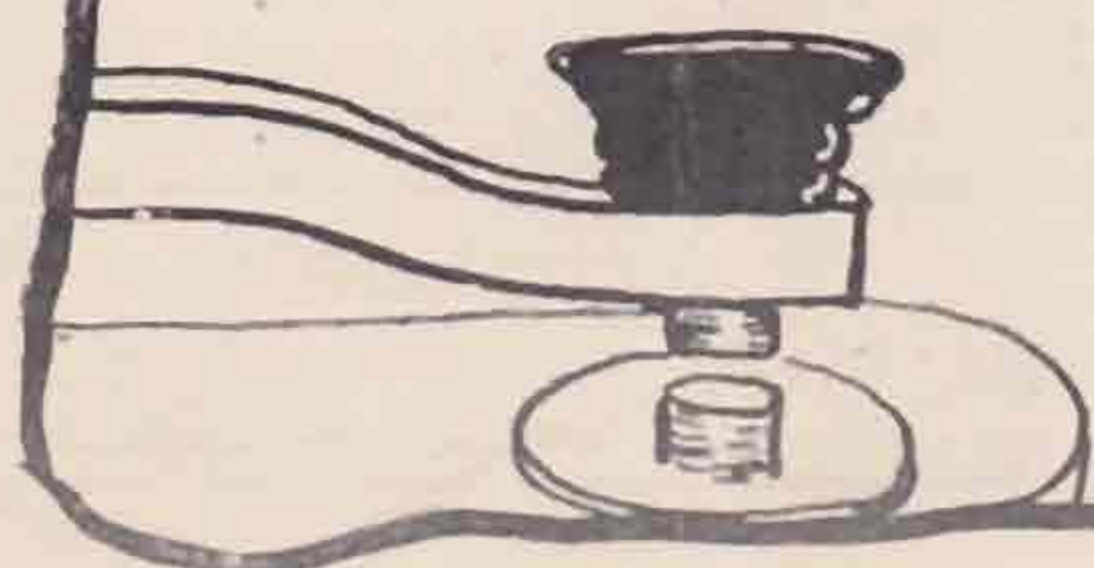
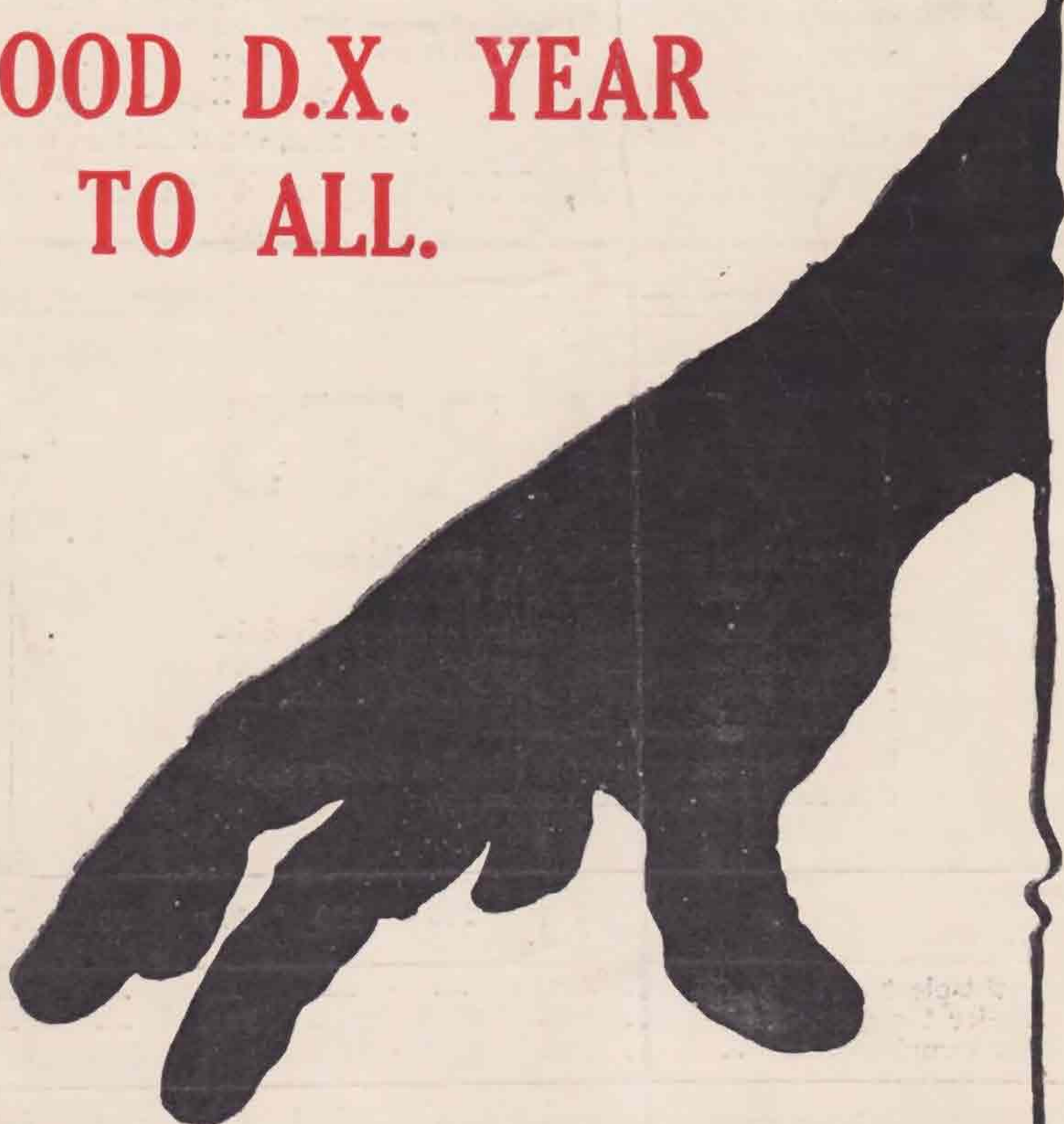


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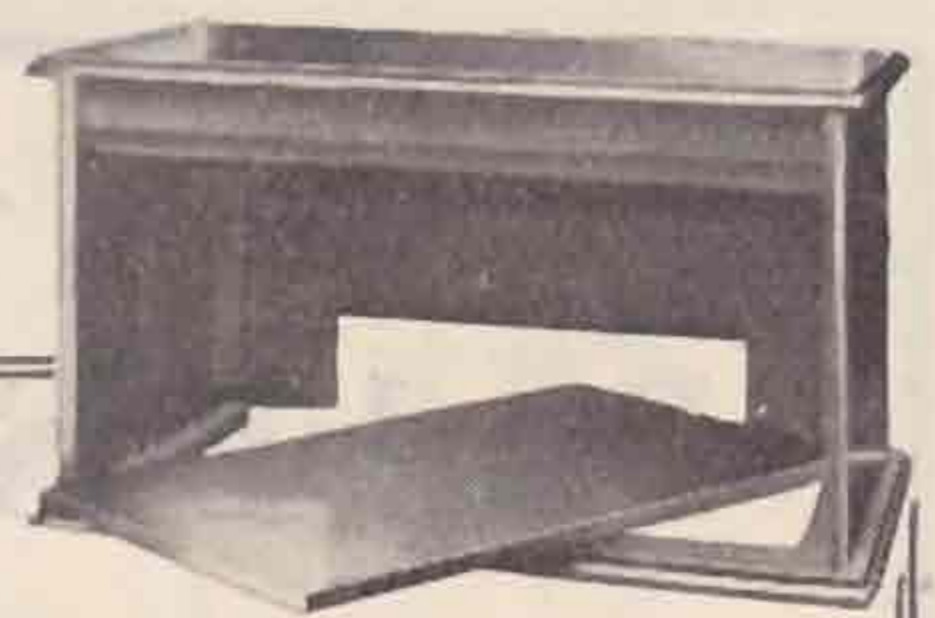
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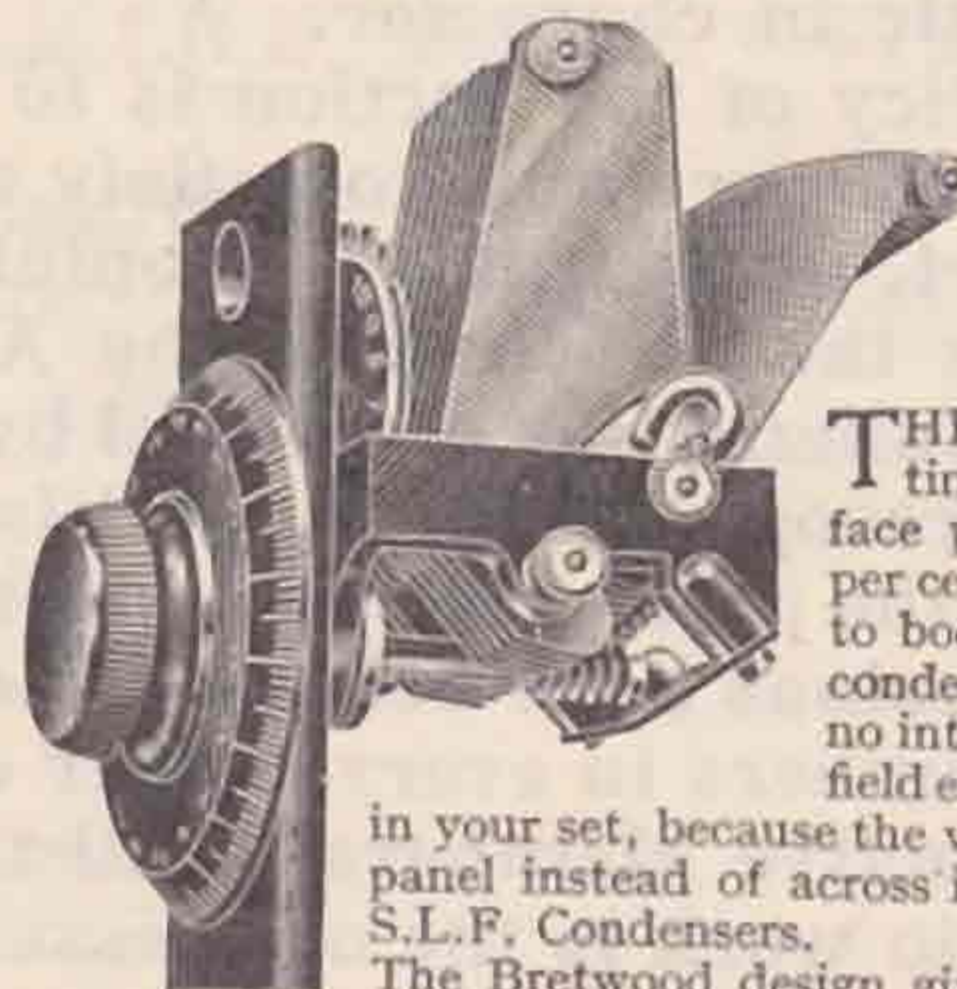
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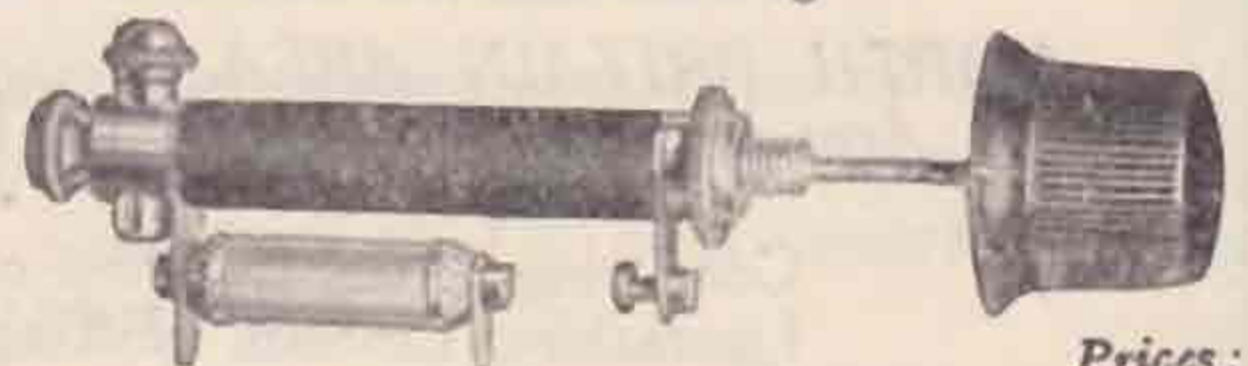
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The Section is governed by a Committee which is elected annually in accordance with rules approved by a Convention held at the Institute of Electrical Engineers, London, in September, 1926, and the Constitution is democratic in character.

The policy of the Section is to accept to its Membership any person or persons who are able to satisfy the Committee that they are interested in Radio Art, or who in their opinion are persons whose Membership is desirable in the interests of the Amateur Experimenter.

The "Bulletin" is published by amateurs for amateurs. The Section is the body recognised by the British Postmaster-General as being representative of the aims and objects of the experimenter. Through its agency great concessions have been obtained in the matter of licences in the past. We have members in every corner of the earth, and we welcome inquiries from prospective Members at all times. A bona fide interest in experimental Radio work is the only essential qualification.

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Devoted to the Interests of the Radio Amateur Experimenter.

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T & R



BULLETIN.

The only British Wireless Journal Written and Published by Amateurs

JANUARY, 1927.

Vol. 2. No. 7.

EDITORIAL

IT is only natural that at the beginning of 1927 we should be wondering what the year has in store for British Amateur Experimenters in particular and the whole world in general. Those of us who are resident in England, Ireland or Scotland have one particular item of knowledge that they can hold on to and know to be as true now as it has ever been in the history of the amateur, and it is that the future of amateur radio in this country depends upon each one of us individually. From the high-powered deep-pocketed transmitter to the youngest British receiving station (BRS), we must one and all realise that amateur radio is still but in its infancy.

Unfortunately, there has for many years been a tendency on the part of those interested in radio work to consider only the Commercial and Broadcasting sides of radio work. Little or no attention has been devoted to the real amateur experimenter or his needs, capabilities or potentialities. He has been almost entirely overlooked even by the technical press, and were it not for the enthusiasm of a sturdy band of pioneers, amateur radio would have been dead this past three years, so far as we are concerned.

We are glad to say that at the beginning of 1927 the outlook is very much brighter. Even the trade is beginning to realise that there is a little British Amateur Journal known as the T. & R. BULLETIN which has a "pull" in almost every corner of the earth. Furthermore, there is in existence a real live experimenters' society.

It is sad to relate that the sudden advent of Broadcasting, which was brought into existence when it was, entirely owing to the representations of the Radio Society of Great Britain (then known as the Wireless Society of London), almost sounded the death-knell of amateur radio—almost, but not quite. There still existed a few enthusiastic amateur transmitters who have since carried on under very difficult and trying conditions. To-day their ranks have been added to considerably. The

T. & R. Section has many hundreds of British and foreign transmitters on its books, and is the second largest organisation of its kind in the world. Quite a number of receiving amateurs have also become members and have been allotted a BRS number which is not, of course, a radio call but an identification number for the purpose of their reports to amateur stations. These receivers are, we hope, embryo transmitters, and we look upon them as the transmitters of to-morrow. This combination of transmitters and receivers has done much to further the cause of amateur radio, and it is but a matter of time before the combination becomes exceedingly powerful and not a bit too soon.

It is felt that we might even now be on the eve of revolutionary changes in the allocation of the ether for the different services. Early this year there is an International Conference being held in Washington at which all the great Powers are likely to be represented. The commercial services are more than likely to make a bold bid for the short waves, and the fighting forces may also claim a large share of the ether space on the shorter wavelength bands. If this is so, we are forced to wonder what will become of the amateur who has done so much to prove that these wavelengths are really useful. Will he be forced up amongst the deadly QRM of the longer waves or will he once again be given a wavelength upon which "he can do no harm," as was formerly said when he was put on to 45 metres? In other words, will he have to go down to the impossible wavelengths of minus something metres or is he to be pushed right up on to the other extremes? Also, with the advent of the beam systems, will he be cut off from the 20-metre mark?

We do not in the least wish to appear "panicky," but there is no doubt that sooner or later the British amateur, and perhaps many foreign amateurs, will have to face a great crisis in their history, and it behoves us all to make haste about our business and see to it that we each do our little bit toward strengthening the movement which now shows so much promise. Let each one become a recruiting agent and see that no experimenter who he knows is any longer outside the membership of our organisation. It is only by this means that we shall be able to "keep up our end" when the time comes.

Early Radio

By W. Ison, G2FB.

I READ with a good deal of interest the article on "Early Radio" in your March number. I also am one of the very early amateurs and recall with interest the struggles of those days as well as the lack of restrictions and the blessing of their being no "broadcasting." Only a few days ago I came across my old spark gap and home-made glass plate condenser. I have just been looking through my old log, too, and that calls up many forgotten episodes. For instance, remarks upon OXM (Mr. Broadwood, of St. Albans) and his huge rotary gap. When he started up we small fry had to close down. I remember calling upon him one evening and finding him up to his elbows in oil, having just discovered a huge glass plate condenser completely perforated. He had had it across a new 10-inch spark coil.

I wonder, however, how many had the curious experiences that I had after the war started.

I remained up West till the time had expired and war had officially begun. I then at once went home, reaching there within an hour, only to find my station already completely sealed up. Unfortunately, the officials who had sealed it up knew nothing at all about wireless, and although I never let them know it I could quite easily, had I wished, have worked it without touching the seals. They had smothered the non-essentials with wax and tape, but the essentials were quite usable. A few days after I was "off."

Some three or four months after this my wife wrote me that a P.O. official had been to see the station and seemed puzzled to find it as he left it and asked for me. On being told I was in the army and away he asked if anyone else had been using the station, as it had been reported as working. She assured him he was mistaken, but he seemed doubtful.

Two months after that an army N.C.O. called, and the same proceeding gone through, but this time the N.C.O. stated that he was not satisfied, and if there were any more complaints he should "have a soldier lodged in the house." By this time, of course, the aerial was down and the accumulators useless. My wife reported to me and was in a great state. I wrote and complained to the P.O., but with no result. About three months after that I got home on leave, and the first night I was home, at about 2 a.m., there was a loud banging at the door. I threw up the window to discover four figures there, who demanded admittance. I at once went down in night attire and opened the door to a subaltern, a sergeant, a private and a civilian. The officer, who demanded to search the house as, so he said, there was a wireless station being worked "here." I asked him into the dining room, the rest remaining outside. The first thing he saw was my tunic and belt, at which he was rather taken back. He asked if I was in the army, and when he heard it was my first night of leave after about six months he changed his tone and became quite friendly, but explained that he must make a search, which he did. He knew something about wireless, and saw at once that his information was at fault. He apologised for troubling me, wished me luck, and we parted. If he is alive to-day and sees this, he will be interested.

I had, however, had enough of this, and I succeeded, through an influential friend, in getting an interview with one of the heads at St. Martin's le Grand. I made no secret of my opinions of his minions, I can assure you, and he agreed with my remarks that it was disgusting. He promised an enquiry, and after some months I got an apology. Shortly after that they came and took all the gear away and kept it till about 18 months after the war. It was then, of course, quite useless.

