of the Scottish H.Q. staff was more or less in evidence there during the run of the Show. Messrs. Edwards, Parsons, and the other members of Messrs. Stratton's staff, were most kind, and we would take this opportunity of thanking them for the facilities they afforded us.

The August BULLETIN contained the obituary notice of G2JZ, and as Mr. Spence was one of the earliest Scottish members, a few further words regarding him will not be out of place. With the exception perhaps of G2MG (who is, we are glad to say, more and more active), G2JZ was the earliest Scottish amateur, and his work dated away back to the " 1,000-metre days," when inductances *were* inductances. He had wide experieence of radio work during the War, and, on his return to civil life, brought back his radio enthusiasm with him. As soon as the War Office lifted the ban on amateur radio he got to work, and his activities in those early days are well remembered by the old hands at the game. Eventually business monopolised his attention, and he ceased to take an active part in radio work. Never, however, did he allow his interest in the Society or its work to fade, and until the very end was an avid reader of THE BULLETIN. Further, he never neglected the opportunity of recording his vote any time Scottish plebiscites were called for, which is more than can be said of many of us. " JZ " suffered for a considerable period before death finally took him, but the end, when it did come, was very sudden, and his passing breaks a link we would have fain kept intact.

Illness was with us right through the holiday season. G2QU, who underwent a serious operation in June, rallied very slowly indeed, and is only now resuming his normal activities. G6WL, who was laid aside by a nervous breakdown, is still very far from well, and is seeking health in South Africa. G6MD was involved in a very bad motor smash at Inverness, and is only now able to get back to work.

Numerous transfers of District took place during the summer, and we shall summarise them briefly. G6JX left Aberdeen (B) for Edinburgh (D), where he is once again active. G2MA left Glasgow (A), for Sheffield, and from the nature of the work he has gone south to take up, it is unlikely that radio will claim much of his attention for a long time to come. 2BYB left Glasgow (A) for Callander (C).

During the holiday recess some new calls came into existence. They are: G6MD (ex-2BLN), G5TA, G2MJ, G2KP (ex-BRS1235), 2AXM (ex-BRS1256) and 2BMP (ex-BRS1349). Also, as we write, 2BXX and Mr. Pritchett have gone up for for their full permits. In addition to the aforegoing, G6UU, who has been quiescent for a considerable time, has rejoined the Society, and anticipates radio activity at an early date.

" B " District is to lose its District Officer. In November, Mr. Hardie (G5FP), who has controlled the District's affairs since January, leaves for Manchester. Mr. Hardie has been a popular D.O., and consequently we are sorry to lose him, nevertheless, we wish him the very best of luck. Arrangements are being made to appoint a successor *pro tem.*

Increased activity in the Mercantile Marine has led to the appointment of various radio operators to this service, and G6AR advises us that he expects to be detailed for foreign service any time.

The new " Guides " are now in our possession, and can be had on application to Scottish Headquarters. The price is 8d., post free.

Numerous visitors were with us during the holidays. Among these were our past President, Mr. Marcuse, also GI6WG and GI2SP. We were also very pleased to make the acquaintance at the Radio Show, with, in addition to Mr. Edwards (G6XJ), already mentioned, Mr. Chapple (G6SC), of Messrs. Varley's.

So far, excepting from " A " District, we have received no word of the resumption of District meetings. Those of " A " District are to take place as formerly, in the evening of the last Wednesday of each month. The locus will be the District Club Room, on the premises of the Regent Tea Rooms, 51, West Regent Street, Glasgow. The first meeting was scheduled for Wednesday, September 26.

Northern Ireland.

With the return to G.M.T., it is hoped that Gi members will give their full support to the D.R. The number of reports received have been very poor during the past few months, but it is hoped that everyone will do his utmost to further the objects of the Society in Northern Ireland. If these notes were to cease, the first to grumble would, in all probability, be the non-reporting people, and it is hoped that this state of affairs shall not be brought about by general neglect to write a few lines each month.

The " air " has been quite lively during the last few weeks, there being several new " fists " discernable. One of these is Mr. Kerr, who has been allotted the call 2KR.

