



T. & R. Bulletin



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The Journal of the Inc. Radio Society of Great Britain

(BRITISH EMPIRE RADIO UNION)

Vol. 5. No. 2.

August, 1929 (Copyright)

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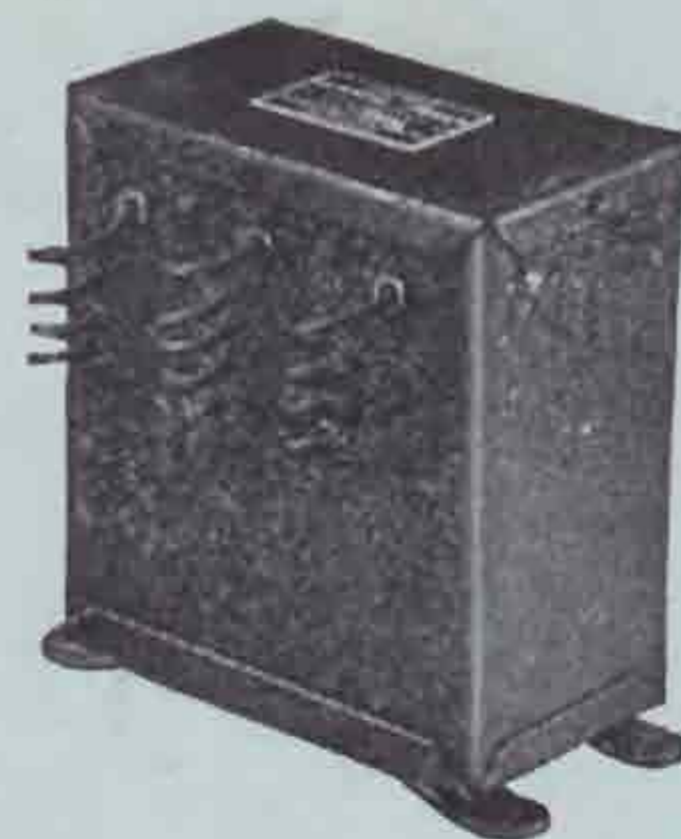
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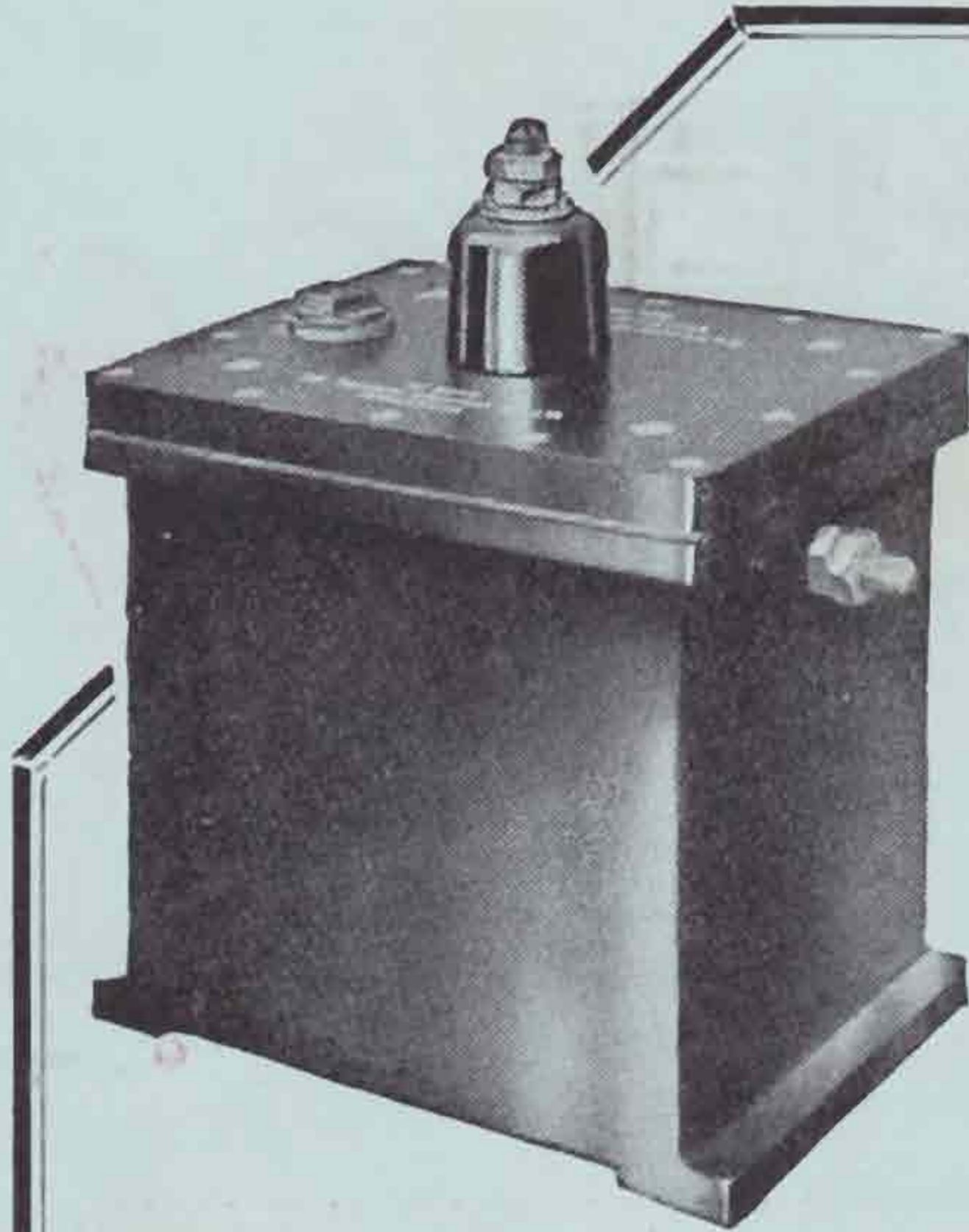
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BULLETIN.

The only British Wireless Journal Published by Amateur Radio Experimenters

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AUGUST, 1929.

Vol. 5. No. 2.

EDITORIAL.

At no time during the year does amateur radio come before the public eye so much as during the ten days when the R.M.A. Exhibition is held in London. For several years past this period has been one when all who are able forgather to examine with critical eyes the latest developments of the radio art ; for three years, too, your Society has been represented at Olympia.

To the R.S.G.B. Stand have come many who have been to we Londoners but call signs previously, but each and all have found a welcome at Olympia, for it has been our aim in London to keep a constant stream of London amateurs on duty to extend a greeting to the provincial, the Colonial, or the foreigner within our gates during that period.

Ham spirits abound during these days, many new friendships are made, many old ones are renewed.

In but a few days the Radio Exhibition will open once again, and amongst the many stands will be found that which will become the "Hams' Mecca."

To every amateur in Great Britain, be he a member of our Society or not, we extend a cordial invitation to the R.S.G.B. Stand. We want to meet you again, old man, if you have been before ; if you are making your initial journey the welcome

will be even more hearty, because it is with you who do not know us that we want to make personal acquaintanceship.

In these days of restrictions and insidious propaganda, we feel it is only by personal contact between London and the provinces that we can maintain a united front against all difficulties.

Month by month your Society has extended its membership. Shortly it is hoped that its sphere may become even more universal than hitherto, but to ensure a continuation of the present pleasing conditions it behoves every one of us to do his bit for the mutual benefit of amateur radio and the Radio Society of Great Britain.

Come, therefore, all who may to London this September, and let us together begin to appreciate each other's point of view. The Society is yours ; we want *you* to help to run it and keep up the traditions and prestige which have been given it in the past by the pioneers of amateur radio. Be not content to listen only, but tell us how you feel about things—tell London where it is wrong, criticise us if we deserve it, but in all things remember that amateur radio in Britain without your Society would have as little chance of surviving as your Society without amateur radio.

It was a happy thought when, four years ago, your Council decided to try the experiment of holding a Convention of its members during the time when the N.A.R.M. Exhibition was taking place. That chance decision proved successful, and gave all who organised it an incentive to do even better in following years. Those who were fortunate enough to be at both our second and third Conventions must have seen the increasing popularity of such a gathering.

The fourth annual Convention will take place on September 27 and 28, in London. Details of the programme arranged are on another page.

It will be noticed that at the business meeting this year the members in Convention will be concerned in the election of officers for the following year.

The delegates' meeting arranged on the same day will, we anticipate, be the scene of much lively discussion, and we can but again urge that *every* British district will make arrangements to send either its newly-elected delegate or a deputy to represent them at this most important meeting.

* * *

In the Correspondence Columns of this issue will be found a letter from a member under the

heading "Thank You." This is published as it contains a statement addressed both to the compilers and to the contributors of the BULLETIN. We seldom receive letters either praising or criticising our efforts in this direction though we would like to say that criticism, preferably of a constructive type, is always welcome. Members must surely have some ideas or complaints and they would do well to remember that apathy and shyness will better neither themselves nor anyone else. Let us therefore have your grouses or praises either at Convention or by means of a letter. •

At this moment we would like to ask members for their opinion on the articles that have appeared recently in the BULLETIN. Are they of the type of article that is required? If not, on what special subjects would you prefer more articles, and on which subjects have there been too many? We feel at times that the pages of the BULLETIN are getting too dry and that the occasional appearance of humorous cartoons and articles would be an improvement. We earnestly solicit the opinion of all members on this subject and would add that all replies will be treated as strictly confidential. Upon the response to this brief questionnaire will be based our future appeals for articles.

Convention and Social Notes.

Convention Programme.

FRIDAY, SEPTEMBER 27.

- 5.0 p.m. Informal gathering at the Institution of Electrical Engineers, London.
- 5.15 p.m. Tea.
- 6.15 p.m. Presidential Address.
- 6.30 p.m. Lecture and discussion on "Commercial Short-Wave Equipments."
- 8.15 p.m. Informal meeting at Lyons' Strand Corner House.

SATURDAY, SEPTEMBER 28.

- 10.0 a.m. Delegates' meeting at the Institution of Electrical Engineers. Chairman: Mr. G. Marcuse.
- 1.0 p.m. Informal lunch at Lyons' Strand Corner House.
- 1.55 p.m. Photograph at the Institution of Electrical Engineers.
- 2.0 p.m. Business meeting.
- 4.30 p.m. Tea.
- 6.30 p.m. Fourth Annual Convention Hamfest at Pinoli's Restaurant, 17, Wardour Street, W.C.

NOTE.—It has been considered advisable to dispense with the Saturday morning char-a-banc trip owing to the difficulty of arranging a visit sufficiently near to Central London to enable members to be back by one o'clock.

Provincial members are recommended to visit Olympia during the delegates' meeting.

Special Notice.

CONVENTION, 1929. DELEGATES' MEETING.

Members are invited to forward either to their present District Representative or direct to Headquarters suggestions or proposals which may be

discussed at the delegates' meeting to be held during Convention.

Convention.

ENTERTAINMENT FUND.

London members are invited to contribute to a Convention Entertainment Fund. All such money will be used for entertaining Colonial or foreign amateurs during Convention, and for certain printing expenses, which it is not considered advisable to charge to the Society account. Receipts will be forwarded to all donors, and a balance sheet presented at the annual general meeting in December. All monies should be forwarded to the Honorary Treasurer, Mr. E. D. Ostermeyer, 59, Gordon Road, E.18, not later than September 25.

Social Notes.

A conventionette was held in Manchester on June 29, 1929, when a party consisting of G6QA, 2AJC, BRS90, BRS245, BRS26, and 2AUH visited G2ZY by kind permission of the B.B.C. After viewing the apparatus the party had a very interesting talk with the engineer in charge who was an "ex-Government op." from Iraq, where he had done also a little amateur work.

The party adjourned to a local café for tea, where G6QA (being an expert in C.C.), gave some very interesting information and many diagrams.

The day's outing was on the whole very interesting and although the date of our next has not yet been fixed, particulars can be had from the address below. All will be welcome.

2AUH, "Kenilworth," Beaufort Road, Ashton-under-Lyne.

Quartz Notes.

By COL. M. J. C. DENNIS (EI2B).

The following somewhat disjointed notes, the result of the writer's experience over more than two years, may be of interest to others engaged in this most interesting subject.

Pebble Lenses. A long time ago the writer purchased some fifty of these for experiment. Of those which were more or less "axis cut," *i.e.*, which showed no colour under polarised light, about 90 per cent. were found to oscillate without reaction as lenses, but after much experimenting the conclusion was arrived at that, with the exception of those cut near the N or T axes, as judged by the frequency-thickness ratio, they were not worth proceeding with, as, after grinding flat, they were all very freakish and uncertain in their behaviour, the main trouble being double frequencies, usually, roughly, of the order of 115 and 135 metres per mm. As it was impossible to determine on what axis they had been cut, nothing was to be gained by further investigation.

The writer then turned his attention to cutting plates from natural crystals, and up to date has cut about sixty T cut and 15 N cut of various thicknesses. All the T cuts, varying from 4 to 1 mm. in thickness, were found to oscillate freely without reaction straight off the slitter when they were neither smooth nor parallel to within about .003".

Grinding. The writer uses three sheets of plate glass 12" square for rough, medium and fine grinding, as this size is just nicely covered by the natural sweep of the fingers during the operation, which minimises any tendency to local wear of the glass. For rough grinding, quick reduction of thickness, 220 carborundum is employed down to about .015" above finished thickness; for the later stages FF, FFF, 400 and 600 carborundum is employed in the order named. Be very careful to see that they are pure and what they purport to be if scratches are to be avoided. The writer obtained his supplies direct from the Carborundum Co., as he found that the supplies from even large tool shops were quite unreliable in this respect. One coarse grain in the finer grades will effectually spoil the work. If the plate is to be polished on one side, which the writer considers desirable for best results, one side should be finished with 600 carborundum, and the other may be left from the FFF grade and about .005" above finished thickness for completion after the other side has been polished, but both sides should be absolutely flat and parallel.

Polishing. For this operation the quartz is cemented with paraffin wax to a piece of thin—about $\frac{1}{8}$ " thick—plate glass or ordinary glass ground perfectly flat, and only very slightly larger than the quartz, say about 1-16". If the glass is too large, there is a great liability to tilting the whole during polishing, causing uneven polishing and thinning the edges. The clean glass on which a small fragment of wax has been placed is held over a spirit flame until the wax melts, when the quartz is placed on it and allowed to settle down by its own weight, being finally very gently pressed down with a wood match stick into contact with the glass, great care being taken that there is no grit between the two.

When cold, any wax which may have got on to the surface of the quartz should be removed with carbon tetrachloride. Mounted in this way, the writer has successfully polished plates only .01" thick. The writer has found the best surface for polishing to be compressed cork (Suberite), at least 1" thick to ensure rigidity, either in the form of a slab, or, as used by him, a polishing wheel mounted on the spindle of the slitting machine. He considers this material to be vastly superior to wood, which is liable to warp when wetted by the rouge and water on one side, and often also contains grit. Light pressure should be employed if minute rounding of the extreme edges is to be avoided, and neither too much nor too little water. It is best to soak the cork in water before starting operations, as the rouge paste will then remain longer in a moist condition. Polishing by hand takes about 45 minutes, and on the wheel less than half that time. A convenient way of testing the flatness of the polished surface is by viewing the reflection of a weighted thread suspended from the window sash in its surface, when the minutest rounding will be at once apparent.

There is one very important point to observe when grinding thin plates. It is often found that when plates are ground below about .02" thick, oscillation becomes gradually weaker, and ultimately ceases. Whilst in some cases this may be due to the inherent qualities of the quartz, it is by no means always so. Such a plate is very appreciably flexible, and unless great care is taken to ensure an even distribution of finger pressure between the edges and the centre when grinding, there is a great liability to make the surface *concave*, which will effectively stop any oscillation. Not very long ago the writer had three plates about .01" thick, which as they approached the thickness for 42 m. band, became absolutely "dud." Careful micrometer measurements revealed the fact that although they had previously been absolutely flat, they had become very slightly concave, about .0002" thinner in the centre than at the edges, and when this was corrected, all three oscillated strongly, as they had done at the earlier stages. This point is, therefore, worthy of attention if difficulty is experienced with thin plates.

One other point. If you have a Nicol, but no analyser, quite a serviceable analyser for colour test consists of the light reflected from a not too perfectly polished wood surface, the top of a wax polished cabinet, for instance.

Kilocycle-Metre Charts.

The Society have obtained a further supply of Kilocycle-Metre charts, available to members at 6d. each. These charts give the conversion of kilocycles to metres, and *vice versa*, at a glance, the conversion factor being taken as 3. The chart extends from 10 to 30,000 k.c. or metres and there are in all 3,000 conversions worked out. We think the chart would be a valuable asset to any amateur station.

Dull Emitter Valves as Laboratory Oscillators.

By MAURICE GIBSON (2BAA), F.T.S.

PART III.

ADDITIONS TO THE CIRCUIT.

A radiation or tuning lamp was added to the oscillatory circuit to indicate the nature of the oscillation. A few turns of insulated wire were wound round the A.T.L., and the ends connected to a small 4-volt bulb in a small porcelain holder. The radiation lamp loop must, like the modulation loop in Part II, be wound parallel to the direction of the turns of the A.T.L.

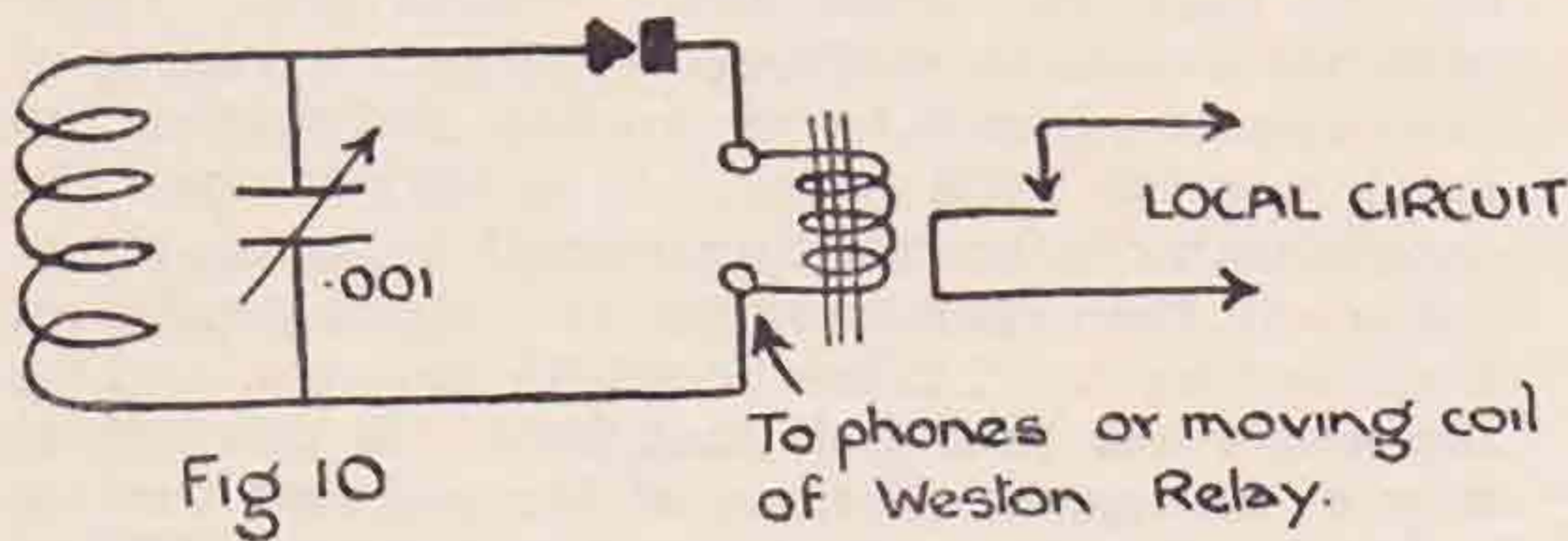


Fig 10

Soon after commencing these experiments it was found necessary for purposes of calculation and comparison to have the equivalent of an ordinary aerial placed before the oscillatory circuit. This usually takes the form of a resistance and capacity. The capacity used was a .0003 microfarads fixed condenser. A hot wire ammeter, used in series with the aerial, having a resistance of 5 ohms, was found to be sufficient resistance, although it is usually necessary to have about 10 ohms. Using the D.E. valve and about 350 volts from the hand generator, a maximum aerial current has been obtained of 425 milliamps.

