THE T. & R.

BULLETIN

THE INC. RADIO SOCIETY OF GREAT BRITAIN

AND THE BRITISH EMPIRE RADIO UNION

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THE INCORPORATED

Radio Society of Great Britain

AND THE

British Empire Radio Union

53, Victoria Street, London, S.W.1 ('Phone: VICTORIA 4412)

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R.S.G.B. CALENDAR

Unless otherwise announced all meetings are held at the Institution of Electrical Engineers, Savoy Place, W.C.2, commencing at 6.15 p.m. Tea is served at 5.30 p.m.

November 27.—Lecture by The Westinghouse Brake and Saxby Signal Co., Ltd., on "Rectifiers and Radio Work."

December 22.—Annual General Meeting. To be followed by a lecture by Mr. D. N. Corfield, D.C.L.(Hons), G5CD, "The Measurement of Speech and Music Qualities."

January 22.—Lecture by The Cosmos Lamp Works, Ltd., on "The Development of the Pentode."

Keep the dates *February* 19, *March* 30, *April* 22.

Details of forthcoming Local Conventionettes will be found under the District Notes Section as they become due.

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The T. & R. Bulletin.

(*Published on the 14th of the month.*)

Hon. Editor: G. W. Thomas (G5YK).

Editorial Committee: A. W. Alliston (G5LA), J. D. Chisholm (G2CX), A. D. Gay (G6NF), J. W. Mathews (G6LL), A. O. Milne (G2MI).

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T&R

Bulletin

The only Wireless Journal Published by Amateur Radio Experimenters in Great Britain

NOVEMBER, 1931. Vol. 7. No. 5

EDITORIAL

IN the May, 1931, BULLETIN we published an Editorial entitled "Mainly to the European Societies." Members will recollect that we deplored the fact that there were still many European stations causing considerable congestion of the ether through the use of their over-modulated and badly spreading notes. We did more than deplore the fact; we stated very definitely that such stations had no right to be on the air, and that we should be glad to see them forcibly removed. We also gave it as our considered opinion that certain European Societies were largely to blame as it was their duty to police their own territory.

From subsequent issues of *O.Z.* and *CQ* (the official journals of E.D.R. and D.A.S.D.) we are pleased to learn that the Editorial in question has aroused some interest in the European Societies. We have, however, one regret—the attitude shown by *O.Z.* and *CQ* in replying to our remarks.

We appreciate *O.Z.'s* comments that they acknowledge the motive behind the article. We cannot, however, appreciate the criticism that *CQ* has thought fit to level at us.

In replying, we feel we must say that the Editorial was written largely because of the remarks so often heard at "ham" gatherings concerning the notes from some Continental stations. Perhaps it is unnecessary for us to say that we did not hear so many remarks regarding our own stations, though the fact that we inserted a mild rejoinder to them showed that we did not consider ourselves entirely free from blame. We also take this opportunity of declaring that the Council of the R.S.G.B. associates itself with the comments made in the Editorial in question, and that they knew that such an Editorial was being prepared. Our Council is alive to the general state of Amateur Radio in Europe; they appreciate the efforts that have been made through the journals of the European Societies to educate their members in the proper adjustment and operation of their stations; but they feel that a considerable improvement is still required in the notes emitted by a few stations.

Our amateur friends on the Continent will surely agree that if 90 per cent. of the stations in Europe are crystal controlled, the remaining 10 per cent. with bad notes could do more damage than ten times their number with good notes. For the proper enjoyment of amateur radio operating in small frequency bands with ever increasing congestion, this 10 per cent. must be reduced to zero if the narrow amateur bands can be made to accommodate all. If D.A.S.D. and E.D.R. were to say that, as far as their countries are concerned, this 10 per cent. has been reduced to zero we should have nothing to say—except possibly to point out that they are the only two countries who could make such a claim. No, D.A.S.D. and E.D.R., we were not kicking against you, and you know it. Further, if any of your executive listen on the medium frequency amateur bands you will have plenty of evidence regarding the real offenders. D.A.S.D.

(*Continued on page* 165).

THE DESIGN AND CONSTRUCTION OF SMALL POWER TRANSFORMERS.

By H. K. Bourne, B.Sc. (G2KB).

PART I.

A VERY large number of amateurs derive the power for operating their transmitters or receivers from the A.C. mains. In general, a power supply outfit consists of a high-tension transformer, a rectifier—which may be of either valve, chemical or metal oxide type—and smoothing apparatus. Usually one or more supplies of low voltage A.C. are also required for lighting the valve filaments. These may be taken either from extra windings on the H.T. transformer, or from separate transformers.

In this article it is proposed to give one method of design for small transformers used for these purposes, in order to enable amateurs to construct them for themselves.

A simple transformer consists of a closed iron core having two coils of insulated wire wound around it; these coils are insulated from the core, and from one another. One of the coils, which we shall call the primary, is connected across the A.C. mains, giving a supply at constant voltage and frequency. An alternating current then flows through the primary coil, thereby creating an alternating magnetic field or flux. This flux cuts the conductors of the coil, and induces a voltage in them in such a direction as to oppose the flow of current, and hence to oppose the voltage of the mains at any instant.

In similar manner this flux cuts the second coil, or secondary winding, and induces an E.M.F. in this also. Then if an external circuit is joined to the terminals of the secondary coil, this induced voltage causes a current to flow in the circuit, the value of which is determined by the impedance.

The E.M.F. induced in the primary is equal to the applied voltage of the mains, less the voltage drop due to the current flowing through the impedance of the primary winding. Assuming the number of turns on the primary and secondary is the same, then the E.M.F. induced in the secondary will be the same value as that in the primary, theoretically. The secondary P.D., or terminal voltage on load, will then be equal to this E.M.F., minus the impedance voltage drop in the secondary winding.

Actually, the E.M.F. induced in the secondary is a little less than that in the primary owing to the fact that not all of the flux produced by the primary winding cuts the secondary coil. A certain portion of the flux, called the "leakage flux," does not cut the secondary winding at all. The coils must be wound as close together as possible to reduce the leakage flux.

The actual flux in the core of a transformer does not depend appreciably on the load, but remains fairly constant. When a load is switched on to the secondary, the current in this winding is flowing in the opposite direction to that in the primary coil at any given instant (owing to the fact that the secondary E.M.F. is in phase with the primary E.M.F., which opposes the mains voltage and so the primary current). Hence, the load current must exert a demagnetising effect on the core due to its field. To balance this demagnetisation, the primary current must increase as the secondary current increases, and so this maintains the flux.

The value of the flux in the core is connected with the induced voltage, frequency and number of turns by the following well-known formula:—

$$E = 4.44\ f\ \phi N \times 10^{-8}$$

where E = induced E.M.F.
f = frequency in cycles per second.
N = number of turns in the coil.
ϕ = maximum or crest value of flux in the core.

Note that the flux is an alternating one, and so its R.M.S. value will be less than the crest value. It is necessary to ensure that the iron in the transformer is not saturated, and so the maximum value of the flux allowed must be below the saturation value for the iron.

From the formula it is clear that the voltage ratio of a transformer is nearly proportional to the ratio of the number of turns in the coils, neglecting the effect of voltage drop. In designing the transformer, the E.M.F. in the primary is taken as being equal to the applied voltage of the mains, that is the voltage drop is neglected, and the formula is then used to obtain the flux in the core.

It is now proposed to work through a particular case of a transformer design in order to illustrate the method adopted.

Suppose a transformer for 210 v. 50 c.p.s. A.C. mains is required for use with a valve rectifier which is to deliver a D.C. output of 500 volts on a load of 120 milliamps. Using two Mazda U65/550 half-wave rectifying valves, a transformer giving 550 volts R.M.S. on each side of the centre tap will be sufficient, as this allows a good margin for voltage drop in smoothing chokes, etc. A filament winding to supply 7½ volts at 2½ amps. is required for the rectifier.

Total output from transformer
$= (500 \times 0.12) + (7.5 \times 2.5)$
$= 80$ wts.

Assume an efficiency of 85 per cent., then the input power to the transformer is $\frac{80}{0.85} = 94$ watts.

which requires a primary current of $\frac{94}{210} = 0.45$ amp.

This is the active current in phase with the voltage. Take a value of 4 turns per volt for the windings. Assuming a current density of 1,000 amps. per sq. in. in the primary winding, the area of wire required is $\frac{0.45}{1{,}000}$ or 0.00045 sq. in. From the tables, it is found that 22 S.W.G. wire is the nearest size. The number of turns required is 4×210, or

840 turns on the primary winding. From the tables, 1,110 turns of 22 S.W.G. enamelled wire occupy 1 sq. in., and so the area taken up by this winding will be $\frac{840}{1,110}$, or 0.8 sq. in.

A higher current density of, say, 1,500 amps. per sq. in. is permissible in the secondary winding, for each half takes the current for only half the time. The cross-sectional area of the wire to take 120 milliamps. is then $\frac{0.12}{1,500}$, or 0.00008 sq. in., and the size of wire is 32 S.W.G. enamelled, which winds 6,890 turns to the square inch.

The number of turns = 4 × 550 × 2 = 4,400. This number must, however, be increased by about 4 per cent. to allow for voltage drop due to resistance, reactance and leakage flux. So the number of secondary turns required will be $4,400 + \frac{4}{100} \times 4,400 = 4,580$ turns. This winding is centre tapped at turn number 2,290. The area occupied by this winding will then be $\frac{4,580}{6,890}$, or 0.7 sq. in.

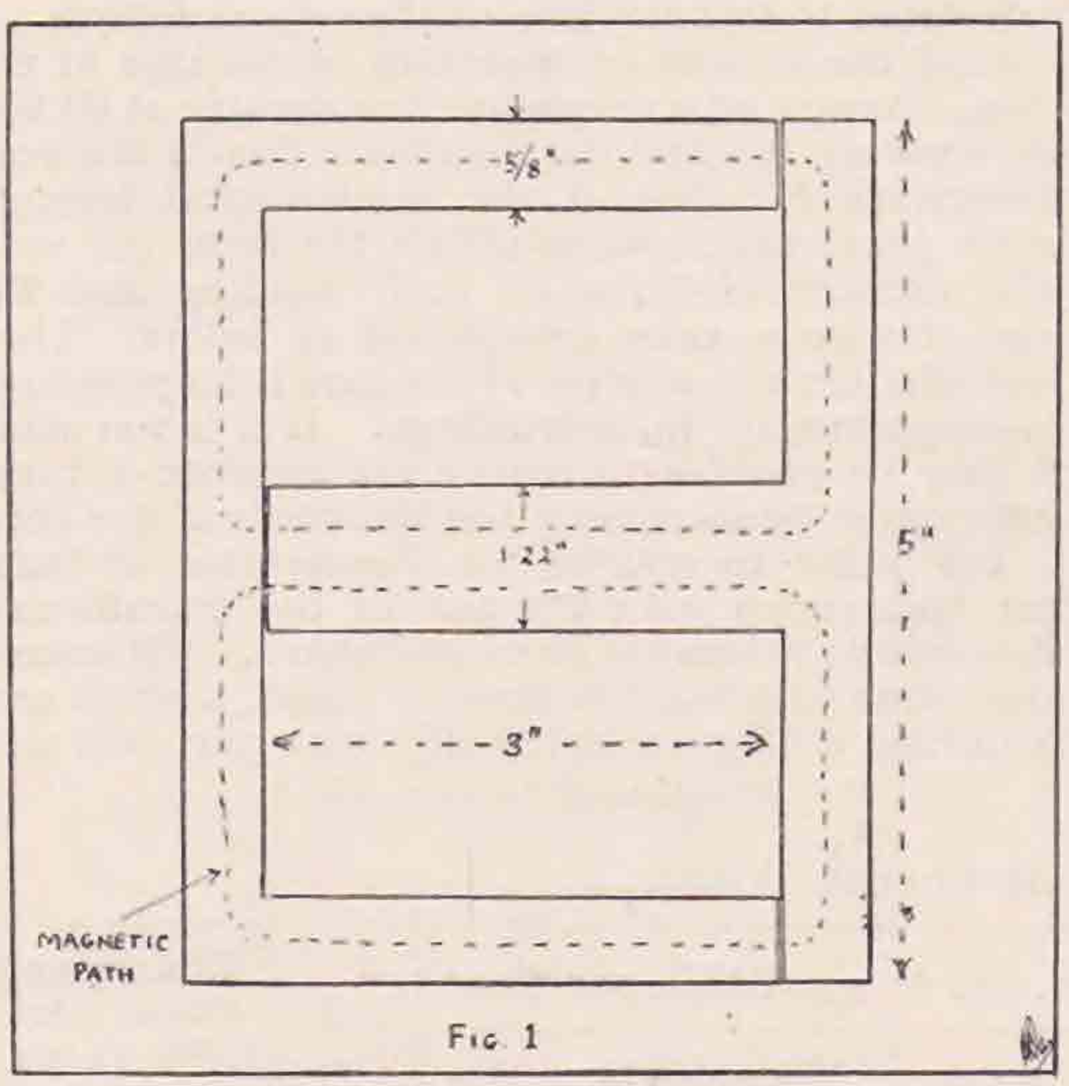


Fig. 1

The filament winding will be the outside coil of the transformer, and as such it will possess the best cooling properties, and so a fairly high current density of 1,500 amps. per sq. in. is permissible. The area of wire required is then 0.0017 sq. in., so 18 S.W.G. wire is suitable. It is best to use D.C.C. wire for this winding, as the extra space taken by the cotton covering instead of enamel is not worth saving with this small coil. Allowing 4 per cent. extra turns as before, the number required is 31 turns and the space occupied is 0.1 sq. in. If desired 16 S.W.G. D.C.C. wire may be used on this winding, as there is ample space, and by using this thicker gauge the transformer should work quite cool. The total area taken up by the three windings is thus 1.6 sq. in. A very liberal allowance of about 50 per cent. must be made for the space taken by the bobbin and the insulation between layers and between the coils.

From a manufacturer's list of stampings it is found that size No. 28 of Sankey's stalloy stampings have a window space of 3 × 1.27 ins., so this will give ample space for winding. These stampings consist of T and U pieces, of high resistance stalloy of 0.014 in. thickness, with insulation on one side. The dimensions are shown in Fig. 1.

Having assumed a value of 4 turns per volt, the next step is to determine the area of core required. We have, turns per volt $= \frac{N}{E} = 4$, and so by substituting in the formula $E = 4.44 f N \phi \times 10^{-8}$ we have $\phi = \frac{10^{-8}}{4.44 \times 50 \times 4} = 112,500$ lines maximum.

Assuming a maximum flux density in the iron of 60,000 lines per sq. in., an area of iron of $\frac{112,500}{60,000}$ or 1.9 sq. ins. is necessary. Owing to the thickness of the insulation on the laminations of the core, only about 85 per cent. of the area of the core consists of iron. So the overall cross-sectional area of the core will be $\frac{1.9}{0.85}$, or 2.25 sq. ins.

The width of the core is 1.22 ins. from Fig. 1, and so the thickness required is $\frac{2.25}{1.22}$, or 1.85 ins.

Take a core 2 ins. thick. By rough drawing the mean length of a turn of wire in the primary, which is wound nearest the core, is about 7½ ins. In the secondary it is about 8½ ins., and in the filament winding about 9 ins. So the lengths and weights of wire for the windings are as follows :—

Primary $840 \times \frac{7.5}{36} = 180$ yards, weight about 1½ lb.

Secondary $4,580 \times \frac{8.5}{36} = 1,100$ yds., wt. about 1¼ lb.

Filament $31 \times \frac{9}{36} = 8$ yards, weight about ¼ lb.

The weights are found from the wire tables.

The length of magnetic path is shown dotted in Fig. 1, and is 2 (6 + 5), or 22 ins. The iron requires a magnetising field of about 10 amp. turns per inch to produce a flux density of 60 kilo lines per sq. in., and so the magnetising field is 220 amp.-turns. Hence the magnetising current is $\frac{220}{840}$ or 0.3 amp.

This magnetising current is wattless, or idle, current, lagging ¼ cycle in phase behind the voltage. Hence the total primary current

$$= \sqrt{(0.45)^2 + (0.3)^2} = 0.55 \text{ amp.}$$

The primary current is thus greater than was taken in the first instance, but 22 S.W.G. wire will carry this satisfactorily, as the current density is only about 900 amps. per sq. in.

From the wire tables the resistances of the windings are found to be :—

$$\text{Primary } 39 \times \frac{180}{1{,}000} = 7 \text{ ohms.}$$

Secondary, 290 ohms.

Filament winding, 0.1 ohm.

$$\therefore \text{ Copper loss} = [7 \times (0.55)^2] + [290 \times (0.06)^2] + [0.1 \times (2.5)^2]$$
$$= 4 \text{ watts approximately.}$$

The volume of iron in the core is found from Fig. 1 to be 0.85 $[(5 \times 4\frac{1}{4} \times 2) - (2 \times 3 \times 1.27 \times 2)]$, or 23 cub. ins., and so, since 1 cub. in. weighs about 4 ozs., the weight will be about 6 lbs.

TABLE I.

Output, Watts.	Turns per Volt.
10	8
20	7
50	6
100	4
200	3

From the curves of iron loss given by the makers of the stampings, the iron loss at 60 kilo lines per sq. in. is about 0.6 watts per lb., and so the total iron loss is 0.6 × 6, or nearly 4 watts.

So the total losses are 8 watts, and since the output is 80 watts, the input must be 88 watts.

Thus the efficiency will be $\frac{80}{88}$, or 90 per cent.

The copper losses and iron losses should be equal for maximum efficiency.

A summary of the steps to be taken in designing a transformer are as follows :—

(1) Decide on the output voltage and current required from the transformer and determine the total output power required.

(2) Assuming an efficiency, find the input necessary and the approximate primary current.

(3) Taking a value for the ratio of turns per volt, find the number of turns in each winding, allowance for voltage drop being made on secondary windings.

(4) Find the size of wire to carry the required current in each winding, without overheating.

(5) Find the space occupied by each winding, and so the window area required, allowing an ample margin for insulation.

(6) From a maker's list of core sizes, choose a size having a large enough window area.

(7) From the value of the turns per volt assumed, calculate the flux, and so the cross-section of iron required, and the thickness of the core.

(8) Find the approximate value of the magnetising current and so the total primary current, in order to determine if the size of the primary wire requires increasing.

(9) Calculate the weight of wire necessary for each winding.

As a check on the suitability of the design the following calculations may be performed if desired :

(10) Find the resistance of each winding and so the total copper loss.

(11) Calculate the weight of the core and find the iron loss. Adding these losses together, the total loss is obtained, and so the efficiency can be found. For maximum efficiency the iron and copper losses must be equal.

The case often arises, where a certain core is at hand and it is desired to make use of it in the transformer if possible. The windings must be calculated to suit the area of the core as follows :—

Find the area of cross-section of the iron in the core. Assuming a maximum flux density of 60 kilo lines per sq. in., find the maximum flux in the iron. Substitute for this in the fundamental formula given previously, and so obtain the turns per volt. The number of turns on each winding and the size of wire is then determined as before. Then find whether the window of the core is large enough to accommodate these windings. If it is too small it may be possible to reduce the number of turns sufficiently by increasing the thickness of the core.

The value to assume for the number of turns per volt varies with the size of the transformer. Reasonable values are given in Table I. Of course, any value within limits may be taken, a small core requiring a large number of turns per volt and

(*Continued on page* 155.)

TABLE II.—PROPERTIES OF COPPER WIRE.

S.W.G.	Diameter. Ins.	Area. Sq. Ins.	Turns per Sq. In. *		Yards per Pound. *		Resistance Ohms per 1,000 Yards.
			Enamelled.	D.C.C.	Enamelled.	D.C.C.	
16	0·064	0.00321	226	173	26·3	25	7·51
18	0·048	0·00180	392	297	46·9	45	13·25
20	0·036	0·00101	685	472	83·3	79	23·62
22	0·028	0·000613	1,110	692	137	129	39·04
24	0·022	0.000379	1,770	977	221	203	63·24
26	0·018	0·000254	2,560	1,280	330	294	94·47
28	0·0148	0·000172	3,760	1,630	488	422	139·7
30	0·0124	0·000121	5,370	1,990	694	587	199·1
32	0·0108	0·0000915	6,890	2,550	915	755	262·4
34	0·0092	0·0000663	9.610	3,020	1,202	1,024	361·6
36	0·0076	0·0000453	13,500	4,110	1,840	1,477	529·9
38	0·006	0·0000282	20,400	5,100	2,810	2,287	850·3
40	0·0048	0·0000180	32,500	6,100	4.580	3,456	1,329

* The figures in these columns are to be taken as approximate only.

