T. & R. Bulletin

Incorporating

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T&R BULLETIN.

The only British Wireless Journal Published by Amateur Radio Experimenters

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APRIL, 1930. Vol. 5. No. 10.

EDITORIAL.

Off Wave Stations.

WE occasionally receive complaints that certain Commercial or Experimental stations are working in the bands which, according to the Washington Regulations, are allotted for Amateur use. We desire to make the position of the Society, as representative of the Amateur in Great Britain, perfectly clear in respect of the complaints.

In the first place it must be understood that these stations are allowed to use our 7,000 and 14,000 K.C. bands, *and that no Amateur bands are exclusive to ourselves.* Article 5, sec. 1, of the General Regulations of the Washington Convention, 1927, states :—

> "The Administrations of the Contracting Governments may assign any frequency and any type of wave to any radio-electric station under their authority upon the sole condition that no interference with any other service of another country results therefrom."

The Amateurs of the world are not a service, we are tolerated. Article 4, sec. 2, states :—

> "The waves emitted by a station . . . . and their radiation must also be as free as practicable from all emissions which are not essential to the type of communication effected."

This regulation may be construed as applying to such troubles as side-waves, spacing-waves, and unnecessarily modulated notes.

The Society has in the past taken action where reports of infringements of the Regulations have been received from members—drawn up in the approved style, *vide* Appendix 2 of the Regulations—and the Society will continue to take action where necessary. Such action in the

past has been successful, inasmuch as the Post Office have made representation in the proper quarter, and we believe that the troubles have ceased.

Members would, however, do well to remember that complaints referring to a foreign station become an international affair and, in consequence, considerable time must elapse before the matter is remedied. Further, as has been mentioned earlier, the Amateurs of the world are tolerated by most Governments and probably regarded as necessary evils by the others ; therefore cases of Commercial stations transmitting in the Amateur bands can only be settled by an amicable arrangement by the Administrations of the countries concerned.

In view of the fact that the Society has obtained success in the past, members may rest assured that all possible attention is given to complaints. We do not possess an Official Listening station, and therefore it rests upon those members who have suitable apparatus to act as watchers of the air. We feel that isolated cases of stations working in the Amateur bands should not be reported at once ; preferably a number of observations should be taken on different days in order to show that the offending station habitually uses frequencies allotted for Amateur use. We do not wish to forward to the Post Office numerous complaints upon which, after further investigation, they are unable to act ; we say this because we are not free from this type of complaint.

Finally, to the whole membership our advice is, " See to it that your own house is in order first."

CALIBRATION SERVICE.

The R.S.G.B. Calibration Service (Standard Frequency Transmission) will be transmitted from station G5BR on the first and third Sundays in each month and by station G5YK on the second and fourth Sundays according to the following schedule :

9.55 a.m. Series of X's, followed by a telephonic announcement that the calibration service is about to be transmitted.

10 a.m. Transmission on 7,050 K.C. (nominal).

10.5 a.m. Transmission on 7,250 K.C. (nominal).

The actual transmission will consist of the call (in Morse) " RSGB DE G—— " (repeated), followed by a two-minute dash and the frequency used. The frequency of the preliminary announcement will be the same as that used for the first transmission : at the close of the second transmission a further short telephonic announcement will be made. Times are G.M.T. or B.S.T. as in force at the time.

Things We Want to Know.

The call sign of the R.S.G.B. member who, during the exhibition of a cinematograph film at a recent meeting, put his arm round his neighbour's waist under a misapprehension.

* * *

Whether G2QY regrets having gone out of business now that " Crystals " are being used to spot winners, and whether any of the other crystal companies will guarantee 100 per cent. results from their products.

FORTHCOMING EVENTS.

April 25.—At the I.E.E. Lecture by the Telegraph Condenser Company. Subject : Recent advances in the construction of Condensers for Radio Circuits. Commence at 6.15 p.m. Tea at 5.30 p.m.

May 16.—Lecture by Mr. Charman and Mr. Clark on " 28 M.C. Transmitters and Receivers." At the I.E.E.

May 23.—At the I.E.E. Lecture by the Mullard Wireless Service Company, Ltd.

June 27.—At the I.E.E. Lecture by the Igranic Co., Ltd., on " Neutrosonic Short Wave Receivers." Commence 6.15 p.m. Tea at 5.30 p.m.

Strays.

Will any stations having information available about radio conditions on various frequencies, with times and dates of any particular observations, please be good enough to forward it to G5KL, 11, Allerton Road, Southport, Lancs. Data in connection with comparison results during magnetic storms is most desired.

(*Continued from next page.*)

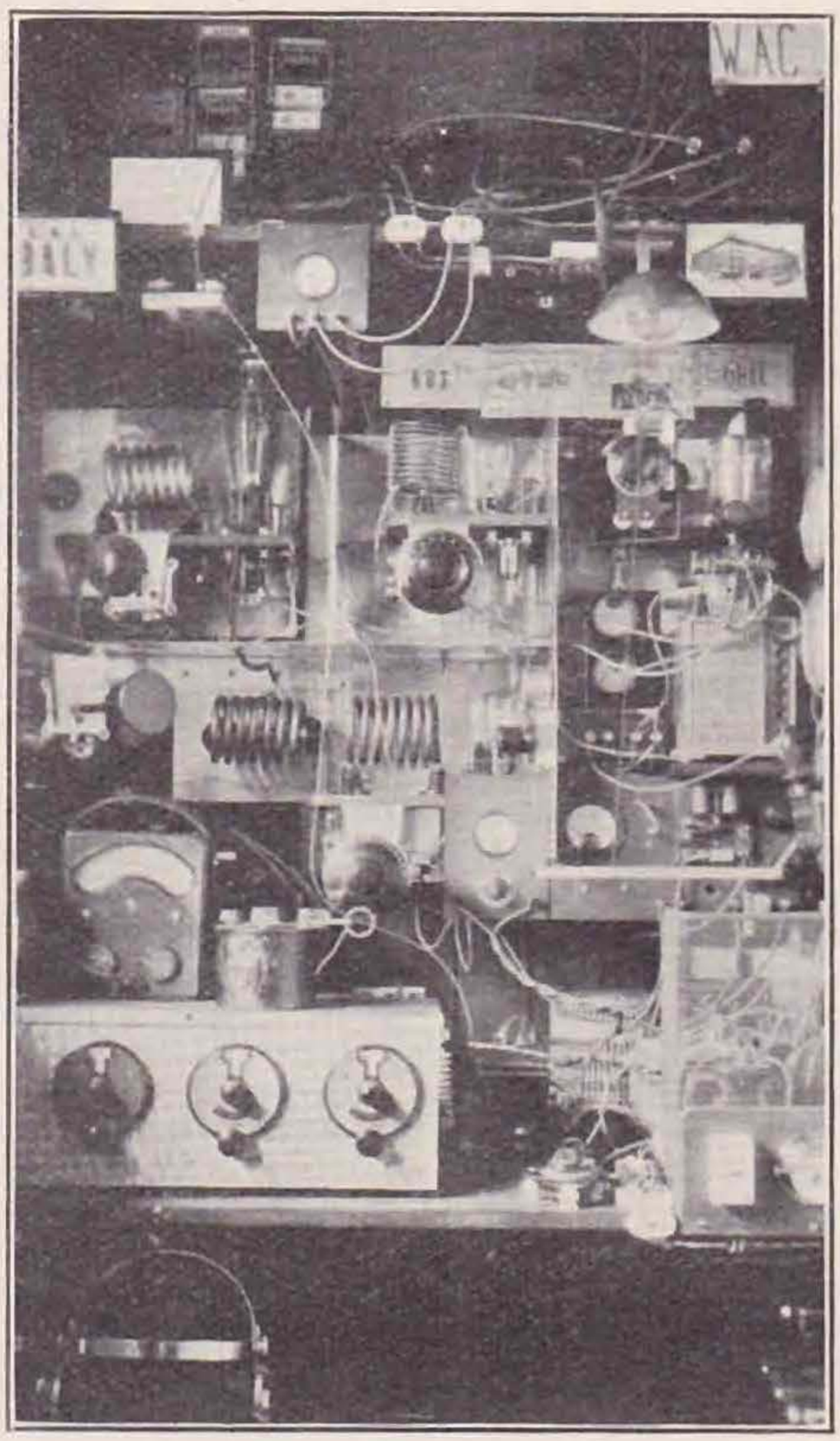
available for radio for which much interesting work is being planned.

No startling records can be claimed for this station. By the end of 1923 most of Europe had been worked with an input of 4 watts. Signals were first reported from America in March, 1926, when using 10 watts. Since then results obtained have kept the station fairly well abreast of the times.

Station Description No. 5.
G6DW.

By Douglas H. Johnson.

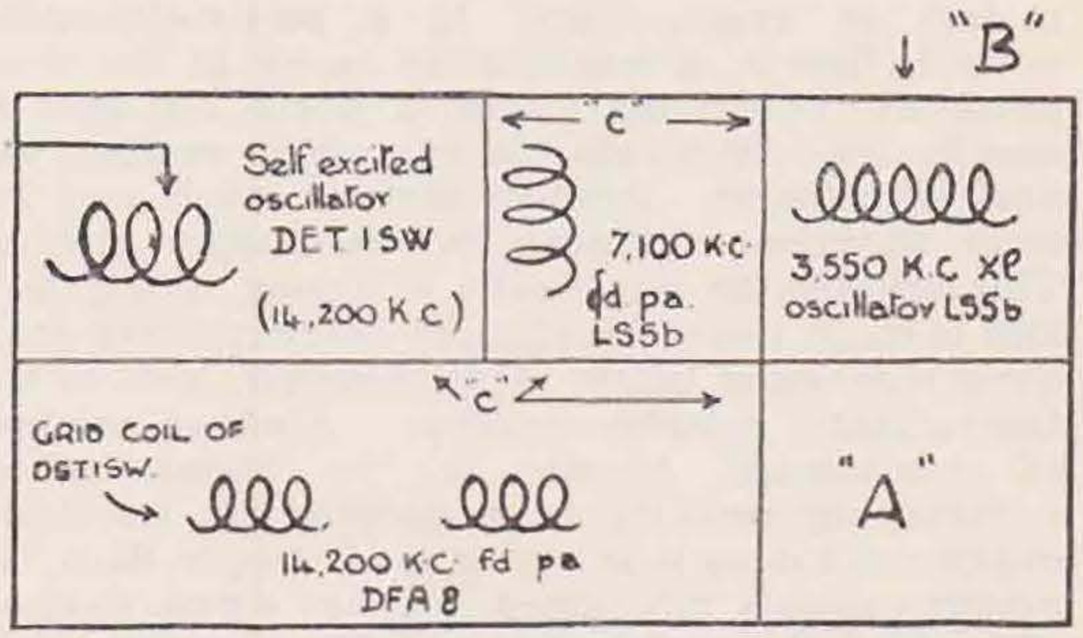
G6DW came into being as an experimental transmitting station seven years ago, when operations were commenced on 440 metres. Much interesting work was done on this wave on low power 'phone C.W. and T.T. A drop was made to the 200 metre band and here low power tests were continued and many contacts made. During the whole period from 1923 to date, operations have been necessarily irregular owing to the owner having to pass several examinations. For this reason it has so far been impossible to participate in the various tests organised by the R.S.G.B. and A.R.R.L.



A receiving station has been in existence since 1921, and during the Transatlantic broadcasting tests of 1923 this was the only station, so far as information goes, that was successful in receiving WDAR of Pittsburg, operating on 395 metres with an output of ½ kilowatt. Reception was on one valve.

At the beginning of 1928 attention was turned to power reproduction, the outcome of which is the Celestion-Johnson moving coil speaker and a successful radio-gramophone.

At the end of 1928 more time was again given to transmitting and some preliminary work done on the 7,000 K.C. band. Crystal control was adopted and apparatus constructed for 14,000 K.C., and here experimental work has been in progress for some time.



A. Compartment occupied by meters, grid bias eliminator, key relay, H.T. voltage regulators, etc.
B. Aluminium covered baseboard approx. 3′ × 2′.
C. Aluminium screens.

Almost every type of aerial has been tried and experiments have shown an ordinary Hertz radiator 67 ft. long and voltage fed 9 ft. 6 in. from the centre, to be by far the best of them all. The same aerial is usually used for reception also.

Receivers have been numerous on the short waves and have varied from the familiar modified Reinartz to the R.S.G.B. S/G 4.

As regards transmitting arrangements, almost every known circuit has been tried on the various wave bands. The photo shows the crystal controlled gear now in use on 14,000 K.C. Nearly all the apparatus is home built and the arrangement of the various units is indicated in the diagram used in conjunction with the reference table. H.T. for the crystal oscillator and two frequency doublers is derived from an eliminator employing a Raytheon full wave rectifying valve. H.T. for the self-excited DET.1 unit is supplied by a separate eliminator employing a Marconi-Osram U.8. During the limited time which has been free for transmitting, all continents have been worked successfully.

Experimental work is now in progress on a new form of direction finder and 28,000 K.C. gear is under construction.

It is regretted that in the past, for the reason already given, this station has been unable to take part in the various activities of the R.S.G.B. One more, and the last, examination has to be taken next month, and after that more time will be

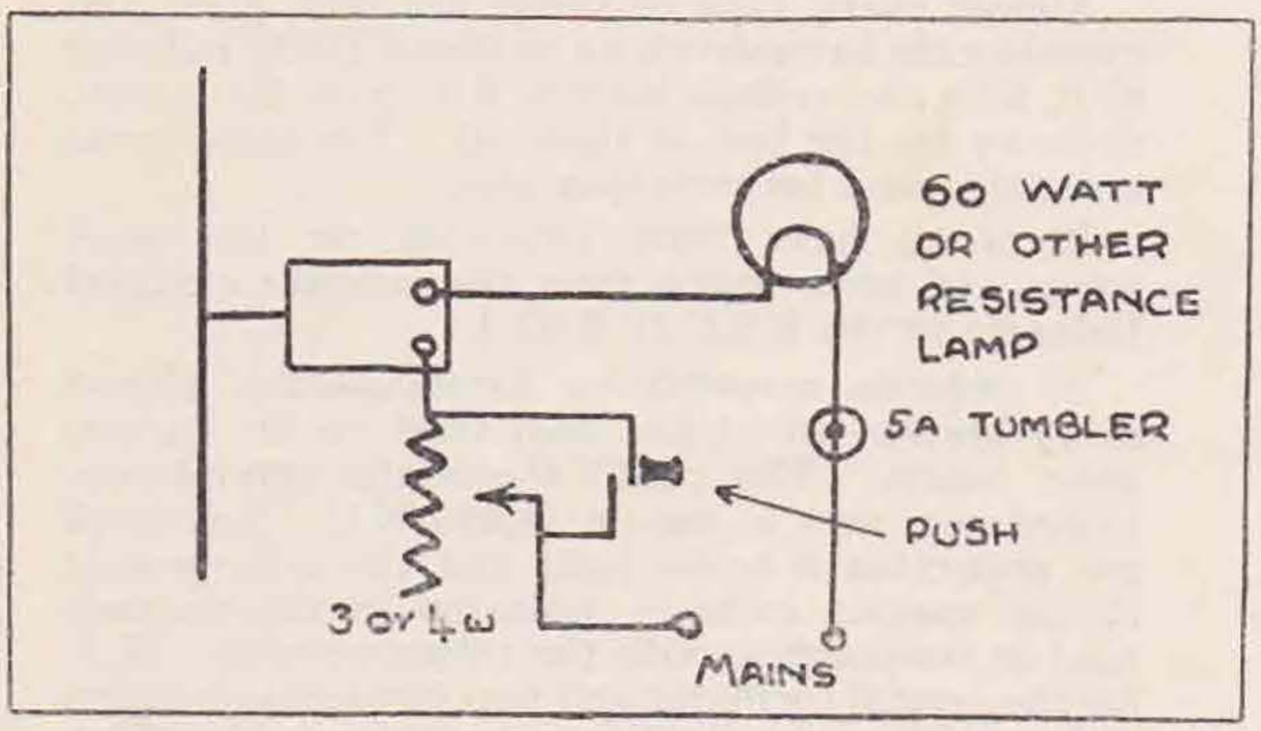
(*Continued at foot of column 2, previous page.*)

The Science of Television.

By Maurice Gibson, F.T.S., M.A.F.deT.

Part 4.

I wish in this part of my series to deal briefly with some of the chief difficulties that are to be met with in the Baird system. It is generally considered that the most serious difficulty is that of synchronising the speed of the scanning discs at the transmitting and receiving stations. Many systems of synchronisation have been tried for television purposes, but unfortunately they are all more or less complicated and correspondingly expensive. One of the most usual of these methods is to couple a small A.C. generator to the disc-driving motor at both the transmitting and receiving ends, using the A.C. current thus generated to keep the driving motors in synchronism. If a motor-alternator is used, that is, a synchronous motor in the same frame as the driving motor, a worm and gear is usually used to rotate the carcase in making the final adjustment. Another method much used for some purposes is known as the Ranger system. This employs an electrically vibrating tuning fork and is much more complicated and expensive than those mentioned before ; it is, however, used in the transatlantic telephotography. Another method of synchronism known as the phonic wheel system, has recently been adopted by television experimenters as it is rather more simple than the systems already mentioned. A very simple method of keeping the receiving disc motor is approximate synchronism, and one which is much used in America, is to accelerate the motor by shorting the speed-control resistance by means of a push button (see diagram).



The next great difficulty is the high low-frequency amplification required. The amplifier, as I have mentioned before, should be transformer coupled, and has to be very carefully constructed or distortion of the image will result, in the same way as distortion of speech would result if used for receiving telephony. Another difficulty is the high cost of the amplifier and of the high tension batteries if these are used. The use of current from the mains is not to be advised in this early stage of television experimental work. The D.C. or rectified A.C. available can never really be sufficiently smooth, and a hum caused by a slight ripple will produce a corresponding distortion of the image. In addition to this the stages and transformers will have to be very carefully screened and the components specially placed with large separation. These difficulties and those obtaining maximum smoothing, are not to be sought after, when the difficulties of television are as numerous as they are at present. In any case, there is little doubt that the smoothest and best D.C. supply for these experiments is obtained from large capacity primary batteries, in spite of the high cost.

Another difficulty to be considered is the lack of standardisation in the scanning discs. In America 24 apertures are used by WGY, 36 by WRNY, and 45 and 48 are also used. In this country 24 and 48 have been used, but 30 is in general use now.

Both in England and in America one, two and three spirals have been tried, the single spiral disc, however, is the one in most general use in both countries. It will be obvious from this that conditions for television research will be much improved when an international standard is adopted. A standard driving motor also might be adopted with great advantage to the constructor.

