



# T. & R. Bulletin

Incorporating

## The Journal of the Inc. Radio Society of Great Britain

(BRITISH EMPIRE RADIO UNION)



Vol. 3. No. 10. April, 1928 (Copyright)

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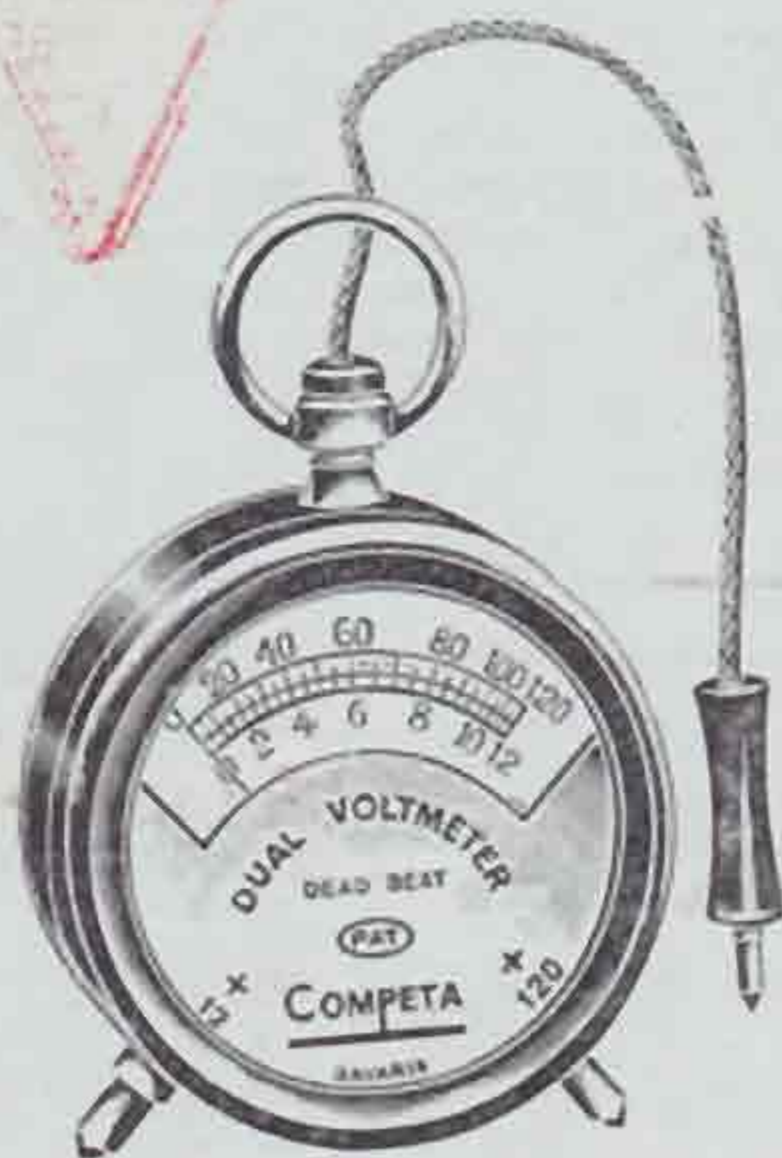
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APRIL, 1928.

Vol. 3. No. 10.

## SOCIETY NOTES

Members will be interested to know that matters of great interest are in being with regard to amateur transmitting licences. Correspondence has been passing between the Society and the Post Office authorities, while a special committee is engaged in dealing with the matter. We had hoped to be able to make some announcements in this issue, but until all outstanding questions have been carefully considered we have been asked not to be too premature in the matter.

\* \* \*

We still want more members. We have been keeping up a steady increase of some fifty to sixty new members a month, but since the last issue there has been a drop. Why is this? We hope change in editorship has not been responsible for this. Please remember that every month is a recruiting month, and it is every member's duty to bring in all his friends interested in radio matters. If they are not technically expert to join our corporate membership class there still is our associate grade.

\* \* \*

The March London Hamfest was like its predecessors, an enjoyable function. Mr. Exeter and Mr. Clarricoats are now getting so used to the organisation and management that they go about the work in quite a businesslike and unruffled manner. Upon this occasion Mr. Bradley was the principal artist, while Mr. Hinderlich was responsible for the ivory punching. After some songs of varied kind, the assembly took to community singing and when the forthcoming rebuilding of Pinolis commences the housebreakers will find the removal of the walls and roof around the Hamfest room an easy matter.

Under our Colonial news will be found a most interesting communication from Mr. G. G. Livesey, FO3SRB. In this he states that the South African Government have officially recognised the S.A.R.R.L. and have negotiated with them in the formation of an emergency corps.

We congratulate our South African colleagues on this honour and wish them success in their difficult task of maintaining communications over the miles of country which to us are outposts of Empire.

\* \* \*

We extend to the newly-founded Radio Society of Czecho-Slovakia our cordial greetings and welcome Mr. Vydra as their British representative.

\* \* \*

The Association E.A.R. has kindly presented the President and Hon. Secretary with honorary membership of that body.

\* \* \*

Mr. Hogg (2SH) has returned from Iceland, and on March 21 he gave us an account of some of his adventures there. It would appear that the setting up of a broadcast station is not such an easy matter, and Mr. Hogg appears to have had some considerable trouble with variations of power supply, etc. His sideline experiments in reception of other broadcast stations were interesting, 5GB being the best received, while other large European stations of higher power were extremely weak.

\* \* \*

The committee unanimously decided at their meeting in March that BRS numbers shall not be allotted to members of the associate class. It was thought that anyone wishing to report on



short wave reception must necessarily have some amount of technical ability and therefore should join the corporate membership grade.

\* \* \*

**THE MANCHESTER CONVENTIONETTE.**—We have just returned from a flying visit to Manchester to attend the first Northern Area Conventionette. It was a great success, and we must congratulate Mr. Wright and the men of the sturdy North upon the venture. The two meetings, one in the morning and the other in the afternoon, were well attended and great interest was taken in the debates. We were delighted with our reception and made a good many new friends. Upon every hand there was evidence of staunch loyalty to the R.S.G.B., and we feel that its interests are safe in their hands as far as the North is concerned.

\* \* \*

One important decision was made, namely, to hold monthly meetings in the area. We shall watch this experiment with great interest and give it every possible support. We have long had hopes of seeing the provincial areas having their own meetings and social gatherings, and this would appear to be the first step towards its fulfilment.

\* \* \*

One important point again arises in the provision of lecturers both for London and the provincial centres. It appears as hard as ever to get members to come forward and volunteer their help in this direction, and yet you always find members ready to give you their opinions and views both upon theory and practical radio work. What we want them to do is to come forward and give them for the benefit of all. If you have a pet theory, now is your time to let us know all about it.

\* \* \*

Though our Society is primarily connected with the scientific side of Radio, we have a number of members who are also kind musicians. Upon their request we have been asked to approach the B.B.C., through our representatives on the Wireless Organisations Advisory Committee, with the object of securing the approval of new musical compositions by a censorship committee of listeners before they are included in the broadcast programmes. There is certainly a need for such action, especially in view of some of the recent compositions we have heard by the younger school of modern composers, which appear to lack all system as regards form, melody or the simplest rules in orchestral treatment.

### Important Notice.

The Society wishes it to be quite clear that it cannot be responsible for the receipt of remittances in respect of subscriptions or other payments given to other members to pay into headquarters. All subscriptions and payments should be sent by postal order or cheque to the Hon. Secretary, Incorporated Radio Society of Great Britain, 53, Victoria Street, London, S.W.1, and made payable to that body. Nobody is entitled to receive moneys on account of the Society and, further, nobody should send any remittance whatever unless he receives the formal notification from headquarters showing the amount due. Non-conformity with these rules makes work at the office difficult.

### West Mid-Britain Area.

We have received three nominations for the appointment of Mr. D. P. Baker (20Q) as area representative. No other candidate having been put forward, Mr. Baker is therefore returned unopposed and will commence duties as manager of the West Mid-Britain area forthwith.

### To Correspondents.

Will members writing to headquarters please note the following points:—

- (1) Short letters are answered first. Long ones of three or four pages are put by until time can be found to read them. Ham language also has to be translated and should be avoided.
- (2) If you must send more than one sheet, please pin them together. The same remark applies to application forms, cheques, postal orders, contributions to the BULLETIN, etc., accompanying letters. Please write your name on the back of each sketch for BULLETIN articles.
- (3) Letters of appreciation are always gratefully acknowledged.
- (4) Suggestions and constructive criticism are cordially welcomed and seriously considered.
- (5) Letters from inconsiderate grouseers are filed away in the waste-paper basket.
- (6) Please don't write postcards in morse. It may be clever but they take time to translate.
- (7) Will proposers and seconders of applications for new members please note *once more* that they must write their signatures with a pen and not a typewriter or rubber stamp.

### Notice.

The short wave radiotelephonic station PCLL of the Dutch State Telegraph Service at Kootwijk will shortly begin to broadcast general information on Holland and overseas possessions. Co-operation of amateurs is requested for insertion of this news, which is sent out successively in Dutch, English, French and German, as much as possible in all local newspapers.

The transmission will provisionally take place every Wednesday between 14 and 15 hours (G.M.T.) on a wavelength of 18.1 metres (16,600 kcs.).

### Forthcoming Events

- FRI. APRIL 20. Lecture I.E.E., 6 p.m.  
G. Marcuse, Vice-President,  
Progress in Empire Broadcasting.
- MAY 19-20. South-Western Area  
Conventionette at Bristol. Open  
to all members.



# Automatic Control.

By A. H. FIELDING (EG-2SW).

Early this year it was decided that a visit to the States would be a good way of filling the summer vacation. The opportunity for doing some radio at the same time was too good to be missed so I decided to make a few tests.

Reports of R6 and 7 were being received from NU's about this time, so I accordingly arranged to take a short wave receiver with me and listen to signals from the transmitter at home on my way across the Atlantic.

The receiver was fairly simple; it consisted of a detector followed by two stages of L.F. amplification. The cabinet was lined with copper sheet to avoid interference from the ship's dynamos. The radio operators on board the ship turned out to be splendid fellows, and at once put up a single wire aerial running from the funnel top to the radio cabin. Owing to the danger of upsetting the D.F. receiver my aerial had to be placed close up against the funnel—hardly an ideal arrangement, but it seemed to work quite well.

So much for the receiving end. The transmitter was not so easy. In the first place, it being July, the tests had to be run about 03.00 G.M.T. in order to take advantage of the darkness.

The transmitter consisted of a Mullard 0/50 valve in a Hartley circuit fed by a Mortley 1200 v. rotary transformer running off the 230 v. D.C. mains.

It was found that the rotary had to be started by means of a variable resistance to prevent a sudden load which was liable to damage the brush gear. I have always been a believer in lighting the valve filament slowly, so this had to be attended to as well.

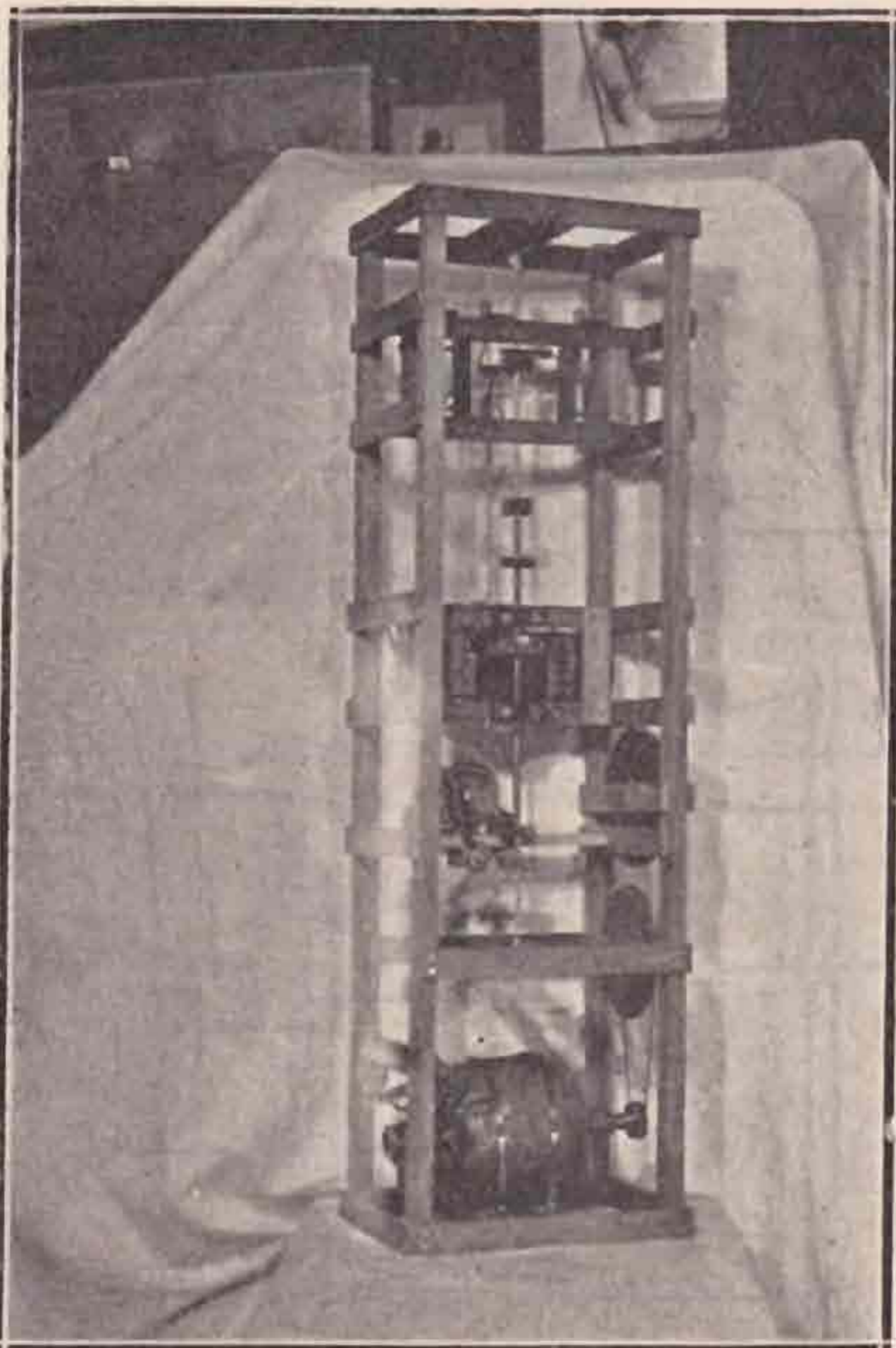


FIG. 1.

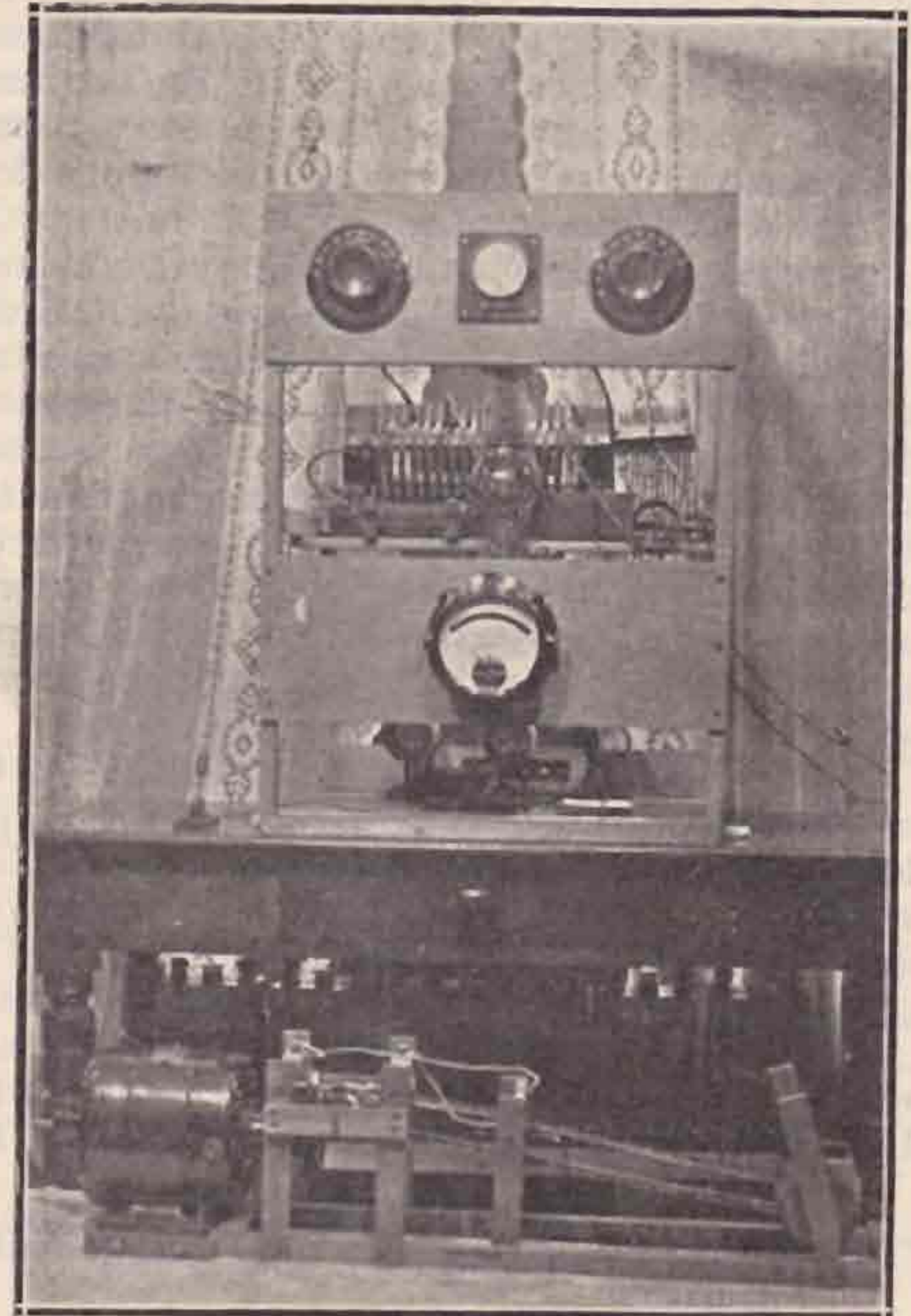


FIG. 2.

The family stoutly refused to climb out of bed on a cold night and start up the gear, so there was no other course open than to make everything work automatically and trust that it would work for a month without mishap.

A machine was therefore designed which filled all these requirements. The finished article changed over the aerial from the receiver to the transmitter; slowly lighted the filament; started up the rotary transformer and switched on an automatic key which sent out the station call sign.

This machine was controlled by means of two special clocks and commenced operation at a predetermined hour, switching off all the circuits after fifteen minutes transmitting. It was then all ready for the next test after the clocks had been reset sometime during the following day.

The machine consists of a wooden framework three feet high and about six inches square. Running vertically in bearings down the centre, is a  $\frac{1}{4}$ " steel rod upon which are mounted the various switch arms for controlling the transmitter circuits. A piece of wooden dowelling is attached to the top end and prevents losses by induction from the aerial switch contacts.

This rod is pulled down by an electric motor mounted at the base of the framework and working through wooden reduction pulleys, winding a cord on a small bobbin. A counterweight attached to the top end of the rod returns it to the normal position when the motor is reversed and releases the cord.



Fig. 1 shows a front view of the machine. The top section is the aerial change-over switch; the middle section holds an ebonite panel upon which are mounted two rows of brass segments which are connected to resistance elements. One set controls the rotary transformer, the other the valve filament.

Referring to the circuit diagram; at the beginning of a test the clock marked A closes the relay circuit; this switches on the starter motor which pulls down the movable rod. Attached to this rod are the contacts marked C, D, E, and F. Contacts E and F are both connected to the aerial and switch over from the receiver to the transmitter. Contacts C and D move slowly over the rows of segments cutting our resistances in the rotary and filament circuits respectively. Across the rotary is connected a motor which drives a strip of cinematograph film suitably punched into Morse characters between contacts connected in series with the H.T. supply to the transmitter. This auto-key may be seen in the foreground of Fig. 2.