Meters and Chirps!

AN interesting experience at G5YM may provide material for thought and investigation at other low-power stations.

The sender is an ordinary single valve arrangement; power supply from a Mackie generator fed from car-type accumulators. Keying is arranged in a manner practically similar to 5JX's Fig. 3 in the August BULLETIN. Reports have invariably been that the note was steady when this sender was in use. But in order to be able to work at any hour, even when broadcasting was on, an attempt has been made to keep the generator hum off the aerial by putting a filter in the power lead. The filter is constructed from two Ford coils (see QST March, 1926) and proved entirely successful in cutting out the undesirable hum and turning the note into pure DC, or nearly so. It also had the desired effect in keeping any sound of transmission off neighbouring sets tuned to BCL waves.

The method of test was to listen to the forced beat note in a BCL set in the operating room. When that note was finally got quite sharp, neighbouring BCL's were asked to listen and report.

But the steady note had given place to a chirp. Not a very bad one, but an upward rise in the pitch of the note was there, and the proud banner of steadiness had to be lowered until the cause could be found. After a good deal of patient investigation the trouble was found to be in the hot-wire aerial current meter, scaled to 1 amp. and usually worked with the needle at about 0.7 amp. When the key was pressed the rise of the needle was seen to be in absolute accord with the swoop of the note. Shorting the meter removed the trouble completely. The power then in use was 25 watts. On reducing to 8 watts the swoop, when the meter was in, was even more noticeable. Again it was entirely removed by shorting the meter. The shorting switch, which was thought to be unnecessary, has been replaced.

I should like to know whether others of the gang find that their H.W. meters are causing a swooping note as they "hot up." Probably the chirp was there all the time, but masked by the spread of the generator modulation. G5YM.

EDITORIAL NOTE.—The chirp effect complained of is bound to occur when a high resistance is present in an aerial. This theory is often proved when a station using a grounded aerial changes over to a counterpoise and the chirp disappears. Obviously the H.F. current in the aerial rises in accordance with the overcoming of the resistance of the H.W. meter, and this is a legitimate reason for shorting the radiation meter when transmitting. It is not generally realised by amateurs that the resistance of the H.W. meter has this effect, and many may benefit from the notes of G5YM above.

Another Amateur Short-Wave Success.

Almost every part of the globe has now been linked up by amateur short-wave wireless, and amongst this band of enthusiastic amateurs a keen spirit of rivalry exists to communicate with the few remaining regions.

The latest achievement in transmission and reception was carried out by Mr. Gerald Marcuse, 2NM, of Caterham, Surrey, who succeeded in establishing two-way communication with Singapore for the first time on record. His report reads as follows:—

"Whilst conducting experiments with the new Marconi valve with special short-wave seals, I heard a station giving the call sign SS.2 SE. calling me, which station proved to be Mr. R. Earle, Harbour Board, Singapore. He said: 'Hearty congratulations on first amateur contact with Malaya,' and stated that he had been up all night trying to get hold of a Britisher. He further stated that the time with him was 6 a.m., and that owing to daylight signals would soon fade. Nevertheless, good communication was established for an hour, and he told me in the course of conversation that he was using an aerial described by me in one of the radio journals, and that it was 'the goods.'"

He then stated that he had received orders to restrict experiments to 23 metres.

This communication was on Morse, of course, and we were both using comparatively low power.

My aerial consisted of a short length of vertical wire, and he received all my remarks without a repeat. The time here was 22.30 G.M.T. (*Marconi News Service.*)

For illustrations see page 9.

Stray.

Having fixed up a Hertz and tuned it, I was conscious of someone being in my den and found it to be my neighbour. On removing my phones his first words were, "And when do the Catherine Wheels begin."

He thought my aerial was shorting or something like that, and came over to tell me about the sparks.

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6 PENNY STAMPS to H.Q.**

In Reply To 6JV.

By G. L. MORROW (6UV).

IN the October issue of the BULLETIN some most interesting points in the shape of queries are raised by Capt. Hampson, and their solution will, I am sure, be of interest to our members, especially the latter problem, which concerns some important questions of design.

Space prevents more than a brief consideration of the questions at issue, and I will, therefore, content myself with a short discussion on 6JV's second query. Before doing so, however, I would like to suggest that Capt. Hampson has chosen for his example of a high impedance valve one which, from the valve designer's point of view, would offer very serious difficulties to produce.

Let us regard any transmitting tube as being, with its associated circuits, a D.C. to A.C. converter.

Although the efficiency of conversion can be made higher than 50 per cent. for various reasons, which it is unnecessary to go into here, in practice this figure is rarely exceeded.

Now, an efficiency of 50 per cent. is only obtained when, among other things, the load impedance equals the A.C. resistance of the tube, and if one plots the relationship between feed and oscillatory current against load impedance, one will find that a maximum value of oscillating current is given by one particular value of load, above which the feed will begin to fall.

In practice, such adjustment of load is effected by the anode tap, but it should be remembered that the associated aerial load will also effect this impedance.

Now, since the position of the anode tap will also affect the frequency of oscillation, it may often happen that with a high impedance valve sufficient anode tap cannot be used to enable an efficient conversion of power to take place, and therefore the transference of power to the aerial is also less efficient than in the case where a tube of low impedance is used and the necessity of a high anode tap not so important.

In general, one may say that, given suitable design of circuits, a valve having low impedance will generate oscillations at high frequency more easily than one of high impedance.

Also the coupling of the aerial transfer coil to the output circuit will be tighter where the valve used has high impedance, but a higher current component of the oscillatory wattage will be caused in the plate coil where a low impedance valve is used.

It will be seen, therefore, that the design of the oscillation transformer should not be

radically different, whichever typed tube is used, provided always that the circuit design is suitable.

Therefore the physical dimensions of the radiating system will not be affected.

Summing up, one may say that if the design and arrangement of circuit is such that the valve can work into a sufficiently large output load to give good conversion efficiency, there will be little to choose between the two types.

Where, however, the requisite load cannot be obtained, the low-impedance valve will prove to be more efficient, as in point of fact, it usually does at very high frequencies.

Extracts from a Log Book.

GMT.
 11.00 Wkrd Z2AC recd msg from G5CT via
 to F8JN and sent msg to RSGB, T. & R.
 12.30 Sect. and reply to G5CT also arranged
 sked for OA3E. Sgs reported R5 to R6.
 14.00 Worked U6DDO and gave him msg for
 14.30 U6RW.
 15.00 Worked U6ZAT and arranged for further
 to tests. Sgs reported R6, but fading
 15.30 latterly.
 15.45 Worked GFUP H.M.S. "Durban" in Indian
 to Ocean by arrangement. Reported very
 16.00 QSA.
 16.30 Worked OA3E and fixed up schedule for
 to Z2AC with him. Signals reported R4
 17.30 with no aerial and earth, and receivers
 4 ft. from aerial leads.
 17.30 Shut down for bed.

This is by no means exceptional, for I have on several occasions been QSO N.Z., U.S.A., India and Africa on same evening.

Calls heard by SS2SE, R. E. Earle, Electrical Engineers' Department, Singapore Harbour Board, Singapore, Straits Settlements.

Official.

The construction of the Standard wavemeter has been completed, and Capt. P. P. Eckersley, A.M.I.E.E., F.I.R.E., has kindly offered to defray the costs of calibration at the National Physical Laboratory.

Any transmitters receiving reports of reception of their 71-metre transmissions in U.S.A. are asked to get into touch immediately with the Hon. Secretary, T. & R. Section, 53, Victoria Street, S.W.1.

We regret that through an oversight, the name of our Irish Area Organiser was omitted from the draft rules which were submitted to the Convention, and to members generally through the post. We tender our apologies to Mr. Frank Neill, and assure him that his good work had not been forgotten, but that the error was due to our very rushed busy period occasioned by the Exhibition and the Convention.

Some Observations on High-speed Fading as Affecting 45m. Transmission.

By G. L. MORROW (G6UV).

INTRODUCTION.

REPORTS received during March, 1925, on the 45 m. transmissions from G6UV showed that at certain times any one given transmission was received at various distances up to 3,500 miles with completely different characteristics of the received signal. Tests were therefore carried out with certain stations with a view to determining, if possible, the cause of this discrepancy, and the results of these observations are given in the following article.

During the latter part of March, 1925, long distance communication was being carried out from G6UV on a wavelength of 45 ms. with an input to the oscillator of 100 watts. The radiating system employed was an inverted L type antenna having a measured fundamental wavelength of 135 ms., which was excited at its second harmonic. This system of excitation proved to be reasonably efficient, since, with an 8in. coupling between the transfer and aerial coils, less than approximately five per cent. of energy was being radiated on the half-wave.

The source of power was a Mortley D-C generator feeding the oscillatory system through a large smoothing circuit, from which it will be seen that there was every reason to anticipate as good a D-C note as had previously been attained on 91 ms.

In order to test the capabilities of the new transmitter a nightly schedule had been arranged with SMWF, who had for many months furnished most accurate and detailed reports on the old 91 m. set, and communication had, therefore, been arranged with SMWF to take place each night on 45 m. at 23.00 G.M.T. On the night that the schedule was timed to commence, G2QM, then located in Glasgow, was worked earlier in the evening. As had been anticipated, signal strength at G2QM on the shorter wave from G6UV was less than on the old wave of 91ms., being now R5 instead of R9 as previously. The point to be noticed is, however, that the note was still reported as being pure D-C. At the pre-arranged time that night SMWF was called, and in his answering report stated that signals were R8 in strength, but that the note was that given by badly rectified A-C and, further, that no difficulty was experienced in

Where is your Article?

reading signals with his detector valve well off the oscillation point.

This report was, naturally, somewhat disturbing, and one was inclined to suspect bad oscillatory conditions at this end; however, it then occurred to the writer that the more probable cause was slight frequency change at an audible period such as was a characteristic of KDKA's S/W telephony. Accordingly, SMWF was asked to stand by for an hour, and the feeds, etc., of the set at G6UV were then checked. Everything appeared to be quite normal, the aerial indication as measured on a thermo-couple ammeter, being 0.68 amp., corresponding to an aerial wattage of approximately 60.

It was then decided that, before any adjustment was made to the transmitter, reports from other stations at varying distances would be most valuable. Communication was then effected with F8SU in Toulon within 20 mins. of working SMWF.

F8SU reported signals R8 with pure D-C note. This was most encouraging, as it showed that the investigations were taking the right track. The next report from SMWF at midnight indicated no change whatever either in note or strength, and the next step was to obtain a report from the States. Shortly after midnight U2CXY was worked, and his report was that the note was R-C. This was sufficient data to go upon, so after arranging schedules with all four stations an attempt was made to deduce something tangible from the results already obtained.

If the distances in great circle of these stations from G6UV are taken in kilometres they will be found to be as follows:—

G2QM	..	..	520 kms.
SMWF	..	..	1,400 ..
F8SU	..	..	1,050 ..
U2CXY	..	..	4,800 ..

From these figures it will be seen that the note appeared to change at a distance between approximately 1,000 and 1,400 kms., and from this it was argued that the phenomenon was probably one involving a high-speed fading effect and was possibly due to some form of interference between reflected components of the wave.

At this point tests were carried out with the same stations over a fairly lengthy period with no alteration of any kind at G6UV, and the same results obtained irrespective of meteorological conditions.

It was considered, and possibly with some degree of correctness, that this effect at so great a distance was unlikely to be caused by interaction between the direct and reflected waves, but in order to confirm this reports were obtained from a large number of stations up to a distance of approximately 500 kms.

The average data extracted from these reports showed that up to 100 kms. signal strength was very weak considering the power used, but beyond this distance the signal strength rapidly increased to reach a maximum at approximately 500 kms., and after this appeared to remain more or less constant with the change of note occurring at about 1,200 kms.

This confirmed the supposition that the direct wave could not cause this effect at this distance, and, therefore, an attempt was made to evolve some theory which would fit in with the observed facts.

In Reinartz's original article in "QST" on the skip-distance of S/W's it was noticed that in each example the author had not assumed a constant angle of propagation from the antenna, and although this fact allowed a clear explanation of his theory one could not be entirely satisfied that this was a justifiable assumption. If one assumes that from a given antenna it may be possible for various slightly differing angles of propagation to exist, one may also assume that at one or more points at a distance an interference band may be produced which would cause a rapid fluctuation of frequency giving rise to the phenomenon noted.

This theory appeared to explain the effect, but it was considered necessary, if possible, to prove or disprove it by experimental means. Whether correct or not, it was considered that the predominating factor in wave propagation of this nature would prove to be the antenna, and therefore an entirely new system was designed and built. This antenna was nearly vertical and had a measured fundamental wavelength of 64.8 ms.

The transmitter was now coupled to this system and the whole oscillatory system tuned to 45 ms. As was anticipated, the indication of antenna current showed an appreciable increase, but the input power was maintained at the same figure as with the old aerial, as it was considered inadvisable to alter more variables than necessary.

A fresh series of tests were now arranged, and the results showed a pure D-C note at all distances, but with the skip-distance reduced to a very much smaller interval.

This latter point is of interest in view of the fact that no alteration in W/L had been made.

The first antenna was now re-rigged and the transmitter and oscillatory conditions repeated exactly as in the first tests. Again the same phenomenon of change of note took place at the same distance as previously noted, and it was therefore concluded that the investigations tended to show that this effect was due to interference bands caused by slightly different angles of reflection from the Heaviside layer.

Once again the 64.8 m. antenna was erected and a lengthy series of tests carried out, but,

unfortunately, it was not found possible to arrange for a reliable receiving station at a distance of approximately 2,500 kms. Had it been possible to co-operate with a station at this distance it was anticipated that interesting data would have been obtained.

At this point, owing to circumstances outside the writer's control, investigations had to be terminated, and have only recently been resumed.

The conclusions arrived at with respect to these tests are as follows:—

It is generally known that with S/W transmission the amount of penetration into the Heaviside layer is determined by the length of wave employed, that is to say, the angles of incidence and reflection will be equal at the critical wavelength and for frequencies above this value the angle of reflection will tend to become less owing to the greater penetration.

If, now, one assumes that, owing possibly to some inherent property of the particular antenna system used, it is possible for a slight periodic variation to take place in the angle of incidence, it would appear also to be possible that a corresponding slight variation might occur in the case of the reflected ray, and at a certain interval of distance an interference band be produced giving rise to a change in the characteristic in the received signal. It is not intended to suggest that this is the correct theory to adopt, but merely that it may be a possible explanation.

Had circumstances permitted it had been intended to augment these investigations by using other wavelengths and antenna systems in both daylight and darkness—all the above tests were carried out with darkness over all the area from which reports were received, and as far as possible with approximately the same meteorological conditions prevailing at G6UV—and to note particularly if any extreme variation in the skip-distance took place.

It is proposed to continue these investigations during the coming winter, and the writer would much appreciate the co-operation of such members of the Section who are interested. It is felt that a serious attempt to discover the possibilities of antenna design as affecting S/W transmission would be of some value to the Section, and if those interested will communicate with him, it should be possible to carry out some interesting work.

Stray.

G6BT thanks the numerous members of the T. & R. who have so kindly sent him messages and cards of greeting for Christmas, and begs them to accept this as an acknowledgment, as it is impossible to reply to all individually, and wishes all a very prosperous New Year and the best of super-DX!

A Few Notes on Operation "on the air."

By F. R. NEILL, 5NJ.

IN view of the interference at present being experienced on the 45 metre waveband, it is, I think, up to all of us to operate our transmitters in the most sensible manner, in order that we may not cause any more QRM than is necessary. The following notes have, therefore, been penned, *not* to show how it should be done, but rather to act as suggestions which may help us to secure easier and more pleasant operation of our stations.

Now, any person desirous of carrying out C.W. tests over either long or short distances, should have a really good knowledge of Morse code, and while we are certainly not expected to be qualified telegraph operators, yet at the same time we *are* expected to be quite familiar with Morse at a speed of 12 words per minute. This means that we should be able to send or receive at this speed without any repeats at all being required or without any errors being made. This is point number one, and it is rather surprising to note that many either cannot, or do not, observe it.

There is a second point—why do so many stations repeat each word twice *without being asked to do so*? It seems the rule at present rather than the exception to find stations only a few hundred miles apart, repeating everything twice, and naturally this practice wastes a considerable amount of time and is liable to cause much QRM. In the writer's opinion words should never be repeated twice unless (a) strength is reported R5 or below, (b) QRM is taking place in any form, (c) one is asked to do so by the receiving station.

The last point refers to the time when contact has been established between two stations. In this case a very short call only is required after a change over, the other station's call letters being sent three times *at most*, and not about seven or eight times, as is sometimes the case.

Finally, a word regarding "test" calls. The word "test" should never be sent more than three times without signing. If this rule is observed a receiving station will not be kept waiting more than a moment until he finds out who the testing station is. The long-drawn-out "test, test . . ." up to 15 or 16 times without signing, makes for waste of both time and temper. A better way is to send the word "test" three times, then sign three times, the whole process being repeated as often as is necessary.

These suggestions are all well-known ones, but it is as well to be reminded of them again, as their adoption will mean better operating and probably less interference.

The Editor thanks all members and advertisers for their kind support in the past year, and takes this opportunity of wishing all every success and prosperity in 1927.

Some Reminiscences of 1913.

By G. L. MORROW, G6UV.

TOWARDS the end of 1913 I was bitten, and bitten badly, by the Radio bug. 2OM—then known as WBX and later as XXU—and I were then at school together, and he was responsible for my first receiver, a wonderful affair consisting of a double-slide tuner (wound surreptitiously on the school lathe), a silicon detector, numerous condensers and a pair of Sterling phones, the latter the pride of my heart. The first time the set was tried out MPD came in at a good R5 strength, and I was so overcome that I remember listening to him from about 10 that night until he finished his WX report about 2 the next morning! We used to vie with each other in hearing the Mediterranean Coast stations, and it may interest the newcomers to the game to know that we considered it a bad night if we could not READ EAO, EAS, FFS, etc., on 600. Early in 1913 came the $\frac{1}{2}$ in. spark coil, transmitting jigger and key; as MBX I made my debut on the air. In those days OXM, 15 miles away, was our star station, and in a fit of optimism I called him one Sunday evening. To my great surprise he came back at me and this was thus my first QSO. The next week I paid a visit to OXM, and was enormously impressed by the 70 ft. tower, the shack and the spark gap operating in some weird and wonderful gas.

After some months of fruitless endeavour I was QSO with WBX, about 30 miles away, by the simple process of collecting all the accumulators I could lay hands on to overload the long suffering coil. My QRH in those days was somewhere around 200 ms., but wavemeters were almost unknown.

We had no BCL's then to worry us, but, like the poor, ECX and MHX were always with us—old-timers will know to whom I refer—suffice it to say that these two stations used to use a 1 kw. (I think) set and "maggies" to communicate about five or six miles!