Good selenium cells are very difficult to obtain unless special research prices are paid, good results being guaranteed. This is due to the highly critical temperature of the molten selenium during the construction of the cell, and also to the degree of light sensitivity of the particular specimen. Photo-electric cells are much more reliable in performance, but are out of reach of the average experimenter owing to their exceedingly high price, costing anything from £4 upwards. Neon tubes vary a great deal owing to the fact that commercial neon is used, the minimum striking voltage varying from 120 to 180 volts. It is more a matter of luck than judgment whether the selenium cell or neon tube obtained is good or bad.

There is no doubt whatever that the science of television is now firmly established and its ultimate perfection inevitable. There are, however, a number of scientists who consider that mechanical scanning is too slow for real success to be achieved along the present lines. It is, indeed, a matter of conjecture whether some form of cathode ray system will eventually supersede the present system or not. There are some twenty stations transmitting television regularly in America, and many have been started in France and Germany. In this country, now that we have cut through some of the usual red tape, jealousy, and vested interest, I think we can hope that this science will make similar strides in the land of its birth.

A TRUE STORY !

G6FD : Do you notice any " chirp " in my note ?

Foreign " Ham " : I do not know what is " chirp."

G6FD : Chirp is like the noise made by a bird.

Foreign " Ham " : Dear OM, your sigs sound like as the little birds.

G6FD wonders if a " cage " aerial will help matters !

Stroboscopic Discs.

By A. Hinderlich (G2QY).

Introduction.

A stroboscopic disc serves as a means of conveniently and continuously examining a rotating piece of machinery both for speed variation with reference to some source of alternating current, and for sudden variations in speed. Examples will be given with reference to gramophone turntable control, but the method can obviously be extended to other purposes, such as television scanning discs, or inverted to examine the constancy of a source of A.C.

Theory.

A gas-filled or vacuum type electric lamp used upon A.C. of f cycles per second has 2f peaks of brilliancy per second.

A rotating disc containing dark and light sectors will appear stationary by the light of such a lamp if 2f light sectors pass a fixed point per second.

At N r.p.m. $\frac{120f}{N}$ dark and the same number of light sectors are required in a complete circle to give the illusion of a stationary disc. Alternatively $\frac{240f}{N}$ radii must be drawn in a complete circle, the spaces between alternate radii being darkened. This is equivalent to an angle of $\frac{3N}{2f}$ degrees between the radii.

In general, neither of these expressions is a multiple of 2n, where n is any integer, and the 2 is inserted to give pairs of lights and darks. There are therefore in general two possible alternatives :—

A.—Two discs, both containing integral numbers of pairs of sectors, one for a disc speed in excess of that required. the other for the next slower speed. Such a compromise is feasible in gramophone work, the discrepancy between one available speed and the next being often less than permissible or expected variation in the supply frequency.

B.—One disc, whose sectors are set out at the theoretical angle. Such a disc gives a "hunting" or "pile-driver" effect, but luckily in the commonest gramophone case (N = 78, f = 50) the effect is hardly noticeable. However, a disc of this type cannot be used to examine the frequency constancy of a system, but only to set the average speed correctly.

Practical.

It is sufficiently accurate to take 2^n or 3×2^n radii covering an arc of approximately 60°, and set out the six radii covering about that angle, filling in the remainder by continued division of the larger angles.

The stroboscopic disc should be viewed through a mask showing about 10 of the sectors. If the mask is of triangular form, such that two sides appear to be radii to the disc, then slow drifts or sudden apparent motion of the disc can very easily be observed.

The following table is applicable to some of the more common frequencies.

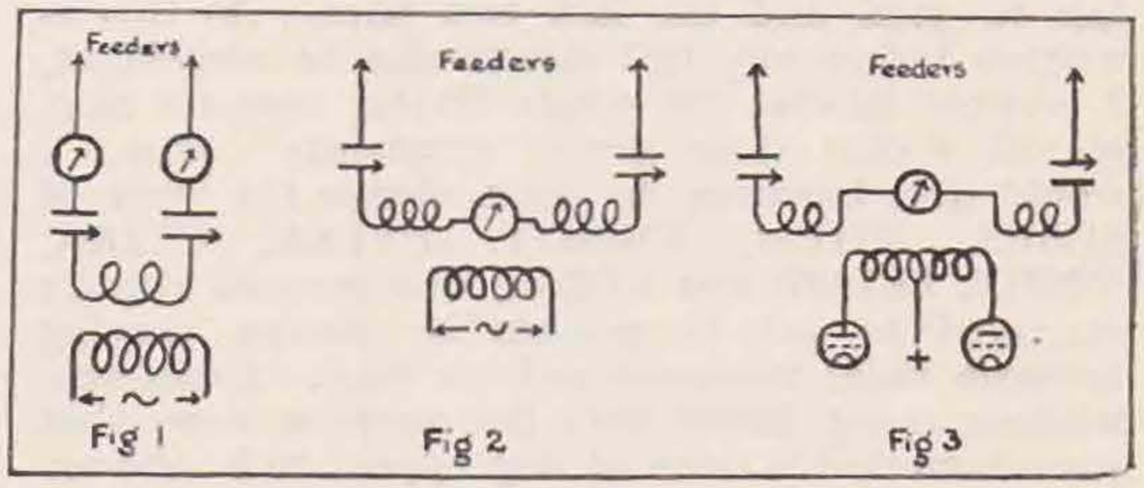
Supply Frequency Cycles Per Second	Method of Division of Disc.	Record Speed at Apparent Standstill r.p.m.	Speed Relative to 78 r.p.m.	Hunting
50	24 radii in 56° 10′	78·00	Correct	1/5 sector
	2×78 sectors	76·92	1·4% slow	None
	2×77 sectors	77·92	0·1% slow	None
	2×76 sectors	78·94	1·2% fast	None
	3 sectors in 7°	77·77	0·3% slow	⅓ sector
25	12 radii in 56° 10′ ...	78·00	Correct	9/10 sect.
	2×39 sectors	76·92	1·4% slow	None
	2×38 sectors	78·94	1·2% fast	None
42	24 radii in 66° 51′ ...	78·00	Correct	6/10 sect.
	2×65 sectors	77·54	0·5% slow	None
	2×64 sectors	78·75	1·0% fast	None
60	32 radii in 62° 25′ ...	78·00	Correct	¼ sector
	2×92 sectors	78·27	0·3% fast	None

Aerial Tuning.

By J. R. Beeton.

Most of the aerial systems in use to-day employ twin wire feeders, which are tuned by condensers in each lead. The aerial is correctly tuned when the current in the two feeders are exactly equal and 180° out of phase. (Fig. 1.)

The average hot wire meter is not accurate, and it is quite impossible to be sure that the currents in the feeders are equal when the meters read the same. The following method of tuning has these advantages : it employs only one meter, and, therefore, the above inaccuracy cannot occur. The arrangement is shown in Fig. 2. Simply tune the feeders till the meter reads a maximum for any given coupling. The theory is that when the feeders are correctly balanced, the current antinode occurs in the exact centre of the coil. This is of special advantage in push-pull sets, because in all probability the coil is already split in two equal portions in order to equalise the loads on the two valves. (Fig. 3.)



Contact Bureau Notes.

By H. J. Powditch (G5VL).

FIRST, the result of "Mr. Blank's" trophy, offered as a challenge award for the QRP Groups. The conditions were, roughly, that the trophy, which will consist of a genuine Irish "Shillelagh" of guaranteed pedigree and unimpeachable brogue, should be held by the QRP Group obtaining the best mileage total with six QSO's with six different countries, a maximum power of 3 watts being allowed. As this was the first competition, only four months were possible for work last year up to December 31.

The actual figures of the winning stations from Group 8A are :—

G5RV.—QSO EU2CU, 1,835 miles. Power, 2.8 watts.
G5RV.—QSO CV5AF, 1,300 miles. Power, 3.0 watts.
G5RV,—QSO OH5NZ, 272 miles. Power, 1.9 watts.
G5PJ and G5AZ.—QSO CT1AA and CT1BK, 986 miles. Power, 2.5 and 1.5 watts.
G5RV.—QSO I1MM, 884 miles. Power, 2.0 watts.
G5PJ.—QSO EAR59, 836 miles. Power, 2.5 watts—

a total of 7,113 miles, with (taking the lower figure) power of 13.7 watts. It must be remembered that in these figures there are six sets of local losses to be considered. Although the total mileage is not great for one contact under good conditions on the total power yet, when we allow for the losses on each QRP contact, Group 8A and their G.C., G2ZN, have put up a fine initial performance in four months, and will cause the winning group for 1930 to get a move on if the trophy is to leave 8A.

Group 8B totalled 6,543 miles under the same conditions, their best figures being G2VV, 1,610 miles; G6SO, 1,289 miles; G2OA, 1,162 miles; G5JF, 1,126 miles; G2RT, 723 miles; G5CM, 633 miles. They should be congratulated on their general work, for the DX is spread over all their members. If the transfer system is inaugurated between the QRP Groups, what will be the cash transfer value to 8A of G5RV?

I hope that this first QRP season has proved of value to the Groups taking part and that, with 8C and 8D included this year, the competition will serve to keep keen rivalry alive between the experts.

We have all been busy on the 28 M.C. tests. Only a few reports have yet to come to CB, but generally it seems that the first two Sundays were fair to good and the last two poor. As this is written before any full results can be arrived at, I propose leaving the whole matter over till next month rather than give "fragments" now. I would like, however, to acknowledge the work of SU8RS, YI1LM, FM8RIT, PY1AA, CT2AA, YI6HT, ZL1AN, and VE2AC, who have all already managed to get in reports by means varying between radio messages and air mail. I can say, without going deeply into the question now, that some remarkable cases of skip appear to be shown. Especially is this the case with signals reaching Scandinavia and originating in those parts. QSO's seem to have taken place over our heads with monotonous regularity!

SU8RS, who has been so successful lately, sends details of an interesting aerial design. It is used for all waves and is inverted L type, the top is horizontal and is full wave (21.2 metres). The vertical portion, which SU8RS calls feeder and shows as a single wire, is five-eighths wave in length, and at its junction with the top a .0002 condenser is inserted. If results are to be considered, this type should be well worth a trial. The aerial is N and S in direction, with feed at S, and is tapped direct to tank coil.

G.C.s have already been notified to look out for ZL2AC at 12.00 G.M.T. on 28 M.C. PY1AA has opened up new fields by logging G6LL on March 3 at 16.00 G.M.T., T9, R3, QSA4. This is the first report of G in PY, and our hearty congratulations to G6LL. VE2AC is very keen, but I have no reports of his signals having been heard yet during the tests. ZL1AN had no results on the first day.

With those few notes, I will leave the tests for the time, and hope to give a detailed summary next month.

By the way, can anyone give SU8RS a cure for T.H., which comes on only after sunset, after the receiver has been good all day? Batteries OK (accumulators), and everything apparently normal. No high resistances, mains well clear, and the trouble only occurs when working on 28 M.C. All usual cures are non-effective.

As to general work, reports are rather less—due to the tests, I presume.

By the time this appears the 2 M.C. tests will be in progress, and I hope the enthusiasm that has marked the 28 M.C. ones will continue for April.

Owing to some delay in obtaining the QRP results, the usual Group description—in this case by the G.C. of winning QRP Group—has to be held over for a month.

Group Reports

28 M.C. Work.

Group 1B.—G.C. G5SY found February "not so good." He surmises that the tests have caused the present difficulty in getting reports. BRS250 joins the "locality" discussion. His view is that this makes all the difference, and he instances that G5WK copied ZS5C (R5), whilst other stations in the same district could not hear the signals. On February 2, G2OD copied W9EF solid, whilst BRS250 found extreme QSS. On February 9, on the other hand, G5WK, with a very "hot" receiver, heard only ZS4M and W2JN, whereas BRS250 heard six W's and the ZS station. A log of six W's and ZS is given, but no W's were heard of February 16, 22, or 23. The G.C. agrees with BRS regarding the locality question, but (as an honorary member of this Group) I don't, or at least

only with qualifications. In 1929 this station (G5VL) was lucky in that W's were heard and worked practically every Sunday. This year, they are as scarce as the proverbial currant in a railway bun. I have put in nearly 40 hours on receiver and heard four hams and two harmonics this month. The locality and gear of the station are the same. So I suggest to G.C. and BRS250 that, although locality has some part in results, yet the preponderating factor is local barometric conditions. May I remind G5SY that in 1929 G5VL was often logging stations which G5SY did not hear. This year it is the opposite. Yet we are both in the same places as before. G6WY logged three W's and ZS. He noted that W1CMX harmonic was audible when W1K harmonic was not, and no 28 M.C. stations were to be heard. YI1LM harmonic was also heard on February 23. G6LL found first half of February the best. He has installed Mazda A.C. valves, the heaters being run from accumulators, and thinks these valves have come to stay. He worked VQ2BH in addition to several W's and ZS4M. G5LU has been away. G5ML has had the usual astonishing results. On February 8 he worked eight W's and ZS4M, in addition to hearing others. He was using an "AOG" aerial, end fed. G5SY logged ZS, OZ, VQ, and several W's. He also notes that no W's were heard on February 16 and 23. With a QRO licence, he hopes for a continuance of the 28 M.C. season in which to get the big noise going.

Group 1*C*.—G.C. G6VP sends the usual full account of the Group's doings. G5YK reports QSO's with W2JN, ZS4M, and NKF. The latter was worked at 15.30 on his 10.7 metre wave. At 16.00 he had to close down to work West Coast sked. on 32.8 M.C. (about 9.15 metres), using a beam transmission. He asked G5YK to listen for this transmission, and the latter was surprised to hear it, R10! KAZ (Honolulu) was heard 10.30 to 12.15 on 23rd. G5YK recommends the use of a driven oscillating P.A. rather than one that has sufficient self-excitation. G6WN's ops. have found trouble with "locked" amplifier and are using uncontrolled T.P.T.G. set. They seem to have worked or heard all our 28 M.C. stations, together with W's, FM, ZS, and YI. G6DH reports more stations heard, but is not satisfied with conditions. He finds parasitic oscillations in a standard T.P.T.G. circuit and blames the length of leads. His present circuit seems to be an Ultraudion with anode condenser across only the plate portion of coil. H.T. pos. is series fed direct to coil tap, and a variable grid condenser is shown. Chokes are used in both H.T. feeds. His log shows seven W's, ZS, YI, VQ. BRS190 found conditions very erratic. Some of the reports tend to show the local variations. For instance, on February 2 he logged W2ACN, W2BWX (R7-9), and W2JN, calling G5YK at various times. Apparently YK did not receive them. On February 2 the log showed eight W's, ZS, ZT, and FM. On February 8, NKF, three W's, ZS, and three OH's. February 9, 14 W's and ZS. February 15, NKF, ZS, and two VQ's. February 16, ZS at R8. February 23, VQ, YI, ZT, and two ZS's. He uses a Triotron U.D.2, and finds it very efficient. (I should say so, G5VL!). 2BIV found a good opening to month and patchy conditions later. He logged two new countries, FM and VE. G6VP has been rebuilding with a more or less standard C.O., three FD's, PA set.

Group 1*H*.—G.C. reports plenty of work, but small results. G2VQ put in 19 hours on March 2 and heard one 14 M.C. harmonic. BRS77 heard two FM stations. He turns in a log showing OH, W's, FM, and ZS heard during February. G5DR has been away on Air Ministry work. G6UJ has only heard FM. G6OO has heard only harmonics till March 9, when W and VQ came in.

Group 1*F*.—G.C. BRS25 hints at "some" receiving log for tests. He is using a new receiver and PM2DX valve in place of PM1HF. He notes stronger signals, but noisier background. Here, again, there were no W's heard on February 16 and 23, and W2NM states that his side of the Atlantic was also blank. W2NM is now located within a mile of W2JN. BRS25's log is in 28 M.C. column. G5WK has worked W2NM and ZS4M again. A totally screened receiver, built to overcome car QRM, seemed to make matters worse. Trials with a half-wave Zepp in progress. G2CX has little spare time, but got his first ZS contact and was reported from Azores. G2DZ is QRM examinations, but has worked locals.

Fading, Blanketing and Blindspotting.

Group 2*B*.—G.C. G2ZC sends a list of possible causes of fading, and tells me that his group will take them one by one for discussion. I particularly note that the last on the list is "Tobacco smoke in room where receiver is situated." Perhaps last to enable the group to take thorough observation of such an unusual phenomenon! Anyhow, G2ZC, if you require any observations from G5VL, he will send you on details of brands, etc., preferred. G6PP has returned from Nice, where he found receiving conditions some 30 per cent. worse than in London. He raises the point of multiple skip, say, 1,700, 4,500, 7,000, 10,000, and 12,000 miles, giving a case that rather points to signals being audible at these distances with skip between. He argues with CT1BL that the Heaviside layer is more important than earth potentials. G2IM considers fading as regards the drop in C of an overloaded valve causing frequency alterations of the wave. G2ZC has a long report answering queries of other members. He is disappointed at the small amount of fading in C.I. during February. A G station was heard by both G2ZC and G6PP on harmonic on February 28. G6YL is also busy with answers to queries and a discussion with CT1BL regarding his cable fade theory. She is of opinion that barometric pressure does affect fading.