Mr. Sproule (2SP) has changed his QRA to 14, Wellesley Avenue, Belfast, and is busy re-assembling his apparatus. His supply will now be from H.T. batteries. Gi6TK has also changed his QRA and is radiating a powerful signal. He has now A.C. mains. Gi5QXwon the recent competition organised by the I.R.T.S. 5HV is active, and will probably rebuild his receiver. With a new valve resembling a small motor-cycle cylinder, 6YW has been working a lot of D.X., and was able to W.A.C. in the course of a few hours, with an input of 60 watts. Mr. Pinkerton is now 2BNL, and both he and BRS1414 send long and much appreciated reports on their activities. 2BNL is experimenting with an A.C. S.W. " super."

EUROPEAN NOTES

Holland.

At the annual meeting of the N.V.I.R., held on May 27, the following officers were elected :—

T. T. Winkler (PA0AX), President ; H. van Breen, LL.D. (PA0FX), Vice-President ; L. Letitre (PA0RO), Hon. Secretary ; C. M. Zoetmulder (PA0ZM) ; E. Kerker (PA0ZF) ; J. S. Kanters (PA0ZO) ; M. Smits (PA0LR) ; L. Alons (PA0OF) ; J. Philips (PA0PH).

At the same meeting it was decided to publish a fortnightly review, " CQ-N.V.I.R." The first number was issued on June 23 of this year.

Activity in Holland still centres mainly around 56 mc. work. On August 26 the first large-scale test of the national 5-metre relay chain, extending across the whole country, was carried out, and proved a great success, in spite of the fact that many links in the chain had deserted their posts to attend the R.S.G.B. Convention ! The most noteworthy result was a direct QSO between PA0DO, situated on a church tower at Etten, and PA0MM on one of the masts of Scheveningen Radio, 60 kilometers away. PA0DO was also received by PA0MAR/XG on the roof of a hotel at Noordwijk, a distance of 78 kilometers.

The Hague section of the N.V.I.R., in conjunction with the National Life Boat Institution, is testing the possibility of equipping lifeboats with 5-metre gear for maintaining communication with the mainland. In a recently held test, PA0ZM, assisted by PA0FY (G6FY), installed his transceiver in the Scheveningen lifeboat ; whilst PA0XG, with PA0YM and PA0WIM, operated a shore station, consisting of an 8-watt transmitter, feeding a vertical half-wave aerial at a height of some 20 ft. The lifeboat, carrying, in addition to the operators, the Secretary of the National Lifeboat Institution and a representative of the Dutch Marine Radio Company, " Radio Holland," cruised round various piers and jetties, with the object of examining screening effects. In spite of the minute power of the ship's installation (1.2 watt), excellent contact was maintained.

The N.V.I.R. will organise a DX-contest from November 23, 23.40 G.M.T., till December 2, 23.40 G.M.T. Amateurs are requested to send their QSL cards as soon as possible after a QSO to the QSL-section of the N.V.I.R., Postbox 400, Rotterdam, Holland.

CORRESPONDENCE—(*continued from page* 145)

THE INTERNATIONAL 28 MC. CONTEST.

The Editor, T. & R. Bulletin.

Dear Sir,—It is with great pleasure that I note the organisation by the R.S.G.B. of a 28 mc. contest over a period of twelve months.

The writer, for one, will be pleased to co-operate whole-heartedly, and I know of several VK2's in Sydney who are planning similarly. Although there have been long periods of deadly silence on 28 mc. here, on the few occasions when tests have taken place netween N.S.W. and other States, there have been some remarkable results. I find that when conditions permit, signals are infinitely superior to 14 mc., there being a higher ratio of signal to noise-level. Contrary to general ideas, I have found 28 mc. to show up remarkably for contacts at night-time. As an instance, about two years ago I was testing a 28 mc. receiver around 9 p.m. Sydney time, when I logged VK4XN QSA5 R8-9 calling CQ. Having a TNT rig handy on 14 mc., I hurriedly ran up some haywire inductances and went after him. He came back with a similar report on my signals. The aerial I used was only shock excited, and was a full-wave 7 mc. doublet ! VK4XN was very QSA for many evenings. When the gang here get together and concentrate on 28 mc., there is usually little difficulty in getting *some* signals between inter-state at some time in the 24 hours.

28 mc. has always been a weakness with me, and I have long cherished an ambition to QSO England at this frequency. An opportunity should present itself inside the next twelve months.

In order to have a fair opportunity of doing something in the matter, I have moved from my old QRA, which was the world's worst for screening, to a new one, and now from my shack window I can peer out over the broad Pacific. My whole station is in the process of rebuilding, and I am working on a 200 watt crystal rig for at least 100 watts aerial power on 28 mc. A directional aerial for Europe will be erected, and I propose to spend practically the whole of that R.S.G.B. twelve months on 28 mc.