A wavemeter roughly calibrated in the laboratory was used to determine the approximate wavelength with the artificial aerial, and this was about 350 metres. The wavemeter consisted of a .001 microfarads straight line frequency variable condenser, a small basket coil, a semi-fixed crystal detector and phones. This wave meter was afterwards used in some control experiments with the D.E. oscillator. See Fig. 10.

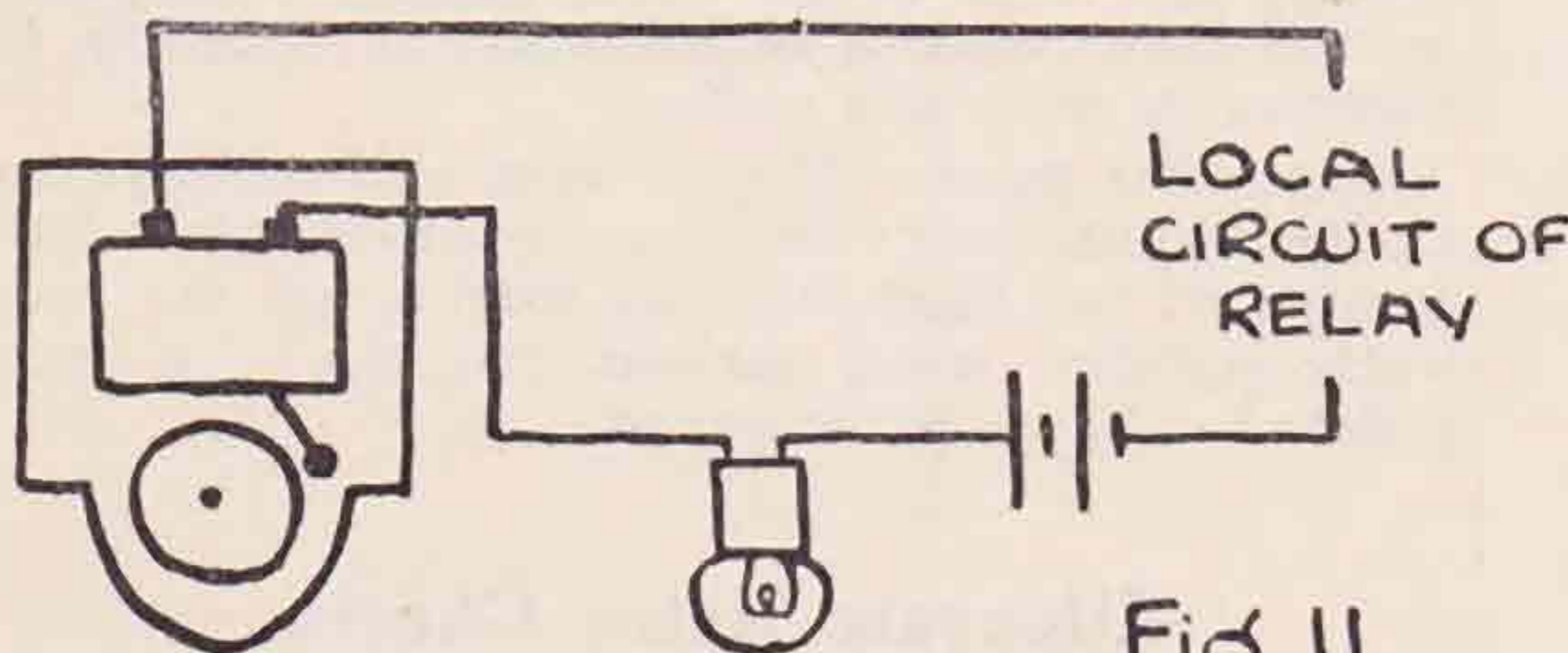


Fig 11

CONTROL.

A number of interesting experiments were carried out with the D.E. laboratory oscillator, chiefly in wireless control of local circuits. There were two Weston super-relays in the laboratory at the time, one of the open type and one of the enclosed Naval type. The enclosed type, for no apparent reason, was not as sensitive as the open type, and was

used for working a Morse inker. The advantage of using C.W. for control is that it is selective; in fact, a number of circuits can be controlled on different wavelengths without using a magnetic switch or anything of the kind. The open relay was mounted in a small mahogany box, and the connections soldered to German silver wires attached to terminals on the side of the box. A small panel was fitted with a 4 volt dry battery, a small electric bell and a 4 volt bulb in a holder, to be used as a local circuit (Fig. 11).

It was arranged so that when a .25 amp. bulb was used, the bulb lit up and the bell rang faintly, and when a .5 amp. bulb was used the bell rang and the bulb lit up faintly. Although high current should not be used in the local circuit of a Weston relay (a battery and a heavier relay should then be used) anything up to a 6 or 8 volt accumulator is quite safe. In the case of the enclosed relay it was connected to the wavemeter circuit and the Morse inker and a 6-volt accumulator formed the local circuit. The inker in question was one by Siemens & Halske, of Berlin. Another series of

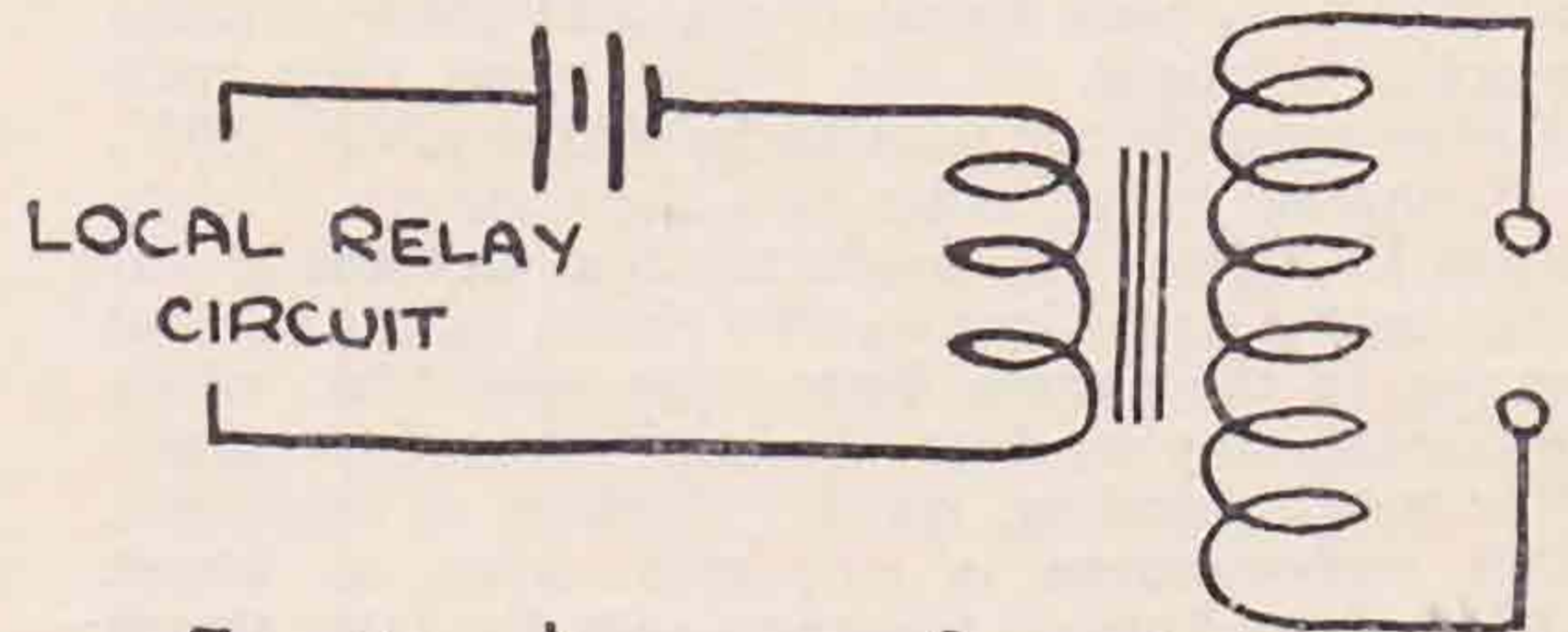


Fig 12. IGNITION COIL CONTROL

experiments were tried with an ignition or induction coil, the primary and the accumulator forming the local circuit (Fig. 12). It was found possible to light gessler tubes, work X-ray tubes, and even blow up miniature powder magazines by wireless control. The vacuum tube, whether gessler, neon, cathode ray, or X-ray, was connected across the secondary and the C.W. key of the transmitter pressed to make the primary circuit of the induction coil. By using a heavy relay and an accumulator in the local circuit, circuits involving electric light mains can be controlled in the local circuit of the second relay. All this goes to show that the ordinary D.E. valve cannot be surpassed both on grounds of economy and reliability for laboratory work and for short range transmission.

The experiments outlined above were concluded in the first few months of this year.

If your Subscription is due, you will help us by remitting without further demand.

Further Notes from India.

By F. RODMAN (VU2KT).

Recent transmission tests on 28 M.C. have produced interesting results. Successful contacts have been made with PK4AZ in (a) full daylight (b) full darkness, and (c) part day and part dark. These contacts have been made more than once at times varying between 8 a.m. and 9.30 p.m. (Indian time) with good signal strength both ways and fading not worthy of mention. Since commencing operations on 28 M.C. in India three radiators have been tried, all full wave voltage fed, the first a horizontal radiator E and W, the second similar but N and S, the third N and S inclined at 30 degrees to the horizontal. Results from the three radiators have been substantially the same, contacts obtained using one of the radiators have been repeated on one or both the others, and the average signal strength is about the same for each radiator.

Conditions during April and May were not too good for distances in excess of 2,500 miles, fading being very marked and signal strength poor, yet from the point of view of variety of countries the period produced good all-round results. Generally, when conditions were favourable for reception of transmitters East of India in the mornings, the reverse was the case in the evenings with respect to European and African stations. Unsettled weather in and around India produced poor results.

In February and March contacts with England could only be made when full daylight existed, in April and May; the best time was after sundown up to one hour after dark.

During April-May the following stations were heard on 28 M.C. :—

G : 2OD, 5YK, 5YX, 5ML and 6VP.
D : 4UE, 4UAH.

VK : 2HU, 3CP, 3MY, 3WG, 3RP?, 3BQ, 3PM, 3JR, 5HG and 6SA.

ZS : 5C.

W : 6CS.

J : 1TX.

K : 1CM.

PK : 4AZ.

FI : 1E (Indo China).

Nineteen contacts were made during the same period spread between the following stations: G2OD, G5ML, ZS5C, VK3PM, VK3RP?, VK5HG, D4UE, PK4AZ, FIIE.

Reports have been received from RWX in Mediterranean, ZL and from W2MD relating to my February transmissions.

Up to the present an increase of power to 50 watts has raised the average signal strength reports slightly, but has had little effect on the number of contacts made, while the higher power contacts have been more reliable when once established, it still seems that the 10 watt man can do nearly as much as his 50 watt neighbour.

QRH can be acute on 28 M.C., and the level at the end of May was as high as I ever experienced on 14 M.C. when in England last summer.

It may interest BRS25 to know that G2FN logged VE4CT in October last year.

My station will be moved to Allahabad shortly. After a few months in action there a further move will be made to China, probably Shanghai. To compete with these moves the necessary apparatus for A.C. mains has been made under trying conditions, it being no amusing pastime winding transformer coils in a temperature approaching ∞° C.

Some Observations on Static.

By W. H. HEBDIGE.

During two months of the summer of the present year I was engaged in trying to log various interesting points in connection with the above, and now offer them to readers for what they may be worth.

The tests were carried out on a 2 valve set with an ordinary P.M.G. aerial; here we are about five or six miles distant from the seaboard. On the whole it has been a comparatively quiet time, with only two mild attacks of thunder, quieter than last year, for instance. It has been noticed that a heavy static storm often coincides with a heavy downpour of rain; otherwise the strongest static was noticed with west wind and clear sky, independent of temperature. Of course, it was more noticeable on long waves than on short waves. Remarks from friends lead me to believe that static varies for separate localities, being strong in one part while weak in another. Static was, of course, picked up with the wind in other directions, but temperature or clouds did not appear to have any effect.

Calibration Service.

Calibration waves will be sent from G5YK on August 25 and September 22 as follows :—

13.00 G.M.T. 7,050 K.C. (nominal).

13.05 G.M.T. 7,250 K.C. (nominal).

A similar schedule will be transmitted on September 8, commencing at 09.00 G.M.T. The call will be R.S.G.B. DE G5YK, followed by a two-minute dash and the frequency used. The accuracy may be taken as better than plus or minus two kilocycles.

Stray.

VQ2NC sends test message every Wednesday at 19.00 G.M.T. on 41.5 metres. Address: Mr. T. M. YULE, c/o. Anglo-American Corporation, N'change Mines, N'dola, Northern Rhodesia.

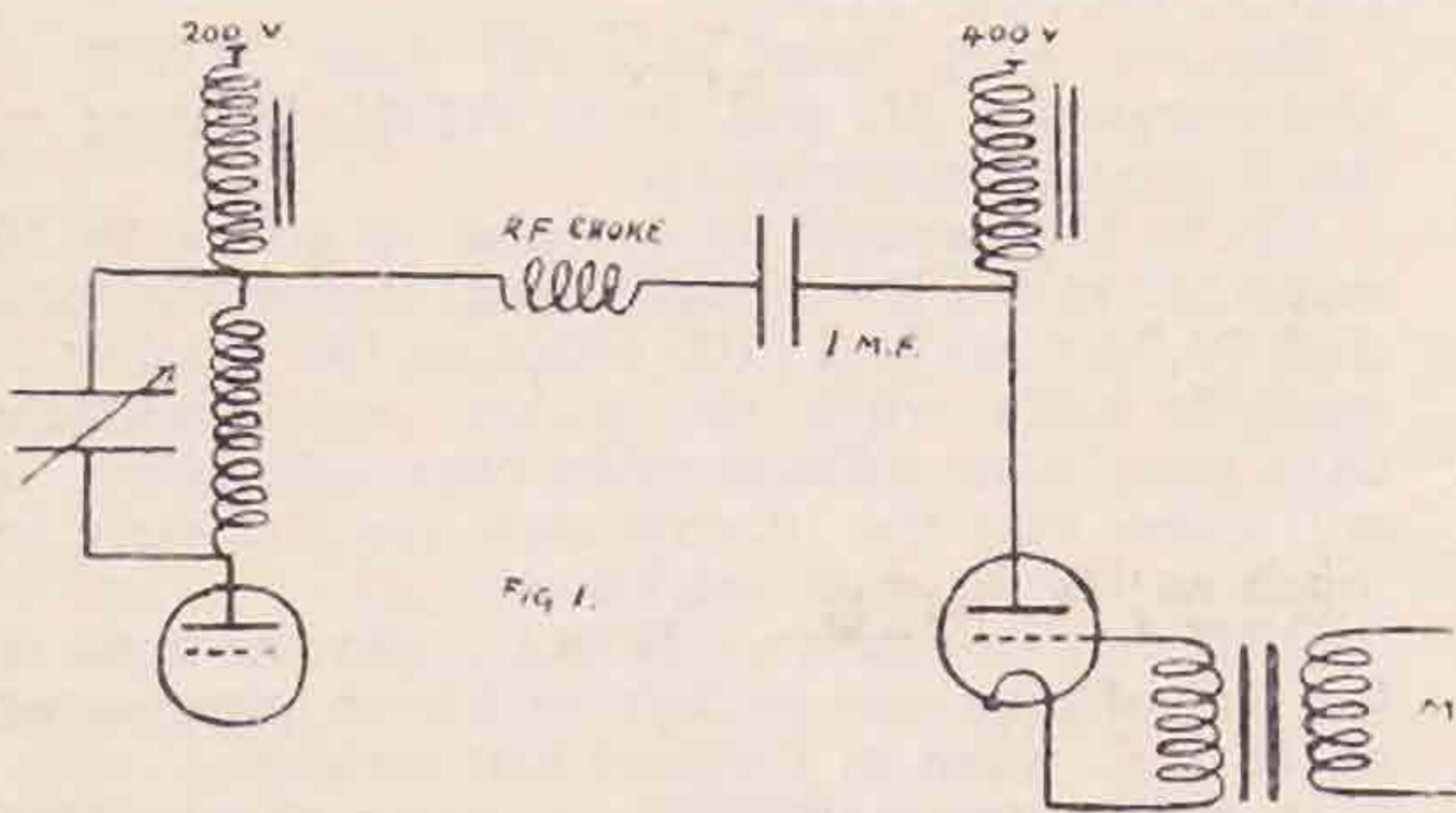
London Area Meeting.

Those of the London Area who attended the last meeting of the present session were rewarded by hearing an interesting talk on "Methods of Modulating Crystal Control Transmitters." It was announced by the chairman (Mr. Bevan-Swift) that owing to Mr. Hinderlich's absence abroad he would not be able to deliver his talk as arranged, and that Capt. Hartridge had very kindly agreed, at short notice, to open a discussion on the above subject.

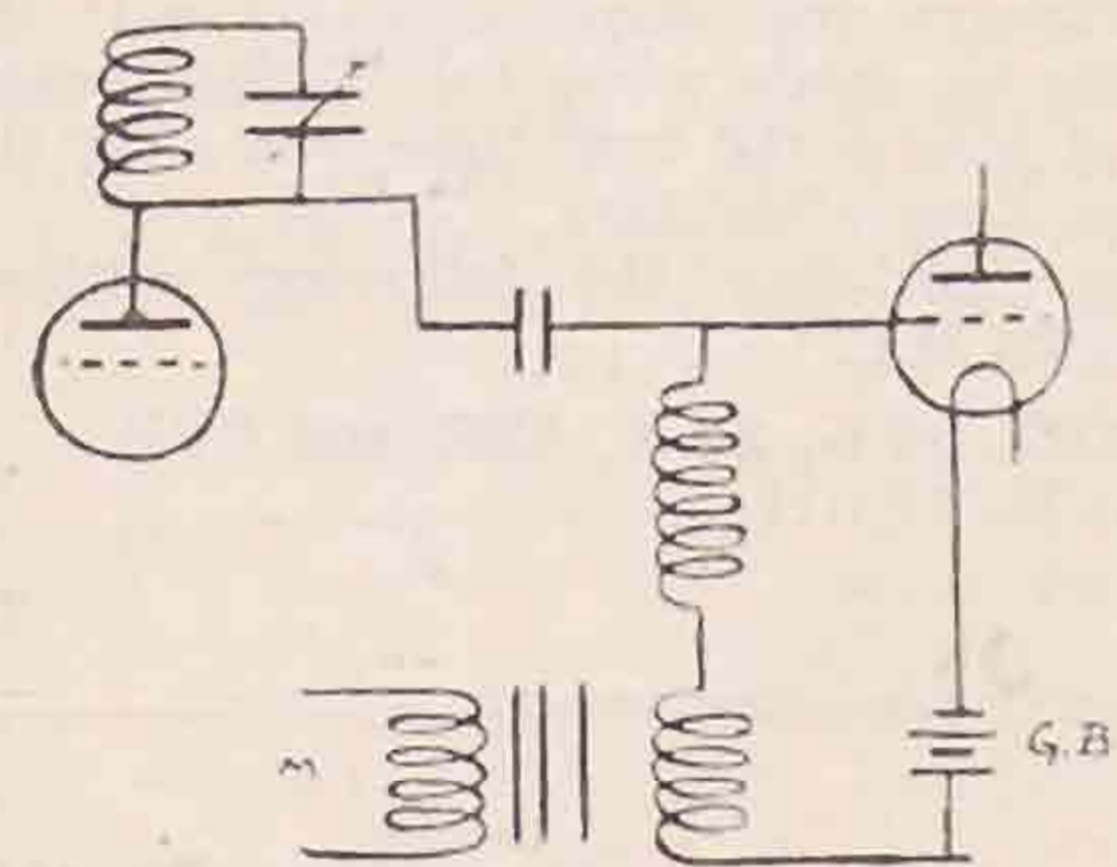
Capt. Hartridge commenced by stating that the usual form of crystal control transmitter, consisting

Owing to the fact that the choke used for control is seldom as good as claimed by the makers, instead of the theoretical 100 per cent. modulation only about 60 per cent. can be obtained. That is to say, if the two valves in the usual choke control system are fed from, say, a 200-volt supply, and the grid of one fully modulated, the peak voltages applied to the anode of the other valve will not vary between zero and 400 volts but between about 80 and 320 volts. The speaker advocated the use of the circuit shown in Fig. 1. The chokes used should match the impedances of the valves. Using voltages as shown, a modulation varying between 200-240 volts (being the H.T. supplied to the anode of the oscillator) can be obtained. As an alternative to using two chokes, a transformer of suitable design could be used and connected in such a way that the two currents tend to balance each other out and so avoid saturation of the core.