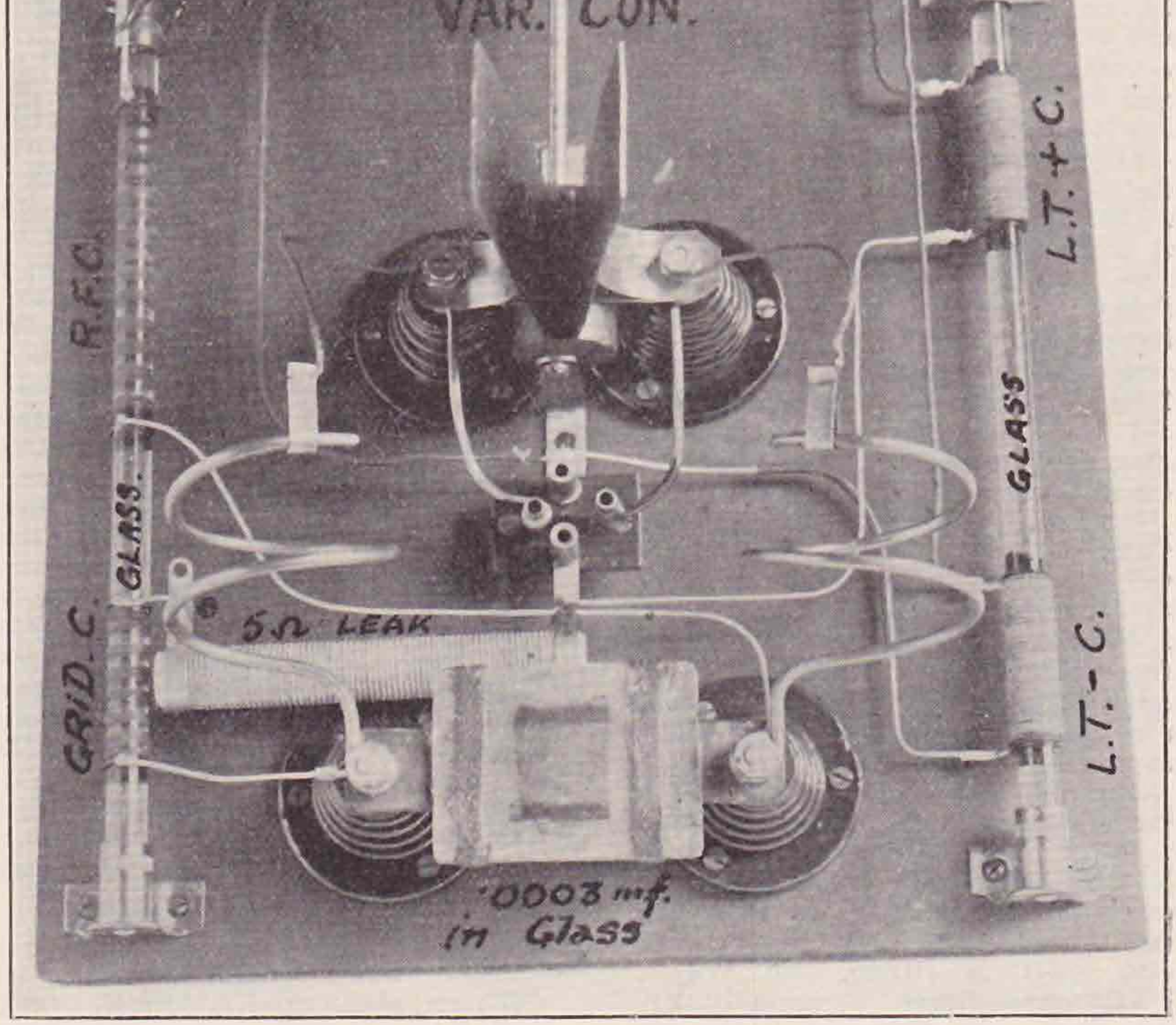
56 M.C. Work.

Group 7*A*.—G.C. G2DT has a new member—G5WK. G2DT has finished the station at new QRA and also welcomes G5WK. G6XN is striving with PA's and FD's, and reports the latter working fairly efficiently. He will be keeping the following sked.:—Sundays: Tx from 14.00 to 14.10; Rx 14.10 to 14.20. He is shortly partaking in a Field Day with portable gear—best of luck, OM! G6TW has a new transmitter, and is extremely pleased with it. Same circuit as the new G2DT set, with slight modifications. It is a circuit that will make practically any valve oscillate, and for QRP an LS5D does admirably with 400 volts.

G2DT and G6TW are running sked with W2AIU-W2CSM, but with no success so far. Three QRO W stations are joining in with the idea of a hetrodyne of all stations working on close frequencies which could first be located before the stations are sorted out. Later news is that no results were obtained over here, and on the other side two stations are out of action with burst tubes. The photo shows G2DT's new transmitter.

QRP Work.

Group 8A.—The first report of the trophy holders for 1930 (G.C. G2ZN) reports conditions as a whole from mixed to rotten. G5RV builds a new CC set and wants reports. He will call "Test 8A" each evening at 18.00 G.M.T., and wants reports from all. G5FA has had only local contacts, but is hopeful for April on 7 M.C. G2AUT is reporting the other members. He has a new Hi-C set on



Group 7B.—Subject to PMG, this group will be away soon. G5QY completes the muster. G6WN has his receiver down to 5.5 metres. G2OW and G2OL have QSO'd twice, as reported in BULLETIN. Ultra Audion and T.P.T.G. were used as straight circuits with DE5B and DE5A valves. The chief trouble seems to be in keeping down the feed current and preventing valve howl, sometimes audible.

trial, which seems good. 2AZR is using Burndept HL425 valves (price 1s.) as rectifiers for mains current. He suggests more attention to QRP on 28 M.C. Also, at the other extreme, he joins G2ZN in the 2 M.C. band and takes 2w fone on L.S. Full permit now in view. A group sked. is proposed for each Sunday at 15.00 G.M.T., and G.C. suggests that other QRP groups join in the arrangement. How about it?

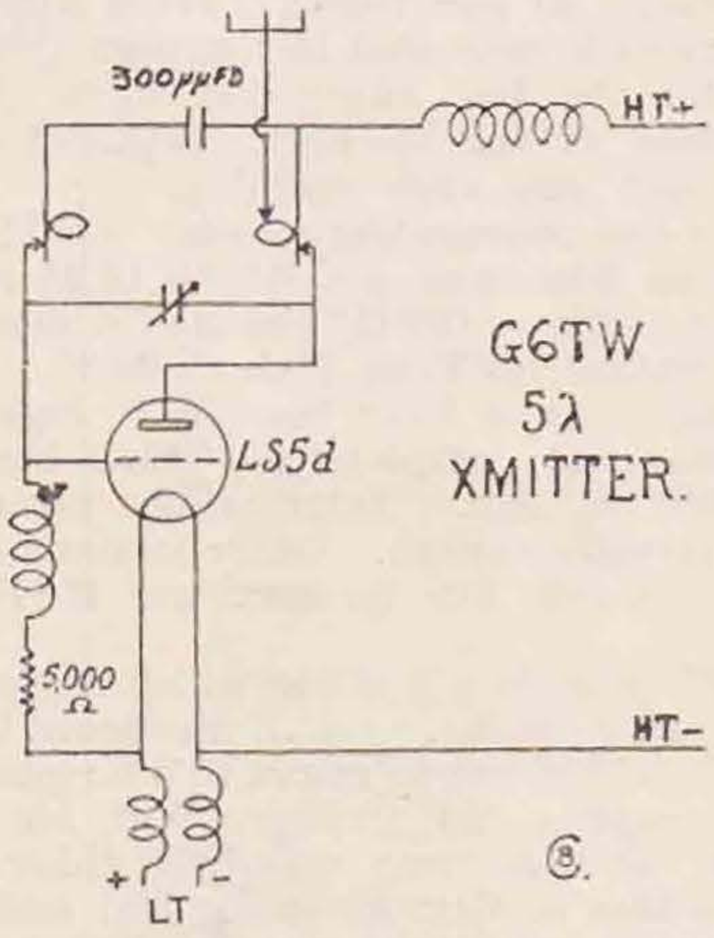
Group 8B.—Well, G.C. G2VV, you seem out of luck. I gather that G5CM has been doing some good work, but I cannot find a report from you. Is it your fault or mine ? Let me have a copy if it is the latter.

Group 8C.—G.C. G5PH wants it known to members that reports should go to him direct, and before going round group. Let him have them by 4th of month, please. G5QA reports that he worked nine W's on January 19 with 3 watts. QSA5 (R7) was the best report. W3AJD was worked each evening at 19.00 for a week on this input. Fone seems to have covered all the Midlands and Ireland on 4 watts. A LS5 with 200 volts is all that is used. G6PS has had two W's with 5 watts input, but a drop to 3 watts broke the contact. Persia and SU were worked on 2.6 watts, and the station " hopes to do better next month." It seems to me that this is where the old gag about Mars might come in ! G5PH has a new op. (Congrats, and I am passing the information on to H.Q. Application form for membership will follow.) Only the usual European QSO's have been possible. G2AT has had business QRM and a too directional aerial which specialises on EI. G2AV is after the W's, but has not got there yet.

Group 8D.—G.C. G2XB is working on fading and wipe out, and asks for reports, especially at dusk. QRAR as 2AUH. G2SA has been studying moon effects on 7 M.C. signals, and concludes that conditions improve as moon increases. Three W's on 6 watts is his report. G6GL is " running into a novel " on aerials. G2YU is going QRO with CC, but no fone. G.C. inserts a short prayer here, from which I gather that Sundays without fone would be the QRP stations' idea of paradise. G2YU stands firm for antenna and counterpoise. G6HK is contributing an article for the BULLETIN on harmonic CC. He appeared to find a " channel " through dud conditions to EAR and CT recently.

2 M.C. Work

Group 10A.—G.C. G6OT has been doing some interesting duplex with G6FM. Some trouble was experienced in eliminating the home carrier, and a frame was found best for reception. It was then possible to balance out the local transmission completely, although, in practice, enough was left to give a side-tone check. With G6ZR (Bristol) break-in experiments were carried out, and it was found only necessary to use a separate aerial for receiving, and a keying method would stop the set oscillating when key was up. This station will be chiefly on 28 M.C. for the tests. G5UM still uses the C/P in opposite direction to aerial and finds it better. BRS164 sked. is maintained, and they



conclude best DX is with moon up. Does rain have any effect ? G2AX sends in some notes on modulation systems. He decides that choke control is preferable in view of difficulties in eliminating hum and also in getting an amplifier to work satisfactorily with grid control. G6QC has also been on weather observation, and he concludes that moonless nights, starless, and with heavy winds and rain, are best for DX. There seems some diversity of opinion here.

Note.—G6QC wants to arrange skeds' before 08.30. Who will help ?

The 28 M.C. Tests.

Some Early Notes.

I had not intended to publish any notes of these results till next issue, but it seems that there is a call for early results, and, in addition, the author of the usual 28 M.C. " Activities " suggests that it will save his typewriter some work.

Well, first a pat on the back for all those good stations who have sent in reports by March 30, as was requested. They have given a wealth of information, theories and surmises, and I am in a state of mental indigestion. And also : a blood-curdling growl at some other stations who are known to have been active, but have not reported.

As you will already know, the first two Sundays were the best for 28 M.C. On the 2nd, FM was heard early in Midlands, London and N. Ireland. EU was heard only in the London area at from R3 to R6. SU8RS was worked before 10 by G6LL, as was VQ2BH. The former is reported only from London and BRS310 at Gloucester. His sigs disappeared by 16.00. BRS327 at Eynsham has a log almost entirely differing from others. UO, OH and W2FF, one of the only two W's reported that day. I would like to have some description of BRS327's station, as he continues to log stations unheard elsewhere. ZS5C is logged in London and Gloucester, but ZS4M, who is very prominent later, is unheard. SU8RS is also patchy, London and Gloucester again. This compares with the 23rd (he was not working on 9th), when he was logged everywhere.

March 9 was the real star day, of course. W9's were like locals, and BRS25 complains that the band was overcrowded with R9 signals for a time. Z, FM, VQ, ZS, OH were logged in small quantities before mid-day. After 14.00 the fun started and continued to 19.10, which I think is G6WN'S and the latest report. ZS4M, ZS4A, VQ2BH appear frequently, but ZS5C is missing. Between 14 and

18 a few W1, W2 and W8 were heard at good strength, and up to 19, W9 swamped the air. BRS327 again sets his own standard by logging no W's, but pulling in LA and VE4AR between 18 and 20. Again both unique reception reports.

March 16 was chiefly ZS4M, VQ2BH and SU8RS. CT2AA was logged for the only time, and an odd F appears. G6LL shares the only W's (W1CMX, R7, in the afternoon), with BRS327, who again logs a special station of his own, W1CPB, both for 16th and 23rd.

On March 23 our friend YI1LM appears. It's very curious to note that he has been QSO over our heads for the last three test days. SU8RS is everywhere at big strength. VQ2BH again appeared, but only after mid-day.

One or two outstanding events. G6HP was QSO SU8RS on fone, and got R7 at 14.25 on 23rd.—F.B. very OM's. G6HP also had a mystery QSO with a station ?6ZY on 16th at 06.35. No G6ZY is known. Can it have been W ? Sigs were R2, CC fading out completely. G6LL heard VKP1 at 15.00 on 9th. Information regarding this station is badly wanted. Other stations concerning whom I would like to hear are HAP3, HAP4, GBZW (?).

YI6HT puts in a fine log which represents only seven hours listening. G6LL was heard by PY1AA on 2nd. G5YK has to resort to a scriptural quotation to express his feelings. Yet his sigs were reported, and he was called, I think. BRS77, who was also at Cambridge for 2nd and 9th, puts in a good log. G2GG at Newbury heard nothing on 9th until 18.43. G6YL seems to have been first to report with G6HP's sigs at 00.25 on 2nd. GI6HI was QSO FM on 4.7 watts. G5PL, who stood by receiver and transmitter during the small hours, had no luck, but his work is valued just the same.

During the dark hours of the tests nothing definite comes to hand, only G6HP's query 6 station. If that does prove to be W we will know that the time is worth watching. Local stations seem to be heard without difficulty during these hours.

Now, after again thanking those stations who have sent in reports, C.B. Manager is going to mount a chair, ruffle his greying hair, and talk straight. There was a general demand for these tests and the work entailed in organisation is heavy. Yet some of you find it's too much work to even send a post card, although we know that you took advantage of our organisation. Is it the game ? Every country in the world knew of the tests (at least, those with ham stations), and all we can show from our own members is a very limited number of reports as compared with our membership. What will those countries think of our keenness ? Not much ! If you had spent hours listening for a foreign test and then found that only a small number of the stations concerned had been active, how about it then ? Compare our position with YI6HT, who sent his log by air mail each week. Scotland or Wales are nearer than YI ! ! If we of R.S.G.B. and C.B. are to keep top of the amateur tree, then we must show results not only from the usual few hard-working stations, but from our full membership.

Reports of D.X. stations heard and worked are given below. As this report is prepared on March 31, detailed analyses and local reports have not been possible.

Calls Heard (an Asterisk indicates QSO).

G5SY.—9th, vq2bh, w9exw, w9ef, w9bba, w3aru, w1bjd, ve4el, w8djv, w9bzg, w6bax.

G6PP.—w2jn, su8rs.

2BIV.—2nd, fm8bg, fm8rit ; 9th, w2aqb, w9bba, w9ef, w9exw, w9azz, w9dgk, w8apd, w8adm, w8ss, w8djv, w9eqv ; 16th and 23rd, nil.

G6WN.—2nd, su8rs, eu5kaa ; 9th, vq2bh, w2aqb, w2nm, w2bg, w2jn, ?8ssa, zs4m, w9byc, w8djv, w9ef, w9bba, w9azz, w9exw, w8adm, w1zl, w3aqi ; 16th, vq2bh, zs4m ; 23rd, su8rs.

BRS77.—2nd, fm8cr, fm8bg ; 9th, zs5c, vq2bh, w2jn, w2aqb, w9bba, zs4m, w8adm, w9ef, w8djv, w9azz ; 16th, vq2bh ; 23rd, su8rs.

BRS25.—2nd, su8rs, eu5kaa ; 9th, oh2nr, w2jn, w2bg, w2acn, w9bba, w2nm, w9ef, w1cmx, w8ss, w9byc, w9exw, w8apb, w8adm, w1zl, w9azz, w8djv, w3ckl ; 16th, su8rs, vq2bh, zs4m ; 23rd, su8rs.

BRS327.—2nd, uoaa2, oh7nb, w2ff ; 9th, hap3, hap4, ?gbzw, la2w, ve4ar ; 16th, hap4, w1cpb ; 23rd, w1cpb.

G6CI.—9th, zs4m, w2aqb, w9bba, w2jn, w4akt, w9ef, w8ss, w8apb, w8adm, w8djv, w9azz ; 16th, nil ; 23rd, su8rs.

G6HP.—2nd, *su8rs, zs5c ; 9th, vq2bh, *w2nm, *w2acn, w9bba, zs4m, zs4a, *w9bba, w9ef, w9azz, w8adm, w6bax ; 16th, ?6zy, *su8rs, *vq2bh, ct2aa, zs4m ; 23rd ; *su8rs (fone).

G6DH.—2nd, nil ; 9th, zs5c, zs4m, *w2bg, w9bba, w2acn, w9ef, vq2bh, w2jn, w8adm, w3aqi, w1zl, w8djv, w9azz ; 16th, zs4m, vq2bh ; 23rd, su8rs.

G6LL.—2nd, *su8rs, *vq2bh, eu5kaa ; 9th, *vq2bh, *w2bg, vkp1, w2acn, *w2nm, w1cmx, w9bba, zs4a, w8ss, *w9ef, zs4m, *w9bba, w9ex, w9azz, *w1zl, w8djv ; 16th, vq2bh, *zs4m, w1cmx ; 23rd, *su8rs.

BRS314.—2nd, su8rs ; 9th, w2bg, w2acn, w2jn, w9bba ; 16th and 23rd, nil.

W2GG.—2nd, su8rs ; 9th, w9azz, w9cca, w9bba ; 16th, nil ; 23rd, su8rs, vb2bh.

GI6HI.—2nd, fm8cr, *fm8gb ; 9th, fm8rit ; 16th, nil ; 23rd, su8rs.

G5VB.—2nd, *su8rs, eu5kaa, xearn ; 9th, vq2bh, w2aqb, w2acn, w2bg, w9bba, w8djv, zs4a ; w9byc, zs4m ; 16th, *su8rs, vq2bh, zs4m ; 23rd, su8rs.

G6MN.—2nd, nil ; 9th, w9bba, w9ef, w9exw, w9azz, w8ss, w8djv ; 16th and 23rd, nil.

G5VL.—2nd, 16th and 23rd, nil ; 9th, w2jn, w9bba, w9ef.

G2CX.—2nd, eu5kaa, su8rs ; 16th, *vq2bh, f8onk, zs4m ; 23rd, yi1lm, su8rs, vq2bh.

G5YK.—2nd and 16th nil ; 9th, w2bg ; 23rd, su8rs.

BRS268.—2nd, nil ; 9th, vq2bh, w2bg, w9bba, w9ef, zs4a ; 16th, vq2bh, zs4m ; 23rd, su8rs, vq2bh, yi1lm.

BRS190.—2nd, su8rs, fm8tui, eu5kaa, zs5c ; 9th, vq2bh, w2jn, w2aqb, zs4m, w2bg, w2acn, w2nm, w9bba, zs4a, w8ss, w8djv, w1zl, w2cjv, w3aqi, w8adm, w9azz ; 16th, vq2bh, su8rs, zs4m ; 23rd, su8rs, vq2bh.