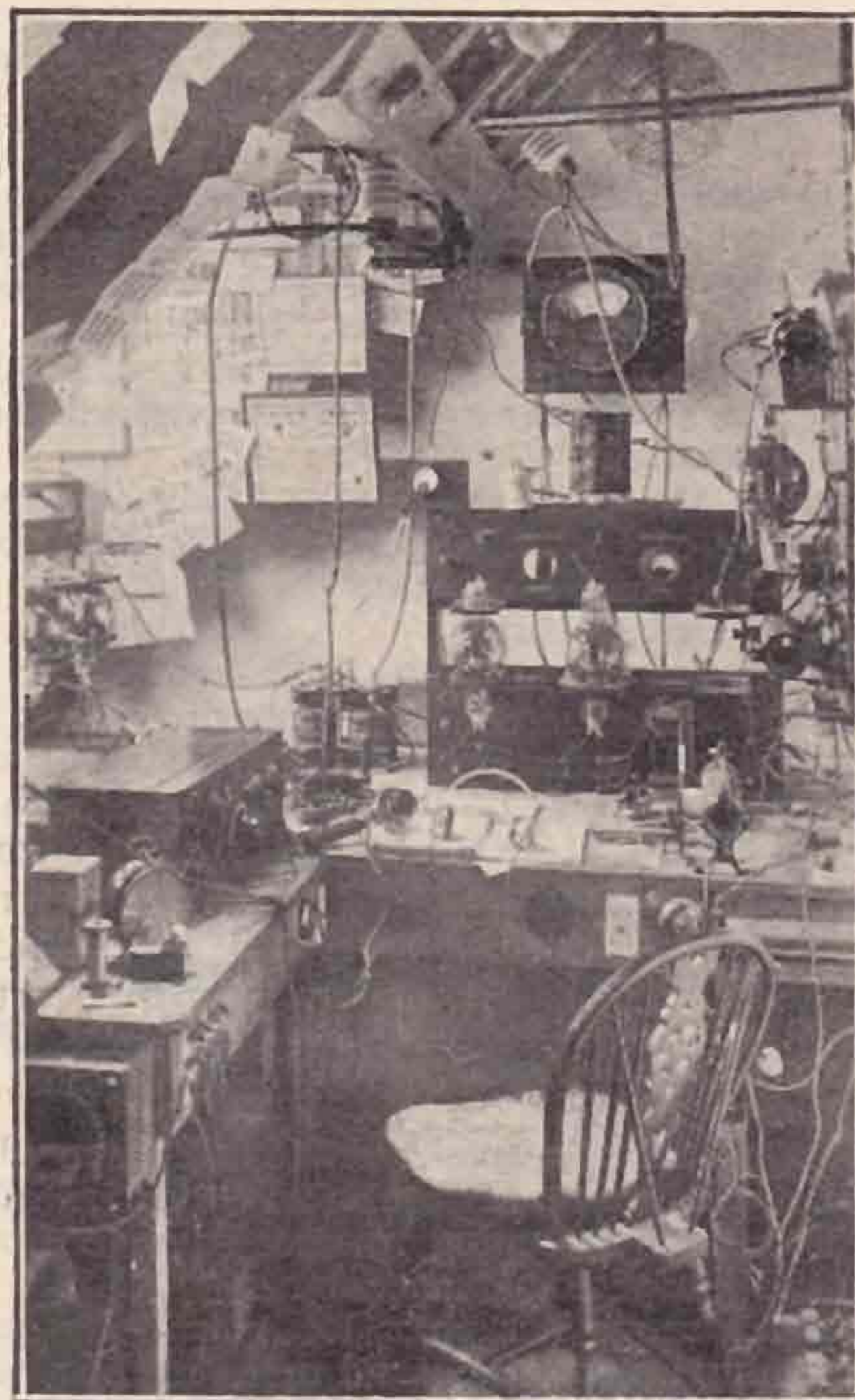
In the summer of 1913 I was staying with XXU, as he then was, and we were vastly intrigued by the activities of a Telefunken station signing BOL. Owing, I think it was, to Parential QRM, listening to BOL at 3 a.m. was not encouraged; thanks to a muffled alarm clock, a piece of string and my big toe, this was overcome, and we listened to BOL calling his head off for hours on end. It transpired years later that this was Nauen with about 50 kw. behind him trying to raise the Kameruns. Whether he was successful I can't say, but I rather think that eventually they did hear him with the help of a few kites and things.

Then there was RY and his wonderful talks to or about "Jufubo." No one seemed to know who or what the latter was, unless it was poor old BYD when he dropped his dots on his WX report.

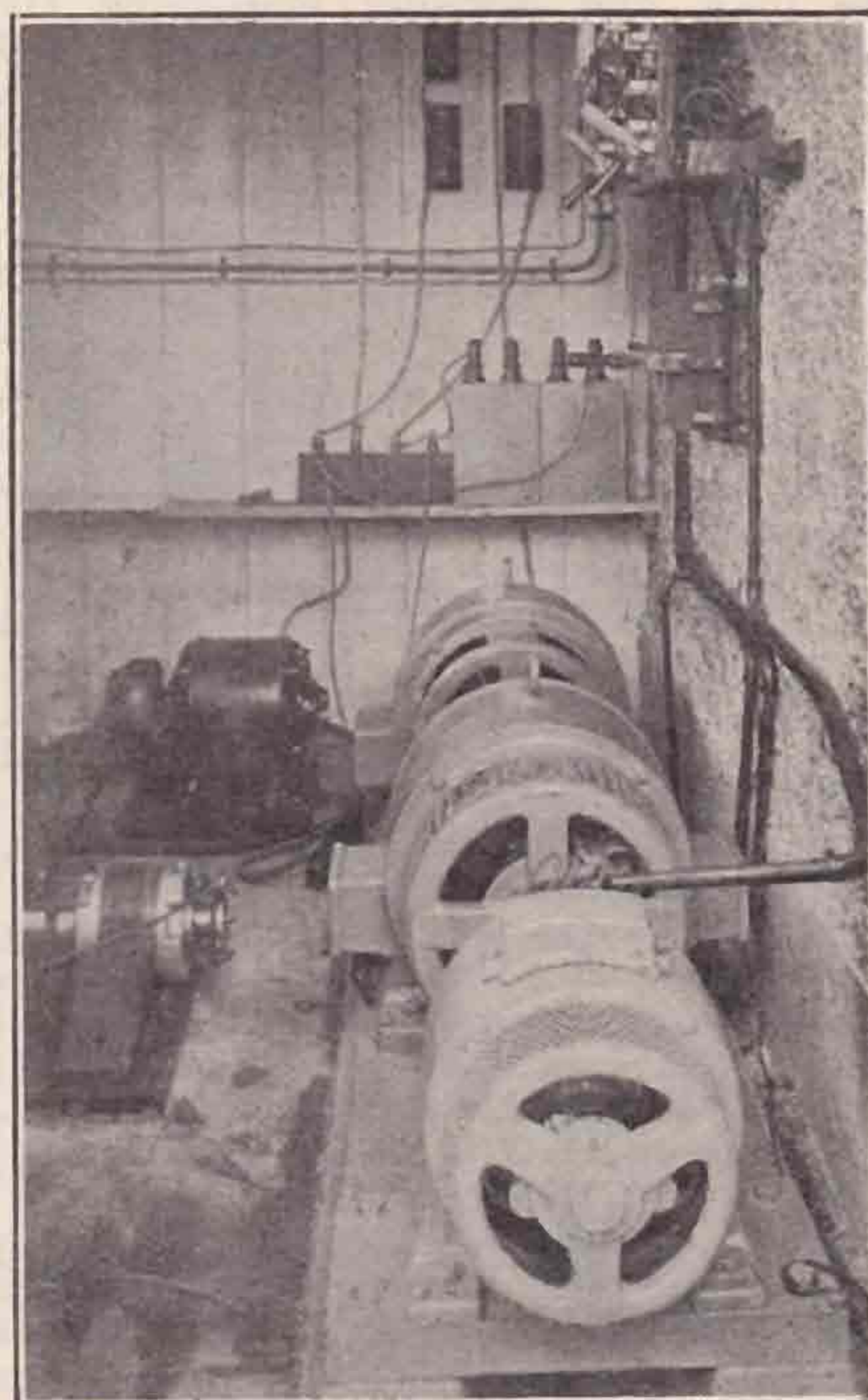
At this time it was one's ambition to receive GB using spark on a QRH of, if I remember correctly, 8,500 ms. When I had copied him early one morning I thought the world held no more pleasures!

Then, of course, came August, 1914, and the end of private radio, until the station was re-erected in 1920 to become G6UV in the latter part of 1923.

Another Amateur Success—Illustrations.



THE MEASUREMENT ROOM AT 2NM.



THE POWER HOUSE AT 2NM.

Excelsior.

By "RADIO REX" (the author preferring to remain anonymous).

NO—not the "youth who bore through snow and ice a banner"—but something approaching these conditions with a portable set. Where did you say? Yes, tucked right away in the fjords and glaciers of Norway, which brings us to the problem—are short waves affected by local screening?

During the past few weeks I investigated the possibility of two-way QSO with England on low power—the mobile station being in the fjords aboard a British ship.

We started off merrily. The transmitter was a hurriedly constructed affair mounted on a plain base of wood, with two Mullard receiving 6v valves. A 2-valve receiver O-V-1, constructed originally by my old friend 2LZ, which has travelled with me from Dan to Beersheba, was also used.

The waters of the Solent sparkled merrily as the good ship turned her nose to the South. Mr. Z., of the . . . Radio Company, was busy up top sides putting the finishing touches to the 600 metre spark set.

I detected an unusual twinkle in his eye when he spied my collection of "gubbins" duly installed on the floor of my sleeping apartment, or to drop into nautical phraseology, my cabin.

"What range has that lot got?" he queried. "Anything up to a thousand miles, me boy," said I, feeling like Harry Tate in the motor-car act, and connecting up my two 100 volt B.C.L. batteries in series with the ship's 100 v DC mains for my plate juice, and inwardly murmuring DV and QRM permitting, Mr. Z. glided away. "Ill just test with the coast station the other side of the Isle of Wight," he said, "and then I'm off ashore."

I tuned up Lizzie and tested with Belgium S1 for a start, went up top and found Z. saying startling things about 600 m. and QRM in general.

"Can't get him yet," he said (the range was 15 miles)—"too much QRM."

"Shall I pass any tlc for om?—via Belgium?" He glared, and went ashore.

Away out in the Channel—with a following breeze—believe me, I didn't feel too good, sitting on the floor of the cabin pounding away with my old friend T. at GFR. . . — . . . — . . . — . . . went my key.

A lot of fishes were fed. QSO resumed. No change of wl—no swinging, queried I, watching the foremast and the single wire vertical aerial through the skylight describing glorious arcs.

"No om No," came back the reply.

Next day, in the grey North Sea, passing over the scene of many naval battles, QSO was perfect at mid-day and sigs. boomed in at night.

Hours went by and the Norwegian coast came into view. My humble 10 watts was still reaching out and reception OK despite bad QRM from dynamos and bilge pumps. Twenty-four hours later we steamed into a fairyland of nature, placid waters with terrific mountains on all sides. At mid-day GFR rolled in cheerily. Thought I, this is where our QSO stops. Not a bit—43 metres liked it (thanks to Dr. Heaviside).

A 20,000 ton liner anchored near. Ever anxious

to have a chat with a radio brother, I went over—walked up mazes of decks and met the great No. 1 in the radio cabin—the other two ops sat and listened open-eyed. What was I, QSO all Europe?

I watched the aerial ammeter creep up to 10 amps. on 600 metres—the coast station couldn't hear them—the screening was very bad. 5XX was inaudible on a 5-valve Fada neutrodyne.

I saw the same needle creep up to 12 amps., and England was called on CW long wave—no joy.

The ops are now applying for membership to the T. & R., and hurriedly getting the goods together. And so the seed is sown. They came over to me, sat on the deck, watched me calling Test. Back came the nippy morse of 6BT, 5TZ, 5MQ, 5MU in rapid succession. FB oms, especially my policeman friend, "who had to be on duty at 2 pip emma." Also had time to catch the odd salmon in the rushing streams and—6BT wanted to know if they were in tins.

Someone said I should call this—Short waves and short nights in Norway. The jest was true. Night never came to us in those latitudes—the sun was up when you fellows were testing with me at midnight.

And so the voyage ended. QSO was always maintained with 40 foot masts and crags like Mount Blanc around me.

Makes one think, doesn't it?

I've worked on these ultra frequencies East of Suez, on the arid plains of Mosul and Baghdad, but never before has such work been done with your help under difficult conditions. No stunt circuits, no Hertz, and a single wire aerial alongside the ship's twin wires.

Stations heard under these conditions were: N0PX, G60X, KW9, 5MA, 5PZ, 5BY, N0BL, 6YU, 6IW, F8VO, BY8, YS, 7XX, SMWQ, SMVJ, G2IP (fone), 2NM (fone working India).

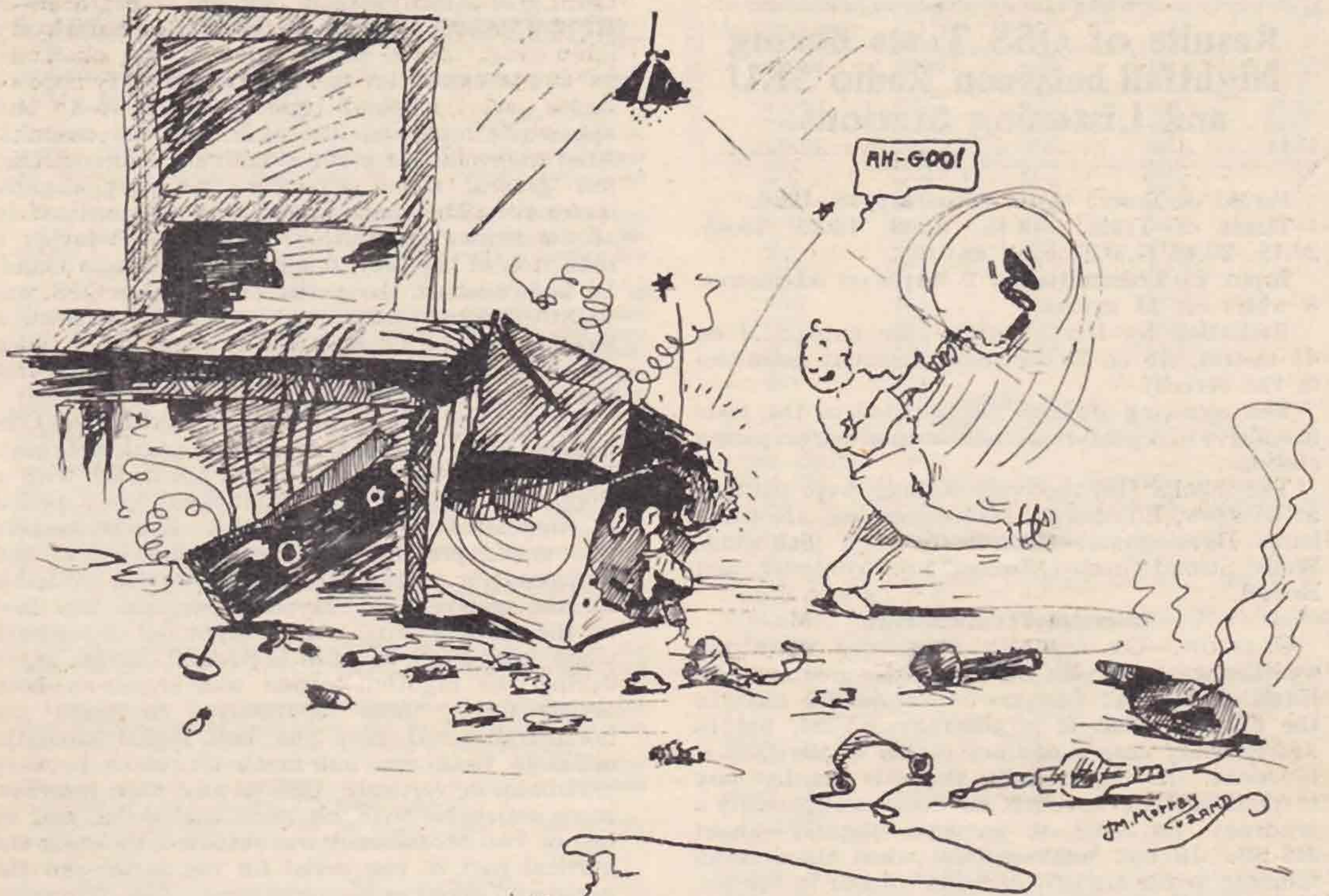
Is Low Power Dependable?

By 6TD.

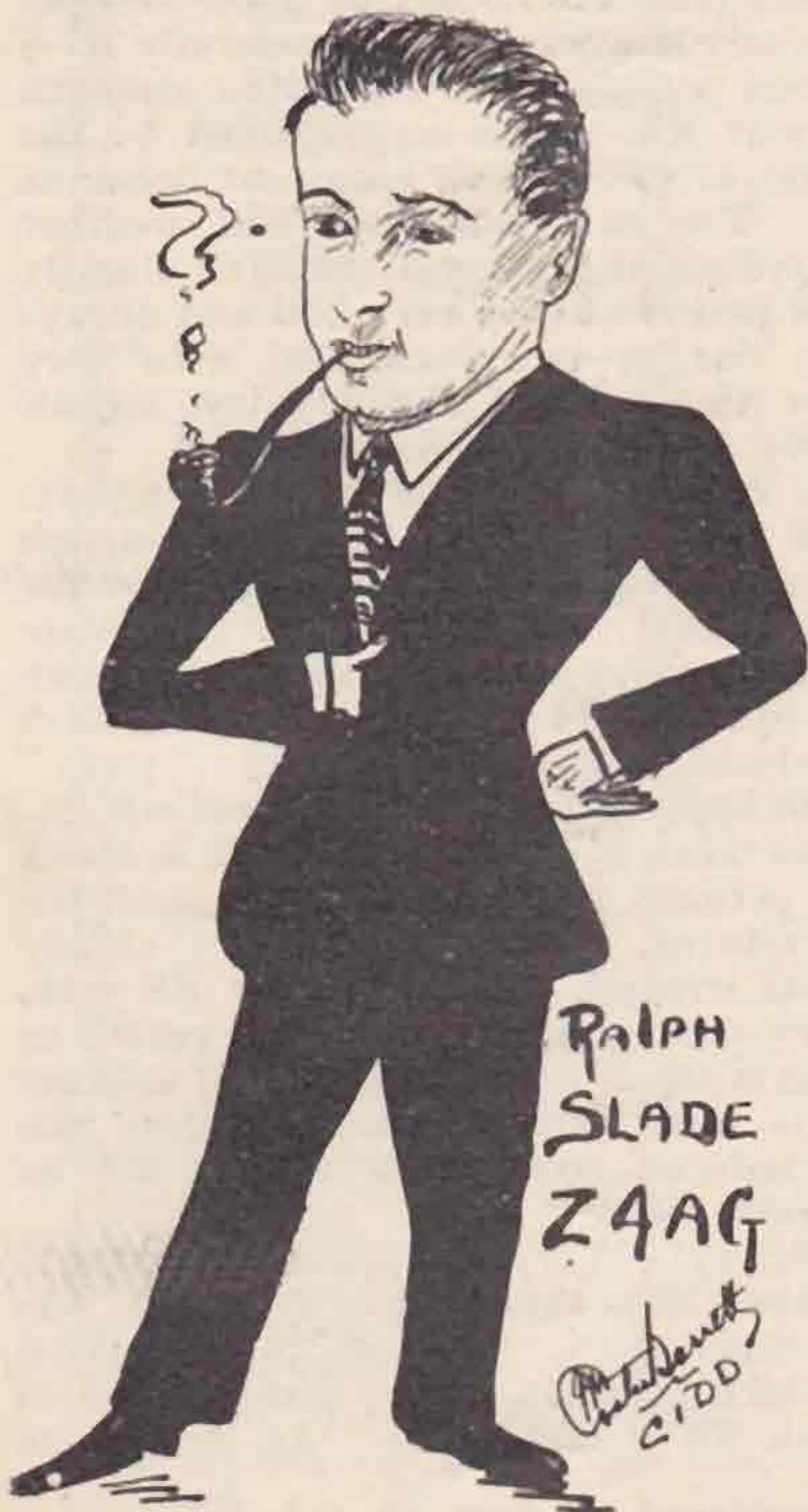
IN view of the statements which have appeared from time to time in the T. & R. BULLETIN concerning the travelling propensities of low power short wave work, I feel that a short article on this subject, based upon personal experience, would not be out of place. With 70 watts on 46 metres I listened to see what was doing on twenty-eight nights in November, the two missed nights being those on which the death of Queen Alexandra was mourned, and one night for other reasons. On six nights I could not hear a Yank or American continental station of any sort. Out of the 28 nights I "got over" eleven nights only, but called each night.