STATION DESCRIPTION No. 17.

VK2HC.

(B.E.R.U. Representative for Australia.)

By D. G. Lindsay (VK2DY).

VK2HC is situated at Yarraman North, 26 miles west of Quirindi, New South Wales. Quirindi is about 244 miles north-north-west of the city of Sydney, and is 1,279 feet above sea level. VK2HC, 36 miles west, is on much the same level.

The station was first on the air at Armidale, N.S.W., and started on September 15, 1926. The first European QSO was F8GM, four days later, VK2HC then using 20 watts on an Osram DE5 tube.

The transmitter and receivers used now are somewhat more elaborate than in 1926, and although it might be considered that we would be somewhat behind the times "down under" we have the temerity to consider that such is not the case.

Crystal control is very popular in Australia—deservedly so—and VK2HC is no exception. The transmitter is a four stage crystal control affair capable of working on the 3.5, 7, 14 and 28 megacycle bands. The crystal oscillator uses either an Osram P. 625 or a Philips TB04/10, the next stage also using a TB04/10. The last stage but one uses a Radiotron UX210, and the last a Telefunken RV218.

One stage is cut out when using 3.5 or 7 M.C., and two doublers are used on 14 M.C., the last amplifier then being neutralised. On 28 M.C. all amplifiers double.

The filaments of all tubes in the transmitter are lit from batteries—using the 32 volts D.C. supply broken down through a common resister. The plate supply is from an Esco 1,000 volt double commutator generator which actually delivers 750 and 550 volts on each section (instead of the rated 600 and 400) at the usual load. This is driven by a very badly overloaded ¼ H.P. 32 volt D.C. motor, and the coupling is not direct but by means of a belt, the motor running at about 1,725 revs. and the generator at 3,500 revs. Several crystals are available so as to avoid QRM and pick the best part of almost any band. The crystals all have fundamentals in the 3.5 M.C. band. The method of using telephony is extremely interesting. Heising modulation would be too hot altogether on the poor old generator (although the motor would probably give in first) and in any case consumption of power is an important consideration in localities like this far away from the usual electric light supply. These considerations definitely rule out Heising modulation, and also rule out the use of tubes drawing large filament currents. The method of modulation employed is the Telefunken or grid control method, and this tube and input transformer, batteries, etc., can be seen in the photo (Fig. 1) just below the right-hand section of the transmitter with a switch close handy. A Radiotron UX240 or a Philips 615 tube is used and the applied audio frequency is supplied from pick-up or microphone and a speech amplifier, the latter consisting of two stages using a PM4, followed by a pentode B443, this tube being actually used as a three electrode power tube, the plate being joined to the screen grid direct. The microphone used is normally an Ericson hand-type, although a Reiss type microphone is available. A B.T.H. or Philips pick-up is employed for music transmission together with any number from a very large stock of records.

The antennæ used are of particular interest. The transmitting aerial is 136 feet long (½ wavelength for 85 metres) and is about 40 feet high. It has feeder 92 feet 6 inches in length, which length is suitable for working on all bands ,the length of the feeders being near enough to the necessary odd-quarter wavelength on any of the four bands. A

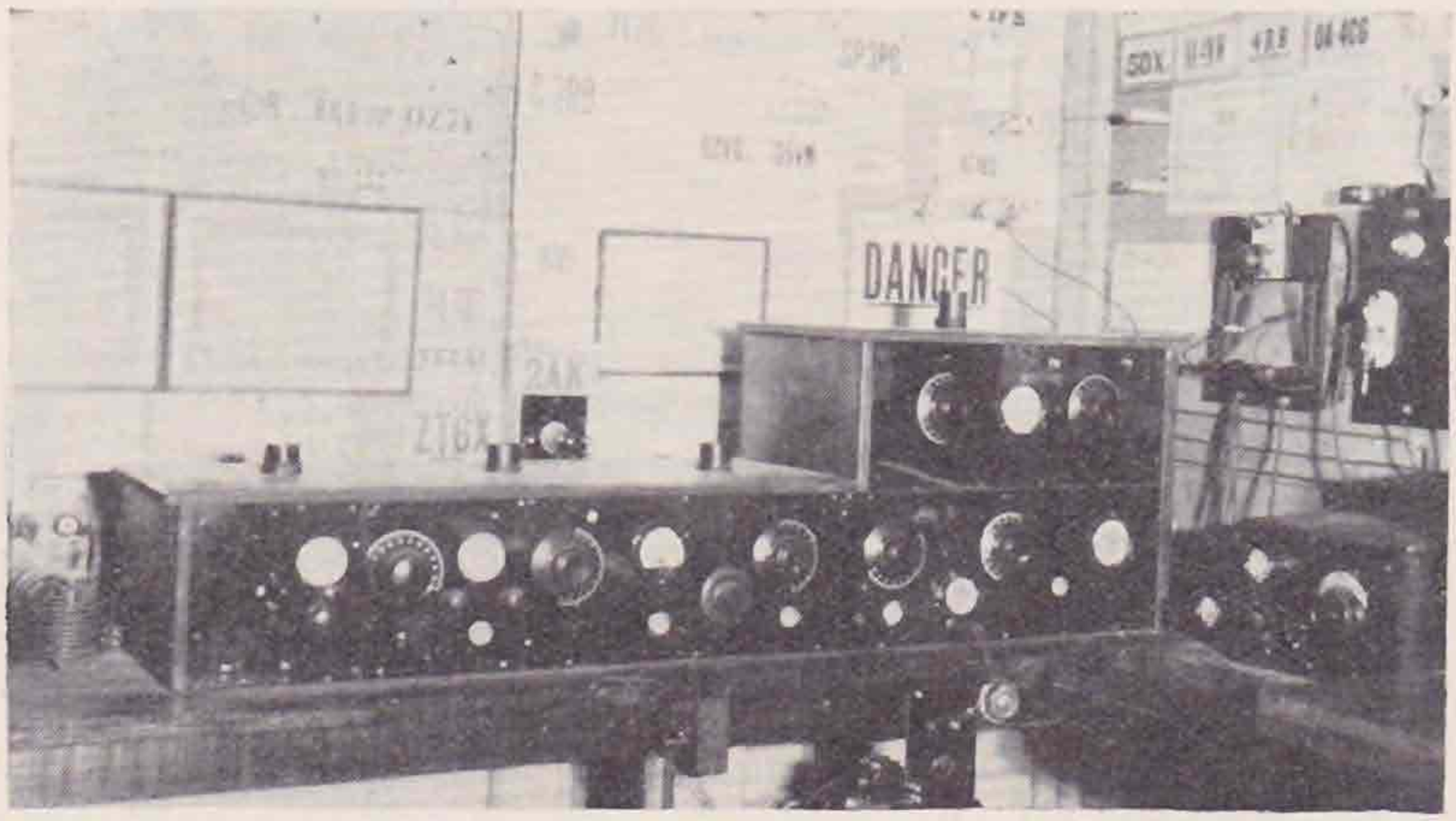


Fig. 1

This shows the 4-stage c.c. transmitter and, at the right, the dynatron frequency meter. The modulator can be seen below the transmitter.

receiving antenna of similar type is used having Zeppelin feeders as with the transmitting antenna the flat top length is 132 feet, but the feeders are 45 feet long. These antennæ, as well as being suitable for work on all bands, are particularly effective, especially the transmitting aerial, as signals from VK2HC should (and do) show.

There are three receivers, two of the short-wave variety and one broadcast receiver, the latter being in another room of the house, with a separate aerial of normal type. The broadcast receiver is rather interesting as a typical example of battery receivers as used in the country districts of Australia. It employs one screen-grid radio frequency stage coupled with a band-pass device to a regenerative detector followed by two stages of normal audio amplification with a power tube in the last stage. A four-volt accumulator supplies filament power, this being connected in series with the 32 volts D.C. house wiring, in that room, so that when the light is used the battery is being charged. H.T. supply is from accumulator H.T. batteries in 20 volt blocks which are charged in parallel from the 32-volt lighting batteries.

seen in the photo (Fig. 2) at the extreme left. This meter is of the dynatron type and uses a UX222 tube. The writer has just lately had three separate checks on a quartz plate by VK2RC, VK2NS, and VK2HC. The readings were 3646, 3645 and 3646 KC/S respectively, thus giving some idea of the accuracy of this type of meter.

A piece of apparatus that saves a considerable amount of hard work is the automatic sending device at VK2HC. This is used for extended tests of any kind—particularly on the 28 megacycle band —where the transmitter is required to run for some time without attention. It consists of a gramophone motor driving a record specially cut to send a succession of V's followed by " de VK2HC." It is rather a weird and wonderful-looking piece of work, but extremely useful, and requires no attention beyond winding it up every quarter of an hour or so.

Now some idea of the performances VK2HC has achieved will be given, and this should serve to show up the remarkable all-round efficiency which has been attained. Fifty-six countries have been worked on C.W. and twenty-four on phone. This of course includes all continents both on C.W. and

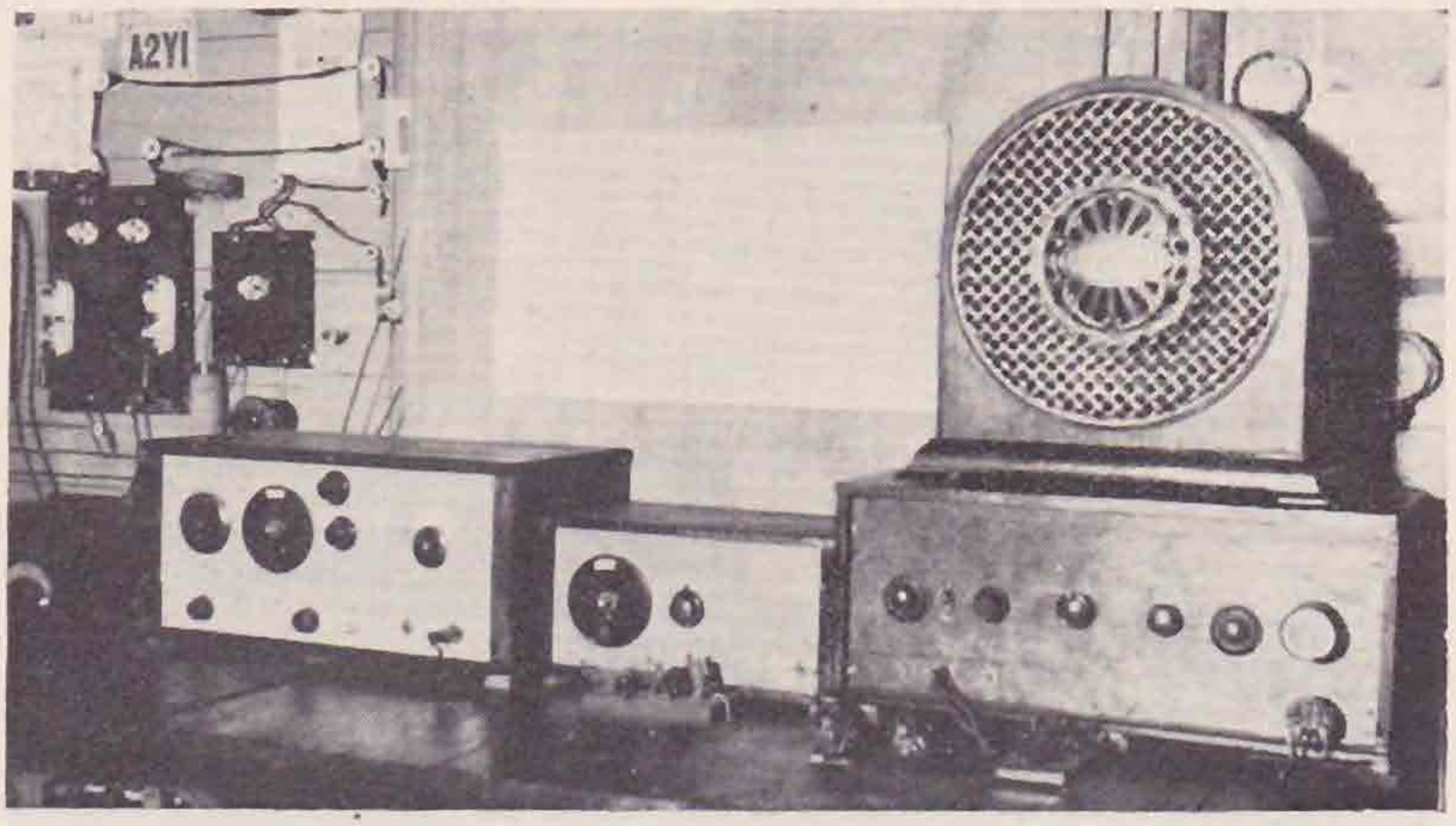


Fig. 2.

The speech amplifier is on the right with the 2-valve short wave receiver-monitor next to it. On the left of this is the 4-valve short wave receiver while, at the extreme left, can be seen the dynatron frequency meter.

The first of the short wave receivers, the one normally used, consists of one screen grid R.F., a regenerative detector and two stages of audio with phones or speaker as required. This receiver is of the conventional pattern in itself, the only unusual feature being the aerial which is used on it as already described. The combination delivers remarkably good signals, the location being rather good for reception—better than in the vicinity of Sydney—except for atmospheric disturbances in summer.

The second receiver is a two-valve affair—regenerative detector and one audio—used as a monitor for both phone and C.W., and also as a local receiver for break-in work with stations in Australia or New Zealand. Both these receivers and the speech amplifier already described have filament power supplied from accumulators and H.T. power from a set of accumulators giving about 180 volts.

What one might term the subsidiary apparatus is also of some interest. A frequency meter capable of particularly accurate work is used and can be

phone, and the W.A.C. feat has been accomplished at least twenty-six times on C.W., and two or three times on 'phone. On the 28 megacycle band some remarkably good work has been done, the most outstanding being a QSO with VK3BQ with two-way phone. VK2HC is also the first VK2 who has been QSO on 28 M.C. 'phone with third and fifth districts in Australia. The mere bald statement of two-way phone work on 28 megacycles hardly does the excellence of the work justice, but anyone who has done much work on that band will immediately realise the unusually good piece of work that was done on those occasions. Very little has been done on 28 M.C. since the QSO's mentioned—very little successful work—as things seem to have gone dead on 28 M.C. in the last few months.

In conclusion one could certainly say that VK2HC is one of the outstanding amateur stations in Australia as far as actual achievement is concerned, and particulraly so when one knows also that in country districts far from towns, power supply and conditions generally are not as good as as in the city or suburban areas.

TRANSMITTING AERIALS.

By Austin Forsyth (G6FO).

(Continued from previous issue.)

A.O.G.

The simplest form of aerial system extant, consisting simply of a wire of indefinite length clipped direct on to the plate coil of the oscillator. The translation of the somewhat irreverent term used to describe this type of aerial indicates that nobody can understand its action, least of all its owner. Though any aerial system which is being worked under obviously unnatural conditions from a theoretical point of view might be called an A.O.G., it is normally assumed to indicate the type of aerial mentioned above.

But, bearing in mind the fact that all aerials are either Hertz or Marconi systems, it must be

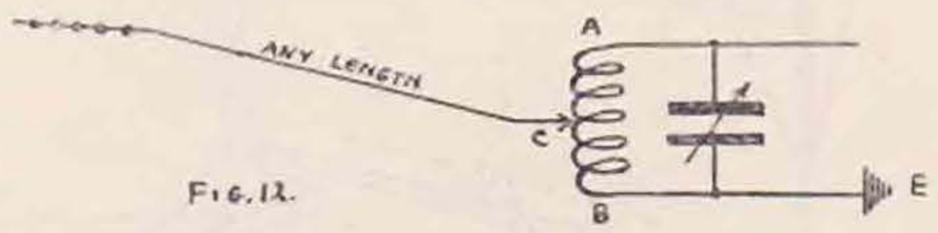


Fig. 12.

possible to define the action of an A.O.G. This term is a misnomer, because actually any such aerial, if not a kind of distorted Hertz, is always a Marconi.

Let us consider the conditions that normally obtain when the name of the Deity is invoked to describe such a system. The oscillator, if not actually earthed by virtue of some connection to the mains, as when D.C. is being used for plate supply, will under all conditions have considerable capacity to earth. Even when A.C. is used for the power supply and the transmitter will appear to be isolated entirely, some capacity path to earth can always be found. The value of this capacity will naturally vary over wide limits in given cases, probably being at a minimum when an all-battery supply is used for the transmitter. The aerial, as we have seen, is clipped direct to the plate coil. In Fig. 12 is shown an arrangement conforming to these conditions, the oscillator coil being the section AB with the aerial clipped on at C, and the tuning condenser, as is normally the case, being across AB. The section CB may be considered, then, as the aerial tuning coil, tightly coupled to AB. The fact that both these sections form parts of the same coil does not affect the theory of the operation. Now, B is at the low-potential end of the coil and it is at the low-potential end that any capacity to earth of the oscillator will be effective. Therefore, the circuit CBE forms, with the aerial tapped on at C, a Marconi-type aerial, and its coupling coil. The coil CB is tuned by the condenser across AB and the feed to the aerial is adjusted by the clip at C. Any alteration of this clip necessitates, in practice, a corresponding adjustment of the condenser to bring the system back on the original frequency; that is, variation at C results in the tuning of AB being altered, which is compensated for by the condenser adjustment. Actually, the position of the clip C depends on the length of the aerial wire and the capacity to earth present, as the coil CB couples the aerial and earth to the oscillator and the amount of coil required depends, in turn, on these factors. The action of the condenser across AB is, perhaps, easier to understand when the way the capacity across the plate coil of a push-pull oscillator tunes it to any required frequency is considered. There we have, in essence, one condenser tuning two circuits.

An improvement on this system is the arrangement shown in Fig. 13, where a wire of indefinite length is clipped to the aerial coupling coil, the latter being tuned by a condenser. This is the well-known "G6JV" aerial where the action of the radiating portion works on the Hertz principle. The aerial coupling is made of such a size that without the aerial being connected it can be tuned to resonance with the oscillator. On clipping on the wire a slight readjustment of the condenser will be necessary to compensate for the added capacity of the aerial, this adjustment being a decrease of the condenser capacity. Now, briefly, the effect of this arrangement is that in the case of an aerial of an indefinite length the whole system is tuned accurately to the oscillator frequency because any part of the wave that cannot be fitted on the aerial is accommodated on the coupling coil, which has been made large enough to tune to resonance with the oscillator when the aerial is not clipped on. In other words, a form of Hertz where any length of wire is adjusted to the correct length by the tuning of the coupling

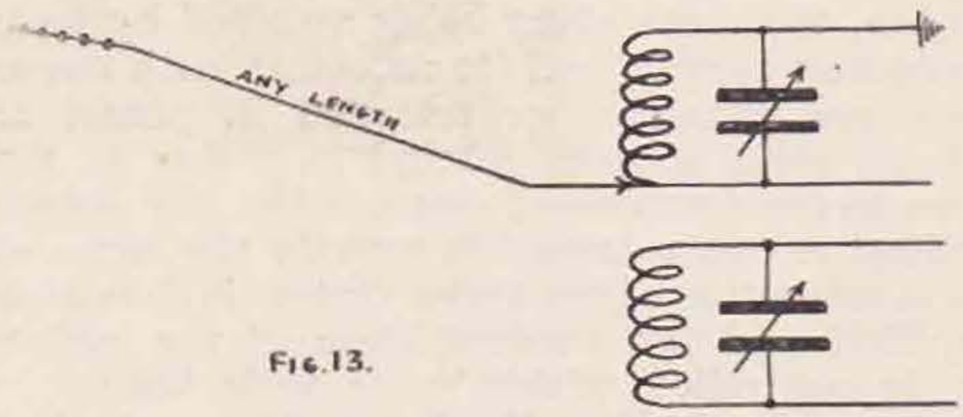


Fig. 13.

coil. This arrangement can be used with practically equal efficiency on all bands, and is a simple but very effective solution to the aerial problem.

The end V of the aerial coupling coil in Fig. 13 will be a point of maximum voltage (consider, again, Fig. 1), and will be sensitive to stray capacity effects. If a self-excited transmitter is used and any trouble is found in this respect, a simple way of overcoming the difficulty is to earth that end by connecting it either direct to earth or to the low-potential end of the transmitter. The aerial then becomes a Marconi, but with the modification that the coupling coil tunes to the oscillator frequency as we have seen. Thus, the aerial system as a whole will still tune accurately to the transmitter frequency.

This system scarcely belongs to the A.O.G.

category, but is given here as the natural development of the A.O.G. pure and simple.