Another method of modulation by voltage variation, especially applicable to crystal control sets, is as follows: Suppose the power amplifier requires 1,000 volts H.T. and the preceding amplifier 500 volts. Then in place of using a separate supply for the sub-amplifier, the 1,000-volt H.T. may be used and the potential reduced to the desired value

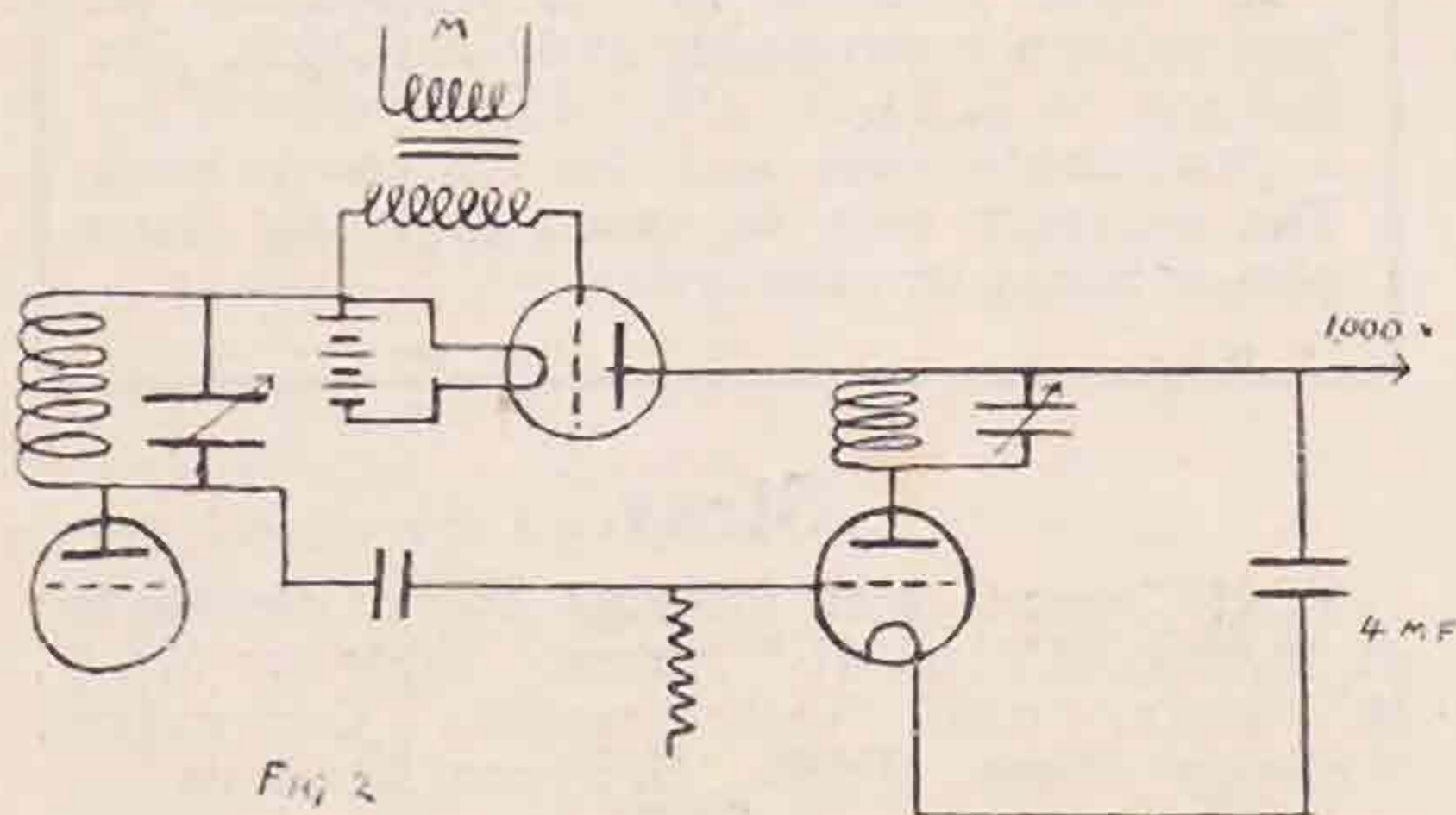


of a number of valves in cascade acting as amplifiers or frequency doublers, lends itself very well to modulation by choke control on one of the sub-amplifiers. A comparatively low-power stage can therefore be modulated with, of course, total absence of frequency modulation. A 'phone transmitter calls for as much care in design as does a good broadcast receiver: the modulation valves must be chosen with care, taking into account the grid swing to be impressed. The lecturer emphasised the importance of working only on the straight portion of the characteristic curve. Considering the valve being modulated, at times the voltages generated by this valve will be twice the voltages during non-modulation; it therefore follows that the valve or valves used as amplifiers after the valve being modulated must only be run at 60 per cent. of their power when no modulation is taking place. To obtain good modulation the output from the modulated valve should be varied a full 100 per cent., *i.e.*, voltage swing=0—2 varies between zero and twice the normal H.T. voltage.



by utilising the anode impedance of a suitable valve connected as shown in Fig. 2. This latter valve can then be modulated in any usual way; the grid bias must be adjusted so that the potential shall be reduced the required amount, and of course this valve must then operate on the straight portion of its characteristic curve. In the preliminary adjustments of this circuit, the set should be tuned so that the power amplifier is giving only about 66 per cent. of its full output, in order that it will not be overdriven when fully modulated. If the modulator valve is too heavily biased, the power amplifier will radiate little or no carrier wave and all side bands, as its anode will receive no H.T. until the modulator valve's grid is driven. For reception under these circumstances the receiver must be in an oscillating condition as otherwise the speech will be very harsh.

Choke control is an expensive system of modulation, and the grid control shown in Fig. 3, usually known as the Van Debil system, is often used a G5CB. The R.F. amplifier should be biased until the output is about 66 per cent. of its maximum



value. The working point will then be well down on the negative side of the curve and when modulation is applied the negative potential will be automatically reduced.

The circuit shown in Fig. 4 is an alternative system of grid modulation used extensively by the German broadcasting stations. Here the modulations impressed on to the grid of the modulator valve vary its impedance, and so vary the grid potential of the power amplifier.

A short discussion followed in which some members gave details of modulating systems they themselves used. The method of choke control modulating a frequency doubler was condemned as being unsatisfactory, though some members stated they had obtained excellent results with it. It was also argued whether the grid leak valve in Fig. 4 served to vary the potential applied to the grid, or whether it acted as a variable grid leak. As the impedance of a valve is not changed by altering the grid potential, it was considered by Mr. Megaw that the valve served to vary the grid bias and did not function as a variable grid leak.

In connection with the design of crystal-controlled telephony transmitters, Mr. G. W. Thomas (G5YK),

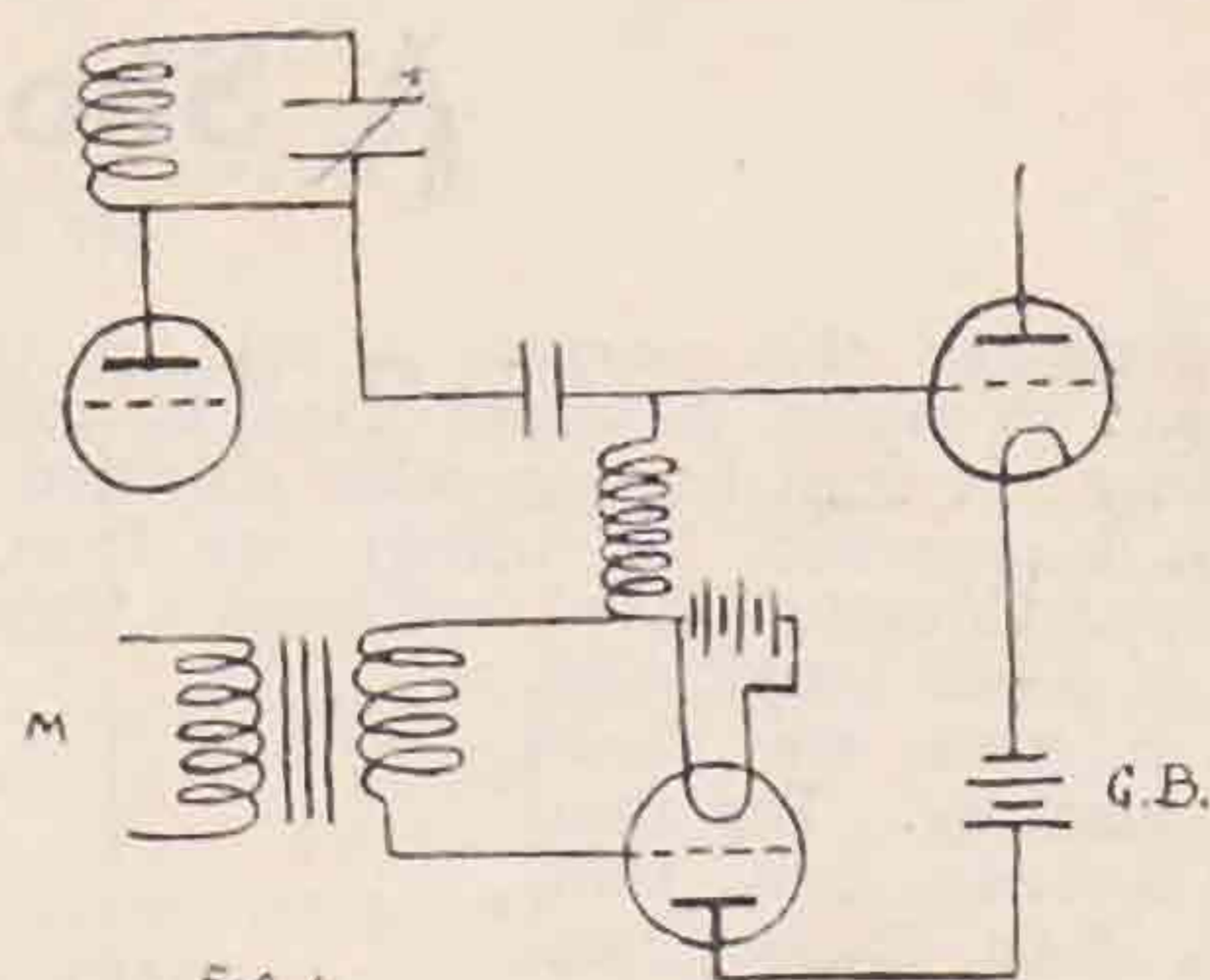


Fig 4

during the course of the discussion, mentioned some experiments that had been carried out on the subject of coupling between the oscillator and frequency doublers and between the frequency doublers and the power amplifier. He showed how various refinements and improvements made in the circuit finally resulted in a much increased output due to a corresponding rise in efficiency.

Statistical Methods.

By A. HINDERLICH (G2QY).

Do you know the story of the man who happened to look up the word "Prose" in a dictionary, and exclaimed, "Dear me, I've been talking prose all my life and never knew it!"? We all use statistical methods, even if we do not apply that high-sounding description to our modest arithmetic.

AVERAGE.—The sum of a number of observations, divided by the number of observations made. Thus, if we observe anode currents of 20.4, 19.8 and 20.7 milliamperes, the average is 60.9 divided by three, or 20.3 milliamperes.

MEDIAN.—Suppose we wish to arrive at the mean of signal strength, based upon 21 reports as follows:

R1, R2, R3, R3, R4, R4, R5, R5, R5, R5, R5, R7, R7, R7, R7, R8, R8, R8, R9, R9, R9.

Taking the average gives exactly R6, which is the one report that was never received at all! Instead, let us cross out the six highest and the six lowest reports. This is equivalent to disregarding freak reports. We are left with five R5 and four R7. Most of us would have described the collection as R5 to R7, which is quite a fair summary. If we like, we could cross out four more high and low reports, leaving R5 as the median.

MODE.—Suppose we were trying to find out the representative short-wave receiver. It would only be another strain on the intelligence to say that the average number of valves was 1.93, or any other figure involving a decimal. In such a case the mode should be used, which is merely the number that occurs oftenest. In the example above, R5 is the mode. Note that the median and the mode are not always the same—when they are not it is always interesting to try and find out why.

ACCURACY.—We wonder how many readers will immediately spot the absurdity in the following statement: "The resistance of three 0.07 megohm leaks in parallel is 23,333 ohms"? Although 0.07

megohm is nominally equal to 70,000 ohms, we know that in practice they might be anything between 65,000 and 75,000 ohms. We were really given that information by the 0.07. Had the values been between 69,500 and 70,500 ohms, it would have been expressed as 0.070 megohm, and so on. When dividing by three, and so getting a recurring decimal, too great an accuracy was implied by the above statement. The correct answer is twenty-three thousand ohms (23,000 ohms), or better still 23,000±2,000 ohms.

PROBABILITY.—There exists a comprehensive science of Probability, involving Integral Calculus and Higher Mathematics. But there is one simple result which can be used to check a good deal of our work. If we classify a collection of results into $n+1$ groups, the numbers falling into each group should be proportional to the coefficients of x in the expansion of $(1+X)^n$. Thus for $n+1=3$ the coefficients are 1, 2, 1. For $n+1=4$ they are 1, 3, 3, 1, and for $n+1=5$ they are 1, 4, 6, 4, 1. Thus, if 16 letters are received at the QSL section, one of which is a violent complaint, four are mild objections, six are mere gossip, four are mild apologies and one is an abject apology, those 16 letters can be considered as inspired by a perfectly normal occurrence.

Applying this criterion to the R reports already given, we see that the R6 report was not being properly used at the time. The number of reports in each class should have been in the proportion of 1, 7, 21, 35, 21, 7, 1. Dividing by 7, we have 0, 1, 3, 5, 3, 1, 0 theoretically, as against 1, 2, 2, 5, 4, 3, 3 in practice, showing that something was not quite right about the higher R numbers, and setting us the problem of deciding whether the R code did not extend high enough, or whether too many reports from the same man were included, or whether there is yet another explanation.

A Short-Wave Set.

By A. JAMISON (G16JA).

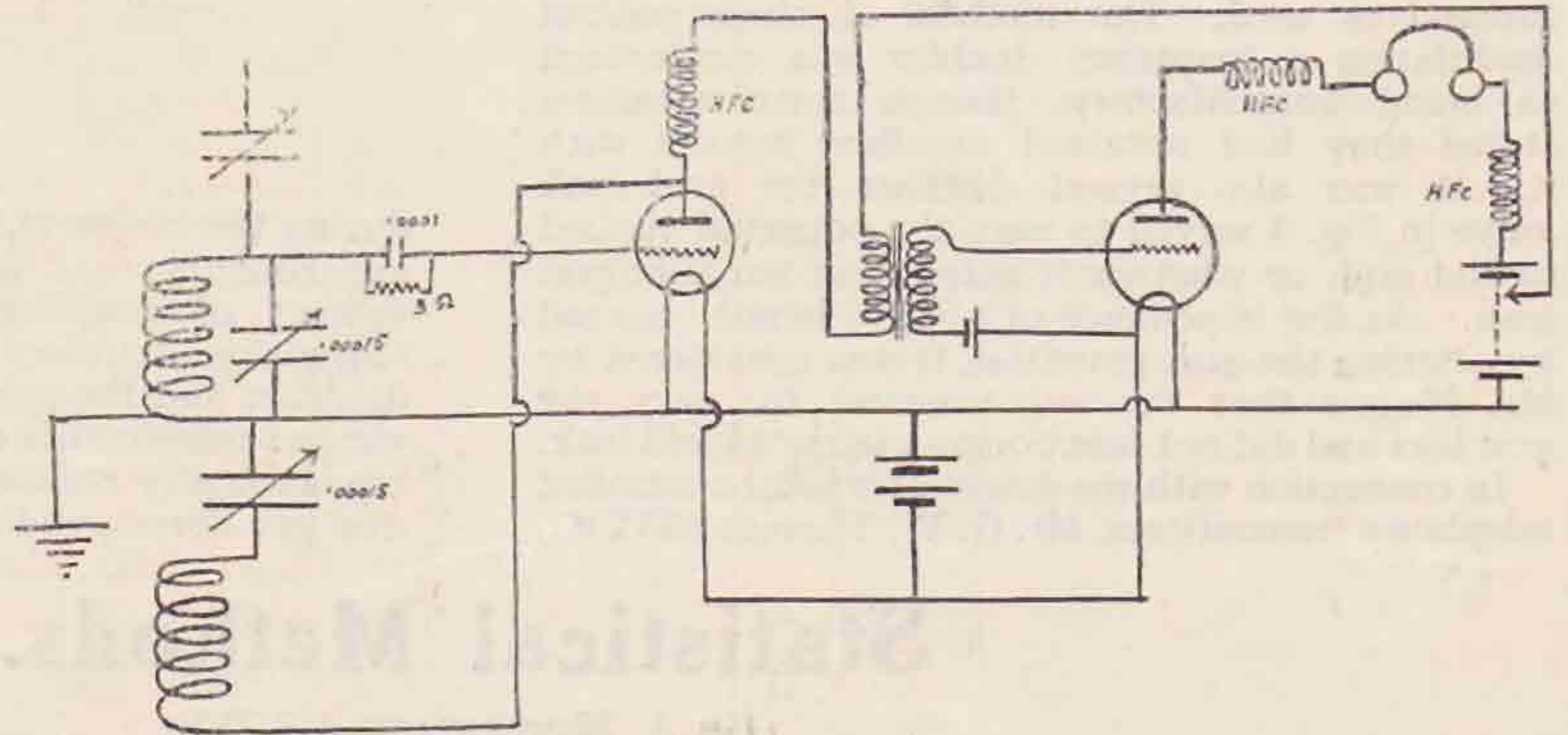
In designing this receiver I set up certain standards to which it would have to conform. They were: It must be reasonably sensitive, have a silent background, be entirely free from land capacity and threshold howl, and cover a frequency range of 3—35 megacycles.

The diagrams are almost self-explanatory. The front panel contains two slow-motion dials (tuning and reaction), which are connected to their respective condensers on the inner panel via "Cyldon" extension spindles. The inner panel is three-ply wood backed by a copper sheet.

Valve base coils are used, and need no introduction to readers of the T. & R. BULLETIN.

The aerial is coupled by means of a neutrolysing condenser. I have found this method as efficient as any other, and is really the only practical way with these coils.

frequency range of the receiver, and I don't think it is worth while making them interchangeable. Mine are screwed down to the baseboard with small pieces of brass strip bent at right angles and screwed into wooden plugs inserted in the ends of the tubes.



All the H.F. components are mounted on the side of the baseboard remote from the tuning dials and the L.F. portion is placed in between the panels.

Care must be taken to place the fields of the H.F. chokes in the phone leads at right angles, or they will be worse than useless.