As soon as the movable rod reaches the bottom a brass stop clamped to it flicks over the double pole double throw switch marked G in the diagram. Fig. 3 shows a close-up view of this switch in a half over position. This stops the motor and reverses its connections to the D.C. mains. Fifteen minutes later the clock marked B opens the relay circuit; the relay arm drops back to its original position, thereby closing the starter motor circuit. This

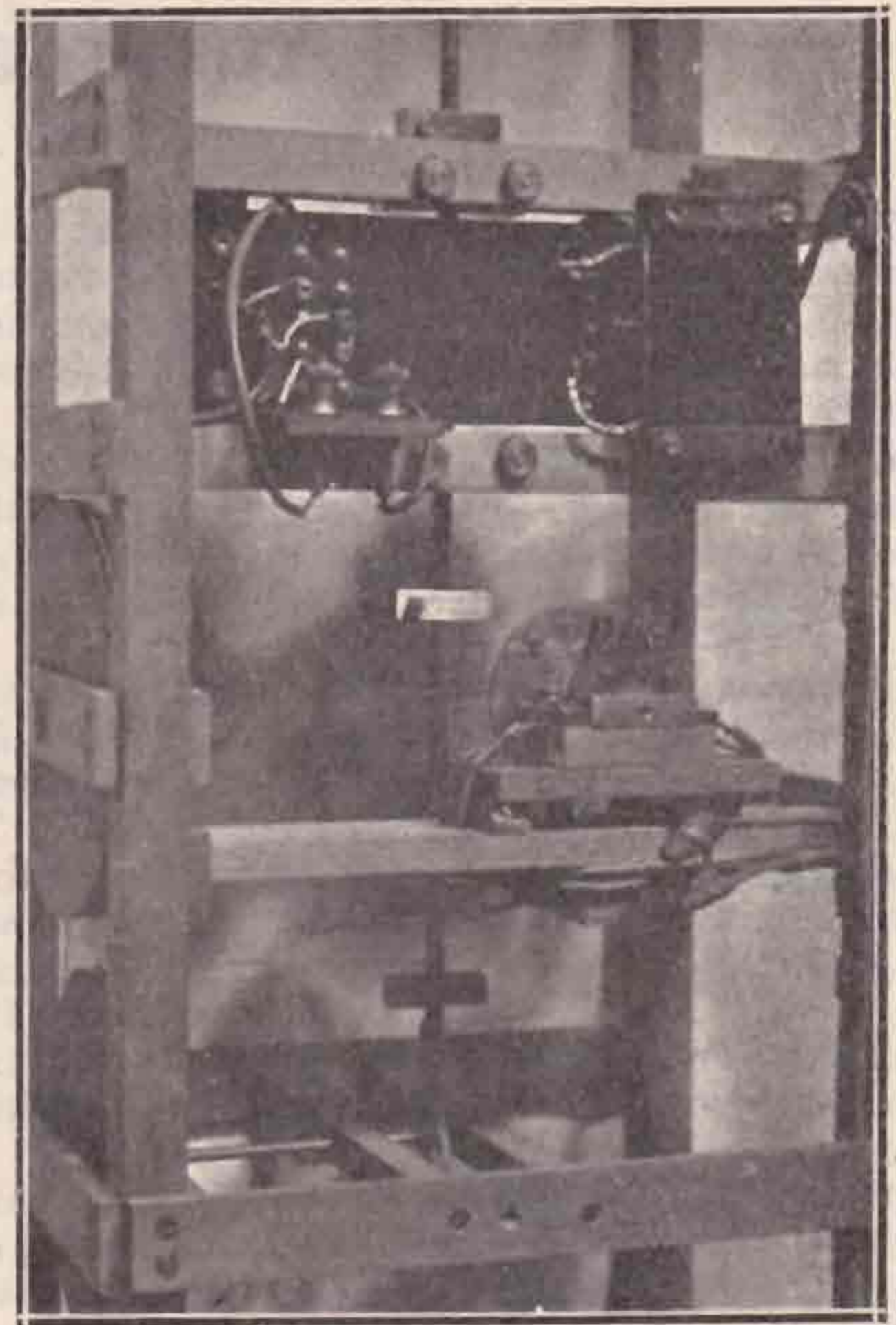


FIG. 3.

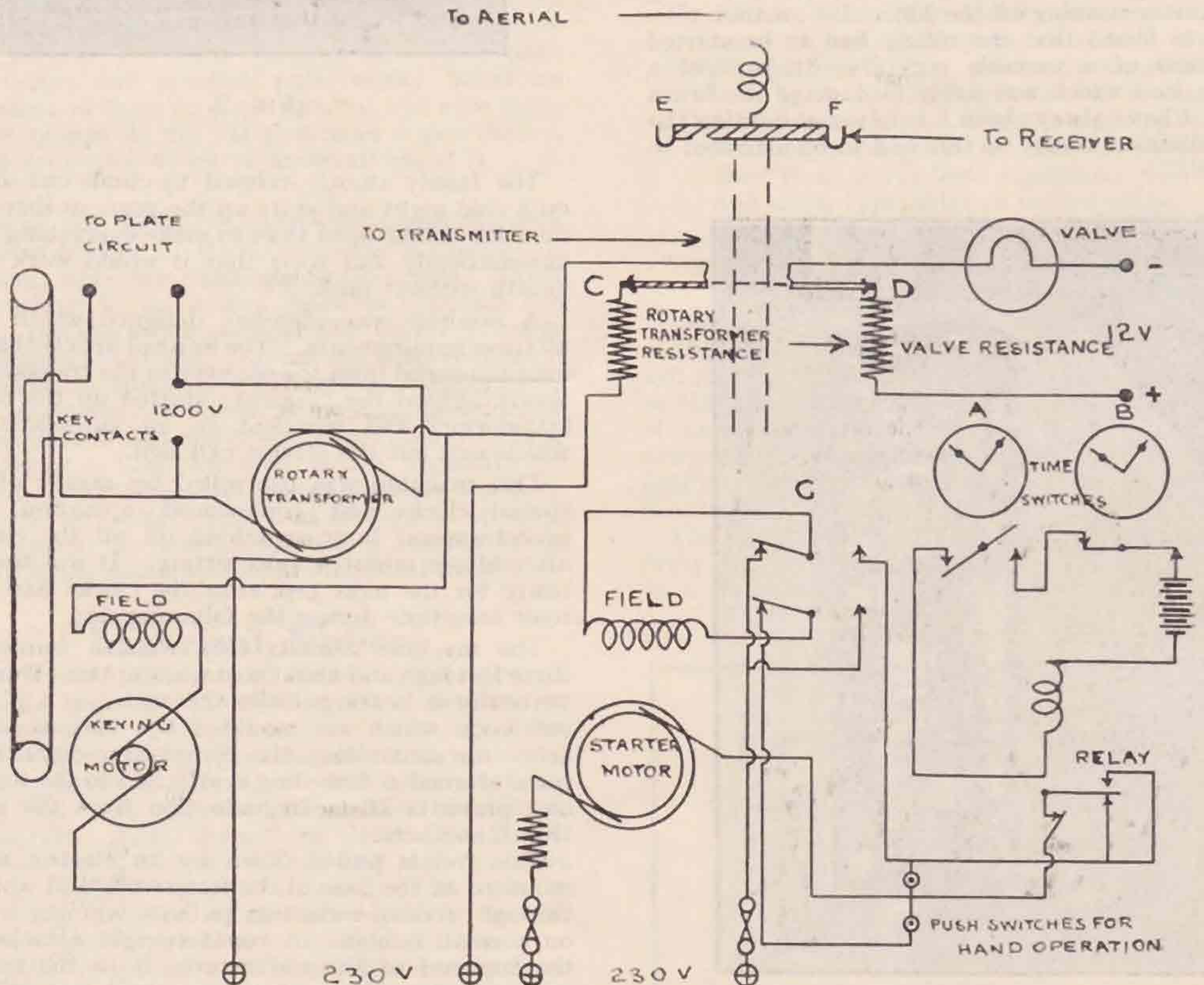


FIG. 4.



motor slowly unwinds the cord and the sliding rod is pulled upwards by the counterweight. When the rod reaches the top of its movement a brass stop attached to it flicks over the reversing switch G which stops the motor and reverses its connections ready for the next test.

To reset the clocks and relay circuit, switch B is opened and A closed. For hand operation when working at home two push buttons connected across the relay contacts are mounted on the receiving table and serve to "change-over" with a minimum of trouble. The whole machine is enclosed in a mahogany cabinet with a glass front.

This arrangement worked perfectly; signals were logged every night until my arrival in New York. For the first four days signals were also transmitted at 15:00 G.M.T. as well as during the night in order to check the daylight range; these were also logged without much trouble.

Now for the advantages of this machine. On a cold winter's morning the set commences to call OA at, say, 04:00 G.M.T.; it calls test for about five minutes, then closes down; an alarm bell instantly rouses the sleeping operator, who rolls over in bed, reaches for the 'phones, and tunes in for replies on the receiver which is located at the bedside. After his QSO he can press the starter button, mounted on the bedpost, and leave the set calling "test" while he warms his arms once more. When he has thawed out the hoar frost, he can press the "receive" button and tune in for replies.

My only excuse for making this somewhat elaborate change-over system is that I have D.C. laid on in the house, and therefore have to be careful how I start up the moving parts; those with A.C. are more fortunate.

### Side-Tone from Your Wavemeter.

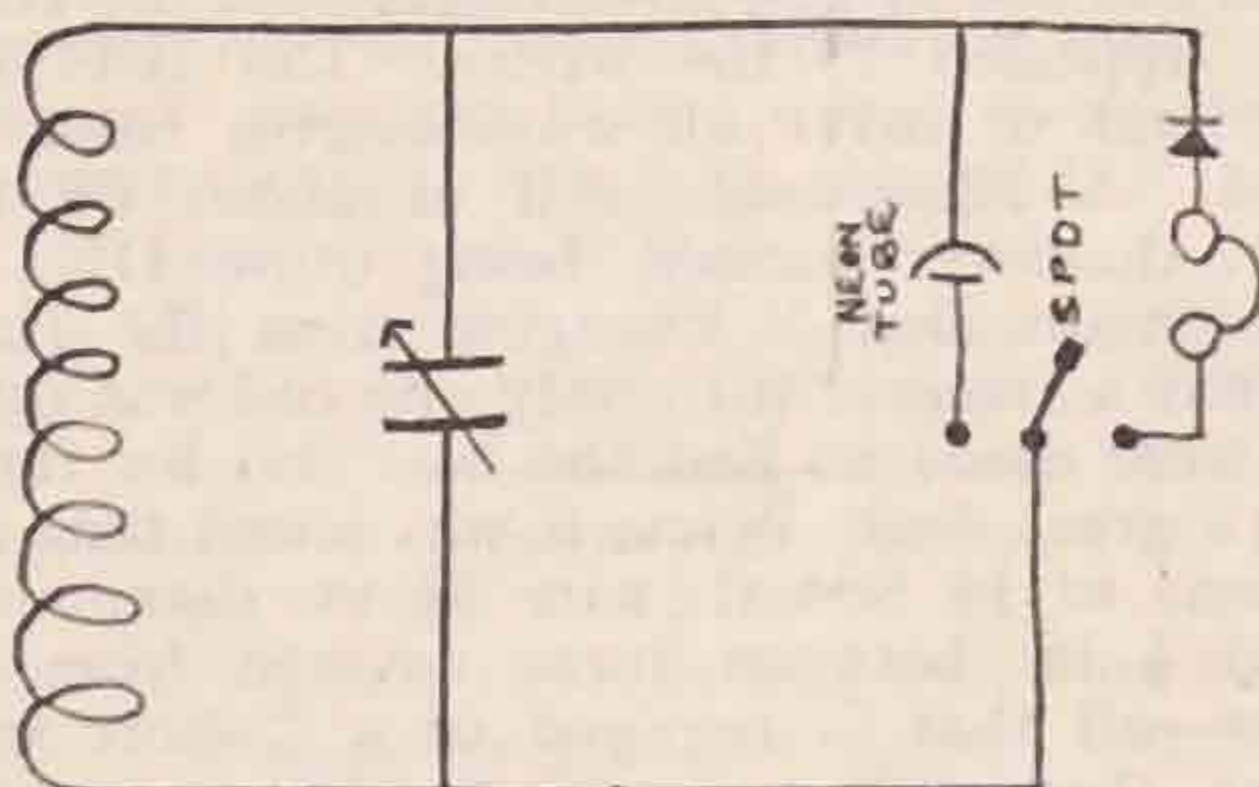
By R. C. HORNSNELL (2ABK).

Anyone who has an absorption wavemeter can successfully use same for checking the modulation of speech transmission.

It is more accurate than the usual listening on receiver, as it is, as can be seen from the circuit, crystal reception on the dead actual QRH.

The circuit is self-explanatory, a S.P.D.T. switch changing over the neon tube from across coil, to a crystal and 'phone circuit across same.

It is best to use the plug-and-jack method on receiver for 'phones, and also on wavemeter to facilitate quick change over.



## Pure C.W.

By ETHERWORM.

British QSB's are admired the world over, but nevertheless there are many amateurs who seem to achieve but poor results despite determined efforts to clean up the last remaining vestiges of "hum" which remain on an otherwise noiseless carrier wave. Particularly do we sometimes note a particularly bad noise when an amateur is attempting to transmit speech, and various reasons for this have been heard over the ether from time to time. For instance, the writer was somewhat alarmed on one occasion to hear a so-called amateur experimenter explain that he had removed his smoothing chokes so as to gain greater power!

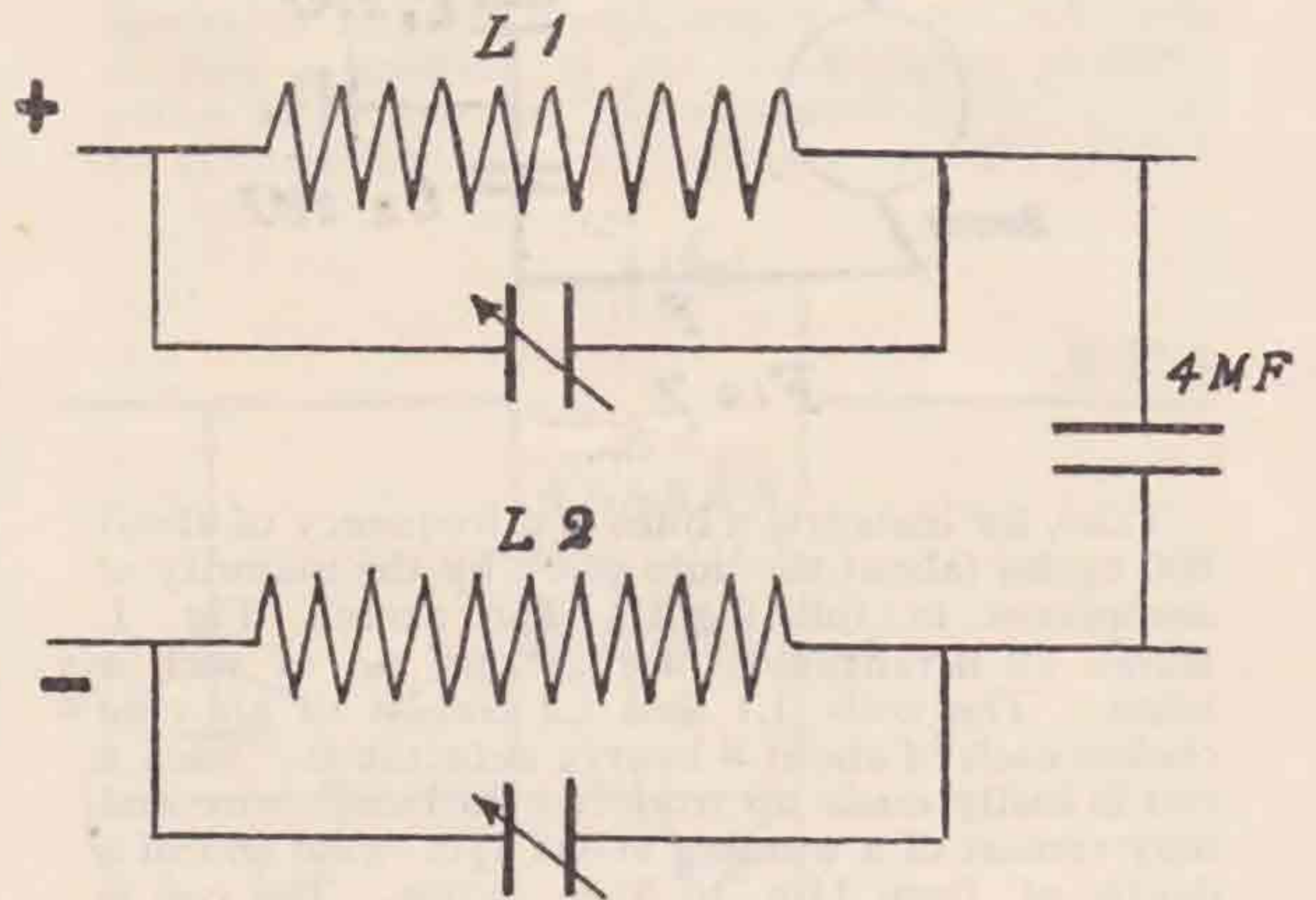


FIG 1

The ignorance which is sometimes displayed concerning smoothing circuits is really surprising and shows very clearly that many amateurs have devoted but poor attention to the problem and do not appreciate the fundamental principles involved. The efforts which we made to clear up the hum or ripple all too often resolve themselves into the application of brute "force filters" consisting of any old iron core choke and a few microfarads of capacity. In some cases the "chokes" consist of the secondaries of inter-valve transformers, and whilst we will admit that these might often prove efficacious in overcoming the hum, yet at the same time they also very often succeed in overcoming the power output of the transmitter, although to be sure they also limit the input. The reason for this is that such "chokes" have a very high D.C. resistance and the voltage drop is very considerable as soon as a few milliamperes are absorbed by the valve anodes.

To make a satisfactory job, however, the problem should be tackled from quite a different angle. Brute force filters are all very well, but a really respectable filter is far to be preferred both from the viewpoint of station efficiency and also from the angle of education and research.

The generator ripple has a definite frequency, as has also any hum that might be present on the local supply mains. Sometimes the ripple might



be of a composite character, *i.e.*, a high pitched noise will be superimposed on a lower note. This latter provides a pretty problem to the experimentally-inclined amateur, but the ordinary ripple may be quite satisfactorily disposed of by ordinary tuning methods.

It is not the intention of the writer to enter into mathematical formulæ on this matter but merely to indicate a simple method of tuning out the unwanted noise, for such noises are easily tunable, just the same as it is possible to design a filter or other circuit for the purpose of accepting or rejecting signals of a radio frequency.

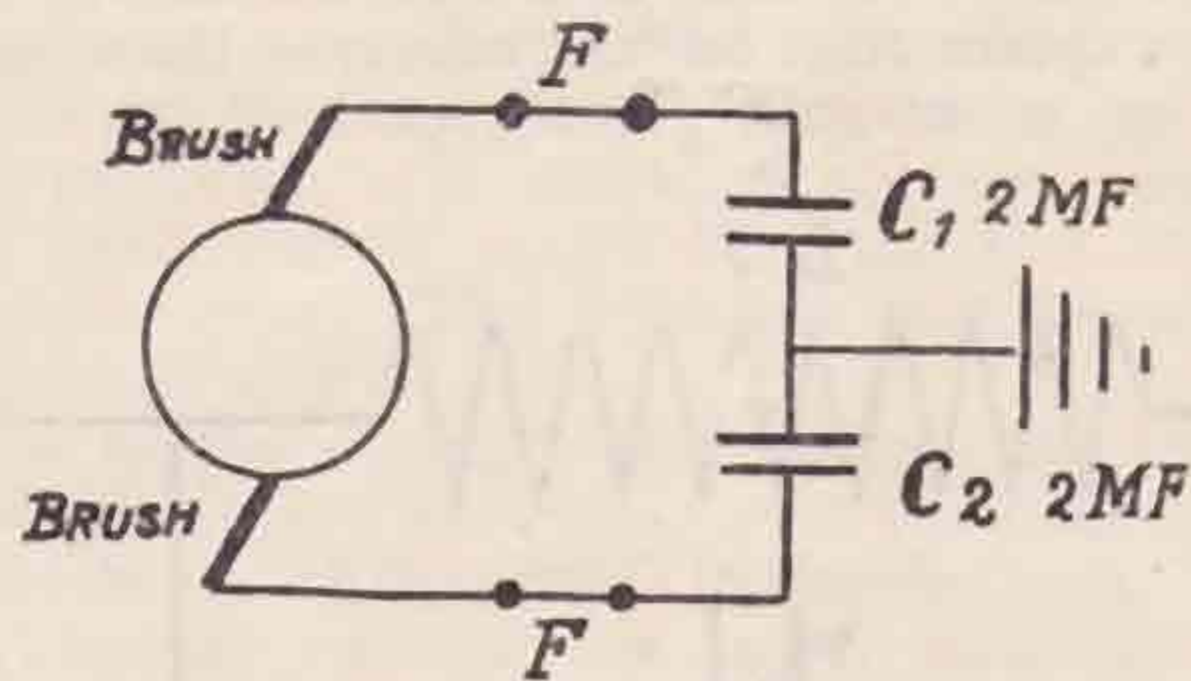


FIG 2

Take, for instance, a hum of a frequency of about 600 cycles (about the note given by the majority of aeroplanes in full flight). The sketch, Fig. 1, shows an arrangement for getting rid of such a noise. The coils L1 and L2 consist of air core chokes each of about 8 henrys inductance. Such a coil is easily made up from No. 38 D.S.C. wire and may consist of a winding about 1½ in. wide and of a depth of from 1½ in. to 3½ in. radius. The coil is purposely air core as this does away with the doubts which arise when iron is used, there being a straight line inductance at a considerably greater current load than is possible with iron cores. Across L1 is a high capacity variable condenser of a maximum value of .01 microfarads\*, and this is used to tune out the hum. It will be found that the tuning is fairly sharp and constant over a wide range of current loads through the chokes. These chokes have a low D.C. resistance and the voltage drop is therefore very small. Should iron core chokes be used, it would be found that (a) the efficiency of the chokes as regards tuning capacity would vary with the load; (b) the chokes are not sharply tunable.