The shortest sittings were from 22.30—23.30. One night I heard a Brazilian but no other country, and another I heard two Canadians, while on another I worked Porto Rico. In each case I was only able to work one country. I expect that many will endeavour to explain this away by saying that I am a poor receiver. Anyway, I can hear PT. IHR most afternoons and A6AG very often about 16.00 G.M.T. What I totally disagree

(Concluded on page 21.)



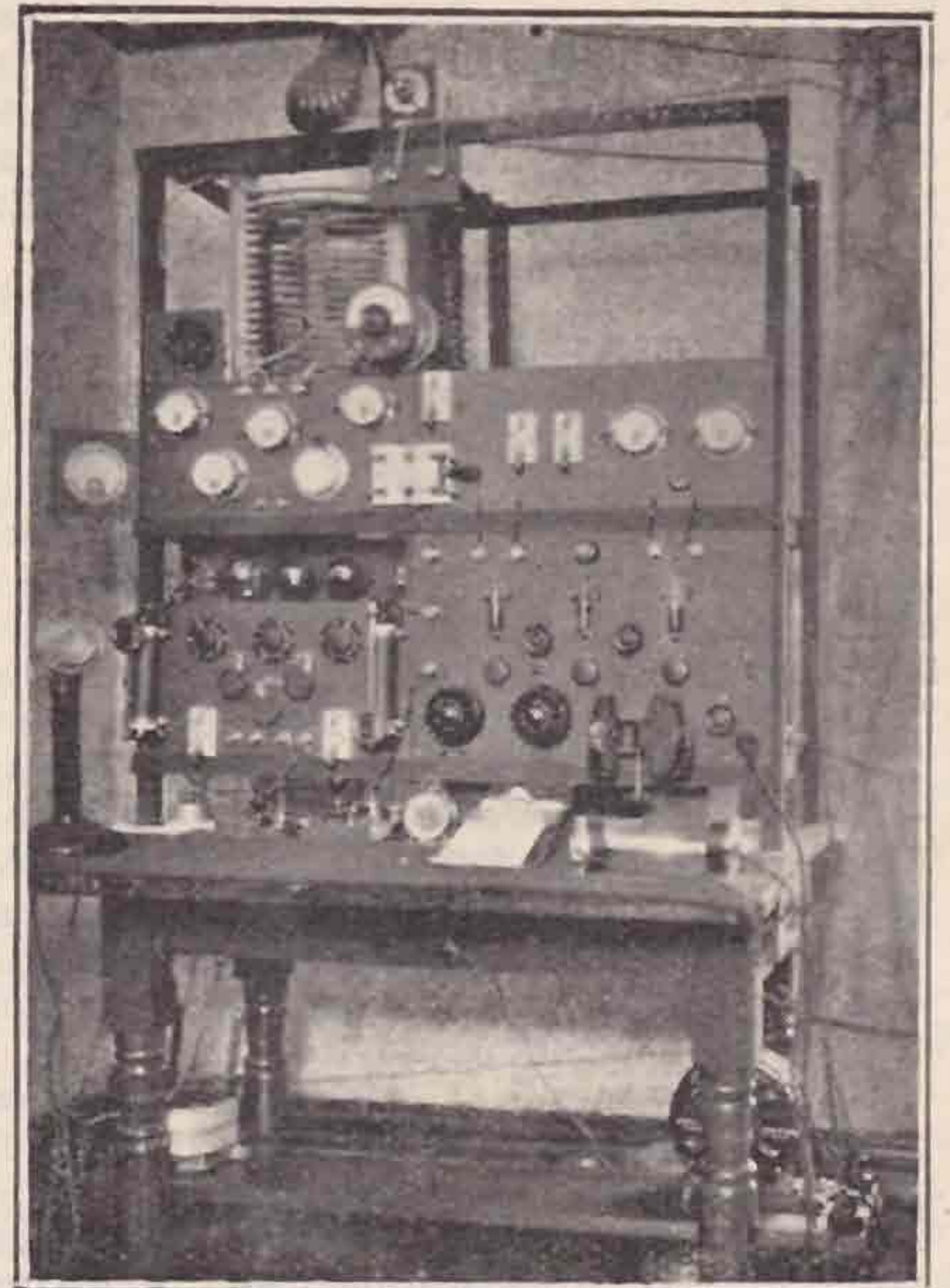
The Little WRECKERFIER!



RALPH
SLADE
Z4AG

W. Bennett
CIDO

WE HAVE STILL A
FEW CELEBRITIES
TO COME.
MAJ. C. W. BORRETT'S
IMPRESSION OF
RALPH SLADE,
ONE OF THE Z'S,
IS SEEN ON THE
LEFT.



G2DR
THE STATION OF MR. S. R. WRIGHT,
NORTHERN AREA MANAGER.

Results of QSS Tests during Nightfall between Radio 5KU and Listening Stations.

Period of Tests: April 8 to May 15, 1926.

Times of Tests: 18.15, 18.45, 19.15, 19.45, 20.15, 20.45 G.M.T. each day.

Input to Transmitters: 9 watts on 45 metres, 8 watts on 23 metres.

Radiation by Hertz aerials. Ae amps: .3 on 45 metres, .18 on 23 metres (at current antinodes in the aerials).

Ten receiving stations participated in the tests (exclusive of reports received from non-participating stations).

The regular (10) receiving stations were situated at Glasgow, Edinburgh, Hale (Cheshire), Nottingham, Birmingham, Redhill (Surrey), Tunbridge Wells, Stroud Green (London, N.), Worcester, and Bristol.

45-metre Transmissions.

GLASGOW.—On fine dry days, and when the weather was generally clear over the great part of England, QSS at Glasgow is practically nil. In the daylight tests it is generally R5-R4, but in nearly every case a distinct period in the QSS is observed. As night falls there is hardly any increase in signal strength, but there is apparently a tendency for QSS to increase slightly—about R5-R3. In bad weather, and when there is an increase in the amount of water vapour in the air, or where large cloud masses cover the sky, the general signal strength is reduced slightly. The fading becomes worse and with longer intervals predominating, and is usually about R4-R2 or R1. On the other hand, if cloud covers the greater part of the sky between London and Glasgow the QSS may be only slight. Fairly long periods of steady strength with one or two bad fades are noticed. The results for Glasgow are practically identical with those of Edinburgh. (See Edinburgh in 23 metre results).

HALE (Cheshire).—Weather fine and dry gives an almost constant signal strength in daylight of R6. As darkness approaches irregular fading takes place and the general signal strength (not the average) is slightly lower, i.e., during the periods of steady signal. The worst period for QSS is during dusk, and this gives the worst signal strength. During nightfall the signal strength increases and is about R8 or R7 when dark. QSS is not so noticeable and not below R6. With heavy cloud or rain around the transmitter the daylight QSS is increased and is occasionally very bad—R5-R2. Always irregular and continuing all through. With general bad weather over the whole distance QSS is bad throughout, the daylight strength is the same as for good weather, but the night-time strength is only about R7-R6.

NOTTINGHAM.—Fine weather conditions were practically the same as for Hale (Cheshire), except that there was no increase in strength as night fell. In nearly every case a very slight and regular fade was observed (R5-R4) during the night-time transmissions. Bad weather had hardly any effect on results. QSS was not greatly increased, but it became irregular.

BIRMINGHAM.—Fine weather conditions here

again give a fairly steady daylight strength about R7 or R8. As darkness approaches some very interesting "quick period" fading was observed. In a few cases the strength would vary in two stages as: R8-6-5-8 and then R8-6-8, and apparently repeating this cycle for a few minutes. After nightfall this peculiar fading would continue, but general signal strength was only slightly increased. The quick-period QSS was noticed in all conditions of weather. With bad weather a reduction of the general signal strength was found. In bad weather the periodicity of the QSS was slightly higher, sometimes as much as twice a second: R5-4-5 or R5-3-5. As night fell a much slower period was noticed, and the QSS became much steadier.

WORCESTER.—I have not much details of QSS noticed here, except the general signal strengths. Fine weather throughout gives about R7 with a slight fall in signal strength at night via a period of irregular QSS as night falls. Reception here was under practically my own supervision, and horizontal or vertical Hertz aerials were available for the receiver. In daytime reception was best on the vertical aerial with a slight fall in strength when changing to the horizontal aerial. QSS during the nightfall period was equal on both aerials (using them separately). At night the horizontal aerial gave the best signal strength, although there was not much to choose between horizontal or vertical. QSS (if any) was, however, more noticeable with the horizontal aerial, and on one or two occasions it was removed by using the vertical part of one aerial for the aerial and the horizontal aerial as a counterpoise. (See Worcester re 23-metre results).

BRISTOL.—A good daylight strength is again found in Bristol (about R7), but on good weather days QSS is nearly always noticed: generally R7-6 in 7 to 10 second periods. The night-time strength falls off to about R5, and is accompanied by the nightfall period of QSS which seems to occur at this distance. The only difference bad weather makes is to reduce the general strength slightly and make this period of QSS very bad and always irregular. On one or two occasions, with very bad rain over this part of the country, signals have been very QRZ and QSS from R2-0.

TUNBRIDGE WELLS.—Only bad weather reports seem to have been received. Curiously enough the worst weather (rain, drizzle, misty) gives the best general signal strength here. Moderate amounts of cloud give a strength of about R6 with gradual fades to R3 or R4. The period of nightfall here again produces some irregular effects; "jerks" occur to R2 and apparently no particular periodicity. After night has fallen the general strength is about the same or perhaps slightly decreased and the regular QSS returns. With wet or very cloudy sky the general strength is about R7 or R8 with, in nearly every case, a 10 or 15 second period in the QSS, which is about R8-R4. With bad weather a long fade is often noticed, though when this happens the reduced strength is not so low as with the periodic fades.

REDHILL (Surrey).—Very comprehensive reports were not received from this station as the op. was moving to another QRA. A good R8 is received in daylight which goes via a very jerky period of QSS to a weak R3 at night time. An increase in

(Continued on page 14, col. 1).

QRA and QSL Section.

WE are pleased to note that Portuguese amateurs have formed themselves into a league.

R. E. P. (Portuguese Transmitters' League) is now in existence under the able presidency of PIAE, Lieut. Eugenio de Avillex, Costa do Castelo 15, Lisbon, Portugal, and our members are invited to forward their cards to this address, destined for Portuguese amateurs.

I am sure T. & R. members wish the new league every success.

The French journal *Radio Amateurs* asks us to publish the change in its address. Here it is:—*Radio Amateurs*, Service des Ondes Courtes, 6, Rue Boinod, Paris XVIII^e.

J. C. Primavesi (Y1BR) has sent us the latest official list of Uruguayan amateurs working on short waves, for which we thank him, and we are also indebted to Mr. Howe (RDH5), who keeps the section supplied with editions of the South American Call Book. This list is very complete, and contains much useful information, and can be obtained by registered post for 2s. from the publishers, *Radio Revista*, Lavalle 1268, Buenos Aires, Argentine.

We would like to point out to new members that space will not allow of the re-publication of the long list of forwarding agents throughout the world, or of the list of intermediates, in every issue of the BULLETIN, but these are kept up to date and will be published periodically. Much useful information has been given in this respect from time to time, and members, who may be interested, may find it worth while to get some of the more recent back numbers.

We understand from the Hon. Organiser that headquarters will post back numbers to members on receipt of a remittance of 6d. per copy.

The last published list of forwarding agents was given in the September and October issues, and a list of intermediates appeared in the September issue.

There was an unprecedented demand for this number at the Radio Exhibition and Convention, and we believe it is not now obtainable, and we give now our latest list of intermediates.

It should be remembered that intermediates are frequently changing and new ones springing up, so that it must not be taken as official or final. Do you know any others?

Have you any suggestions for the improvement of this Section, if so, please let us have your suggestions.

A ...	Australia	KC ...	Latvia
AI ...	Tripoli	KY ...	Kenya Colony
AU ...	Alaska	L ...	Luxembourg
B ...	Belgium	LA ...	Norway
BA ...	Albania	M ...	Mosul
BE ...	Bermuda	M ...	Mexico
BG ...	British Guiana	MF ...	Morocco
BN ...	British N. Borneo	N ...	Holland
BO ...	Bolivia	NP ...	Samoa
BR ...	Roumania	O ...	South Africa
BU ...	Bulgaria	OE ...	Austria
BZ ...	Brazil	P1 ...	Portugal
C ...	Canada	P2 ...	Azores
CB ...	Belgian Congo	P3 ...	Madeira
CH ...	Chili	P4 ...	Guinea
CHN ...	China	P5 ...	Cape Verde
CO ...	Columbia	P6 ...	Angola
CR ...	Costa Rica	P7 ...	Mozambique
CS ...	Czechoslovakia	P8 ...	Goa
CZ ...	Canal Zone (Panama)	P9 ...	Macao
D ...	Denmark	P10 ...	Timor
DA ...	Dutch Africa	PE ...	Palestine
DF ...	Faroe Isles	PI ...	Philippine Isles
DY ...	Uruguay	PR ...	Porto Rico
E ...	Spain	PT ...	Panama
EG ...	Egypt	Q ...	Cuba
EI ...	East Indies	R ...	Russia
F ...	France	R ...	Argentine
FA ...	Algeria	S2's ...	Finland
FC ...	China	SM ...	Sweden
FI ...	Indo-China	SR ...	Salvador
FM ...	Morocco	SS ...	Straits Settlements
FS ...	Syria	T ...	Turkey
G ...	Great Britain	T ...	Esthonia
GC ...	Scotland	TE ...	Esthonia
GH ...	Ecuador	TJ ...	Trans-Jordania
GI ...	Northern Ireland	TL ...	Lithuania
GW ...	Irish Free State	TP ...	Poland
H ...	Switzerland	TUN ...	Tunis
HU ...	Hawaiian Isles	U ...	U.S.A.
I ...	Italy	X ...	Portable Stations
IC ...	Iceland	Y ...	India
IC ...	Indo China	Y ...	Uruguay
J ...	Japan	YS ...	Yugoslavia
JM ...	Johore, Malay	Z ...	New Zealand
K ...	Germany		

QSL's Waiting.

The following have not less than three cards each waiting to be claimed.

Will they please forward stamped addressed envelopes for them to this Section.

Will members please help us to diminish the list?

2BDY	2HQ	2ZA	5WP	6YQ
2BK	2JX	2ZF	6BJ	6YV
2BMO	2KF	5BV	6DO	6YX
2BNR	2LF	5DH	6HI	6ZC
2BOW	2OC	5DS	6KK	BRS6
2BZ	2OG	5FJ	6LJ	BRS9
2CA	2OJ	5GF	6NX	
2CH	2OW	5HG	6OU	
2CO	2PP	5IR	6OW	
2CS	2RL	5MU	6PA	
2DA	2ST	5NN	6RM	
2DF	2UD	5OK	6TM	
2DX	2UN	5QG	6TV	
2DY	2VQ	5OZ	6US	
2FM	2VS	5RZ	6VJ	
2FO	2WW	5US	6WS	
2GV	2XV			

QRA's Found.

- L-1AG.—A. Greg, Gillen, Luxembourg (Inf. G6UV).
- BXY.—Naval W/T Station, Stonecutters Island, Hong Kong (Inf. G5GW).
- T2X.—QSL to O. Leesment, Aia t 6, Pernau, Esthonia.
- R-BH5.—M. Cardeñosa, Caseros 960, Cordoba, Argentine (Inf. A. F. C. Adye, T. & R.).
- OE-JZ.—J. Zwerina, Favoritenstrasse 64, Vienna 4. (Inf. A. S. Clacy, T. & R.).
- Y-1NA.—P. H. Evangelist, Durazno, Uruguay. (Inf. A. F. C. Adye, T. & R.).
- R-1AK.—A. Kojewnikow, 1/2, Presbrajenski Lane, Nijni-Novgorod, Russia. (USSR).

QRA's.

- 2AFO.—F. Edmonds, 178, Richmond Hill, Accrington, Lancs.
- 2AHP.—J. Spafford, 15, Priory Road, Blidworth, near Mansfield.
- 2AJL.—J. Hum, 17, Eastwood Road, London, N.10.
- 2AVZ.—J. W. Higgins, 23, White Street, Govan, Glasgow, S.W.
- 2AWH.—L. S. Crutch, 15, Mundania Road, London, S.E.22.
- 2AWL.—J. G. Millar, 121, Alleyn Park, London, S.E.21.
- 2BFM.—D. C. Birkinshaw, Holme Bank, Broomgrove Road, Sheffield.
- 2BPB.—J. Cyril Adams, 35, Newton Street, Greenock, N.B.
- 2BPL.—S. J. Meares, 220, Melfort Road, Thornton Heath, Surrey.
- 2BWR.—D. H. C. Rudd, 83, Cricklade Avenue, London, S.W.2.
- 2RU.—W. G. Dixon, Pipwood, Rowlands Gill, Newcastle-on-Tyne.
- 5AN.—E. W. V. Butcher, 16, Manor Gardens, Purley, Surrey.
- 5LL.—G. Liversidge, Oxley Woodhouse, Huddersfield.
- 5XH.—L. W. Hooke, 87a, Haverhill Road, Balham, London, S.W.12. (Transmits on 23, 44-46, and 90-200 m. Power up to 50 watts, CW and TEL).
- 6FD.—F. E. Dominey, 19, Shooters Hill, Cowes, Isle of Wight.
- 6HM.—H. F. Malcher, Station House, North Ealing, London, W.5.
- 6JS.—J. Steele, Braehead, Dalry, Ayrshire.
- 6XL.—J. E. Taylor, Taymore Bungalow, Lyons Gate, near Crene Abbas, Dorset.
- 6QL.—P. H. Berry, Gill's Hill, Radlett, Herts.