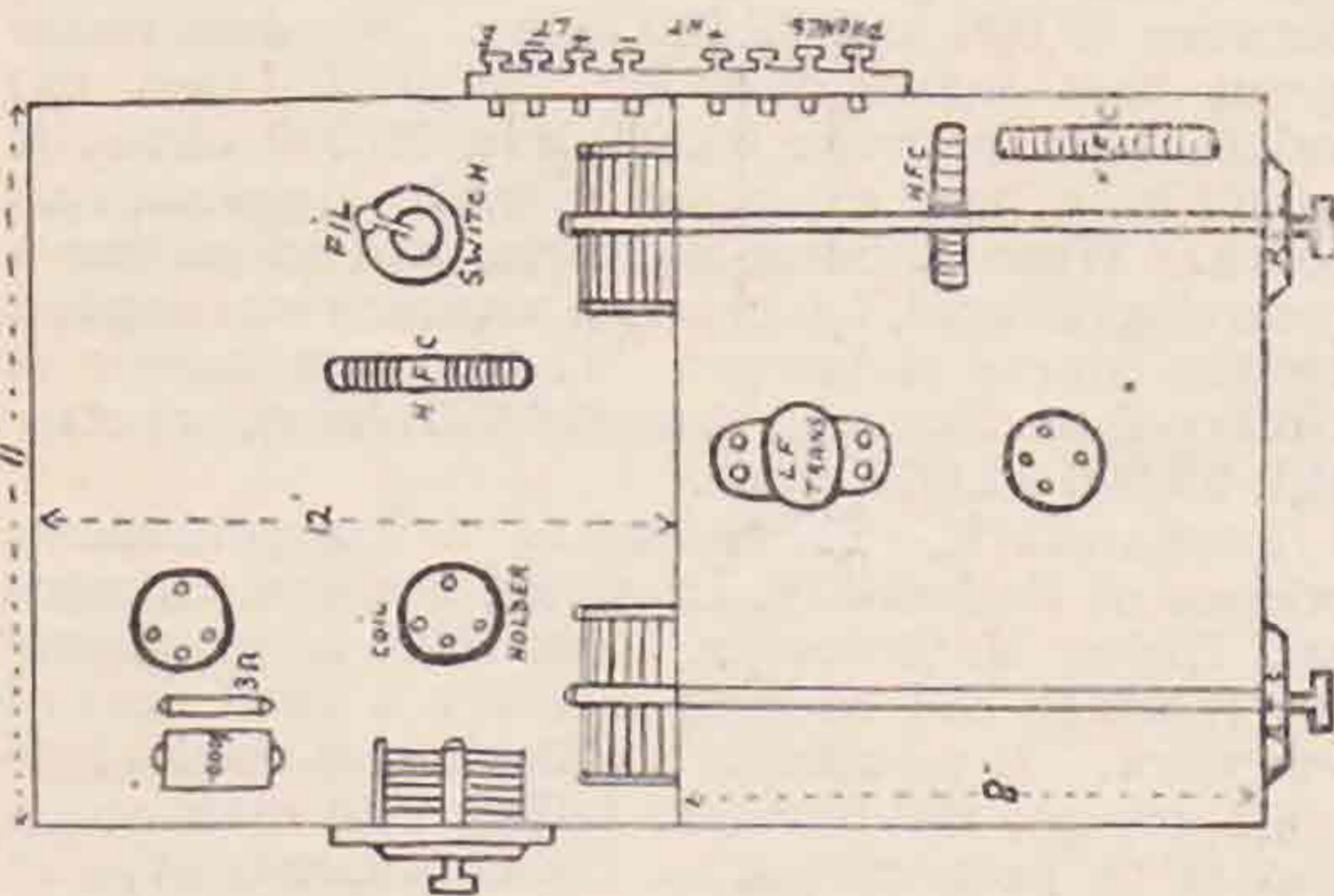
The variable condensers used are "Cyldon bébé" condensers. These have a small external field and so avoid losses due to stray couplings.

The intervalve transformer is a "Lissen" 8s. 6d. While this transformer has a sufficient primary impedance to give reasonably good amplification and quality, it is not great enough to cause threshold howl.*

I would be very pleased to hear from anyone constructing a receiver on these lines.

In conclusion, I would like to take this opportunity of contradicting the rumour that I have christened this receiver "The Megahertz Two"!

* See T. & R. BULLETIN, March, 1928, p. 21, and April, 1928, p. 13.



The H.F. chokes consist of 4-inch lengths of 1/2 in. diameter glass tube filled with 38 S.W.G. D.C.C., turns being spaced about two diameters. I find these chokes work quite well over the whole

Five Metre Transmissions from G6XN.

AUGUST 18 AND 25.

14.00-14.10 G.M.T. and for ten minutes past each hour until 22.10 G.M.T.

SEPTEMBER 1 AND 8.

04.00—04.10 G.M.T.

08.00—08.10 "

10.30—10.40 "

20.00—20.10 "

21.00—21.10 "

22.00—22.10 "

Transmissions will consist of a repetition of "Test" (3 times), "Five" (3 times), "DE" (once), "G6XN" (3 times).

28 MC in Iraq.

Y11LM (Mr. C. D. Connerton, Box 117, Baghdad, Iraq), will adhere to the following schedule of transmissions on 28,000 KC until further notice. Reports on fading, strength and quality of signals are required. Reception will not be possible before October owing to heavy interference from electric fans.

Mondays-Fridays	...	0445 to 0500 G.M.T.
Tuesdays	...	1700 to 1730 G.M.T.
Saturdays	...	1000 to 1030 G.M.T. 1400 to 1430 G.M.T.
Sundays	...	0730 to 0800 G.M.T.

Chemical Rectifiers.

By R. L. VARNEY, G5RV.

"Why not use chemically rectified A.C., OM?"

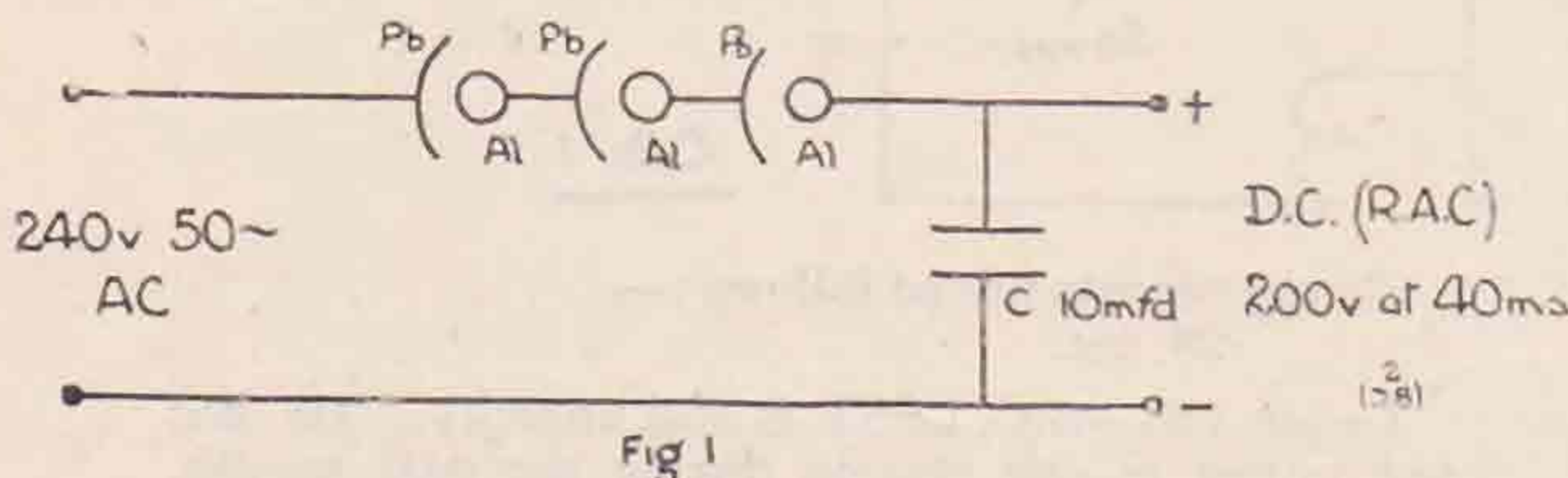
"Because it is messy, inefficient and troublesome." That is the answer that I imagine a great many amateurs would give.

Now, it is to those amateurs that I wish to prove that a chemical rectifier, provided it is carefully constructed and operated, is capable of really excellent service.

The writer is well aware that many splendid articles have been written on the actual construction of chemical rectifiers.

Probably the most well-known (and most condemned!) chemical rectifier is the aluminium-lead combination in a solution of ammonium phosphate.

All of you know how to construct such a rectifier. The writer does not intend to bore you by going over old ground again, but to give some information upon the actual working of these rectifiers.



In the first place, a rectifier of this type should be capable of passing *twice* the actual working load. This is the foundation of good service. The solution need not be a saturated one. The best strength should be found by experiment. For half-wave rectification of 240 volt 50 cycle A.C. three cells joined in series give good rectification with small loss of voltage. Needless to say, all cells should be thoroughly well "formed" before using.

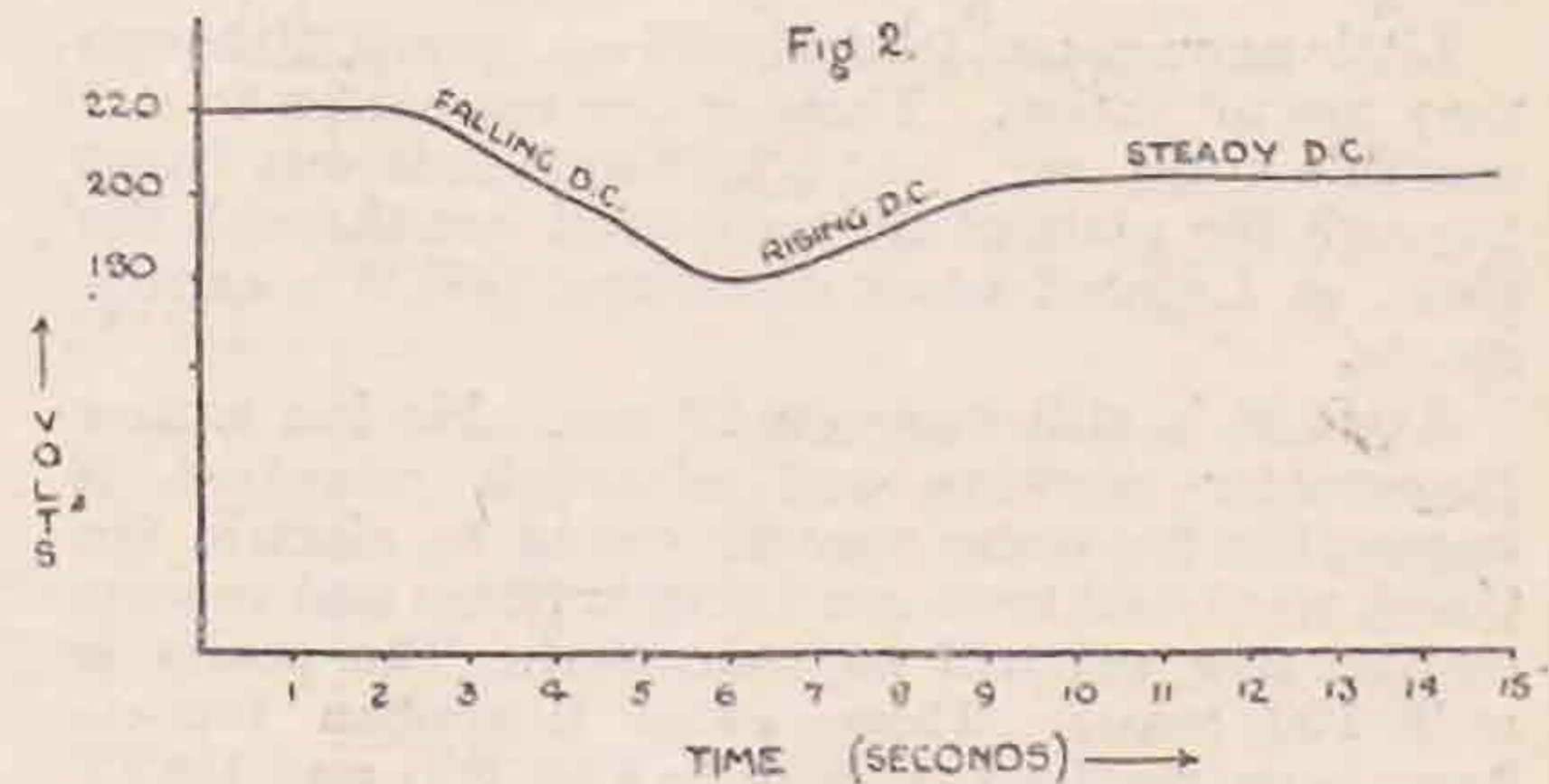
When thus "formed," a thin silica-like coating will be apparent upon the aluminium electrodes.

Now for a few words upon the working of a typical C.R.A.C. system, which has been in use at the writer's station for the past three months continuously. The circuit is shown in Fig. 1. The cells are built in half-pound jam jars and are very compact. They will easily pass 200 M.A. with almost imperceptible heating and very little sparking. Indeed, they are required to pass this current for a continuous period of 12 hours once every six weeks, in order to charge the H.T. accumulators. The usual load is 40 M.A. to the C.C. transmitter. Smoothing is carried out by a bank of condensers, the total capacity being 10 mfd.

No chokes are used. The note is always reported P.D.C. and dead steady. Only stations within 20 miles can trace the very slightest ripple.

Undoubtedly, the use of quartz control makes the note so pure, but even with a self-excited T.P.T.G. circuit the note is reported "D.C. with slight ripple and good to copy."

This rectifier was constructed three months ago and has not been touched since. There is no mess



at all. The efficiency is 80 per cent. (240 volts A.C. gives 200 volts D.C. at 40 M.A.).

There is one curious point that the writer has noticed while using this rectifier, and which he has never seen in print before. That is, when the rectifier is first switched on, A.C. is delivered for a second or two; this changes to D.C. and the voltage falls rapidly until a minimum point is reached, after which the voltage rises again to a maximum value and remains there. It is then steady direct current.

This effect is decidedly not a mere fluke—it has been noticed upon every occasion that the rectifier has been switched on. Particularly can this effect be noticed when the rectifier has been lying idle over a period of some hours and is suddenly switched on.

Fig. 2 attempts to show this phenomena graphically.

Little more remains to be said, except, perhaps, that the writer has also tried valve rectification of A.C., but this method, though giving excellent results, requires very costly apparatus if anything like a large current is desired. Taking 40 M.A. at 200 volts from a valve rectifier has so far proved too expensive, in the way of valve renewals, to be used continuously here!

In conclusion, the writer would say that he would feel amply repaid if this article manages to induce some of the stations still using unrectified A.C., in our now all too narrow bands, to give this cheap and reliable rectifier a trial.

Stray.

Owing to the fact that all the 28 M.C. reports this month report dead conditions, the usual résumé of activities on this frequency have been omitted this month.

Mr. F. L. Hogg (G2SH) states he will be in Iceland during September and asks amateurs to be on the look-out for TF2SH on the 7,000 and 14,000 K.C. bands. He also hopes to work on about 192 metres under the call TF3TF.

Contact Bureau Notes.

By H. J. POWDITCH (G5VL).

Work during the past month has been "good in places" but not startling. If one judges from the present appearance of the North Cornish coast in this neighbourhood there can be few people left in other parts of the country to carry on serious work. To "lift" a phrase from last month's Editorial, "the diversions during the summer" are in full swing.

Little news comes from the 56 mc. group, although they are all active. There is one correction to last month's notes, *viz.*, that a half-inch hole was burnt through the plate of the valve and not through the glass, as I stated when describing G6TW's experiments.

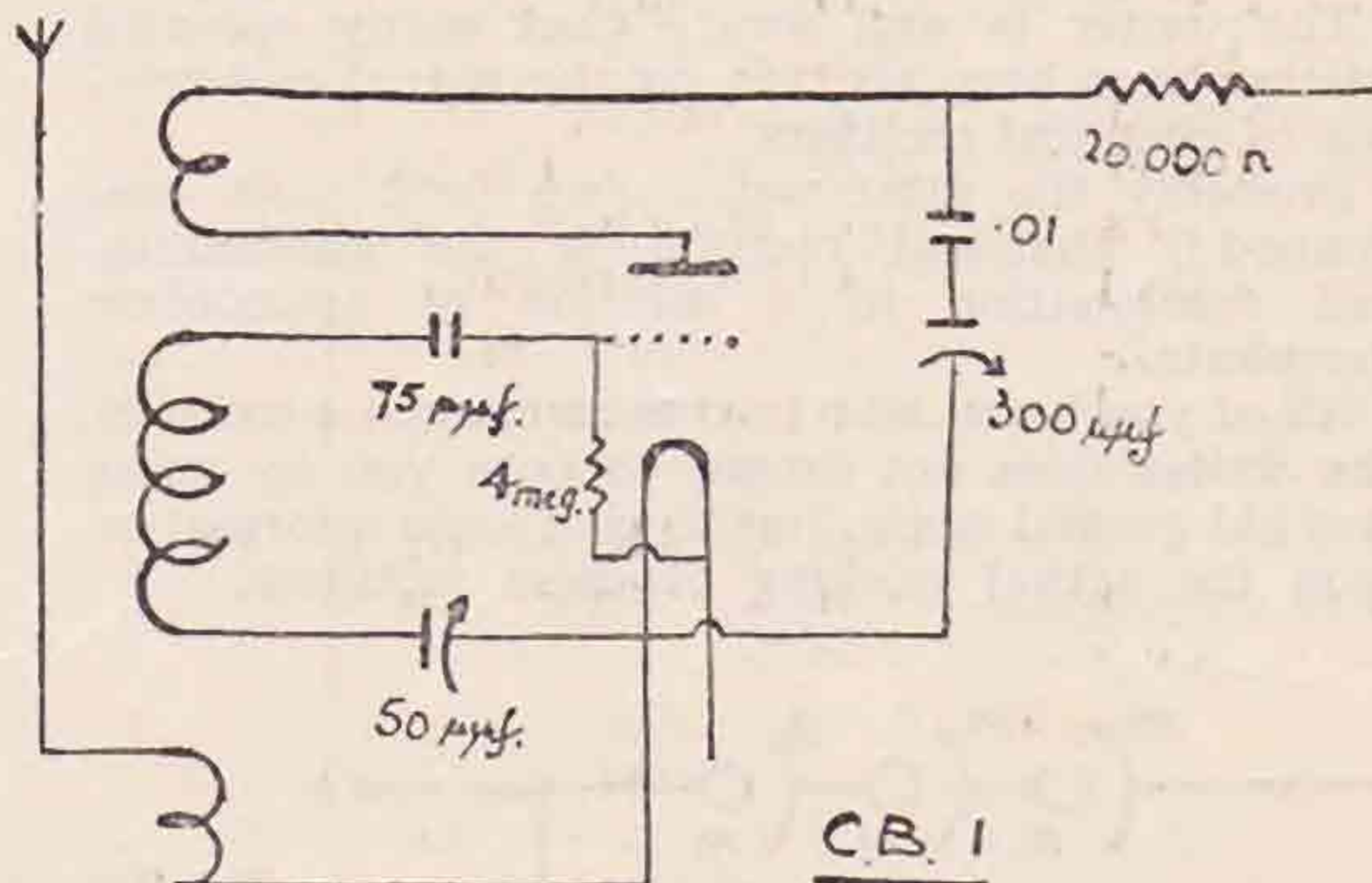
AQILM is still busy on 28 mc. He has a new transmitter working and although reception is impossible for some months owing to electric fan QRM, week-end tests are being kept up and reports on the new set will be welcomed. The power is still 100 watts. Three more European reports have been received, UOCA (R3 to R2) and D4YT (R5 to R2) on March 18, and D4AUH (R7 to R2) on March 24. The old Mesny transmitter was then in use.