The foregoing is only an illustration of the possibilities of this method and the design of the chokes will depend upon the frequency of the unwanted noise, the higher the pitch the greater the inductance required. Also harmonics sometimes need attention.

Noise in the D.C. generator can more often than not be cured with an arrangement as illustrated in Fig. 2. This is a simple gadget to apply, and incidentally will be useful to any member who habitually runs electrical machinery for the purpose of charging batteries or running lathes, etc., and at the same time has a receiver in his immediate vicinity. Those amateurs who listen on side tone or who work duplex may also find the idea of service.

\* Ex ship condensers of this capacity are available from some of our advertisers at a low cost.

## Notes on Short-Wave Receivers.

By F. APPLETON, BRS.92.

Just a few notes on a couple of receivers which have been used here as standard. The writer likes to stick to one receiver as far as possible, so as to get uniform results. The shunt-fed Hartley with a loose coupled aerial stood its own for over a year, and only recently has it been superseded.

Running over my log book, I've raked up a few notes which may be of interest.

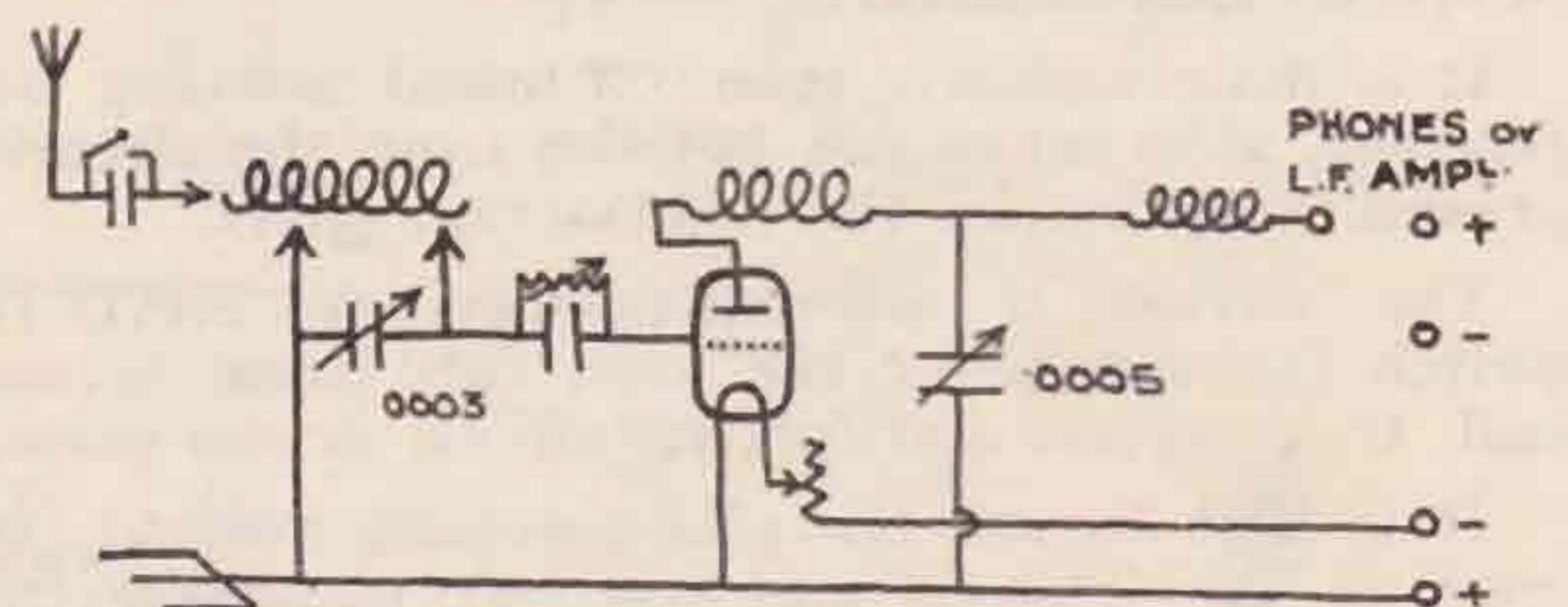
The coils used were secured by means of plugs to three separate supports (+4, +7, or 10 turns centre tapped coils 3 in. diameter made of 22 D.C.C. wire—four turns for under 30 ms., seven turns for 45 band, and 10 turns for 50-70).

The snag in this circuit here was the H.F. choke. Plug in coils had to be used, and 150 was suitable down to 40 ms. or so, but below that it was found impossible to oscillate unless this value was changed to 100. Also below 20 ms. only about a 75 would suffice. This is, I know, common, but I thought it worth mentioning. A variable grid leak was found also to be a necessity in spite of its bad name—the only suitable one has been a "Bretwood-de-Luxe"—a really fine leak, and providing one renews it every now and then, I think it leaves nothing to be desired; nine months seems the average life of the leak mentioned, and, after all, this is not dear.

Oscillation control by potentiometer was also tried, but although useful, I don't think it is worth the extra "control"; anyway it was soon scrapped here.

The A.T.C. was used for some time across the whole of the secondary coil, but the lowest QRH obtainable was in the region of 25 metres with this arrangement, although one, of course, got up higher.

Now for the best circuit used here—nearly a "straight" one—diagram herewith.



This has one or two advantages over the Hartley which appealed to the writer. The H.F. choke was found to cover all wave-lengths from 16-90 metres. A home-made coil of about 65 turns, 2½ in. diameter former, being quite OK. Also as the main idea in changing from the Hartley was that a receiver with only one coil was desired, tests were made to find the best coil for the job. After a great deal of time it was found that about 12 turns of 14 S.W.G. wire 3½ in. diameter and spaced ½ in. between turns covered from 16-90 metres—all that is required of a "short wave" (higher than this can usually be accomplished



with one's "B.C." receiver). The reaction coil will be OK for 16-90 metres, and consists of seven turns 14 S.W.G.,  $3\frac{1}{2}$  in. diameter, spaced  $\frac{3}{8}$  in. between turns. By the way, here's a tip that will save a lot of trouble: Instead of troubling with coil "stands" and their consequent messing about with loose plug contacts, etc., get a piece of ebonite rod 1 in. thick and to height required (10 in. here—this clears stray "capacity," etc.) and fix vertically to baseboard. Then get a piece of ebonite about 1 in. wide by 10 in. long and fix at right-angles to this, securing it at the end with a screw, preferably into the rod end. This gives an "inverted L" upon which the coils can be *rested*, connections being taken by means of useful spring clips. The piece of ebonite forming the top of the support should be quite 1 in. wide, as otherwise coils will "roll" and upset tuning. Coupling can also be varied easily.

This receiver oscillates easier than the Hartley, and a variable grid-leak is *not* essential, although handy. Although again, in the Hartley, only power valves worked as detectors, in this circuit any good (and, of course, suitable) valve is OK. The "super" detector in the 2-volt range here is "SPIS" *red spot*. Next to that the PM2 and DE6 are good stable tubes. Anode guise with a maximum of 25-30 volts on detector is used with these valves—very often only 12-15 volts are required, reaction thus being very smooth.

By the way, don't always blame the condenser for being noisy; trouble here just been traced to slow motion dials. These were a popular and efficient type, but all seem a wash-out on short waves. With gears, "crashing" is caused in "taking up," and with friction a continuous "background" effect has been noticed.

A counterpoise is "the goods" on short waves, of course. A comparison with a direct earth is interesting. On 2XAF, for instance—with counterpoise R7 with direct earth R3-4—also signals, seems more stable. This is with the circuit in question.

Another point is that, in spite of perverse opinions, the condensers are screened from each other, and from the operator to reduce hand capacity effects to a minimum, and this proves useful.

BRS.92 asks all to accept this in "Ham Spirit," and not get too critical over it. He welcomes suggestions and criticisms.

### Stray.

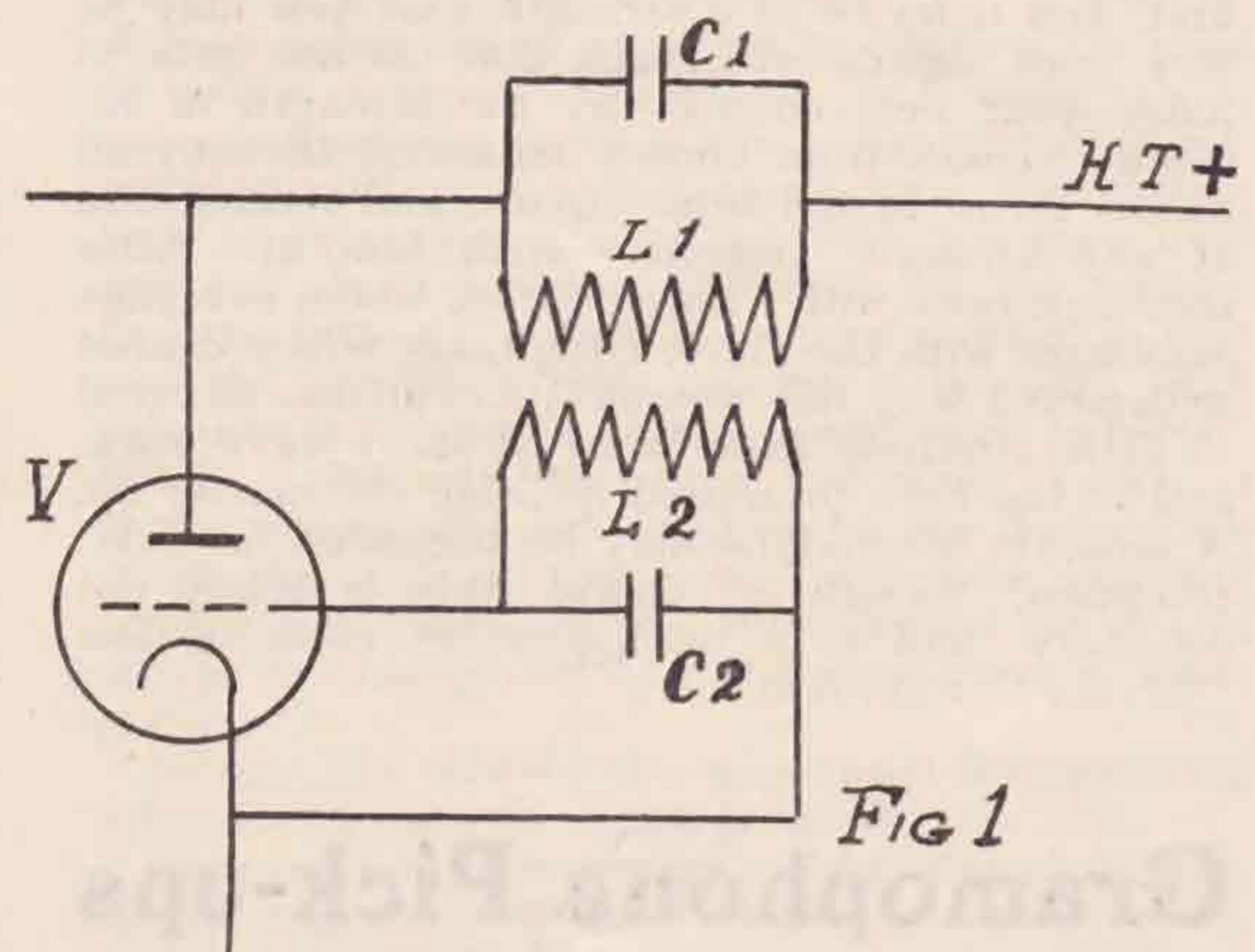
A little confusion exists between G.M.T. and G.C.T. (Greenwich Civil Time). 00.00 G.M.T. is our noon; 00.00 G.C.T. is our midnight. Amateurs all over the world use G.M.T. and G.C.T. indiscriminately, but always think of 00.00 as our midnight. A much better name would be plain Greenwich Time. Don't be alarmed if you see G.C.T.: read it as G.M.T.

Look out for A7Q and A6Q, both on 50 metres. A4X, at time of writing, is testing on C.W. from Cape Town in connection with the Emergency Communications Scheme, on Sundays at 10 a.m. and 6 p.m. *That is 12.00 (G.M.T.) and 20.00 (G.M.T.)*. A test message first on 80 metres, then on 35 metres, as soon as the change can be made in the wavelength of the transmitter.

## The Problem of Weak Signals.

By A. M. HOUSTON FERGUS (2ZC).

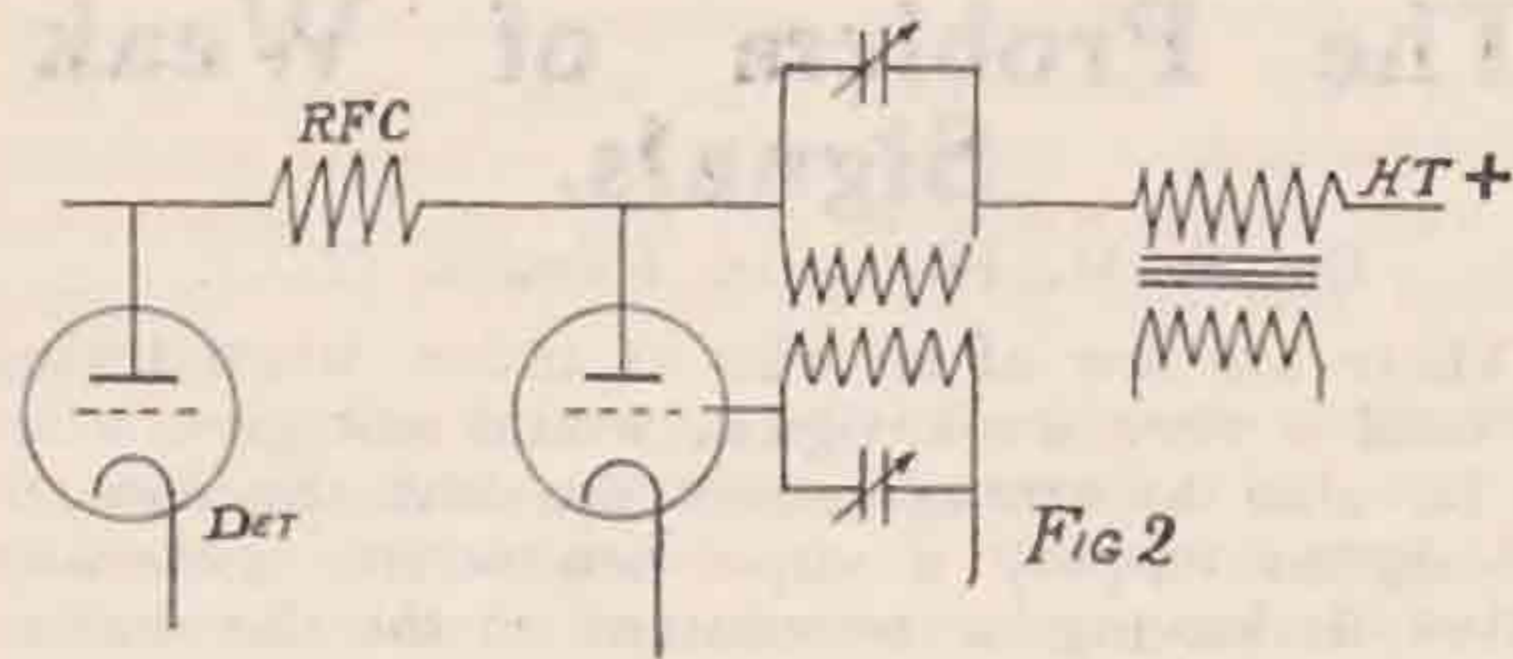
There are few of us who at times, when trying to read a very weak signal, would not give a lot to be able to strengthen it up, but the idea of having to employ a super-heterodyne generally leaves us having to be content to let the matter stay there. The use of more than two stages of low frequency has, as everyone knows, many disadvantages, and even two stages can try one's temper when conditions are none too good. It is an interesting fact that most of the very latest practices are little more than old ones, served up with modern modifications, and this same fact set the writer hunting round, and it did not take long to find a solution of the weak signal problem, which is to use the "super-regenerative" circuit in conjunction with an ordinary straight circuit.



The best way to do this, no doubt, is to have the super-circuit as a separate unit, as at times when a really strong signal is being received, it is convenient to be able, by means of a switch, to receive on the straight circuit alone. For the convenience of those not having the super-regenerative circuit at hand, if reference is made to Fig. 1, the details will be easily seen. L1 is of 1,500 turns and L2 of 1,250. C1 and C2 are each 0.01, and in the set under review are both variable. This is not absolutely necessary, but it has been found that by using variable condensers a much finer and smoother control is obtained. The valve V may be of any type, so long as it will oscillate, and is of course of the same voltage as the valves on the set, as the L.T. supply is common, as must be the L.T. negative. Fig. 2 shows how the circuit may conveniently be included in the circuit of the receiver. If it be not required to fit a switch, signals may be obtained in the ordinary way by switching off the valve V, and/or shorting out the coil L1.

There is one point to note, and that is, that the leads to the reaction coil may need to be reversed, but this can easily be tried. After testing this out on the 20, 30 and 40 bands, it was found that a signal inaudible on O-V-1 came in at anything around R7, and that any station of R5 could be





brought up to an unbearably loud R9 without the full scope of the super-regenerative circuit being needed. It has one disadvantage, and that is that one may be deluded into thinking a station is within easy reach of your own QRP range if it be overlooked that the super is in action, though if every ham used it the world would be at their beck and call on the smallest power. It is safer to pick up your station on the straight circuit first, and if he be of a strength that you may be sure your signals will reach him (as one gets to judge your own chances by the strength of incoming signals from known distances) then by all means throw in the super-circuit, and receive him at any strength you may wish him at. After thorough tests with Capt. Bolitho, whom everyone associates with the above circuit, the writer cannot understand why this wonderful circuit has received so little attention from hams on short wave work, and so has been prompted to bring the matter up. A separate heterodyne may be suggested for C.W. reception, though of course this is really not necessary, and is a refinement of more or less "luxury" reception.