Change of Call Sign.

- 2BMD.—Now 6QL.
- 2BVO.—Now 6HM.
- B-4QQ.—Now B-A2 (Inf. GW-11B).
- A-2CS.—Now A2SH (Inf. R. A. Bartlett, T. & R.).

QRA's Wanted.

- G-XAN. PI-WUA1. G-2MN.
- All new QRA's to G-6BT.
- NOTE.—When enclosing cards for QSRg, send stamps loose. Always send stamped and addressed envelope or postcard, when replies are required.

G6BT.

QRA and QSL Section, T. & R. RSGB,
82, York Road, Bury, Suffolk.

DENMARK.

By E. POULSEN (D-7MT).

7BX, after having been closed down for some time, is now working again on low power. The transmitter used employs loose coupling and a Hartley circuit. With an input of only .27 watts, Denmark, Germany and England have been worked. In England sigs were reported R5 by G6PA. G2RG reported sigs as crystal controlled! Hi! All reports on sigs from this low power set will be much appreciated and acknowledged.

7XU is working with a low power transmitter, but so far, due to bad screening from metal building, and many BCL aeriels, has only worked Finland, Germany, Sweden and Belgium, and if he does not soon get some reports from G's will be scrapping it. The high power set, employing 75 watts, will be used over the Christmas holidays.

7ZG reports QSO's with N. Africa, P and YS, using an input of 15 watts.

7MT has been very successful with an input of .5 watts, and may soon try to maintain DX with .1 watt. When QSO PIAJ, he asked him to stand by for a change over to Hertz aerial. PIAJ reported ND. Next morning the cause was found. The Hertz was not there, but gracefully reposing on the ground. Hi! He usually (Concluded on page 21).

Results of QSS Tests—concluded from p. 12.

signal strength is also noticed here when there are heavy cloudy skies.

STROUD GREEN (London).—At this short range a signal strength of R7 was recorded practically every day. Cloudy skies gave a slight increase to about R8, and QSS was most noticeable when it was raining or the weather was rough. QSS in all cases was irregular. (See Stroud Green *re* 23 metre results.)

23-metre Transmissions.

If heard at all the signal strength in Edinburgh was never more than R4. On a clear fine day the strength was steady and remained the same when and as night fell. QSS was generally noticed after dark and was always very bad, a fairly long period which brought the signals down to inaudibility. The least suggestion of bad weather, cloud or rain, reduced the signal strength and produced bad QSS all through the test.

WORCESTER.—Here the signals were only heard on two occasions, and only at night time with the horizontal aerial; strength was remarkably good for this "blind area" distance—R5. In both cases the night was clear and the air fairly dry. Reception was tried on the vertical aerial, but only produced what was thought to be a signal!!

STROUD GREEN (London, N.).—Signals were heard on all occasions here, and nothing seemed to alter their strength or QSS. Strength was R4 and there was absolutely no QSS any time.

A Few Causes, Probable and Otherwise, of QSS and the Results Detailed Above.

1. Change in height of the reflecting or, better still, refracting layer. This probably produces the greatest effect on the longer distance. At an intermediate distance the waves which are reflected from this layer may cause a wipe-out or enhancing result in the signal due to the simultaneous reception of this reflected wave and the wave which travels with its "feet on the earth." On a short wave like 23 metres the receiver may be located in such a position that it received the "Earthbound Wave" without the possibility of receiving the reflected wave. The only QSS effects produced here would be as in (3).

2. Reflection from clouds. A large cloud may prove of sufficient size to reflect (probably with some absorption) radio waves, and if it were located over the transmitter, would probably alter the angle at which the wave would strike the "refracting" layer above. It is thought, then, that considerable QSS effects may be thus produced on both nearby and DX receivers. A large cloud area may, however, be low enough to prevent any signal passing through it. It is thought that clouds, although of large area, will produce more complicated QSS than movements in the ionised belt, since the depth of any cloud area is probably not so constant in its conducting properties as the ionised layer.

3. The gaseous products of a large industrial area may be sufficient (by producing ionised gases and conducting clouds) to cause QSS effects. This may be the cause of the "quick period" QSS at Birmingham. Between this station and Stroud Green there is no large works of any kind, and those 23-metre signals apparently had an easy journey.

4. Polarisation of the wave as it travels through the ionised layer or by re-radiation from metallic conductors near the receiver may give certain QSS effects where the receiving aerial is, for the

greater part, horizontal or vertical or some other direction.

It is hoped that the above results will prove useful to other experimenters, especially those located in the large industrial areas where one can, so to speak, chain up a nice cloud of ions and feed them with a few watts. It is also hoped that others will send their results in to the "BULL" as it is feared the above article only covers a small part of the globe, and is perhaps not much use to the DX or traffic ham.

R. POLLOCK.

Cash and Service.

Have you ever calculated what you spend on wireless journals each year, and do you ever estimate what service you, an advanced amateur, get in return?

The following table, based on current prices of various British journals, is of interest to you:—

Weekly paper at 2d. equals 104d. per year (52 issues, 8s. 8d., plus post).

Weekly paper at 3d. equals 156d. per year (52 issues, 13s., plus post).

Weekly paper at 4d. equals 208d. per year (52 issues, 17s. 4d., plus post).

Monthly paper at 6d. equals 72d. per year (12 issues, 6s., plus post).

Monthly paper at 1s. equals 144d. per year (12 issues, 12s., plus post).

The subscription to the T. & R. Section is 15s. per annum, and includes a monthly issue of the T. & R. BULLETIN, use of the QSL and QRA Section and other advantages detailed elsewhere. Monthly BULLETIN equals 180d. per year (12 issues), equals 15s. per year (post free).

But your subscription covers both the membership fee and your BULLETIN subscription, 5s. only going to the latter.

Therefore, we have:—

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We have left another little item until last. Every T. & R. Member receives a copy of the officers' log book and diary, priced at 3s. 6d., and he is not asked for any further sum than 6d. to cover postage. Can you get more for your money *anywhere*?

CHANGE OF QRA.

G.2UV is now located at "Woodlands," Rugby Avenue, Sudbury, Middlesex, owing to recent entry into matrimonial state. Congratulations, 2UV!

Cutting and Working Ebonite.

THERE is sure to be a time when certain hams wish to make a posh job with some small electrical fitting which will contain ebonite.

It must first be mentioned there are two kinds of this material, which may be mathematically sub-divided, the main qualities being genuine Ebonite, while the other is Muckite, ingredients being reclaimed rubber, ebonite sweepings, with the possible inclusion of a few filings, and perhaps some slate dust to give it colour, and something or other to hold it in seemingly harmonious cohesion.

Concluded on page 21.



Refinement

The important part played by voltmeters in both transmitting and receiving sets calls for instruments of absolute precision and exactness.

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Mid-Britain Notes.

Prepared by 6JV.

Back Numbers of "Bulletin."

I HAVE one or two copies only of back numbers from February 1926, to date. Price to members, 7d. post free per copy. Proceeds of sale to BULLETIN Fund. Here is your chance to secure that missing back number you have been wanting so badly. They won't go far, however, and so be sure you are the first to apply.

Shropshire (via 5SI).

6TD reports a small amount of evening work with U.S.A., Canada, Australia and South Africa. He says that November 13 to November 21 was an excellent period for early evening work, but that U.S. signals faded out soon after midnight.

6US, who previously resided in Wales, is now in Shropshire for the winter, and is "running-up" the set for some work with about 6 watts, so we may hear further of him.

5SI reports *nil* except for strictly local work. Accumulator trouble is partly responsible for this state of affairs.

H. L. Palmer has moved out of the tin hut and finds reception much better. He has offered to give some help, and a useful job will shortly be found. Tnx, OM.

Cambridgeshire (via 2XV).

All Cambridgeshire "hams" are so "fed up" with the everlasting spell of bad conditions that they are getting seriously near to going back to BCL's, and even 5YK, to whom I always look for some sort of report, seems very dismal in his letter, which reads that he has "spent off" much valuable juice in pumping out 20-metre signals without any luck.

2DB raised U4WS on 5 watts during the QRP tests, and has also worked a number of stations at a distance of about 300 miles on 1 watt, and received reports of R7 signals from many; this has aroused his QRP fever, and he is building a "posh" QRP set now. (Don't forget, OM, the nicer they look, the "worse" they work! Hi!)

2XV has been QRW on 32.7 metres, but is disappointed with the small number of QSO's compared to the amount of time spent on the job. However, contact has been effected with Z3AR, U3RF, U3LW, U1GA, U4DD, and C2AX was heard replying to a "test," but never came back. 2XV is also now regularly conducting tests on 160-170 metres (telephony) on Sundays, from 9.00 a.m. until 2.00 p.m., and reports of reception are welcome from all—particularly as to percentage of carrier wave modulated.

A probable newcomer to the transmitters' list in Cambridge is Mr. Carter, of Newmarket Road, who has joined the ranks of the T. & R. as a first step into the amateur world. Welcome, OM.

Northampton.

Mr. Trasler has nothing to report this month, but intends to be "up to the eyebrows" in radio during the vacation. He says that he has taken a tip from 2AYB, who puts it thus:—"You don't put unnecessary fittings on a racing car"—so he is going to build a really simple receiver. All the same, OM, don't forget that the racing car needs a mag. and carburettor besides the engine.

Warwick (via 2BPI).

BRS3 (Saltley) reports very "periodic" conditions. He requires information regarding QRA of BI9CM and FSSLHA.

BRS29 has logged several new stations, including CH and LIT. Who can tell him the QRA of LTIZ?

2BMW reports only QRW, and 6JL has logged several U's on indoor aerial.

BRS31 is constructing a new receiver and has done little else; 2BLM is making power transformers.

6YU has moved to Leeds, and 5SK is still calling U's without success so far.

2BPI is expecting great things from his recent overhaul. Several OM's have failed to report. Please alter this next time.

Worcestershire (via 6AT).

Will all Worcestershire members please note the QRA of 6AT which is 28, Terry Street, Dudley, Worc., and please send in reports by 5th of the month.

Worcestershire is poorly represented at present and some intensive recruiting is required.

6MW reports "nd" owing to his aerial being down; he hopes to get going in the New Year.

6WF is joining the section, and after curing his aerial ammeter of an attack of paralysis caused by a QSY to 45, is putting some good fone out over ranges of 150 miles.

6AT recently changed from a Master oscillator to a Hartley circuit, and was astonished at the effect on the ammeter. The QSB does not seem to have suffered seriously; he was QSO with TLIZ with the new arrangement and reported R5. This on six watts in daylight.

Staffordshire (via 5UW).

6UZ sends in a good DX report this month, both for QRP and QRO. With the former, he was R3 in Portugal, using 3.5 watts. With QRO, 6UZ has raised 12 U's (1st, 2nd, and 8th districts), one BZ, one Australian, 35 Europeans, and one African. (FB, OM.) Has also worked fone to Sweden, France, and Belgium.

6BH (via 6UZ) has joined the T. & R. and celebrated the fact by deserting 440 metres, and starting up on 45 metres. Our cordial welcome, OM, and please report to 5UW by the 7th of each month.

2VG.—No report to hand, OM. Why? But 6UZ tells us you are very QRW. We should like to hear from you monthly, OM, and by the 7th, please.

5CW (via 6UZ) has moved to a new house, and possibly has been too busy to report.

2WN.—No report, OM. Please send one along for next month.

NOTE, PLEASE.—Will all T. & R. members in Staffordshire kindly send 5UW a postcard, advising him of their (1) call sign, (2) name, (3) address. A list will be made out from these, and a meeting will be called. Advice cards will be sent out convening the meeting to all members who notify 5UW.

Wolverhampton and District.

20Q.—5UW officially opened 20Q's new shack on November 14, when three districts of the U.S.A. and three districts of Canada were worked in one night. Three more U's and several Europeans have since been worked. 20Q has also received three cards from India reporting his sigs R4 to R7. FB, OM.

2NV reports bad QRM from business, but has obtained a new generator, and is reconstructing for 45-metre work, and hopes to be on the air just after Christmas. Reports by the 7th, please, OM.

6HT has reported some good daylight DX, notably Spain and Lithuania at midday. Has obtained a new DO40 bottle, and hopes to do well with it.

5PR is operating for 6HT between intervals of preparing his own transmitter.

5UW has no outstanding DX to report this month, but was very pleased to open 20Q's new shack with such fine results. Has completely rebuilt his station, both receiver and transmitter, logged many B's, but failed to QSO any of them.

2TN and 2UY have started up on 45 metres and detailed reports are wanted OM's.

5DA (ex Berwick-on-Tweed) informs 5UW that he has a S.W. receiver working, and hopes to get a QRP transmitter perking shortly.

2WN (Hanley) reports having finished the new shack. He notices a great improvement in efficiency which he ascribes to the absence of stray capacities due to brick walls, etc. He has put up a counterpoise, and is expecting early delivery of a generator.

Norfolk.

6JV has completed his rectifiers for battery charging, and these are functioning according to plan. He has carried out tests in order to determine the optimum adjustments of an oscillator. He is of opinion that there is more in this question of adjustment than is generally supposed, and that a few watts correctly applied will reach out further than many watts from a transmitter which is not exactly correct in its adjustment. He thinks that this is a large part of the reason why some QRP stations can show better DX than some QRO's. Included in this matter of adjustment is, of course, the question of feeding the aerial at the correct point, which point varies with the method of excitation adopted—i.e., voltage or current feed. It has been noted that the adjustments which procure the best reports for steadiness of note, absence of chirp, and intelligibility of speech, are *not* those which provide maximum excitation with minimum feed current when the aerial is disconnected. It is thought that there is food for further thought and experiment in this matter, and the tests will be continued.

Irish Notes.

By 5NJ.

I AM glad to say that this month I have received more reports than usual for this column, and I take this opportunity of thanking all who have reported. Even yet, however, not more than twenty-five per cent. of our stations ever think of letting me know their activities, and I can only say once more that I welcome reports by the 10th of each month. I do not like to refer to this matter so often, but as I have said more than once, we want this column to be representative of all our stations, and this can only be accomplished if the necessary reports are forthcoming.

As regards last month's DX, conditions may be described as very uncertain and variable. The low power men nearly all report bad conditions, yet those using higher power have had very consistent results. Some "freaks" have also occurred, such as the reception, at the writer's station, of A's and Z's as late as 11.15 a.m. GMT, and the two-way working, on 45 metres, between 6MU and USADE as late as 11.25 a.m. GMT!

The detailed reports will now be dealt with. In Northern Ireland, 6MU sends an excellent report. He has been QSO the U.S.A. on many occasions with various districts, and is the first Irish station to be heard in the 7th district, being very unlucky not to QSO there. He has also worked India (DCR) twice, Irak (IDH), Russia, Lithuania, and USADE at 11.25 a.m. GMT, as well as hearing two Japanese stations, JKZB and JIB.

6SQ finds, on his very low power, some difficulty in raising anyone after dark. Nearly all stations worked to date have been in a straight line from his station, thus making it appear that his signals have a pronounced directional effect. During the month, 20 G's have been worked, one Belgian, and one Swedish station, all on a power of .35 of a watt. The Swede was worked in daylight, and the others between 17.45 and 18.45 GMT.

5MO is still working on low power and has no special DX to report this month. A new transmitter has been in use since December 1, and reports show a decided improvement in signal strength.

5WD has also a new transmitter on the air, but has nothing startling to report just yet. Three new countries—viz., O, EAR, and DF—have been worked, this making a total of 16 countries and 146 stations since the station commenced work ten weeks ago. Thirteen of these countries—including the U.S.A.—were worked with an input of 4.8 watts maximum, using dry cells. This is surely very nice work. At present a hand generator is in use and good reports on phone transmissions are being received from nearly all parts of England.

6YW is off the air completely at present. 6TB has commenced again after a long absence through pressure of business but is as yet not on regularly.

5NJ has had another satisfactory month's work. Although only on the air at the week-ends, Australia, New Zealand, South Africa, Uruguay, Brazil, Tasmania, and Borneo have been worked, and reports have arrived from U.S.A. 5th district, Rhodesia, and the Australian 6th district. Very consistent two-way working is being done with Australia and South Africa on an input of 75 watts.

5GH has been too busy for any work on the air, but hopes to resume very shortly. He had very bad luck during QRP week, not being able to get near the set at all.

In the Free State, 11B has done very consistent work with the U.S.A. on inputs never exceeding 9 watts. He has worked, amongst many others, UIAAO, 3KR, 2CVJ, and LAPV, and a report has arrived from U5ALH, of Texas. That means his signals have been heard in the 5th U.S.A. district on 9 watts input—an excellent bit of work surely! Besides this, many of the more distant Europeans, such as Russia, etc., have been worked quite

easily on various occasions. Recently, out of six "test" calls, five were immediately answered by U.S.A. stations, this resulting in QSO's with UIRD, 1YZ, 2CVJ, 1ACI, and 1YB. He seems to be the "star" GW station this month!

18B has not had much time for regular DX, but has worked LAIA, S2ND, PIAE, LITIB, OKE and the Faroe Islands, as well as Morocco and Madeira. He has also a fine reception log for the month, including two Japanese stations.

15B is R7 in Belgium and France, but does not get much time as yet for regular work on the air.

14C has had an excellent month's work. He raised his first Yank a few weeks back, following this by working four others in a few days. The stations worked were U2CTN, 2FC, 2GX, 2CUQ and 1BMS. This was on an input of less than 10 watts. But the best work—news of which I have just heard—is that 14C has worked the Straits Settlements on 10 watts, being the first Irish station to do so. (Congrats, OM, on that splendid work!) Unfortunately, I have no details of this QSO at the time of writing.

Just before going to press, news has arrived that two new stations have been licensed in N. Ireland, these being 2BR and 6MK. Another new station, to be operated by Mr. Smith, of Whitehead, will have been licensed when these notes appear, and particulars of call, etc., will be given in due course. This station will commence work on crystal control on 45 metres, and the operator is fortunate enough to be available for test work at any time of the day, or night, by arrangement. He will be pleased to report to stations if requested.

Scottish Area Notes.

AT the commencement of a new year I take the opportunity of wishing all Scottish stations the very best of good luck for 1927.

The QRP tests have come and gone, and as far as reports furnished are concerned few of the Scottish stations have much to show for their work. General conditions were very bad indeed in Scotland during the test week, and all circumstances being considered, very little in the way of real DX could be expected. We trust that should there be a repetition of these tests next year, the weather clerk, or whoever it is who accepts responsibility for etheric conditions, will be more kind to us.