I mentioned last month that Q.M.S. Roberts, temporarily BRS255 until his new Army call comes along, has a new aerial group in hand. There is still room for one or two stations in this new group for work on aeriels and propagation generally. BRS255 sends me a lot of very interesting dope, in fact so much that it is hard to make a selection for these notes. One thing will interest many of us and that is his offer to deal with any general queries. I understand that he has practically unlimited reserves of books of reference and that any information to be gathered from these and his own experience are at the service of CB members. For a circuit that will get down to 1 metre or thereabouts he shows series tuning as sketch No. 1. This does not call for low capacity or debased valves as the tuning is done through the valve capacity itself and a D.E.L. valve works satisfactorily. In fact, a fairly large capacity valve base will be the better as it will tend to balance the coil capacity. For the coil itself, where with parallel tuning of 30 mmf. a tube base coil of 18 turns was wanted to cover 40 metres, with the series tuned circuit 46 turns are required.

The same principle is used in the transmitter sketch shown, No. 2. I have not the space to give all the details of the series tuned receiver and transmitter circuits with the arguments for the use of this tuning system but BRS255 is very emphatic as to the benefits and wants to get the system more widely used. I am asking him to deal with anyone who cares to follow up the circuits if they will start an argument with him.

Another idea which the 28 mc. group will find of interest is an aerial coupling for receiver. The set is enclosed in an iron box and aerial is taken to the grid coil end of the box itself. The box is not connected to circuit but may be earthed at end

opposite to aerial connection. Things must be so arranged inside that the grid coil is not in either the horizontal or vertical centre of the box. Whilst signal strength is reduced from R9 to a good R5, an extra L.F. stage can be used and the present problem of car QRM is said to be solved.



Group reports are as follows :—
28 mc.

Group 1B.—G.C. G5SY is still unlucky. He has not pulled in one station during the past month. Meanwhile a new transmitter and $\frac{1}{2}$ -wave vertical aerial are ready for better conditions.

Group 1C.—G.C. G6VP says that OH2NAP is on every Sunday morning and waiting to "butt-in" to the G6WN-G6VP schedule. G5YK was on each Sunday but only found the last two profitable. On June 23, UOXY automatic sending came in, and a QSO was effected with D4UE, QSA5 each way. On the 30th SUC was R1, fading out within ten minutes. He is using an Ultraudion receiver with a S.G. stage which does amplify. G6WN operators have been on each Sunday also, on Schedule with G6VP. G5WK and GKS have been the only calls heard. When using one-half of the big C.F. Hertz their signals were heard at G6VP. G6UJ is still running schedule with G6OO. His aerial is badly screened by 60 ft. buildings and as a C.F. Hertz was the only means of getting out on 14 mc. he hopes to be successful with one on 28 mc. G6OO has not had a QSO but heard PLF calling PCR, PMB calling VS and LSE with ABC call. He wants exact QRH of these stations, all are near the band. G6VP is received at G6WN and G5WP "any old time." On June 16 he heard two stations calling him, one almost certainly G6WN with FB C.C. note and the other a RAC note. Will the latter please give G6VP a report as motor QRM barrage came down on his signals. G6OO and G6UJ are working in with Group 1C until the present hard times pass over and Group 1H can be re-started.

Group 1E.—G.C. G2OD had a report from ZS4A who received signals at R6 on May 12. BRS72 was receiving VU2KT in May and G2OD

agrees with his experience that a long horizontal aerial is better for reception than a short vertical, pointing out that W2JN, who was the most consistent DX station, used a large horizontal aerial for his transmissions. Last month BRS72 heard UOXY three times, D4UE and harmonics of CT1AA and YIIMDZ. G5UB has been trying out the extent of his ground wave with a new aerial. QRM from cars is still worrying both G2OD and G5UB.

Group 1F.—G.C. G2CX says that G5WK is another sufferer from car QRM. However, as the G.C. adds that G5WK has just got a new car, perhaps it is not G2OD's type of interference! G6HP has been listening but N.D. BRS25 is holiday-making but logged UOXY and D4UE on 23rd. PA OCX is on his way to England. G2CX has not yet settled down after move but heard one RAC signal, probably a local harmonic.

Group 1G.—G.C. 2YU reports that G5UF joins this group. No QSO's reported and things generally very dull.

Group 3A (Crystals).—G6XB is carrying on to keep the group alive and BRS242 and 2BHI are joining him for the time.

Group 4A (Best Times).—G.C. 2AUH gives his forecast for the month. BRS90 hears from ZT6X that the "wipe out" has occurred there and that November to February is the best period for G stations. 2AJC has been having a trying time with receivers (full permit now). 2AUH and BRS136 are still arguing the effect of local weather conditions.

AUG. 20—SEPT. 20. GROUP 4A D.X. GUIDE.
All Times G.M.T.

		14 M.C.	7 M.C.
Australasia	06-00-08-00	05-30-07-30
America North E.		22-00-08-00	23-00-08-00
	W.	22-00-02-00	W5 at 07-30

South mainly vice-versa as compared with North American.

Africa ... Very FK, FM, FE, unreliable. and FQ heard. (L.A.R.U. Intermediates).

Asia ... 20-00-23-00 Siberia 23-00

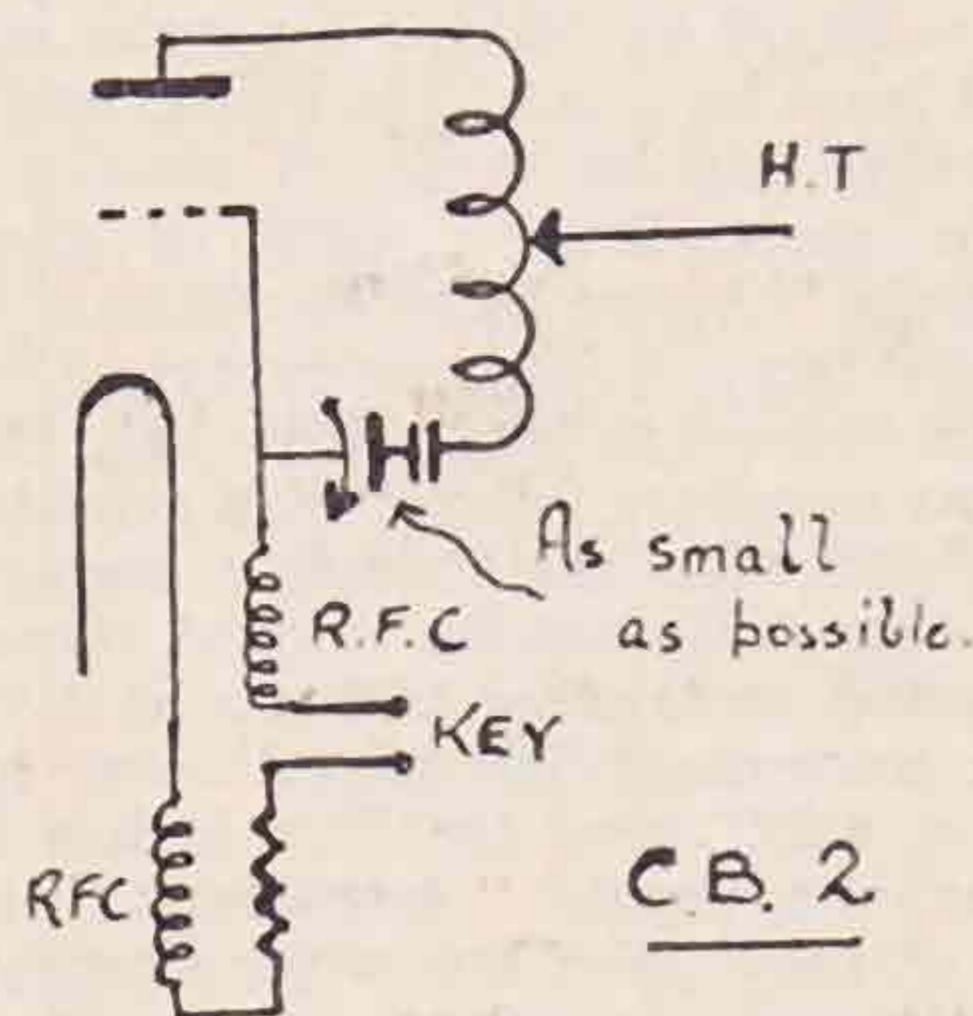
It should be noted that times are very unreliable for this period.

Group 5A (3,500 kc. fading).—The long-awaited licences for the band have at last arrived, though times allowed for transmission are still limited.

Group 7A (56 mc. Work).—G.C. G2DT, better known to the world as BRS125, has blossomed out with a full licence. Congrats! He is still running schedules with WSDHW and G6TW but nothing has been happening lately. He has lately heard that some signals picked up some time ago were *bona-fide* automatic transmissions from G5WF. G6TW continues with his end of the work. He was worried by a regular beat in receiver and traced it to the pendulum swing of a grandfather clock. Apparently the contact of the escapement gave some static release. By turning the aerial the note was lost, proving it to have been of electric and not mechanical origin. G6DH may have been heard by G2DH but was trying out circuits at the time and does not know definitely if the signals were his.

Holidays will interfere with work in the future. WSDHW is now on the air with beam antenna. Schedules are:—Saturdays, 13-00 to 13-30 and 21-00 to 21-30 G.M.T. throughout August. QRH 57 to 58 mc. G6TW heard a loud carrier on July 14, 11-00 to 12-15 and 14-30 to 15-00 BST.

Group 8A (QRP).—I am sorry to hear from G.C. G2ZN that he has had to undergo an operation. Luckily he is now over the worst and hopes to be active again very soon.



Group 9A (Weather Investigation).—G.C. G5UQ has got out a schedule of transmissions which will be carried out by himself, G2AI, G6PA, G6CI, and G6RB, starting on August 15. The 14 mc. band will be used and all listening stations are asked to stand by for these test signals and to send in weekly reports direct to G5UQ. The tests signals will be: Test—WxDx (twice)—Code Group (twice) de G... followed by a 15 second dash. The form of report wanted is the date and code number given in transmission. Signal strength (R code) or nil. Fading in the following code. "N" for nil. "Q" for quick, less than 3 seconds. "M" for medium, from 3 to 15 seconds; "S" for slow, more than 15 seconds. Tests will take place at the following times, all G.M.T. Mondays, 12.45 (G5UQ), 21.45 (G6CI). Tuesdays, 06.15 (G5UQ). Wednesdays, 12.45 (G5UQ), 21.00 (G6PA), 21.45 (G6CI). Thursdays, 06.15 (G5UQ). Fridays, 12.45 (G5UQ), 17.30, 17.45, and 21.30 (G2AI), 21.45 (G6CI). Saturdays, 13.00 (G6CI), 22.30 and 23.00 (G5UQ), 23.00 and 23.30 (G6RB). Sundays, 06.30 and 07.30 (G6RB), 11.45 (G5UQ), 13.00 (G6CI), 21.00 (G6PA). The above will be in operation until October 1, when it will probably be amplified. As the working of this group will be dependent upon reports I shall be very glad if anyone who can will circulate it to the foreign and colonial stations to whom they may be writing and also ask for it to be given publicity in any Ham papers with which they may be in touch. The QRA of any such papers will enable it to be sent to them if you can let G5UQ have these. Please sent them at once so that we can get all the publicity possible.

Group 10A (1770 kc. Work).—G.C. G6OT has now got together a band of stations and this group will be fully under way at once. The G.C. has succeeded in getting enough volunteers to form the nucleus for a second group so that additional stations to complete another group will be welcome.

"Anti-Bunk."

Judging from the favourable reception of the whole idea of our anti-bunk party, which appeared in the May issue of THE BULLETIN, there are points that need extending. First of all, while "Anonymous" ought to remain as such, at the same time there seem to be many who want to get in touch with the head of things. This is rather difficult, as everyone must be his, or her, own head or chief; yet at the same time it has been thought that, as the party may in time reach large numbers, it is as well to start off by having someone amongst us who will at least be a concrete being, and to whom communication can be made, if necessary, as we want to be more than a gang of ghosts, with idealistic ideas. As we have no officials (and hope never to need any), it is up to everyone who wants to see A-B a success to lend all the help that can be given. Two members, who live in remote parts of the world, and who are therefore considered safe from any Anti-A-B attacks, should there be any, have consented to take on the job as a temporary one till the movement has gained more ground, in the shape of G2ZC and G6YL. It has been suggested that the words "Anti-Bunk" savour of slang, and so they may, but what alternative have we, as these two words seem to sum up the situation very well. However, if anyone can suggest anything that is better, and which fits the case, let him divulge his idea. Till then, let the movement go under that title, and, for short, let us use the letters "A-B" as a new Ham abbreviation. So far the gang is only in its infancy, but at the same time it includes members in Britain, Portugal and Denmark, so even at the start it has an international aspect. Now one of the first things to be done is the clearing of the amateur bands of commercials, and the clearing of the commercial bands of amateurs. Trust the commercials to look after themselves, so let the amateur look after himself. This, in the spirit of the Washington Convention, is a simple thing, and while we hear a lot about the jamming of our bands, surely those who find them being jammed need only take the call of the offender, his correct frequency, and send in a formal complaint of his being "off wave." That comes under our rule No. 1, as outlined by "Anonymous."

Rule 6 also needs immediate attention, namely, the clearing of the band when calibrations are in progress. THE BULLETIN publishes details as to when these calibrated waves are sent, and, as the time is a short one, surely everyone can make a point of keeping a silence, such as our ships do for distress calls. Their period is for three minutes twice hourly, so surely 10 minutes every fortnight is not too much to ask all amateurs to close down for. One can easily fill up those minutes, even if the service be not taken, but for that matter the service should be taken every time, as a check, and our object is to do our best to allow the service an uninterrupted sphere of usefulness. If any A-B hears a station jamming the service, we suggest he stand-by, and call the station at the first opportunity, and, once contact has been made, tell him that he was jamming the calibration. It is more than likely that 75 per cent. of offenders are unaware that they are jamming, and would not do so willingly, but the fact that the service is jammed is quite enough to stir up the feelings of all true

A-B's. Read the times of such transmissions, therefore, and make a point to keep a period of silence at the times and days given.

Under rule 2 we want to see the endless Test and CQ calls cut down. A foreign station recently sent 52 CQ calls before signing his call. Three "Test," "de," three station calls, and this repeated three times will raise a station, if such is to be raised. Try it. The non-working of any station using raw A.C. on the 7 M.C. band has already been put into operation by several of our more rabid A-B's, in spite of what some have written on the subject.

As this has been penned shortly after the article in THE BULLETIN first dealing with the subject, none of us know how we may be expected to be backed as yet, but we want to try and make A-B a regular feature, if possible, and to get a backing from as many honest-hearted A-B's as we can, so if you care to let us know that you are, or have become, an A-B, we shall be glad to welcome you, and if you be willing to help us, you will be even more welcome.

(Continued from next page.)

to take the "oath of secrecy" before the P.M.G. Work then went on with renewed vigour, VK7CW and VK7DX constituting the principal link with Launceston and the mainland of Australia, handling the greater part of the cable and press traffic, which would in ordinary circumstances have been carried by telegraphic lines.

Thousands of words of press and messages were handled by these amateurs in the few days they were called on to work. VK3RJ in Victoria formed one of the principal links at the mainland end, and, being a P.O. official, was able to copy press, etc., at 25 words per minute. Work was carried on right through the night in many cases.

VK7CW's residence presented an animated scene on the Saturday morning of the disaster. The yard round the shack was filled with reporters looking for copy, telegram boys with bundles of urgent telegrams, the overflow from the commercial station VIH, and other people anxious for news of their friends in the devastated areas.

In the shack were Crosby Walch (VK7CW), a typist from the local newspaper *The Mercury*, and three spare op's, including the engineer from the local B.C. station 7ZL, and piles of telegrams strewn all over the place.

Most of the work was carried out on the 40-metre band, but was hampered by ship distance effects, which are very prevalent between Hobart and Launceston (130 miles), probably due to the mountainous and heavily wooded country between these two cities. Eighty-metre transmission was resorted to when fading was pronounced, and the two bands furnished a sure means of communication with the northern parts of the island, as well as with the mainland.

Other stations who assisted in the work were VK3YX, VK7LJ, VK7HL, and other mainland and Launceston transmitters. These stations again demonstrated that one system of communication, amateur radio, never fails in any emergency.

Chemical Rectifiers.

The following letters have passed between Mr. M. Gibson (2BAA) and Mr. G. R. Lee (2BHI) as a result of the former's recent article on chemical rectifiers. The correspondence is reproduced here in the hope that it will be of interest to members.

DEAR MR. GIBSON,—I read with interest your article on chemical rectifiers in the April number of the BULLETIN, and I have now gone so far as to commence to build one; there are, however, one or two points on which I am not quite clear.

First, is the electrolyte a solution of basic sodium phosphate or of the acid salt? Second, is it necessary to have the electrodes of any definite shape? And again, may I use the rectifier without a transformer? I should be very obliged to you if you would solve these problems for me. I expect they are very elementary, but I don't know the first thing about chemical rectifiers.—Yours sincerely,

G. R. LEE.

DEAR MR. LEE,—I was very interested to receive your letter of the 29th inst. The ordinary laboratory "sodium phosphate" Na_2HPO_4 is really disodium hydrogen orthophosphate, and has a slightly alkaline reaction in solution and is therefore basic. By the "acid salt" I suppose you refer to sodium dihydrogen orthophosphate NaH_2PO_4 , which has a very slightly acid reaction in solution.

With regards to the electrodes, I have found that the larger surface obtained by the plate and grid described is of advantage. Rods and wires, owing to smaller surface polarise much quicker than the above, thus increasing the resistance of the chemical cells. I do not know that there is any advantage in the form I gave them; they should, however, be both about the same size. I think

advantage can also be gained by having each electrode in a couple of a different form to its fellow. The shape of the electrode must to some extent determine the formation of the ionic stream, and by having the second electrode of a different form it should be possible to check any surging of the ions, and hence increase the degree of rectification obtained.

You should not use the rectifier without a transformer if you are using an earth connection on your transmitter. If you do not wish to step up the voltage you should use a 1 to 1 transformer. The reason is that the electric light companies object, as it interferes with the frequency of their alternators.

You will find that, although there will be difficulties, this subject offers a large field for experimental work. The saturation of the electrolyte is very critical, and I do not recommend "topping up" the cells with a saturated solution to compensate for evaporation. This appears to upset the stability of the rectifier, which takes time to recover. Larger cells could be used so that the effect of evaporation is not very great. Insulated lids with vent holes and holes for the connecting wires could be provided, also to reduce evaporation. The last words of the article should be noted about smoothing and increasing the number of cells. A small misprint should also be noted in the article: the upper voltages in the secondary of the transformers in Figs. 3 and 5 should be 250 volts in each case. Wishing you every success in your experimental work, and hoping that you will let me know what progress you make.—Yours sincerely,

MAURICE GIBSON.

Amateur Radio and the Recent Tasmanian Flood Disaster.

By W. A. BOUSFIELD.

A few weeks ago Tasmania suffered from an appalling flood disaster, in all parts of the island, owing to an abnormal fall of rain, extending over several days, with a consequent bottling up of flood waters in her mountainous valleys. Damage to stock, houses, mines, etc., amounted to well over a million pounds sterling, some people losing everything in the mad rush of the flooded rivers.

In the northern city of Launceston, situated in a hollow at the junction of the North and South Esk rivers, the greater part of the suburbs of Invermay and Inveresk were submerged for days, with a result that 4,000 people were homeless and had to be accommodated in halls, etc. The city power station situated in a narrow gorge was completely washed away, cutting off the town's supply of electricity, boats were washed away, and sheds were moved bodily in places where the flood waters rose to greatest heights.

All communication between Hobart (the capital city in the south) and Launceston in the north was stopped owing to the sweeping away of railway bridges, road bridges and telegraph lines. Thus

the southern part of the island was completely isolated from the north and from the rest of the world because the cable service to Melbourne passes through Launceston before crossing Bass Strait.

The commercial station VIH at Hobart was pressed into service, but could handle very little traffic, as ship communication occupied most of the time, and the 600-metre wave was not altogether suitable for transmission to Melbourne VIM in daylight (300 miles).