## Gramophone Pick-ups

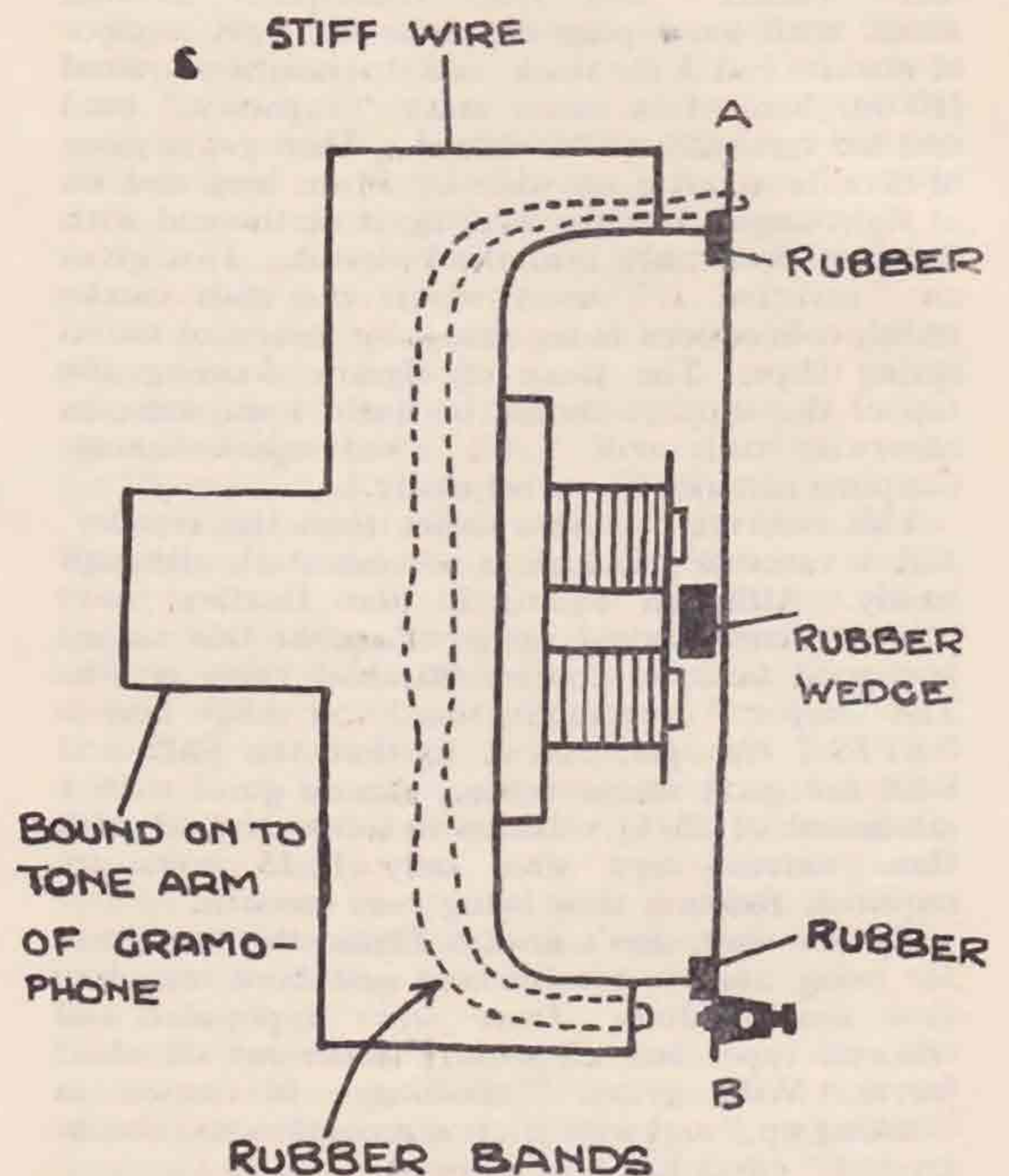
By G. A. CHAPMAN.

Having in my possession a gramophone, some electrically-recorded records, a good cone loud speaker and a passable two-valve L.F. amplifier, I decided to try the effect of combining them without expending any cash.

A single 2,000 ohm ear-piece was removed from a pair of B.T.H. headphones, and the diaphragm and cap taken off. Referring to the diagram, A.B. is a piece of "Meccano" strip with a small pillow terminal fixed to one end to take the needle. It is placed across the pole pieces with two small rubber pads between it and the edges of the ear-piece. It is then held on to the ear-piece by several strong rubber bands which are looped round one end, passed round the back of the ear-piece and then looped round the other end. Enough bands were used to hold the bar firmly. A wedge was now inserted in between the pole pieces between the bobbins and the bar. The ear-piece was then fixed to the tone-arm of the gramophone by a stiff piece of wire.

The first results, which were obtained before the last-mentioned rubber wedge was inserted, were rather terrible, but after the position of the wedge had been carefully adjusted (this is critical) the final results were very good indeed, if anything,

better than actual broadcasting. It may be found necessary (as in my case) to bend the bar slightly in order to decrease the gap between the bar and the magnets.



The whole contrivance did not take very long to rig up and is well worth trying. If the experimenter has not got a closed gramophone it is essential that the gramophone and the loud speaker be in different rooms as the pick-up is liable to make many loud, nasty noises which spoil everything. In my case I had the gramophone and set in my den, and the L.S. in the dining-room, and used the other ear-piece as a microphone to announce the records, shortcircuiting it when not in use.

I should be very pleased to hear from any experimenters who have been testing with pick-ups.

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# Joint Article on Quartz Crystals

By 2BFA AND 5MU.

During the past few months I have carried out what has been to me some interesting crystal control work with odd samples of quartz. The idea originated through finding out that quartz was formerly used in optical work. An optician friend with whom I had a talk had a look round his scrap to see what quartz (or pebble as he called it) he had. He gave me four lenses, all of good quartz. He also informed me that quartz is not now used in optical work; that it is valueless in this business, and that only an old-established optical firm would be likely to have any samples.

I have since ascertained from other opticians that they can from certain wholesale houses get small supplies very cheaply. In one case I paid 3s. 6d. for two blanks and two finished lenses, which is not at all unreasonable. I started with about 15 pieces of quartz and my first job was to find the best way of adapting them for c.c.

At the outset, let us warn the experimenter that quartz is harder than glass and far more brittle. It is useless trying to grind it on an emery wheel unless it is running true, and then only the edge of the crystal should be ground with the edge vertical and not horizontal. The quartz must be held between the fingers and not on a solid rest. Don't grind this way unless your piece of crystal happens to be too large. It is better to make a larger holder. To cut a flat crystal in half, a wheel glass cutter will do this, or a diamond can be used if it is available. To test which is quartz and which is not is easily done. Hold the crystal near an oscillating receiver with suitable coils. Reckon 3 metres per thousandth of an inch in thickness or 150 m. per m/m, which will give an approximate guide as to which coils should be used. A characteristic ring will be heard in the 'phones. Better still, put the crystal in a holder across the grid coil of the receiver. This will give louder signals. Some pieces will be found to give oscillations all over the place. This is because the two surfaces are not true to each other. A good piece will have harmonics with its own set of side tones. I noticed also that in a piece of crystal which has more than one point of oscillation when ground, the one that can be used is that which can be heard loudest when held between the fingers some distance from the coil.

In testing a crystal it may be found that it is quite good in its original form, but as soon as grinding is commenced all trace of oscillation will disappear until another thickness brings out an oscillation. Sometimes it goes down in jumps. Some pieces seem to be more constant than others. Some pieces may have two distinct frequencies, perhaps close together. In fact, each one appears to have individual characteristics on almost its own personality. One should not be disheartened if after a few hours' work the crystal seems to be of no use, because my experiments seemed to show that although a crystal may be weak when grinding is finished, and there may be only a faint oscillation when it is tried on the receiver it recovers after working in a tuned grid tuned anode circuit or a

Hartley, where the crystal takes the place of a tuning condenser and the coil tapped to the crystal's wave-length. In fact, the best crystal produced so far had this characteristic, and it compares in every respect with the best commercial product and will work very well with 1-16 in. air gap each side of it and no choke or grid coil.

Many different ways of grinding were tried before a satisfactory and efficient means was arrived at. The following is a description of the method:—

If the crystal is too large it should be cut in half, then ground square on a smooth, true emery, as previously described. Then a sheet of  $\frac{1}{4}$  in. or  $\frac{3}{8}$  in. plate-glass 15 in. square, and fine carborundum were used. A circular motion was employed and care taken to see that an even surface was being obtained. As much carborundum as will cover a sixpenny piece will be found to be enough to take down the surface at considerable speed. Polish one side before working on the other; one has then a flat surface, and this will be helpful when the grinding of the reverse side is started. A good polish can be obtained by cleaning the glass of every particle of abrasive and using about enough flour emery to cover a threepenny piece, working with water as before until the surface feels more or less oily. Then turn the glass over and put about ten drops of water on the surface. Dip the little finger into the emery powder so that just the top has a little dusting of powder. Rub this into the water on the glass and work as before. When it feels oily rub faster, and when it feels as if the quartz will slip from under the fingers run it off the edge of the glass; otherwise you will scratch it in removing it. By this time the quartz should be transparent and almost as clear as plate glass.

Note.—The side of the glass used for polishing must not be used for rough grinding.

Only sufficient flour emery should be used slightly to discolour the 10 drops of water. If a better polish is required, jewellers' rouge can be used in a similar manner to the emery.

So far we have one side dead flat and polished. To get the other side true a good micrometer is required, for preference one with metric markings. Start grinding with carborundum as before, but make sure not to tip the crystal. If the lens is of the convex type, measurements should be taken as soon as a ground disc about  $\frac{3}{8}$  in. diameter appears. Grind afterwards with a little extra pressure on the thickest side until the whole surface is true within half thousandths. Then use emery powder until it is dead true. As soon as a parallel surface is obtained, try the quartz in the receiver for wave-length and follow it up to the required frequency by gentle methods and even grinding with flour emery powder. When just a metre or so below the desired frequency the crystal may be polished on that side. Then you have the finished crystal. When measuring the crystal it should be washed and the hands well wiped to make sure that no grit gets under the mike. If rouge is used, the crystal should be scrubbed with soap and water, and it should not have a trace of colour in it or it may stop oscillation. I believe that optical quartz is what is known in radio as the T cut, which is the most difficult to get going. It also has a high temperature co-efficient, but has a better output when once it is working than the N cut. If it is used for a



standard wave metre it should be calibrated at a stated temperature and always brought up to this temperature before use.

I would suggest that before grinding a piece of quartz one should try the whole process of grinding and polishing on a similar shaped piece of glass. If you do not you may, as I did, spoil a good piece of quartz through insufficient practice, as one has to work to the 20/1,000 part of an inch to get a decent crystal. To get the crystal going I found that about 4 or 5 watts on a Hartley circuit was good, and after a little use this way it seemed to increase in strength until eventually it would work on any circuit. Before handing this MS. over to 5MU for details of how home-made crystals work, I would like to say I do not consider myself an expert on crystal matters, but just pass on information gleaned as the result of experiments to fellow radio enthusiasts, and hope their work will prove as successful, instructive, cheap and useful as my own.

In this half of the joint article I think I should commence with—How the idea arose. 2BFA and 5MU are in the habit of meeting every Thursday afternoon, and amongst various topics discussed, radio has a small part. During one of these afternoons 2BFA made the following remark, "Why not use crystal control OM?" "Reply, great idea! But, see the price list!" Nothing more was said concerning crystal control during that afternoon. On the following Thursday we met as usual, and after some conversation on various matters I was agreeably surprised when 2BFA produced from a pocket wallet a small piece of "glass" and handed it to me with the cryptic remark, "Quartz, QRH180; Try it out." That evening the old 180-metre transmitting coils were unearthed, dusted, etc., and finally the transmitter was perking very FB on 180 metres. Now for the quartz crystal. After a few minutes hard thinking (this was the first time that quartz was handled, and not a book could be found on Crystal Control work) the crystal was connected across the grid coil of the transmitter. Here the first snag was encountered. How could one tell if quartz was controlling? More hard thinking, and the milli-amp-meter was watched to see if it gave any indication of control. Finally, this method was adopted, the receiver was tuned to about 540 metres, and the beat note was heard very nicely; then a 60,000 ohm resistance was introduced into the H.T. plus lead of transmitter, and as the valve was oscillating weakly it gave a weak note in receiver, on pressing the key, which shorted the resistance, the weak note became strong. After various adjustments a spot was found where the weak note was found to be dead on the same wave-length as the strong note, very different to the usual mark and space notes. This seemed as if the crystal was controlling O.K. These tests were carried out on the artificial aerial which is used before any signals are put into the ether. The radiating aerial was now connected and everything in readiness for a test to 2BFA who had arranged to listen at 21.30 G.M.T. A few test calls were made, but either it was too early, or that "Slams" had forsaken 180 m. No replies were received; however, a letter arrived on the Saturday morning from 2BFA saying, "Test very successful, real c.c." Thus ended my first attempt at c.c. Curiously enough, this crystal

would not oscillate when connected in any grid circuit without the grid coil. Yet, after a few weeks connected across grid coil this crystal would oscillate weakly without assistance when connected in a Hartley circuit without a grid coil. It has since been ascertained that "crystals improve with use"; this information was derived from that excellent little book of Messrs. Quartz Oscillators, Ltd., entitled "Quartz." This "home-made" crystal was now used in a Hartley circuit as a control, the valve being a Mullard P.M.2 with 120 volts on the anode, the input being 1.2 watts. Using 10 watts in the P.A., this crystal was able to take control and really gave wonderful results. The aerial at G5MU is erected on two high fir trees and, as explained in the August BULLETIN, it is impossible to keep aerial from swinging in even the most mild wind. Every report from co-operating stations said "UR WVE DED STDI ES FB C.C."

Now a "commercial" crystal was purchased from Messrs. Quartz Oscillators, Ltd., and after some little time, during which every attempt was made to understand the vagaries of a real crystal, tests were made comparing the two crystals. Stations again reporting "FB CC no difference in the crystals." To be quite candid, it is quite probable that we found a good piece of quartz; however, a supply of quartz was obtained from 2BFA, and I commenced grinding on my own. After spoiling the first one, I eventually made four crystals that would control frequency when connected across grid coil of transmitter, so it is quite possible that these crystals may prove to be as good as those professionally made. In concluding this article may we say that this article is prompted by the novelty of producing crystals suitable for the control of radio transmitting gear, from spectacles that once adorned, possibly, a "Ham's" nose. We are not quartz specialists; when in doubt see 2QY, and lastly we are now aware that many better articles on C.C. have been written, so, brother hams, please don't write horrid letters concerning this to the Editor; instead, take pity on two hams who have ground off the tops of their index fingers.







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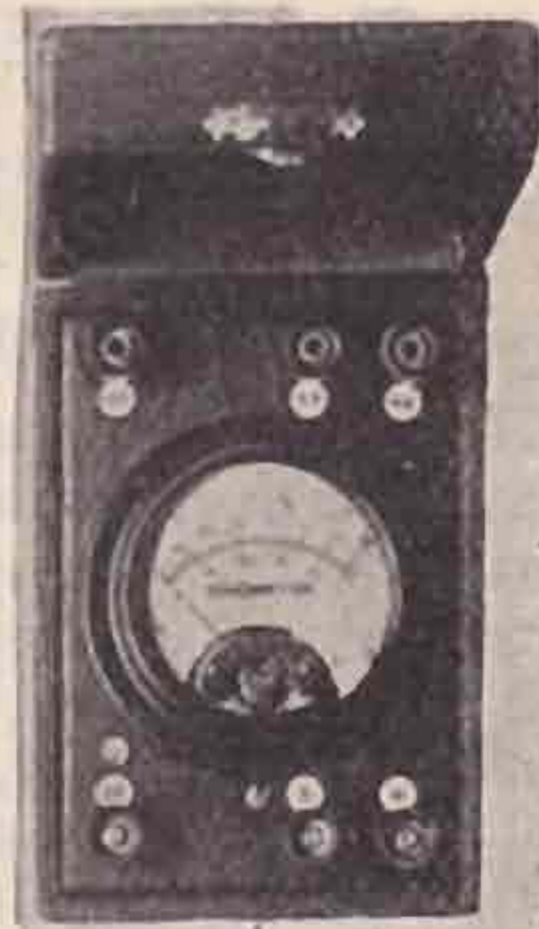
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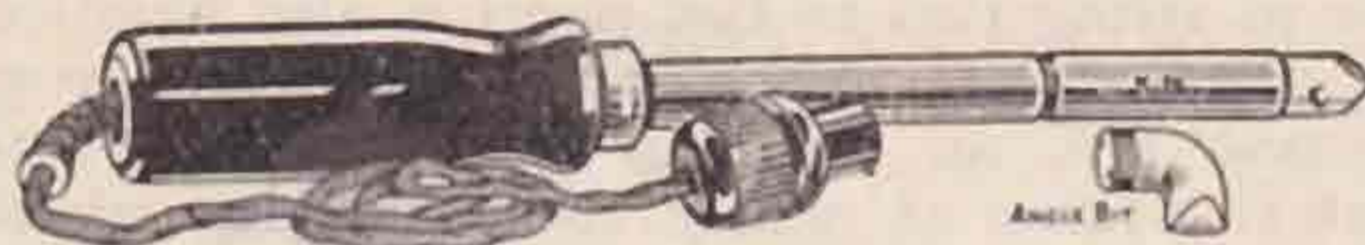
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# A Little Geometry of the Parabola.

By A. HINDERLICH (2QY).

Reflector systems for very short waves are coming into the limelight. They are of two types. A row of tuned aeriols with a row of tuned reflector wires behind it presents no constructional difficulty—but skill will be required to ensure that all the aeriols are correctly in phase.

Then there is the single vertical antennæ associated with a group of reflector wires arranged in the form of a parabola. Here the aerial is easy to erect, but the marking out of a parabola about forty feet across will be a new form of exercise for most of us.

There are three ways of drawing a parabola, suited to different circumstances:—

(1) From the formula  $y^2=4ax$ . This is the easiest when squared paper is available. If the "depth" of the parabola be  $x$ , then the "opening" is  $4\sqrt{ax}$ . The vertex is situate at the origin  $O$ , and the focus  $S$ , where the aerial must be placed to send parallel rays in the direction  $OX$ , is situate a distance along  $OX$  from  $O$ . To plot the parabola on the ground two tape-measures and two assistants with a right-angled board apiece would be required. If it is required that the reflector wires be situate at a definite distance from their neighbour, the method will prove very laborious. (2) If  $S$  be a fixed point (the focus)  $YY^1$  a fixed line (called the directrix), and we make the distance  $SP$  equal to  $PM$ , when  $PM$  is perpendicular to  $YY^1$ , then  $P$  describes a parabola. To plot the parabola on the ground requires two tape-measures, one tied at  $S$ , the other held by an assistant at  $M$ , who so places himself as to make  $PMY^1$  a right-angle. To place a reflector-wire at a given distance from the last, a piece of string tied to last point is also handled by the director of operations at  $P$ . (3) Given a direction  $OX$  an opening  $PQ$  and an accessible point  $O$  situate at nearly twice the desired depth of the parabola.  $OP$  and  $OQ$  must make equal angles with  $OX$ , but  $OP$  need not equal  $OQ$ . When they are unequal the diagram is not quite symmetrical, but the apparently clumsily-worded construction that follows gives a true parabola.

From  $P$  set off *any* distance  $S$ , in the direction of  $O$ , and from  $O$  set off the *same* distance in the direction of  $Q$ . Join the points so found. Repeat as often as desired. The lines so drawn are all tangents to the parabola.

The tangent at the vertex is the one perpendicular to  $OX$ , and cuts  $OX$  at the vertex.

Any pairs of tangents at right-angles to each other meet on the directrix, which is parallel to the tangent at the vertex.

The focus is situate as much in front of the vertex as the directrix is behind the vertex, and also lies on the axis  $OX$ .

Every tangent cuts both the tangent at the vertex and the axis  $OX$ .

The point of contact with the parabola is situate at an equal distance in front of the tangent at the vertex.

This method sounds complicated as described, but it is easily the quickest and most accurate way of sketching out a parabola, besides which only a ruler, plain paper and pencil is required.

## Social Notes.

### SOCIAL COMMITTEE.

The composition of this committee is as follows: Mr. Clarricoats (6CL), Mr. Bradley (2AX), Mr. Brookes (2CB), and Mr. Denny (6NK).

In order to make new members feel at home when attending meetings or other Society functions, this committee have arranged to introduce all new members who make themselves known to any one of us. A small lapel badge will be used for identification purposes.

We have received a very cordial invitation from Mr. Courtney Price (20P) to take part in the first South-Western Area Conventionette which will be held on May 19-20 at Bristol. It has been suggested that a charabanc party from London be organised; providing at least 15 will join the party this can be arranged. Failing this, perhaps those who possess motor cars would make up parties and help Mr. Price and his colleagues to make this conventionette the success it deserves.

Please let me know *at once* if you will help in this matter.

\* \* \*

With the near approach of summer our thoughts turn to the open air and *field days*. In London we have 200 or so active transmitters or B.R.S. members. Would it not be enjoyable to organise a London area field day?

If you think so, send me a post card suggesting a date (June or July) and the name of a rendezvous you would prefer.