BRS310.—2nd, su8rs, zs5c, w2jn ; 9th, w2acn,

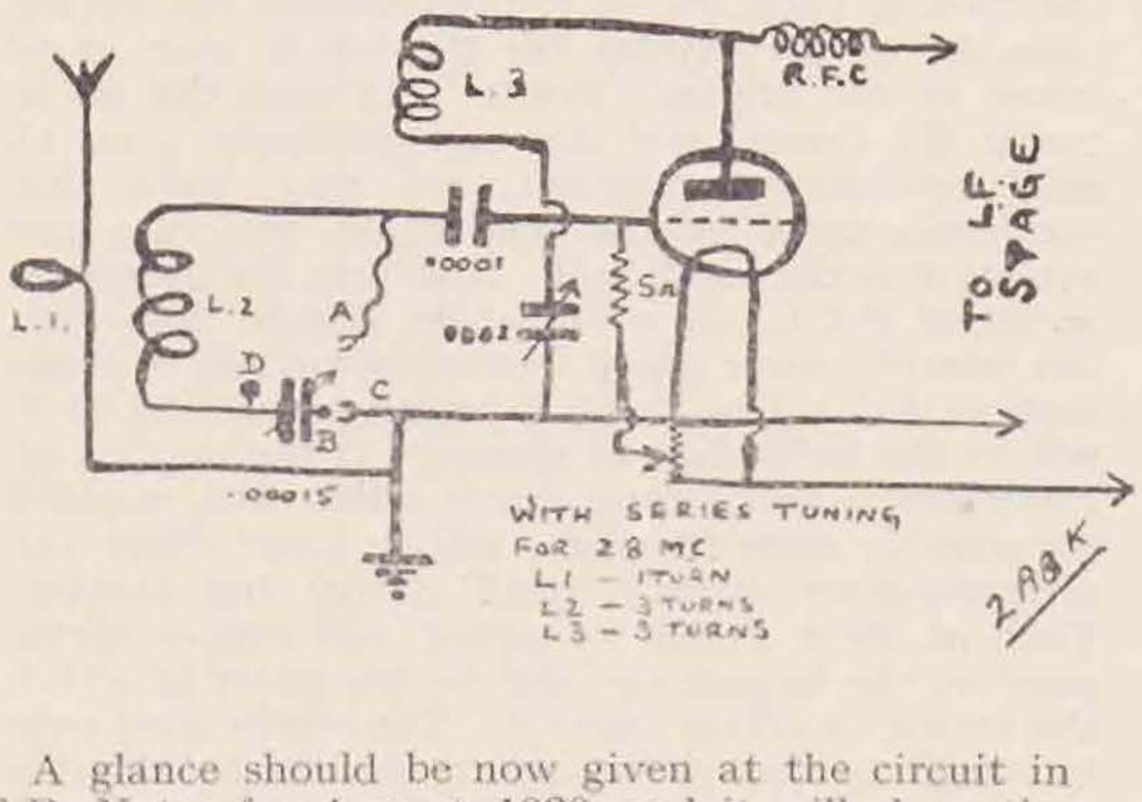
(*Continued at foot of next page.*)

Series Tuning Experiments on 28 M.C.

By R. C. Horsnell (2ABK).

Glancing through my back numbers of the "Bull." I found in C.B. Notes for August, 1929, a suggested receiver circuit for series tuning by BRS255.

My own receiver is quite a commonplace 0—V—1, and I was loath to pull it down, yet I wished to try series tuning on 28 M.C. especially. On this frequency I have spent much time and care in perfecting the receiver, and did not wish to upset the calibrations of the set, therefore necessity for this caused me to scheme out a way to use either series or parallel tuning of the grid circuit at will, without any switches and much bother.



A glance should be now given at the circuit in C.B. Notes for August, 1929, and it will show the "series" arrangement, and in my diagram it shows an uncompleted circuit with two wander points, A and C (these are spades on flex wires) and two fixed points B and D. It can now be seen from this that if we join A to B and C to D we have ordinary parallel tuning of the grid coil. Now, by joining C to B and leaving A hanging loose we have a series arrangement exactly as the C.B. circuit. These flex spades join easily on to the terminals of the grid tuning condenser, and they necessitate practically no change in wiring of receiver, and incidentally, I may add in passing, make no difference to my original parallel 28 M.C. calibrations.

By now I expect anyone who has read as far as this is wondering if it is worth the bother, etc. Unless you are interested in frequencies of 28 M.C. and above I do not think it will be, owing to the bother with coils. I, personally, use the parallel arrangement below about 14 M.C. as before—*but* 28 M.C. sigs. are now quite double the former strength and they cover three to four times the space on the condenser scale. Naturally, a larger grid inductance has now to be used; in my case, three turns 3 ins. diameter in place of one turn with former tuning arrangement. Also hand capacity is far less noticeable. This arrangement with a ·00005 condenser, according to BRS255, goes down to 1 metre, but I, personally, use a ·00015. Aperiodic aerial coupling, as shown, seems necessary, as clipping aerial to plate coil, or connecting via a small condenser to grid, causes a medley of noises similar to those heard on an open circuit of a B.C.L. set when the grid coil is removed. Give it a trial if you do any 28 M.C. work and you will not regret it.

My first try-out on 28 M.C. filled a page of R.S.G.B. Log, including G, ZS, W1 and 2 district sigs., and all louder than ever before with parallel tuning.

(*Continued from previous page.*)

w2jn, w9ef, zs4a, w8ss, w9byc, vq2bh, w9bba, w4akt, w2bg, w2aqb, w2cvj, w9ef, zs4m, w8djv, w9azz, vq2bh, w9exw; 16th, vq2bh, zs4m, w2bg, su8rs; 23rd, su8rs.

OK2LO.—9th, w2bg; 23rd, su8rs, yi1lm, ok2et, ok2ny.

OZ7T.—2nd, *su8rs, *fm8rit; 7th, *fm8rit; 16th, zs4a, w2jn, w9ef, su8rs, *zs4m, oz2u, vq2bh; 23rd, yi1lm, *oz2u.

CT2AA.—9th, g6yc, g6mn, g5yk, g6dh, g6nf, g2ux, g2od, g6vp, g6hp.

ZL1AN.—2nd, *w6bax.

FM8RIT.—2nd, g6ll, g5wk, *oz7y, *oh2nm, *oz1a, *oz2q, *oz7t, *su8rs; 16th, *oh2nm, *su8rs, vq2bh, yi1lm.

FM8CR.—2nd, *oz7y; 16th, *oh2nm, *su8rs.

FM8BG.—2nd, *gi6hi, *oz7y, *sm6wl.

OH2NM.—9th, *zs4m.

YI1LM.—9th, w2bg, oh2nm, ok2gn, *ok2si, d4uah, *uozz, vq2bh; 16th, fm8rit, ok2si, oh2nm, uo3op, oz2su, vq2bh, oz7t, oz7y, d4ua; 23rd, f8rv, *d4uah, g6ll (three times), oz7y, uo3op, *ok2si, *oz7t, g6dh.

PY1AA.—2nd, G6ll, vq2bh, w2aqb, w2acn, w2jn, w2za.

YI6HT.—2nd, g6hp, g6nf, g6ll, g5yk, su8rs, g2cx, g5wk, paodw, fm8rit; 9th, g5yk, g6hp, g6ll, g6vp, paodw, g6uj, fm8rit, g6nf, g5qf, g6dh, g5ml; 16th, su8rs, g6hp, g6ml, fm8rit, g6vp, g2cx, g6ot, g6wk, g5wk, g6nf.

SU8RS.—2nd, *G6hp, g6ll, *g6dh, g5vb, g5ml, *g5wk, *fm8rit, *oz7t, oz7y, d4zo, g6nf; 16th, *g6hp, g2od, *fm8rit, *fm8cr, *oz7y, oz7t, *ok2si, *d4uah, uo3op, zs4m.

XU2UU (Shanghai).—No G's heard on 2nd or 9th.

G5ML.—2nd, eu5kaw; 9th, g6ll, *w9ef, w8apd, w2aqb, *w9bba, w9exw, w2bvg, w8ss, w9azz, w2bhq, w8djv; 16th, *vq2bh, su8rs, w2bg; 23rd, g6hp, *su8rs, *vq2bh, fm8rit.

Stray.

PK1CX, whom we all remember as PA0CX and representative of R.S.G.B. in Holland, has now started up in Java, Dutch East Indies, and asks British stations to look out for him at the following times on 14 M.C.: Saturdays, 16.20 to 18.20 G.M.T.; Sundays, 16.20 to 17.20 G.M.T. His QRA is as follows:—J. H. Koen, 29 Pav, Pegangsaän, Oost, Weltevreden, Java, Dutch E. Indies.

Harmonic Crystal Control.

By A. M. H. Fergus (G2ZC).

IN the January issue of The Bulletin appeared an excellent article on C.C. by G2NH, in which, however, a statement was made to the effect that harmonic control is not reliable. This statement was challenged, and the outcome of it is the present article, at the suggestion of G2NH. Had it not been for the untiring efforts, in the way of spade work, of both G5MU and G6PP, the article might never have been written, but the many little difficulties having been overcome successfully, thanks to these two stations, and a lot of time being used up at this station, has brought certain facts to light, and these may be of interest, if not actually of use, to many stations who would like to be on C.C., but who have not mains, etc., to feed a row of greedy valves. Many points have been brought to light, in different articles, but in these notes it is hoped to bring out some of the practical aspects of C.C.

In the first place it is of rather importance to grind the crystal to an *odd* harmonic. For instance, one of 1,775 K.C. that is a really good one will do nothing in the way of harmonic control on 7 M.C. Even so, some crystals seem to control better than others, and possibly luck comes into the question to quite an extent. When grinding down, it is a good plan not only to watch the actual frequency of the crystal, but also test it on the coil that it is going to control on, and by watching both frequency and harmonic clicks it will soon be seen which of the various harmonics may (yes, *may* is important) take up the work required.

If a click on 7 M.C. seems to be O.K., then we must test it out, and if it does not suit, then there is nothing for it but to re-grind until we get a click that will control. This point, however, has been explained in past articles, and it is only brought up as being of importance.

The next point of importance is that one must use loose coupling. Direct coupling will not work under ordinary circumstances, and while the writer has done the impossible and actually got a C.C. report on 14 M.C. from a D.C. Hertz, as a rule it is quite out of the question. Start with very loose coupling, and always keep it loose if a reliable signal is to be expected. By reliable it is meant that the transmitter will at once function as C.C. the moment it is switched on; in passing, the writer was recently away on a yacht for two months, and on the valve being switched on on his return, without the key being pressed, there was the control right away. If this is not "reliable" what is? Most crystals used harmonically must be treated like a new car engine, in that it is important to run them in by starting off with very low power indeed, and as the crystal gradually becomes run-in, then, and not till then, may power be increased a little at a time. A watt or so is ample to start off with, though some crystals will take more, or some less, than this to start with, and in one case the writer found one that started off with from 6 to 8 watts quite happily, though this is exceptional, so use the lowest possible power till the crystal gets run-in. Once the crystal has been run-in, then coupling can be gradually tightened, but nothing is to be gained by having this too tight at any time.

Perhaps the most important thing of all is the actual tuning, as this can make all the difference in the world, and as nothing has appeared from a practical point of view, let us start and tune the set. Taking the question of reliability, one must have a reliable circuit, and as the series feed TPTG answers to this, let us choose this as the circuit to be used.

We already know where our click is on the crystal, so we start off by tuning the grid and anode coils to this frequency, with the aerial coil disconnected, and the crystal not in the circuit at all. Having done this, put the crystal in (in the grid circuit, across the whole of the coil) and reduce the tuning capacity to counterbalance the added capacity of the crystal till the set is once more tuned to the original setting. As once the set is tuned the crystal will control with quite a lot of grid condenser movement, we may leave this condenser alone for the time being, and turn our attention to the anode coil. Now here lies the whole secret of H.C.C., as we must be able to tune with our fingers "razor sharp" or use some sort of slow-motion dial. This being a personal question, it is left to the individual to choose. If the anode coil condenser is now swung slowly either way, a point (or possibly more than one) will be found where the milliampmeter gives a small dip of the pointer. Each of these should be noted, and one of them, possibly the largest dip, will be the point at which the crystal is taking control. The anode must now be tuned to this point, and if the Rx or Monitor is tuned to the harmonic of the frequency we should hear a C.C. signal. If not, then try another place where a dip occurs, and so on, till we find the point where control does actually take place. If there be any doubt about it, let the transmitter have a run of five or ten minutes on the best dip, and then see what happens, and follow this out.

If the crystal is going to control at all, it will have shown some sign of life by this time, and, taking a note of the position on the anode dial, we can now connect up our aerial coil, with very loose coupling, and still with tiny power. The aerial is now tuned in the usual way, and more than likely the anode coil will need re-tuning, but as we now know the dip of the pointer that does take control we ought to be able to find the correct tuning again. Care has to be taken in watching for this dip, as it can be very small indeed, and a very close watch has to be taken for it.

It will be quite obvious that an ordinary H.T. key position will not allow continuous oscillation, and as this is of the highest importance in H.C.C. we have to shunt the key with suitable resistances and condensers. This has a considerable influence on the actual note sent out, and possibly experiments alone will give the best results. Valuable help was given to the writer by G6PP, who stood by while changes were made, until the actual note that was wanted was being sent out, but as a rough guide a condenser of from 0·01 to 1 mfd. and a resistance of about 25,000 to 30,000, both in parallel

with the key, ought to give good results. To show how important it is to get the correct value, 25,000 across the key with one of 28,000 in series with the condenser gave much too much lag, and the final arrangement was found to be a ·01 condenser and a resistance of 28,000 ohms in shunt with the key, which, by the way, is in H.T. negative.

The writer is firmly under the impression that tuning is the whole secret, and one can often be troubled by a spacer using this form of H.C.C., but here it is a matter of correct tuning, and nothing else, and one of the handiest forms of assistance is some form of monitor, which can conveniently be constructed in a large biscuit tin, so that it contains its own batteries. If such an instrument be constructed carefully, it can be made to act as a monitor, or a frequency meter of very considerable accuracy, but this is outside the scope of this article. Unless the writer's station is using break-in the monitor is always in use when sending, as it is not only a truthful teller of the behaviour of the crystal, but is a great aid to really steady sending at any speed. Failing a monitor, the receiver tuned to a harmonic is quite a good guide, though owing to the loudness of signals it is not so pleasant to listen to, and the note is a great deal too loud to tell just exactly the behaviour of the crystal. It may not be out of place to stress the importance of accurate tuning, in summing up, as only within the past few weeks the writer was asked to stand by for a station which had borrowed the complete transmitter and crystal of a station which is always a beautiful T9 on the air, and which would have been expected to give exactly the same performance, but it is proved that the borrower had not quite grasped the importance of fine tuning, and in the course of nearly an hour's adjusting, while he now and again struck a proper T9 (in adjusting, and then lost it again), no part of any of the QSO could have been given as anything else but T8. It takes quite a lot of time and practice, but, once grasped, the use of H.C.C. is as easy as any form of transmission. The question of efficiency possibly depends on the crystal itself, for while there are crystals that undoubtedly reduce the DX efficiency of a station, there are others which actually raise the signal strength, and the writer has one that, with actually a smaller input than using the set self-excited, has raised both the strength and distance coverable. However, it cannot be denied that a weaker signal coming in " rock steady " is a much more pleasant one to copy than one a little stronger that has irregularities in it, and as the running costs of H.C.C. are no higher than using a self-excited one-valve transmitter, to anyone having a little patience and skill in tuning it is well worth the trial. There are so many stations on the air which will be pleased to assist while adjustments are being made, in tuning and key resistances, that there need be no fear of not getting a certain amount of assistance. Finally, it is a little difficult to express in words what could be shown in a few minutes, but if any ham has near him one that uses H.C.C., a visit and practical demonstration would show its simplicity in a very much clearer way than this article has done.

Correspondence.

Oil-Cooled Valves.

To the Editor of THE T. & R. BULLETIN.

DEAR SIR,—I am interested to see that Mr. C. H. West, writing in the March number of THE T. & R. BULLETIN, draws attention to the advantages which may be gained by water-cooling the glass envelope of a valve used as an oscillator at very high frequencies. Several years ago, when premature failures of thoriated filament valves used at frequencies around 15 by 10^6 were first noticed, I suggested the total immersion of the valves in insulating oil as an aid to keeping the glass temperature down and to removing the heat more rapidly from the hotter parts of the bulb. The filling of the seals of large valves with oil is, of course, quite an old trick and will often save a valve which might otherwise have " sucked in " on heavy overload. It was mentioned in the BULLETIN, by Butement I believe, about 1925. It is now generally realised that much of the trouble experienced with dull-emitting valves at high frequencies is due to the heating and consequent liberation of gas from the inner surface of the glass and, one might add, a good deal more to unsuspected high frequency currents flowing in a thin surface layer of the filament. It is therefore evident that the scheme Mr. West suggests will help matters by keeping down the bulb temperature (particularly so in a " gettered " valve like the UX 210), but the part of the valve where the greatest heating often occurs, the foot and pinch, is not catered for. The heat conductivity of glass is so poor that cooling the bulb will have little or no effect on these parts. Also it must not be assumed that the heating is greatest where the " gettering " is thickest, as the heating is often considerable in metallic layers which are so thin as to be almost invisible. I am inclined to think the total immersion scheme would be much more satisfactory. Water will then be ruled out as cooling medium on account of (1) the impossibility of getting or keeping it sufficiently pure under ordinary operating conditions to prevent considerable conduction and (2) its high dielectric constant (about 80) which would lead, in a single-ended valve at all events, to increased stray capacities and dielectric losses. This is unfortunate, as water has a greater specific heat (and therefore a greater cooling power) than oil, but a very useful cooling effect can be obtained with oil, and I commend the scheme to any adventurously-minded users of power oscillators at frequencies above say, 15 by 10^6. The valve might be mounted in an inverted position in a large glass beaker containing the oil (pure paraffin, for instance, which has a dielectric constant of about 2 and quite a low power factor), the foot of the valve, which should be decapped to reduce losses and allow free oil circulation into the pinch, being submerged to a distance of a

few centimetres. With a little ingenuity a circulating system with a shallow basin acting as a "cooling pond" might be arranged, the cool oil being fed through a glass tube on to the pinch of the inverted valve where it is most needed, so setting up a regular circulation past the glass surface.

If a thermometer is fitted as indicated in Mr. West's letter, its readings may be calibrated in terms of non-oscillating anode dissipation and the calibration used to find the approximate anode loss and efficiency under working conditions. For the benefit of those who have never tried to make measurements of this kind I would add that it is not difficult to get some idea of the conversion efficiency of a valve in this way, but if any sort of accuracy is required it is a difficult and tedious business. In fact "thermometer reading" methods have been rejected as unsuitable for accurate work.

Yours faithfully,

E. C. S. MEGAW.

Radio Telegraphy Laboratories, City and Guilds (Engineering) College, South Kensington.

March 17, 1930.

Loose Coupled Aerials for S.W. Receivers.

To the Editor of THE T. & R. BULLETIN.

DEAR SIR,—I have recently been trying some experiments with the old loosely coupled and independently tuned antenna circuit for short wave work. I find that for tuning in weak telephony signals this method is definitely superior to any other method of coupling, contrary to the prevailing notions concerning short wave receiver design. I find the range of settings of the antenna condenser which will kill oscillation in the grid circuit and then back off my antenna coil until that range is narrowed down to a few degrees. I then increase the reaction until the set is just about to oscillate and tune in the signal, keeping both the grid and antenna condensers in tune with it. In this manner I have received intelligible speech from W. G. Y. (31-32 metres) on a bad night, when all I could raise was the squeal of their carrier wave when I used any other method of coupling such as the untuned inductive coupling, the small capacity coupling or the direct conductive coupling through one or two bottom turns of the grid coil.