Amateur radio then commenced to make a name for itself, as it has always done in an emergency. VK7CW and VK7DX established communication with VK7CS in Launceston. VK7CS had to work with batteries, as the power supply had been cut off, as previously described. Not long after the start of this work a slight hitch occurred at the northern end, which compelled 7CS temporarily to suspend operations.

However, soon after this the amateurs concerned were enlisted at post office stations, and were made

(Continued at foot of column 2 previous page.)

Some Further Keying Notes.

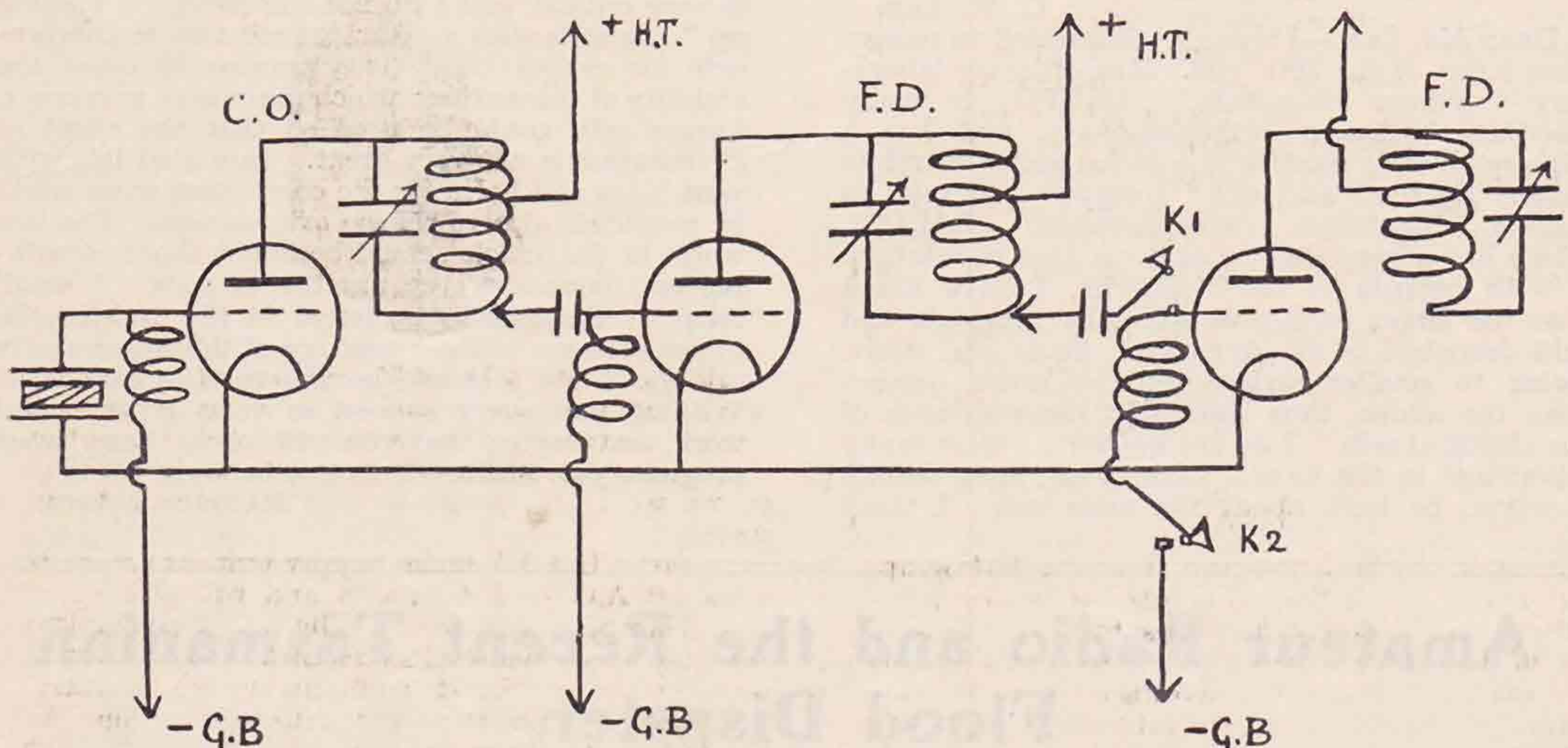
By L. A. LAFONE (G6ZA).

As it is about a year or a bit more since I last perpetrated an article on keying, perhaps you can bear yet another, especially as I produced one about modulation more recently, probably to the intense annoyance of those who blame 'phone stations for all the interference.

Since my last keying article the entire outfit has been changed to crystal control, the only oscillating valve is the crystal oscillator which is followed by a frequency doubler and then by either a further frequency doubler for 14 megacycles, or a power amplifier for 7 megacycles; neither of these valves however, gives any radio frequency output unless driven by the preceding one. The key was therefore placed in the grid exciting lead of the third valve; this worked quite well most days, but on

I am not the only one who does not know all the theoretical side of the game I shall ask it here. Why does an L.S.5b, when acting as a frequency doubler, proceed to consume 60 milliamps at 400 volts and -80 volts grid bias when driven hard; whereas when used as an amplifier it takes about 7 milliamps at 400 volts and -10 volts grid bias. And also how is it that, apparently being grossly overrun, the emission does not fall off? Now there is a chance for our really scientific members to help me quite a lot.

I must beg everybody's pardon for having stated that a crystal will hold the frequency dead steady even when the crystal oscillator is modulated, as the editorial footnote to my article in the June issue has made it clear that I was wrong. If, as is



K₁ is original key position.

K₂ is present key position.

occasions it seemed to leak a bit, and therefore it was abandoned.

The present method has now been in use for about three months, and it seems to work perfectly steadily and satisfactorily. The key is now placed in the bias lead of the last valve and when up the grid of this valve is isolated, the anode current falls to zero, and no output is obtained; all reports obtained give the note as steady and no chirp, so it seems to be a fairly good position.

Now I want to know something, and as perhaps

stated, an unmodulated stage were employed after the crystal oscillator, would it be necessary to neutralise that stage, if a frequency doubler, to ensure a constant frequency if the load on the frequency doubler was varying?

Now, don't everybody say "the man's ignorance is pitiful" and leave it at that; it may be pitiful, but the best way of learning is by asking questions, and if a few more questions and answers appeared in the BULLETIN I dare say it would be of still more use to our many non-scientific members.

SPECIAL CONVENTION STRAY.

Next number is Convention number. A wonderful double number. Don't forget to tell your friends about it now. If you are coming to Town write to HQ at once if you want to know the names of some London Hams with a bed to spare.

Book Reviews.

"TELEVISION." By Sheldon and Grisewood. Published by the D. Van Nostrand Company, of New York. Price 3 dollars 50 cents. 194 pp.

With television an established science, it is surprising that so few really useful books have been published on the subject. In this, the first American book on television, the joint authors have done much to remedy the matter, and accordingly deserve commendation.

In all matters technical it is difficult to interest the layman and the professional together, but in "Television" it would seem that every effort has been made to present a difficult subject in a manner such that all who have a basic knowledge of Radio in general may readily understand.

The historical development of television has been well covered, and the preliminary chapters devoted to "Optical Systems" and "Electro Magnetic Waves" prepare the reader for a quick appreciation of the more intricate methods which are employed to produce television proper. Two interesting chapters explaining the operation and construction of the selenium and photo electric cell should be read by all interested in picture transmission and talking pictures, as well as television.

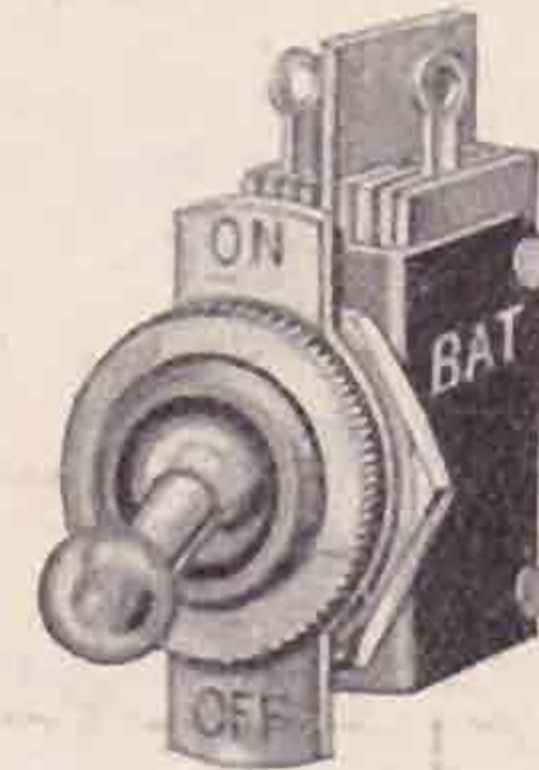
In later chapters the Baird, Bell, Jenkins and Anderson systems are described, whilst a forecast of the future possibilities of television concludes this excellent little pioneer manual.

Stray.

An offer has been received from the Fultograph Company to lend a limited number of picture transmitting and receiving machines to selected members of the Radio Society of Great Britain. We have made a preliminary investigation of the process and it seems extremely interesting and quite suitable for amateur use. If any members are interested in picture transmission and wish to participate in this work, will they please apply to HQ. The list will, as stated, be limited to those who can work the process.

Trade Notice.

Messrs. Claude Lyons, Ltd., of Liverpool, have recently placed upon the market a considerably improved type of power toggle switch to replace their 1928 one, and the price has been *reduced* from 3s. 6d. to 2s. 6d. In an interesting pamphlet the makers state the chief requirements in high quality switch design, and their new type has been designed to meet all these requirements. It is intended for panel mounting, and is of unobtrusive yet handsome appearance; it is quiet electrically, and will break 3 amperes at 250 volts. The indicator plate measures only 1 in. by $\frac{5}{8}$ in., and the back of panel space required is $\frac{15}{32}$ ins. (wide) by $1 \frac{3}{16}$ ins. (high) by $\frac{7}{16}$ in. (depth). The



single-way type sells at 2s. 6d. and the two-way one at 3s. 6d. These and many other interesting details concerning this switch are well set out in their pamphlet, which also shows full scale drawings of the switch in various stages of fixing on to the panel.

Lyons' "B.A.T." mains supply units are made to work off A.C. or D.C. mains, and will give up to 50 milliamps. "hum-free." The A.C. type employs the Raytheon filamentless rectifier, complete with its smoothing circuit and mains transformer: provision is made to supply different voltages for the H.F., S.G., detector, L.F. valves, etc., through Clarostat variable resistances. Output 300 volts (no-load), 220 volts at 50 milliamps. Lyons also make L.T. eliminators, trickle chargers, etc., and heavy duty types for special work.

R.S.G.B. Sales Department

The following can be obtained from Headquarters on application:—

A.R.R.L. Handbook, by Handy ...	4/-
Citizens' Radio Amateur Call Book (4/- to Members)	4/6
Enamelled Coat Badges of Emblem	2/6
Members' Headed Notepaper (per 100 sheets)	2/-
Enamelled Car Plaques of Emblem	3/6
Call Sign Brooches... ..	2/6
Rubber Stamps of Emblem ...	1/6

"T. & R. Bulletin."

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Craven House, Kingsway, W.C.2.
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The First Welsh District Conventionette at Swansea.

The members of district Number 15 met at Swansea on July 20 for a Conventionette. The party was not a large one, but Ham spirit was very manifest and was gratifying to the organiser.

The members met at Thomas' Café for lunch, after which a visit was paid to the B.B.C. station, where, by the courtesy of the B.B.C. and Mr. Mills (late G5OZ), a very interesting lecture was given.

Tea was partaken at Mumbles and a visit was made to the station of G5GJ. All present then made for Thomas' Café, where dinner was served.

After dinner a discussion was opened as to the use of the 1.7 M.C. band for local 'hone tests, and it was agreed to carry out tests on this band. After further discussion on points for the convention in London, the party set off for further station visits.

G5PH was visited, where the owner expounded the art of crystal control; from there the party visited G5AS.

District Representative Elections.

1929-1930

In accordance with the nomination forms that appeared in the July issue of the BULLETIN, the following are the persons nominated by the respective Districts to serve on the 1929-1930 T. & R. Committee:—

- No. 1. D. J. Beattie (2AJC) and J. C. Harrison (G5XY).
- „ 4. A. C. Simons (G5BD).
- „ 6. R. C. Horsnell (2ABK).
- „ 7. H. C. Page (G6PA).
- „ 9. G. Courtenay-Price (G2OP).
- „ 12. T. A. St. Johnston (G6UT).
- „ 15. H. Andrews (G5AS).

No nominations have been received from the following Districts: Nos. 2, 3, 5, 8, 10, 11, 13, 14 and 16.

In accordance with Committee Regulations, a ballot is necessary in respect of District No. 1, from which two or more nominations have been received. The ballot form shown below should be completed by members residing in these Districts and returned to Headquarters not later than September 1, 1929.

BALLOT FORM.

DISTRICT REPRESENTATIVE ELECTION, 1929-30.

I desire to record a vote in favour of
Mr.as representative
for No. 1 District.

Signed

Call Sign

Radio and Weather.

By E. L. OWEN (G2OW).

On looking over recent numbers of the "Bull," the writer has noticed increasing reference to amateur investigation of the influence of weather on radio reception; and it seems worth while to bring to the notice of those whom it may interest particulars of the excellent system of coded weather reports available for anyone who reads Morse, issued several times a day from GFA, whereby the amateur may in half an hour or so obtain complete information of the meteorological situation over any required area, only an hour or two previous.

The complete codes and particulars of European reports is contained in the Stationery Office publication M.O.252, price 4s., plus about 1s. 6d. for supplements, bringing it up to date. Forms for constructing one's own weather maps (Form M.O.2214—Western Europe) may be obtained, price 2s. 8d. per hundred, and full instructions for constructing the maps in M.O. 255, price 9d.

For the benefit of London and district hams using these transmissions, excellent reception of GFA (fundamental 4100m.) is usually obtainable on either 512m. or 456m., or, failing these, 1367m., which avoids the use of special long wave coils. Incidentally, these harmonics, down to about 274m., form a useful check for a wavemeter on the broadcast band.

Wireless in Lighthouses.

By W. H. HEBDIGE.

Readers may be interested in the type of radio now in use in lighthouses. The transmitting set, a valve set of the usual Marconi type, is kept in constant operation; the filaments of the valves being "dimmed" in the interval when no signal is being sent out and switched fully on again when signals are transmitted.

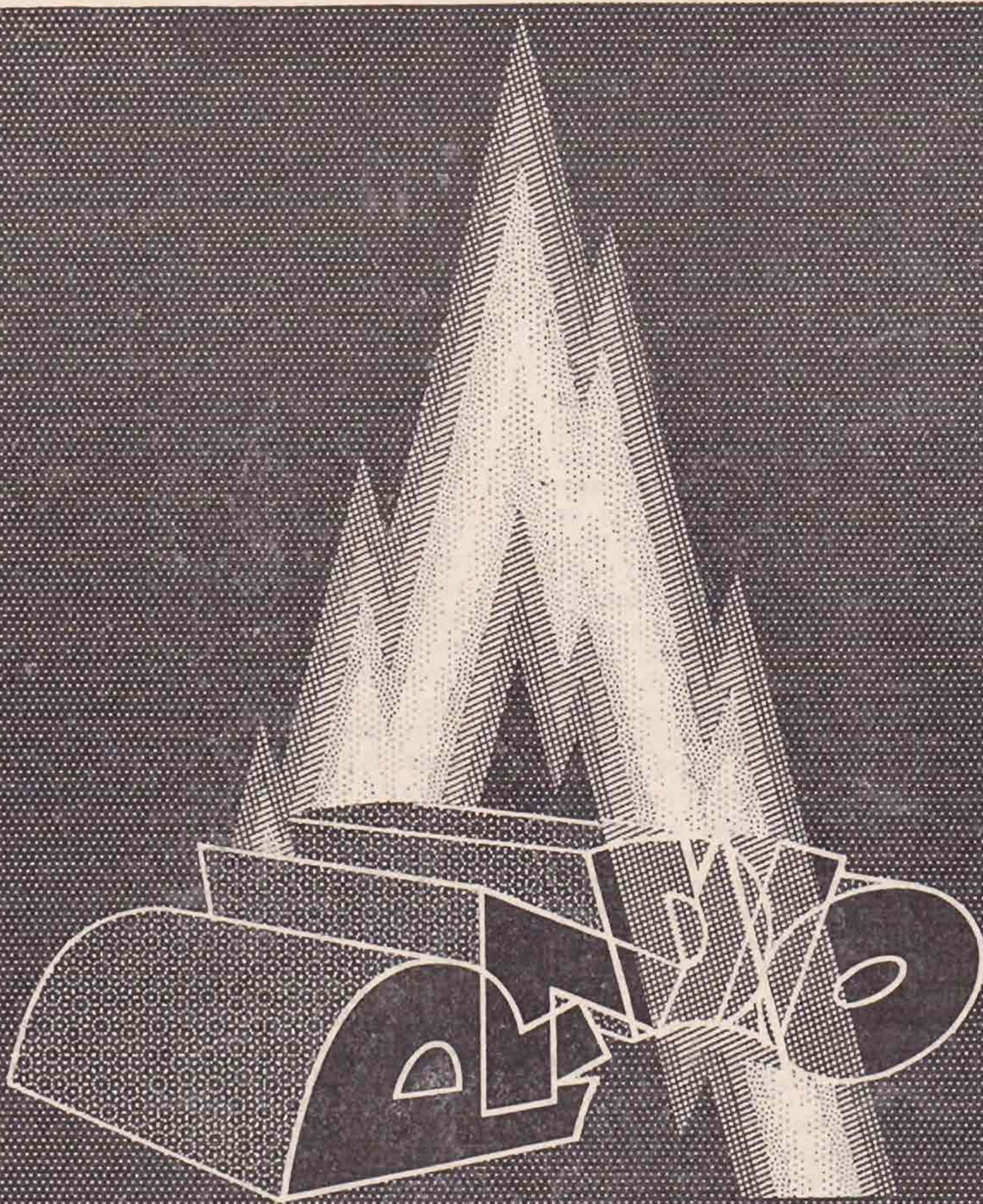
The current to valves and also the signal is controlled by a revolving drum driven by a clock-work motor; when the motor runs down a bell rings in the keeper's watch room to warn him to re-wind it.

The signal, controlled by the revolving drum, consists of a series of letters, a different series being allotted to each station, say, the figure 9 sent three times, a five-second dash, three more 9's, every half-hour. Wet batteries are used to run the set, and these are, of course, charged in the usual way, with this exception: the engines are started on petrol by an electric starter; when they are warm a tongue of metal in the exhaust pipe expands with heat, automatically switching over to oil. Should the engine become cold again it switches her back to petrol until warmed.

When the batteries are fully charged a relay stops the engine, and when the voltage drops below a certain point starts it up again.

The wave-length used is 1,000 metres (300 K.C.), radiation $4\frac{1}{2}$ amps. Too much cannot be said, for obvious reasons, about the actual circuit or aerial system used. The whole thing is proving very successful and may in time banish all visual lights.

GET THAT "BULLETIN" FEELING AND TELL US ABOUT IT.



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ADMISSION 1/6 DAILY
TUESDAY SEPT. 24 & OCT. 1 UP TO 5 P.M. 2/6

NOTES & NEWS FROM THE BRITISH ISLES.

DISTRICT No. 3.

Representative: JOSEPH NODEN (G6TW), Coppice Road, Willaston, Nantwich.

First, may I sincerely thank all those that have sent me congratulations on my 56 M.C. success. I am pleased to note that a number of BRS men in this district have succeeded in obtaining their open aerial licence; also it is interesting to note how well the R.S.G.I.B. is represented in North Cheshire. Keep to it, fellows, for I know you are faced with difficulties in your quarter. IG2SO is doing very little owing to business. Can someone rekindle the fire of enthusiasm here? C5FC (ex BRS152) is using TP-TG with 2 and 4 watts, and has worked a number of Continental stations. 2BHI (Ex BRS186) reports that conditions were not good for reception. G2VP (Ex 2AZN) is on the air and worked Spain, using 2.5 watts to a Triotron UD2. G2CG (Ex BRS126) started with 4 watts, and worked a number of Continental stations. Will have C.C. shortly. G6TW mostly confined to the 56 M.C. band. Will stations trying to get going on this frequency please key their call sign, for at times I have heard some excellent carriers, and could not report owing to lack of call sign. I may say the absence of QRN on this band is particularly noted and QRM! G2OA, using Q.S.T. Hartley circuit, has had a number of excellent reports, with an input of 5 watts. He states that in the district there may be a number of fellows who would care to have a little slow Morse practice, so he is willing to send out at 11 a.m. Sundays on 168 metres. Will those interested please drop him a line?