For the information of any G's who may QSO VK2NO (on any band), the new QRA is " Warilda," 14, Yanko Avenue, Bronte, Sydney, N.S.W.

Sincerely,

Don B. Knock,
(VK2NO),
Radio Editor, The Bulletin.

Empire B.E.R.U. News.

B.E.R.U. REPRESENTATIVES.

Australia.—H. R. Carter (VK2HC), Yarraman North Station, via Quirindi, N.S.W.

Bahamas, Bermuda and the Eastern Part of the West Indies.—P. H. B. Trasler, (VP4TA) No. 2 Mess, Pointe à Pierre, Trinidad, B.W.I.

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

Canada.—C. S. Taylor (VE1BV), Stewiacke, Nova Scotia; R. Prissick (VE2CX), 27, Bellevue Avenue, Westmount, Montreal, P.Q.; W. P. Andrew (VE3WA), 1337 Dougall Avenue, Windsor, Ont.; A. E. Howard (VE4CJ), 2401, 25th St. West, Calgary, Alberta; and A. L. Cusden, (VE5HJ), 1465, 17th Avenue, New Westminster, British Columbia.

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

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

Egypt, Sudan and Transjordania.—Lt. E. S. Cole (SU1EC), Haking House, Abbassia, Cairo, Egypt.

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

Irish Free State.—Col. M. J. C. Dennis (EI2B), Fortgranite, Baltinglass, Co. Wicklow.

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

Kenya, Uganda and Tanganyika.—R. O. Davidson (VQ4CRL), P.O. Box 31, Nairobi.

Malaya.—T. G. Laver (VS3AC), Government Electrical Power Station, Johore Bharu, Johore.

Malta.—H. G. Cunningham (BERS.161), H.M.S. "Royal Sovereign," c/o G.P.O., London.

Newfoundland.—E. S. Holden (VO8H), Box 650, St. John's, Newfoundland.

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

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

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

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

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

Australia

By VK2HC *via* VK2XU, ZL4AI and G6HB.

Conditions on all bands seem to be improving. On 14 mc., Europe can be regularly worked about 12.50 G.M.T. VP5AB and VP4AA are often heard and worked on 7 mc. during the evenings.

Early morning DX, on 7 mc., with Europe and Africa, is also improving. Great preparations are being made for the forthcoming Centenary Contest, and results are awaited with interest.

Ceylon.

By VS7GJ.

VS7RP is the only one to report this month, and he mentions that 7 mc. is beginning to show an improvement, although static is still bad. VS7RA and 7GJ are putting out well-modulated 'phone, but as the latter has been up country recently, activity has been somewhat restricted.

In order to more adequately safeguard the interests of members in S. India, it has been decided to appoint a separate representative from that part of the Dominion, and our old friend Shepherd Nicholson (VU2JP) has agreed to take office. Best of luck, om!

The writer is most anxious to see a rally of Ceylon members, and requests that each one of them sends in a regular monthly report. He is anxious to prevent the pack defending the pearl of the East from drifting!

(*Late News, received via G2VQ.*)

VU2FY reports extraordinary conditions on 7 mc., LU, VK and ZL having been heard in the early evenings. After 10 p.m. local time, no DX has been heard on 14 mc., although at other times W6 stations have been heard calling CQ. VS7GJ reports conditions variable, and seldom alike for two days. A fair amount of Western DX has been worked, but the North-East monsoon is now making its appearance, and QRM is heavy during the evenings.

Hong Kong.

By VS6AX, *via* VS6AG, Z14AI, and G6HB.

Conditions on 14 mc. have been very bad, but on 7 mc. VK and ZL stations have been good. All VS6 stations are showing a great interest in the forthcoming VK Contest. VS6AH is now active with 50-watt pentode single valve transmitter, while VS5AC and VS6AQ continue regular fone schedules with excellent results. VS5AC, of Kuching, Borneo, is getting fine contacts with his 5-watt transmitter.

Irish Free State.

By EI2B.