\* \* \*

Convention arrangements are now in hand. The organisation of this will, in the main, be undertaken by this Committee working in conjunction with the London area managers.

If you intend to visit London for this function will you write to us at once so that accommodation can be booked for you—and finally, will all London members who have accommodation available let me know immediately.

We shall endeavour to make the Third Convention better than ever, but we must have the provincials here with us to succeed.

### S.W. BRITAIN CONVENTIONETTE.

I now have to announce that the Conventionette will be held at Bristol on Saturday, May 19. The Bristol Radio Society is giving hearty co-operation, and has arranged a Field Day on the Sunday (May 20), and its members have kindly offered to accommodate outside members to bed and breakfast.

The provisional arrangements are as follows:—Members arriving Saturday morning would gather at some convenient place in the city and meet members of the Bristol Society.

After lunch travel by charabanc to the P.O. Transmitting Station at Portishead (subject to official permission).

Tea at Portishead, followed by demonstration of interest to members at the Technical College, Bristol.

Dinner at a Bristol hotel, followed by an informal meeting. Dinner will *not* be a dress affair, and the



cost will vary with the number attending (say 3s. 6d. to 5s. maximum).

The Conventionette is open to R.S.G.B. members and O.W. and Y.L.'s from all areas.

May I appeal for your attendance and support. Please write when you read this, as time is getting short, either to me or to W. A. Andrews, Esq. (5FS), 167, Bishop Road, Bristol. The latest date for applying is April 30. Those attending will receive further information by post card.

Don't forget, OM's! This must be a good show, and can only be so with your support.

#### THE "CAMFEST."

On Saturday, March 10, the Cambridge gang broke out into a tea party fever which was the outcome of an idea originated by 5YX—the venue was "The Spring Hotel," Cambridge, where a good tea was served, consisting of "ham" sandwiches (hi), etc.

Quite a distinguished company were present, including all the Cambridge "æther shakers" and friends, also the following visitors were welcomed: EXOA30M, G2SH, 5MN, 5MS, 6BD, 6CJ, 6QB, 6XP, 6TR and BRS89.

After tea and amongst the usual QRM attendant at these functions, the party were interested in talks covering various subjects, viz:—"Ham Radio in Australia," by EXOA30M; "H.F. Amplifiers on Short Wave," by 6CJ; "A Simple Receiver," by 6TR; and "Transmitters for the Shorter Waves," by 5YK. Many interesting discussions were set up as a result of these talks, particularly that of 6CJ, which resulted in him being pressed to leave his demonstration H.F. receiver in Cambridge for a few days—it was then put into goo work at 5YX, where Australian Broadcast was recently received at great strength.

We are pleased to note that Sir Oliver Lodge was given the Freedom of Stoke-on-Trent, his native city, amidst scenes of great enthusiasm, on Wednesday, March 14.

### "Threshold Howling."

By A. BLAKE (2BWB).

The writer has been keenly interested in the recent correspondence on "Threshold Howl," having recently built a receiver (O-V-1), which produced this form of annoyance to perfection.

The circuit was varied from the usual Reinartz arrangement to throttle controlled Schnell whenever any variation of chokes, etc., was made, with exactly the same results for either arrangement.

Various chokes were tried from a "Pukka" filter to an 80,000 ohm anode resistance, and all produced the same result, namely, an L.F. growl which, on the loud speaker, could be heard all over the house. This only occurred on a sharply defined band of 31-36 metres.

GW11B's experiment of a power valve using 16 volts on the anode or a detector seemed to be more a palliative than a remedy but, following his idea of a detector grid howl, the values of the grid condenser and leak were changed—but the howl wasn't!

As soon as the March "Bull" arrived with G16JA's letter, a high-class British transformer 4-1 ratio was removed and a 4s. 6d. Frenchman 5-1 ratio substituted. Amplification and quality has suffered but the howl has entirely disappeared.

The writer is a theoretical babe, and on that score craves indulgence; but suggests that the primary of a good transformer, having a high impedance may become tuned to a frequency of, say, 20 cycles per second, and may give rise to a species of Armstrong super-regeneration by feeding this low frequency back to the grid through some small stray coupling, or possibly through the capacity of the valve itself.

EG6CY's article in the March issue rather bears this out if we consider his list of valves simply on the score of inter-electrode capacity and, naturally, the valve is less sensitive without a grid condenser and leak which would explain why he had not been blessed before with this pleasing (?) phenomenon.

The writer hopes that he has stirred up a regular hornet's nest of discussion on this subject, but that it will not take the form of trigonometrical annihilation by "size 8" brains!

## Contact Bureau Notes.

By 6YW.

It is with a "grand and glorious feeling" that I write the notes this month, as the response to the Editorial note and to our unknown friend, "Harry," has been very satisfactory. In fact, we have just about doubled the roll since the last "Notes"; this is very FB, but let's see if we can better this next month. I know a big number of real experimenters who have not yet joined up, and I should like to see some of the old hands giving us the benefit of their experience.

Just look at this list for the month:—G6RB, G6BT, G6BR, G6PI, G2CH, BRS76, G5VY, G5MO, G5WD, G5BQ, G6HP, BRS91, BRS98, BRS114, G6WD, BRS144, G2AUH, G6YK, G5PL, G6NK, G2SO, G6JK, G6AH, G6MN, G6GC, G6QT, G6TR, G6SV, EPIBK.

This makes a roll of 63 now, and all sorts of experimental work.

Gi6MU has given me some notes he made on a few tests with the transmitter, on dielectric and eddy current losses at radio frequencies.

The field was set up by a coil of 12 turns of No. 10 bare copper wire and which carried about 3 amps. of R.F. current at approximately 6.66 megacycles (45 metres), and the maximum R.F. voltage was 700. Various conductors and insulators were placed in this field, and the increase in power required from the oscillator was noted. This gave, approximately, the losses.

A 7-in. by  $\frac{3}{8}$ -in. iron bar placed axially inside the coil gave a loss of  $4\frac{1}{2}$  watts. A brass disc, 3 in. diameter by  $\frac{3}{32}$  in. thick was placed  $\frac{1}{4}$  in. from the end of the coil and with its diameter parallel to the coil diameter, and the recorded loss was 2 watts. Then a piece of slightly damped wood was placed in a similar position to the brass disc, but its dimensions were  $3\frac{1}{2}$  in. by  $3\frac{1}{2}$  in. by  $\frac{1}{4}$  in., and its losses were  $1\frac{1}{2}$  watts. Finally, a piece of bad "ebonite" (?) took the place of the wood, and its loss was 1 watt.

To quote 6MU: "Considering there was an apparent power of something like 2 kilowatts in the oscillatory circuit, these losses are surprisingly small. The true R.F. power available from the oscillator was 45 watts. The moral of this is that it probably does not matter very much having quite a lot of either metal or insulator fairly near a coil as long as the coil is well designed and its field reasonably small."

6MU would like to know what a well-designed coil for 45 metres is like, and suggests that some member of CB does a little work on these lines (and sends CB the results.—6YW).

These figures of losses are very interesting, and while not perhaps of laboratory accuracy, are quite accurate enough to give a close indication of the behaviour of the materials used. But, in my opinion, the most striking thing about this communication from 6MU is that it shows how a little ingenuity applied to our ordinary apparatus, will enable interesting results such as these, to be obtained, and I suggest that further work along these lines might be done by some of our members.

Similar communications to this one are earnestly



requested, and if you have any results of any sort or if you have come across anything peculiar, please send in a little note to the CB.

I have a good list of members now working on various aerial problems, and it has occurred to me that they should form a group and work together, with one station as a group centre. I know that quite a lot of correspondence has passed between several stations in the North of England on the subject of aerials, and (having participated) the points of view expressed and the discussion in general were, I know, very helpful to myself and, I am sure, to the others. I suggest that a member with this problem at heart, and having done work on aerials for some time, should volunteer to act as "group-centre" for aerial work, and that letters should be passed round the members of the group giving the arguments and theories of the writers. This idea is, in a way, actually in force at the moment, but perhaps it can be organised. The number in each group on a problem like this would, necessarily, be limited, but the number of groups need not be limited.

I know of several good men for "group-centres" on this problem, but "no names—no pack drill," so I will ask for volunteers, please.

At the same time, I think the time is ripe for a group on that problem of "threshold howling," so again—volunteers, please.

I suggest limiting the groups to a membership of six each, but any number of groups under a "centre" for a given problem.

Will members who wish to be allotted to a group for "active" work, please send a stamped envelope for the address of their "centre"?

As so many communications to CB are still going to my old QRA, may I repeat my present address: 59, Marlborough Park North, Belfast, N.I.

Later Note: G6LN will be carrying out scheduled tests on "skip" after March 29, for one half-hour before and one half-hour after sunset, and asks for reports from BRS stations on any of his transmissions in order to discover the directional effects of his present aerial, as well as for the observations on skip.

### QRP Tests.

Full details of the forthcoming tests are to be found on page 17 of last issue. Don't forget them; if you can't, or don't want, to go in for the transmitting tests, then take part in the receiving ones.

A word about the indoor aerials. An outdoor aerial, if tuned near the wave of the transmitter, may do a lot of harm in tests of this type by acting as a reflector and give one station an unfair advantage over others. We do, therefore, ask stations not to make use of such an advantage. All outdoor aerials should be lowered down to the ground; if this is impossible, then earth the aerial. In any case, the outdoor aerial should be kept as remote from the transmitter or indoor aerial as possible. This, of course, means that all members taking part in the transmission tests must use an indoor aerial for reception. If you don't already use one put one up now and get accustomed to it; many always use an indoor aerial for reception, as it often gives an increase of signal strength over mush.

G. W. THOMAS,  
5YK.

## Notes and News from the British Isles.

### NOTICE TO AREA MANAGERS.

*Commencing immediately reports revert to the old style. Area Managers are asked to use their discretion when sending in reports, and are asked to draw them up on the lines adopted in this issue.*

*Area Managers may appoint an independent representative in the London Area to attend meetings of the Committee and to vote on their behalf. A letter appointing a member to the purpose mentioned shall be addressed to the Hon. Secretary informing him of the appointment.*

*Members appointed by Area Managers for this purpose shall not already be serving on the Committee as Representative Members.*

### London Area.

By G. A. EXETER (6YK).

The fifth of our little "Hamfests" has come and gone, and I am sure we all enjoyed it just as much as the first. Will all the London men watch these notes for the announcement of our next, which I hope will take place very shortly?

Notwithstanding the fact that reports can now be sent in in the old style, we are not getting as many as I should like to see. Perhaps by the time these notes appear things will have altered, and I shall be kept busy writing up the reports for publication.

The Contact Bureau has been established for the purposes of publishing all notes upon experimental work, and Mr. Allen asks that all our men assist him in this work as much as possible, so please send him a card as he requests as soon as you conveniently can. Don't forget!!

### Northern Division.

By 6CL.

We are pleased to welcome into the area 6SC and hope to hear his sigs. very soon. Friend Buckingham (late 2AXL) is now radiating on 45 metres under the call 5QF. We were glad recently to see at 6CL Mr. Schreinbeck, of Bremen, who interested us greatly with his stories about the sword of officialdom which hangs over all unlicensed transmitters in Germany.

Reports are as follows:—

6PP, using only 4 to 5 watts on 45, has been QSO several NU stations. All of these contacts were made at night when QRM was at its worst. This speaks well of the signal sent out from this station. It was noticed that best results were obtained with the aerial coil coupled to  $\frac{1}{2}$  in.

5QF, using  $\frac{1}{2}$  watt on 45, has made some QSO's in EG. Hopes to QRO with 300 volts Pertrix batteries.

5CD has carried out some 'rhone tests on 150. No DX.

5UM has experimented with crystal M.O.P.A., and is bewailing the loss of three "bottles." We wonder if there is any connection between these events. This station also is on the 150 band and inquires where everyone is: (Try 45, OM—or is it 42 now?)

5GU is testing  $\frac{1}{4}$  wave Hertz (we presume 45 metre band) only 8ft. high, and has been QSO EP (R4).

BRS92 has been listened on 180—but what to, he does not say! We believe he is tackling the P.M.G. for an open aerial licence.

6SC is now in the area—his QRA being 28, Duke Avenue, N.10

6OT is busy on research. (What about giving us a talk at the I.E. one evening, OM?)

2AX has been QRT most of the month, but has worked several NU's on 23 at midday. Tests have been made with a Selfridge's bargain basement bottle—price 4s. First report was R5 from Nijni Novgorod, using 6 watts. The 2AX6CL portable call sign has been changed.

5AD and 5KU report that owing to violent QRM from certain QRP stations in North London it is impossible to QSO DX stations. Both stations have ordered a box of flashlamp batteries to overcome their troubles.

6CL suddenly went mad for four days, and worked a dozen NU's and a Canadian. Input was 9 watts, and all QSO's were effected between 05.00 and 08.00 G.M.T. A first attempt on 23 resulted in bad language only!



## Southern Division.

By 6PG.

6BB has been QSO all NU, NC1 and AG with usual 8 watts. Is testing aerial coupling with relation to skip on 45 metres. On 23 metres he has been unable to raise NU, but has worked FMSRIT several times. QRK R3 to R6.

2AI has done some good 'phone on 170 metres and worked 5QV and 6WI (Colchester). He has also got over his difficulties on 45 metres with hand generator. Best QSO's: ED, EF, EN, EB in daylight.

2BWR has nothing to report. He is thinking about trying television and has applied for a licence.

2NH is engaged in 10-metre reception, NU2JN being received several times. He is also trying R.F. amplification on 20 metres, with screened valves. Attends the usual 9-metre party on Mondays.

6WY has constructed a new T.P.T.G. with chemmy rectifiers giving 10 watts P.D.C. He has worked 18 European countries, NE, NC1 and 2, NU1, 2, 3, 4, 5, 8, and FM. He finds a 69-foot V.F. aerial F.B. Two NU8's have been worked on 20 metres.

5BQ is experimenting with measles. Hi! Please don't QSL, OM!

6HP has been testing chokes in transmitter. He has QSO'd 51 NU's (1, 2, 3, 4, 5, 8 and 9) and NC 1, 2. Has been perking on 23 metres and QSO FOA7L (R4). EH has been added to Europeans and he has thus worked all Europe. ER was QSO on 23 metres (R7).

6AP has been working with chemmy rectifiers and has QSO ED.

6PG has been very busy, but has done a little work on 23 metres. One or two "skeds" have been fixed up, but there is little to report at present.

## Eastern Division.

By 6LB.

6LB has devoted most of his time to tests with U.S.A. on 23 metres, and is trying to discover why contact can be maintained with the 8th district well after midnight when all other districts have faded out.

6UT has at last worked the NU after repeated efforts, and, unlike 6LB, finds his signals also travel well to the East, having worked a ship in the Dardanelles on 23 metres.

6TX has also raised NU after many months' intensive effort and is running a "sked" with NUSCLA.

6LL is dividing his time between 8-metre work and building a crystal-controlled transmitter.

## Western Division.

By 6YK.

We welcome a new man in the shape of 6CO. He reports working to date eight countries, best being Trieste on 4 watts, R4. He wants a "sked" on 23 metres on Thursday afternoons. Any offers?

BRS102 has been working overtime racking his brains for applying for his A.A. permit. He is very interested in Zincite Xtal oscillators and would like some dope on this. (What about applying to friend 6YW, OM?) He reports conditions on 30-45 metres very favourable during February and logged all Continents.

5VP reports that he has been off the air for two months, but his generator is being tuned up and will be on again shortly. He reports also an interesting bit of news, that in December last he was QSO J7DD (Zagreb) and test messages were passed to and from his colleague G2ASX who was there on business. 7DD was in touch by land line with G2ASX, and the test was very successful. (Vy FB, OM.)

BRS106 is another new man in this area and to whom we extend a hearty welcome. He has built a single-valve Hartley and hopes to compare its working with that of his previous set, which was a Weagent. He asks if some kind transmitter will adopt him as a second operator for Sunday work and would be very grateful for the opportunity to see what can be arranged. His address is Cambridge University Settlement, 131, Camberwell Road, S.E., and signs J. H. McCall. (What about it, someone?)

## Scottish Area.

Manager: J. WYLIE (5YG).

There is a slight improvement this month in the number of reports received, but in view of the excellent nature of DX and general conditions pertaining in February, the response is still very disappointing.

The attention of all stations is drawn to the reversion to the old style of reporting, which apparently is preferred generally.

The writer has had the pleasure of a visit from NC2CG, Jack Argyle, D.M., of the Quebec Division of the A.R.R.L. who is at present over here on business. Argyle is a very "live wire" in radio matters, and 5YG at least has enjoyed every minute of his visit. He (2CG) comments on the fact that receiving conditions generally are far better over here than in NC, as is instanced by the fact that while we frequently hear NC up to R6, they rarely, if ever, hear us over R3 or R4.

I am sorry to record that D.M. 6KO is once again in hospital. He has undergone a very serious operation, and I am glad to say is going on well.

One or two stations took part, I understand, in the A.R.R.L. contest, but have not thought it worth while to report on their activities.

### No. 1 District (By 2WL).

2WL has built a S/W superhet which functions very satisfactorily. No DX work has been done except to assist 5YG with schedules, etc.

5XQ has re-designed his aerial system, converting it to Zepp-Hertz, and as a result has worked NU several times with 8 watts input. Experiments on this system will be continued through March.

5YG is doing well on 23 and 45 metres. A Zepp-Hertz aerial system is used, and in this connection some very interesting facts have been observed regarding leakage of H.F. currents, over presumably good insulators. Of this more anon. NC and NU schedules are being kept on both waves. A large number of test messages were taken and returned during the A.R.R.L. contest.

6MS was on the air for a few days on his return from Australia, but has now left for Mexico and will not be heard again for a month or so.

6NX is getting out well on 45 metres, and has worked innumerable NU stations on that wave. He has also tried 23 metres, but was not very successful on that wave owing to fierce RX QRM from a nearby electrical motor.

### No. 2 District (By 6IZ).

2AP has developed an unconventional "non-QRM" circuit for broadcast wavelengths, with promising results. March will see a continuation of this work.

6IZ is engaged in the design and construction of a new 23-metre TX embodying the TPTG circuit and making use of paralleled L.S.5 valves. A new Zepp-Hertz aerial will be erected in March and the new TX tested on same.

### No. 3 District (By 5YG. Pro tem.)

6KO did a little work early in the month, but illness and an operation supervened, and he will not get home till the end of March.

## South-Western Area.

Manager: G. COURTENAY PRICE (2OP).

5VL has after several months' trials, got 23m. working satisfactorily. Finds results just now best from 2100 to 0100 G.M.T. for NU. About 50 QSO's there.

6JK too busy doing DX in air to do much in ether. Work in coupling of Hertz with view to QRP efficiency on 45m. NU1, 3, 4, wkld., rept R3. Input 9 watts.

6RB work mainly confined to A.R.R.L. tests. During the 14 days of these tests conditions were found good for NU contact and QSO was made on all 14 days. This station received 79 test messages and sent 76 reply test messages. From 19th to end of month on QRP two watts owing to breakdown, but all Europe worked on this power.

2YX amongst other things is looking forward to the Conventionette.

6UG same as 2YX.

5FS is making every effort to make the Conventionette a success. Reports visiting 5MQ, 6RW and 2XY.

6ZR. All Europe now worked on 2 watts. Hopes to join 90 metre gang soon. Forty schedules now going on 45 metres. Wants BRS reports from Scotland.

BRS122 using O-V-1 and O-V-2 between 17 and 100 metres. Will be pleased to co-operate with any station requiring reports. Has been working with 6OQ and 6AY.

BRS80 reports a number of schedules on 20-200 metres. Hopes to be transmitting shortly.

## Mid-Britain Area.

Manager: H. J. B. HAMPSON (6JV).

As the result of the recent Referendum our Area is now reduced to the following counties:—East to West Norfolk, Cambridge, Huntingdon, Leicester, Rutland, Northampton. Will sub-area managers please note that in order to "keep our end up" as an Area it is more than ever necessary to collect all reports possible and to forward them regularly and punctually by the 15th of the month?

While upon the subject of this important change in our organisation, I would like to express my best thanks to all who have helped to develop the old Mid-Britain Area since its formation. Here's a handshake, too, to those whose feathers have grown until they prefer to fly their own course. We all wish them the best of luck and we believe that they will not forget the old Mid-Britain Area and the friendships which have been made beneath its wing.