I have a switch to cut out my antenna tuning condenser and search with a closely coupled untuned antenna circuit; having raised the station I want I switch in the antenna tuning condenser and back off the coil as before mentioned.

Yours faithfully,

W. S. HUGHES.

10, Little St. Mary's Lane, Cambridge.

Points from Letters.

"CQ DX."

The letters on the above subject in the last two issues of the BULLETIN raise a rather important point, viz., "What is DX?" Personally, I have always understood such calls to mean that the station calling does not wish to work a local station, and I interpret "local" as meaning within, say, 500 miles. Provided that the answering station uses his call sign at fairly frequent intervals during his reply, it is not obvious to me that the caller has any serious grievance, as he can always ignore the reply of any station whose views as regards "DX" do not agree with his own. EI2B.

We should always endeavour to work each other in a manner and on the bands where we will cause as little interference with other stations as possible, but I still maintain that DX is not the only thing that counts in amateur radio. But I should like to ask Mr. Keeman a question. What is the least distance that can be considered DX? He mentions 1,000 kilometres. My own estimate is 1,000 miles, and I never reply to a "CQ DX" call unless it fulfils that condition, other than under exceptional circumstances. G6PP.

Silent Keys.

It is with deep regret that we have to record the death of Mr. H. L. Thomson (G5NU), an old transmitter and a keen member of the Society, who met his death in a disastrous motoring accident on March 1. G5NU, of Cannock, Staffs, was a pioneer in the Midlands during the 440-metre days, though recently found little time for radio owing to his appointment as manager and chief engineer of the Cannock Power Co. Our sincere and heartfelt sympathies go to his relations and friends.

We also have to record the death of Mr. Mervin S. Woodhams, of Rugby, Warwickshire, G6WO, who passed away suddenly on March 24. Mr. Woodhams was a well-known amateur among his brother experimenters in the British Isles and abroad, and he will be sincerely missed. He had been actively interested in transmitting for many years. To his many friends and relations we extend our sincere sympathies.

H.F. Choke Construction.

No doubt we all have our pet ideas as to the easiest and best method of winding H.F. chokes for use in the transmitter, but possibly the following suggestion may be of interest to a few.

As it was found impossible to purchase any of those much-recommended articles, boiling tubes, in any of the towns near here, I had to look for substitutes, and finally found one which has proved very satisfactory—opal tubes as used for electric "candle lamps." These can be obtained at practically any electrical shop, and are made in lengths from 4 to 6 ins. and various diameters, but $\frac{7}{8}$ in. and 1 in. are standard. The ends of the windings can be secured with sealing wax, and mounting can be accomplished in many ways, but probably the easiest is to cut a section off a whisky bottle cork. (Yes! Port will do just as well!) and fix it to the baseboard by means of a single screw through the centre. The choke can thus be easily and solidly mounted, and will occupy a minimum of space. G5AQ.

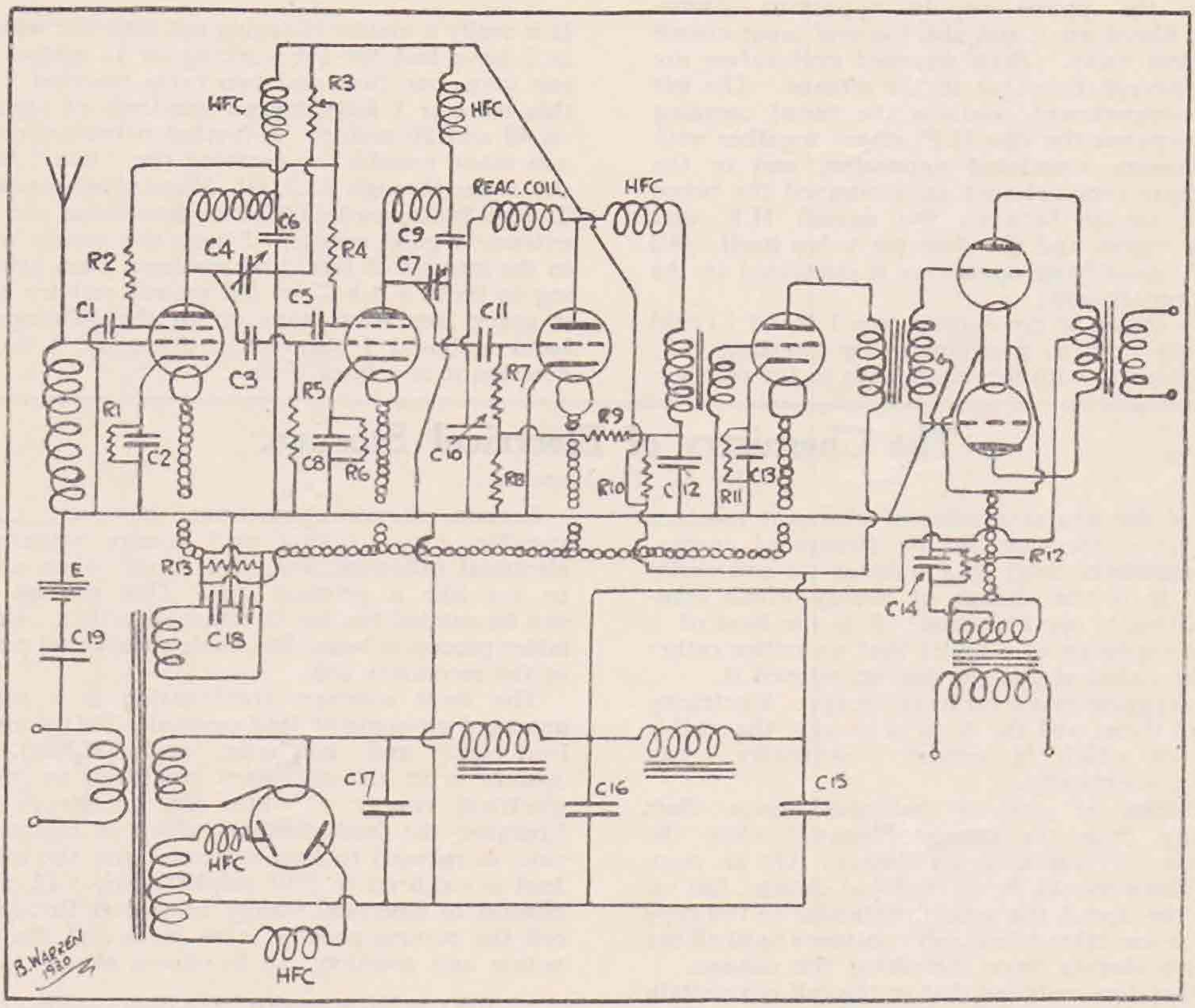
Stray.

F8RVL will be testing on 10.50 metres each day at 12.30 G.M.T. Please report to REF.

A 6-Valve All Mains S.W. Receiver.

By R. Holmes.

AS I have been a serious experimenter in short wave work for the last two or three years, I think I must have tried about 20 or 30 different types of circuits. I remember building my first short wave set. It was a one-valve "Hartley," in which I had a "Cosmos 2-volt red spot" as a detector, and I remember the thrill of bringing in 2XAF the first night. Anyhow, that got quite common, and the best thrill I had was bringing in some amateurs working 'phone on 45 metres. At the time I could not understand Morse, and I used to log all the telephony amateur stations. This really started my experimental work on S.W. receivers. As time went on I built several O-V-I receivers which gave good results, and when the screened grid type of valve came out I at once built different types of I-V-I sets, which gave smoother reaction and better results on telephony. As soon as A.C. Cathode screened grid valves appeared on the market I built a 1-V-1 all electric S.W. set, but for some reason I could get nothing else but hum below 20 metres. It was some time after experimenting with that set that I decided to build a powerful 6-valve A.C. S.W. set, which would be free from hum. The set has 2 screened grid H.F. stages det., one straight transformer coupled L.F. and a stage of push pull with provision for inserting headphones after the first L.F. The aerial is choke fed to the first S.G. valve, thereby eliminating one tuning control. The two H.F. stages are tuned anode coupled with reaction on the second H.F. anode coil; a leaky grid detector follows, care being taken to keep it free from motor boating and hum. Four different types of A.C.



C 1, 5, 19.—.1 mf. Mansbridge condensers.
C 2, 6, 8, 9, 12, 13, 14, 18.—2 mf. Mansbridge condensers.
C 4, 7.—.0003 variable condensers.
C 10.—Reaction .0002 condensers.
C 15, 16, 17.—4 mf. Mansbridge condenser.
C 3, 11.—.0003 fixed mica condensers.
R3.—0-50000 Potentiometer.

R1, 6.—200 Ohm wire wound.
R2, 4, 11, 12.—1,000 ohm wire wound.
R8.—1,500 ohm wire wound.
R5, 7.—2 megohm Met. Vick. moulded resistances.
R9.—100,000 Met. Vick moulded resistances.
R10.—25,000 Met. Vick. moulded resistances.
R13.—50 ohm centre tapped filament resister.

valves were tried here, and I found a 164 volt Mullard gave smoothest reaction. The detector is then coupled to the first L.F. through a Ferranti A.F.3. A 104 volt was best for this stage as it is quiet in action. A Mazda A.C./H.L. was slightly louder, but was full of "crackles." The first L.F. is then fed to a push-pull amplifier which consists of a A.F.5 (c), a pair of P625's, and an O.P.M.I. (c). The panel is 30 ins. long by 8 ins. wide and has in its centre a drum dial, and a knob either side of it, one for voltage regulation on the screened grids and the other for reaction. The cabinet is divided into four compartments by means of aluminium screens, the two centre ones occupying together one-third of the total size. The left compartment contains the power supply apparatus (transformers, filters, etc.), and also the grid input circuit of the first valve. Both screened grid valves are placed through holes cut in the screens. The left centre compartment contains the tuned coupling circuit between the two H.F. stages together with the necessary associated apparatus, and in the right centre compartment are contained the tuned coupling circuit between the second H.F. and detector valves and the detector valve itself. All the L.F. amplifying apparatus is contained in the right compartment.

In the course of my experiments I found I could reduce the hum to a minimum by inserting H.F. chokes in series with the plate leads to the rectifier. I also shunted two mfs. across the L.T. filament supply. It is a matter of experiment to find the best choke for shunting across the aerial and earth. I found that a home constructed one with a high inductance gave best results.

Now as regards the coils. It was an easy matter to purchase or make some 6 pin formers, 2½ in. diameter, and wind my own coils. The first coil has only one winding, whereas the second has two windings. I give a chart of the coil windings below :—

	1st Coil.	*2nd Coil (Anode).*	*Reaction.*
40 metres	6 turns	6 turns	4 turns
20 metres	2 ,,	2 ,,	3 ,,

It is really a matter of trying out different windings as I have had the set working on 12 metres with one turn, one turn and two turns reaction. With this receiver I have logged hundreds of amateurs on 40 and 20 metres. A further reduction of hum was made possible by earthing the "live" side of the main through a .1 mf. Mansbridge condenser. This set is also used on the broadcast band and gives extremely good results. I hope this article will be to the interest of BULLETIN readers. I am attempting to build a 0-V-1 set (all mains) and try to get it going free from hum up to the 56 megacycle band; should I succeed in doing so, I hope to describe it in a later issue.

The Chemistry of Electrical Storage.

By W. H. HEBDIGE.

One of the characteristics of chemical reaction is that it is accompanied by change of energy, which manifests itself in a manner we can easily detect. It is the change of energy which commonly attracts our attention; it is the heat of a fire, the explosion of a bullet that we notice rather than the chemical change that occasioned it.

We recognise many forms of energy. Electricity is one of these, and the form of energy, the visible results of which is termed "electricity," can originate chemically.

All forms of primary batteries derive their electricity from the energy liberated when the chemicals in them undergo change. On an open circuit there should be no chemical change, but on closing the circuit the action particular to the type of cell in use takes place and continues until all the chemicals therein have completed the change.

We therefore consider that in the cell is a certain system made up of chemical substances. This system contains a certain amount of energy, and the reaction which occurs on the circuit being closed converts this system into another one consisting of different substances. This second system also contains energy, less than the former one; the difference has been liberated in the form of electrical energy. When the transformation of the substance is complete, liberation of energy ceases and the cell is run down.

Now, in most cases it is possible to re-convert the remaining substances, by chemical processes, into the original substances, and part of the operation would entail the supply of an equivalent amount of energy to that given out as electricity while the cell was working. Such regeneration of the cell is not a really practical proposition.

Certain chemical reactions, however, are reversible, *e.g.*, "taking up" energy when under electrical influence, and give it off when allowed to act like a primary cell. This process must not be carried too far in either direction. On this latter process is based the whole theory and practice of the secondary cell.

The most common combination is a suitably arranged grouping of lead peroxide (PbO_2), metallic lead (Pb) and sulphuric acid (H_2SO_4). This system is in the necessary condition to produce electrical energy. While the energy is being liberated the lead dioxide, which is the positive side, is reduced to lead sulphate, and the metallic lead is oxidised to lead sulphate, too. If, now, a current of electrical energy be passed through the cell the reverse process takes place and the whole action and reaction can be shown thus:

$$PbO_2 + 2H_2SO_4 + Pb \rightleftarrows 2PbSO_4 + 2H_2O.$$

Less common than this is the iron or "Edison cell," consisting of (positive) nickelic hydroxide ($Ni(OH)_3$) and (negative) a plate of iron (Fe) in a solution of potassium hydroxide (KOH). When "giving off" energy the nickelic hydroxide is reduced to nickelous hydroxide and the iron to ferrous hydroxide and the action and reaction may be stated thus:

$$Fe + 2Ni(OH)_3 \rightleftarrows Fe(OH)_2 + 2Ni\ (OH)_2.$$

During charge and discharge there is little difference in the potassium hydroxide solution. The efficiency of the iron cell is not so great as that of the lead, but it presents certain advantages, it is very durable, will stand severe jolting, and its high cost is balanced by its long life.

"Directional Aerials."

By Brian W. Warren, G6CI.

FOR some considerable time the writer has been testing various kinds of S/W aerials under varied conditions, and has come to the conclusion that one type, namely, the "Hertz," definitely exhibits directional properties. This effect, as set out below, has been named the "45° radiation theory," for want of a better title! Incidentally, it may show that, while one is able to work South American stations with ease, some difficulty is experienced in getting satisfactory reports from U.S.A., despite the fact that the latter is much nearer to our own country.

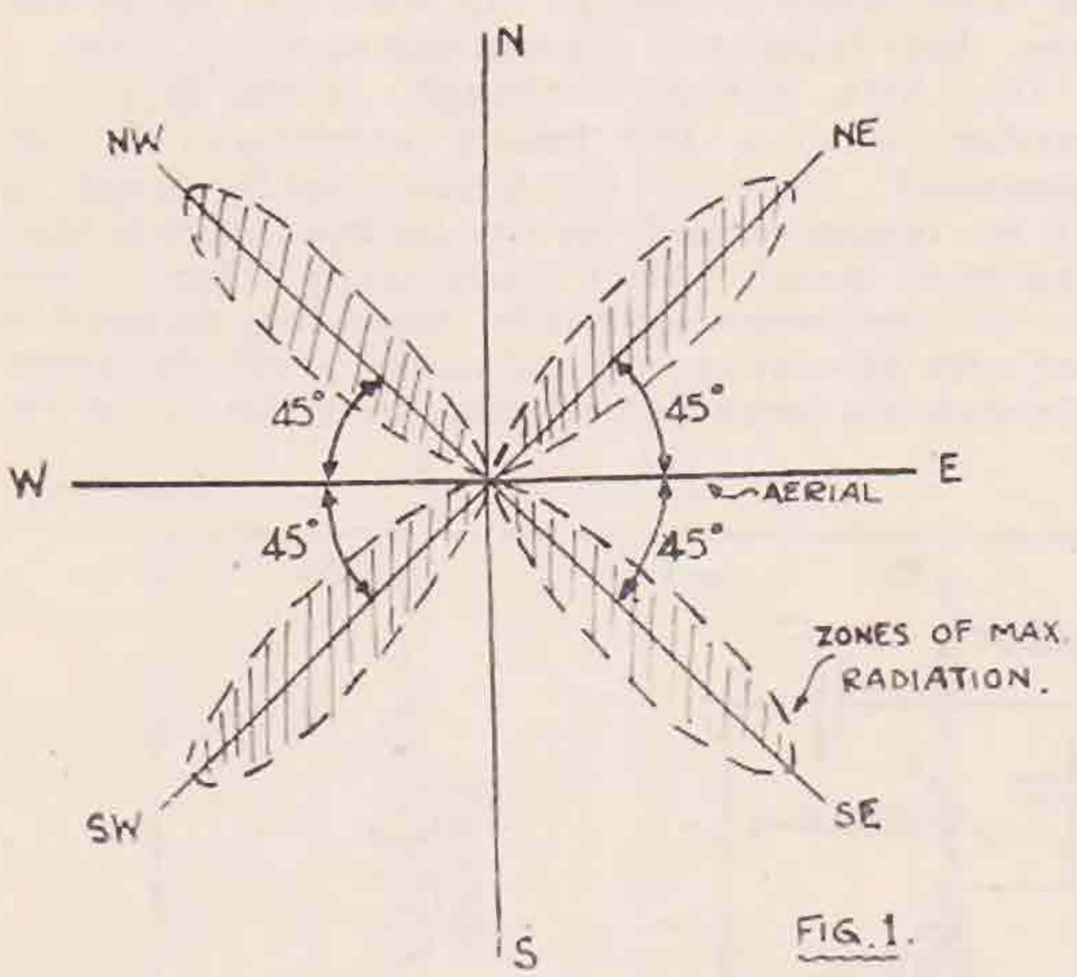


FIG. 1.

It has been found that a full-wave Hertz aerial, when suspended at a height of one half-wavelength from the ground, radiates the greater bulk of its energy in a plane 45° to that of the aerial.

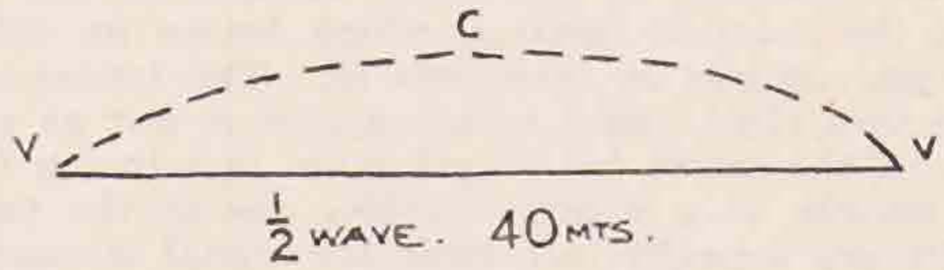
That is to say, suppose one's aerial be slung in the plane East and West, then maximum radiation takes place in the planes N.E.-S.W. and N.W.-S.E. Reference to the diagram will explain what is meant.