In tuning the "G6JV" aerial, the coupling should be adjusted in the usual way, and it should be possible, on all bands, to pull the valve out of oscillation when a self-excited circuit is used. Having tuned for a given plate current value with the aerial on, cutting off the aerial should result in the feed current, as indicated on the plate milliammeter, falling back to a point between its reading for no load on the oscillator (*i.e.*, the coupling coil entirely disconnected) and the value obtained when the aerial is tuned. The fact that it does not fall all the way back is due to the fact that with the aerial off the coupling coil is still partially tuned to the oscillator. If this fall-back is not obtained and the feed current increases, or does not alter, the aerial is tuned the wrong side of resonance and is probably not radiating. Swinging the condenser to the other side of resonance will put things right. Incidentally, this process is a good test for finding if the aerial is working as it should as a "G6JV."

For an aerial system of the single-wire-any-length type, the "G6JV" is undoubtedly the best arrangement and is, indeed, one of the most efficient systems for all-band operation.

* * *

Beam.

This term refers to an aerial system which is designed to be highly directional, either by arranging for the radiation to be concentrated in a "solid" beam, as in commercial working, or simply by using a reflector system which improves radiation in one particular direction.

It is the latter form which is used chiefly at amateur stations, and though the methods employed at commercial stations are interesting and instructive, the reader is referred to the text-books, as the subject covers a very wide field. It may be just mentioned, however, that the theoretical form of parabolic reflector is never used in commercial practice, the same effect being attained by feeding a radiating system and its reflectors with currents which are advanced or retarded in phase, and, with an aerial system erected in a line at right-angles to the direction of propagation, the radiation obtained is concentrated in exactly the same way. The construction of the aerial system is thus greatly simplified and the concentration of the radiation can be controlled within quite wide limits.

In amateur working, the simplest form of reflector consists of a wire of the same length as the radiating wire, lying in the same plane and distant one-quarter wave from it. Thus, we might have a 20-metre half-wave aerial (33 ft. long), fed in any convenient manner, and with the roof, say, E. and W. The reflector could be parallel and 16 ft. 6 ins. away, lying on the north side of the radiating wire and at such a height that the line joining the centres of the two wires would make an angle with the horizontal. Maximum propagation would then be south and the angle of radiation would be approximately the angle to the horizontal mentioned.

Now, it will be seen that the limits to which a reflector system at an amateur station can be taken depends on several factors. Namely, space available, required direction of maximum propagation and the consideration of whether the reflector is to be adjustable, thus to vary not only the angle of radiation, but even the direction of maximum radiation.

It is probable that no amateur is using an aerial system which is intentionally directional on 20 metres, as what most require is maximum radiation in all directions. Further, the dimensions of even the simplest reflector system on that band would be such that unless the facilities on the site were exceptional, it would be extremely difficult to make the arrangement at all flexible, and, therefore, one would be practically tied to maximum radiation in one direction.

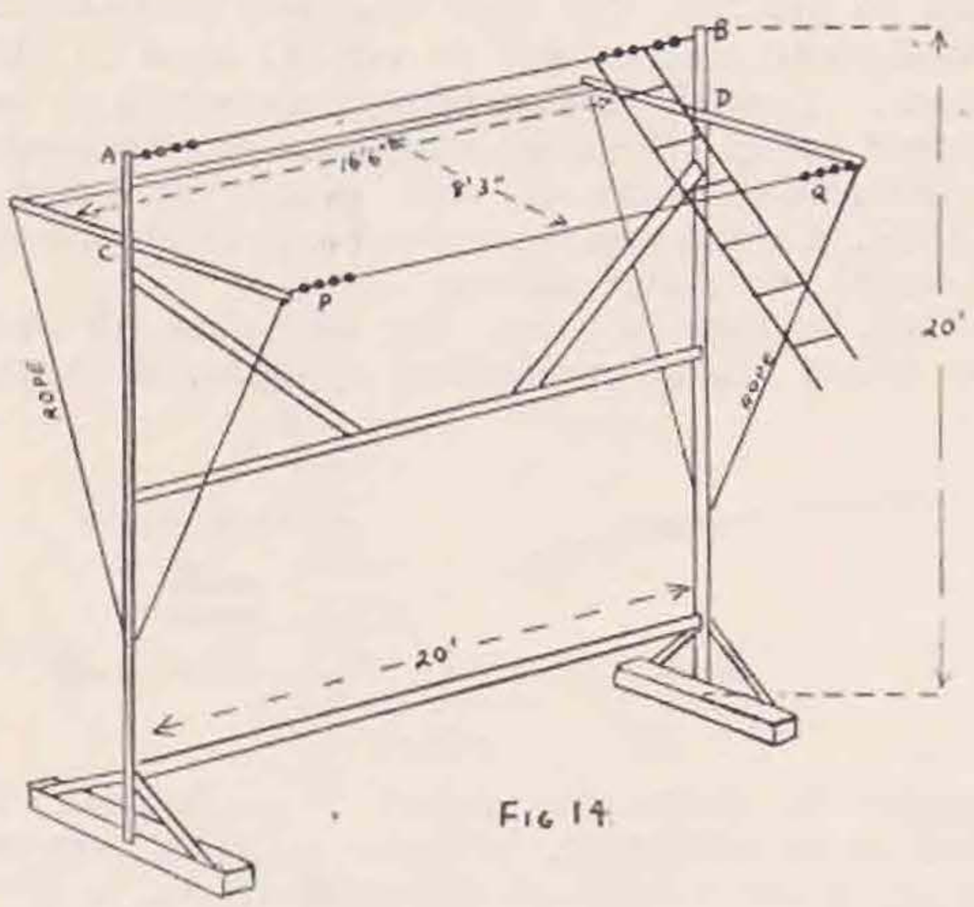


FIG 14

It is comparatively easy, however, to devise a kind of universal reflector system for 10-metre work, as the dimensions are all halved. By "universal" it is meant a system which can be made to radiate at any angle of radiation in any direction. From the results so far achieved by different stations in all parts of the world, it is fairly certain that only by some directional system can there be any consistent and satisfactory international communication on 10 metres.

In Fig. 14 is shown such a reflecting arrangement. Two uprights 20 ft. high are fixed firmly together about 20 ft. apart, the whole framework being strongly braced and the construction being entirely of wood. The uprights could be mounted on wide feet, as shown, and if the whole assembly was made of a light wood, the framework would be easily moved about, provision being made to anchor the feet by loading them with weights, or by any other method ingenuity can devise. Thus, the frame could be set up in any position. The aerial is then strung between the uprights, as at A and B, its length being calculated for a given frequency in the 10-metre band in the usual way, and fed in any convenient manner, though a voltage-feed Zepp system is shown. Two wooden laths, 12 ft. to 14 ft. long, are then pivoted at C and D, as shown. The reflector wire (PQ in the sketch) is the same length as the radiating wire and a quarter-wave away. The laths are also braced and the pivots at C and D should work easily and smoothly. Ropes attached to the laths enable the reflector to be swung through 180 degrees, as will be apparent from the sketch. Further, the line of propagation, which is at right-

angles to the length of the aerial, can be altered merely by moving the framework till the desired orientation is obtained.

Now, this question of orientation is not quite as simple as it may seem, as the shortest distance between two points on the Earth's surface is the Great Circle distance, and therefore the orientation of the frame must be such that the waves will travel along the Great Circle line. It is obvious, of course, that from such a small and simple system there will be no great concentration of the energy along this line, especially at long distances, but the maximum propagation will be in the direction of orientation, and therefore the system will have very marked directional properties. The Great Circle line is not the straight line between two points when an ordinary map or atlas is used to get the direction, so that a map of the world constructed on a Great Circle projection should be obtained, when the required bearing can be taken off with a circular protractor and straight edge. Here, again, the method will only be a very approximate one because the map would have to be on an enormous scale to get the bearing between two places accurately, but correct orientation for maximum projection in the direction of any given locality, such as, say, from the South-East of England to Tasmania, can be obtained with sufficient accuracy. To get absolutely accurate bearings recourse must be made to rather more mathematical methods, which can be found in any book dealing with surveying or spherical trigonometry.

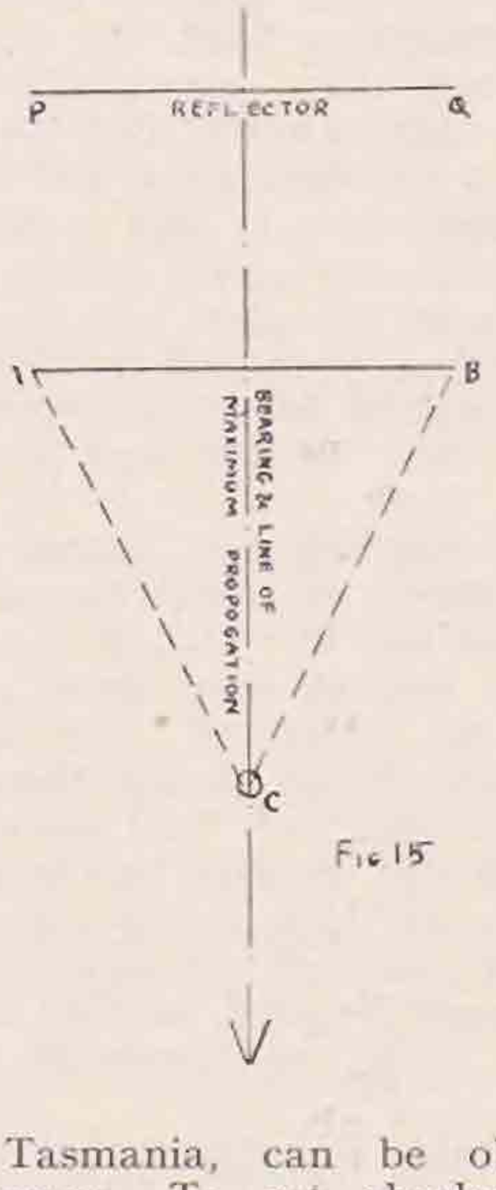


Fig 15

Having obtained our bearing, an accurate compass-needle, reading against a clear and well-divided scale, is required finally to set our aerial in the correct line. The average type of pocket-compass hung on a steel watch-chain definitely will not do. The best kind is the one known as the Miner's Dial, but is not likely to be easily obtainable. The most accurate compass that can be begged, borrowed or otherwise requisitioned should be set up some distance from the site the frame is to occupy and the required bearing set off. The centre of the aerial wire is then sighted along the compass-needle and if the instrument is not provided with sights, this operation must be carefully carried out. The ends A and B of the frame are then set by measurement, so that they are at an exactly equal distance from the centre of the needle. The frame is then orientated correctly for the obtained bearing and the reflector can be swung up to any position such that it is behind the aerial for the direction required, and the angle of radiation is then adjusted to whatever value that may be wanted. It might be mentioned that it has been found experimentally that an angle of 30 degrees to the horizontal is the most effective for propagation on 10 metres, but this must not be taken as a definite value, as it is more than likely that the best angle varies under different conditions and is certainly dependent to some extent on the frequency.

Fig. 15 shows how the orientation process is carried out by the description given above.

This aerial system is, of course, half-wave on 10 metres, and therefore could be worked as a full-wave directional radiator on 5 metres.

The success of the method here outlined for obtaining controllable directional radiation depends entirely upon the degree of accuracy aimed at in the work of setting up and operating the system, and the greater the care taken in this respect the better the results will be, but with the 10-metre band in its present state nothing can be guaranteed.

* * *

General Notes.

So far as getting DX on any band with any of the aerial systems described is concerned, the reader will know that this is not automatically achieved by designing an aerial for theroetically correct operation. Even if the aerial is working exactly as it should, DX is controlled by so many factors over which the operator will have no control that in any given case it may or may not be possible to work DX, and the only way to find out is to try. Further, there is no such thing as the *best* aerial, but there is a best radiating system for each aerial site, which can only be found, so far as most amateurs are concerned, by experiment. One arrangement will probably give the results if another does not. And there are many possible combinations to try.

The aerial is undoubtedly the most neglected feature at the average amateur station. It is difficult to see why this should be so, because it is the aerial that radiates the energy into space, not the transmitter. Yet the first thing done is the construction of the set, which is usually carefully designed and built. It is then tested and got to work at the highest pitch of efficiency. "An" aerial is then hurriedly erected, probably a copy of what someone about 100 miles away is using, he happening to be a star DX man, and the combination is fought with for a few weeks, when the transmitter is scrapped on the ground that "it's a rotten circuit," and the whole procedure is repeated till someone suggests a little attention to the aerial.

It would be far better to design an aerial system first, erected with due consideration of the local conditions, and then follow with the transmitter, which should be adjusted to feed the aerial correctly, instead of forcing the aerial to work with the transmitter.

In any given location, the angle of radiation is what chiefly governs the DX-ing properties of the aerial. If it is low, other things being equal, DX will result. But it is not easy to get any control of the angle of radiation under ordinary conditions, as this factor is influenced by many things, such as the surroundings of the aerial site, height above ground, and so on. Therefore, the explanation as to why some people, using low power and a so-and-so aerial, and other men with high power and a such-and-such, all get DX, is because they all have one thing in common, and that is the necessary low angle of radiation ; which is a matter of luck as much as anything. In the same way, there are many people who have not been able to overcome their difficulty in this respect till they blazed through it by using high power. It is not entirely a matter of a super-efficient transmitter that brings a low-power man DX (though it is a very great advantage). The man who earns his DX is the man who gets it by overcoming natural difficulties.

In all the systems described, little has been said about tuning for the reason that remarks made as regards one arrangement apply to any other, except in the one or two special cases given. Generally speaking, loose coupling should be employed and the actual distance between the aerial coupling coil and the oscillator coil should be as great as possible, consistent with proper excitation and sufficient feed to the aerial. The coupling coil should be tuned to resonance with the transmitter, not de-tuned, as is usually recommended. This point applies particularly where a driven oscillator is used to feed the aerial circuit. Apart from the easy control of aerial coupling and feed, loose coupling has the added advantage that, in the case of aerials not connected to earth in any way, the possibility of interference with broadcast is considerably reduced. In the same way, aerials which are meant to operate as unearthed systems, such as the end-on Hertz, are more likely to do so when they are isolated from the oscillator (which is invariably connected to earth in some way), and are coupled by means of a separate coil.

Some references have been made to the necessity of operating a Hertz on its actual resonance frequency, as distinct from its calculated frequency. As the resonance point is only finally fixed when the aerial is in its working position, the difficulty of getting this value can be overcome by the following method :—

The transmitter is tuned to the supposed resonant frequency of the aerial by means of a good monitor-frequency meter with the feeder clip off. The feeder is then put on the plate coil of the oscillator at any point where it will take feed, and if there is no change in frequency, as indicated by the beat note in the monitor not altering, the aerial is correctly in tune with the oscillator and, of course, its frequency is as was assumed in the first instance. If, however, there is a change in frequency, as will probably be the case, it is necessary to vary the oscillator frequency till a point is found where there is no change in the beat note heard in the monitor when the feeder is clipped on and off. This frequency, once found, should be carefully noted and permanently marked on the monitor dial, as it is valuable information.

This method refers more to the case of the single-wire fed Hertz than to the Zepp-fed arrangement, as the latter is much more flexible as regards its working frequency than, say, the "Windom." But even when Zepp-feed is used, the same way of finding the resonant frequency can be used, though the process is tedious and rather more complicated. It is necessary to re-tune on the feeders after each adjustment and to search for an oscillator frequency giving maximum current indications on the meters or lamps in series with the feeders ; this then being the required frequency.

The oscillator used for these tests must, of course, be self-excited and the frequency meter stable and reasonably accurate.

When using Zepp-fed aerials, the best method of tuning the feeders is to mount the necessary condensers and current indicators on a feeder-tuning panel, taking off leads to the aerial coupling coil, though the actual lay-out is always a matter of individual taste.

In all aerials, the mean height of the radiating portion of the wire should be such that it is not less than one-quarter wave above the ground, though this is often difficult to achieve on the lower frequency bands.

In the sketches the aerials have been shown in a variety of positions, as whether they are horizontal or sloping, straight or bent, the action is scarcely affected, though care should be taken not to bend them to such an extent that the angle between two sections is less than about 140 degrees.

When a single valve is used in the final position in the oscillator, the aerial should be coupled so that it is nearest the plate end of the coil in the oscillator. When push-pull oscillators are used, the aerial coupling must be symmetrical round the oscillator coil, as has been shown in several sketches.

The aerial coupling coil, except in the special cases given, should be about the same size as the oscillator plate coil to which it is coupled.

Single-wire feeders that show a tendency to radiate can be "doctored" by means of series condensers and chokes to get their resonant frequencies well clear of the working frequency, but there will also be some loss in efficiency.

As Fig. 1 shows, there is always maximum voltage at one or both ends of any aerial. Therefore, the insulation should be good, so that something more than "three penny egg-insulators at each end" is necessary.

It will probably be noticed that the roof-length for a Hertz as given in Fig. 10 produces a slightly different result to that obtained for the same frequency by the formula in the introduction. This is because the allowance for the "average site" effect is 2.07 in the former case, as against 2.1 in the latter. As the actual resonance frequency will not be obtainable accurately in either case till the aerial is in position, this difference is not of much importance.

Finally, I have to acknowledge reference to the T. & R. BULLETIN, *Q.S.T.*, *The Radio Amateur's Handbook*, *Wireless Telegraphy and Telephony* and to many conversations with numerous amateurs, from all of which sources combined much of the information used in the preparation of this article has been derived.

B.E.R.U. CONTEST, 1932

To the Radio Amateurs of the British Empire.

PUBLICITY SECTION,
53, VICTORIA STREET, LONDON, S.W.1.

DEAR OM's,

We have received the suggestion from so many quarters that the B.E.R.U. Contest should be held during four week-ends that the Council has decided to hold the next Contest during the four week-ends in February, 1932. Other suggestions made by Groups in the Colonies and Dominions have also been embodied in the Rules. It will be remembered that the original idea of the Contest came from New Zealand, and we hope that the Contest will again receive good support. VK2NS, of Australia, won the Trophy this year—who is going to win it next year? We think the present Rules give everyone an equal chance, and we particularly request everybody to send in their results whether they think they will get an award or not. All British stations, both transmitting and receiving, are eligible to compete, and we hope you will do so (read particularly Rules 6 and 9)

Copies of the rules, including the form on which to make your entry, are being put in loose in every copy of the November BULLETIN. In addition, all D.R.'s in Great Britain and all B.E.R.U. representatives abroad will receive supplies.

The few simple Rules are printed below, and if you are uncertain on any point, or have not an entry form, will you please write to the B.E.R.U. representative in your country or nearest to you.

With best wishes for 1932.

ARTHUR E. WATTS (G6UN),
Acting Vice-President and Hon. Publicity Manager.

RULES FOR B.E.R.U. CONTEST

To be held during Four Week-ends in February, 1932, commencing at 12.00 G.M.T. on February 6, 13, 20, 27, and ending at 24.00 G.M.T. on February 7, 14, 21, 28, respectively.

1. Any licensed amateur wavelength may be used.

2. One point counted for each 1,000 miles or part of 1,000 miles for each Station worked, but if the same Station is worked on two of the bands, two points are counted for each 1,000 miles or part, and if three bands, three points for each 1,000 miles or part. Distances measured by Great Circle. Thus a QSO of 950 miles counts 1 point, a QSO of 3,150 miles counts 4 points. Two QSO's of 3,150 miles with the same Station on different wavebands would count 8 points, etc. The total obtained in this manner will be multiplied by the number of Groups worked.

3. To be valid, Stations worked must be in a different part of the Empire from where the Station competing is situated.

For this Competition the Empire is divided into the following Twelve Groups:—

(1) British Isles.
(2) Canada, including Newfoundland and Nova Scotia.
(3) West Indies, including Bahamas, Bermuda, and British Guiana.
(4) South Africa, including N. & S. Rhodesia.
(5) Kenya, Uganda, and Tanganyika.
(6) Egypt and Sudan.
(7) Iraq.
(8) India, Burmah and Ceylon.
(9) Malaya.
(10) Hong Kong.
(11) New Zealand.
(12) Australia.

4. British Stations not actually situated in the British Empire may compete and will be considered as being in whichever of the Groups mentioned in Rule 3 they are nearest to.

5. The winner to be decided by the points mentioned in Rule 2.

Everyone competing is required to send to the B.E.R.U. representative in his country or to the Hon. Secretary, R.S.G.B. and B.E.R.U., 53, Victoria Street, London, S.W.1, a list of Stations worked (listed as shown below). If a continuation sheet is required, please rule it in the same way.