May I be permitted to add one personal note? It had been my intention to resign from the Area management in the event of division. On reflection I have decided to complete my term of office until next Area Election, since this appears to be the wish of the majority. Meanwhile members would do well to discuss and decide upon a suitable manager for next year, and because Cambridge is now easily the first county in importance I would suggest that Area headquarters might well be moved there.

The remarks made in last month's notes regarding this year's Conventionette are of course cancelled. Perhaps we could arrange a little meeting at Cambridge. Has anyone any suggestions?

Congratulations to Cambs. and 5YX in the "Camfest."

Cambridge (reports to 2XV).

5YK has been continuing experiments with M.O.P.A. and is convinced that it really is "the goods" for 20 and 40 metre work. He has had interesting QSO with OZ and OA; research on 8 metres is progressing favourably here.



6CR has been busy on 23 metres, and has already hooked a few Yanks on this wave, QSO in one or two cases being as late as 11.45 p.m. G.M.T.

5YX has made no definite report, probably due to being busy organising the "Camfest" and working multitudes of Yanks, etc. It is rumoured that a vertical antennæ may appear here soon.

5JO has been busy clearing up his QSB with some result; he is now complaining about being "covered in blind spots"—we hope this disease is not catching—these spots do irritate OM, don't they?

2XV is still QRP here waiting for a T250 bottle but on 7 watts telephony has been worked at R8 strength by Belgian 4CK for over an hour with great pleasure as the operator of this station speaks excellent English. A few Yanks and Canadians have also been worked on 23 metres, including a few test messages during the A.R.R.L. test period.

#### Northampton (by 6TR).

BRS89 has done some excellent reception of Pacific Coast NU stations.

6TR expects to be working on the 20 metre band by the time these notes appear.

2CH is awaiting the arrival of a crystal. He is working a M.O.P.A. and has experienced difficulties with unsteady D.C. mains.

#### Norfolk (by 6JV).

2BWB has been rebuilding and is now turning his attention towards 8 metres.

6JV has merely kept various schedules while building a portable supersonic receiver.

#### Warwickshire (by 6CC).

2YX.—Latest experiments have been with a vertical aerial of 20 feet of copper tube. Results:—Best DX has been with Bagdad.

6CC.—Latest experiments have been with building a new transmitter. Intentions to prove that steel masts are a disadvantage. Results so far prove this!!!

## Northern Area.

Manager: S. R. WRIGHT (2DR).

My first duty this month is to call attention to the fact that the form of sending in reports for insertion under this heading has reverted to the old method.

I hope that the reports will be sent in as briefly as possible, as the time taken to select items for publication from several pages of non-relevant matter is very considerable. Therefore, have a heart, you fellows, and send the report on a separate sheet of paper. This does not mean I don't want you to write a letter! I am always glad to hear from any ham in the area or out of it, but not mixed up with the month's report! Kindly remember the stamp if you want a reply.

I hope the change in the method of reporting will appeal to the majority of hams, and the number of reports will increase accordingly. Send them by the 12th of each month or they will be too late.

#### Yorkshire.

By 2DR.

6VJ is trying a V.F. Hertz aerial and is taking observations on skip-distance. The input is 5½ watts to a T.P.T.G. circuit. NC1BR has been worked also NE8AE, and both gave him R5.

5UB is testing aeriels on 45 metres, also different methods of keying. Schedules wanted here, while a 23-metre transmitter is under construction.

BRS107 finds swotting morse not as easy as it sounds, and is carrying out work on 8 to 20 metres. There are not many about on 8 metres, he says, nor on 90 metres, and asks why more hams don't use the 90-metre band. I agree with him.

6DR continues his aerial tests on 23 and 45 metres, but is not having much success in the matter of QSO's on the lower wave. He has worked one new country this month and "crossed the pond" seven times.

2DR has got some good fading measuring gear in working order, and the results from some of the stations under observation are illuminating.

2YU is doing wonders with his small set, and it speaks volumes (literally!) for the semi-vertical V.F. aerial in use here, for 2YU gets across the pond very consistently. His pure D.C. note has a good deal to do with it, I think.

6XL hopes to get going again shortly, and has rebuilt his S/W receiver.

I should like to know what has happened to the rest of you.

The following failed to report:—5SZ, 2XY, 6TY, 6BR, 5US, 6YR, 6WD, 5CX, 6IG, 6OO, and a few others.

#### Lancashire.

By 5XY.

2QV has been off the air owing to illness, but had a visit from 5MQ and worked five NU's in a very short time when the input was under 8 watts.

5JW is continuing Zeppelin aerial experiments, and becomes more and more convinced it has directional properties. He says he can touch U.S.A. any night, but nowhere else. Has anyone else noticed this about these aeriels?

5XY has not done much work this month but raked up a Zedder one night to prove the set was not quite dead. What about a "black list" for your area, OM?

Wanted.—Reports from Lancashire!

#### Cheshire.

By 6TW.

2SO reports nothing doing owing to business QRM.

BRS98 wishes to co-operate on skip distance and fading tests with any other station similarly interested.

BRS126 is ready for tests with anyone.

BRS127 also wants schedules with other stations.

5BR working mainly on 90 metres with T.P.T.G. 5-7 watts. A fundamental aerial is used. Heising modulation employed when on telephony. He finds this wave very satisfactory for working G's, but experiences a fade out after 01.00 G.M.T. (Gone back to bed, OM!)

6TW is trying to solve the problem of why he and 2SO cannot QSO on 45 metres. The distance is about 20 miles. All kinds of aeriels have been tried, but so far without any really satisfactory results. Any suggestions anybody?

NOTE.—Will any of the Cheshire hams interested in a meeting during this summer please communicate with 2SO or 6TW?

#### Northumberland, Durham, Cumberland and Westmorland.

By 2AIZ.

6GC will be on the air shortly before these notes appear—on 8 and 150-200 metres after a complete re-build.

6QT finds work on 8 metres very interesting, but there are few co-operators on this wave.

#### Derby, Notts and Lincs.

By 6MN.

6LI reports from France that his QRA from March 10 to May 1 will be Stourton Hall, Horncastle, Lincs.

5BD has had negative results from his Hertz experiments and is experimenting in coupling coils. He raises NU nightly and has been across over a hundred times in 13 weeks. He also raised NU after much trouble on his 23-metre Hartley set. Now building T.P.T.G. This station works on 90 metres every Monday evening.

BRS103 reports bad conditions for reception.

2ABI, after rebuilding his Reinartz O-V-1, gets down to 20 metres and thereabouts very satisfactorily.

6LN is experimenting to find the best value of grid leak of a given valve. Best DX, ETPZO (R4). Schedules are being fixed with BRS98 to investigate nightfall fading, and more stations are wanted for co-operation in this work. (Try BRS126 and 127). Normal power in use here—2.4 watts.

6MN is observing nightfall fading effects with V.F. full wave Hertz aerial. He gets a peculiar trouble of being reported bad QSS at 600 miles, although his 3rd harmonic is dead steady (presumably at his end, not at 600 miles!).

## Southern Area

Manager: L. MEYER (2LZ).

5UY has been experimenting with 45 metre fone on Sundays.

6NZ has changed QRA and has now A.C. mains. Expects to drive his hand generator with motor. New arc aeriels being erected. Opinions are wanted on valve and chemical rectifiers.

5QV still very active on 23, 45, and 177 metres, has worked fone with Canadian 1AR. Good speech is being put out on 177.5 metres.

2TO has just concluded another trip to the Continent. His YL has turned into his OW. Best of luck OM.

2MI and 2MJ have raised the States on 45 metres.

6VV is starting up again on 150-200 metres.

2LZ has burst forth again on 150-200 with good fone using an Amplion "mike" and says he may start up on 23 again soon.

2ABK has not done much, except to test a new receiver and transmitter (portable) at 2LZ.

BRS91 has been carrying out tests with a pick-up made from a B.T.H. earpiece with excellent results.

2HJ has done very little except QSO with ET on 45 and EC and FM on 23. Hopes to be more active next month.

I have pleasure in recording a visit to 6YL, and found that the station had been very active, judging from the QSL cards on the wall, the outfit is very neat and quite a treat to see, no hay-wire, as is usual with OM stations. 5OK and 5SN are starting up television!!

## Northern Ireland Area.

By E. MEGAW (GI6MU).

Conditions for DX and particularly for NU have been exceptionally good during most of the past month and many of the GI's have done excellent work on low power. At the time of writing, however, 40 metres and 30 metres seem to be rather falling off though "20" is steadily improving as the days get longer.

GI6WG has brought up a point which is worthy of mention here: he suggests that we should cut out as much as possible of the superfluous "vy best 73's and best DX and good luck and hope CU agn" sort of thing which is often included towards the end of a QSO; the writer thoroughly agrees with this and recommends it to the notice of all members as he feels that, although abbreviations have their place and their uses, much of the kind of thing referred to above is quite unnecessary and often rather childish.

Now for the individual reports:—

5WD is trying an aerial—counterpoise system and thinks it better than the "Hertz"; he has worked many NU's in the 1st, 2nd, 3rd,



4th and 8th districts with the hand generator, including 11 in one night.

6WG is also using an aerial with counterpoise; he has worked about 26 NU stations and has had several R6 reports from them.

5MO has worked the 5th district on 23 metres as well as several nearer districts with a watts chemical R.A.C. (Congrats OM!). He wants schedules with NU on 20 metres.

6YW has been trying a "phase-change" aerial on 23 metres and has worked several NU's; on 32 he has worked the 2nd and 8th districts and AQ1LM again, also SFV 250 miles S.W. of Madeira, and, last but not least, he has been heard R3 by AI2KX!

2CN has been seriously ill but we are very glad to hear that he is now O.K. again; he has just started tests with a new T.P.T.G. and C.F. Hertz; he has had two reports of R7 near the Black Sea.

2WK hopes to have his generator in operation with a "P.D.C. note" very shortly.

2IT is working on a new C.C. set to which he will shortly add a T.250 power stage with C.R.A.C. plate supply; he has worked NU6UF in daylight on 23 metres.

6TB has been very busy but is trying occasional tests with a condenser microphone.

5HN is now at a new QRA: 29, Colinvew Street, Springfield Road, Belfast. He is still using very low power.

6HI has been experimenting with a remote indicating aerial ammeter and would be glad of any reports on his signals.

6MU, being infected with the prevalent spirit of low-power DX, managed to raise and work AI2KX with an input of 1.9 watts, signals being reported R4 to R5.

It will doubtless be of interest to the many amateurs who have heard and worked AI2KX to know that Mr. Drudge-Coates is returning to England in April.

## Irish Free State Area.

By COL. DENNIS (GWL1B).

Reports received direct have been rather better this month, and I hope that next month there will be still more.

During the past six weeks DX conditions have been very good, and, with the exception of three nights during the recent spell of snow, they continued so. As individual details are barred I will summarise the position by saying that many of us have worked more than 40 transatlantic stations during that period and without keeping unduly late hours. Also there are no GW stations over 10 watts, and some of the most successful were using H.T. from batteries of 300 volts or less. I wish to place on record the following remarkable achievement.

On February 26, at 20.00 G.M.T. 18B, using an input of 4 watts from H.T. accumulators of 200 volts, worked OA3KS, his sigs. being R2 to R3. We are all now hoping for SB's!

Now for reports.

12B getting good transatlantic reports on both 45 and 23 m. Testing 'phone on 5 watts, PM6 valve, grid modulation, and getting good reports from G stations.

14B is getting very good results with new transmitter, using 300 v. H.T. from batteries. Includes two 4th dist. N.U. stations amongst many others worked.

18B has rebuilt his transmitters, using H.T. from accumulators pending arrival of mains. Schedules kept with NX1XL and FE1FS. NU1BLF worked with 2 watts input.

19B is again in the air with 4 watts input. Experimenting with a stage of H.F. amplification in his S.W. receiver using screened grid vlv.

14C practically QRT, being busy with exams.

16C worked his first NU with a input of just 2 watts.

17C busy with exams, but keeping schedules with AQ1LM on 23 m. and with ED7JO on 90 m. On 45 m. reported R6-7 in 9th NU dist.

11B is experimenting with minor alterations to aerial system. Getting very good DX but is doubtful how far this is due to aerial alterations or to the good conditions prevailing.

## Notes and News from British Dominions.

### CEYLON.

By G. H. JOLLIFFE.

Station 7VX, which is situated on a rubber estate in the Kalutara District, approximately 24 miles to the S.W. of Colombo, and inland about 14 miles, is so far the only amateur transmitting station working in this island although there are several others with transmitting licences.

7VX is operating with a transmitter not usually heard of, consisting of a loose coupled aerial coil with a variable condenser in series in the aerial lead. The secondary coil has a variable condenser across part of the coil, and from this coil the H.T. and anode

connections are made. The reaction coil, which is of a basket type, feeds back to the grid via the usual grid leak and condenser.

A rotary transformer is used to generate the H.T. supply, and the output of the set amounts to 20 watts.

With this set 7VX has successfully established communication with Tasmania, Australia, Philippines, Dutch E. Indies, India, Rhodesia, and South Africa, and in all cases sigs have been given as very steady and strength about R4-5. It may be interesting to know that voltage drop does not apparently affect the wave-length.

I have heard but not yet QSO'd the following:—OA7SL, OA6WP, OA5CM, OA3LP, OA7LP, OA3JK, OPIGZ, AI2DX, OZ3AU.

TELEPHONY.—So far reception from 5SW is very disappointing, and PCJJ are not coming through as they used to do. Java comes through as a rule very well also some of the Australian stations. Recently several other telephony stations have been picked up in Ceylon. I should like to suggest that any station doing such transmission would give their call sign more often.

### SOUTH AFRICA AND RHODESIA.

By G. G. LIVESEY (FO3SRB).

On January 18 A6R succeeded in transmitting strong and steady signals over a distance of five miles. A4M was the recipient, and both receiver and transmitter deserve honourable mention.

A6Q, W. H. Lucas, "Shenfield," Kockemoer, Transvaal (new licence), is on 50.5 metres, and 53.75 metres also.

A4V may be expected to be transmitting on 80 metres, as well as his usual crystal controlled wave-length.

A7T. His QRA is P.O. Box 78, Potchefstroom, Transvaal.

A3C is on 20 metres, and he has worked with NUISW, NUSCUG, NU1AJM, NU6EC, AI2KT, and Australia.

A3V. During the past three months this station has had 57 long distance QSO's.

FK5CR. A new QRA—S. A. Pegram, Box 23, Nairobi, B.E.A. He is an old pre-war experimenter, who has had re-infection by the "Bug." Is using only 4.5 watts— $\frac{1}{2}$  wave rectified A.C.—on 40 metres. Armstrong circuit.

3MS is on 35, 28 and 22 metres.

The new telegraph station at Nairobi, with power 10 kilowatts, should be testing now. Anyone hearing is, please QSL to FK1MS.

FK4MS has been QSO with OA.

### RHODESIA, SOUTHERN.

4SRB—new transmitter—T. Greaves, P.O. Box 646, Salisbury.

3SRB had the privilege of some work at 6SRA's station a short time ago. 6SRA is using a C.F.  $\frac{1}{2}$ -wave Hertz aerial, on about 37 metres—1,000 volts on two L.S.5 valve in parallel, in a split Colpitts circuit—rectification at the moment is by a vibrator reed affair he made himself, but a D.C. generator is soon to be installed. All transmitter and receiver design is very finely executed.

On this occasion 3SRB had the "phones" on for the first time for five months. Very few African stations were heard, and the number of commercial stations was alarming. The first commercial heard was KEL—California. Maven was also very strong. At this time of year conditions are bad—static like a pan of "frying bacon" crackling, and it seems unduly hard to copy signals outside the country. At least as far as Rhodesia is concerned, and especially with low powers. The conditions seem to be so noticeably erratic—more so than seem credible to anyone who is not a resident in Africa. One of the most important things that has occurred in the history of the S.A.R.R.L. is now taking place, in that negotiations are in progress between the S.A.R.R.L. and the Government, in order that the best and most reliable stations shall be formed into an "Emergency Communications" Section to be employed by the Government in case of interrupted communication by the usual means—i.e., telegraph, etc. Only the most reliable stations are any use under this scheme. Test messages have been transmitted by various "star" stations, to see how good communication over the Union may be, and to test the actual technical qualities of the amateur transmissions themselves. These transmissions have been checked by the Government stations. Only those members of the League who are consistent workers, and good operators, are of any use as far as this Emergency Communications Section "is concerned. To the writer, and to the rest of the Radio Society of Great Britain, this co-operation of the League and the South African Government will give much food for thought. It is a most significant occurrence.

Rhodesia, not belonging to the Union of South Africa, does not fall under this arrangement, but a meeting is being held among our twenty-three transmitters in Southern Rhodesia, on February 20, to consider offering our technical service to the Government on the same lines as the Union. The difference lies however in that the Union Government took the initial step in making the suggestion. The transmissions now taking place in order to test the system are on 80 and 35 metres.

It should be added that in time of trouble the military would be responsible for the control of the "Emergency Section" and that under normal conditions it would be a civil affair.

Each Division will have an O.C. amateur, acting under the military authorities.

The S.A.A.R.L. is the first amateur body to be officially recognised by a Government. No small honour.

The Minister of Defence, in co-operation with the P.M.G., has instigated the Government side of the enquiry, and subsequent



proceedings; and further the Minister has expressed great surprise at the efficiency of the amateur system in South Africa, declaring that it was far beyond what they expected.

A completely revised scheme is being produced by the League, and presented to the Government. The system will be run on the same lines as the "Red Cross," as regards its control by the civil authorities (the P.M.G.), and the military authorities.

As regards wavelengths most convenient for traffic here, it has so far been found that for reception up to 200 miles 80 metres is better than 35 metres, but beyond, at this time of year, 35 metres is more reliable.

The appointment of Government Emergency Stations would be made by the P.M.G., advised by a committee of League members—the O.C.'s of the various Divisions.

The hon. secretary of the S.A.R.R.L. has asked all members who are no longer interested in amateur radio and League activities to send in their resignations; at this stage of affairs it is considered that the League requires no "passengers." This of course does not apply to places outside the Union—in Rhodesia it is, for instance, far harder for some of us to maintain reliable and efficient stations, since the condition of this colony is comparatively undeveloped—the purchase of wireless apparatus even of the simplest kind is limited to Bulawayo and Salisbury only, and even there only a very limited choice of material can be obtained.

(One is much inclined to question the wisdom of asking for these resignations, as has been done. The question is: can the League be benefited by such a reduction in membership? The action rather savours of riding the high horse too soon.)

VQG, the Nairobi station, has been testing with GBO, and had got through for practically 24 hours. He is using 18 metres by day, 28 metres by night. His note is like GBM. It is understood that VQG's broadcasting activities will commence in three months' time, with a wavelength of 90 metres, power 10 kilowatts.

## Notes and News from Europe.

### BELGIAN NOTES.

By EB4FT.

The two Liège amateurs, M. Ziane and M. Regnier, whose results on short-waves are well known, are working together, to test DX 'phone.

The following is a short description of the station during the first tests, which took place in the Autumn of 1927:—

The oscillator is a Mesny equipped with an electrolytic rectifier, and a filter, using a condenser of 2 mfd. The H.T. transformers served as modulation chokes, and were replaced by the H.T. material of 4WW. The modulation is made through two E6 valves, with 40 volts of grid bias, and driven by a T.M.W. transformer, this one being used at the output of a microphone amplifier using two valves, a B-406 with 100 volts and a B-403 with 200 volts (40 mA). The microphone is of the German army type.

On first tests, the station was heard at loud-speaker full strength in all Europe and Algeria. Numerous contacts were successfully established, and the best DX was made with oz-2BP for more than an hour, with a strength of R6 to R7.

The modulation was reported of excellent quality, and similar to broadcasting.

4ZZ, 4WW, and 4AX have built their common station outside the town, far from city disturbances. Their new official call is EB4WX, and the QRA: Club Liégeois d'émission, Box 128, Liège.

4FT made the first QSO between Belgium-Madagascar, on February 4, with fb8HL, of Tananarive. The QSO was quite easy, and lasted more than half-an-hour, without any QTA. The power at 4FT was 90 watts.

### CZECHO-SLOVAKIA.

By EC2YD.

We are informed by Mr. Vydra (EC2YD) that he has been appointed communications manager for Great Britain and Dominions by the members of the Radio Club of Czecho-Slovakia. He takes this opportunity of expressing to all British amateurs his best wishes on behalf of his colleagues, and hopes that the friendly co-operation already existing between the two countries may grow to the mutual benefit of all concerned.