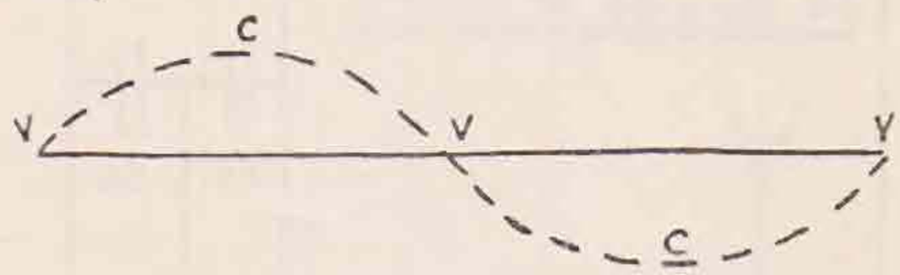
When the aerial is operated at one half-wave these directional properties disappear, and radiation becomes equal in all directions.

Not much is known at present of an aerial worked at $\frac{3}{1}$ or double-wave, as it meant working the particular aerial, at the time of the tests, on ten metres, and little time was available at that period. However, very satisfactory results were obtained with the U.S.A., which rather suggests that directional properties are minimised when working at double-wave. This, by virtue of the fact that the U.S.A. is out of the direction of the writer's aerial and poor results are had when using a full-wave radiator on twenty metres. On the other hand, these non-directional results at 10 metres might have been due to the fact that a multi-wave aerial is quite suitable for that wavelength, and that the directional properties, which may, or may not, have been there were functioning in some other direction.

It is interesting to note, while on the subject of 10 metres, that W2JN uses an aerial $\frac{1}{2}$ waves long, slung horizontally at a height of one wavelength above the ground and his results are best shown by the fact that he is the most consistent "W" station received in this country.

The particular aerial used by the writer in his tests was a single wire "Hertz," 64 feet in length and slung in an East and West direction. Voltage feed at one end was used and effected by tapping direction to a high "L" plate circuit.





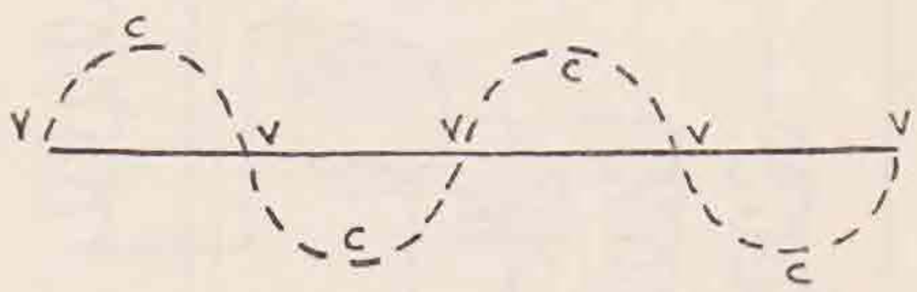


FIG 2.

Thus, operation on 40 metres is at one half-wave, on 20 it becomes full wave, while on 10 metres it is $\frac{3}{1}$ or double-wave. A glance at Fig. 2 shows the voltage and current distribution in the aerial at the various wavelengths.

The writer is greatly indebted to Mr. Somerset, G2DT, who kindly conducted some pre-arranged tests with South Africa to test the theory and whose results met with complete success.

In conclusion, anyone who may have experienced similar results to those outlined above is requested to come forward and compare notes in order, possibly, to bring to light numerous other points of interest bearing on the above.

Strays.

VK2JZ (A. S. Mather) is on the air at 08.00 to 11.00 G.M.T. nearly every day on about 14,277 kc and will be very glad to QSO G stations.

F8WOA (J. Chambat, Pont du Château, Puy de Dôme, France) is on 7 M.C., and is anxious to get in touch with G stations on telephony.

Improving the S.W. Screen Grid Receiver.

By H. C. Page (G6PA).

I EXPECT most people will agree with me when I say that the chief drawback to the Screen Grid receiver is the pull between the two tuned circuits. So far this unfortunate occurrence has been ignored, but I hope in the following lines to show how this may be almost, if not completely, eliminated. A receiver in which there is no pull between the tuned circuits is as easy to tune as one of the usual detector and L.F. sets. It is quite easy to cover any of the bands without having to touch the reaction control, which leaves us with just two controls to take care of. The tuning of the Screen Grid valve tuned circuit is not at all sharp in the set to be described, in fact it can be used mainly as a volume control, for as the two circuits are brought into tune the signal strength increases, there being no need to alter the tuning of the detector circuit.

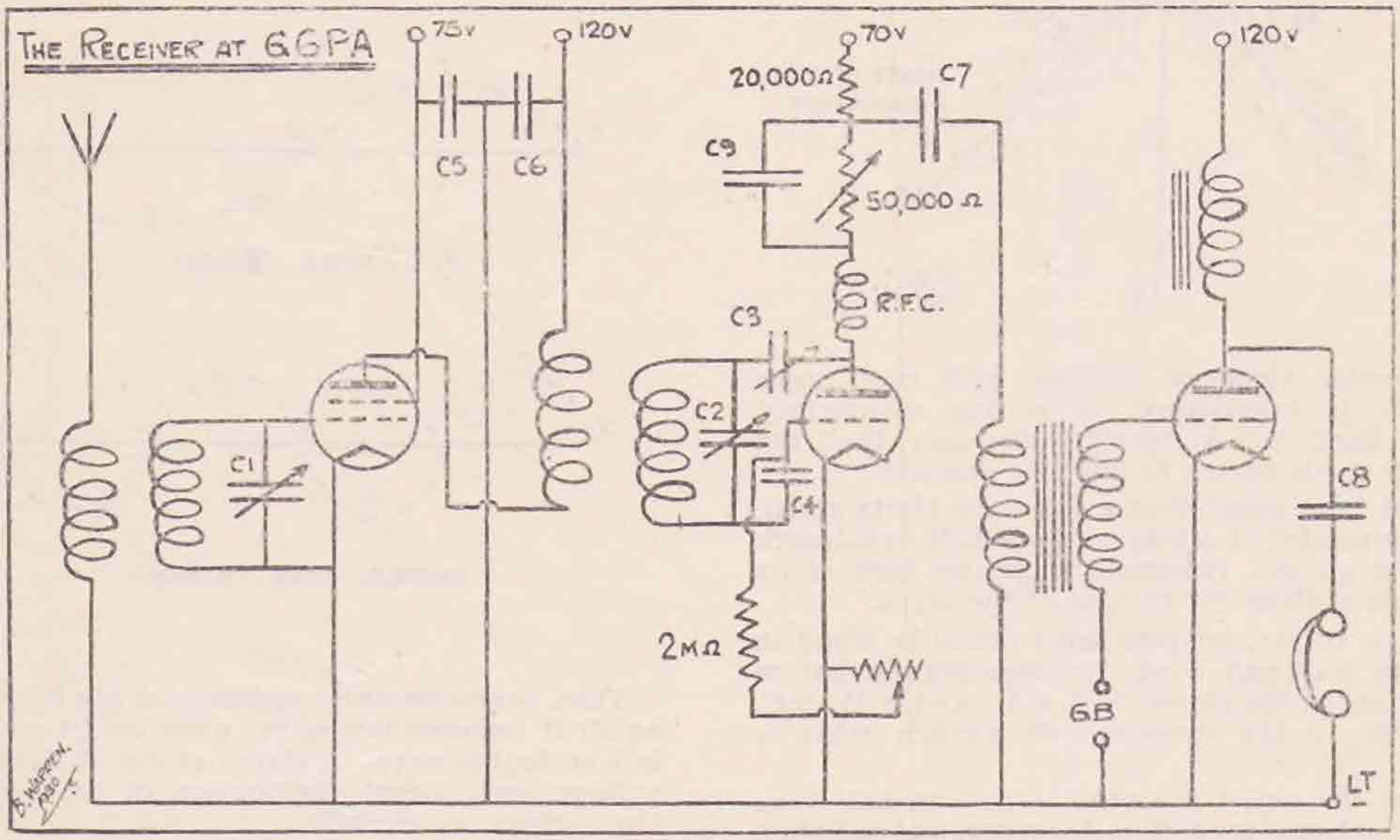
A glance at the circuit diagram will show that the set is transformer coupled. The Auto coupling used in most sets is the whole cause of the bad pull. A carefully designed H.F. transformer will overcome this entirely.

Further perusal of the diagram shows that the detector valve is used in an Ultraudion circuit. There are several reasons for this choice. The most important of which is, the fact that a valve base only has four pins—yes, the receiver uses valve base coils. The other important factor in the choice of this circuit is the fact that it is a very good performer on the higher frequencies, that is, above 14 M.C. Anyone who has tried to get the ordinary Screen Grid set to work on these higher frequencies, while using the usual reaction coil will know how trying a task it is. The Ultraudion is very simple to work when trying to cut coils to the proper size, there being only one winding to worry about.

One little difficulty, though, is the fact that neither side of the tuning condenser can be grounded. However, this is overcome by mounting all the tuning controls on a panel five inches behind the main panel. After many trials I have come to the conclusion that it is impossible to build a set with absolutely no hand capacity effects, unless the dials are mounted well away from the rest of the set. With this arrangement I cannot detect any capacity effects at all, even on 28 M.C. This is when tuning in a weak carrier to silent point, not just a CW note.

I may as well say at this point that I do not propose to give full constructional details of this receiver. Most of you are, no doubt, better mechanics than I am, and will know better how to design the set.

Perhaps the most important part of the receiver is the coils. These I will describe as fully as possible, especially the H.F. transformer, for here the secret of the set lies. I need not say a lot about



C1 and C2—·00015 mfd.
C3—·0002 mfd.
C4—·0001 mfd.
C5, C6 and C8—1 mfd.
C7—·01 mfd.
C9—2 mfd.

the Aerial-Screen Grid coil, as this is quite conventional. The aerial winding is wound on the top of the valve base, and the S.G. tuning coil at the bottom. The number of turns will depend entirely on the way you build the set, so I shall not trouble you with these.

The H.F. transformer, as already stated, is the most important. According to theory the ratio of primary to secondary turns, should be of the order of 1-2. A ratio of 1-1 was tried to commence with, but this, while giving signals quite as loud as an auto coupled set, gave quite a pull. True, this was nothing like so bad as with the auto coupled set, but it was still bad. The next step was to increase the ratio to 1-2. This proved quite good, but still there was a little pull, and as the real purpose of the experiment was to do away with this, something had to be done. Now, the reason for what follows I cannot explain. The primary was wound with very fine double silk-covered wire! The secondary with No. 26 D.C.C. The ratio was kept the same, and the pull practically vanished! All future coils were wound in this manner and in all cases it was successful. If anyone can offer an explanation of this I shall be very pleased to hear from them.

Although valve base coils are very fine for all frequencies up to and including 14 M.C. I do not recommend them for frequencies above this. My present coils for 28 M.C. are made of No. 12 gauge bare copper wire. I take a few feet of this, clean it well, and then wind it round a one-inch diameter former. It is allowed to spring off, and the resultant coil is cut into the desired lengths. These coils are mounted on a small base, made as follows :— Take a small circular piece of ebonite and drill it as for a valve holder. Place valve pins in the holes, with a good big soldering tag under the nut of each. The two coils can then be soldered to these tags. This is much more efficient than valve base coils, and the gauge of wire is quite large enough to make a rigid coil.

It would appear that as the efficiency of the S.G. valve drops off, *i.e.*, as the frequency is increased, the ratio of turns on the H.F. transformer can be lessened. I find that a ratio of 2-3 is quite satisfactory on 28 M.C. Although the primary is not of fine wire, the pull is negligible. Perhaps this is due to the decrease in efficiency on the higher frequencies.

Perhaps you may wonder why I chose valve base coils. Well, there is a very good reason indeed for this—their small field. Owing to the small field it is not at all necessary to use full screening. In fact the only screen in the receiver is one between the S.G. part of the set, and the detector. There is a circular hole in this, through which the top of the S.G. valve protrudes.

Turning once again to the diagram you will notice that there is a 150,000 ohm variable resistance in the plate circuit of the detector valve. This is the reaction control. The reaction condenser is mounted on the back panel, and is a small " Formo " reaction condenser. The use of resistance reaction control is to be recommended, as there is absolutely no change in frequency when this is used. The use of the potentiometer is essential. Without this really smooth control is not easy to obtain.

Now let us take a look at the L.F. side of the set. What's that 20,000 ohm resistance and ·01 Mfd. condenser doing there? Have you ever experienced threshold howl? I'll bet you have. Well, that little arrangement is an absolute cure for threshold howl on all frequencies. Of course, if you prefer to, you can take that condenser straight on to the grid of the L.F. valve, and have a R.C. L.F. amplifier. However, this does not give a very big amplification, so the transformer is to be preferred. For those of you who aim at real quality reproduction, this form of coupling is to be recommended.

The transformer in use here is a Marconi " Ideal," and although this used to be very bad for threshold howl in the old set, with the eliminator there is no trace of it.

The output to the phones is choke filter coupled. This enables one side of the headphones to be placed at earth potential, and helps to eliminate the irritating alteration in signal frequency when one moves away from the set. Of course a resistance can be used in place of the choke, but then the H.T. to the last valve must be increased. This also applies to the resistance in the detector plate circuit. An increase to 50,000 is quite a good plan, if one does not mind the extra H.T. required.

The wiring of the set is best carried out with " Glazite." All the H.F. leads should be as short and direct as possible. I would recommend that a bare copper wire be used for the negative filament connections, then all points which require earthing can be soldered to it.

Use rigid valve holders for the coils. The " Tonex " Co. turn out some very nice ones. The holders in use here for the valves are " Formo " ones, as are the tuning condensers. Just a word as to the tuning condensers. If you use the " Formo " ones, and I recommend these, you will be able to dispense with a long back panel, as these condensers are supplied mounted on an aluminium panel, with four inch extension rods. The reaction condenser and the potentiometer can be placed on a small ebonite panel placed beside the detector tuning panel. The metal panels of these condensers can be earthed, as the condenser is well bushed from the panel.

Of course a ·00015 Mfd. tuning condenser is much too large for work on the 7 M.C. and higher bands. To overcome this I always place a small air-spaced fixed condenser in series with the main tuning condenser. When working on the 1·7 M.C. band this is shorted.

The volume from this set, when working on 7 M.C. is nearly always too loud for headphones. As a rule the filament of the L.F. valve is dimmed somewhat. This helps to lessen the background. It must not be thought that the background is troublesome. Provided good batteries, or H.T. accumulators, are used, the background is not at all noisy.

On 14 and 28 M.C. the amplification from the set is not so great as on 7 M.C., but on 14 M.C. it is quite good, and there is some amplification on 28 M.C., though not a very great deal. Still, it is better than with an auto coupled set.

Provided reasonable care is taken in the design of the H.F. transformer, and the rest of the set, I feel sure the ease of control, and the lack of threshold howl will surprise you. In conclusion I may say that the receiver here was rebuilt no less than five times before the present design was adopted!

"On Starting Up."

By "Uncle Tom."

The Editor has asked me for a short series of articles which will serve the double purpose of answering a large number of questions and letters that he receives more or less regularly, and of interesting those members who are as yet not holders of licences, and indicating roughly to them the way to go about getting them when they feel that they are capable.

We will imagine, therefore, that you, reader, are a member of R.S.G.B., whose sole qualifications are an ability to make a receiver that will receive, and a large quantity of enthusiasm. Without the latter, by the way, you will never do much; I cannot give the prescription for it, but you will have to acquire it somehow.

My first words of advice are these: Don't be in too much of a hurry. You may, if you are lucky, cajole the G.P.O. into giving you a full licence as soon as you can send and receive Morse at 10 w.p.m., but you won't be a good ham, for all that. The very *first* thing to do is to study as many numbers of the Bulletin as you possess, and to get together all the information you can on the subject of short-wave receivers. If you own receiver doesn't strike you as being all that it might be, improve it until it is. Then just *listen*.

In my opinion you cannot do too much listening to amateurs and amateur work before attempting to transmit. If you really take an interest in it, swot Morse as hard as you can, absorb all the usual proceedings adopted by the really good active transmitters, and get the whole idea into your head reasonably well, there is no reason why you should not be a really good ham from the day you get your licence.

Incidentally, if you go about things in this way you will find that the procedure of getting the licence is not the awful, nerve-racking business that too many seem to think it is. Those who are refused point-blank by the G.P.O. may generally take it for granted that they have "given themselves away" somehow—either by the tone of their applications or by an obvious betrayal of the fact that they don't know what they are talking about. Generally the latter!

To return; when you think you are ready, apply to the R.S.G.B. for a B.R.S. number. This will be a great help in getting into personal touch with transmitters in this country. Report their transmissions unless they are high-power "DX" men to whom your report will obviously mean nothing, and make your reports as comprehensive as possible. You will find that they are appreciated, and, further, you will find that you are welcome at the local hams' shacks, and that they will gladly give you advice on anything that worries you.

Regarding Morse, it is futility of the first order to shirk learning it. There is a great deal of telephony going on on the 7 and 14 M.C. bands nowadays, but the fact remains that the majority of amateur work is carried out in Morse, and, anyway, you've *got* to learn it before you get your licence. It is sheer childishness to pretend that you can't pick it up, so get down to it right away, and you will always be glad of it. There is no better way of learning it than by first acquainting yourself with the alphabet by means of a buzzer and, if possible, a friend who will operate it for you or is learning at the same time. Then, after this first stage, get on the air and listen to anything and everything that is sending slowly enough even for you to pick out a letter here and there. That is doubtless all that you will be able to do at first, but you will find the number of letters increasing daily until you can actually copy a whole weather report from GFA or some similar station. Given sufficient perseverance, one cannot fail to acquire a good working knowledge of the code in less than three weeks or a month, and after this the rate of progress will vary directly as the amount of practice put in..

Before long has elapsed you will be at the stage when you can receive the code at quite a respectable speed, and the main worry of your life will be to decipher the numerous "Q" signals and other abbreviations used by "hams." Lists of these have appeared from time to time in the Bull. and in QST, and you will also find much very useful information in the A.R.R.L. Handbook, obtainable from Headquarters. In any case, you should make a point of getting this, as there seems to be nothing connected with short-wave communication that is not comprehensively dealt with in it. It is invaluable to every "starter-up," and, incidentally, if some of the old hands would read it and use their heads a little more, the ether would be a much nicer place than it is.

Enough has been said this month to get you really started, and next month I propose to deal rather more fully with the direction to take when you are ready to apply for a licence.