The following stations are reported active:

EI2B, 5B, 6B, 8B, 3C, 7C, 4D, 9D, 5F, 6F and 9F. EI5B has now received confirmation of his contacts in July with LU4DC and LU6DJK in one case being reported R6 with a 10 watt input on 7 mc. EI6F has also worked J2GX on 14 mc. with the same input. EI5F has received several reports from S. Australia of reception of his 7 mc. signals. We were all glad to have our old friend EI7C back in Dublin for a short time this month on holiday from G. The cup given by the I.R.T.S. in the recent competition open to EI and GI stations, has been won by GI5QX, and was presented to him at a pleasant meeting of the Society in Dublin on September 29. We are glad to welcome a new B.E.R.U. member in EI5B, who is now going strong, after an all-too-long absence from the air. With reference to my August Notes, I have since received from G6YL confirmation of the report by EI5F of European stations making use of DX calls. She tells me that in one case she was able to identify a French station guilty of this practice and to report him to R.E.F. The QRA of EI2G, mentioned as a new station in the same notes, is G. Riley, 58, Belmont Avenue, Donnybrook, Dublin.

District 5 members at a recent 56 mc. Field Day.

Malaya.

By VS3AC.

British Empire link stations are asked to note that Mr. J. MacIntosh, of Kuala Lumpur, Malay States, has been appointed an Empire link station.

Radio conditions during the past few months have been particularly bad on both 7 and 14 mc., but it is hoped that when the wet season sets in an improvement will be noted.

Northern India.

By VU2LJ.

Except for one or two bright patches at the end of the month, conditions were extremely bad during August.

VU2BL, 2BN and BERS231 have all been bitten by the 56 mc. bug. Transceivers were first built, but the usual method of utilising the detector valve as the oscillator was "found wanting," so a separate push-pull oscillator was tucked away in a corner of the box. The whole set measures only 3 ins. by 9 ins. by 10 ins., and is extremely efficient.

VU2BL is transmitting regularly on 28 mc. from 11.30 to 12.00 G.M.T., every Sunday. He wishes some co-operation from members, even negative reports will be appreciated, as, so far, it appears to have been wasted time. 2BL also wishes to know what comprises a portable station, after having seen some photographs of the 1934 N.F.D. "portables"!!.

With regards to VS3AC's query: The licence fee in India is Rs. 10 (approximately 15s. sterling). Amateurs are limited to 10 watts input, and only in exceptional circumstances are higher power permits granted

Northern and Southern Rhodesia.

By ZE1JE.

With the advent of spring, conditions are improving by leaps and bounds, and DX signals are coming through in good style, from all directions, from 16.00 G.M.T. almost daily. The 7 mc. band is the most reliable at present up to about 22.00 G.M.T., after which time it becomes very congested. The 14 mc. band is very free from static, but few stations seem to be operating there.

Two new transmitting licences have been issued during September, ZE1JO and ZE1LP, the former to L. R. Arnott, Box 341, Salisbury, and the latter to T. Greaves (ex FO-4SRB), Box 754, Salisbury, both of whom are applying for B.E.R.U. membershp.

G. E. King (ZE1JF) is still on low power and has contacted VK (code), with 3 watts input on 7 mc.

F. C. Whitmore (ZE1JJ) is reported W.A.C., but confirmation has not been received by the writer.

J. W. Mavis (ZE1JE) has also qualified for W.A.C., having at last contacted S. America, which continent has been the stumbling block for the last two years! The station contacted was LU2EG, who reported him QSA 4, R4 and T9. He has also worked VK4, 5 and 6, J and SU during September. Repeated attempts to QSO G have failed, although signals from this part are coming through daily from 18.00 G.M.T.

New Zealand.

By ZL3CP *via* ZL4AI AND G6HB.

This month shows great activity on 7 mc., and English and European stations are being contacted regularly.

The outstanding recent event was the presentation of the Senior B.E.R.U. Trophy to Callender ZL4BT, by the President of the N.Z.A.R.T. (Collett, ZL4BP), at a function given by the Otago Branch of the N.Z.A.R.T.

Dodds (ZL4FK) presided over a large attendance, and the proceedings were broadcast by the Local Station, thus bringing before the public the good work being done by the B.E.R.U. in promoting Empire friendship. Excellent speeches were made by the Chairman and President, outlining amateur work in the past, and giving details of the B.E.R.U.

Mr. Callender, in his reply, said: "The Contest was in every way enjoyed." He congratulated the B.E.R.U. on the success they had achieved. Full details appear in "Break In" for September.

EDITORIAL.—(*Continued from page* 123).
difficulty lies in persuading members to put pen to paper.