All entries must reach your B.E.R.U. representative by March 15, or if sent direct to London, by April 30, 1932, which is the final date for receipt of entries.

6. All members of the B.E.R.U. are eligible to compete, and anyone not a member at the commencement of BRITISH EMPIRE RADIO UNION CONTEST may compete, providing he sends his application for membership and subscription with his entry.

7. A maximum of 10 contacts on each wave-band will be allowed with Stations in any one part of the Empire as defined in Rule 3.

8. The premier award is known as the B.E.R.U. Challenge Trophy, and will be competed for annually. Awards will be made to the winning Transmitting and Receiving Stations in each Group.

9. The awards for Receiving Stations will be in accordance with the foregoing Rules, but with the following addition, the Station called as well as the Station calling must be stated for every point claimed. Only Receiving Stations will be eligible for these awards.

10. Will all B.E.R.U. Groups or individuals in the Colonies and Dominions please send any suggestions they wish to make for the 1933 Contest.

B.E.R.U. CONTEST, 1932 (*Specimen Entry Form*)

Full Name and Call Sign .....
Address .....
Transmitter .....
.....
.....
Receiver .....
Power Used During Contest .....
Aerial .....

DATE.	Time G.M.T.	Station Calling (for use of Receiving Stations only).	Station Called.	Waveband.	Station Called. Signals.			Station Calling. Signals			Group of Station Called.	Distance in Miles. Great Circle.	Points Claimed for each QSO.
					QSA	R	T	QSA	R	T			

A FEW YEARS ON 45 METRES AND 7 M.C.

By M. W. Pilpel, G6PP.

IT was suggested to the writer some time ago that an outline of the vagaries of the 7 megacycle band might be of interest to newcomers to the game, and it was with the object of acting on the suggestion that this article was written. No apologies are made for going over old ground, and while experienced amateurs will find little or nothing new in the following paragraphs, it is felt that there must be a comparatively large number of BRS's and new transmitters who may be able to glean a few hints, and it is to them that this article is addressed.

The writer's experiments on the high frequencies extend over a period of some six years, and although it might be thought that an enormous amount of definite data could be collected in that time, it must be admitted that this is hardly the case. True, a large number of observations have been made and copious notes taken, but general conditions have varied to such a great extent during the period mentioned that one hesitates to make any definite assertions in print. If the tolerant reader will bear this in mind he will be able to understand any apparently conflicting statements which may arise in the course of the article.

Experiments were started in the winter of 1925-6, but were confined to the receiver as transmitting facilities were not available. At about that time the old 45-metre band was coming into its own, although it was by no means so congested as in later years. It was noticed that during the daytime British and North-Western European stations could be received with great ease and were scarcely ever affected by serious fading ; in fact, during the hours of daylight such a thing as complete fade-out was either unknown or of exceedingly rare occurrence. As the day wore on rather more distant transmissions began to make their appearance, and about half-an-hour after dusk all the nearby stations faded out, this often happening with great suddenness, the band being full of British, French, Germans and others at one minute and five minutes later there was comparative quiet, only the more distant signals remaining. By about 22.00 G.M.T. the North Americans came through well on their 36-40-metre band, and on 32 metres South Americans were often to be heard at good strength, but it was noticed that on nights when North Americans were loud, Brazilians, Chilians, etc., were inaudible, or at any rate very scarce and weak. On other nights when the South Americans pounded through hardly a sound could be heard from the U.S.A. apart from 4th district. This fact is mentioned because the rule does not seem to hold good nowadays when PY's and WI's are frequently heard side by side.

In the late spring of 1927 G6PP first took the air, and, as happens in nearly all cases, considerably more time was devoted to radio than hitherto. Conditions during that summer and the following winter were, to the writer's mind, the best since the advent of short-wave amateur radio, and this opinion is known to be held by many other transmitters who were active at the time.

In the summer it was found possible to communicate with British stations up to a late hour, long after darkness had fallen, and at the same time to connect with amateurs situated at distances of 1,000 miles or more. Fade-out did not occur until the early hours of the morning ; in fact, G's were often heard and worked as late as 24.00 G.M.T. It will thus be seen that skip did not exist except for a few hours before dawn. Towards the winter things began to change, and by November it was impossible to hear or work any stations nearer than about 800 miles after 19.00 G.M.T. Instead, it was contemptuously easy to connect with, say, Portugal or Finland at almost any hour after the time mentioned, although quite low power, 2 to 3 watts, was used ; indeed, there was hardly a night from November to March when an R6 report from Lisbon could not be relied upon.

In the spring of 1928 several contacts were effected with U.S.A. when using slightly under 5 watts, and most of them were between the hours of 22.00 and 24.00 G.M.T. When comparing these results with those obtainable now, it must not be forgotten that while in those days there was no American interference to contend with, that created by Europeans was considerably worse than it is at present owing to the bad notes on the air, raw A.C. being the rule rather than the exception. From February till April fade-out occurred between 18.30 and 20.00 G.M.T., and skip distance was usually about 800 miles, but in the summer of 1928, as in the previous year, skip was hardly ever noticeable until the early morning.

The following winter things began to take a turn for the worse. During the autumn it had become rather difficult to connect with British stations after dark, but this was put down to local effects. When winter came, however, it was noticed that at times conditions were very peculiar. It was possible to work Spaniards, Swedes, etc., during the afternoons in broad daylight, a thing that had been regarded as a very great feat a year before. On some evenings, too, a complete fade-out of nearly all signals occurred, so that only very local contacts could be effected.

On January 1, 1929, the great change over from 45 metres to 7 megacycles took place, and there was widespread anxiety to see whether the new frequency would exhibit different characteristics to the old one. Conditions improved at about the same time, and everybody was congratulating everybody else on the marvellous new band. It should be noted that no contacts with U.S.A. were made from G6PP during that winter, although as nearly identical conditions as possible were produced at the transmitting end to those obtaining the previous year, and even a slight increase of power yielded no result. Another spell of poor conditions set in with the summer of 1929, and contacts with nearby stations were very difficult to effect after dark. Skip was noticeable in the evenings in contrast to previous years, and was mostly about 500 miles compared with 800 in winter.

Conditions remained bad for many months; by bad it is meant that they were worse than the experiences of previous years would lead one to expect, and they did not show any appreciable improvement until March, 1930, when there was a very bright period. All too short, however, for the following month saw the start of the very worst patch of conditions that the writer has experienced or hopes to experience. From April till September it was an utter impossibility to arrange a schedule with any station further away than five miles and be quite sure of keeping it. This is, of course, from the point of view of the 5-watt station, as high power might have cut through anything—then, again, it might not! It is a fact that on more than one occasion the writer found to his dismay that a similar transmitter to the one which had established contact with America two years previously was incapable of putting readable signals over a distance of eight miles. During the day it was generally difficult to work any British stations, but there was often a skip of about 500-600 miles in the late afternoons, increasing to 1,000 miles soon after dark. Apart from this, contacts were frequently hard to maintain, even though they could be established, and many times signals would fade out at both ends without warning, this pointing to the skip varying from minute to minute. There was some improvement as winter approached, but things were not really good until April, 1931, when they brightened up and remained in that state till the first week in June.

There must be a good reason for these widely varying conditions, and there is one theory which fits in very well with the effects observed. This is the sun-spot theory, and without going into details, it is very briefly that during a period of maximum sun-spot activity conditions on high frequencies are good, while during a "minimum" they are the reverse. The complete sun-spot cycle takes 11.1 years (disregarding the greater cycle of 33 years), and a maximum of activity last took place in 1927-8, the winter of Utopian conditions. We are, as will be seen, rapidly approaching a minimum which is due in 1933, and conditions are undoubtedly deteriorating year by year with certain exceptions. It has recently been stated that there is a minor peak of sun-spot activity every 15 months or so, and this has coincided with uncanny regularity with the bright patches already mentioned, namely, January, 1929, March, 1930, and April to June, 1931. Working on the assumption that the minor peak takes place, it seems probable that the next bright spot in conditions can be expected some time about May, 1932, and an all-round improvement soon after 1934, reaching the zenith in 1938-9, but the writer would not like to commit himself on this point, as so many theories in connection with radio have already been exploded.

In conclusion, it may be said that, as a rule, under normal conditions the following peculiarities may be expected to be encountered when working on the 7 M.C. band. Skip: January to March, day 200 miles, night 800-1,0000 miles; April to September, day none or occasionally 50-100 miles, night 500-800 miles; October to December, day 100-200 miles, night 1,000 miles or more. Fade-out: Spring, 19.00 to 21.00 G.M.T.; summer, 21.00 to 23.00 or even later; autumn, 21.00 to 17.00; winter, 17.00 to 19.00. These figures are only approximate, and may vary somewhat with unusual conditions.

It is to be hoped that a few of the newer members of this society will have found some point of interest in this article, in which case its purpose shall have been achieved.

SOCIETY CELEBRITIES No. 2.

STRAY.

One lightship skipper to another off the East Coast (speaking slowly): "Are you there, Jim? I said I loike to hair them amater fellers a'wark'n on Sunday noit. Wunnerful interest'n."

DESIGN OF POWER TRANSFORMERS

(*Continued from page* 146).

vice versa, but the values in the table will give a transformer with the minimum cost and high efficiency.

If a transformer with a small core and a large number of turns is used, the iron losses will be small, but the copper losses will be great, and also the regulation will be bad owing to the high resistance of the windings.

Regarding the assumption for the efficiency, it is safe to take from 75 to 85 per cent., the smaller value applying to the smaller transformers.

Table II gives the properties of copper wire which will be found necessary. If a winding to carry a large current is required, so that wire thicker than 16 S.W.G. is needed, it is often simpler to wind two or more windings of thinner wire in parallel.

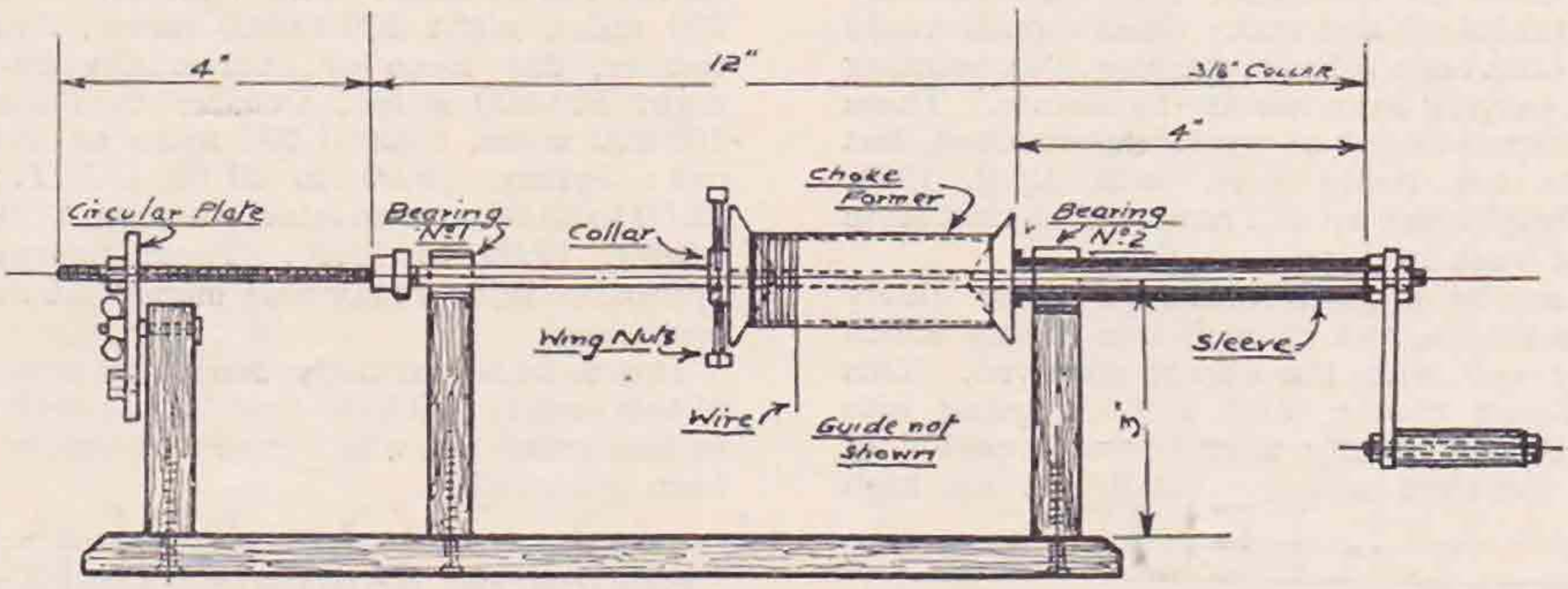
Note that the current densities assumed in the case which has been worked out are purposely on the low side. In cases where expense is of prime importance and bad regulation is unimportant, the current density in the inside winding may be increased to about 1,400 amps. per sq. in., and that in the outer windings to 1,800 or 2,000 amps. per sq. in. In this case the transformer will run fairly warm.

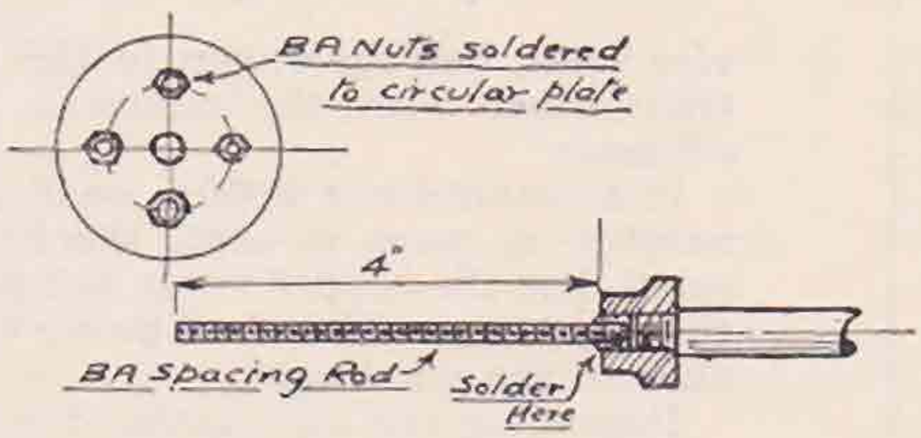
(*To be continued.*)

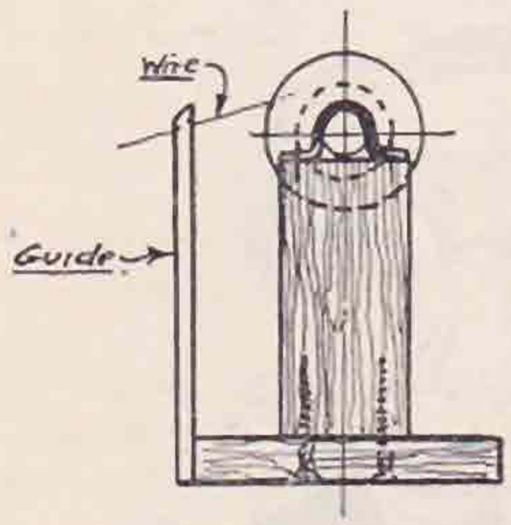
A UNIQUE WINDER FOR H.F. CHOKES.

By W. H. Heathcote (ZT6X).

SPACED wound H.F. chokes are easily made when a screw-cutting lathe is available. Seldom, however, do these expensive items form part of a ham's equipment, so I trust the following description of a machine which has been used by the writer for some considerable time for winding these chokes will be of assistance to our hams. Most of the material necessary will be found in the junk box, but even if all of it has to be purchased the cost would not exceed a couple of shillings. As spacing the windings decreases the distributed capacity of a choke, and, what is more important, raises the breakdown voltage at the end turns, where the voltage per turn is always highest in a transmitter of any power, the time spent in making this machine is well worth while.







SPACE-WOUND CHOKE WINDER
ZT6X

On reference to the illustration it will be observed that a lateral motion of the former is obtained when the handle is turned in a clockwise direction. The B.A. nut soldered to the circular plate, through which the spacing rod screws, moves the choke former along, the amount of travel per revolution being dependent on the pitch of the thread on the B.A. spacing rod.

Baseboard and Bearing Supports.

A piece of wood 16 ins. by 4 ins. by 1 in., say, will serve nicely as a baseboard. To this two blocks of wood to carry the bearings are screwed—these are $2\frac{3}{4}$ ins. in height by 3 ins. by $\frac{1}{2}$ in. One is fixed about $\frac{1}{2}$ in. from the edge of the board and the other 8 ins. further. Another block of wood $2\frac{1}{2}$ ins. in height by 3 ins. by $\frac{1}{2}$ in. is mounted 4 ins. distant from the second block, and to this is fixed the circular plate.

Main Shaft.—A piece of 2 B.A. rod 12 ins. in length screwed $\frac{1}{2}$ in. at one end and, say, $1\frac{1}{2}$ ins. at the other will answer the purpose.

Sleeve.—The purpose of the sleeve is to enable the choke former to be inserted and removed with a minimum of trouble. A glance at the illustration will show that if the main shaft is released from the socket (to which the spacing rod is soldered) it is only necessary to slacken the wing nuts on the collar, when the main shaft can be instantly withdrawn, thus releasing the choke former. The sleeve is 4 ins. in length and of sufficient diameter to enable the main shaft to pass freely through. Although not clearly shown in the illustration, a collar about $\frac{3}{8}$ in. in length is soldered over the end of the sleeve nearest the conical disc. Without this collar the tubing has a bad habit of cutting into the disc if the latter be made of ebonite or other soft material.

Bearings.—Both of these are $\frac{1}{2}$ in. in length. No. 1 can be a piece of tube similar to that used for the sleeve. No. 2 will have to be large enough

in diameter for the sleeve to pass through. The bearings are soldered to brass "saddles" and screwed to their respective bearing blocks.

Spacing Rods.—Four pieces of rod 4 ins. in length, of 2, 4, 6 and 8 B.A., are soldered to 2 B.A. sockets, which, by the way, were obtained from 2 B.A. terminals. Care should be taken to see that sufficient space is left after soldering for the main bearing shaft to screw firmly into the socket. A simple way to ensure this is to screw a piece of wood half-way through the socket, which is then placed upright in a vice with the spacing rod as near the centre of the socket as possible. The solder is then run in the case of the smaller-sized rods, into the surrounding cavity.

Circular Plate.—A disc of 10 gauge brass 3 ins. in diameter will be suitable. Holes slightly larger than the B.A. spacing rods are bored $\frac{1}{2}$ in. from the centre. Through the centre a hole is bored to enable the plate to be held in position on the supporting block of wood by means of a small bolt and wing nut. Solder B.A. nuts corresponding to the gauges of the spacing rods used over the holes already bored for that purpose.

Handle, Collar and Guide.—The handle is very simple and needs no description. A 2 B.A. nut is soldered on the side nearest the sleeve. The one shown on the outer side can be the top of a 2 B.A. terminal and merely acts as a locknut. The collar is about $\frac{1}{4}$ in thickness, holes being bored and tapped at opposite sides for the wing nuts. The guide can be made of either wood or ebonite, notches being made with a file every $\frac{1}{8}$ in. or $\frac{1}{4}$ in. along the top. The reason for this will be explained later. The conical discs can be of tin, wood or ebonite.

After the shaft, discs and choke former have been placed in position, the wing nuts on the collar are tightened up. On turning the handle pressure on the sleeve will centre and tighten up the former, after which the locknut at the end of the rod can be fitted.

The machine as described above will only make a winding up to 3 ins. in length. Two chokes could be wound and placed in series if it was desired to wind a choke on a former of over, say, 2 ins. in diameter. Ebonite or fibre tubing cut into lengths of 4 ins. are used by the writer as formers. At $\frac{1}{4}$ in. from each end a hole is drilled and a valve leg fitted. The bases are made of ebonite strips to which valve sockets are fixed to correspond with the legs on the tubing. All chokes coils are thus interchangeable.

2 B.A. rod has 30 turns to the inch, and 4, 6 and 8 B.A. have approximately 40, 50 and 60 turns respectively, so chokes of 90, 120, 150 and 180 turns can be wound.

When winding chokes of, say, 100 turns, to increase the distributed capacity it is a good idea to use the 6 B.A. spacing rod, and, after winding 25 turns, the wire is removed to the next notch cut on the top of the guide. The same procedure adopted after each 25 turns have been wound. The result is sectionalised spaced choke.

A number of improvements will suggest themselves to hams. In fact, I have made several myself, but in order to make things as clear as possible I have shown and described only the machine as originally made.

AMATEURS ASKED TO ASSIST.