No. 4 District is sadly in need of a leader. Will none of you fellows step into the breach? This month has only yielded two "QRW" reports, and these, one from a non-radiating transmitting station, the other from a BRS. Now there are at least four radiating licences in this district, and one of these stations, to my definite knowledge, took part in the QRP tests. Surely he at least might be expected to pass some comment on the tests. I have often said before, and I make no apology for repetition, it is really most discouraging to have to hold back these notes month after month, waiting for reports which never materialise. Once more I would reiterate that a "nil" report is 50 per cent. better than "silence," as "silence" denotes lack of interest, and if Scottish stations have one thing to contend with more than another, it is—if I may express it so—mutual apathy. Now, you fellows, do come to life, and lend a hand.

2WL has now taken over No. 1 District, and his first month's notes are included in this report.

I have pleasure in recording the following inter-station visits: BRS6 to 2SR, 2HN and 2BQN to 5YG. I cannot stress too far the importance of these inter-station visitations OMs. There is nothing like them for fostering an esprit de corps, and, in addition, there is not a single one of us, however advanced, but can learn something from his neighbour.

I have to welcome three new stations to No. 1 District, 2HN, 6JS, and 2AVZ.

2HN, Mr. Hutson, is probably better known to some of us as Y3VX (Ceylon). 6JS is owned by Mr. J. Steele, Braehead, Dalry, Ayrshire. The other station, 2AVZ, is owned by Mr. J. Higgins, 23, White Street, Govan, Glasgow.

I have also to report the registration of a new receiving station in No. 4 District. His No. is BRS62 and his QRA is A. Robertson, 27, Ladysmith Road, Edinburgh.

A warm welcome to you all; OMs.

5YG.

No. 1 District (by 2WL).

2FV carried out a number of 23 metre tests, but with little or no success. He complains of lack of co-operation. (Why not get into touch with 6IZ OM?—5YG). He has now completed his new short wave receiver and finds it FB.

2HN is busy getting some gear together, and hopes to be on the air before next month.

2WL, since starting last month, has carried out about 70 QSO's, and has had R9 reports from several parts of the Continent. His power never exceeds 4 watts, but he more often works with 1 watt, this being all the power meantime available from his much shorted dry batteries. A master oscillator drive has been experimented with and has proved highly satisfactory, numerous reports of "crystal control" having been received.

Further experiments are shortly to be carried out with a quartz crystal, and reports of QRK, QSB, steadiness of wave, and WX will be valued.

On the reception side, an 8-valve S.W. super-het has been tamed, and on this some remarkable phone reception has been achieved.

5YG.—Very little will be heard of this station until April next, when he hopes to be on the air with a 50-watt transmitter operated from a new QRA. Spasmodic working may be carried out in the interim, but this will probably be on low power from H.T. accumulators, as after much trouble the single phase 25 cycle A.C. mains have had to be more or less abandoned as a most unsatisfactory source of power.

6NX has been doing his usual good work with the "U's" and "C's," having "worked" 6 "U's" and 2 "C's" since his last report, being QSO twice with some of the stations. He had an R6 report from UIADM, and in all he has been 12 times "across the pond" in November. In addition, R9 reports have been received from "F" and "SM." All this work has been done on 10 watts and under. During QRP tests only one QSO was accomplished, and that with friend 6BT.

2AVZ has just received his AA licence, and hopes to follow it up with a radiating licence in due course.

The following stations did not report: 2TT, 6YQ, 2OW, 2MG.

No. 2 District (by 6IZ).

2VX, having now got fully established in his new QRA, has completely rebuilt his transmitter, and great results are expected from the new gear. According to accounts, the new transmitter is a thing of beauty, and is to be exhibited to the Aberdeen and District Radio Society at a lecture on "short waves," which Mr. Clark is scheduled to deliver to that body. Demonstrations of S.W. phone reception will be given, which phone will be provided by 6IZ from his station. (Good luck to you, OMs, and many converts—5YG). Business QRM is very severe just now, and it will be the end of December before much DX can be done.

6IZ also reports business QRM. A little has been done on 23 metres, but only one report has been received, this from London giving R8 on O-V-1, at 11.30 GMT, "QSB gud and stedi." So far no QSO's have been achieved, but he lives in hope. Some work has also been done on the 45 band, without any outstanding results. The present Mullard 0/20 is to be paralleled by a second and 35 watts is hoped for from this combination. Very little was done during the QRP tests, the only QSO worth recording being with an "F" station, who reported R5 when the input at 6IZ was 3½ watts. Work on the "break-in" has been continued, but without much success owing to "wipe out" from the transmitter.

6VO has been doing rather FB. QRP work of late, the power being 4½ watts. During the QRP tests, amongst others, he was QSO with U2MD and P3FZ. He also had a report from France to the effect that his phone was received R5. He has had a little trouble with a "chirpy" QSB, and is showing distinct leanings towards crystal control. He is expected to be heard shortly with a nice "pip pip" like NKF. Work has been begun on a special transmitter for 23 metres, but it will be some little time before this is complete. His monthly reports for the BULLETIN are transmitted to 6IZ by phone (and jolly fine phone, too—6IZ).

The following stations did not report: 2JZ and 6GQ.

No. 3 District (by BRS6).

2SR has been overtaken by disaster. His "stick" broke owing to wind pressure, and a new steel one proved faulty. As if this was not sufficient trouble to go on with, he fused his aerial ammeter (trying to raise MARS?—BRS6), and is therefore at present QRT until repairs, etc., can be made. To fill in time, a start has been made with the construction of a S.W. super-het.

5JD continues to carry on the good work until such time as it becomes necessary to QRT in order to "flit" south. He is using A.C. mains as a source of H.T. supply, but finds difficulty in smoothing the rectified juice. All manner of chokes and condensers have been tried without any great success. An electrolytic rectifier is used satisfactorily for charging H.T. accumulators, the electrolyte being sodium bicarbonate. A start has been made with the construction of a power transformer for the transmitter, as the voltage available from the mains after voltage drop in the rectifier is too low.

5NW has been doing a good deal of phone on 44 metres, and reports from "G" and the Continent are very gratifying. He has also been QSO with D, K, W, N, I, and F, all giving R8-9. British reports give R6-7. Recently about 19.00 GMT contact was made with IINA, who gave him R7, and IIDR, who reported R9. Mr. Allan was unable to switch over to phone, however, owing to BCL QRM.

5WT is presently QRT owing to domestic QRM, but hopes to resume in a week or two.

6GY is temporarily QRT owing to Varsity being in session, but expects to be "on the air" about Christmas.

6KO has done good work. He has been twice QSO with U.S.A., and once with Canada, during November. His power was derived from a hand generator, the output being fed to the plate of an LS5. The "aggravated Hertz" is still in use. With the same combination phone has been used, a Ford coil being pressed into service for grid modulation, and a report has been received from S. Wales giving 100 per cent. audibility.

The following station did not report: 2BB.

No. 4 District (by 5YG pro tem).

2BFQ at Varsity meantime, but expects to resume during the Christmas vacation.

BRS62 has the same state of affairs to report.

The following stations did not report: 2TF, 5BA, 5HC and 5IP.

Northern Notes.

(Collected by 2DR.)

MY first duty this month is to thank all the hams very heartily who helped me to win the election last month as Northern Area Officer. I am not able to thank you individually, but please take this the only intimation, etc. I hope you will back me up next year as well as you have done this, and we shall put the Northern Area where it belongs.

Quite a number of newcomers reported in response to my call to arms two months ago, but, unfortunately, their reports came too late to be included in the November issue. If you don't wish to be left over until next month, OMs, please note that reports must be in to the various collectors by the 10th of the month AT THE VERY LATEST, and reports arriving after that date simply have to be put on one side until the following month.

Yorkshire has risen nobly to the occasion, but Lancashire and Cheshire are in the background. My trusty henchman for Lancashire, 5XY, writes a positively unprintable letter, saying that there are over 200 licensed hams in Lancashire, and he can only raise one report, and that is his own! Say, OMs, just let 5XY see what kind of notepaper you have, and send him a line or two.

The only thing of note this month is the absolute dead silence on the air after about 18.00 until 20.00 GMT. Where has everyone gone to? The F's fade away then, and are heard no more until next day, and the G's also seem to die the death about this hour.

Now for the reports:—

Yorkshire (reports to 2DR).

6BR has been busy as usual, and has worked some U's in the early hours of the night, seven to be exact, the best being U-4AK (Tampa, Florida), who gave him R3 and said that 6BR was the only G station he had ever heard. Indian Y-DCR has been worked three times, and 9.2 watt sigs have been reported again in Australia, this time in Sydney. Not a bad month, OM; stick to it.

2YU is a newcomer to the column. Starting on 440, he has been working down the scale towards 45, and by the time these notes are in print should be heard on that wave. He is unlucky in having no mains or generator, and therefore will be restricted to five or eight watts maximum input. However, lots of good work is possible on 45 with that power, OM.

6XL is another newcomer, his QRA being: Mr. F. Garnett, The Park, Eccleshill, Bradford. He should be heard on 45 after December 18, and is using 10 watts from Exide H.T. accumulators, Hartley circuit and a Hertz aerial. Knowing 6XL's past work in the matter of DX receiving on a single valve Reinartz, I have very little doubt but that he will live up to his call-sign, so some of my QRP brass pounders will have to beware of 6XL.

5SZ, after a very hectic fortnight, has got a new shack delivered, erected, wired, new aerial and masts put up, 200 watt generator mounted, tried a dozen or so aerial and counterpoise systems, worked four Yanks on c.w., a few other G's on fone, and, finally, smashed one 50-watter, and a gale wrecked one 40 ft. mast, and that's that. He wishes to thank all hams who sent in reports during his preliminary tests, as they assisted him greatly. 5SZ should be an acquisition to Yorkshire and a loss to Lancashire. Power used 160 watts.

6OO (sum call, OM!) is yet another newcomer, and up to now is the only ham I have heard from on the East Yorkshire coast, his QRA being Bridlington. He has rebuilt his set to RFB with a Hertz aerial. Before this with 1.6 watts he has worked Europe well, getting R6 reports, and R8 in Italy with 8 watts from an Evershed. Fone on this power has also brought good reports from stations in the British Isles.

6TY has worked 21 new stations this month on ten watts, the best being P-1AJ and EAR10. He tells me he has evolved a new Hartley type of circuit, which is giving excellent results on a Hertz aerial. This latter was adopted on 2DR's advice, as 6TY's position is not of the best to get good work out of a third harmonic inverted L. He also reports good fone work using a one-valve speech amplifier and choke control, the whole of the H.T. being derived from the A.C. mains through rectifiers.

5KZ is very vexed because he did some excellent DX during the QRP tests, but outside the allotted hours. During the actual tests the best DX was SMZN (1,100 miles). Hard luck, OM! Using 4.8 watts, the whole of Europe was worked, and sigs reported by Indian Y-DCR. Hams, congratulate 5KZ on the arrival of a YL at his household, a real loud speaker!! The arrival so upset him that he forgot to send in his QRP test report!

2DR has been QRW business, but has found time to try out a good few tests with Hertz aeriels and a new type of A.C. rectifier. Ten watts has been the maximum power, the 50-watt set has been in disgrace since the QRP tests, but is soon to be on the air again. No stations of note have been worked, but several hams got shocks when they were told that the aerial in use was only six feet high! An F gave R8 with such an aerial and seven watts input.

23 Metre Work.

6BR tried 23 metres one Sunday evening at 18.00 GMT, and at once received a reply from U.S.A. No others have reported work on this wave.

The following have NOT reported: 2XY, 6YR, 6IG, 5US. Hi!!!

Lancashire (reports to 5XY).

5XY paid a visit to 2DR this month. He is awaiting his Mortley, but should be busy by December 31.

5MS started up and worked Europe and then decided to rebuild, but is on the air again now.

5JW, what about that promised report, OM?

Now, play up Lancashire. (They won't stand for that from a Yorkshireman, so look out, 5XY).

Cheshire (reports to 6TW).

6TW says there is nothing of note to report from his station this month, and wants to know what the G stations are doing during the week. He is thinking of coming off the QRP set and coming out on to the high power platform.

2SO has sent no report. Hi!!

No other reports from Cheshire, so you had better roll up next month, not in ones, but thousands.

Isle of Man (reports to 5XY).

This is the area, gang, three transmitters and two reports. I wish other areas would try and beat the I.O.M.'s.

6IA sent me a heap of information for which I am duly grateful. He has been experimenting with aerials, with ten watts into a coupled Hartley, and DET-1 valve. With this set he has been QSO with U-1AG, and had a report of R5 sigs from Victoria, Australia. Apparently the I.O.M. is a transmitter's paradise, as the mains are 220 or 440 volts D.C., and as all the BCL's have to use H.F. valves to get results, there are no complaints of key-clicks or other amateur QRM.

5XD tells me that since his station was opened last July he has had 356 QSO's in 10 European countries up to October 7. That is going some, OM. This was done on a loose coupled Hartley, 6 watts from D.C. mains, and either an L.S.5 or an 0/20 valve. His aerial does not strike one as being ideal, so the results are all the more valuable for that. He states that sea fogs are apt to blank out sigs on QRP entirely, and has found this to occur four times out of four tests. That's all, gang for this month, but for the love of Mike, all hams who have failed to report this month, please see that you let one waft this way for next month.

Southern Notes.

Prepared by G-2LZ.

5 AD using a power of 30 watts, reports several two-way contacts with American and Canadian stations. After January 1 he will be working on 23 metres, and would like reports.

6ON, of Worthing, is now experimenting on direction finding under the new call 2BRX. Anyone interested in this work should get into touch with him at once.

2AOL is carrying out some interesting tests on low power with combined transmitter and receiver circuit. He hopes eventually to work duplex telephony.

6QL has been experimenting on the 150- to 200-metre band. With a power of 3 watts over 400 miles range has been obtained. He is now building a 45-metre set for low power DX work.

5HS sends in an interesting report. He has been QSO with Hong Kong and has been reported in Borneo and Shanghai on 44 metres. During the low power tests he worked seven Americans, one Canadian and one Uruguay. Power input 4.8 watts crystal control. 100 watts is now being used on 23 metres. C-3FC has been worked 15 times to schedule between 15.30 and 19.30 G.M.T. Also two-way working has been done with C-9AI and the 1st, 2nd, 3rd, 4th, 6th and 8th districts H.S.A. U-6ZAT was worked for half an hour at 18.00 G.M.J. This appears to be a record.

6CL reports 85 two-way workings during November. Spain and Yugo-Slavia were added to countries worked. Altogether 21 stations were worked in nine countries, also SFV and LAB. Power $4\frac{1}{2}$ watts.

5AX has just started up on 45 metres with 5 watts power. QSO was established with U-LAAO, and power reduced to $1\frac{1}{2}$ watts when sigs were reported as still readable. With a further reduction of power to $\frac{1}{2}$ watt sigs were RI, readable in parts. C-3HE has also been QSO.

Kent reports 2MJ and 2MI are still endeavouring to do some real DX on 45 metres. 6PG is building a new transmitter for 45 metres. 2QN comes on for a short time on Sunday afternoons on 'phone, but his modulation is not up to his old standard. A new station has started in Gravesend, call 6NS; we hope to welcome him as a new member soon.

Channel Islands report nothing of note this month. 6PU has been QSO, U.S.A. three times. He and 6HZ are busy with short distance phone tests on 45 metres. 2ZC has been off, as he is building a new transmitter. 5GW expects to be on the air again in the New Year.

Herefordshire, Bedfordshire, and Bucks (Via 6UV).

Reports from these counties are most disappointing. There are, according to the latest lists available, no fewer than 27 stations in this division, and only two have reported, and one of the said two was in London!

I realise that many of these 27 stations may not be actually on the air, but these notes do not exist merely to record DX work; they are intended to chronicle any work of an interesting nature, and I happen to know that quite a few stations in my own county, Herts, are doing useful DX. Now then, you fellows do you want the rest of the areas to think that we in this division never do anything? If you do, just go on as you are; but if you don't

want to give this impression, please let me have your reports by the 5th of each month.

Make one of your New Year resolutions be "I WILL report each month," but please don't let it be like most of our resolutions t

BRS17, at St. Albans, is very active, and did some most useful work during the low power tests, the surprising thing being the large number of British stations logged between 21.00 and 02.00 when at 6UV, less than 15 miles away, none were audible at all. 6UV has been carrying out a large number of tests on 44m.s. with a maximum input of 5 watts to determine some theories re Skip distances. During these tests in November he has worked 10+ stations in every country in Europe and got over to the States after a lapse of two years. A daily schedule is being kept with SMWF at Stockholm. 6UV's 100-watt set is also being used occasionally.

5NN. The first week in November, and one day prior to that week, 5NN worked 15 Yanks on 4.8 watts, and was heard in Winnipeg on an indoor aerial. Denmark, Faro Isles, Sweden, and other European countries were also worked. This is 5NN's first effort at low power work. Conditions appeared to be good during most of the QRP week. A super transmitter is at present under construction at 5NN, and it is to be the very last word in crystal controlled sets. Already over two months have been spent in structural work. The whole station has been redesigned and the aerial system rebuilt throughout. The station is being laid out with a view to relaying the American broadcast programmes, and special apparatus is in course of construction to deal with this scheme.

It is hoped that the station will be ready in time to include a description of it in the February issue of the BULLETIN.

The Radio Society Log Book and Diary,

AND INTERNATIONAL LIST OF AMATEUR CALL SIGNS.

BY the time this notice appears, most of our members will have received this year's copy of the above-mentioned book *entirely free of charge*, except for 6d. to cover postage.

At the time of writing we have a copy before us, and having carefully examined it, we feel bound to say that there has never been anything published like it before. It comprises an extremely useful log book ruled and dated for each day in 1927 with blank pages for memoranda, and contains in addition to the most comprehensive list of British and Foreign Amateur Stations ever published, several interesting and instructive articles of general interest. Beautifully carried out in fine glossy paper and of foolscap size, containing many advertisements of reputable and guaranteed firms, the whole is a credit to the publishers, Messrs. Printing-Craft, Ltd., of 34, Red Lion Square, W.C.1, and the Radio Society of Great Britain.

The price per copy to non-members is 3s. 6d. It is a fitting companion volume to the Short Wave Handbook (Handy), published by the American Radio Relay League, referred to below, and no amateur should be without either.

The Radio Amateur's Handbook.

BY the time this appears in print, copies of this Handbook, which has been advertised in the T. & R. BULLETIN for the past two months, will be in the hands of those who have had the foresight to order well in advance.

A specimen copy has been received from the publishers, the American Radio Relay League, and we have no hesitation in saying that every amateur transmitter should possess a copy. In its pages will be found a wealth of information concerning the practical side of wireless transmission. It has been written primarily for the beginner, and any theory discussed is as simple and fundamental as it can be made; nevertheless, even the oldest transmitter is bound to benefit by possessing the Handbook.

It comprises 178 pages of technical matter, and is lavishly illustrated with diagrams and photographs, there being approximately 200 illustrations. The subjects covered are thoroughly and carefully dealt with, and every essential feature of transmission work has been given a place, from the learning of the code and the erection of suitable apparatus for the purpose, to the consideration of the best type of aerial to use under given conditions and materials to use in it. Various transmitting and receiving circuits and the lay-out of the gear are studied, and also the construction of coils and power transformers and methods of obtaining high tension supply. A chapter on Fundamentals, and an Appendix containing many tables and useful data are alone indispensable to every amateur, both beginner and "old hand."