He gives us the following interesting information:—

The Radio Clubs of Czecho-Slovakia are organising all short-wave tests in that country, officially, only in connection with reception, as the Government does not sanction the use of transmission apparatus.

The following are the appointed headquarters officials:—ECIRO (Honorary President), AA2, 2UN, 3SK and 4AV (District Managers), and 1KX (QRA and QSL Manager). The official organ of the Society is "Československa Radio Svět," which has a special short-wave section.

They will be pleased to receive from us regular notes having reference to radio matters in England.

The membership of the Society is 50 of which 20 are transmitting members.

The QSL service which was previously undertaken by EC-AA2, is now in the hands of Radio Club Československy, Praha 2. Slovansky Ostrov 5 (via R.K.C.S., being the official abbreviation).

In addition to this service they are organising a special section for amateurs who know no other language than their own. This service will allow British amateurs to arrange schedules and discuss radio matters more readily.

Letters for this section should be addressed to either EC1XY or EC2YD for EC1XY.

It is hoped that British amateurs will take advantage of this useful service.

Most of the active amateurs are using powers of between one and five watts. An interesting series of tests has been made EC1FM using a double grid valve with 20 volts on the plate. With this arrangement he was reported R4 at a distance of 400 kilometres.

EC1YL is the only station in the country operated by a lady, who works with a 3 watts input on 40 metres.

EC3SK uses an indoor aerial with low power and has worked 1,000 kilometres at R4.

### DANISH NOTES.

By ED7MT.

The conditions for DX as well as "local" work seems to be better than ever; the NU's are coming in very strongly after 22.00 G.M.T.

7FP is now working with 70 watts R.A.C.; his best QSO this month was PGO, a station on Nova Zembla.

7FR has done good DX work on QRP; he worked 10 NU's on about 15 watts, his best QSO was 4SA on Porto Rica.

7MT is now carrying out experiments with different rectifiers. The big set is now also on the air but only when the BC6 station has closed down.

7RW is a new Danish QRO station owned by the radio papers "Popular Radio" and "Radiolytteren." The transmitter is crystal controlled and works on 42.125 m., with about 300 watts. The station is transmitting a gramophone concert every evening, after 22.30 G.M.T.

Detailed reports will be very much appreciated and answered with a QSL card. The address is: Raadhushpladsen 55, Copenhagen K.

### FRENCH NOTES.

By EF8PY.

Very interesting tests have been made by a submarine, launched at Nantes, and operated by 8JT; the call has been XEF-8JT, and several QSO's were established, amongst which was one with a NU station. Anyone having heard XEF8JT is requested to send a report, for which he will receive a special QSL card.

Other tests are being made by two French submarines, cruising in the Atlantic and the Mediterranean Sea, using the call XEF8XOX. Certain tests will be done when the submarines are diving.

Tests on 10 metres continue between 8CT and NU2JN; 8CT was recently R7 on 10 metres; the tests are made in the afternoon between 3 p.m. and 3.30 p.m. (G.M.T.).

SDOT is now a soldier in Algeria, and operates sometimes at the key of FM8RIT.

SGI makes tests on standard wavelengths each second and fourth Sundays of the month; the time is from 2.15 p.m. to 3 p.m. (G.M.T.), the wavelengths being from 44 to 20 metres. The call is OD-ETL de EF8GI.

### GERMAN NOTES.

By EK4CL.

Traffic conditions have improved immensely here last month, "dud" nights being very rare. Even after dark it was very easy to get in touch with Europe as well as with NU. On the lower band conditions seemed to be very favourable, too, and it is easy to QSO the States nearly the whole day.

The three Munich pioneers of amateur picture transmissions succeeded very well, some pictures being sent by wireless nearly perfect. The monthly new German c.c. station is 4CD, of Berlin. We hope that lots of EK's will follow his example.

Our third annual convention will take place in Dresden during Whitsun. We should be very pleased to greet here any foreign ham. May we ask all amateurs, who intend to join our convention, to drop a line to D.F.T.V. at once?

### HOLLAND.

By ENOCX.

The month of February has brought us a big convention which was held at the Hague. Our national organisation was entirely remodelled; and a new council elected. The whole was put on a firm basis, rules for the mother-club and for the district clubs were fixed up, and all this, we hope, will be found satisfactory by our Government and the licences will come to us in a short time.

In the meantime activities are still going strong. The signals from the British QRP Transmitters Society for checking wave-meters are highly appreciated over here.

ENODU is working with very low power. Hooked up Algerian 8SSR at R6 when using 1 watt input.

ENOPRS finds 32 metre very good. With 5 watts input worked distances up to 1,000 miles with remarkable results in full daylight.

ENOWM, one of the finest QRP stations, dismantled.

ENOCX is still on low power; has worked all Europe, except Portugal. Worked Maroc twice in a week. Input now increased to 4 watts.



# Correspondence.

## Instructions to Correspondents.

*We are always glad to hear from members. Correspondence published in these columns should be written clearly on one side of the paper and marked "For Publication."*

*All correspondence should be addressed to the Editor, T. & R. BULLETIN, who reserves the right to refrain from publishing any material which is lacking in general interest or for other reasons. Correspondence for publication will not be acknowledged.*

*Correspondence must be kept reasonably brief.*

Re "STRAIGHTENING OUT THE AERIAL."

To the Editor of T. & R. BULLETIN.

DEAR SIR,—I should like to offer a few criticisms of Capt. Hampson's article under the above heading which appeared in the March BULLETIN.

I will discuss the points with which I find myself in disagreement in the order in which they occur in the article.

First, I must protest against the suggestion that the introduction of the so-called "Hertz" aerial introduced anything new in the way of theory, and its very name testifies to its antiquity.

The fundamental theory is precisely the same for the "Hertz" as for the inverted L, or indeed for any other type of aerial, and a complete interpretation of any observed results will *always* fit in with this theory.

There is no vagueness at all about the correct length for a Hertzian aerial: this point was dealt with in some detail in the writer's recent article: likewise there is no difficulty in determining the optimum point for voltage-current feed (single feeder). The question of feeder radiation was also dealt with in the article just mentioned.

Mr. Aughtie's criticism (in the Correspondence Columns of the March BULLETIN) of my article should effectively clear up any doubt that may have existed on the subject of double-feeder lengths. I should like to express my agreement with this criticism, but I am not quite clear about Mr. Aughtie's statement that an ammeter in the feeder *never* reads less than the aerial current. On the face of it this statement is not correct, but doubtless the point will be cleared up in Mr. Aughtie's forthcoming article on aeriols.

Capt. Hampson also refers to *untuned* aerial and counterpoise systems: this is surely a misnomer as any aerial and counterpoise combination will have a perfectly definite fundamental frequency (in exceptional cases *more* than one) which may be varied by altering the constants of the aerial circuit in the ordinary way.

The writer is completely mystified by Capt. Hampson's conclusions with regard to the relative length of aerial and counterpoise. Provided the appropriate feed method is employed this system may be fed efficiently at absolutely any point throughout its length: this may be shown quite conclusively by the application of fundamental principles. I can only conclude that Capt. Hampson has in some way misinterpreted the results of his tests.

His Fig. 7 seems to be nothing more than a particular form of the familiar voltage current-fed Hertz on which the writer has already expressed his views in the BULLETIN. The voltage and current distribution shown in this diagram is, as it stands, physically impossible, and both parts of the "roof" will definitely carry oscillatory R.F. current.

It would be very interesting to know what led to the postulation of this somewhat startling theory.

In connection with counterpoises it should perhaps be pointed out that the "electrical length" of a multi-wire counterpoise will be considerably greater than its physical length, mainly on account of its relatively large capacity per unit (physical) length.

With reference to the use of an "earth" in place of the counterpoise, the reason that this has fallen into such disfavour is that it is almost impossible to obtain a really low resistance connection to earth on short waves, since this resistance is inversely proportional to the square root of the wavelength. (See also the remarks on this subject in the excellent paper on aeriols in the March issue of "Q.S.T.") Therefore unless an exceptionally low resistance "earth" is available the counterpoise is preferable.

Although Capt. Hampson's method for determining the frequency at which an aerial system will draw power from the transmitter (*i.e.*, will resonate) is perfectly feasible, it is surely much simpler to determine the fundamental frequency of the system from its dimensions: it is always possible to do this approximately and, in the case of a simple Hertzian (*i.e.*, non-earthed) type, with considerable accuracy.

With reference to the relative values of the impedance of the load due to the aerial and the impedance of the generator (valve) the latter will in all normal conditions be very much greater than the former, and it is for this reason that we have to transform down the voltage of the valve output to a value suitable for application to the load: if this is done correctly the power in the aerial will be greatest at resonance, but the *stability* of a self-excited

oscillator will be improved by slight de-tuning. (See Mr. Aughtie's "Theory and Adjustment of a Transmitter" in the March BULLETIN.) At the same time, because an aerial circuit is *de*-tuned, it does not follow that it is *un*-tuned.

Capt. Hampson's final "universal" aerial is evidently just a Hertz or a Marconi aerial with a "phase-changer" L.C. circuit at the feed point, by varying the C of which the fundamental frequency of the aerial may be adjusted, the L being also used as the coupling coil. If the operating frequency is less than the natural frequency of the L.C. circuit, the latter acts as an *inductance*, and if the operating frequency is greater, it acts as a *capacity*. Hence, by varying the natural frequency of the "phase-changer" we can increase or decrease the natural frequency of the whole aerial system, in precisely the same way the natural frequency of a Marconi aerial is usually raised or lowered by the inclusion of capacity or inductance in the aerial circuit.

This phase-changer scheme is not, if I may say so, exactly new and it is used by several British amateurs, and also, I understand, by the Marconi beam stations.

This arrangement is, as Capt. Hampson suggests, also applicable to double-feeder systems (both "Lévy" and "Zeppelin") and, in fact, to any point in any aerial system at which voltage or voltage-current feed is required.

As to the possibility of there being an optimum length of wire for a given wavelength, this depends solely on the position (including shape, direction, etc.) of the aerial, and each case would have to be considered on its merits from a point of view of directional radiation.

With regard to Capt. Hampson's remarks *re* "harmonic excitation," I regret to say I am again in complete disagreement with him! If the transmitter is tuned to 45 metres and the aerial tuned to resonance (*i.e.*, max. aerial power and therefore max. radiation), the natural frequency of the aerial *must* then be the frequency corresponding to 45 metres or some sub-multiple of this frequency: otherwise what is the cause of the maximum radiation? I think the error must lie in the determination of the natural frequency of the aerial.

The excitation of any length of wire by tapping one end of it on to the anode coil of a transmitter was discussed by the writer in his recent article and need hardly be re-discussed here, the reasons for the optimum length for the wire being a multiple of  $\text{metre}/2$  were also stated.

In conclusion, the writer hopes that Capt. Hampson will not take exception to this rather extensive but well-meant criticism of his very interesting article. There is nothing like free discussion to clear up a problem like this, and I hope to see some counter-criticism in the next BULLETIN.

Yours sincerely,  
E. MEGAW (6MU)

To the Editor of T. & R. BULLETIN.

SIR,—Please accept my best thanks for giving me the opportunity of replying to Mr. Megaw in this issue of the BULLETIN.

Regarding Mr. Megaw's protest at my temerity in suggesting that the voltage-fed Hertz aerial and single wire feeder introduced any new theory, I would like to point out that the statement in question must not be dissociated from its context, and the paragraphs which preceded the remark indicate fairly clearly, I think, the purely relative nature of the meaning which was intended. The introduction of the "Hertz" focused attention upon theories which (if not new to the few fortunate ones whose knowledge of these matters extends further into the past than many of us would claim) did constitute something novel to the average untrained experimenter to which class I have the honour to belong. If this is not so, why was the voltage Hertz aerial not the first type of aerial to be used by the majority of British amateurs as soon as the move downwards was made from 90 metres to 45 metres? Fundamentally, of course, there was no new theory, as indeed we are assured that fundamentally there is "nothing new under the sun"!

Regarding the correct length of the Hertzian aerial, am I to understand that Mr. Megaw would erect such an aerial with no other apparatus than a yard measure and guarantee to calculate its length, and the length of and optimum point of attachment of feeder, so accurately that subsequent adjustment by trial and error would be eliminated? I would suggest that this theoretical length would be modified in practice by the presence of neighbouring earthed bodies—some kind of house being usually, if unfortunately, part of the normal amateur station.

My reference to the "untuned" aerial was again relative and not absolute. Clearly every aerial system has a "fundamental" or "natural" frequency and to this extent is tuned. My meaning was surely sufficiently obvious from the text? By "untuned system" I mean an aerial and coupling coil and counterpoise or earth in which the physical length of wire is chosen at random (and without the assistance of a yard measure) and which is used as a radiator of R.F. energy upon a variety of wave bands without any alteration. In this sense it is "untuned." Can Mr. Megaw suggest a better name?

I of course agree with Mr. Megaw when he says that "provided the appropriate feed method is employed this system may be fed efficiently at absolutely any point throughout its length." I have clearly been unsuccessful in my attempts to point out that I referred to the use of one and the same aerial system for use



upon any and every wave between, say, 20 and 200 metres, and in which, for the sake of convenience and rapidity of QSY, it is not necessary to move from the operating room to effect such QSY. This postulates that the *same feeding point* shall be used for all waves. It is not, I think, so much that I have misinterpreted my results as that Mr. Megaw has not understood what I attempted to say, and this may be due to my own clumsiness of expression.

If Mr. Megaw will read the paragraph immediately below Fig. 4 in my article he will see that when referring to Fig. 7 I have said: "The system cannot work as a Hertz, etc." This is the same thing as Mr. Megaw says in different words: "The voltage and current distribution shown in this diagram is as it stands physically impossible." This figure was an attempt to show by diagrams the existence of an impossible state of affairs and to suggest what would happen if attempts were made to excite a system which is theoretically wrong.

Regarding the use of an earth instead of a counterpoise, I do not dispute the statement made by Mr. Megaw and will offer no comments except that in practice I have found so little difference in the reports of my QRK, etc., whether using a counterpoise or otherwise, that I personally dispense with the use of the counterpoise in the way described. Anyone may easily test this for himself.

I am glad to receive Mr. Megaw's assurance that the method described for determining the frequency at which the aerial will resonate is feasible because I use it regularly and effectively, but I personally find my method simpler and more rapidly effected than that suggested by Mr. Megaw, and I must again remind him that I am speaking of the use of the *same* aerial as R.F. radiator upon a *variety* of wave bands.

Regarding the relative value of the impedance of the aerial load and the impedance of the generator, it will be noticed that the word used to describe this relationship was "matching." The word was deliberately chosen in order to avoid the implication that the two impedances should be quantitatively *equal*, and I am quite aware of the voltage "step down" between the anode and coupling coils to which Mr. Megaw refers. His criticism is again due to misunderstanding my meaning, and I made it quite clear that detuning is desirable for sake of stability. Nor did I imply that a *de*-tuned aerial is *un*-tuned.

So far from claiming that the system described by me is new, I took pains to point out that it is as old as the first radio message, and all I suggest is that this particular application of the "phase-changer" system to an aerial of uncalculated dimensions, and for the purpose of radiating upon all waves, has not (so far as I am aware) been described previously, and the article in question was written for the benefit of those to whom such an application may have been novel, and in order to promote discussion of interest.

Regarding "Harmonic Excitation," Mr. Megaw says, "If the transmitter is tuned to 45 metres and the aerial tuned to resonance the natural frequency of the aerial must be the frequency corresponding to 45 metres, etc."

In the remarks which follow it must be understood that I refer to an aerial system whose physical length is such that its fundamental wavelength exceeds that of the oscillator drive—*i.e.*, the aerial is not in resonance *at its fundamental*.

I think the best reply I can make is to reproduce an account from my "Experiments Log" of one of the experiments which led me to the conclusion stated. It is then easy for anyone to repeat the test and either to confirm my result or to point out where (if anywhere) the test leads to inaccurate conclusions:—

Date, October 21, 1927. Apparatus, LS5 in RFB circuit, 370 volts at 35 milliamps.

The oscillator was tuned to 30 metres and a three-turn coupling coil tuned by a parallel condenser (.0003 max.) was loosely coupled up. Three aerial systems were attached to the coupling coil in turn, of total lengths (A) 105 ft., (B) 145 ft. and (C) 175 ft. respectively. The coupling and tuning were adjusted in each case until the "double humped resonance peak" merged into a single optimum, and the maximum glow was obtained in the pea lamp indicator of an absorption wavemeter.

After switching off the drive oscillator the loaded fundamental of the aerial was then measured by loosely coupling an oscillating circuit to the coupling coil and measuring with a reliable heterodyne wavemeter the QRH at which oscillation ceased when employing the loosest possible couple. This gave the following results:—

Aerial.	Length.	Measured Radiating QRH	Measured "loaded fundamental" of aerial.
A.	105 ft.	32 m.	67 m.
B.	145 ft.	31.7 m.	81 m.
C.	175 ft.	31.7 m.	118 m.

Hence, even allowing for inaccuracy due to absence of laboratory equipment, a comparison between these figures and the nearest harmonic of the measured radiating QRH reveals a discrepancy which in my judgment is sufficient to justify further investigation, using apparatus of greater precision than that possessed by the average amateur, and until such measurements have been made by someone really competent to make them, I beg leave to enjoy the opinion which I have expressed, and which I was at pains to point out is purely personal and therefore open to correction.

I dare not now extend this reply to include an account of the experiments which led me to state my opinion with regard to the possibility of what I have called "a symmetrical excitation." I certainly will do this in due course, however, in order that readers may have the opportunity of deciding how much importance they care to attach to this, and in the meanwhile I will endeavour to examine the whole matter more extensively.

Finally, I should like to thank Mr. Megaw for the interest which he has shown in my remarks, and to express the hope that the outcome of this discussion may be to clear up some of the problems connected with the behaviour of antenna systems and thus lead to a more comprehensive appreciation of the theoretical and practical considerations which are involved in this very interesting and fundamental subject.

Yours sincerely,  
HUGH J. B. HAMPSON (6JV).

To the Editor of T. & R. BULLETIN.

SIR,—Would you kindly let all stations know that I shall be closing down for the summer as I am spending six months in England. I wish to thank all those who have co-operated with me during the past three years, especially the B.R.S. stations who have sent most useful reports. I am looking forward to meeting many old friends this summer.

Yours sincerely,  
R. J. DRUDGE-COATES (AI2KX).

To the Editor of T. & R. BULLETIN.

DEAR SIR,—On p. 14 of the February BULLETIN I am given credit by the Contact Bureau for arranging tests with NX1XL. This is no doubt a clerical error, as the credit is due to 18B who, I understand, made the arrangements referred to.

WG11B.

ITALIAN IIF0.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—With reference to my letter in the February issue on behalf of QSL cards for EI1FO, GI2WK has written me to say that the Italian is in error as far as 2WK's station is concerned, in that no QSO took place between the stations.

In fairness to 2WK, I trust you will see your way to insert this letter.

Yours sincerely,  
J. WYLLIE (Gc5YG).

To the Editor of T. & R. BULLETIN.

DEAR SIR,—I would mention that my QSL for IIF0 was sent off immediately after our QSO.

J. CLARRICOATS (G6CL).

To the Editor of T. & R. BULLETIN.

DEAR SIR,—Please allow me a little of your valuable space to justify myself about EI1FO's QSL. I have most certainly received his card but have not QSL'd here, the explanation being, that I was not transmitting at the time mentioned, nor have I QSO with EI1FO and again I should not be using R.A.C. I therefore cannot see myself justified in QSL'ing some "pirate's" transmission.

Just around Christmas and the New Year I received several cards reporting my sigs. R.A.C., at times when I was not on. In two cases the QRA was given as Dundee.

I should be very glad if EI1FO, 1XW, EF8GDB, EI1DY, EK4UU DE, 0655 and G6SM, would forgive what appears to be no QSL from G2AK.

I am, sir, yours sincerely,  
C. H. YOUNG, JR. (G2AK).

To the Editor of T. & R. BULLETIN.

DEAR SIR,—I have been asked by NU2FS to "tell the boys over here" to send him a card if they receive him. His QRA is:—Ellsworth E. Springer, 911, 71st Street, Brooklyn, N.Y., U.S.A.

V. G. MELLOR (BRS31).

To the Editor of T. & R. BULLETIN.

DEAR SIR,—When working stations for the second time recently, the fact has been brought to our notice that many cards sent by us never reached their destination.