Non-stop Flight to Cape Town Planned. *Short Wave Equipment To Be Carried.*

WE have received the following letter from The Air Ministry asking for our co-operation in a non-stop flight to Cape Town.

Air Ministry,
London, W.C.2.

Dear Sir,

On or about November 22 Squadron-Leader Gayford is attempting a non-stop flight to Cape Town in a long range monoplane. The machine in question will be fitted with a short-wave transmitter (master oscillator) operating on a wavelength of 33.71 metres (8,900 K.C.).

Transmissions will be made from the aircraft in flight every two hours at the even hours commencing from 06.00 at the start.

These transmissions will take the form of CQ, CQ, CQ v GEZAA—position (repeated three times).

In the event of a forced landing being imminent the aircraft will transmit the following: SOS, SOS, SOS v GEZAA—position (repeated three times).

I wonder if you would be good enough to publish this information in your journal in order that all British amateurs who care to do so can follow the progress of this attempt on the world's non-stop flight record. Any messages received may be posted to Head of Signals, Air Ministry, Kingsway, W.C.2.

In the event of a distress call being intercepted the information should be immediately telephoned to Holborn 3434, Ext. 383, or communicated to the Air Ministry as soon as possible.

With many thanks,
Yours faithfully,
R. F. DURRANT.

The Secretary,
Radio Society of Great Britain,
Victoria Street, S.W.1.

Members have in the past been dubious as to whether their licence permits them to intercept, and to send on by post or otherwise, messages intended for a third party, of a type likely to be received from the aeroplane, as their licences strictly forbid the handling of anything except purely experimental messages. In this instance, however, the Post Office have stated that no objection will be raised to any such messages being sent direct to the Air Ministry. It must be realised, though, that *no message, or its purport, shall on any account be passed to the Press, or to any other person, or body, than the Air Ministry.*

CONTACT BUREAU NOTES.

By H. C. Page (G6PA).

THIS month finds me with practically nothing to record. For some unknown reason no one has sent me any items of news for publication, a most unusual state of affairs. This being the case, I want to take the opportunity of saying a few words to all C.B. members. It is becoming increasingly apparent to me that quite a number of the members of groups have lost sight of the reason for their formation. May I be allowed to remind you for a moment of the real aim of the Group System. Briefly it is this : six members are banded together to study some particular branch of radio work ; they are not there just to carry out general experimental work, but to put all their energies into the consideration of one special part of the subject. As a good example of what I mean I would ask you to study very carefully the proceedings of the groups working on Fading and Blind-spotting. While many of you may not agree with some of their statements, I am sure you will agree with me that they stick to their subject all the while.

I very often see, in reading the group reports, that G6XYZ has now changed his aerial, or some part of his apparatus for some other type of aerial, or apparatus. That is quite in order. He should be trying new things all the time, but for his work to be of any value to Contact Bureau (and you must remember that the membership is supposed to be helping one another by the exchange of views), he must state fully his reasons for so doing. If he just makes the change without any real reason, then his work is of no value to us. The clear statement of one's reasons for any change immediately lifts one's work from the stage of "cut and Try" to the realms of serious experiment.

When I am reading through the material sent in for publication I often come across highly controversial statements. I publish these on purpose, so that you may have a chance to start a discussion among yourselves. Doubtless you do have these discussions. Now what about giving me a chance to publish your replies in the Notes. Do nót be afraid to say what you think. No one will respect you the less for stating your views, even if they are proved to be incorrect at a later date.

I hope that you will forgive me for writing in this strain. My excuse must be a great desire to see Contact Bureau grow to be of even greater value to us all.

Group Reports

28 M.C. Work.

G6VP, Group Manager.

Group 1*B*.—G5SY says that although he has been on regularly, he has heard no DX, with the exception of commercial harmonics. On October 4, 1931, he heard an old friend, G2FN, calling test. This, however, later on proved to be an harmonic of 7 M.C. The distance was 30 miles. He states that his members do not consider the reception nor the working of local stations worth reporting, and that their silence does not therefore imply any lack of interest or that they have not worked on the band.

G6WY is to work on the band again, and a new transmitter, using a locked T.P.T.G., from a 7 M.C. crystal, is in course of construction. He intends using an LS6A with some 500 volts on the plate.

Group 1*C*.—As usual G6VP has been on regularly but beyond local work has nothing new to report. Some tentative work on aerials has been carried out, but no conclusive results have been possible on account of no distant stations heard or worked.

G6WN.—Although they state that other matters have prevented them from putting in as much time on 28 M.C. as they would have wished, their log again bears testimony to their work. A half-wave semi-vertical aerial is to be tried next. Schedules with ST2D and W2AGX were without result. Here is their log : September 20, heard G6VP, G6YK, G5VB, G2BM ; October 4, heard G6HP, G6XN, G6NF, G2OL, G2BM ; worked G6LK, G5YH. October 11, 1931, heard G5BY, G2BM, G5SR, G6VP.

G5MP is new to the frequency but seems to be getting away quickly and gives some details of his receivers, which employ two stages of peaked L.F., the frequency being about 1,000 cycles. L is the secondary of the ubiquitous Ford spark coil timed by parallel condenser C. He, however, omits the value of this capacity.

A screened grid valve as detector employs the normal grid input circuit, obtaining reaction from the screening grid. The anode is coupled to the grid of the 1st L.F. valve by the conventional R.C.C. system.

One interesting point is that the screen grid potential can be varied between 40 and 200 volts with no difference to the smoothness of the reaction control.

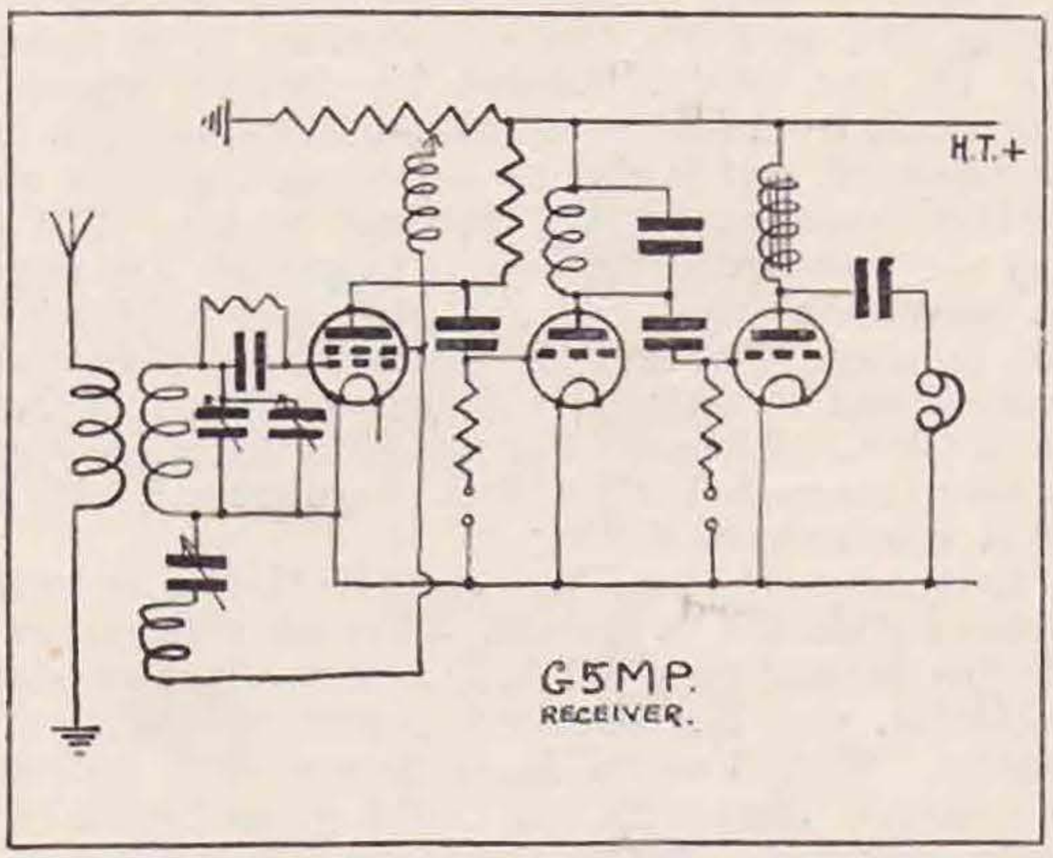
He is interested in the single wire feeder $2/2\lambda$ Hertz, viz., the "Windom." Many hams are reverting to this type, which was ousted by the more easily designed Zepp, but which nevertheless seems to be an unparalleled DX getter *when* properly adjusted. G2XH has been rebuilding and has no active work to report in consequence. BRS588 has kept some of VE2AC's skeds without result. Alterations to his receiver have also been undertaken. G6LK sends in his first report. He is using a O-V-1 Schnell with pentode output. The grid coil is 14 turns 2″ dia. series tuned. His transmitter is an Ultraudion-DET 1 and 500 volts of dry batteries. He has done quite a lot of work on aerials and notes how the strength of received stations have varied amongst themselves according to the type in use. When he used one 66 ft. long, he used to QSO G6HP (30 miles) constantly during 1930 and early 1931 ; but states that he cannot raise anyone on it now, although he receives G6HP, R6, G6VP R6, G6WN R5. He next tried a 33 ft. top feed 11 ft. from centre (another Windom), but still without result, but G6HP was R9, G6VP R6, G6WN R3. The next one tried was 99 ft. but the strength of all signals was down, G6HP R3, G6VP R4, G6WN R5 (another day ?). He has worked G6WN and G5CM. Coming back to the band after a long absence he is up against the inferior conditions of the moment. A few years ago anyone could do things on 28 M.C., but to-day very few can, and then only when conditions permit.

G5VB has been adjusting a new transmitter and complains about the performance of his DET 1. I can assure him that this is not general of the type. The valve is an exceedingly good one, the only fault likely is excess of excitation. He is CC on 7 and 14 M.C. already and is building for CC on 28 M.C.

Group 1F.—BRS25 has done some listening but only heard local G's and "umpteen commercial harmonics." This is interesting, as the WN's have not heard a single one during the last month, nor have I. He comments on last month's wonderful log of the WN's and also wonders whether the whole of the 127 stations were genuine 28 M.C. signals or harmonics. He has heard: *Genuine* 28 M.C. sigs., G's, 36 (32 confirmed by QSL). DX, 62 (48 confirmed by QSL). Harmonics, 36, making a grand total of 134. He has a vacancy in his group. He complains of lack of reports although G6HP and G2DZ have been heard working.

I understand that G5LA was heard in OK on the 18th. By the way, is LA in any Group yet?

To conclude these Notes, may I again ask you all to support your centres. Do please show some appreciation of the work these men are doing for you.



Fading, Blindspotting, and Skip.

G2ZC, Group Manager.

Group 2A.—G6MB is now G.C. in place of G6NK, who has retired from the group. G6MB reports that 2A have some new ideas, one being to give the BRS members some observation work on certain fixed stations. The majority of the group think that weather does not affect wireless, save in the case of thunder-clouds. The theory of tides in the upper layers seems to find favour in the group, and the question is to form a discussion at an early date. It has been suggested that if radiation possesses the property of inertia (mass), the depth of penetration into the Heaviside Layer would depend partly on the power of the station, and thus in turn, skip might vary with power. 2A would be glad to have opinions from others if anyone can give a definite ruling whether radiation does possess this power, and any reports will be welcomed by the G.C.

Group 2B.—The group are concentrating on a cure for fading, and also on the effects of earthquakes on wireless signals. There is now little doubt that earthquakes do have a decided effect, principally in raising the skip in the higher frequencies. The group are collecting evidence of any earthquakes recorded, and it is hoped to publish a full list, either next month, or the month after, of every recorded earthquake of recent times, and it is hoped that with the co-operation of other hams who might be interested, and who keep notes in their logs, as to conditions on the various bands, to compile enough evidence to show the general effect of such 'quakes. G6YL has kindly taken over the collection of any records, and any matter connected to the subject, might be sent to her direct.

We have had valuable data supplied by VU2FX, and would like to acknowledge, with thanks, his very full reports, We should be very glad to have similar reports from any of our B.E.R.U. stations, and such reports can either be sent to G6YL, or to any of the group. The members are: G6YL, G6PP, G2IM, G2ZN, CT1BK, G2ZC, and our hon. member ex-CT1BK (Brazil).

Group 4A (3·5 M.C. work).—Reports this month seem rather scarce and those that are in report very little work done, apart from the usual Continental contacts. Conditions as a whole appear to be looking up but everyone is still complaining of static.

G2XS has been on the band throughout the month and has found conditions fairly good. Is now building a new C.C. transmitter for this band. G6WY has fixed a schedule with ZL4BT on 7 M.C., and will get the station to listen for him on 3·5 M.C. Is using a S.G. valve as detector with reaction control by condenser and resistance on the screening grid. and says this solves all T/H and A.C. hum troubles. G2KB has been testing out his new transmitter and says it is working very well. Is now using only one L.S.5 in PA and is finding greater efficiency than with 2 in. parallel. G2WP has been carrying out tests with ¼ wave A.O.G. aerial and to his surprise has succeeded in getting out well over Europe. Has noticed some peculiar skip effects on G stations lately. G6FO is regularly on the band and says that QRM looks like getting as bad as 7 M.C. soon. Has considerably improved his receiver by employing an old Cosmos AC/SG valve as detector, heater running off batteries. G2XT reports very little doing and finds that DX is non-existent and even SP, EU and FM very weak. Is only able to use the band outside B.B.C. hours owing to interference. BRS408 reports conditions steadily improving, static having decreased. Says atmospherics appear to be lowest when wind is easterly and temperature low, and highest when wind westerly with higher temperature. G6RB has been on a good deal both in the daytime on Sundays and at night during the week. Has noticed that skip distance this year is greatly increased compared with corresponding period last year. During the past few weeks there appears to have been a complete fade-out of G stations after about 22.00 G.M.T. G.M. would like to mention that a second group is now running on this band with G2KB as G.C.

QRP Work.

G2VV, Group Manager.

Group 8B.—G.C. G2VV has been busy improving his receiver and finds that a S.G. valve used as a detector is a big improvement. Has been testing out chokes wound to a quarter of the working wave and finds that the no-load M/A are lower than when

using a choke of no special dimensions. Has been busy looking up 28 M.C. work and will shortly be on the air with a 28 M.C. Ultraudion with 5 watts input and asks for reports! Reports conditions greatly improved on 7 and 14 M.C. and also increase of QRM! G6PV has been trying out a 66-foot AOG against the 33-foot VF and likes the 33-foot better for all-round work on 7 and 14 M.C. Has also been working on 2 watts, testing a DE4 with 6 volts on the filament against a PM6 and a CT25X, and thinks the PM6 is most satisfactory. Notices improved conditions. G6SO reports conditions about the same as usual, not too good! Has been testing fone on 1.75 M.C. Work on the 3.5 M.C. band has been rather curtailed by bad QRN. Complains of lack of G stations heard on the latter band. Has heard G5BJ of Birmingham, on 14 M.C. when G5BJ was actually working on 56 M.C.! Strength was R3 and tone C.C. 2ANU has at last put in for a full ticket and is awaiting the verdict! Has been trying grid control fone and finds the quality very good. Enclosed interesting circuits for budget circulation.

Group 8C.—G.C. G5PH sends in a report after four months' silence! Has been spending much time in grinding crystals for 7 M.C. work and is now using a COPA outfit. The input to the CO is 1.5 watts at 150 volts, and the PA has 5 watts at 300 volts to a LS5. Also has TX arranged as per the G6HK C.C. for quick change to MOPA. Crystals used are 7 M.C. fundamental, which, he says, are very thin and take some grinding! CT2AN has been visiting G5PH and collecting data for crystal work and will be using the above method from CT at a later date. G5PH has received a report from VK giving him R5 with the above outfit, and if anyone would like the circuit he will be pleased to forward same on application. G5LC has been testing ultra QRP, 1.4 watts to a CT25X on 14 M.C. and has had very encouraging reports and QSO's from most Europe. G2WS is using a new push-pull TX on 14 M.C. with 5 watts, which has raised SU at R8! Is also on 1.75 M.C. and using a 1.75 M.C. crystal across the coil which, he says, is easy to control. He is anxious to arrange schedules on the latter band and asks for co-operation. Please note new QRA of G2WS is 4, Ridge Mount, Cliff Road, Hyde Park, Leeds.

Group 8D.—G.C. G6BU is now using T.P.T.G. with grid control fone and has received some excellent reports, using 3 to 4 watts input. 2AGN is testing fone. BRS534 has filled the vacancy open by G5MR's resignation and sends details of his receivers. Employs a quarter meg. resistance in the L.F. stage to cure threshold howl. G5QY sends a list of DX worked with 5 watts which is nothing short of marvellous! During September he has noticed that DX in the south and east is much easier to work than that in a westerly direction. Has also worked OZ on 1.75 M.C. He greatly regrets that owing to business QRM he must resign from this group. (We are sorry to lose you, OM.—G.M.)

Group 8E.—G.C. EI7D has not yet completed his new outfit. G6XM resigns and BRS493 fills his place. He hopes to have an "A.A." ticket soon. G2OC complains of bad conditions and says things are worse than ever! Is using all AC for his TX, and is getting T8 without crystal. Is using a DE5B as oscillator and an LS5 as P.A. Is getting 75 to 80 per cent. fone mod. reports, without any amplifier. G5JU has been using a CT25X with 120 volts on the plate and has been doing quite well with it. Using 3.5 watts and a two-stage amplifier, is getting good reports on his fone. Has been experimenting with different size coils and a C/F aerial.

Group 8F.—G.C. G2TJ is rebuilding to CO-FD-PA with a 3.5 M.C. crystal. Says conditions poor. Will shortly be working on 1.75 M.C. and requests reports. G6QA also rebuilding but active on 1.75 M.C. Finds that if his RX is placed a considerable distance from the TX results are better for reception!! (What's the explanation, QA?—G.M.) G5LN has worked OZ and D on 1.75 M.C. with 4.5 watts input, which seems worthy of mention, as some people think QRP is no good for this band! Requires only Asia for a 2.8 watts WAC as he has just worked VK. G2PF has been out with his portable station G2PH and had some good QSO's. Reports 14 M.C. and 3.5 M.C. bands "dead"!!

2 M.C. Work.

G5UM, Group Manager.

A spell of good conditions has been noticed by Group 10A on 2 M.C. from September 27 to October 11, the period covered by current reports. The static level has decreased considerably, as is to be expected, but is still by no means negligible on certain evenings, for no apparent reason. G2FS has now commenced operations in earnest, and is to be heard every week-end on 2 M.C. with a T9 note. He is using a T.P.T.G. with harmonic crystal control, and is particularly anxious to obtain reports as to QRK. At present he has 66 ft. aerial sloping down to the radio room 40 feet above ground, with a 66 ft. counterpoise sloping up.

Exigencies of space have caused G5RX to cast about for ideas for a suitable all-bands transmitter. He has decided upon a T.P.T.G. driven by a crystal oscillator, and has obtained extremely gratifying results. With 5 watts' input greater H.F. output is available than with the COPA or push-pull CO previously used. Better signal strength is reported, a fact that the G.M. can confirm from two QSO's; on one occasion G5RX was R6 (at dusk) and during the second contact was R7 (in darkness). A 2 M.C. crystal is used for the 2 M.C. and 3.5 M.C. bands, and a 7 M.C. for both the 7 M.C. and 14 M.C. bands. At the moment no final decision has been made regarding a suitable type of aerial, and experiments are still in progress with 33 ft. east-to-west and 66 ft. north-to-south.

G6FO drops a bombshell with his declaration that, in his opinion, "a C.C. transmitter is wasted and is entirely unnecessary on 170 metres, as it is very easy to get a T9 note with a much simpler, more economical and, in most cases, more efficient transmitter when a self-excited arrangement is used. The R.F. output of a self-excited set is usually higher than with a C.C. transmitter and the same input, unless one is working with some sort of COPA outfit, when the R.F. developed should be better than with a single valve self-excited layout. If one has a good frequency meter the old cry of "when I'm on C.C. I know I'm in the band" loses its point." Comments please! On the receiving side, G6FO hopes to complete a 3-valve SG-SG-Pen set, with A.C. valves operated off large batteries.

Both he and G.M. are hoping to try pentodes in push-pull in a C.C. transmitter. G5UM has had QRM from recent radio shows, but has managed to put in a few hours at the key. He has noticed a definite skip effect on the band, and stations over 300 miles distant seem far more consistent in strength, and as regards QSB than those nearer. The following report on conditions may be of interest, especially to Group 2B: September 27, good, but rapid fading; slight background QRN. October 4, excellent; G5RX (Lancs.) reports G2QI (Newport) as R8 on telephony; G6FO says conditions were good; G5UM worked D4WUM (Saxony) fading slow, but QRN slightly increased. October 11, band very lively, but complete QSC at times. G6FO reports hearing numerous OK and PA stations' overtones from 3.5 M.C. at QSA5.