Monmouth.

G2BG's silence is explained at last; he has just opened a new radio business. 73's for success in your new venture. 2BG says he now has 250 A.C., so he hopes to have an ample source of H.T. BRS237 has changed his RX to an amplifier, plus whatever detector, etc., he cares to put in front. BRS239 has nothing particular to report except that conditions generally are bad. G2HH has now regained the 80 metre (3.5 M.C.) permit, and hopes to continue an interesting series of experiments that were recently interrupted. The permit is limited, so he asks for help from anyone who hears his signals. Plans are well in hand for the 56 M.C. set which will be working in August. 2HWT has had a flare up with some of his apparatus so has to rebuild again. However, as the call of the wide open space and a different brand of ether calls him, I think it will be a few weeks before work commences seriously again.

DISTRICT No. 4.

Representative: E. R. MARTIN (G6MN), Castle-mountain, Worksop.

G5BD had an interesting four-way QSO lasting three hours with PY, K, F, W. G5CY has worked all Europe, the Azores and Siberia on 7 M.C. G2AT just commenced work with 2 watts, and is getting on well. G6MN, very little transmitting done; busy comparing cone and moving coil loud speakers.

DISTRICT No. 5.

Representative: D. BAKER (G2OQ).

G2OQ, the representative of this area, being away on holiday, these notes have been compiled in his absence by G5UW, who, having just returned from his holidays, has experienced terrific QRM from all sorts of causes, which prevented him from notifying all the fellows, and thus resulting in somewhat scanty reports. Reviewing the reports that have come to hand, G6CI heads the list for Warwickshire with a very creditable performance on 14 M.C. band. G5ML has not reported, but I guess he will get busy when he reads this. G2OQ has been QRT throughout the month, as he is away on holiday, but rumour states that a new C.C. set will be built shortly after his return. G5LK, like G2OQ, is also absent on holidays, while G6HT is still pondering whether a "spring clean" would be beneficial to his transmitter, or otherwise. G5UW has started up again in real earnest, and QSO has been effected with several new countries. Old-time schedules with South America and Oceania have been resumed, and plans are being prepared for construction of a new transmitter that is going to be the "goods." G6UZ has erected an assortment of Levy aerials for all three bands and at different angles to each other, and separate transmitters are being built for each band. 6UZ says he prefers pottering around the shack testing different circuits to getting cramp sitting up late after DX QSO's. G6SO sent in his report so early that unfortunately same has been mislaid. Many apologies, G6SO. G2ZW has been doing a lot of work with Norway. G5BJ is still doing well and having regular contact with five Continents. Waiting anxiously for QSO with Oceania for WAC. Has worked CE2AB on fone, and was given QRK R6, and now works regular schedule with this station. G6CC has nothing to report. G6CI had many QSO's during the month with South America on 14 M.C. band. AR8UFM (Syria) and K4KD (Porto Riccaro) are new countries worked. A little work has been done on 7 M.C. The speech amplifier in construction is giving some trouble in the shape of motor-boating. This may be O.K. at the seaside, but does not find favour in a radio shack. G6XJ has portable apparatus now completed and is looking forward to good work in East Anglia. G6XQ reports too much personal business this past month for much radio work. G6MC has now W.A.C. Many new South Americans were raised, but Yanks were on the whole poor.

DISTRICT No. 6.

Representative: G. W. THOMAS, 169, Hills Road, Cambridge.

I am sure we are all sorry to hear that G5YX has been suffering from appendicitis and has, in consequence, been off the air for a month. He is, however, convalescent now, and hopes to be able to spend many hours on the air in the near future. G2XV has been heard working U.S.A. in the

WE WANT MORE TECHNICAL ARTICLES.

mornings, but has sent in no report. G5YK and G6CR have nothing to report, though much time has been spent in S.G. receiver design. G2HJ sends in a nil report: BRS204 suffers from bad interference and static whenever he gets a chance to listen, but has heard the odd corners of the world. He hopes to get a transmitting licence soon.

Essex.

Sub-Representative: 2ABK.

G5SN has been busy on 1.7 M.C. with music tests, using a triotron cone as a microphone, with excellent results. 2BVR has a number of 28 and 56 M.C. receivers and is now experimenting with quartz resonators. BRS233 was very successful with his portable receiver in Devon. G2SA reports bad conditions on 7 M.C., but has worked some new European countries. BRS191 has a nil report. 2ABK has built a S.G. receiver with excellent results, but finds 3 dials a trouble; says 28 M.C. has been dud. G5RV has been using 100 volts H.T. at a new QRA and has had several good European contacts: he thanks those members who kindly responded to his appeal for reports on 7 and 14 M.C. tests. G2DO and G2DQ are new stations in the district, and it is hoped they will soon be members. At present building the station.

DISTRICT No. 7.

Representative: H. C. PAGE (G6PA), Newgardens Farm, Teynham, Kent.

There appears to have been very little outstanding DX done in this area lately. G6LK, with eight U.S. Districts, appears to have done better than most. Although there has been little to record there are a greater number of reports than ever. I begin to think that when the winter evenings come I shall be kept busy writing up these notes. Anyway, I hope so!

Surrey.

Sub-Representative: G2VV.

An interesting gathering took place on July 14, when G5JF, G6LK, 2AMN and G2VV met at G5CM's. A very enjoyable time was spent and in the evening a visit was paid to G2VV's station. May I take this opportunity of thanking Mrs. G5CM for the kind way in which she received us. G2RT sends his first report: 16 European countries have been worked. BRS188 is now G2DZ. In a week he worked 10 countries. G5CM has been doing some real QRP work. Using 0.84 of a watt to a one-valve receiver, he has worked five countries! He uses a TPTG transmitter. G6LK has done little this month, but has been QSO Cuba. G2VV has been heard by WIBUX on 14 M.C. This is the first time he has been heard "across the pond." Has also been heard in the Azores on 7 M.C. A new TPTG is now installed and seems to be working well. The input at this station is 5 watts. He is now waiting for one more station to complete his Five Watt Group.

Sussex.

Sub-Representative: G5UY.

BRS125 is now G2DT. We are very glad to welcome him to the air. He is slowly getting his gear together and hopes to be working soon. He is keeping schedules with W8DHW and G5TW on 56 M.C., but reports no success so far. G5AQ has not been very active this month and only managed to raise W on that Band. A.C. mains are just coming through, and hopes are entertained

of a complete re-build of transmitter and change-over to motor-generator. G5UY has little to report. He has been grinding more crystals. Only local Europeans have been worked.

Kent.

Sub-Representative: G6PA.

G2AHU sends his first report. He is a new member and we welcome him heartily. He has been for his Morse examination and hopes to have his ticket very soon. G6PA has been running a schedule with NKF on 28 M.C., but has not heard him yet. Very little DX has been done here. Three transmitters are working here and the switching is like a 'phone exchange! The 7 and 14 M.C. sets are TPTG, while the 2 M.C. set is an Ultra-audion.

DISTRICT No. 9.

Representative: G. COURTENAY PRICE (G2OP), 2, St. Anne's Villas, Hewlett Road, Cheltenham.

Generally conditions have not been very good, with occasional bad QRN. FK4MS tells me that he is coming to England in September for some months, and is looking forward to meeting many British amateurs. I, personally, am looking forward to meeting many of you at the Convention. G5FS is C.C. on 1.7, 7 and 14 M.C., but has nothing of unusual interest to report. Q5QA is again at a new QRA, but is already on the air on low power. G6RB has been mostly on the 14 M.C. band, and has worked VE 2 and 3 districts, W1234689, PY, LU, CE, K4, KFR5. Best reports R8 from PY and R7 from LU. Has altered antenna to a full wave Zepp with a remarkable improvement in DX. G6RR is finding difficulty in getting a good antenna, but has worked RV and SU. G6XB has not been on the air for several weeks, but will be going again by the time this is in print. Is C.C. on 7 M.C., 14 M.C., and 28 M.C. G2YX has done little during the month, and will be away the first fortnight in August. G2OP is on 1.7 M.C., and is C.C. on 7 M.C. and 14 M.C. Has been running a sked with FK4MS on 14 M.C., but conditions have been bad. BRS212 is in Rugby for two months, and has with him a portable one-valve receiver with which he has logged 20 countries. BRS242 is now away for three weeks; has had several all night sittings with good DX log. Is busy building a special 56 M.C. receiver. BRS254 has not done much during the month, but has been trying different aerials.

DISTRICT No. 10.

Representative: J. CLARRICATS, "Ciel," Hartland Road, N.11. 'Phone: Finchley 3512.

Reports are at a low ebb due, I presume, to the holiday season and to the fact that conditions were so poor during July.

G5UM mentions that the 1.75 M.C. group is now formed. He and G6OT are hoping to make this a star "C.B." group. Mr. Hum assisted the Golders Green Society at their recent open-air outing. His own station is once again being rebuilt. G5QF has done very little, but is getting interested in 56 M.C. His new house seems well located radioally. G6PP has been less active owing to poor conditions, but seems more confident of his transmitter as a result of some consistent reports received. By an extraordinary coincidence he finds that his 5-watt signals have been heard in Ceylon. G6UN was in Norway holiday-making

during July. G2AX is busy building an R.S.G.B. stand transmitter. No serious work has been done during July, but his signals when he is transmitting seem to reach most continents. G6CL started up again with a new "Pertrix" supply. Using 7 watts, Brazil and North America were worked regularly, but conditions seemed very poor generally. North London seems to have dropped 7 M.C. like "hot cakes." A decent contact on this band seems a thing of the past unless one can get on during normal "business hours"!!

G6XN has now W.A.C. Uruguay, twice satisfying the demands. He was in France during July, but hopes to be working on 28 and 56 M.C. during August. He has built a tantalum rectifier and reports that results are improved. He has solved his "keying" troubles and promises "Bull dope." G5CS after a very long "holiday," has come to the front again. He is commencing on 14 M.C. with an "acquired" T250 S.W., and in his preliminary skirmish sent a few meters to their doom. He has "appropriated" G5HS's receiver, and in general seems to have lost none of the true ham spirit where "scrounging" is concerned.

DISTRICT No. 11.

Representative: L. H. THOMAS (G6QB), 66, Ingram Road, Thornton Heath, Surrey.

Since BRS25 is the only one to send in a report on the B.R.S. competition arranged for this month, he undoubtedly merits honourable mention, or the "starred rectangle" for meritorious performance, but I am afraid it must be called "no race." At all events, it is a treat to have someone in the area who reports as regularly as BRS25. Although he has only been able to listen on seven days during the month, he has logged 18 countries outside Europe! On 28 M.C. he has heard UOXY and D4UE. He has also received a card from VK2JJ, which makes it appear that when he received him his input was 2.8 watts from dry batteries. Some going! G2AI reports that the series of experiments using an aerial 15 feet high and 44 feet long are completed with very satisfactory results on 7 M.C., sigs being R5 in Ural Russia. Mains are now in use with voltage doubling A.C. after having considerable trouble due to an unsteady note. He will be testing every Friday at 6.30 p.m. B.S.T. on 21.2 metres. G5PL has worked four W stations and has up a new full-wave aerial. G5SH reports for the first time; he is working on 7 M.C. with a "modified G5WK circuit" (please enlighten me, O.M.) CC outfit, and has worked most of Europe with it. G6HP sends in a long list of DX worked. He adds, however, that the whole equipment has been rebuilt with an eye for tidiness. G6NT has worked a few new countries and plenty of DX. G6QB has done nothing of note during the month. G6WY has worked five new countries—CM, NJ, LU, KFR5, K4, but reports nothing else. G2CX has been too busy for radio this month.

DISTRICT No. 12.

Representative: L. J. FULLER (G6LB), 13, Seagry Road, Wanstead, E.11.

G6FY has done little radio beyond a few CB tests on 3,500 K.C. and a little mid-day work on 7 M.C. G6TX is running a QRP TX on 7 M.C., and is hoping to get a new QRA complete with A.C. mains in the winter. He is preparing a 20-watt outfit in readiness. G6UT has found 14 M.C. very poor for all districts except South America.

G2ZN has undergone an operation and Division 12 wish him a rapid return to health. G6LB has, like 6UT, found 14 M.C. very poor except for South America. He has had his first PY QSO and has also raised K4. His enthusiasm has been raised by the receipt of a report from Tasmania giving him R4 when using 6 watts.

DISTRICT No. 13.

Representative: H. V. WILKINS (G6WN), 81, Studland Road, W.7.

We still seem to get only the usual stations reporting each month—no new ones. Will all in this area please send their August reports on time as I shall be away, and several days will elapse before my report reaches headquarters. My brother and I wish to thank various members of the "Midland" areas for the pleasant evening we spent with them after our visit to Hillmorton recently. G5RG has nothing to report. G5RV sends his last report as a member of this area. He sends best wishes to all in this district and hopes to keep in touch with them over the air. G5LY has not been very active, the only DX was SU (R6), Y1 (R6), RV (R7). G6VP finds LU, PY, and CX easy to work on 14 M.C. with average reports QSA (R8). W5's and VE's were disappointing, but can be worked even on "fade out" nights. He has added another 6 mfd's to his filter with beneficial results. Has got phone to SU (R7) 100 per cent. readable. G6WN is still working DX on 14 M.C. Has spent much time on 28 M.C., and heard EAM, GKS, G6HP, and has been QSO with G6VP for two Sundays on this wave, using 8-10 watts of C.C. BRS72 found conditions erratic on all bands. Has heard UO, CT, EAM, GKS, and G6HP on 28 M.C. Is applying for full ticket. BRS222 is struggling with an all mains four-valver.

DISTRICT No. 14.

Representative: JOHN WYLLIE (G5YG), 31, Lubnaig Road, Newlands, Glasgow.

In view of the fact that very many of our transmitters are on holiday during the month of July and August, I do not propose to take up valuable space in the BULLETIN with purely negative reports, therefore the regular notes will be omitted in this issue.

DISTRICT No. 15.

Representative: H. ANDREWS (5AS), Wireless Depot, Ystradgynlais.

G5OC has gone DX hunting, having worked 32 countries. His first test call on 14 M.C. brought back W8DJV who reported R5. G5GJ is off the air, and is busy converting to CC. G5PH now working C.C. on 7 and 14 M.C., best DX AU. He is also preparing an article for the "BULL." on a cheap and easy way to make your own QSL cards. G2AV is on the air again, being at sea. He is making and testing new transformers for H.T. supply. G5TJ is working schedules with Z7HW, and reports that the latter is anxious to work G stations on 7 and 3.5 M.C. 2ASB has passed his Morse test, and is awaiting his call. 2AGK getting ready for his test and building TPTG for use with a 600-volt hand generator. G5AS has little to report as he has been very busy with conventionette arrangements, but I should like to thank all members who assisted in making the Conventionette a success, and to assure them that another will be held at a near date.

DISTRICT No. 16.

Representative: C. MORTON (GI5MO), "Simla,"
Glastonbury Avenue, Belfast.

There seems to be a little more life in the district this month, and although nothing of note has been reported, with the exception of a contact on 28,000 K.C. by GI6HI, I am glad to get the reports even though some of them are negative ones. Judging from those received, conditions on all bands appear to be normal for this season of the year. GI2CN is changing his address. GI26YW

is using an entirely new transmitter and receiver, and hopes to have something good in the way of DX to report next month. BRS251 is busy rebuilding his receiver. GI6HI has been working on 28,000 K.C. On June 23 he succeeded in raising D4UE, being reported QSA5. He is, I believe, the first GI to make a contact on 28,000 K.C. and deserves to be congratulated. GI5WD and GI5MO have nothing to report. GI6WG is working principally on 7,000 K.C., and is getting good reports, most of them being T9, using a hand generator to a TPTG circuit.

B.E.R.U. News.**IRISH FREE STATE.**

By COL. DENNIS (EI2B).

I am afraid that there is very little of interest to report this month, the long spell of fine weather and outdoor counter-attractions having put radio somewhat in the background.

We hope to approach the P.M.G. with the object of having our licences extended to permit of the use of the 28 M.C. and 56 M.C. bands, and also, if possible, some increase of power above the 10 watts which is at present the limit for all EI stations. During the recent 28 M.C. tests some of us were granted permission to use this band, a very serious handicap seeing that at these high frequencies much preliminary experimenting is necessary to success. In view of the previous successes of at least two of our stations on this band, it is a little hard that they should now be debarred from continuing their experiments, and we hope, therefore, that our representations, when made, will be favourably received. As the election of Area Representatives is shortly to take place, it is for your consideration, O.M.'s, whether you would not prefer to have someone who is in closer touch with you than I am as representative. Living as I do at a considerable distance from all, it is only very rarely that I can meet any of you, and were it not for the assistance afforded by 7C I should have had great difficulty in collecting material for these reports. Still, if you wish me to continue as your representative I am quite ready to do so. It is my own experience and that of most stations which have reported that conditions on all bands have been very bad for some weeks past. One rather peculiar skip freak was observed on the 14 M.C. band during the night of July 7. On that night the writer received many G stations at R5 to R8, and also had his own signals reported R5 to R6 by BRS242 between 23.00 and 24.00 G.M.T., whereas ordinarily not a single G station is audible from a much earlier hour. Now for reports, such as they are. EI8B has built a SG short wave receiver and thinks it worth while, although, when the writer heard from him, he was troubled with threshold howl. He worked a few W stations on 14 M.C. and is keeping a sked. on 7 M.C., being CC on both bands. EI7C has done nothing worth reporting and is at present away on a holiday until the end of July. EI8C has worked PY on 7 M.C. at about 20.00 G.M.T. with only about 8 watts input. EI4D did some fone work on 7 M.C. at

the beginning of the month, but is now in England on a holiday. EI2B on 14 M.C. having failed dismally to make a success of his full-wave Zeppelin aerial with feeders tuned by parallel condenser to $\frac{3}{4}$ wave, has now made his feeders $\frac{3}{4}$ wave actual with greatly improved results. He is using the harmonic of a recently-ground 42.3 metre crystal in 2SZ circuit and has had good CC reports from the more distant European countries, as well as from a couple of 1st district W stations worked in the early part of the month. He has been doing little or nothing recently owing to pressure of outdoor work.

NEW ZEALAND.

By J. JOHNSON (ZL2GA).

The month of May was rather remarkable. DX on 14 M.C. was very spasmodic, and it appears that European stations were very QSA about 03.00 G.M.T. and again about 09.00 G.M.T. On 7 M.C. Europeans came in also very early, about 03.30 G.M.T. The 28 M.C. band is very active around Australasia and a large number of stations are working at 00.00 G.M.T. Sundays. ZL2OZ has received confirmation of his 28 M.C. reception by AI2KT. The South African contact has been lost again after some considerable activity. An Auckland listener, Mr. M. Charton, has been doing good reception on 3 M.C., having receive a large number of W stations. There is a possibility of reviving this band for DX and so lessen the QRM on 7 M.C. At nightfall here (about 5.30 G.M.T. during May) it is a hard job on 7 M.C. to hear other stations than W's. The bottom of this band seems the least populated as far as can be judged.

QSL cards for stations whose QRA is not available should be sent via New Zealand Association of Radio Transmitters, P.O. Box 779, Auckland, New Zealand, and not through private stations, as forwarding of such cards means considerable expense to the owners of these stations.

[We are very pleased to receive regular reports from New Zealand and welcome a brief monthly letter from someone located in each one of the British Colonies.]

CEYLON.