TRADE NOTICE.

From Lectro Linx, Ltd., we have received samples of their new Springscrew Wander Plug. These, which sell at 2d. each (2½d. engraved), employ the usual CLIX "spiral-split" contact pin giving a good and self-cleaning contact. A new wiring device is incorporated in a short horizontal insulator. On test, these plugs were found quick and easy to fasten to the wire (no tools or screws required), and appeared to give a firm contact in the battery.

A Silent Key!

No, OM's, this is not obituary! But if any of you happen to be so situated that the tapping of your key after the rest of the family have retired at night causes them loss of sleep, it may possibly save an obituary notice! That was how I was placed some time ago, owing to the fact that my gear is housed in the bedroom. The trouble was easily overcome, however. All that is required is a suspension-type bell push and a length of flex, and there you have a perfectly noiseless key! It sounds a bit crude, perhaps, but I can vouch for it that it works quite OK, and I'm not so sure that if you try it you won't prefer it to the orthodox pattern in a short time! G5AQ.

HIC et UBIQUE.

Boy Scouts Assistance Scheme.

Since the publication of the above scheme last month several of our members have volunteered to assist by offering their stations as Pivotal Centres from which instruction may take place.

The work of organising the scheme is being undertaken by Mr. H. C. Page, Newgardens Farm, Teynham, Kent, who has been appointed honorary manager *pro tem.* All correspondence should therefore be sent direct to him at that address.

It is hoped to publish a full list of Pivotal Centres shortly; meanwhile offers and suggestions will be appreciated by Mr. Page.

In connection with the scheme the Honorary Secretary delivered a short talk on March 25 to the Scouts and Rover troops attached to the London Banking Houses. Further talks will be given on request to headquarters.

Reseau Belge Convention.

We have received information from Mr. Paul de Neck that the Belgium amateurs propose organising a Convention in Antwerp during the time the International World's Fair is open in that city.

The Congress will commence on or about July 12 and will last until July 15. Following the meeting visits will be made to Liege and Brussels.

It is proposed to organise an official R.S.G.B. party providing a sufficient number of our members are interested.

The preparations will be in the hands of the Deputy Social Manager, Mr. C. S. Bradley, 81, Shirley Road, Croydon, who will be glad to receive offers of support.

W.B.E. Certificates.

We have pleasure in announcing that the W.B.E. certificate has been awarded to the following members :—

G6NT, C. S. Hunt.
G6UT, T. A. St. Johnston.
G6OH, G. S. Samways.
G5MQ, E. Menzies.
G6RB, R. Bartlett.
G6CI, B. Warren.
G5WQ, J. Witty.

This certificate has been designed by Mr. Arthur Watts (G6UN), our Publicity Manager, and engraved by the well-known firm of lithographers, Bradbury, Wilkinson & Co.

We should like to mention that the W.B.E. certificate will be awarded to Colonial as well as home members, and would urge them to make their claims immediately.

Claims to First Contacts.

The following claims to first contacts have been lodged at headquarters :—

Kenya, by Alan Smith (G6VP) on May 1, 1928, at 21.40 G.M.T. (23 metres).

Estonia, by Maurice Pelpel (G6PP) on April 28, 1928, at 23.10 G.M.T. (45 metres).

Luxemburg, by G. S. Samways (G6OH) on January 23, 1926, at 18.50 G.M.T. (45 metres).

In order to preserve a true record of these claims it is essential that documentary proof be submitted. There are at least 80 " workable " countries in the world, and it will be of historical value to record the occasions of premier contacts from Great Britain on the various amateur bands.

May we ask especially for details of the first contacts with Australia, New Zealand, Canada, U.S.A., Brazil, South Africa, India, Egypt, and the Argentine. Many we think we know, but it is proof that is required.

Our Belgium friends have recently organised an interesting competition to establish the station who has worked the most countries—the lead to date is 78. Can any of our members beat this total ?

Calls Heard.

By VK2HU, New South Wales.—G-21z, 2xv, 5ml, 5wk, 5uw, 5rq, 6hp, 6qb, 6rb, 6wt, 6wy, 6dw, 6vp.

Erratum.

Page 233, March Bulletin, list of components below diagram. For C_2 read C_3, C_3 read C_4, and C_4 read C_2.

Unlicensed Transmissions.

The attention of our members is drawn to the letter from Colonel Dennis published in the March BULLETIN.

In this letter the writer scathingly attacks the "pirate," and deservedly obtains the full support of the Council of this Society.

Recent communications which have reached our offices show clearly that a number of unlicensed amateurs are still active.

We wish, therefore, to take this opportunity of formally stating that any information which is received at H.Q. and which is likely to assist in the tracing of "pirates" will be forwarded to the G.P.O.

There is no reason whatsoever why any amateur should operate illegally. If he is a member of R.S.G.B. (and we venture to suggest some in the past may have been) he can seek the advice not only of H.Q. staff but also that of his District Representative. We fear that not nearly enough of our members realise their D.R. is always ready to hear and advise. He is a member of H.Q. Committee and is represented at committee meetings by the Provincial Representative. If you are a B.R.S. or hold an A.A. ticket, and wish to get your full permit, don't fight shy of your morse test or worry because your first application was turned down—there are many members near you who will assist you, and if they fail write to H.Q.

We trust this little homily will receive the attention it deserves.

Associate Grade Members.

In accordance with a recent resolution passed by the Council, it has been decided that in future persons holding full transmitting licences cannot be accepted as Associate Grade Members.

Present Associate Grade Members holding full transmitting licences will be required to apply for transfer to the Corporate Grade at the end of their present year of membership.

QSL Section Notes.

No letters have been received on the subject of standard QSL cards as discussed in the Notes last month, so that it is assumed that there is no demand for them. For this relief much thanks!

There seems to be a little misunderstanding in some quarters with regard to the use of the QSL Section by members. The service is free to members, inasmuch as no fee is required for the distribution of their cards to other stations at home and abroad, but it is the rule of the Section that cards received for distribution to British members are forwarded in their own stamped addressed envelopes (or those purchased from the Section as outlined in the October BULLETIN). Envelopes or stamps for this purpose cannot be supplied free as, owing to the great use made of the Section, the financial burden on the Society would be too great.

J. D. C.

QRA Section.

It is very gratifying to find one European country following another in rapid succession in the matter of issuing licences. The amateurs of three more countries have recently been given official permission to transmit, namely, Austria, Poland, and Portugal. The call signs of the first named consist of the prefix UO, a numeral, and two letters; those of Poland, SP, the figure 1, and two letters in alphabetical order, e.g., SP1AA, SP1AB, etc. The calls of Portuguese stations remain unchanged. The only European countries containing amateurs that are still unrecognised are Estonia, Lettland, Lithuania, Rumania, and Jugo-Slavia, and it is to be hoped that the governments of these, too, will be persuaded that the amateur is not an undesirable being, to be stamped out, but an asset to the community, and worthy of encouragement. The unfortunate case of Germany has not been included in the above, but news to hand from there now expresses a doubt as to whether individuals will ever be granted licences, on political grounds.

M. W. P.

New Q.R.A's.

G2XV.—G. A. Jeapes, 2, Salisbury Villas, Station Road, Cambridge.
G5DD.—A. Dodsworth, 145, Hyde Park Road, Leeds.
G5FU.—E. G. Foulkes, "Katheric," Handsworth Crescent, Rhyl.
G5HA.—R. Watson, Greys End House, Rotherfield Greys, Henley-on-Thames.
G5HP.—H. S. Pace, The Priory, Panmure Road, London, S.E.26.
G5SV.—M. F. Somerville, 13, Elm Park Mansions, Park Walk, London, S.W.10.
G5XD.—B. C. Christian, "Chelston," Church Road, Lower Bebington, Birkenhead, Cheshire.
G5YN.—E. Y. Nepean, "Westleigh," Boreham Road, Warminster, Wilts.
G6LI.—A. E. Livesey, 1, North Parade, Lincoln.
G6LY.—J. H. Blakeley, 2, Hazel Grove, Forest Gate, Whitegate Drive, Blackpool, Lancs.
G16TC.—T. S. Craig, 43, Southwell Road, Bangor, Co. Down.
G6TG.—R. Harris, Berwick St. John Rectory, Shaftesbury, Dorset.
G6XN.—L. A. Moxon, Flat 1, 52, Hogarth Road, London, S.W.5.
G6YY.—E. S. Rowland, 27, Upper Brownhill Road, Nursling, Southampton.
2BJJ.—W. Mitchell, 12, Grange Road, Southport, Lancs.
2BPU.—A. J. Perkins, 127, St. Asaph Road, London, S.E.4.
2BSJ.—D. N. Biltcliffe, 41, Church Street, Morley, Lancs.

The following are cancelled:—G2ML, G2VA, G5NU, G5YX, G6LT, G6PQ, G6XH.

QRA WANTED.—NA1XLR.

NEW MEMBERS.

J. R. Ellison (BRS328), Hollinbank, White Lea, Heckmondwike, Yorks.
J. Shepherd Nicholson, c/o Kanan Devan Hills Produce Co., Ltd., Pullivasal, Munnar, Travancore, S. India.
R. Haskell, 17, Werter Road, Putney, S.W.15.
J. N. Smith (BRS329), "Astroll," 73, Oakland Avenue, Belfast.
L. C. Whitney (BRS330), 9, South Street, Swindon, Wilts.
Oscar Egenes (ZT5R), P.O. Box 49, Durban, S.A.
Paul Graham-Fouche (ZS4Q), 43, Steyn Street, Bloemfontein, S.A.

A. S. Mather (VK2JZ), 14, William Street, Singleton, N.S.W., Australia.
J. L. Green (VE4BQ), 115, Furby Street, Winnipeg, Canada.
Ian Campbell-Bruce (BRS331), "Summer-Hill," Tenterden, Kent.
John Oxley (BRS332), 282, Easter Road, Leith, Edinburgh.
Raymond Coombs (ZT6F), Box 7028, Johannesburg, S.A.
Eric A. E. Jones, 46, Lady Margaret Road, Kentish Town, N.W.5.
R. S. Wood (BRS333), 8, Roxburgh Street, Galashiels.
C. R. Carter (BRS334), 3, Park Crescent, Falmouth.
J. T. Robertson (BRS335), 1, Forest Gardens, Galashiels.
W. A. Scarr (BRS336), 282, Stainbeck Road, Chapel Allerton, Leeds.
W. F. Bennett (G6QC), 12, Chalk Pit Hill, Chatham, Kent.
D. Brice (SU8RS), No. 1 Wireless Company, Polygon Barracks, Cairo, Egypt.
Victor A. Sims (BRS337), 29, Rochford Avenue, Westcliff-on-Sea.
W. E. Wale (SU8WY), No. 3 Company, Egypt Signals, Polygon, Cairo, Egypt.

NOTES & NEWS FROM THE BRITISH ISLES.

DISTRICT No. 1.

Representative: D. J. BEATTIE (G6BJ), 14, Rosehill Mount, Manchester Road, Burnley (Tel. 3659).

G2DH is busy getting his transmitter working amid difficulties. He visited G5FC, G2CG, and G2VP. G2XB has cured his chirp, and is contemplating a complete rebuild for 14 M.C. G5JF has had the bad luck to have a couple of accidents, and so has had only a few more or less local QSO's during the month. G5ZN is using a key filter, which gives no signs of key-clicks or wipe-out on the broadcast receiver a few yards away. Circuit to anyone interested. BRS161 has done little. He had the misfortune to fail in the morse test, for his full ticket, but in spite of this he is plugging away at the code, and hopes to bring it off soon. (That's the spirit, OM!) BRS274 is still active as are most of the others who have not reported. Mr. Holmes, of Liverpool, has passed his morse test, and is now awaiting his call-sign before coming on the air on C.C. and choke control phone. G6BJ has to report a partially built station still held up by non-delivery of parts. Should be on the air soon. I have decided to inaugurate a monthly letter-budget on the lines carried on by Mr. Page in District No. 7. Letters may be on any subject connected with radio (YLS doubtful!) and should reach me not later than the 20th of each month. In cases where no monthly report is sent, it will be taken from these letters. Rules and conditions will be given with the first budget.

DISTRICT No. 2.

Representative: T. WOODCOCK (G6OO), "Santos," George Street, Bridlington, Yorks.

G5QY erected two new antennas $\frac{1}{2}$ λ for 14 M.C. and similar for 7 M.C., both fed with untuned feeder, tremendous improvement all round. Interesting QSO moving automobile XD4GO. Conditions freakish March 14, not a single G heard, yet local stations were QSO G. G6PS still sticking to QRP for most QSO's, raised RV1G getting (R6) and SU8RS (R5) both on an input 2.6 watts. Raised W on 5 watts on two occasions. G6UJ been busy on 28 M.C. tests. Has xtal control adapter working fb on 7 M.C. and 2 M.C. bands, after scrapping harmonic control methods (for general work). Reports conditions only fair. Had FM on 28 M.C. G5DR.—Business QRM nearly over, participates in 28 M.C. tests. No DX, but fone on 7 M.C. brought good results. G6XC unexpectedly moved to Swindon by his employers, i.e., Radio Relay Exchange. His new QRA is 14, Victoria Road, Swindon. Hopes to install gear at this QRA later. Sorry to lose you from Dist No. 2 OB!

G2AUT and BRS245 say conditions on 7 M.C. improved, but March 16 was worst ever, not single G heard up to 1300, after which blanket slowly lifted, QRM being terrific. G2AUT also listened between 0500—1900 on March 13, 14, and 15, no DX being heard. BRS279 found similar conditions to above. Hopes to QRX on 2 M.C. band during tests and will welcome skeds. G2KO (ex BRS264) "takes the air" on 7 M.C. after great struggle with TPTG and will welcome reports on his xtal control, etc. BRS253 completed RSGB4 reports performance very fb! (on batts), and now trying to obtain reasonably silent background, using D.C. mains and eliminator. 2BIV finds his Schnell RX will oscillate fb on 4 metres, and reports hearing VE for first time on 28 M.C. band during February. BRS290 on 7 M.C. band conditions fairly good for DX hrd ZL and VK, but 14 M.C. very inconsistent; says 28 M.C. complete blank, all tests and other times. G6OO has been very busy on 28 M.C. tests and logged four W stations, but no QSO's. Xtal control adapter built up by G6UJ and myself as per G2NH'S article in January "BULL." All reports welcomed on transmissions on 2 M.C. tests G2DV has moved to Scarborough from Catterick Camp and his station now QRT for a short while. Before closing down he added AU and VT to DX list on 14 M.C. Interesting (inter-Army signals) QSO's were carried out with VTVVZ (the expt stn of the 2nd Indian Divn. Signals) on three successive afternoons, thanks to the R.S.G.B. s/w 4. G6SK has only had QSO's on 7 M.C. band so far, and is preparing for 14 M.C. working.

DISTRICT No. 3.

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

G5FC has now added PA to Xmitter, also rebuilt receiver O-V-2 and is still on 7 M.C. G5BR transmitting on calibration skeds, also hoping to be in the 1.75 M.C. tests during April. G2VP is now going on chemically rectified A.C. and working on 7 M.C. G6GL: A new Ultraudion transmitter is being built and new aerial. G2OA will be in the April 1.75 M.C. tests. On the 14 M.C. band has

worked a number of W's and YI6KR with 200 volts H.T. from accumulators. G6TW: The 56 M.C. skeds have been carried out, but a little time has been found for 14 and 7 M.C. work. The 14 M.C. band has been dead, and distant stations coming in very weak. Will be trying out a 28 M.C. Xmitter during April.

DISTRICT No. 4.

Representative: A. C. SIMONS (G5BD), Lynwood, Mablethorpe, Lincs.

I am glad to have all the usual repots, OM's, but wish a few more of you would remember to drop me a card on the 20th. Conditions last month have been about as usual—moderately good—with a decided peak (March 8-10) to very good. Incidentally, there appears to be a considerable decrease in activities on the 7 and 14 M.C. bands at the moment. G2AT is again active, very QRP on 7 M.C., and is trying to get harmonic C.C. G5CY getting very good 14 M.C. results from all Europe, but can't extend his DX. G2IO comments on poor DX conditions, but has worked Iraq with input of 4½ watts on 7 M.C. G5BD worked 5 continents, South America again being missing. One new country (Java) added to DX. 10 U.S.A. worked on March 9, all on 14 M.C. 2BIC heard all continents on 7 and 14 M.C. Is expecting full licence almost daily, and will then be QRP C.C. on the same two bands. G6LI continuing aerial experimental work. Completed extensive screening operations to eliminate local QRM and finds DX reception now possible. G6HK active on 7 M.C. with harmonic C.C. QRP. QSO YI2QG on 5¼ watts. G5FA has redesigned his transmitter and will try a Zeppelin antenna. I would like to give G6PA'S budget idea a trial, so if you will send me along your letters we will make a start.

DISTRICT No. 5.

Representative: D. P. BAKER, Crescent House, Newbridge Crescent, Wolverhampton.

Warwickshire.

Sub-Representative: G6CC.

G2ZW has put up a Zepp aerial with the idea of improving his range. So far he has only worked Northern Europe. G5BJ reports that March 10 was an exceptionally good night for working U.S.A. Signals were reported very strong in most districts there. This was on 14 M.C. band. He is also active on the 7 M.C. and 1.75 M.C. bands. G6CC is active on the 14 M.C. band. Most work has been done with Northern Europe. G6CI is active again. This time he is back on the 1.75 M.C. band. G6XJ has been active on the 7 M.C. band. Most parts of the world have been worked, with some good reports from U.S.A.

DISTRICT No. 6.

Representative: R. C. HORSNELL (2ABK), "Hepani," Wickford, Essex.

G6QX has received permits for 50 watts, and 28 and 56 M.C. work. Complains of many "G" stations being off wave. G2SA is continuing observations on moon's phases. 2BVR has been busy on 28 and 56 M.C. BRS233 and 191 have both heard W stations on 'phone on 14 M.C. BRS233 has been busy on valve curves, plotting and checking. BRS77 has found conditions excellent at times on 28 M.C. W8 and 9, ZS, etc., all logged. 2ABK has been listening a lot during 28 M.C. tests, but DX has been patchy. SU8RS, ZS4M and W8 and 9 were the best. I am sorry there has been no response to my appeal for reports. What are you all doing, OM's? Surely you are not inactive; I hear many stations on the air from this district each Sunday.

DISTRICT No. 7.

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

The notes in this area seem to grow fewer and fewer, and this is no doubt due to the Budget. G5CM is using an Ultraudion on 7 M.C. and a T.P.T.G. on 14 M.C. He has done some good work with only 2.5 watts. G2VV has scrapped his Ultraudion in favour of a T.P.T.G. He has been getting out well on 7 M.C. but has done little on 14 M.C. G2DT has managed to get on the air again from his new QRA. He is working his station completely from the mains. Power detection is now being experimented with. G2AX has been continuing his fone work on 1.7 M.C. G6PA burnt out all his receiver valves, but has been working all over Europe on fone on 7 M.C.