Antenna Group.

G2OP, Group Manager.

The new season having begun, I have taken the opportunity of reorganising the antenna group, which is now divided into three sections—(*a*) C.C., with G2CJ as G.C.; (*b*) Self-excited with G6MB as G.C. and (*c*) B.E.R.U., with G2OP as G.C.

The new B.E.R.U. section, of course, consists of overseas members and at the moment these are VS2AF and ST2D. Will three others who are interested and can carry out tests and work, please send me their names?

While at Convention I was asked a number of questions, and for the benefit of everybody I will deal with three now:—

1. When using the Zepp remember that radiating portions can be connected to BOTH feeders. If room permits, try one portion, then add a second in the same straight line, and lastly, move them out of the same straight line. I shall be interested to hear your results.

2. The radiating properties of the Zepp are definitely dependent on its height. The vertical Zepp gives strong radiation in the horizontal. The horizontal Zepp when about $\frac{1}{4}$ wavelength high gives very strong vertical radiation, but as the height is increased this strong field falls off rapidly to a certain height, where further increase seems to bring it back again in a certain measure.

The horizontal Zepp now in use at my station appears to give high angle radiation and good local results. To obtain the low angle radiation for DX it is necessary to tilt the top in the same way as stated by VS2AF in his excellent article in the November, 1930, BULLETIN.

3. Regarding the tuning of the Zepp, it should be remembered that perfect resonance must be obtained in both the top and feeders, and to get this it is necessary to tune them separately, otherwise tuning the whole affair simultaneously means introducing an error in the feeder distribution to balance an error in the radiating portion. The method adopted by 11MM is the best and is as follows:—

A. Prepare antenna and feeders according to the many tables already published, but with an insulator inserted at the antenna-feeder junction. (The antenna can later be connected across this insulator to the feeder with a clip.)

B. With the clip disconnected, erect system in its working position. Turn on transmitter using very low power and very loose coupling. Tune feeders to resonance and note reading of feeder condensers.

C. Lower antenna and connect top to the feeder by clipping across the insulator. Re-erect and turn on transmitter as before but with enough power to give good readings. (Keep frequency the same.) Again tune feeders to resonate. If the readings are the same as in para. *B*, all is well. If the capacity has to be increased the top is too short. If the capacity has to be reduced the top is too long. This method will show up errors of a very few inches and is ideal for finding the correct top for your particular QRA conditions.

Television.

Group 11*A*.—G.C. G5CV has been active during the last month, mostly in connection with a L.F. amplifier. The high frequency response has been improved by using an iron-cored choke for the grid leak to the output valves, and the final circuit resulted in S.G., Det. (anode bend), 3 L.F. (R.C.-R.C.-Choke). As it is not always realised that for a scanning disc of any given diameter there is only one correct size for the holes, the formula for obtaining this is given below:—

$$\frac{2\pi r}{n^2 d} = K$$

Where "r" = Max. spiral radius or $\frac{\text{Diameter}}{2}$

"n" = number of holes.

"d" = length of side of square holes.

"K" = Disc Ratio (*i.e.*, $\frac{\text{Arc}}{\text{Pitch}}$).

For the Baird Process "K" = 7 : 3 (3 horizontal) and 30 square holes, of course.

G5GJ reports that in order to overcome the drawbacks of a bent motor shaft, he is experimenting with a thin celluloid disc painted black. By means of a jig he is going to scrape away small squares instead of punching holes.

2AOB has joined the Group but unfortunately is at present in hospital.

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28 M.C. Experimental Transmissions.

Frequency.—28460 K.C. approx.
Call Sign.—To be furnished later.
Schedule Times.—Weekdays:—12.00 G.M.T.
15.00 ,,
18.00 ,,
Saturdays:—11.30 ,,

Nature of Transmissions.—The following code letters will be sent for approximately one minute each: A, B, C, D, F, G, J, K, L, M, N, O, P, Q, R, U, W, X. Reports on the signal strengths of as many of these as possible are desired. Stations should listen for at least ten minutes before deciding that no signals are audible, as considerable variations in strength are expected.

Announcements of the tests will be made on 14230 kc. at approximately 11.45, 14.45, and 17.45 G.M.T. on week-days, and at 11.15 G.M.T. on Saturdays. The station will normally stand by on 14 M.C. for reports immediately after the 28 M.C. tests, but will make arrangements for any special tests on 28 M.C. with any station who will call on 14 M.C. Preliminary tests of the transmitter will

(*Continued on page* 162, *col.* 2.)

28 Megacycle Test Conditions.

JANUARY 23-24 ; 30-31. MARCH 19-20 ; 26-27.

In reporting, all stations heard, or worked, should be noted in the log.

The tests will be run between 12.00 G.M.T. on the Saturday of each week-end, and 00.00 on the Sunday.

GENERAL REGULATIONS.

1. The terms of any licence issued by H.M. Postmaster-General must be strictly observed.

2. Stations taking part in the tests agree to supply any details they may be asked for, and also a description of their apparatus, if necessary.

3. Schedules may be arranged if the time of the distant station is not occupied for too long a period. This is to insure that no one station in the British Isles holds the attention of the distant station to the exclusion of other entrants.

4. The tests are open to all members of the Society, in the British Isles. Points will be awarded for each authenticated QSO with a station outside the British Isles. For receiving stations the same method of scoring will apply.

5. Contacts made with one station (or reports of one station) may only count twice in any one day, if the two contacts are made on separate transmissions separated by a period of not less than *four* hours. Similar conditions will apply to reports from receiving stations.

6. Full logs of the tests must reach Contact Bureau by April 5. Written confirmation from stations heard, or worked must be supplied later, if desired.

7. The judgments of the results will be in the hands of C.B., but in the event of a dispute the matter will be referred to the President of the R.S.G.B., and his decision will be final. In the case of a tie the general merit of the work done will be taken into consideration.

8. All entries for the tests must reach Contact Bureau by January 16.

All reports must be sent to G6PA, Plumford Farm, Ospringe, Faversham, Kent.

New Members.

CORPORATES—GREAT BRITAIN.

A. G. ROWE (G2RW), 2, Westley Road, Bury St. Edmunds, Suffolk.
S. A. C. HOWELL (G5FN), 117a, Trafalgar Road, Gillingham, Kent.
H. S. NORRIS (G5NS), 56, Victoria Road, Ebbw Vale, Mon.
C. J. DEAL (G6QO), " Inworth," West Cliff, Clacton-on-Sea, Essex.
R. W. S. PARRISS (2BGK), Rutland Cottage, Oval Gardens, Alverstoke, Hants.
T. MARTIN (2BHM), 3, Gladys Road, South Yardley, Birmingham.
A. WATTS (2BPB), Flint House, St. Peter's Road, Sheringham, Norfolk.
D. G. KENNEDY (BRS621), The Firs, Sturminster Newton, Dorset.
J. JOHNSTONE (BRS622), Innes Buildings, Tranent Park, East Lothian.
J. C. HIBBERD (BRS623), 5, Colville Villas, Colville Street, Nottingham.
G. WELLS (BRS624), 44, Grovelands Road, Palmers Green, N.13.
A. A. J. HOLLANDS (BRS625), 24, Manor Road, West Wickham, Kent.
D. G. G. BRACE (BRS626), 122, High Street, Herne Bay, Kent.
G. MCLEAN WILFORD (BRS627), 31, Elm Park Gardens, S.W.10.
R. L. HUNT (BRS628), 341, London Road, Romford, Essex.
R. L. NICHOLSON (BRS629), Northwick Hotel, Evesham, Worcs.
R. H. ROLINGS (BRS630), 25, Dawes Street, Gillingham, Kent.
W. A. GRIFFIN (BRS631, ex-A), 27, Park Road, Leyton, E.10.
S. A. STEVENS, B.Sc. (BRS632), 82, York Road, King's Cross, N.1.
H. SMITH (BRS633), 170, Holland Park Avenue, W.11.
R. KERRY (BRS634), 61, Cranbrook Road, Parkstone, Dorset.
C. S. POLLARD (BRS635), 21, Berkhamsted Avenue, Wembley, Middlesex.
R. E. EAMES (BRS636), 52, Mall Road, Hammersmith, W.6.
E. A. F. STENT (BRS637), 15, Boundary Road, Woking, Surrey.
A. W. ANDREWS (BRS638), Tregerthen, St. Ives, Cornwall.
I. R. ARTLIUR (BRS639), Bryn Eiran, Blaenau-Festiniog, N. Wales.
H. S. BENNELL (BRS640), 14, Sandwich Buildings, Rotherhithe, S.E.16.
CAPT. R. A. H. GALBRAITH (BRS641), 26, The Village, Charlton, S.E.7.
J. D. G. TURNER (BRS642), 47, Kent Gardens, Ealing, W.13.
L. W. F. PHILLIPS (BRS643), " Baffycot," West Runton, Norfolk.
H. D. BRAMWELL (BRS644), South Corner, Druids Cross Gardens, Calderstones, Liverpool.
H. CAMPBELL (BRS645), 36, Kenton Lane, N.W.9.
E. A. SPRINGETT (BRS646), 12, Princess Road, Regent's Park, N.W.1.
E. A. W. SPREADBURY (BRS647), 92, Woodlands, North Harrow, Middlesex.
A. L. WESTLAKE (BRS648), 13, Church Road, Ashford, Middlesex.
W. B. SAVAGE (BRS649), 292, Bishopsgate, E.C.2.
K. B. ROULSTON (BRS650), 5, Pine Tree Avenue, Humberstone, Leicester.
E. J. A. VAUGHAN (BRS651), c/o Upper Slough Farm, Allhallows, Kent.
T. WALMSLEY (BRS652), 52, Warnerville Road, Broad Green, Liverpool.
G. H. S. BRADLEY (BRS653), 56th (Army) Field Brigade R.A., The Drill Hall, Barrack Road, Exeter, Devon.
H. S. MOLYNEUX-FFENNELL (A), 20, Mount Pleasant, Cheshunt, Herts.
R. J. J. STRANGE (A), Key Dell, Horndean, Hants.
REV. J. F. LAVELLE (A), Lahardane, Ballina, Co. Mayo, I.F.S.
G. E. COUSINS (A), 15, Funtington Road, North End, Portsmouth, Hants.

CORPORATES—DOMINION AND FOREIGN.

G. B. RAGLESS (VK5GR), South Road, St. Mary's, South Australia.
J. F. LATEGAN (ZS4U), Town Electrical Engineer, P.O. Box 8, Hoshof, S. Africa.
R. EVENETT (BERS79), 31 (A.C.) Squadron, R.A.F., Quetta, N.W. India.
R. ANDREWS (BERS80), c/o, Lloyds Bank, Ltd., Bombay, India.
W. J. ALLMOND (BERS81), M.E.S. Jalapahar D.H. Rly., Darjeeling Hills, Assam.
B. J. CAMPLING (BERS82), c/o, MacAndrews & Forbes Co., Soke, Turkey in Asia.
J. S. H. YOULDON (BERS83), c/o Asiatic Petroleum Co., Ltd., St. Helens Court, Singapore.
J. O'LEARY (BERS84), Spring Hill, Enniscorthy, I.F.S.
N. C. HOLMAN (BERS85), s.s. *Nassa*, c/o Anglo-Saxon Petroleum Co., Ltd., St. Helens Court, Singapore.
CAPT. B. FITZPATRICK (BERS86), 2/15th Punjaub Regt., Mingaladon, Rangoon, Burma.

(*Continued from page* 161.)

be made on 14 M.C. for about a week before the 28 M.C. tests begin.

Approximate date of starting tests on 28 M.C. will be *November* 30, 1931. At present, no details of the apparatus can be published, but will probably be furnished later.

Reports may be sent to: C. G. PHILLIPS, c/o. Engineering Department, University College, Gower Street, London, W.C.1.

HIC ET UBIQUE.

I.A.R.U. Calendar.

AN examination of the sixth (June, 1931) Calendar of the I.A.R.U. shows that it is mainly concerned with a report from Mr. K. B. Warner (Secretary of the Union) on the C.C.I.R. at Copenhagen this year, and follows up with some comments on the interference situation from commercial stations in the exclusive amateur bands.

We do not propose examining in detail the report of the Copenhagen Conference as this was ably done in Mr. Warner's original summary and published in the July BULLETIN. It is stated very definitely that some attacks will be made next year on the amateur frequency assignations, and that the need for a united amateur front is a real one. The question of the admission of non-Government representatives at future C.C.I.R. meetings was on the paper. It is not generally considered, however, that amateur representation will be allowed at Madrid next year, except under the cloak of some department. Although it is thought that few Governments are actually hostile to amateurs, there are many who would be willing to agree to restrictions proposed by another administration. It appears possible that the maximum licensed power for amateur stations of 50 watts may be discussed.

The next world conference is fixed for Madrid (in accordance with the Washington Regulations) and will commence on September 15, 1932, and may possibly last until Christmas.

* * *

The Washington Regulations state that "any Government may assign any frequency to any station on the sole condition that it causes no interference with the service of another country." Therefore, a Government may put a commercial station in one of the exclusive amateur bands, *but* we (the amateurs) have only to prove interference with our own stations, and we have a legitimate right to make representation to the Government of the offending station. Such action was taken by American amateurs recently with gratifying results. It is pointed out that the proper procedure is to file such a petition with your own Government, adding a request that they will make the necessary representation to the foreign Government concerned; the petition would best be filed through the National Society, and not from an individual. Protests should not be lodged through Berne Bureau, which has no power to act on such a matter. It is necessary to include full details of dates, times, frequencies, stations with whom the offending station caused interference, etc., before making the official complaint. It will be seen that the mere report of commercial stations working in our exclusive bands will not in all cases suffice to have them removed, though the bands are ours and we have a legitimate right to fight for possession.

Council Elections, 1932.

In accordance with the following extract from the Articles of Association, the undermentioned gentlemen have been nominated for Council for the year 1932 :—

48.—Not later than the 24th day of November in each year the Council shall send to each Corporate Member entitled to vote a list of duly qualified persons whom they nominate for the offices of President, Acting Vice-President, Hon. Secretary, Hon. Treasurer, and other elected members of Council in December next following. This list must include at least four names of persons not serving on the existing Council.

49.—After the issue of the Council's list and not later than the fourth day of December next following any ten Corporate Members (but not more than ten) may nominate any other duly qualified person by delivering their nomination in writing to the Secretary, together with the written consent of such person to accept office if elected, but each such nominator shall be debarred from nominating any other person for the same election.

33.—The affairs of the Society shall be managed by a Council consisting of the President, the immediate Past-President, the first Past-President, the Acting Vice-President, the Hon. Secretary, the Hon. Treasurer and eight elected Corporate Members.

Retiring members eligible for re-election :— President, Mr. H. Bevan Swift (G2TI); Acting Vice-President, Mr. Arthur Watts (G6UN); Hon. Treasurer, Mr. E. Dawson Ostermeyer (G5AR); Hon. Secretary, Mr. John Clarricoats (G6CL).

Council : Mr. J. D. Chisholm (G2CX), Mr. A. D. Gay (G6NF), Mr. H. B. Old (G2VQ), Mr. T. A. St. Johnston (G6UT).

Nominated by Council : Mr. J. J. Curnow (G6CW), Mr. J. W. Mathews (G6LL), Mr. A. W. Alliston (G5LA), Mr. J. C. Watts (BRS246).

Should any ten members wish to nominate any other person to serve on the Council, such nomination should reach the Hon. Secretary by December 4, in accordance with Article 49. Following that date a ballot form will be sent to all home members.

Kent QSO Party. Nov. 22nd/23rd, 1931.

23.00-01.00 *G.M.T.*

On Sunday evening, November 22, there is arranged for ALL Kent members of the Society a 1,750 K.C. QSO party, in which both transmitters and receiving stations can take part.

The idea is that Kent stations shall attempt only to work each other, and that every contact shall count one point, a complete contact being an exchange of reports. BRS stations shall endeavour to receive as many Kent stations as possible, and every one heard counts one point. Thus, there will be a winning transmitter and a winning BRS station.

Every contact and every report MUST be acknowledged by card, and all cards should be sent to G6WY not later than November 31 for checking purposes, and it is hoped that these scores can be put in the BULLETIN.

No prize is offered, but if this is a success, one might be considered at a future occasion.

C.W. ONLY must be used, and anyone using phone during the contest will be disqualified. It is especially asked that TEST calls should be sent slowly to enable the BRS men to read calls more easily. It is suggested that "TEST KENT" be used, so that "foreigners" do not answer our test calls.

It is hoped that as many Kent stations as possible should get on the air between 23.00-01.00 G.M.T., and mark the date down as November 22. PSE QSL.

Appreciation for Our Honorary Secretary.

Members will be pleased to learn that Council at their meeting upon October 21 unanimously decided to grant to their esteemed Honorary Secretary, Mr. J. Clarricoats, an honorarium as a small token in respect of the service he has rendered the Society. The secretarial duties have become so extensive during the last two years that they would easily absorb the whole time of anyone undertaking them. Mr. Clarricoats has thrown the whole of his spare time into the venture with an enthusiasm which is unparalleled for a voluntary effort.

The mass of detail involved in such work as the organisation of Convention, the arranging of meetings, the huge mass of correspondence to be dealt with and the carrying out of the dictates of Council, are inconceivable in extent. We feel sure that all will endorse the recognition of such endeavours.

QRA Section.

Manager: M. W. PILPEL (G6PP).

New QRAs.

G5CN.—F. M. CAINE, 75, Warren Drive, Wallasey, Cheshire.
G5FI.—G. R. SCOTT FARNIE, "The Grange," Cefn Coed, Merthyr Tydfil.
G5FV.—W. A. CLARKE, Lynton, Hull Road, Keyingham, E. Yorks.
G5KC.—E. W. HARRIS, 16, Chevening Road, London, N.W.6.
G5KD.—F. M. SMITH, 253, Westbourne Avenue, Hull.
G5LP.—E. WILLIAMS, 14, Wall Street, Ebbw Vale, Mon.
G5LQ.—J. TOVELL, 13, Central Square, Brigg, Lincs.
G5LR.—W. P. CARGILL, 10, Duffield Road, Pendleton, Manchester.
G5ML.—F. W. MILES, "Tudor Lodge," Gilbert Hill, near Kenilworth.
G5NF.—C. L. WARD, "Bryn," Upper South View, Farnham, Surrey.
G5NL.—N. G. NOLAN, 1, Langley Cottages, Staines Road, Bedfont, Middlesex.
G5XF.—J. BUTTERWORTH, 1088, Manchester Road, Castleton, near Rochdale, Lancs.
G5ZZ.—R. EMERY, 94, Boundary Road, London, N.W.8.
G6PC.—C. D. PRICE, "Ardath," Park Lane, Wednesbury, Staffs.
2AQU.—E. A. BELLAMY, 10, Mapperley Hall Drive, Nottingham.
2ASG.—G. F. BLOOMFIELD, 27, Belmont Avenue, London, N.17.
2BBN.—E. W. J. CLAYTON SMITH, 13a, Exchange Mansions, London, N.10.
2BKF.—L. O. ROGERS, The Cottage, Hambutts, Painswick, Glos.

The following are cancelled: G2QT, 2AHK, 2BJD, 2BMN.

QRA Wanted.—VX1BN.

G2CO is owned by N. Cooknell, not Cookwell, as stated in the September BULLETIN.

QSL Section.

In spite of the somewhat poor conditions prevailing on all hands, the numbers of QSL cards passing through the Section show no sign of falling off, and it is certain that if conditions do improve to any extent all records for numbers of cards handled will be broken.

Mr. W. H. Martin, GI5HV, the QSL manager of the R.T.U. of Northern Ireland, asks me to remind GI amateurs that their cards should be collected from him and not direct from H.Q. in London. Envelopes, therefore, should be kept at his address, and he will be pleased to forward cards to all stations in Northern Ireland promptly to the right quarters. He also has a number of unclaimed cards on hand and would be glad if the owners would collect from him.

J. D. C.

CALLS HEARD.

Contributors to this section will assist considerably if they will list their calls in strict alphabetical and numerical order.