Two interesting notes have been sent in by Mr. Jolliffe (VS7AG ex 7VX) and Mr. Rahim (VS7AP ex 5VX). Mr. Rahim says that the authorities are very willing to help them, but unfortunately little interest is shown in transmitting in the island. The only other active station seems to be VS7AI,

who is in company with 7AG and 7AP, working on the 14 M.C. band. Mr. Rahim reports hearing several British stations, including G6WN, G5ML, G6NT and G6HP, but cannot pick up the low-power men he heard earlier in the year. He is anxious to receive reports from British amateurs. Mr. Rahim's address is: "Rillington," Wellawatte, Colombo, Ceylon.

CANADA.

We have had the pleasure of a visit during July from Mr. John C. Stadler (VE2AP) who was in

London for a short time on his way back to Canada. Mr. Stadler was able to visit several of the London transmitters and has returned home again after having strengthened many friendships begun "over the air." VE2AP has kindly offered to take any QSL cards for 2nd district Canadians whose QRA's are unknown, and assures us of rapid delivery. He has also undertaken to obtain any outstanding cards from Canada, and if the G stations concerned will write to him he will do the rest!

Notes and News from Europe.

GERMANY.

By W. RACH.

There is little to report from Germany during the month of June, as the licence question has again been indefinitely postponed by the German Government; consequently most amateurs have had to be content with receiving only. This is the only short-wave work that the German amateurs can carry out without coming into conflict with the authorities. On 14 M.C. DX has not been so good. Nevertheless, a few stations have been successful. D4BY of Berlin, using 8 watts input to a $\frac{1}{4}$ -wave Hertz erected on a yacht cruising on a lake near Berlin, has worked Japan and got R5. On 28 M.C. there is now considerable activity, D4UAH and D4UE of Munich, also D4AW, D4CO, D4AC of Berlin, are working on that frequency. D4AW and D4CO are using the same transmitter, which is crystal-controlled with 8 watts input. They recently received their first reception report from England. We are pleased to be able to announce that the Austrian amateurs have unanimously been elected as a section of the D.A.S.D. We will henceforth undertake the representation of the Austrian O.M.'s in I.A.R.U. matters.

SWITZERLAND.

By XHB9MQ.

Conditions for amateur operation in our country are very difficult, very few stations being in the possession of official licences. Of these HB9D (Zurich) who uses telephony on 41.5 metres, HB9F (Lausanne), who is a lady operator, by the way, HB9Y and 9G (also of Lausanne), are the most active.

The operator of HB9D (Mr. Degler) intends now to found an association, the S.A.S.U., for licensed amateurs only, and in strong opposition to the unlicensed.

We unlicensed have no connection with the licensed men but are all members of the D.A.S.D.

This is the reason that we receive our QSL cards, *only via D.F.T.V. D.A.S.D. Berlin.*

Unlicensed stations in general are those with two letters after the number, such as 9MQ, 9RL, 9KM, 9NM, 9WG, preceded by the HB or XHB of course.

All cards for unlicensed Swiss amateurs should be sent always to D.A.S.D. until I send new advice.

We hope that in time we can join the licensed S.A.S.U. organisation.

Now some information about unlicensed stations in Switzerland.

There is HB9RL near Zurich working with QRP3-6 watts. He hopes soon to have 30-50 watts D.C. from a generator.

HB9WG is in the south of our country.

HB9KM.—I have written him for information but no reply so far. (I heard once that he was snapped by P.T.T.)

HB9NM is a man who is urgently required, for he has QSL cards which he has received for Swiss hams and no one here knows anything about him.

HB9MQ will soon have two transmitters; HB9MQ at Zurich with QRO, that is to say, 6-15 watts. Then near Zurich, where I work all the week, I propose using a small Hartley with max. input 3 watts call XHB9MQ.

ROUMANIA

By CV5AF.

At last the R.C.R. (Radio Club Roumania) has been formed and we amateurs hope to form a short-wave section shortly. The Roumanian transmitters are: CV5AF at Bucharest, working on 7 M.C.; CV5AS at Craiova, experimenting on 7 M.C.; CV5OR (exact address unknown), a newcomer on 7 M.C. Late ER5AB is starting again soon, for which we are very glad, as he is a technical man with a splendid reputation. I am sorry there are so few G stations audible here, but DX conditions depend largely on QRM from Russia.

Strays.

During the recent speed attempts made by Capt. Campbell at Verneukpan, S. Africa, ZTIX was officially appointed to maintain communication with Verneukpan and was allotted the call ZSX. The wave used was 31 metres and ZSX used one of Messrs. Leslie Dixon's well-known AT/40 valves. ZSZ and ZSW were stations at Verneukpan and Capetown respectively.

EAR117, Barcelona, is on the air every night on phone from 22.00 G.M.T., using 7,000 KC. The transmissions consist of band music, gramophone records and CQ's in phone buzzer. He welcomes report cards and in reply will send a Spanish double postal card. His address is Luis de la Tapia, Tavern 26 (S.G.), Barcelona, Spain. Four B-406 Philips valves with 190 volts of H.T. accumulators are used.

NEW MEMBERS ARE WANTED.

QRA Section.

BY M. W. PILPEL G6PP.

In these notes last month I gave RW as being the prefix for Persia, but I am now rather dubious whether this is correct, as I have been given RW and RV alternately as the prefix for that country. Will anyone who has received a card from RW (or RV) IG please let me know which is the right one.

The Czecho-Slovakian QSL agency has recently been changed, and is now S.K.E.C., Postbox 303, Praha II. This corrects the QRA given in the December, 1928, "BULL."

I should be glad of information about any reliable QSL agencies in South America, *i.e.* Brazil, Argentine, Chile, Uruguay, etc.

NEW QRA's.

- G2AF.—C. BRYANT, 5, Creffield Road, Colchester, Essex.
 G2AT.—J. W. MARLOW, "Hadleighdene," Fitzwilliam Street, Mablethorpe.
 G2CG.—J. B. MORTON, 3, Ashfield Road, Altrincham, Cheshire.
 G2DH.—H. N. WALLS, "Redcliffe," Forefield Lane, Great Crosby, near Liverpool.
 G2DO.—G. GREEN, 476, High Road, Dagenham, Essex.
 G2DQ.—H. COLLIN, London Road, Wickford, Essex.
 G2DT.—E. T. SOMERSET, Inholmes Park, Burgess Hill, Sussex.
 G2DV.—J. R. BEETON, Royal Signals Mess, Catterick Camp, Yorkshire.
 G2DZ.—B. HALL, 25, Coombe Gardens, New Malden, Surrey.
 G2FV.—W. SCOTT HAY, 38, Netherlee Road, Cathcart, Glasgow.
 G2II.—A. M. RALLI, 7, Abbey Road, Rhos-on-Sea, Colwyn Bay.
 G2NF.—G. S. WHALE, North Wales Wireless College, East Parade, Colwyn Bay.
 G2OW.—E. L. OWEN, 43, Mount Park Road, Ealing, W.5.
 G2OL.—S. W. CUTLER, 15, Queen's Gardens, Ealing, W.5.
 G2UX.—G. EDWARDS, 159a, Hillingdon Street, London, S.E.17.
 G2VP.—V. PERCY, 44, Ashfield Road, Altrincham, Cheshire.
 G5FC.—F. D. CAWLEY, 85, Hale Road, Hale, Cheshire.
 G5RV.—R. L. VARNEY, 12, Hall Street, Chelmsford, Essex.
 G6AX.—A. L. CLARE, 111, Oldham Road, Rochdale, Lancs.
 G6ZS.—C. GRUNDY, 234, Rishton Lane, Bolton, Lancs.
 2ABQ.—W. LUCAS, 64, Worsley Road, Winton, Patricroft.
 2AWT.—S. REES, 39, Brynhyfryd, Aberbeeg, Mon.
 2BHL.—G. RUSSELL LEE, 25, Boundary Road, West Kirby, Cheshire.
 2BVL.—A. E. BROOKES, "Cleve House," Cleve Woods, Downend, Bristol.
 The following are cancelled: G2WP, G5XW, G6AV, G6HJ, 2AZN.

NEW MEMBERS.

- A. RAHN (ES3OW), Consiori T25, K2 Tallin, Reval.
 R. A. COLBY CUBBIN (G5CZ), Strathallin Cliff, Douglas, I. of M.
 T. M. YULE (VQ2NC), N'changa Copper Mines, Northern Rhodesia.
 J. M. CRUICKSHANK (BA1), Nassau, Bahamas.
 R. L. CLODE, R.N. (Associate), H.M.S. "Resolution," Mediterranean Fleet.
 F. G. MERKLE (Associate), 21, Brodrick Grove, Abbey Wood, S.E.18.
 C. W. NEEMS-STANLEY (Associate), 42, Darent Road, Stamford Hill, N.16.
 E. W. LARK (Associate), 11, Winnipeg Road, Lowestoft.
 E. F. OLIVER (Associate), 41, Rhodes Avenue, Wood Green, N.22.
 P. L. HARDMAN (Associate), 20, South Street, Rochdale.
 J. S. ATKINSON (Associate), 38, Belle Vue Street, Scarborough.
 J. S. K. STEPHENS (Associate), 23, Cobden Avenue, Copnor, Portsmouth.
 J. C. STADLER (VE2AP), 4,334, Westmount Avenue, Westmount, PQ, Canada.
 C. J. MUMFORD (CT1BL), Rua Bocage 59, 3º D, Lisbon.
 H. W. DALY, 73, Castleton Road, Goodmayes, Ilford, Essex.
 S. NEWELL (G5RX), 9, Western Road, Stackstead, Bacup.
 J. S. G. MARK, 10, Canongate Road, St. Andrews, Fife.
 L. R. CHESTER, Fern Bank, Florence Road, Hornsey, N.4.
 J. A. NORTH, Thorndale Farm, Wetwang, Malton, Yorks.
 C. G. PHILLIPS (G5PJ), "Trewyth," Kewferry Hill, Northwood.
 E. J. COSTER, 46, Tideswell Road, Eastbourne.
 B. WHITEHOUSE (G6WF), 32, Bourne Street, Dudley, Worcs.
 J. H. GOODLIFF (2AUT), 609, Queen's Road, Sheffield.

B.R.S. NUMBERS ISSUED.

261. H. W. DALY.
 262. J. S. G. MARK.
 263. L. R. CHESTER.
 264. J. A. NORTH.
 265. E. J. COSTER.

B.R.S. NUMBERS RELINQUISHED.

186. G. RUSSELL LEE (now 2BHI).
 175. A. C. BONVALOT.

QSL Section.

BY J. D. CHISHOLM, G2CX.

The summer slump in radio activities generally has been reflected in the QSL section, and the number of cards handled per week has been steadily decreasing.

Apologies are due to those members who have written to the section and received very belated replies, but owing to severe business QRM I have

been unable to keep abreast with the correspondence. With the possibility of more time in which to attend to correspondence in the course of the next few days, I hope to catch up again with the letters.

Thanks to the efforts of some transmitters who have taken the trouble to find out the addresses of the QSL agencies of some of the lesser known countries by radio, we are now able to forward, almost without exception, every card entrusted to us to the right destination without delay.

The list of calls for whom cards are waiting, but who have omitted to send us envelopes, is growing smaller month by month, and is as follows:—
2: ao, av, cs, ho, lv, lz, og, oq, pp, to, vq, xg. 5: ad, cg, gs, ja, ls, ro, uw, vf. 6: br, cd, da, fh, fo, ga, gl, hj, td, tn, ty, uu, uy, vv.

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.

Thank You.

To the Editor of T. & R. BULLETIN.

DEAR OM,—Just a note to say that the BULL is improving by leaps and bounds and may I congratulate the contributors and compilers on the excellence of the July issue?

I believe in stating praise when due.

Sincerely yours,

GEO. ED. WEBSTER, JUN. (G5JF).

Calls Heard.

W. A. BOUSFIELD, York Street, Bellerive, Tasmania.—April and May, 14,000 kc.: G—2cx 2nm 2od 2xv 2zp 5bj 5by 5bz 5ml 5mq 5qv 5sw 5vl 5wk 5yk 5yq 5yx 6bd 6cr 6dh 6hp 6lb 6mc 6rw 6ut 6un 6vp 6wi 6wo 6wy 6xc 6xb 6xn 6xj 6xq 6yq.

C. HARRISON, VK7CH.—14,000 kc.: G—2xv 5by 5bz 5ml 5wk 5yk 5ux 6hp 6qb 6cr 6vp 6wi 6xc 6xq GI6wg. 7,000 k.c.: G—5by 6rb 6wt.

A certain American Ham arrived to take up his abode in England, bringing with him a complete Power Supply for use with 110 volt mains. Finding 230 volt mains the order of the day over here, he journeyed to a well-known Radio Store in London and explained his need of a two to one step-down Power transformer. The reply from the sweet young thing behind the counter was: "Yes, Sir, is it for a Melody Maker or a Master Three Star?"

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TENDERS invited for construction of Crystal-controlled Transmitter (7 and 14 M.C.) and S.W. Receiver, suitable for use at sea.—B. CHRISTIAN, 19, Canning Street, Liverpool.

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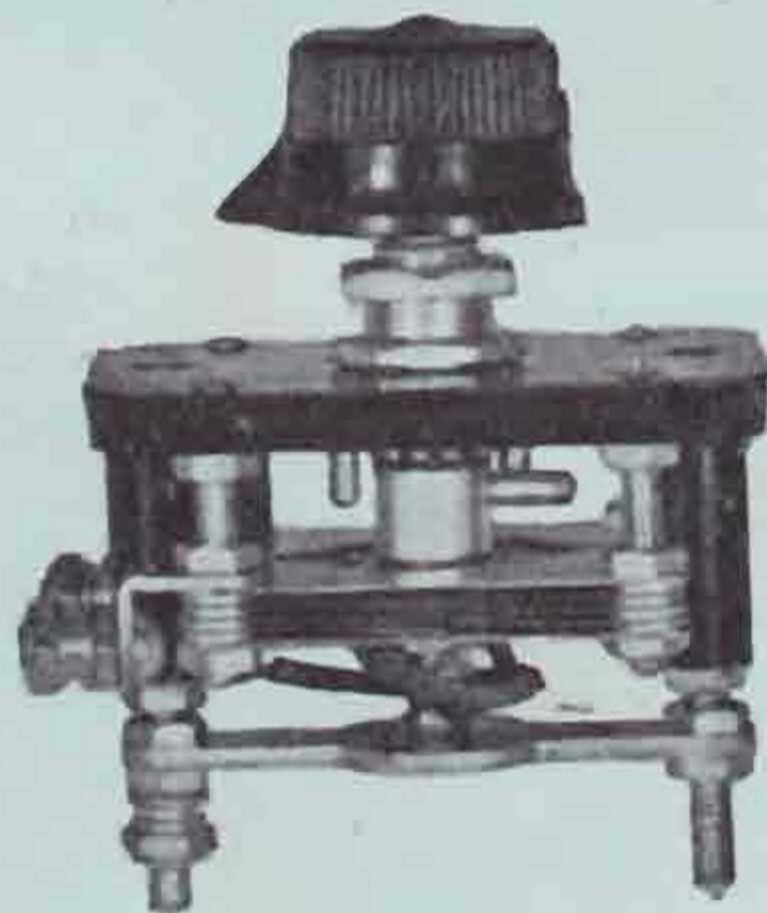
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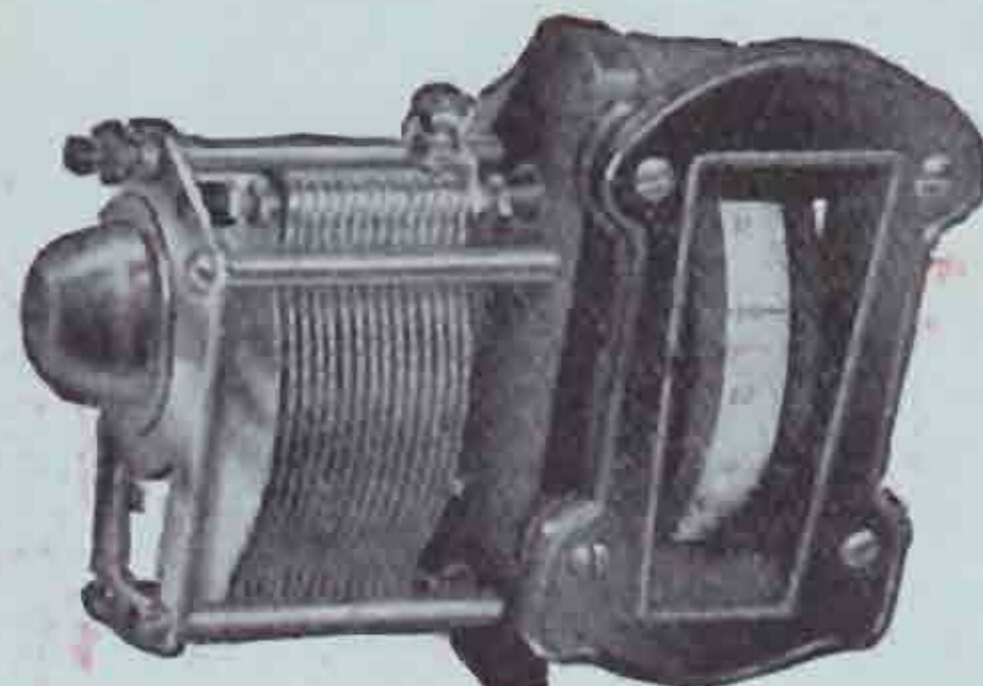
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DRUM CONTROL CONDENSER



There are many points of interest and advantage about this new condenser that will appeal to all readers of the "T. & R. Bulletin."

It has both Quick and Slow Motion control. The scale 0-100 is clearly marked, gives definite hair line readings and is easily seen from above. The condenser is secured to the panel by two screws through the moulded Bakelite top plate. These screws pass through and hold the neatly designed Bakelite escutcheon, thus entirely insulating the condenser from the panel and cutting out all possibility of shocks through the screws.

A metal insert in the moulding ensures easy and dead true fixing, and gives very robust mounting. Drums and Escutcheons are supplied in either Black, Walnut or Mahogany finish.

PRICES COMPLETE: .0005, 15/-; .00035, 14/9; .0003, 14/6.

Phosphor Bronze Balls, 6d. each.

Write for Illustrated Catalogue (T.R.).

OLYMPIA, STAND Nos. 128 & 133

WINGROVE & ROGERS, LTD., 188-9, STRAND, LONDON, W.C.2.



**POWER
AMPLIFYING
AND LOW
POWER
TRANSMITTING
VALVES.**

**TYPES D.F.A.6.—
D.F.A.7—D.F.A.8.**

TYPE D.F.A.6.

The Mullard D.F.A.6 Valve is a power amplifier suitable for use with very large loud-speakers. The anode voltage may be raised to 400 volts and with this high voltage a large grid base results. Under these conditions, large outputs free from distortion can be obtained. The filament is stout and a long life is assured. With 100, 200, 300, 400 volts anode potential, grid bias of approximately 5, 10, 20 and 30 volts should be used. This valve can also be employed as a low-power transmitter dissipating 10 watts continuously with perfect safety.

TYPE D.F.A.7.

The Mullard D.F.A.7 Valve is similar to the D.F.A.6, and due to its much larger grid base is suitable for the largest loud-speaker installations. It can also be used as a transmitter or modulating valve with voltages up to 400 on the anode.

TYPE D.F.A.8.

The Mullard D.F.A.8 Valve has a high amplification factor, and is suitable for resistance capacity amplifiers using high anode voltages. It can also be used very successfully as a low-power transmitter.

	D.F.A.6	D.F.A.7	D.F.A.8
Filament Voltage	4.5 volts	4.5 volts	4.5 volts
Filament Current (max.)	0.85 amps.	0.85 amps.	0.85 amps.
Anode Voltage	100-400 volts	100-400 volts	100-400 volts
Total Electron Emission	60 m.a.	60 m.a.	60 m.a.
Anode Impedance	4,500 ohms.	2,850 ohms.	15,000 ohms.
Amplification Factor	6.4	2.4	19.5
Mutual Conductance	1.45 m.a./volt.	0.85 m.a./volt.	1.28 m.a./volt.

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THE · MASTER · VALVE

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