DISTRICT No. 9.

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

DX conditions during the month have again been very patchy. The first few days of the month were fair, but the next fortnight was worse than dud. I was beginning to think that the bottom had dropped out of the 14 M.C. band. However, week-end of 23rd brought a welcome return of reasonably good conditions. It has been noticed that conditions in the 28 M.C. band seem to go more or less hand-in-hand with those of 14 M.C. The excellent article by G6PA has brought forth several requests for a budget in this district, and I am all in favour of it. It is suggested that for a start everyone interested will give a description of his station stating why that particular outfit has been chosen and any general remarks or experiences. The budget should be sent with your next reports, and will only be sent to those who themselves contribute. G2CJ is on week-ends only, and worked all continents on 23rd inst. on 14 M.C. Has also worked VQ2BH on 28 M.C. G2IP is on 1.5 M.C. fone and 14 and 28 M.C. morse. G2OP has not been well, and has done little except a few W contacts. G5RQ is on 14 M.C. working much DX. G5WY is the new call of BRS145. G6HL has been home from Egypt, but is now on his way back. He will soon be on as SU6HL on 14 and 28 M.C.C.C. G6RB is on 14 M.C., and is building a new 28 M.C. outfit. G6XC I welcome to this area from the north. Hopes to be on the air at his new QRA by the time this appears. BRS145 is now G5WY (see above). BRS310 seems to have heard everything there is to be heard on the 28 M.C. He has got an RX working on 56 M.C., and will co-operate with any station on either band. Station visits: G2RT to G2CJ and G2CJ and BRS310 to G2OP.

DISTRICT No. 10.

Representative: J. CLARRICOATS, "Ciel," Hartland Road, N.11.

The following stations have been active:—G6UM (1.7 M.C.), G6PP, G6UN, G6OT, G5QF, and G6CL (7 and 14 M.C.), G5UM has been observing twilight effects, whilst G6PP reports variable conditions on 7 and 14 M.C.; he is now preparing for 28 M.C. These two stations are the

only reporters, and as they are both members of C.B., it is wasting valuable space to enlarge on their activities under these notes.

DISTRICT No. 11.

Representative: L. H. Thomas (G6QB), "Conway," 66, Ingram Road, Thornton Heath, Surrey.

Judging from reports, there has not been much activity in the area this month except for the B.R.S.'s, three of whom report very regularly and deserve congratulations on this score. This, incidentally, cannot be said for the hams. BRS25 has been on 28 M.C. only, and reports exceptional conditions on March 9, when he logged five W9's (one at Denver, Col.). He has also had his first accident with H.T. on filaments during seven years of radio! Hard luck at this stage, OM. BRS190 has made the astonishing discovery that all his 56 M.C. reception has been taking place on 42 M.C.! He thinks he can really get down now. He also is hot on 28 M.C. BRS250 is yet another of them, but he also listens on 7 and 14. Has heard AF1AA on 14 M.C. QRA? BRS317 reports from Wellington College as an absent friend, but wants to co-operate with hams during vacations. He and BRS324 are both working in a room about four by two and find it rather trying. G2AI is working still on 7 M.C., but reports most of his transmissions spoilt by "fone maniacs." (I hope to be one myself soon!—D.R.) G2GM has worked VE on 7 M.C., and all continents again on 14 M.C. He hopes to go on C.C., and makes strong remarks about the other stations in the area using "Goyder Lock" systems that don't! He is going to use the G5YK arrangement. G2CX has been working all kinds of DX on 14 M.C. as well as his usual 28 M.C. work, but is generally found listening to broadcast. Hi! G6QB has not been on the air during the month owing to other activities and week-ends away, but hopes to be on 28 and 1.5 next month.

DISTRICT No. 12.

Representative: T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4. Telephone: Chingford 118.

G2ZN reports a quiet month, chief work being on 14 M.C.; is preparing to go on 28 M.C. with QRP. G6LL has been busy on 28 M.C. tests, working several W's and ZS. BRS314 on 28 M.C. has received the following: SU8RS, W2BG, W2ACN, W2JN, W9BBA, F8EX. 2AZR is receiving on 28 and 56 M.C., and will certainly operate on both on receipt of a ticket, which he hopes to obtain shortly. G6UT, on 14 M.C., has found good DX this month, ZL and VK being worked on several occasions; has also worked CV for the first time. G6LB has now worked all continents, VK having completed the list; has also worked YI and CE, all on 14 M.C. At the monthly district meeting, Mr. L. J. Fuller (G6LB), late District Representative, was presented with a cigarette lighter as an appreciation of his services in the past. Amongst those present were two old timers, G5AI and G5PD.

DISTRICT No. 13.

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

The star stations this month again seem to be G2OL and G2OW, who have had two 'phone QSO's on 56 M.C. Several stations have taken up this frequency with a fair amount of success. The reports are as follows: G6VP says it was the most unreliable March he has ever struck, but has done some good DX. Has spent much time on C.C. work and abandoned the locked T.P.T.G. and now uses P.A., and finds it quite as good. G2OW has been on all the four higher frequency bands. Found 7 M.C. good, 14 M.C. dead, 28 M.C. only locals (there must be something wrong with RX on this band), several QSO's with G2OL, and heard by G6CO on 56 M.C. G5VB worked U.S.A. on 14 M.C., SU8RS on 28 M.C. with 5 watts. Uses half wave 14 M.C. aerial only 18 ft. high for both waves. Rebuilt receiver and taps aerial on grid coil, and finds signals 40 per cent. louder on 7 and 14 M.C.; hopes for same on 28 M.C. G2OL rebuilt 58 M.C. receiver and hopes to work break-in with G2OW on this wave. Uses two-turn untuned aerial coil on transmitter. Heard pure D.C. carrier on 56 M.C. on March 16 at 14,15 to 14.30 G.M.T., and wants to find the owner. Found 14 M.C. dead and 7 M.C. nearly so. G6XN has got C.C. going on all waves, including 56 M.C.. Finds the H.F. chokes the most tricky things. G6WN has aerial down and lost a filter condenser, and other minor troubles. Found 28 M.C. the best ever, and heard G2OL on 56 M.C. with another hill in between. G6CO does not report, but has heard G2OL and G2OW on 56 M.C., but not G6XN, who is nearer.

DISTRICT No. 14.

Representative: John Wyllie (G5YG), 31, Lubnaig Road, Newlands.

The period February-March has proved a most unfruitful one in respect of reports and matters of general interest. I do not, therefore, propose to take up valuable space, and will accordingly be brief. Generally speaking, conditions have been very poor during the period under review, a fact which has apparently been responsible for much reconstruction of gear in the area, which in itself is all to the good. One feature pertaining to the conditions which is worthy of comment is the prevalence during the first part of March of an inordinate quantity of "static" of a particularly violent type. This is most unusual at this period, and, I think, may be attributed to the presence in the atmosphere of the large quantities of sleet, hail, and snow to which we have been recently treated. The following stations have been busy with reconstruction work, which, as indicated, has curtailed their energies in other directions:—G6WL, G6NX, G5XQ, G5DK, G2WL, and several others. G2MA has been on the air (loathsome expression) quite a little, and has definitely proved to his satisfaction the advantages of loose aerial coupling. G6MS is at last reaching out. G5CL has had his first W contact, using 10 watts to an Ultraudion circuit. G6KO reports no further contacts on 28 M.C. He also reports hearing very little on this band during the tests. G6YG, apart from successful schedules with CM8UF, has little to report.

DISTRICT No. 15.

Representative: H. Andrews (G5AS), Wireless Depot, Ystradgynlais.

It is hoped to hold a Conventionette at Cardiff in the near future, and I should like, in this connection, to have a list of names and address of all members of this area. It is interesting to note that the movement to aid the Boy Scouts in matters

relating to wireless has met with the approval of many in this district, and I understand that some have already taken up with the officials in their towns. G5TJ has had the misfortune to blow four valves on his M.O.P.A., but will be going for the 1.75 M.C. tests. G6FO (ex-BRS80) is working on the 1.75 M.C. band and welcomes reports on his CW and fone. (Congrats on your new call, OM !) G6FS has a 50-ft. mast in course of erection, and he has installed a generator driven by a water motor. G5PH is still very active, but rather busy, due to being GC Group 8C. G2AWX, together with G5TJ, paid a visit to G5AS, and a very interesting personal QSO ensued. G5AS finds conditions on 7 M.C. bad. He was very pleased to have a visit from G5TJ and 2AWX, and will be always pleased to see any of the OM's whenever they can drop in.

DISTRICT No. 16.

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

Conditions during the latter part of the month have been reported as bad on all bands, after having been fairly good at the beginning. The best station this month is GI6HI, who made contact with FM on 28 M.C., using less than 5 watts input to an ultra-audion circuit. He is on this frequency every Sunday afternoon, and will be glad of reports. GI2CN is busy building a rectifier of the A.C. supply, which will be installed very soon. BRS322 has applied for a licence and is awaiting the news. GI5HV now has crystal control working well on 14 M.C. GI5MO is on 14 M.C. at week-ends with 3 watts input. GI6YW, GI6TB, GI5WD, GI6MG all report they are inactive at present.

B.E.R.U. NEWS.

IRISH FREE STATE NOTES.

By COL. DENNIS (EI28).

I am afraid that this month's notes will be very brief, as the only active stations appear to be EI2B, EI8B, EI8C, EI2D (week-ends only), and EI5D. EI8B has had reports on his 28 M.C. signals from CT1AA and W2BG. EI7O is still waiting the rectifiers for A.C. mains supply, and is only very occasionally on the air with power supply of 60 volts from H.T. accumulators. EI8C has worked both North and South America on 7 and 14 M.C., but I have no details. EI4D is, as usual, too busy with the work of W.S.I. to be much at the key. EI2B has nothing of interest to report. I have received no outside reports as to "conditions" prevailing, but at the writer's station 14 M.C. is still very "patchy," whilst 7 M.C. has, on the whole, been fairly good, with some absolutely dead evenings when not a single station was to be heard on this band. There was one very abnormal evening, March 10, when G's and all Europe came in strongly and were worked until after midnight ; they usually fade out completely at about 20.00 G.M.T. On the other hand, March 12, when barometer and weather conditions were as nearly as possible the same as on the 10th, was one of the dead evenings noted. Freaks of this nature are difficult to explain on the data available.

EGYPT.

Conditions during the past month have shown an all-round improvement, and are now very much the same as at this period of last year. QRN is rather troublesome at times, but a D.C. signal comes through it easily. SU8RS has at last made a start on 28 M.C., his first QSO being with G6HP. SU8WY has been QRT for the last part of the month, and has little to report. ND. on 28 M.C. so far. SU1WT (late SU8CW) is going on 14 M.C., as he cannot get out of Europe on 7 M.C. Hopes to report a W.A.C. or W.B.E. in the near future. SU8RS is on this band all and every Sunday from now onwards. Finds the S.G. 4-valver works perfectly, but develops a threshold howl as the sun goes down. Does anybody know why this is ? It happens every day, and only on 28 M.C. Has heard seven countries so far and worked five, but no DX. No W stations heard up to March 16. Input here is 40 watts to a split Hartley aerial a 14 M.C. full wave, V fed.

SOUTH AFRICA.

By W. HEATHCOTE (ZT6X).

During the past month DX on the 7 and 14 M.C. has been very good indeed, although QRN on the High Veld has at times been very troublesome. ZS5U has been in great form and worked all continents in 2 hours 50 minutes. Several of the Division 6 boys have intimated their intention of lowering his record in the near future. Our old friend the "Bridge Builder" ZT5X has shifted camp to Underberg, and hopes to land the elusive "Yank" and thus qualify for his W.A.C. ; he has only 3 watts at his disposal. ZS6P has completed his 1930 M.O.P.A. and is working satisfactorily. New Zealand amateurs have at last made an appearance, and ZT6X managed to QSO several of them during the past week. VTVVZ (Wheeler, of the Signal Corps, Quetta, India) and KA1JR also worked. ZU6N has been going strong recently. ZT6R managed to QSO Ireland a short while ago, in addition to qualifying for his W.A.C., and ZU6Y reports having worked EAR ; both these hams are using very low power. Quite a number of S.A. amateurs intend participating in the 28 M.C. tests during the coming month, and hopes are entertained of some useful information being obtained.

Readers of these notes who are interested in the activities of the S.A.R.R.L. can obtain copies of the official magazine of the League, Q.T.C. (which is also printed and published entirely by amateurs. Hi) on application to Mr. Raymond Coombs, Box 7028, Johannesburg ; the Oversea subscription being only 10s. per annum. The following members of the S.A.R.R.L. have joined the B.E.R.U. during the past month : ZT5R, ZT6C, ZS4Q, ZT2C.

NEW MEMBERS ARE WANTED.

RHODESIA.

By G. G. Livesey (FO3SRB).

There are only two stations—3SR and 3SRB—working on 7 M.C. here at the moment. Others may be on 14 M.C., but they are not heard owing to skip. There are, however, many stations in the Union working on 7 M.C. Conditions from mid-January to mid-February have been bad, usual QRN and bad fading. W stations on 14 M.C. are weak and difficult to obtain, whereas during the previous winter they were plentiful and loud. High power W stations on 7 M.C. are loud in the early morning, but appear to be working each other. The German commercial DHE is received here well, and if, as is believed, he marks the upper limit of the amateur 7 M.C. band, then numerous American amateurs are off wave, above him. (DHE has often been in the amateur band.—Ed.) 3SR has just become a member of RSGB, and this makes the fifth here in Southern Rhodesia. (Splendid.—H. Q.) He is on 14 M.C. from 15.00 to 17.00 G.M.T., and also from 20.00 G.M.T. on.

NOTES AND NEWS FROM EUROPE.

CZECHOSLOVAKIA.

By L. Vydra (OK2YD).

OK2SI, OK2CM and OK2YD were working on 28 M.C. during the tests, and the former worked SU8RS and YI1LM. Many other central and South African stations were heard, though, with the exception of commercial harmonics, no signals were received from the West. On 14 M.C. conditions to Australasia, Asia and South Africa were good during the first half of March only; conditions West very bad all the month. 7 M.C. is now restricted to local working only on account of QRM. Only a few W stations were heard during the A.R.R.L. contest.

HOLLAND.

By H. Pomes (Assistant Traffic Manager, N.V.I.R.).

On the 3,500 K.C. band European communication increases, and many hams seem to find out all over again that this narrow channel can be used both for fone and code work with low power at relative big distances. On 7,000 K.C. good Continental communication was possible during daylight. The 14,000 K.C. band offered many occasions for working all continents. Usually VK and ZL may be heard early in the morning; after 14.00 G.C.T. many stations in Asia were worked; from 17.00 to 19.00 G.C.T. South African stations come in fb. Then, under favourable conditions, American stations are very loud until midnight. We can state with great certainty that a western wind and higher temperature bring in more stations during night than an eastern wind together with a lower temperature. From the 28,000 K.C. band can only be reported that a few times American stations were logged during the tests organised by the R.S.G.B. Our annual meeting was held on March 16 in Utrecht. A new committee was elected; our new president is Mr. J. Corver, one of the most outstanding figures in Dutch amateur radio. Further, a beginning was made with co-operation between the N.V.V.R., the oldest radio society in our country, and the N.V.I.R., the Dutch I.A.R.U. Section.

NORWAY.

By G. H. Petersen (LA1D).

During March most Norwegian hams have been active with European contacts, and generally report fair conditions. LA1G reports, however, ZL and VK fine 07.00—08.30 G.C.T., and W, ZS, ZT 17.00—20.00, and has made a lot of work on 14 M.C. LA2K is using a portable 3-watt transmitter on week-end trips, signing XLA2K, and would welcome reports. LA1J, our most active Bergen station, is working on 14 M.C. At headquarters we are preparing for the general meeting, which is to be held at Oslo early in August. We expect a good representation of active Norwegian hams, and any foreign OM who may visit our town during these days will be heartily welcomed at our hamfest.

SPAIN

By A. C. Wilberforce (G2IY).

The annual general meeting of the E.A.R. was held on March 16, in Madrid.

EAR21, of Bilbao, was successful in working all Continents within 4½ hours between 17.45 G.M.T. and 22.15 G.M.T. on January 29.

During March the E.A.R. and the Argentine Radio Club have been running a special annual competition.

PORTUGAL

Representative: C. J. Mumford (CT1BL).

On March 5 the Society "Rêde dos Emissores Portuguêses" was officially recognised by the Government, who handed our headquarters its legalising papers duly signed by the responsible Ministers. We are now waiting for our individual licences to be arranged.

CT1AA has spent most of his time at telephony with good results. CT1AE is still trying very hard to make a really perfect filter for his R.A.C.

CT1BK has been fairly successful on the 14 M.C. band, having worked Australia and U.S.A. with low power. For the last seven days conditions have been very peculiar here, only very distant stations being audible between those hours, when the 40 metre band is usually crowded. On March 14, for instance, at 10 p.m. G.M.T., CT1BL could only hear EU and SP stations, both of which he worked, obtaining C.C. R7 reports. CT1BL is not C.C. and uses low power.

BELGIUM.

By Paul de Neck (ON4UU).

On the two active bands the DX conditions were much better during this month and good contacts were made.

On the 14 K.C. band and in the beginning of February the best hours for DX were certainly from 07.00 to 08.30 G.M.T. and from 14.00 to 17.00 G.M.T. Midday work gave good results with Australia, India, New Zealand and some U.S. districts.

Please, foreign friends, do not forget to enlist for our big International Ham Congress in Antwerp, Liège and Brussels next July. Don't lose this opportunity of visiting your Belgian radio friends.

AUSTRIA AND GERMANY.

By W. RACH (D4ADF).

It is with the greatest pleasure that we have to report that amateurs in Austria are to get their licences without further delay. Up to now the following are officially licensed :—UO1JZ, UO1TN, UO1JF, UO1JN, UO6GR. Some more are to follow shortly. On this occasion the territory of Austria has been divided into different districts, which will be numbered subsequently. A detailed report on this scheme will follow in our next report.

D4UAH has succeeded in establishing contact with W2BG on 28 M.C. QRK mutually varied from R3-R7. D4UAH was using 15 watts.

During the period covered by this report conditions on 14 M.C. seemed very favourable. Many of the German stations hooked up during evening hours with the United States, and in daylight good conditions for VK and ZL traffic were observed.

On 7 M.C. conditions were fair during early February. D4GJ, of Beuthen, worked with SU8WY on 1.5 watts. QRK R5.

A few OM's were busy on 3.5 M.C., amongst them D4KZA, of Berlin, D4ABV, of Breslau, and HB9MQ in Northern Switzerland. We hope that some more stations will QSY to 3.5 M.C. in order to reduce QRM on 7 M.C.

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