R. Barr (2 *BHK*), 4, *Dunkeld Gardens, Oldpark, Belfast, N. Ireland. September and October.*

14 and 7 M.C.: au7ak, cn8mi, cn8mk, gbrq (QRA ?), gx2tm (QRA ?), ka1jm, lu3de, pk1pk, pk2wj, pk3bm, pk3bq, pk4aj, py1cr, su1ch, st2c, st2d, ve1bl, ve1bv, ve1cc, vk2lz, vk2xu, vk4gk, vo8mc, vs3ac, vu2ah, w7aul, zc6jm, zs5m, zs6y, zt6c.

* * *

A. T. Mathews (*BRS*497), 24, *Woodside Park Road, North Finchley, London, N.*12. *September* 14 *to October* 18.

14 M.C.: gx2tm (QRA ?), ka1cm, om2cj, pk1pk, pk1jr, py1xo, py2bn, py2bq, st2c, st2d, vk2xu, vk4gk, vs3ac, zd2a, zs1b, zs4m, zs6y, zu6w.

7 M.C.: hh7c, kdv5, k4rg, lu4bh, vk2lx, vk2oc, vk2tx, vk3bq, vk3hk, vk3jk, vk3lq, vk3pr, vk3rj, vk3wl, vk3yl, vk3za, vk3zw, vk5hg, vk6gi, vk6wi, vk7ge, vk7gk, vs7fd, yn1u (QRA ?), zl2ab, zl2bi, zl2ci, zl2cu, zl2go, zl3ab, zl3aq, zl3aw, zl3az, zl3cc, zl3cm, zl4ao, zl4ap, zl4bt.

* * *

W. A. Scarr (*G2WS*), 4, *Ridge Mount, Cliff Road, Leeds. October.*

2 M.C.: g5av, g5bc, g5gy, g5ih, g5rx, g5um, g5wb, g6fo, g6qb, g6sf, g6sy, g6tg, g6uf, g6us, g6vv, ok1bq.

* * *

VS7GT, Ceylon.

14 M.C.: g2ga, g2rv, g2zp, g2is, g5bj, st2d, vu2df, zs6y, zt6x.

7 M.C.: vk2ba, vk2jp, vk2ps, vk2zw, vk3jr, vk3wl, vk5hc, vk5pk, vk5rw, vk6bo, vk6gf, vk6nu, vk6or, vk6sk, vk6wi, vs1ad, vs6ae, vs6ah, vs6ao, vu2ah, vu2cs, vu2df, vu2ss, ze1je, zs2d, zs5u, zt2c, zt5b, zt5r, zt6j, zt6k.

* * *

BERS25, Aden, during September.

14 M.C.: g2by, g2dh, g2dz, g2ig, g2ma, g2oa, g2rv, g2ux, g2vq, g2wv, g5la, g5mu, g5pj, g5pl, g5qy, g5sr, g5vb, g5vn, g5wj, g5yk, g6ax, g6gd, g6mn, g6nf, g6rg, g6vp, g6wn, g6wt, g6wy, g6yk, st2d, su1aa, su1ch, v1yb, vk2xu, vk4gk, vq4crf, vs3ac, vs7ap, vs7gt, vu2ah, vu2df, zc6jm, zd2a, ze1jg, zs4m, zs6y.

* * *

Ing. M. Santangeli. Via S. Eufemia, 19, Milano (5).

7 M.C.: g2zx, g6ba, g6bb, g6bd, g6bo, g6wy, g6xn.

14 M.C.: g2pa, g2vq, g5fc, g5rx.

Editorial—(*continued from page* 143).

appears by the article to have assumed the rôle of defendant in general, and attempts to show that the European Societies have done all they could in the matter: some may have done all they could in the past, but there is obviously still room for improvement. If instead of attacking us for having drawn attention, in firm language, to the state of affairs they had sided with us and endeavoured to carry the words of "reform" still further over the Continent, we should have been thankful. As it is, Dr. Curt Lamm, through *CQ*, only attacks our hard statement of the truth. No mention is made that D.A.S.D. even associate themselves with the idea behind the Editorial. We can only say, then, that Dr. Curt Lamm has somewhat surprised his many friends in England, and that the splendid co-operation that has existed in the past between the R.S.G.B. and D.A.S.D. has failed at the very moment when co-operation was most desirable.

We should like to point out to E.D.R. that we stated "we consider it their [certain European Societies] duty to police their own territory," and are therefore at a loss to understand the statement in *O.Z.* that we [the R.S.G.B.] wish to act as "policemen" in the matter. Far from that being the case, our main desire is to draw the attention of the other Societies to a matter which, in our opinion, should be remedied by them in the interests of Amateur Radio Transmitters generally.

We can only hope, in conclusion, that E.D.R., D.A.S.D. and other Societies will read this and the former Editorial in the spirit which was intended, and endeavour to use their influence in their respective territories to remedy a state of affairs to the benefit of all. We had no desire whatever to hurt anybody's feelings, and we never expected our remarks would be interpreted in the form that appears to have been taken. We sincerely hope that co-operation between the European Societies will continue, and look forward to the time when Europe will lead the way in the technique of Amateur Radio.

BOOK REVIEWS.

TELEVISION. By E. H. Felix. 272 pages, 73 diagrams and photographs. Published by The McGraw-Hill Publishing Co., Ltd., London. Price 12s. 6d. net.

The author of this well-presented little book has made a valuable addition to the literature on the subject. He tells the story of television in a calm and logical way without glossing over the undoubted difficulties or undervaluing successful steps in the development. His fluent, but concise style is immediately attractive, and his analysis of the technique is sufficiently complete to present the essentials without the drag of irrelevant details and statistics.

After a general survey of the problem the author divides the subject into six processes—scanning the field of view, the light sensitive element, transmission, reception, converting the signal into light, forming the image in reproduction; details of the receiver scanning disc and its associated problems are included. Each section describes the problems in a very clear way and deals critically with the various methods which have been employed.

A chapter is usefully devoted to the eye as an instrument, and another to "detail" requirements of television. A word of praise is well deserved for several interesting illustrations demonstrating the degree of detail obtainable with various multiples of broadcast channels; in one case two illustrations have been interchanged, but the mistake will not mislead the reader.

A very sound chapter deals with the programme possibilities of television, and will cause the reader much imaginative thought.

Perhaps a goose was walking over my grave, but I shuddered as I read the chapter on commercial possibilities, especially the section dealing with "Testimonial Advertising"; this certainly holds unthinkable possibilities of the "Before and After" sort! Let me quote a little from this section:—

"To deliver the same testimonial by radio and television may require that the endorser be persuaded to visit the broadcasting station in person. He must then read the prepared speech with more than a show of sincerity; his voice must carry conviction and his face must show no embarrassment. . . . Perhaps television may eventually restrict the advertiser to bona fide testimonials."

The concluding three chapters are concerned with establishing a television entertainment service, industrial and commercial applications of television appliances, and the future progress of television.

"Television" is certainly to be recommended as a most informative and well-balanced book written in a very attractive way. T. P. A.

"GARDENING GUYED." By Derek McCulloch, illustrated by Will Owen (Messrs. Ivor Nicholson & Watson Ltd.). 3s. 6d.

Derek McCulloch (Uncle Mac of the B.B.C.) is well known for his witty and humorous writing and this new book is no exception to the rule. The contents, together with the extremely funny sketches of Will Owen, will raise many a laugh.

CORRESPONDENCE.

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

Esperanto as the Amateurs' Language?

To the Editor of T. & R. BULLETIN.

DEAR SIR,—Several "relays" of the Editorial which appeared in your August issue have been transmitted through your correspondence columns, and it is very gratifying to find that so many British "hams" feel alike on this matter.

It is not my wish to "jam" anybody's signal, but as G5QY has, quite by accident I believe, "jammed my signal," I want to draw his and others' attention to at least one other organisation, which might be described by me as G5QY described Amateur Radio, *i.e.*, "doing much more to foster world peace than any other international organisation."

There are, I suppose, something like a million Esperantists in the world, and up till recently I have worked almost entirely in that sphere of radio which served that community and helped to add to its numbers.

As I stated in my last letter, I fell upon Amateur S.W. Radio and found its potentialities quite by accident, so I am all with G2MI, G5QY, G2UV, G5QC, 2AWV, etc., for World Peace by Amateur Radio, but I think I am much better equipped than any tongue-tied "ham."

I feel certain that many, many more QSO's would materialise if we could understand the other fellow's "fone" call; and is not "fone" the best way for friendship? It is not all foreign "hams" who have such a splendid knowledge of English as ON4TO (a new member of ours), F8JS and PA0IM. How many G "hams" are linguistically inclined? This seems rather unfair, doesn't it?

The Esperantist radio B.C. "fans" have a motto, "Radianigu la Esperantistojn-Esperantistigu la Radianojn," and that is the big task I have set myself. The task is so big that I cannot find time to build a decent S.W.Rx.; more workers are wanted. G5QY, what about it? It takes about as long to get the hang of Esperanto as it takes to "get" Morse.

Sincerely yours,
W. H. MATTHEWS (BRS591).

"It Pays To———."

To the Editor of T. & R. BULLETIN.

DEAR SIR,—I should like to congratulate the R.S.G.B. on the effectiveness of their advertisements in the BULLETIN. The writer recently made use of the Exchange and Mart Column, and the result was astonishing! The response was similar to that received the day after that 50-watt phone set was first operated on 7 M.C.

It was impossible to reply to all those who did not enclose a stamped addressed envelope, and where postage was not enclosed money was returned, as most of the articles could be sold several times over.

Yours truly,
"DISPOSALS."

The Sunbury and District Radio Society.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—In the interest of those R.S.G.B. men who reside in the above district, I will ask the favour of a little space.

The Sunbury and District Radio Society was formed last May by three local enthusiasts, including the writer. The first meetings were held at a member's QRA, but finding the membership increasing, we recently arranged to hold our meetings at the Parish Hall, Sunbury.

We have been fortunate to secure Mr. Henry T. Ferrier, the radiologist, as our president; our committee is filled by men who all have some considerable knowledge of the district.

Our membership is very mixed, comprising amateur transmitters, super-quality experts, loud-speaker designers, retailers, and a number of DX "fiends." Nevertheless, we are all united in our interest in radio.

We hold fortnightly meetings on Fridays.

Any member of the R.S.G.B. who reads this letter, and who feels at all interested is invited to write for particulars, either to me at the above address or to G6NK, who is better known in "Ham Radio."

We shall also be very pleased to welcome any visitors to our meetings. "YLS" please note that you are included in this invitation.

Wishing the "Bull" 73's.

Yours faithfully,
RICHARD K. SHEARGOLD (2AKN).

A Reply to "West Country."

To the Editor of T. & R. BULLETIN.

SIR,—With reference to the questions sent to you and published in the October BULLETIN by "West Country," it struck me that I could possibly answer two of them, Nos. 2 and 3, to his satisfaction. Without further ado I will proceed to do so.

(2) *Why, when the plate tank of the F.D. is tuned to the required frequency, does the C.O. stop oscillating?*

This is due to a phenomena known as the "Miller" effect. What happens is, when the F.D. plate tank is tuned to resonance at the required frequency its impedance is greatest (parallel resonance), hence the fall in the F.D. plate current. Now, as all valves have an internal and external capacity existing between the grid and plate, an H.F. current flows from the plate circuit to the grid circuit, the maximum current flowing when the plate external impedance is highest. This current or feed back is out of phase with the current already existing in the grid circuit, with the result it opposes that current and damps the grid circuit heavily; in other words, damps the plate circuit of the C.O., causing it to stop oscillating.

The remedy is (*a*) use a looser coupling between the F.D. and C.O., *i.e.*, feed the grid of the F.D. from a tap on the C.O. tank coil; (*b*) use a F.D. which has a lower M; (*c*) use a lower L/C ratio in the tank of the F.D. (Note: With (*a*) more pep is required from C.O. to get same drive.)

(3) *With choke control modulation, should there be any kick in the plate M.A. of the modulator, oscillator or valve that is being modulated? If so, what does this denote and why?*

First, for the best quality phone no kick is permissible on the modulator or oscillator (P.A. or whatever it is) or any valve for that matter. For average phone a little movement on the M.A. of the modulator is allowable, but none on the oscillator. If the plate current of the oscillator shifts, it means frequency modulation for certain if the valve is self-excited, and if not, distortion of a kind that may not be very noticeable on local work, but fatal for any DX phone.

As regards what the kick denotes, generally, an upward kick denotes too muchr bias on the modulator due to bottom bend rectification, and a downward kick too little bias due to top bend rectification or grid rectification if R.C. coupled on the grid side. I say generally, because the direction of the kick may depend on the plate circuit impedance; *i.e.*, speech choke or the like.

Assuming we have the optimum grid bias on the modulator, then too high a plate circuit impedance will give a downward kick, and too low an impedance an upward kick; this effect is more or less marked on speech and music due to the frequency varying, and in consequence the plate circuit impedance varying, but an altogether too high or low impedance will give a noticeable kick. Many readers will probably have noticed that with output valves feeding a loud speaker the amount of kick varies with different speakers or different taps on an output transformer due to this effect.

Yours truly,
D. N. CORFIELD (G5CD).

The Resistance of the Tuned Circuit.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—I hope that the correspondence with Mr. Heightman concerning the dynamic resistance of a tuned circuit is not, by the addition of this letter, made redundant. It is necessary, however, to point out that Mr. Heightman's reasoning is based upon the fallacious assumption that doubling the inductance of a coil only doubles its resistance.

This is true only if the larger inductance coil occupies a much larger space than the lower inductance coil. With given space, and space is usually limited, doubling the inductance of a coil may quite well quadruple its resistance, leaving the dynamic resistance the same as before.

A circuit could be made with a far lower inductance taking up an enormous space which had for a given frequency a higher dynamic resistance than one with a very high inductance occupying a small space.

Yours faithfully,
P. P. ECKERSLEY.

Concerning Morse Practice.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—Will you kindly allow me to correct a misapprehension which arose from my remarks at Convention regarding Morse Tests. Owing to the fact that I mentioned 6 to 8 and 12 to 14 words per minute, some members present thought that code words were transmitted. This would, of course, not be allowed. By pre-arrangements made with would-be listeners, my tests were taken from the first page of a well-known periodical, so that they could check their reception if they so desired. The speeds referred to can be easily estimated after practising with a buzzer, a series of code words of five letters and a watch.

Yours truly,
W. H. SLOUGH (G5SL).

Radio and Earthquakes.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—I think that G2UV's last letter upon the above subject, in the October issue of the BULLETIN, calls for some comment. Therefore, I beg you to permit me to use a little of your valuable space to this purpose.

First, I would thank Mr. Corsham for clearing up the interference difference (*i.e.*, different bands).

It is now agreed, I think, that earth tremors have a definite effect upon the propagation of radio signals.

Now, the point I wish to emphasise is, that in my letter in the August BULLETIN, I did not advise the use of plain language for all amateur radio communications, but suggested that for use in the cases mentioned by G2UV, such as Earthquakes and other abnormal occurrences, the use of plain language is much to be preferred in transmitting data of real importance. Especially is this true when one realises the amount of misuse to which some of the existing codes are still subjected by the amateur fraternity.

Our friend goes on to say that he is sure I would not want the amateur to revert to plain language for all purposes, thus proving to the world that we have not the groundwork in us to justify the proud title of "Amateur." Certainly, I do not suggest the use of plain language for all occasions, as I have already remarked, but I do know that the over-use of certain abbreviations, such as "tnx." "OM and OB" "FB," "ere," "QRU cuagn," and others of similar ilk are liable to cause a detrimental impression of the amateur in the eyes of the world. In short, the once lauded "Ham Language" has had its day.

With regard to G2UV's remarks about the inconsistency of radio conditions causing rapid alteration in the *readibility* of signals, I would suggest that he is being irrelevant here, as the portion of my letter to which he refers, dealt with the misinterpretation of the *tone* code. There is absolutely no excuse for saying "Your sigs T7 fb stdi." The "T" code defines a T7 signal as one which is unsteady in frequency, yet unmodulated by RAC or AC.

I note the Editorial remark relating to the consideration of reprinting in the BULLETIN the various abbreviations likely to affect amateur communication, and would like to see this done in a suitable form for hanging up in the radio shack if possible.

By the way, my remarks to which G2UV alludes, were not penned after a bad QSO with some amateur but some amateurs!

If this correspondence has aroused some interest,

(*Continued at foot of col.* 1, *next page.*)

MORSE PRACTICES.

Following on the suggestions made by various DRs during Convention, arrangements have now been made to inaugurate a regular series of Morse practices commencing Sunday, November 22, 1931.

Transmissions will be made in accordance with the schedule outlined below, each district being responsible for a 30-minute period during which time transmission will be made on the 1.7, 3.5 and 7 M.C. bands. It is not proposed to give the actual call signs of the stations who have been invited by the D.R.s to transmit the practices, as last minute changes may occur, but BRS members will be able to recognise the transmissions by the following call-up procedure :—

Morse Test DE G . . . District . . .

SCHEDULE 1.

Sundays : November 22, December 6, December 20, January 3, January 17, January 31, February 14, February 28, March 14, March 28.

District	1	...	09.00	G.M.T. to	09.30	G.MT.
,,	2	...	09.30	,,	10.00	,,
,,	3	...	10.00	,,	10.30	,,
,,	4	...	10.30	,,	11.00	,,
,,	5	...	11.00	,,	11.30	,,
,,	6	...	11.30	,,	12.00	,,
,,	7	...	12.00	,,	12.30	,,
,,	8	...	12.30	,,	13.00	,,

SCHEDULE 2.

Sundays : November 29, December 13, December 27, January 10, January 24, February 7, February 21, March 7, March 21, April 4.

District	9	...	09.00	G.M.T. to	09.30	G.M.T.
,,	10	...	09.30	,,	10.00	,,
,,	12	...	10.00	,,	10.30	,,
,,	13	...	10.30	,,	11.00	,,
,,	14	...	11.00	,,	11.30	,,
,,	15	...	11.30	,,	12.00	,,
Scotland	A	...	12.00	,,	12.30	,,
,,	B	...	12.30	,,	13.00	,,

Each 10-minute period will be divided into two sections : from, say, 09.00 to 09.05 a speed of between six and eight words per minute will be used, whilst from, say, 09.05 to 09.10 the speed will be increased to between eight and 12 words per minute.

Each 30-minute period will be divided as follows :

First 10 minutes on 1.75 M.C. band.
Second 10 minutes on 3.5 M.C. band.
Third 10 minutes on 7 M.C. band.

Telephonic announcements will probably precede the Morse transmissions.

BRS members are requested to advise headquarters immediately after each week-end period to enable those responsible for the service to judge its effectiveness.

Correspondence—(*Continued from page* 167).

or even brought some hard remarks about G5RV's head, at least that is better than the usual apathy towards the code signals !

Yours radioly,

44, Marconi Road, Chelmsford. R. L. VARNEY (G5RV).

Boy Scouts' Assistance Scheme.

To the Editor of T. & R. BULLETIN.

SIR,—Having succeeded in getting the 33rd Newcastle Troop of Boy Scouts interested in Amateur Radio, and hope to have them on the air as soon as B.R.S., it is my wish that one day some of the boys will qualify to operate a fully-licensed station.

Once they have commenced work they will put Amateur Radio on a better footing in this locality, as new recruits are constantly joining their ranks and competition will no doubt exist between different troops.

All of us like some return for our labours, and there is nothing more encouraging to the receiving station than to have his reports answered.

I appeal to the members of this society to see that every report received from Scout receiving stations is replied to.

I shall be only too glad to forward QSLs to scouts in this district.

Yours truly,

23, Salters Road, Gosforth, Newcastle-on-Tyne. J. R. WILSON (G2XT).

(Council intend to discuss again the question of reviving the Boy Scouts' Assistance Scheme, and will be glad to have suggestions from members.—J. C.)

Calibration Services.

A Calibration Service will be transmitted from G2NM, Mr. Marcuse's Station at Sonning-on-Thames, Berkshire, on 3,583.13 K.C., according to the following schedule.

At 11.00 every Sunday (Telephony).

At 23.00 every Sunday and Thursday (Morse).

Times are G.M.T. or B.S.T., as in force. The frequency has been checked and approved by the Post Office.

* * *

The next N.P.L. Calibration Service will be transmitted on December 1 next on 1,785 Kcs., commencing at 21.00 G.M.T. The full details of this service will be found on page 126 of the October BULLETIN.

Members are reminded that wavemeters and crystals may be sent to A. D. Gay, G6NF, 49, Thornlaw Road, W. Norwood, London, S.E.27, for calibration. Wavemeters 3.5 M.C. range calibrated only. Apparatus should be sent carriage paid both ways and appropriate fee, see page 234, February BULLETIN.

Strays.

We are asked to point out that the call G5KA is being used by some unauthorised person for telephony on the 3.5 M.C. band. The station G5KA is not licensed to work on this band and requests amateurs to refrain from answering such signals.