If amateurs, transmitting or receiving, still owed cards for QSO's or reports previous to January 31, 1928, send a note to that effect, we shall be pleased to send them a second QSL.

QSO's and reports are always acknowledged by the end of the month during which they arrived, and we greatly regret that so many of our cards have gone astray.

Yours faithfully,  
J. B. AND R. D. SCOTT (GW17C)

To the Editor of T. & R. BULLETIN.

DEAR SIR,—This club has recently been formed to study the science of television, and would welcome applications for membership from amateurs who are interested in the subject.

Although only just formed, we have been fortunate in attracting some of the best scientific brains of Dorset, and generous support from the general public.

Trusting you will find room for this letter in THE BULLETIN.  
N. W. WRIGHT (2BFA).



To the Editor of T. & R. BULLETIN.

DEAR SIR,—Reference "Threshold Howl."

I was very glad to see the remarks in the February BULLETIN re this matter by GW11B and the method he adopted to cure the same, whereas he used a Cossor 610, I have been using a DE5, and find that almost any valve with these characteristics will oscillate smoothly on low anode voltages, the DE5 I have used on as low as 12 volts.

My point, however, is that to use a valve of this type is using the least line of resistance, and to a certain extent sacrifices efficiency.

His remarks re the cause being a grid trouble is perfectly correct in my opinion; this can be proved if meters are used in the anode and grid circuit, and the same watched and current checked from just before to over the point of oscillation, particularly "just before."

In case others are interested, I would say that I have found that one or a combination of three factors are the chief cause of the howl in question.

First, the type and construction of the grid coil.

Second, the method of construction and position of coupling of the part of coil used as feed back. Also position of coupling of aerial coil.

Third, according to the valve in use, grid leak and condenser.

If the above points are suitably attended to, it is possible to use almost any good detecting valve. In use here now is a PM5X, using a grid condenser of .00004 and leak of  $1\frac{1}{2}$  megohms, this gives perfect oscillation control free of any howl whatsoever, and by far better detection of weak signals.

Moreover, if this trouble is tackled at its source, it is possible to follow with as many stages of L.F. as one's ears can stand.

I should be pleased to give circuit and type of coil to anyone interested.

Again thanking GW11B for having stated what, in my opinion, is the real trouble in threshold howl, viz., excitation of that part of the circuit where it is not wanted—the grid!

T. GEESON (EG2SO).

To the Editor of T. & R. BULLETIN.

DEAR SIR,—I wish to thank 6JV for the very excellent way in which he has described the difficulties of erecting an aerial system to work efficiently on a number of waves, even if they are in harmonic relation.

Referring to his remarks on the untuned aerial and counterpoise, I really don't think it is usually employed at amateur stations, except for one or two particular wave-lengths on the short-wave band, an untuned system such as he describes will not be excited unless tight coupling is used, and naturally the first thing the amateur will do is to attempt to tune the aerial into resonance with the drive. He therefore at once uses a form of tuned aerial. In this case he will rarely use very loose coupling and tune into exact resonance, but will couple a little tighter and detune slightly, as this usually makes for better results. It is still, though, a tuned aerial.

6JV's coupled resonance circuit with an aerial only attached to one end of the coil is excellent as a makeshift system that will work with any aerial on any wave-length. But he then goes on to suggest putting an earth on to the free end of this circuit. Now, does 6JV really mean an earth or a 20-ft. earth lead? There is a deal of difference on 45 or 23 metres; and I think that, having in mind the circumstances under which most amateurs work, he must mean an earth lead.

6JV also mentions using a counterpoise instead of the earth, of exactly the same length as the aerial, and he shows on Figs. 8 and 9 how it will work. But suppose that, instead of being able to put up a 110-ft. aerial and 110-ft. counterpoise we could only erect 70 ft. in each case: then we should have a voltage loop in the centre of the coupling coil and the system would not draw power on 45 or 23 metres, but it would very easily on a wave of about 30-35 metres. Really, I think 6JV has returned to the third paragraph of his article, and has shown that harmonic operation is quite all right on some wave-lengths, when due allowance has been made for the fact that a loaded wire will oscillate on the wave to which it is tuned, called the fundamental, and other waves, none of which are an exact sub-multiple of the fundamental.

If, as mentioned above, an earth lead is used, then the lead must be approximately equal to any even number of quarter waves, otherwise there will be a voltage loop in the tuning coil, with bad pick-up and heavy losses.

I am personally very much against a counterpoise of any considerable length if near the ground or any earthed objects, as all the radiation from it would appear to be at once absorbed and not given a fair chance of getting away. Better still to use as little counterpoise and as much aerial as possible. A short counterpoise of a little less than quarter wave is often very useful to help resonance.

In conclusion, 6JV need not think for one moment that his article has been of little value as it has brought to the fore many points and has shown what a vast amount there is in aerial design for those who have the available space.

Yours faithfully,

G. W. THOMAS (5YK).

169, Hills Road, Cambridge,  
March 23, 1928.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—Research reception and fading experiments have been carried out in conjunction with G5TV. D2 reception on 45 and 32 metres very good this month. Amongst the new countries logged are NA, NX, NR, SU, SR, SV, AQ, AI, AC, also AO7LJ in daylight at 0926 G.M.T. R6 on 32 metres. QSS co-operation wanted on 32 metres. EGBRS is 53, The Avenue, Sunbury-on-Thames, Middlesex. Please insert in the BULL. O.M. Tux vy 23s es DX gm EGBRS is.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—The S/W Club of Lwow, the L.K.K., has begun a QSL Section. QRA is Lwow, Rue Bielowskiego 6 Poland. All QSL cards for the hams of Lwow, Krakow, and Wilno should be sent via L.K.K. Cards for the other ET hams via PKRN, or also via L.K.K.

QRA: PKRN Narbutta 30, Warsaw.

B. DUNN (6YL).

#### BRITISH, AMERICAN AND AUSTRALIAN TRANSMITTERS USING MULLARD PM VALVES.

MESSRS. THE MULLARD WIRELESS SERVICE CO., LTD.,

Commissioner Street, Johannesburg.

DEAR MR. LLOYD,—With reference to my recent very good reception of broadcast from 3LO, Melbourne, 2XAD, 2XAF, KDKA and 8XK of America, PCJJ and ANE of Holland and Java, and 5SW England, you may be interested to know that I attribute the consistent and good loud-speaker reception from these stations to your very excellent Mullard valves. I am satisfied that the PM5B, as a detector, has no equal. When signals either morse or telephony, are tuned in, I find that this valve gives about 30 per cent. greater signal strength than any other valve I have ever used; and I have tried many during my experiments. The power valves are all that can be desired, and with the correct amount of grid bias they give good mellow amplification on all frequencies. For your information, the stations mentioned operate on the following wave-lengths: 3LO Melbourne, 32.2 metres; American 2XAD, 21.9 metres; 2XAF, 32.77 metres; KDKA, 63 metres; 8XK, 26.8 metres; PCJJ, 30.2 metres; ANE, Java, 24 metres (variable) and 5SW England, 24.3 metres.

I hope this will be of interest and of use to you.

With kind regards,

Yours sincerely,

(Signed) F. C. ELLIOT-WILSON (Capt.),

Radio Stn. FOA5M.

29, Third Avenue, Roodepoort North.

January 18, 1928.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—At 16.45 to-day, I received the following station on about 19 metres FDNA. His call was CQ, EGFD, NA. Pse QSL QRK, etc. QRK here was R4 and QSB A.C.

As this station did not give his QRA, I should be pleased to hear from any ham who can give me any particulars of this station.

F. C. MASON (2BXM).

To the Editor of T. & R. BULLETIN.

DEAR SIR,—Will all who are experimenting with 10-metre reception please note that NUSALY is on 10.5 metres every week-day from 12.00 to 15.00 G.M.T., and every Sunday from 11.30 to 20.00 G.M.T. Also NU2JN every Sunday from 15.15 to 15.30 G.M.T. on 9.8 metres. Other NU stations at present on 10 metres include NUIXAM, NUISZ and NU6UF. Reports to me, please.

Yours faithfully,

E. A. DEDMAN (2NH).

65, Kingston Road, New Malden, Surrey.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—May I reply to 6QB? Thank you!

Yes, "Old Timer," you are quite right. It is a mess on 45 metres. I can only take exception to one of 6QB's remarks, i.e., "deserted every night." No, 6QB, 5XR, 6YZ, 2CI and 5MU have kept this QRH going strongly at nights and Sunday mornings and evenings also. However, since you started your 90-metre parties, there has been a decided increase in ham signals on this band, and as I listen for calls on this band from 22.30 to 23.30 every night I think the following is a fairly full list of regular nightly 90-metre transmitters: G—600, 6UJ, 5BR, 2BI, 6DP, 6PA, 5XR, 5MU. There are also a few who pop up and to this QRH make a hurried call, get a report, and then are heard no more. Should any ham desire a report on his 90-metre signals, just call 5MU at 22.30 G.M.T., or send a card arranging a "sked." For 90 metre work the power here is usually 6 watts crystal controlled. 90.25 metres, and this is good enough to put an R4 signal into the Faroe Islands (ED7JO). So hams, roll up and swell the FB 90-metre band and get some real good work without the QRM of the aforementioned MESS.

Yours faithfully,

C. W. TITHERINGTON (G5MU).

West Lodge, Moigne Combe,

Near Dorchester, Dorset.

March 19, 1928.



## Q.R.A. Section.

We much regret that Mr. C. A. Jamblin has found it necessary to resign his position as manager of this department. Will all members making changes in their address or hearing of other alterations, kindly advise Headquarters pending the appointment of a new officer of the Section.

## Q.S.L. Section.

Following a suggestion received by me, it has now been arranged that any member wanting his cards which have been left over on month can apply to G5KU at 166, Kentish Town Road, marking the application "Old Card Department."

It is suggested that a fee of 6d. be made for sending these cards, which will be used for the purpose of defraying QSL expenses.

Please mark your letter "Old Card Department."

These old cards will be kept for six months. Thank you.  
"ACK DON."

### BRS NUMBERS ISSUED.

- BRS148.—G. King, 6, Taff Street, Caepantwyll, Merthyr Tydfil.  
BRS150.—K. C. Radbourn, 67, London Avenue, Radford, Coventry.  
BRS151.—J. Dobbin, 17, Thomas Street, Portadown, N. Ireland.  
BRS152.—F. D. Cawley, 85, Hale Road, Hale, Cheshire.  
BRS153.—Capt. J. Withers, 13, Magazine Square, Leicester.  
BRS154.—G. F. Johnson, Gas Works Cottage, Thaxted, Dunmow, Essex.  
BRS155.—L. J. Creese, 41, Thomas Street, St. Paul's, Bristol.  
BRS156.—T. J. Norton, Hazelwood, Grantham.  
BRS157.—F. A. Russell, 7, Step Terrace, Clifton Road, Winchester.

## Book Reviews.

**PRACTICAL TELEVISION.** By E. T. Larner. (Ernest Benn, Ltd.) This book contains a complete history of the progress of television as we know it at present. The opening chapters treat of the historical aspect and reveal the many and varied attempts of the early workers in the field. This information will be invaluable to those experimenters who are interested in the subject. The properties of selenium and the selenium cell are thoroughly set forth in a further chapter, and the fact revealed that many workers who had pinned their faith in this substance have practically abandoned it as useless for practical purposes. The photo-electric cell is also comprehensively described both in principle and in its commercial form. The book also treats with the optical side of the subject and gives full information essential to the study. The book concludes with a description of the work of Mr. I. L. Baird and the various devices used by him in transmitting vision. Mr. Baird has also written the Foreword to the book. We have read this work with considerable interest and can confidently recommend it to all our readers who wish to take up the study of this interesting branch.

**"NONSERICKS."** By Uncle Mac. (Derek McCulloch, Announcer 2LO), illustrated by Ernest Noble. If you want a good laugh you should get this excellent little production. As its preface states, it contains nothing but nonsense, but the nonsense is subtle and never boring. It is accompanied by illustrations which are equally funny, and it is hard to say which is the worst. At all events, we must congratulate "Mac" and his fellow conspirator Ernest on their illustrated Limericks and other effusions and hope they will live to produce another volume.

## Calls Heard.

NU.—1aep, 1bc, 1bcr, 1uo, 2ao, 2aol, 2dr, 3hi, 3kw, 4bl, 4ft, 4xi, 5aq, 7az, 8adm, 8ago, 8akz, 8apn, 8asf, 8btr, 8ax, 8cfr, 8cp, 9as, 9dng, 9dph, 9clh, 9ewh, 9hm, 9xi.—Heard on 19-20 metres, 9.0-10.30 p.m. G.M.T., March 4, 1928.—A. E. LIVESEY (EG6L1), 15, Rue d'Orléans, Pau-B.P., France. QSL's will be acknowledged.

Calls heard by NUSCFL, C. C. Justice, 433, S. 17th Street, Columbus, Ohio, U.S.A., January 10 to February 14, 1928.—20 metres—eg2qm, eg5by, eg5hs, eg5ml, eg5vl, eg6ia, fo1z; 40 metres—eg2xy, eg5by, eg5kl, eg6rb.

Calls heard by Mr. F. S. Adams, Wireless Section, R.A.F., Ismaili, during daylight:—

EG's—2od, 6wn, 6rb, 2bm, 5yk, 6hp, 5za, 2kf, 5by, 2nb, 2dx and 6fz.

Calls heard at NU-3PF (R.S.G.B.):—

EG—2ig, 2cx, 2vq, 2sc, 2cp, 2gf, 2kz, 2xy, 2ay, 2dn, 2cc, 5bd, 5ad, 5by, 5vl, 5is; EG—5gq, 5jw, 5sz, 5yg, 5yk, 5ml, 5wq, 6rw, 6bb, 6ja, 6wg, 6ll, 6rb, 6at, 6nf, 6yq, 6wi, 6hp, 6uh; FO—a3v, a4x, a6r, a9a; FQ—pm; OA—2tm, 2dy, 2xi, 2yi, 2ss, 3wm, 3bq, 3vp, 3xo, 5hg, 5ph, 5wh, 7lj, 5rj; OZ—1an, 2at, 3ar, 3au, 4am.

## Notice.

In a letter from OA2RX, he says he tried the 20-metre band at the beginning of December but found results so bad that after a fortnight he returned to the 30-metre band. Also, he says the EG station are not heard on either the 20 or 30 band; really, now, the 45 band is the place for EG's and not 30 metres. Wish to goodness the antipodes knew it.

## EXCHANGE & MART.

Rates ½d. per word, minimum charge 1s. 6d.

**WANTED.** — High Tension Transformer, 1,000-0-1,000 volts, centre tapped, for plate supply for small transmitter. Input 240 volts. State lowest price accepted.—THOMAS F. HARWOOD, School House, Mill Hill, N.W.7. (2BPV).

**MULLARD U/150 RECTIFIER.** Brand new, not unpacked, £4 10s. 200-250 volt D.C. Motor coupled to 600-1,000 volt D.C. generator. Just overhauled. £5 10s. B.T.H. Aircraft H.T. Generator, £4; Newton 200 watt Alternator, 30s.—J. COOKSON, c/o 20, Victory Road, Blackpool.

**FOR SALE.** — Quartz Crystal, 44.38 metres. Oscillates freely with air-gap and without reaction; suitable for control on 20 and 10 metre bands as well as fundamental; holder and choke supplied.—Full details on application to 6MU, Fortwilliam Drive, Belfast.

**FOR SALE.** — Transmitting Panel, complete in cabinet; also Portable Transmitting Panel and Four-valve Station Receiver and Portable Receiver, double outfit. Cheap.—If interested, full details from C. W. LILES (6TH), Newport.

**TRY** a One Pound Jar of Norfolk Honey for 1s. 8d. (postage extra) from 2 BEE W BEE, Ivy Cottage, Costessey, Norfolk.

**TRANSMITTERS** please note.—We are making a Rectifying Valve to cost you 15/-. Specifications: Fil. volts 5½, plate volts 1,000 with an output of 50 m.a. Guaranteed. Send for price lists of new valves and repairs to—NORTH LONDON VALVE Co., LTD., 22½, Cazenove Road, Stoke Newington, N.16.

**DON'T** forget your log pads.—6 CC.

## Situation Vacant

**EXPERIMENTAL ENGINEER** required, able to design and make production models, components, receivers, etc.—Apply, stating experience, etc., to T. & R. BULLETIN.



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**A**N accurate wavemeter is essential to every experimenter.

This Dubilier Wavemeter is fitted with a special buzzer which retains its adjustment and gives a high clear note making sharp tuning an easy matter. The self-contained dry battery is controlled by an on-off switch and the case is of polished mahogany.

Readers of the T. & R. Bulletin are invited to write to us at once and avail themselves of this special offer, while it lasts.



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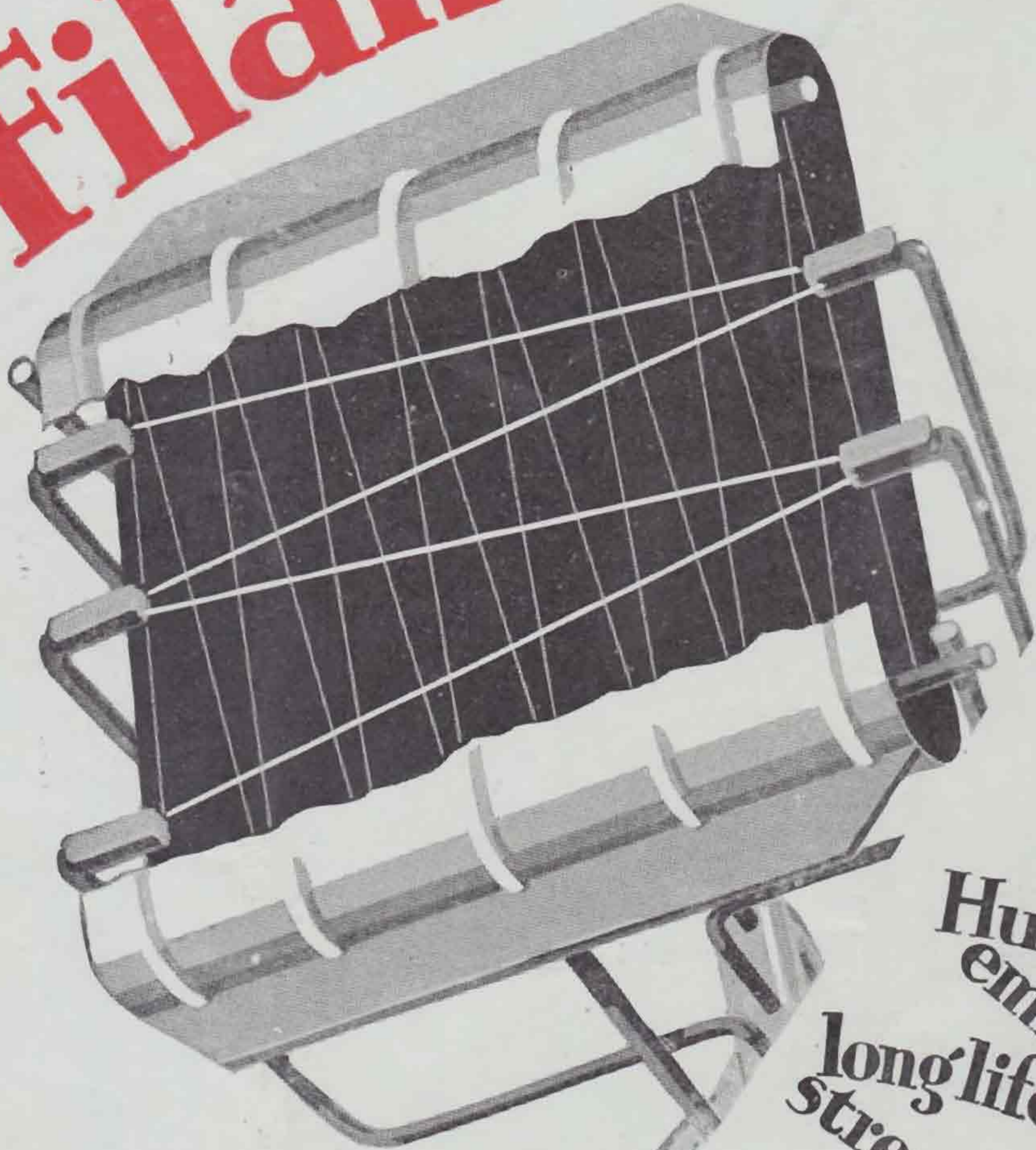
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