In our last issue Mr. MacIntosh, of Malaya, described his experiences with a new electron-coupled oscillator, whilst in this issue Mr. Braaten, of New York, explains a new method of reporting amateur signals. These are typical of the type of articles which we believe appeal to our readers, but there are countless other subjects such as, for instance, link-coupling, the application of new valves to our requirements, and directional antenna systems, which, so far, have received scant attention in these pages.

This occasion seems appropriate to draw attention to the poor quality of material generally submitted for District and R.E.S. notes. The fault does not lie with those who are responsible for the production of the notes, but with members themselves. District notes should reflect the activities of the home membership at large, and be a record for all time of the work done during each month, whilst the R.E.S. notes should be a chronicle of progress, both from a research and experimental point of view. Are they ?

The long evenings which lie before us here in Great Britain should provide ample opportunities for preparing contributions to this journal. We trust that we have enlisted your sympathy with our views, and that the cry, "More technical articles," will not be heard again for many months.

ULTRA HIGH FREQUENCY OSCILLATIONS

(*Continued from page* 125)

LECHER WIRE SPACING.

The useful propagation of H.F. energy from the circuit is a function of the anode and filament Lecher wire spacing. In close proximity the radiation is small. Increasing the distance increases the radiation ; the distance is not critical, but at too great a distance the circuit becomes unstable and is greatly affected by external capacities.

The maximum obtainable H.F. energy depends greatly upon the equality of the valve characteristics. A filament rheostat is inserted in the filament supply of the valve with the greater emission and adjusted until Ig is equal. Under these conditions the two valves are practically equal.

It is not proposed in this article to describe the method of modulation, although it may be stated that the Heizing method in the grid circuit affords a good percentage modulation, nor has the construction of suitable receivers been touched on, as these latter two subjects will be described at a future date.

TACKLING THE LOW POWER PROBLEM

(*Continued from page* 129)

The fact that the house wiring is all common led to a very simple solution of the remote control problem at the transmitter. By "common" it is meant that every positive point in the house is connected to every other one, and the negatives the same, throughout the house wiring.

A pair of small rubber insulated wires were run from the control position to the harness room. Two relays were obtained, one capable of breaking several amperes, and the other much lighter. They are relay 1 and relay 2 respectively.

Relay No. 1 controls the motor of the dynamotor, the circuit starts with a connection to minus 50 v., at the transmitter, this passes through the two valve filaments, and their dropping resistors, then through the winding of Relay No. 1 and from there along one of the wires to the control position, through a switch there to plus 50. When the switch is shut the valve filaments are lit and the relay closes, starting the motor. The motor picks up speed sufficiently slowly to allow the valves to warm up.

The keying relay connection is from minus 50 at the transmitter through the relay winding along the wire to the control position, to key and then to plus 50 through a limiting resistor R8 ; this layout has given no trouble whatsoever.

G2IS does not indulge in DX, as the input to the doubler is only about 4 watts ; contacts, however, are made with local Continentals, who report good T9 signals.

This transmitter seems to have a lot of "trimmings," but they have proved well worth while, in order to give maximum efficiency from a low-powered station. Perhaps all the meters are not essential, but most of them were acquired as the result of a bargain advertisement in the BULLETIN by Standard Telephones & Cables, Ltd. !

Empire Calls Heard.

R. J. Lee (*BRS*1173), *Heathfield, September* 1st *to* 23 :—

7 mc. : zl1gx, hy, 2ab (2), bu, bx, bz (4), fr (2), fz, gf, ht, kk (2), 1b, nc, pc, 3ax (4), fl, fp (2), gm (2), go, gr, ja (6), 4ai, fw, fz, vk21z, 2zc, 3dp, mr.

14 mc. : ve1ak, 2dm, vp2cd, vp3e, vq4crp, xzn2b, xzn2c (2).

(Figures in brackets denote number of days stations were heard.)

EXCHANGE AND MART

(*Continued*)

WANTED.—Two Thermal Meters 0-1 amp. Also Hammarlund Comet Pro., National or similar Receiver. — JOHNSON, 6, Denmark Road, Churchtown, Southport.

WANTED.—Monitor, frequency meter, calibrated 7 m/c., 100 kc. oscillator. Send details and price.—G5JL, 6, Mount Pleasant, Diss, Norfolk.

1·7 MC. Pebble Crystals for sale. 5/- each.—G2XT, 23, Salters Road, Gosforth, Newcastle, 2.

Patents and Trade Marks.