Space does not permit of our reviewing the whole book page by page, but it can safely be said that never before has such a book been published, dealing as it does with every aspect of radio work in a thoroughly practical manner with a minimum of mathematics, which latter are sometimes confusing to the amateur.

Correspondence.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—With reference to my article on Crystal Control in the previous issue. The amplitude of the oscillation in the grid circuit of the tuned-plate tuned-grid circuit is largely governed by the type of valve used. I have recently found that with some valves the amplitude is so large that the control from the crystal stage is not sufficient. The control can be considerably increased by reducing the strength of the grid oscillation by the usual method of neutralisation, where a tap is taken a few turns below the earth end of the plate coil, through a condenser, to the grid coil. As partial neutralisation only is required, the adjustment is not critical.

This procedure will generally increase the efficiency of any tuned-plate, tuned-grid circuit as an excessive grid amplitude causes a large grid current to flow. In one case the power loss due to grid current was reduced by one-half, and the range of synchronisation increased three-fold.

Some amateurs are having difficulty in making their crystal oscillate because they are using a valve of the LS5 type. This is very unsuitable for the crystal oscillator. The LS5B, DFA8, or similar type is much better.—Yours sincerely,

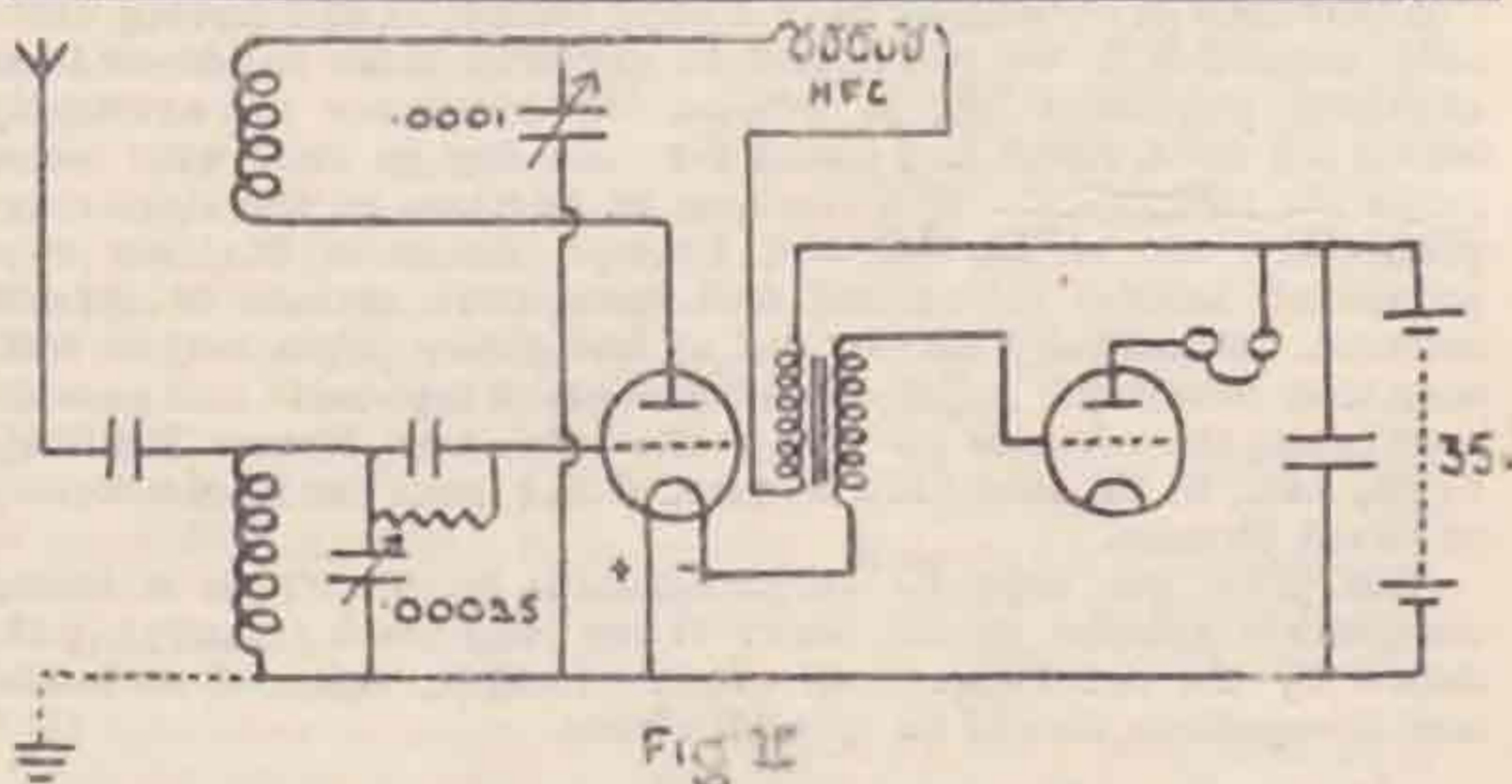
C. W. GOYDER, 25Z.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—With reference to the article in the November BULLETIN by Mr. Charman (6CJ) on the subject of wavemeters, there are one or two points which I should like to raise in this connection. The resonant frequency of any circuit containing a capacity in parallel with an inductance is given by the condition for parallel resonance, namely, $E.R$ where the circuit

$$I = \frac{1}{R^2 + (2 - fL)^2}$$

has a certain amount of resistance. This being so, such an arrangement can have one, and one only, resonant frequency. Now, if two such circuits—as, for example, a wavemeter coil and the aerial transfer coil of a transmitter—are coupled together in such a manner that the resultant fields assist each other, the effective inductance of the two coils will be increased by the amount of mutual inductance present. This is, presumably,



It is regretted that in the article on page 17 of our December issue, Fig. II. was wrongly shown. The above is the circuit diagram of 6MU's receiver.

EXCHANGE AND MART.

MACKIE MOTOR GENERATOR, Input 24v., B.C., Output 1,500 volt., D.C., and mounted on bedplate and coupled to Mackie 200 volt, $\frac{1}{4}$ H.P. Motor., 5,000 R.P.M. for sale, £20; Can be used mounted from mains or unmounted from Accumulators. Also Burndept Thermo Ammeter, 3 amps. and D.C. Voltmeter., 500v. up, £6 the two.—Box 68, T. & R. BULLETIN.

G.600 SURPLUS:—Mullard 0/20 15/-. Two T 15 12/6 each. Two D.E.5's 10/- each. Hoyt milliammeter 0 to 50 ma. 21/-. Exchange. Wanted T50 or VO/50.—WOODCOCK, 8, George Street, Bridlington, Yorks.

200 VOLTS of Ediswan H.T. accumulators. Good condition, in five blocks. Must be cleared to make room for generator. Best offer secures. Write G2M1.—41, Victoria Avenue, North-down, Margate.

what Mr. Charman has in mind in saying that the "resonance frequency of one is pulled by the other," but it is by no means similar to what occurs when, say, two alternators are being synchronised, and one rather feels that 6CJ's method of explaining this phenomenon is somewhat misleading.

When a wavemeter is so closely coupled to a transmitter that the mutual inductance is pronounced, it is very difficult to obtain a sharp reading owing to the amount of energy transferred to the w/m, but it does not follow that a double-humped resonance curve will, of necessity, result. Considering Mr. Charman's curve, which shows both a positive and negative ordinate, the plot given appears to indicate a complete phase reversal between two—presumably—close frequency readings. Under the conditions stated, such is impossible. If one considers the abscissa of this curve as representing some scale of increasing capacity—whether logarithmic or otherwise does not matter for the sake of argument—then it appears that it requires a very considerable increase of parallel capacity to produce a change of frequency in—as 6CJ puts it—the oscillator. If the oscillator is correctly designed and properly adjusted such a change of frequency as is indicated should not occur and certainly cannot be truly represented by the shape of curve given. If an absorption w/m is coupled loosely to a driver no amount of "condenser twiddling" can make the w/m indicate anything but the frequency of the drive. After all one deliberately adjusts the variable element in a w/m in order that it shall indicate resonance, and this can only be when the w/m is in resonance with the circuit it is desired to measure. I am sure Mr. Charman will forgive me but, frankly, I do not understand his continual reference to "frequency pulling"; if a w/m is correctly used it will not alter the frequency of the oscillator. If the w/m is incorrectly used a blurred indication will result, due either to too large an amount of energy being absorbed or to shock excitation or a combination of both, but unless something is radically wrong the amount of frequency change which Mr. Charman indicates will not occur. If one wishes to transfer the frequency indication of one's transmitter to one's receiver in order to tell if interference exists on one's operating w/l, then the most accurate method of determining this is the method which transfers the reading to one's receiver in the most direct way.

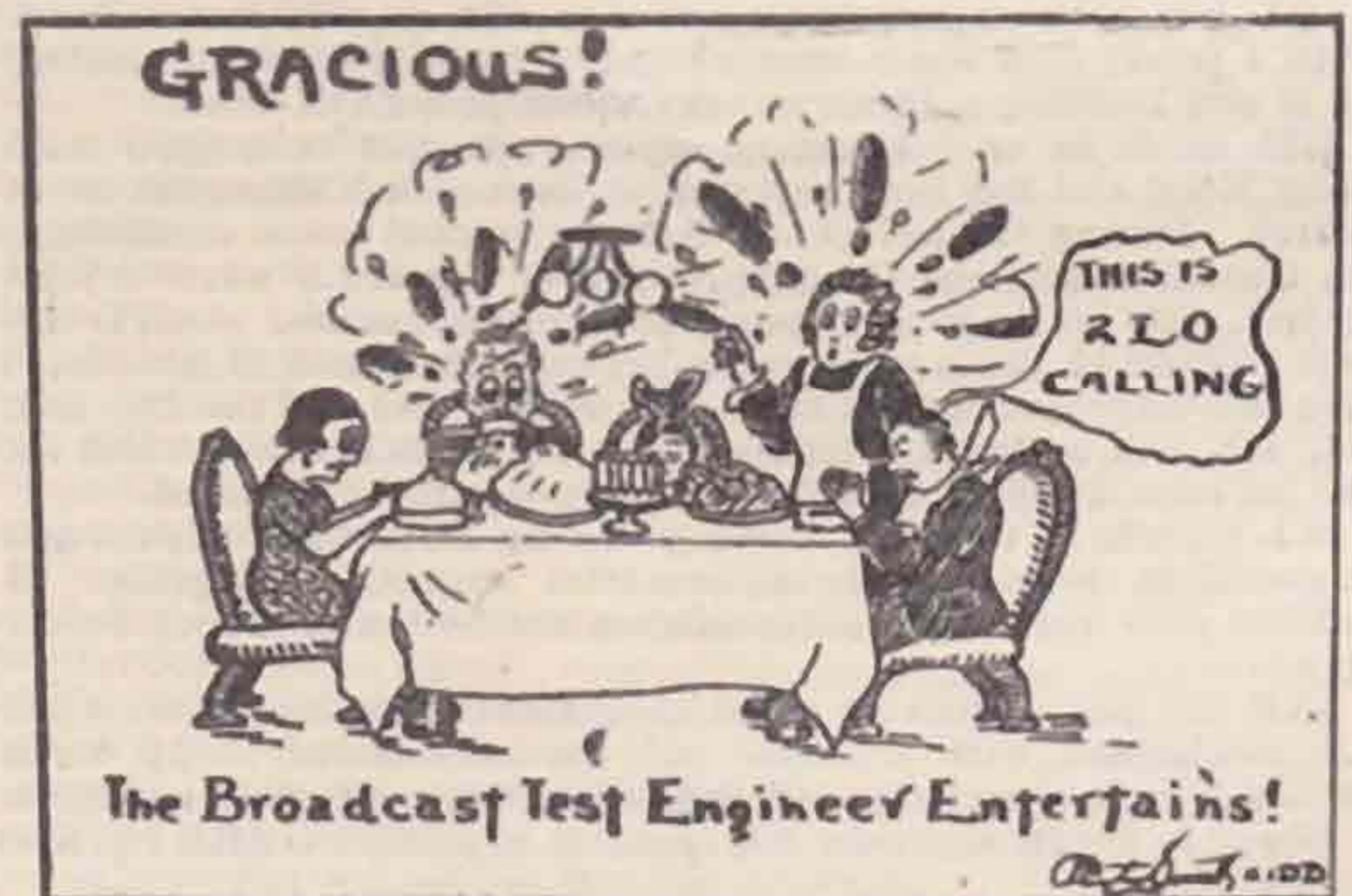
In conclusion, may I repeat that for scientifically accurate wave measurement one should incorporate either a thermogalvo or an ordinary centre reading galvo and suitable rectifier in one's wavemeter. If this is done no difficulty will exist in obtaining accurate readings of either transmitter or receiver.

I am, Sir,

Yours faithfully,

G. L. MORROW (6UV).

Penolver, Berkhamsted, Herts.



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Is low power dependable?—concluded from p. 10.

with is that 50 watts is sufficient to work America most nights, regularly if you prefer that it should be put that way, and New Zealand most mornings. It might here be said that my 70 watts is used inefficiently, and perhaps this is right. If this is the case, how is it that on nights when I couldn't get over, or only with difficulty, the only European stations heard being called by America were stations of known high power? How is it that a well-known low power station stated definitely the other day to me that November had been absolutely dead for him? This same station has been working America throughout the summer on 10 watts and less at times when my 70 watts would not get there?

To me it appears that high power generally gets there (400 watts or more), especially when moderate power fails. Low power fails when moderate power just does it, and that on real DX nights low power does wonders, but those nights are few and far between. For example, December 1, 2, 3, and 4 were for me fairly good nights. Signals were not particularly good, but DX worked easily (I am speaking of up to 0000 or 0100). Under these conditions a low power says "this week has been absolutely dud again." C2AX, with whom I have a schedule, says of December 3, which seemed a fair night to me, "only heard G's 2NM, 2CC, 6NF, 5QV, 6TD last night." (He also said that it was raining in Montreal when we had 20 degrees of frost).

I am of opinion that no one with an input limit of 50 watts can work either North or South America consistently every night or even four out of five nights, unless possibly he starts at 10 p.m. and stays solid until 9 a.m. On the other hand, I quite agree that it would be quite feasible to work U.S.A. every night for a week with 10 watts, given a run of seven nights' exceptional DX weather, which is expecting something of a miracle.

Another point is that the daylight range in winter on 45 metres on simply ridiculously low power input seems extraordinary. 1,000 and 2,000 miles on a few watts input seems the rule, and it is not impossible to do this distance on a power of less than one watt. I have not tried this, but I have heard other stations doing it, and the daylight range does not seem to vary to anything like the same extent as the night range. I have a card here now: "Am QSO all Europe daylight with 6 watts, but not U.S.A. yet."

It seems impossible to forecast what a night is likely to bring forth. The best night I have ever had was a thick foggy night, and the aerial and counterpoise was frozen hard with ice-insulators and all. There was a bright moon above the fog and a fat icicle on the lead-in. On this night I had exceptional results. First, second, third, fourth, and eighth districts were worked one after another, yet I had made up my mind that it was going to be a "dud" night. It seems that these matters are such as to constitute a useful line of inquiry for our members. Having written, I wait in fear and trembling for the wrath of the multitude to fall upon my devoted head. I expect that everybody will disagree with me and no one will agree with the other. Please don't all speak together, and have mercy on our Editor!

Cutting and working ebonite—concluded from p.14

The former being the article under discussion, it is of course made out of pure rubber and sulphur, and owing to the presence of the latter ingredient, when any attempt is made to cut it, the sulphur unites very easily and rapidly with the iron, forming iron sulphide. Mass production methods permit of the use of diamond cutters or moulding, but the ham cannot indulge in this. Now for the remedy. Very best pure turpentine, if used fairly freely, will prevent this chemical action, and the cutting edge will remain sharp, and the ebonite can be finished direct on the lathe, which requires little polish, and this is best done with rouge and paraffin, and not run dry or it will burn. By the way, turps dries up sticky, so clean your lathe and tools after the experiment.

Scrap ebonite is a problem. The amateur cannot collect enough to interest the scrap buyers, or get rid of it by a gift, so the writer has conceived the idea that, by immersing it in hot (very) water, useful household (small) commodities can be made, rough bent, and turned—say, a pin box for the O.W., or something equally useful.

Now, to digress to screw-drivers, the writer has smiled at some people and this tool, and how to hold it! Do you know if you let the butt rest in the palm of your hand in the usual way, and grip it between the second and third fingers, closing these round it, a "crampless," powerful grip of great strength can be got.

There is another side-light when reverting back to our mutton. Most hams tack or screw scales to panels, for it is said they "won't stick," but we have seen a catalogue which states: "Filament scales are permanently fixed to the panel, and will not scale or pick off, and are totally unaffected by climatic conditions." As the writer of this (hoping Editor will pass it) article happens to be the culprit who published the said catalogue, we will pass it on, process as follows:—Rough cut out a piece of ebonite (here for the scrap) to the size of scale, boring if it is passing a spindle; now lay scale on panel to which it is to be fastened, and mark round with a scribe, remove scale, and rough up panel inside markings criss-cross all over, good and deep—a sharp file point will do—then apply to the back of the scale a fairly liberal coat of Nicolustre or other celluloid thick varnish, immediately apply to ebonite, place over the disc, and then a 7-lb. weight pinched from the kitchen when the cook is out—leave this for a couple of hours and the job is done. Of course, it *can* be deliberately levered off, but no ordinary use will effect it.

"SWISHER."

Denmark—concluded from page 13.

finds it impossible to QSO G's after about 18.00 GMT, but was pleased to receive a report recently from GC5NW giving him R5 at 21.45 GMT. He has not been successful in raising further R stations at this hour, and even our higher powered stations are but weakly after 18.00 in Copenhagen.

Several new D stations will soon be on the air, and at present QRX for licence.

OXZ is a new Danish commercial station at Lyngby.

D-NSC is again on the air, and will be glad of reports from G's if they hear his station.

Calls Heard.

A—2bk, 2ij, 2tm, 2yi, 7cw, 7hl. BZ—1ac, 1ad, 1af, 1al, 1aj, 1ak, 1am, 1an, 1ao, 1ap, 1aq, 1ar, 1au, 1av, 1aw, 1ax, 1ay, 1ib, 1qa, 1bd, 1bg, 1bh, 1bl, 1bl, 2ab, 2af, 2ag, 2aj, 2ak, 2am, 2ar, 5aa, 5ab, 5ad, 6qa, 6qb, SPM, SQ.1x, SQ.4. C—1am, 1ar, 2hv, 2zc, 3kp. CB—fz. CH—2ab, 2as, 2ld. FI—1acg, J—3xp. KC—z4. LIT—1b—m, 1n, 9a. O—A3b, A4z, A6n. Pi—1au. PR—4ja, 4sa. Q—8kp. R—Afl, Cb8, Db2, DX8, DZ9, HA2, NA2. SS—2se. TL—1z. U—4dd, 4ft, 4iz, 4jk, 4li, 4mc, 4pk, 4qy, 5amt, 5fr, 6dn, 7vh, 7wu, 8adg, 8alk, 8atv, 8aul, 8avd, 8avl, 8bay, 8bni, 8bra, 8bth, 8buy, 8daq, 8drj, 8dse, 8pk, 8tby, 8ze, 9act, 9bpb, 9bl, 9bdq, U—9cd, 9ctg, 9czw, 9ek, 9ln, 9to. Y—1bp, 1bu, 1cd, 1cg, 2ak, 2ap. Z—2ac, 2ae, 2xa, 3ai, 3ak, 3ar, 3xb, 4aa, 4ac, 4am.

SUNDRIES.—TJ, CRJ, BXY, AND, ANF, S-KTC, LOR, XAN, LAIF, VOQ, WNP (Fone). DX heard on straight O-V-1 by L. L. Parry (BRS-29), 106, Church Road, Moseley, Birmingham.

U.S.A.—1aao, 1aba, 1abz, 1adi, 1aef, 1afo, 1afu, 1afy, 1ajm, 1ajx, 1ale, 1als, 1amp, 1aox, 1apl, 1aq, 1asu, 1avl, 1awz, 1axa, 1axx, 1aya, 1ayj, 1ayl, 1bcn, 1bdt, 1ben, 1bhm, 1bkv, 1bms, 1bux, 1bz, 1bzb, 1caw, 1cdp, 1ch, 1ckp, 1cmf, 1cmp, 1cnz, 1csy, 1cue, 1ga, 1gp, 1hb, 1kf, 1kl, 1lc, 1lj, 1lv, 1nl, 1nq, 1or, 1pe, 1rd, 1rf, 1ry, 1sl, 1sw, 1uz, 1vz, 1wl, 1xam, 1xj, 1xv, 1zw, 2aby, 2afg, 2afq, 2air, 2aiv, 2agk, 2akv, 2ali, 2all, 2alp, 2amj, 2amq, 2arv, 2ar, 2avq, 2axy, 2ayj, 2bal, 2bkr, 2blm, 2bm, 2bvd, 2bv, 2bw, 2bzo, 2ce, 2cft, 2crb, 2ctf, 2cug, 2cvj, 2cvk, 2czr, 2ds, 2ej, 2ev, 2fj, 2ha, 2ho, 2kx, 2nz, 2pv, 2sb, 2tb, 2tp, 2xs, 2xt, 3ab, 3acu, 3auv, 3av, 3blc, 3bmz, 3bns, 3bqp, 3bva, 3cdv, 3ckj, 3dh, 3ds, 3ee, 3gei, 3gp, 3hg, 3jo, 3jm, 3mv, 3np, 3pf, 3sj, 3ut, 4ah, 4ak, 4bn, 4ci, 4dd, 4ei, 4fa, 4fd, 4ft, 4fw, 4jr, 4km, 4mi, 4te, 4ob, 5aad, 5apo, 5anl, 5cd, 5ck, 5dl, 5ev, 5ff, 5gl, 6am, 6ts, 8ade, 8ago, 8ahl, 8alk, 8aly, 8amu, 8anc, 8aul, 8avd, 8ayg, 8bas, 8bcm, 8ben, 8bf, 8bfb, 8bjh, 8bjy, 8bkn, 8bm, 8bmn, 8box, 8bpq, 8brc, 8bth, 8byt, 8cbr, 8ccr, 8cli, 8cpk, 8cqm, 8cxh, 8cye, 8daq, 8ded, 8dia, 8dpn, 8dpq, 8dsy, 8dtt, 8eq, 8kc, 8mc, 8sv, 8uy, 8xe, 9adg, 9ain, 9akm, 9alm, 9atv, 9axb, 9axq, 9azn, 9bel, 9bk, 9bna, 9bre, 9ckw, 9crv, 9csq, 9ct, 9czw, 9cdz, 9dea, 9dm, 9dr, 9drs, 9eag, 9ebj, 9ees, 9ejg, 9eji, 9ez, 9la, 9mc, 9pt, 9zk, U-aa7. C—1ar, 1da, 1dd, 2ax, 2al, 2do, 2fl, 3xi. Brazil—1ab, 1ax, 1ad, 1ak, 1al, 1ap, 1ar, 1bi, 1bl, 1br, 1ib, 2ab, 2af, 2ag, 2am, 2ia, 6qa. Chile—2ab, 2ar, 2as, 2ld. Argentine—Ba1, bc8, dz9, hb5. Uruguay—1am, 1cg, 1fb, 2ak. Borneo—Bn, sk2. South Africa—a3z, a4l, a4z, a5x, a52, a6n. Phillipine Islands—1dl, 3ac, Fl, 1b, Jm2pz, Fs8lha. A—5bw, 5hg. Z—3ai, 3ar, Bf9gm. Miscellaneous—AND, NPO, WIK, KTC, NAG, WLL, JXia, XD? Heard on Reinartz + 1lf on 18-75 metres, November 7 to 24.—B. and F. SMITH (BRS3), 101, Highfield Road, Saltley, Birmingham.

New Zealand—1ao, 1ax, 1fe, 2ab, 2ac, 2ae, 2gc, 2xa, 3ai, 3ar, 4aa, 4ac, 4am, 4av. Australia—2cm, 2cs, 2ij, 2yi, 3bd, 3bq, 3ef, 3bs, 4cm, 5ku, 7cs, 7cw. Argentine—FF9, AFI, pi, 1BD, WUAJ. Japan—JKZB, JOC, JRG. Brazil—1ao, 1ak, 1bc, 1bi, 1qu, 2ab, 2af, 5ab, 5ad, 5ae. China—GFUP, 9AA, BXY. South Africa—A3B, A4Z, A5X, A6N. Canada—1ac, 1ar, 1dd, 2fo, VOQ, 3KP. Borneo—SK2. U.S.A.—6ew, 6oi, 7it, 7wu.—D. O'DWYER.

U.S.A.—U—1lw, 1uw, 1ch, 1bzb, 1bqt, 1am, 1da, 1cj, 1gr, 1ctp, 1air, 1awe, 1ac, 1bcn, 1clv, 1mv, 1aud, 1xaa, 1rd, 1ckp, 2gk, 2fp, 2arq, 2ev, 2aib, 2byg, 2cvo, 2ckk, 2cmk, 2crb, 2kh, 2cs, 2tk, 2am, 2arv, 2apv, 2aev, 2rs, 2ff, 2ah, 3jw, 3rf, 3mv, 3mu, 3cju, 3cdk, 3afw, 3acl, 4dd, 4ll, 4jk, 4rm, 8edu, 9od, 9wi. Brazil—BZ, 1ar, 1bi, 1bc, 1qa, 1an, 1ad, 1aq, 1ak, 1bg, 1ai, 2am, 2ab, 9qa. Australia—A—2yi, 2sh, 3xo. New Zealand—Z—3ai, 4aa, 4am. Miscellaneous—YICX, TJCRJ, PR4JA, HIK, PRS, KTC, Y1BR, CH2AB, OVI. 30-40 metres.—F. G. PRATT, 54, Lombard Street, London, E.C.3.

Calls heard at G2XV during November (30-50 metres):—U—1avr, 1ga, 2tb, 3rf, 3lw, 4rm, 4dd, 9avy, 9bbw, Z—3aa, 3ar, 3ai. Assorted:—JM2PZ, B-U3, C2AX, SPM, BZ5AA, QRA ere "Chandos," Gt. Shelford, Cambs. Eng.: QRK?—G. A. JEPES (G2XV).

G calls heard in Latvia (extracted from Latvian "Radio" by G6BT).—By KC2K—2nm, 5ds, 5hs, 5tz. By KC2N—2db, 5ku, gi21T. By KC2R—2rg, 2sw, 5uq, 6hf, gi6mu. By KC2U—2db, 2it, 2ms, 2nm, 2nt, 2pp, 2rg, 2sw, 2bl, 5alt, 5dh, 5fq, 5hs, 5ku, 5lf, 5li, 5mq, 5pm, 5tz, 5us, 5uw, 5wv, 5xy, 5zg, 6br, 6bt, 6cl, 6hf, 6hz, 6ia, 6jv, 6mu, 6nx, 6og, 6oh, 6qh, 6tx, 6ty, 6ug, 6vp, 6yw, gc, 6iz, 6ux, gw, 18b. By KC2V—5hs.

Calls heard by T. A. ISERBYT (BRS25), "Lynmouth," 18, Broughton Road, Thornton Heath Surrey, between October 20 and November 14. Receiver O-V-1 modified Reinartz.—A—2yi, 3ls, 5bg. B—4aa, 4qq, h5, k44, o8, s5, ul, v33. BZ—1ad, 1ai, 1al, 1am, 1aw, 1bi, 1ib, 2ab, 2af, 2ag, 2az, sq1q. C—1ar. CH—2as. CS—2un. D—7jo, 7xf, 7zg. EAR—10, 19. F—8ba, 8ca, 8di, 8fj, 8gm, 8il, 8ix, 8ku, 8pi, 8apo, 8cax, 8ffr, 8imr, 8kmz, 8ncx, 8oic, 8olu, 8oqp, 8pam, 8pml, 8rbp, 8rot, 8rvr, 8sst, 8udi, 8vcd, 8wms, 8ynb, 8yor. FA—8vx, 8ssr. FM—8pmr, ocrb. I—1au, 1bw, 1ce, 1dm, 1ma. K—4ap, 4az, 4mca, 4uaj, 4uhu, ss28. KC—eq, z1. L—1jw. N—oam, oaz, ozah, odg, opm, owb. OE—hw. P—1ae, 1ak, 3fz. Q—8kp. R—bal. S—2bs, 2co, 2nq. SM—rt, tt, to, tq, tx, us, vj, wf, ws, wu, xv, zv. TP—aj. TJ—crj. U—1ag, 1cb, 1ch, 1lc, 1cr, 1rd, 1ro, 1sw, 1tz, 1uw, 1xv, 1zd, 1zs, 1aae, 1aao, 1aap, 1aci, 1amd, 1asu, 1azr, 1bzb, 1cjc, 1cjh, 1ckp, 1cmp, 1cmx, 2fj, 2md, 2nn, 2py, 2tp, 2wc, 2xg, 2aby, 2agt, 2aml, 2amj, 2anx, 2apd, 2bsj, 2erb, 2cvj, 2xaf, 3au, 3lw, 3ud, 3afq, 3bof, 3bu, 3bw, 3cdv, 3cju, 4ak, 4cv, 4iz, 4lk, 4ni, 5ev, 5es, 8kc, 8sv, 8ben, 8brc, 8buy, 8don, 8dpn, 9cn, 9eji. Y—2ak. YS—7xx. Z—2xa. Various—agc, aabl, gbm, wiz, wax, and, suc, perr, pell, fw, lpl, hik, sgl, spm, sp, kn5, nau, b82.

RECEPTION OF G STATIONS, QRP TEST.

44-46 METRES.			
Call.	Strength.	Call.	Strength.
2CC	R4	5NN	R3
2CS	R3	5TD	R2-3
2DR (?)	R2-3	5ZU	R6-7
2HM	R4	6CL	R5
2MS	R2	6IY	R2-3
2NH	R3-4	6MU	R3
2OD	R4	6NF	R3
5FQ	R3	6OT	R3
5GQ	R4-5	6QH	R5
5GU	R3	6TX	R3-4
5HJ	R3	6UV	R5
5HS	R3	6VO	R3-4
5JX	R3	6VP	R3
5KV	R4-5	6YD (?)	R2-3
5MA	R5	6YR (?)	R2-3
GW13C	R5-6		

Receiver O-V-O.

H. E. COOK (BRS17).

St. Albans.

November 1-7, 1926.

Date.	Tests.	QSB	Wave.	QRK	Time G.M.T.
July 4	4AA ZG 2SZ				05.00
" 2	cq, test g5DH	cw	34.5	8	04.50
June 25	cq g 5DH		34.5	8	04.50
" 23	g 5SI	(cld l)	37	3	23.40
" 22	1BD de g 6RM				22.55
" 8	g 5TZ		45	6	23.00
" 8	test g 5MU	cw	43	4	22.50
" 7	g 6UD	cw	41	4/5	17.10
" 5	BZ de g 6YU				19.15
" 5	cq de g 2ND		34.5		14.35
May 30	2cm ag 2OD		34	6/5	05.26
" 28	test g 2DB		45		22.50
" 23	A6N og 2DX				19.30
" 23	3aai ug 2SZ	wkg			
" 19	test g 2ZC	rac	45.5	5/8	19.45
" 18	test g 2LZ	cld44			19.30
" 18	2am de 6xy?				19.15
" 16	2TK gg 6TD		20? or	3	18.00
			arnc?		
" 16	test g 2SZ		34		17.40
" 9	ABN OG 2OD		20? or	2/3	18.50
" 9	lib bzg 2CC		arnc?		13.55
" 9	6ia gg 6TD		19? or		13.45
			arnc?		

I will appreciate some reports of my sigs heard in Great Britain, especially on wave of 26 mts. I would be glad to arrange test on 5 mts. band.

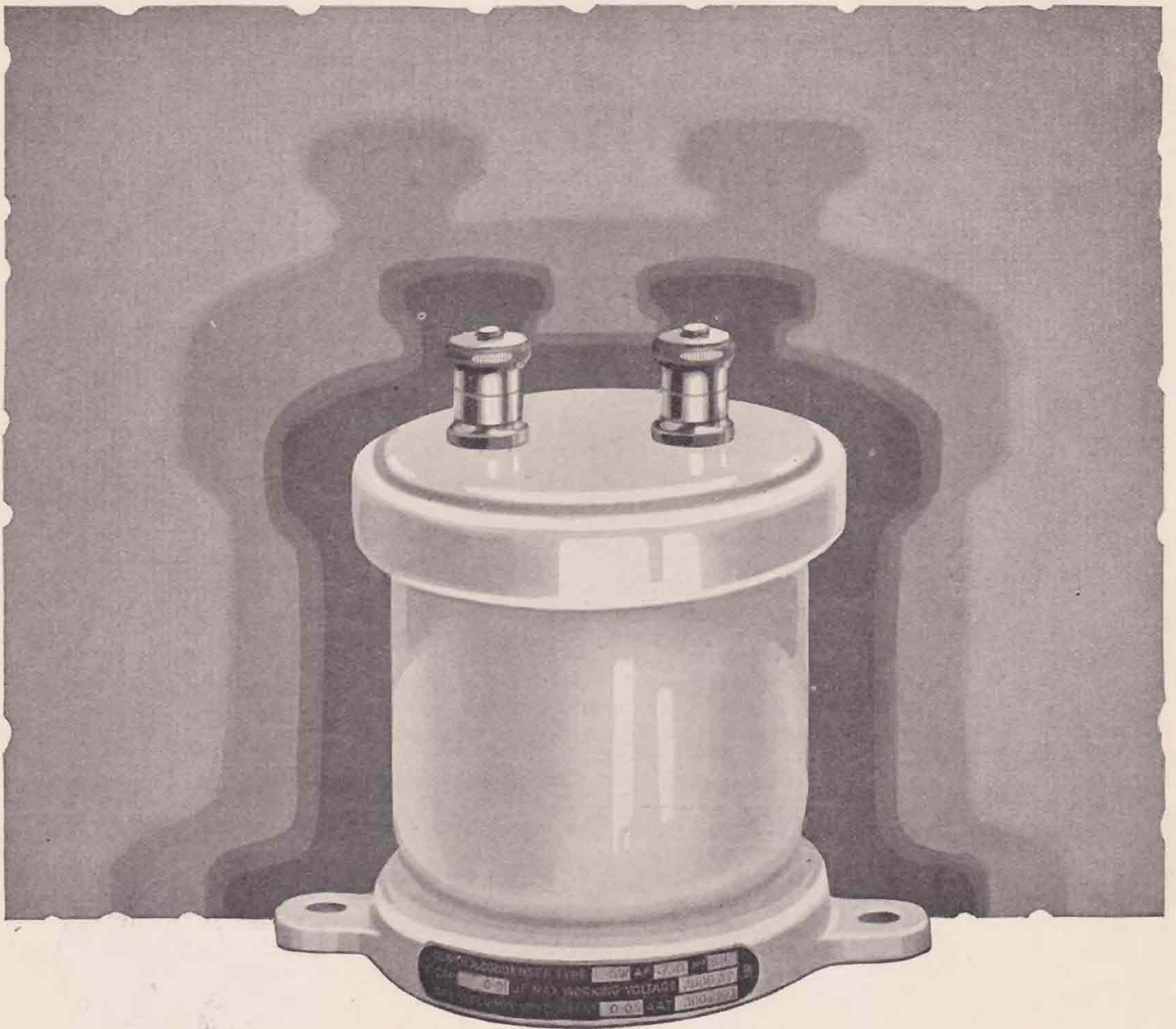
i I ER

ING SANTANGELI.

Ing. Santangeli Mario, S. Eufemia No. 19, Milano (5), Italy.

A New QRA.

Mr. W. J. Coyle, of 134, London Road, Southend-on-Sea, reports that the call-sign 5OK has been allotted to his station. W/L 150-200 metres.



Condensers for Transmission

Our range of Condensers for Medium and Low Power Transmitters covers all normal requirements, and we shall be pleased at all times to advise those engaged in research as to the Types best suited to their needs.

The AF range, designed primarily for Anode Feed purposes, and the SWAF range, designed to operate in circuits where the wavelength is below 100 metres, have capacities between 0.00005 MF and 0.05 MF for working voltages up to 6,000 D.C.

As will be seen from the illustration (which shows a Type SWAF 750) these condensers are enclosed in porcelain containers. Adequate insulation is thus provided for the high potentials above earth at which the condensers will generally be required to operate.

These condensers may be employed as high frequency by-pass condensers or as grid condensers for transmitters.

The Type SWAF are also suitable for use as Aerial Series Condensers, Oscillation Circuit Condensers, etc.

The prices for these condensers vary from 35/- to 70/- according to the type required, and we shall also be pleased to quote for any condensers constructed to meet special requirements.



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DUCON WORKS, VICTORIA ROAD., N. ACTON, W.3



Take your H.T. requirements from the A.C. Mains

Mullard Low Temperature Filament Rectifying Valves of the DU class have been specially designed to be used in conjunction with the house lighting supply for charging H.T. accumulators or working an H.T. supply unit.

A very important feature of these valves is the conservative rating of the filament voltage, which enables them to be operated under the hardest working conditions.

Complete circuit instructions with operating information is supplied in the Technical Leaflets available free on request.

HALF - WAVE RECTIFYING VALVES

Mullard	DU/5	or	D/10
Filament Volts	2.7		4.0
Filament Amps.	0.77 (max.)		1.1 (max.)
Price	15/-		20/-

FULL - WAVE RECTIFYING VALVES

Mullard DU/2			
Filament Volts	..		4.0
Filament Amps.	..		1.1
Price	..	..	30/-

Write for fuller information and secure the advantages of an inexpensive H.T. supply

Mullard
THE MASTER VALVE



The Mullard Wireless Service Co., Ltd., Mullard House, Denmark Street, W.C.2