BRS635 draws attention to Senator Marconi's new record when he maintained telephone conversation over ten miles on .5 metre, and hopes the day is not far distant when our 560 M.C. enthusiasts will make their sets white hot in trying to beat it !

STATION DESCRIPTION No. 18.

VU2JP

By J. S. Nicholson (VU2JP).

IN answer to the request for descriptions of Empire radio stations, the writer thought that a short article on the above station might be of some interest.

VU2JP is situated at an elevation, or was, of some 6,250ft. above sea level, but has since moved to a lower level, namely, about 5,000ft., and is situated in a district where the rainfall varies considerably over a short distance, namely, from 60ins. rain per annum to 300ins. per annum over about 20 miles.

VU2JP came on the air only very recently as an official station, but despite atrocious conditions some fairly good DX has been done and, strangely enough, all of this has been done on 7 M.C., as at the time no coils were available for 14 M.C. There is not much outstanding in the station and many similar descriptions have been read.

Owing to the location of the station, and that batteries had to be taken some 20 miles for charging, activities were very limited at times, and as a result economy had to be met right away, and there was also the possibility of being moved from one bungalow to another so that portability had also to be considered as one of the main features.

The power supplies were arranged that either of three types could be employed. Firstly, an anode convertor was available and was soon made use of. Later, through the kindness of G2NM, a rectifier unit was obtained from home, and when it was hoped to get this going the inevitable happened—a change to a bungalow with no power, and, so to speak, the unit was "on the shelf."

The power unit consists of a Chester Bros. transformer for 220 volt 50 cycle mains and gives an output of about 400 volts at 130 ma. and an L.T. supply of 3.5 amps at 7 volts. Two Mazda half-wave rectifier valves are used (65/550's), and these, in conjunction with a 20 henry choke and a single 6 mfd. condenser, give an H.T. supply of all that could be desired.

The transmitter components are all receiving parts, and the valve in use for the past few months was an LS5, which has had many a hard knock, besides having several years service before going into the transmitter.

The aerial is the usual half-wave Hertz Zeppelin, voltage fed, and so far has proved quite good. The top is 65ft. 10in. long and the feeders are about 30ft. long and are spaced 2½in. by means of ebonite rods. The aerial is inductively coupled to the transmitter and is tuned by a variable condenser .00025 mfd. capacity in parallel with the feeders, and it has been found during tests that it is immaterial whether the condenser is in parallel or whether two series condensers are used. The Wilkinson aerial has also been tried out and has proved quite equal to the Zeppelin to date for local work (up to 260 miles), but due to conditions being so bad generally it has not been possible to try it out properly on DX work. As soon as these improve a thorough trial will be given to this aerial and a report submitted. A monitor is continually used at the station, and this is considered to be one of the most useful pieces of apparatus in the station.

The receiver is that described in *Wireless World* in September, 1927, and has been found equal to the demand so far, being very quiet in operation and oscillating quite freely on 28 M.C., though separate receiver is being built from "junk." The only change made in the above receiver is that a spacer condenser was added to the grid tuning condenser, making it possible to cover the 7 M.C. band by 80 degrees and the 14 M.C. band on 40 degrees. This was placed in parallel with the grid condenser.

Band changing on both the transmitter and receiver can be carried out in less than a minute, while changes from mains to a convertor supply can be done in a matter of seconds.

A TC04/10 is at present being tried out with A.C. to the filament and the H.T. from the mains also (rectified) and to date results are very promising, all reports being C.C. note.

All the work has been done with a maximum input to the plate of 3.6 watts, and VK2, 5 and 6, VS6, PK, KA, AU have all been worked. Ultra QRP tests were also carried out with VS7AI at a time when QRN was approaching its worst here, and QSO was made ultimately with 0.45 of a watt.

The distance is about 250 miles and so QSO should be possible under the worst conditions with about 1 watt.

While on the subject of VS7 I should like to record my sincere thanks for all the kindness shown by VS7 hams to me during my short visit to Ceylon in January of this year. Visits were paid to VS7GJ and also to VS7FP, VS7AI, and chats were made with VS7AL and VS7AI over the telephone. Everywhere one went there was that wonderful ham spirit, and I hope that if any of the gang are up this way that they will be sure and look me up. In all the stations visited, simplicity was the keynote, and VS7AI's shack was a treat—a very simple but *very* neat transmitter and receiver, but he has much to show for it and must have a record that is hard to beat. Again, many thanks, OM's, and thanks again to G2NM and to G6PA for all the help.

Stray.

Morse practice is being given by G2MI on 1.7 MC. from 10.15 to 10.30 G.M.T. on Sunday mornings. Ten minutes at 4 w.p.m. and 5 minutes at 8 w.p.m. preceded by fone.

Empire B.E.R.U. News.

B.E.R.U. Representatives.

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

British West Indies, Bahamas, Bermuda, and British Guiana.—H. B. Trasler, No. 2 Mess, Pointe à Pierre, Trinidad, B.W.I.

Canada.—C. J. Dawes (VE2BB), Main Street, St. Anne de Bellevue, Quebec.

Ceylon and South India.—G. H. Jolliffe (VS7GJ), Frocester Estate, Govinna, Ceylon.

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

Egypt and Sudan.—H. Mohrstadt (SU1AQ), No. 1 Co. Egypt Signals, Polygon, Cairo.

Hong Kong.—P. J. O'Brien (VS6AE), 12, Kent Road, Kowloon Tong, Hong Kong.

Iraq.—H. W. Hamblin (YI6HT), Wireless Section, R.A.F., Shaibah, Basra, Iraq.

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

Kenya, Uganda and Tanganyika.—H. W. Cox (VQ4CRF), Box 572, Nairobi, Kenya.

Malaya.—G. W. Salt (VS2AF), Glenmarie Estate, Batu Tiga, Selangor, Malay States.

Newfoundland.—Rev. W. P. Stoyles (VO8MC), Mount Cashel Home, St. John's East.

New Zealand.—D. W. Buchanan (ZL3AR), 74, Willis Street, Ashburton; and C. W. Parton (ZL3CP), 69, Hackthorne Road, Cashmere Hills, Christchurch.

Nigeria.—Capt. G. C. Wilmot (ZD2A), 1st Battalion Nigeria Regiment, Zaria, Nigeria.

N. India and Burma.—R. N. Fox (VU2DR), c/o Messrs. Lyons (India), 11, British Indian Street, Calcutta.

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

South Rhodesia.—S. Emptage (ZE1JG), Salcombe, Plumtree, Southern Rhodesia.

AUSTRALIA

By VK2HC.

IT is with the deepest regret that I have to record the passing of our fellow amateur and friend Trevor Watkins, VK7DX, one of the oldest and best known amateurs in Australia and familiar to every local and DX ham. We all join in extending our sincerest sympathy to his family.

Some good local work on 56 M.C. was done by VK3WL, VK3PA, and VK3BQ last month, but on 28 M.C. there has been nothing but few local QSO's over short distances. A slight improvement is noticed on 14 and 7 M.C. bands; DX signals are still weak but improving. The 3.5 M.C. band is excellent with some QRN as summer approaches, but quite a number of good VK-W contacts have been made. The annual W.I.A. Convention will take place next month in Sydney; all States will be represented. The T.D.S. in all States are very active. The official WIA TX now being tested on 9580 KC and reports are requested.

[Since these notes were written we have received messages from VK5HG via HB9Q and G6BX stating that 14 M.C. reception of European signals in VK is becoming better daily after 14.30 G.M.T., and that on October 4 VK3WL was again successful in establishing contact with VK5HG on 28 M.C. Congratulations to both stations concerned.—Ed.]

BRITISH ARABIA

By BERS25.

Listening was carried out throughout the night of the eclipse of the moon (26th). It was found that from the first quarter to the last quarter of the eclipse, i.e., 19.20 to 21.20 G.M.T., no sigs. whatever were heard. At 21.40 G.M.T. sigs. from the first and second districts U.S.A. began to come in at strength R2. These increased in strength rapidly until at 22.00 G.M.T. W123789, together with South American districts RX1, CM2 and HC1, were all heard and conditions seemed quite exceptional. Watch has been kept often at the times stated before, but results have never before been so good. Whether this was due to the eclipse period or not I am, of course, unable to say.

CANADA

By VE2BB.

I regret to report DX conditions not so good this month, and although some good contacts have been made conditions generally are freakish.

VK and ZL stations come in fairly well from 11.00 to 13.00 G.M.T.

We are anticipating interesting DX developments on 3.5 M.C. and 1.75 M.C. this winter.

CEYLON & S. INDIA

By VS7GJ.

Throughout this month conditions on the 14 M.C. band have been consistently bad, and although occasionally signals are heard, they are liable to fade right out without warning.

At the moment the 14 M.C. band is very active, and it is at times difficult to work a station without QRM. South Africans and Australians are now coming in well on this band.

(*Continued on page* 177, *col.* 2.)

Notes and News from the British Isles.

DISTRICT 1 (North-Western).
(Cumberland, Westmorland, Cheshire, Lancashire.)
D.R. · Mr. S. Higson (G2RV), "Hebblecroft," Egremont Promenade, Wallasey, Cheshire.

DISTRICT 2 (North-Eastern).
(Yorkshire, Durham, Northumberland).
D.R. · Mr. L. W. Parry (G6PY), 13, Huddersfield Road, Barnsley, Yorks.

DISTRICT 3 (West Midlands).
(Warwick, Worcester, Staffordshire, Shropshire.)
D.R. · Mr. V. M. Desmond (G5VM), 199, Russell Road, Moseley, Birmingham.

DISTRICT 4 (East Midlands).
(Derby, Leicester, Northants, Notts, Rutland, Lincoln.)
D.R. · Mr. H. B. Old (G2VQ), 3, St. Jude's Avenue, Mapperley, Nottingham.

DISTRICT 5 (Western).
(Hereford, Oxford, Wiltshire, Gloucester.)
D.R. · Capt. G. C. Price (G2OP), 2, St. Anne's Villas, Hewlett Road, Cheltenham, Glos.

DISTRICT 6 (South-Western).
(Cornwall, Devon, Dorset, Somerset.)
D.R. · Mr. H. A. Bartlett (G5QA), 95, Old Tiverton Road, Exeter, Devon.

DISTRICT 7 (South-Eastern).
(Berkshire, Hampshire, Kent, Surrey, Sussex.)
D.R. · Mr. J. Drudge Coates (G2DC), "Burleigh," Farnborough Park, Hants.

DISTRICT 8 (Eastern).
(Cambridge, Huntingdon, Norfolk, Suffolk.)
D.R. · Mr. C. E. Runeckles (BRS163), "The Myrtles," Needham Market, Suffolk.

DISTRICT 9 (Home Counties).
(Bedfordshire, Hertfordshire, Essex, Buckinghamshire.
D.R. · Mr. F. L. Stollery (G5QV), "Kingsmead," Lancaster Gardens East, Clacton-on-Sea, Essex.

DISTRICT 10 (South Wales and Monmouth).
(Monmouth, Glamorgan, Breconshire, Carmarthen, Cardigan, Pembroke.)
D.R. · Mr. A. J. E. Forsyth (G6FO), "St. Aubyns," Gold Tops, Newport Mon.

DISTRICT 11 (North Wales).
(Anglesey, Carnarvon, Denbighshire, Flintshire, Merioneth, Montgomery, Radnorshire.)
D.R. · [To be appointed.]

DISTRICT 12 (London North).
D.R. · Mr. S. Buckingham (G5QF), 19, Oakleigh Road, Whetstone N.20.

DISTRICT 13 (London South).
D.R. · Mr. A. D. Gay (G6NF), 49, Thornlaw Road, West Norwood, S.E.27.

DISTRICT 14 (London East).
D.R. · Mr. T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4.

DISTRICT 15 (London West and Middlesex).
D.R. · Mr. H. V. Wilkins (G6WN), 81, Studland Road, Hanwell, W.7.

SCOTLAND.
D.R. · Mr. J. Wyllie (G5YG), 31, Lubnaig Road, Newlands, Glasgow.

NORTHERN IRELAND.
D.R. · Mr. C. Morton, (GI5MO), 27, Bristol Avenue, Belfast.

District Notes for publication should be written as concisely as possible and should be in the Editor's hands by the 25th of the month preceding publication. They should be of a general rather than personal nature. Individual reports from County Representatives will not be accepted for publication.

DISTRICT 1 (North-Western).

A LONG report from Lancs. F.B., but I am afraid that I can't incorporate it all. The response from this county is very encouraging, though some of the older members are rather apathetic. The letter budget is in full swing. We welcome all the new members and hope you will have full tickets soon. Several long lists of DX as well, but say, OM's, send these along to the "Calls Heard" columns. 2AWV wants your 28 M.C. skeds. G5KL is going push-pull on 28 and 56 M.C. G5WQ off to VK-land and hopes to send reports. G6GV has sked with ZL2BI, and G2QB sked with ST2C. Only North-West Cheshire appears active; what about it, OM's in the East? Let us have your reports. Congrats. to G5CN on his full ticket and good note. Is getting good reports, but says conditions are very bad on 7 M.C. G5WG has fb new RX and is still troubled with QRM! G6OM is another convert to 28 M.C., and hopes to get going soon. G6GL has 1.75 M.C. sked with EI7C. G5GY still puts his fone all over Europe at R9, on 7 M.C. G2OA is using push-pull T.P.T.G., and thinks it better than C.C. (?) He, too, is busy with 28 M.C. and has had R9 QSL report from FM. Also thinks his antenna is directional for VK and Far East. G2RV has social QRM but manages to get in a little work.

Now just a short message to all the District. G2RV will be at his QRA on Wednesdays and wants as many of the OM's as possible to take advantage and call in for a chat. Also don't forget that we have a meeting on the third Saturday in every month in Liverpool. Write to G2OA for full particulars.

DISTRICT 2 (North-Eastern).

Unfortunately, owing to very bad conditions on 14 M.C. during the past month, and also that several stations have been QRT owing to holidays and rebuilding, I have not very much to report. G5LN, a newcomer, has been very active and has worked VK4GK on 4.5 watts, but complains that 14 M.C. has been poor otherwise. G2XT has been rebuilding. G6US has been active every week-end and done a little on 14 M.C. Has no difficulty in working anywhere in England on 4 watts' input on 1.7 M.C. G6PY has been on the air. G5DI, G6YL, G2TJ and G6FG report but have been inactive.

DISTRICT 3 (West Midlands).

We are very pleased to welcome G2KB, BRS77 and G5JI to this District. G2KB is now at Rugby and his new QRA is 24, Regent Place, Rugby, and he will be pleased to see any members visiting that district.

Our local meetings are held on the second and fourth Tuesday in each month, and we are pleased to welcome visitors who happen to be in Birmingham.

The following stations are active: G5ML, G5BJ, G6XQ, G5NI, G2ZW, G2WW, G2PD, G5VM.

DISTRICT No. 4 (East Midlands).

In the first place I would like to say that the team spirit of the Leicester and Nottingham counties is most solid, everyone where possible is showing 100 per cent. enthusiasm. At the October monthly meeting, held in Nottingham, all attendance records were broken. Decisions were made regarding morse practice. G2IO and G2VQ arranged to give daily transmissions on 40 and 80 metres respectively, the 40-metre to operate at 10.30 p.m. and the 80-metre at 7.30 a.m., the result up to date being that full advantage has been taken by the BRS. Also reports of appreciation have been received from several parts of the country. Half-hour listening periods are also in operation; these also have met with a certain amount of success. A field day took place on Sunday, October 25, the

transmitter being supplied and operated by G2VQ, working with the portable call sign of G2VR. Will all members please note this call sign? The transmitting gear was fixed in a trailer caravan and drawn to the secret spot by the Lea Francis Hi. Two portable masts (17 feet) were erected, and a crystal control outfit with 22 watts input was used on the 80-metre band, transmissions taking place from 10.30 a.m. to 3.30 p.m.—10 minutes on and 10 minutes break. QSO's were made with EI2B, G6YC, and G6BX. Five car parties set off with portable DF sets, which included G2HD, G2IO, G2OC, G2XS, G5DM, G6MN, 2AQU, BRS453, 521, 548, 549, 559, 582, 583, and 601, BRS366 assisting G2VQ at the transmitter. Each party had a starting point about 12 miles from the transmitter. The first car to locate G2VR contained G2IO, G2OC, and BRS582, and the second G5DM, G2HD, and BRS548, the remaining hams being unsuccessful, and were compelled to open their sealed envelopes at 3.30. One very amusing incident happened to BRS453 and 521: they took bearings at a spot (with the frame fixed to the top of the car), then went a few miles further and found their frame missing, and, of course, were compelled to turn back and make a search for the lost aerial, and to their surprise found a gang of youngsters amusing themselves with it. Anyway, to wind up a most enjoyable day, tea was taken at one of the local hotels. Much interesting data was obtained, and when compiled will no doubt be published. I have much pleasure in announcing that BRS559 has been appointed CR for Leicestershire, and must congratulate him for putting new life in this county and arousing interest of some of the old hams. Keep it up Leicester! No report has been received from G6LI regarding Lincolnshire. Now, you hams there, put your backs into it, and let's hear something from you all. G5IX, of Skegness, attended the October meeting in Nottingham, and visited several stations, particularly remembering the journey in the fog from Worksop to Nottingham, arriving about 3.30 a.m. in G2VQ's car, Hi. Conditions have been reported very patchy on all bands. Now, fellows, don't forget the monthly meetings held the second Saturday in each month at the Reform Club, Victoria Street, Nottingham, at 5 o'clock.

DISTRICT No. 5 (Western).

A meeting of Gloucestershire members was held at Bristol on October 15, when the programme for the coming year was submitted and discussed. It was decided to hold meetings each month at Bristol, and that the letter budget be scrapped in favour of a monthly bulletin to be issued by the CR. Mr. Weber's programme is comprehensive, and he hopes to double the membership within the next few months. Regarding Wiltshire, Col. Palmer points out that the membership is very scattered, and that as Salisbury Plain cuts the county, it is not possible to hold regular county meetings. It is therefore most important that a really good letter budget should circulate. Contributions for this should reach G2BI not later than the first day of each month, and the younger members are invited to state their difficulties so that these may be answered by the more experienced. Morse practice as suggested by H.Q. will be sent out. G2BI will send out on 80 metres on the first and third Sundays in the month, from 11.10 to 11.20 G.M.T., and Gloucestershire is arranging for the 160-metre and 40-metre bands; details later.

DISTRICT 7 (South-Eastern).

It is with much pleasure that I submit the first monthly report for the new No. 7 District. I wish to thank C.R.'s and members for their support and co-operation in getting the District running smoothly under the new scheme. The response *re* the proposed Morse Practice Scheme is very gratifying, and I am glad to find such enthusiasm prevailing.

G6WY reports activity throughout Kent excellent, and a well-supported letter budget is in circulation. The newly-formed society of the Gillingham "gang" is going well and two of the members have been invited to assist in the Morse Practice Scheme as in this particular area there are many BRS members. An all-Kent QSO party is being arranged to take place on the 1.75 M.C. band for November 22 at 23.00 G.M.T.; details are appearing in the BULLETIN.

G6NK says general activity throughout Surrey is good. Regular meetings are being held on the first Sunday in each month. The meeting is usually held at the home of an active transmitter, and interesting debates are held. The last meeting took place at G2NH and there was a discussion on Goyder Lock *versus* neutralised P.A., the general opinion being that the locked method gave a bigger r.f. output than the neutralised. At present the county is not running a letter budget as the majority of members meet often, but if any Surrey "ham" wants one, please write in to the C.R. G2VV reports that the Farnham Society is going strong and that interesting talks are being arranged for their Tuesday night meetings at 8 p.m. All are welcome.

Owing to the recent District changes, the flourishing letter budget in circulation under the control of G6GZ had to be suspended. A new letter budget which will provide for Hants, Sussex, and Berks is being organised by G6GZ. Members of the above counties are invited to co-operate and to help to get a new and bigger budget going. C.I. and I.O.W. members are cordially invited to contribute, and don't forget, all of you, NO letter—NO budget.

Like Hants and Berks, the members in Sussex are somewhat scattered and therefore cannot get together often (try the letter budget, hams.) G2AX, G2AO, and G5BS have volunteered to assist in the forthcoming Morse Practice Scheme and it is hoped to get a local press write-up on the matter in the hope of roping in new members.

DISTRICT 9 (Homes Counties).

A very satisfactory number of reports have been received and a bumper mail is expected next month. Please write before the 15th. The three C.R.'s are giving commendable attention to their territories and all are keen to help the BRS men in every way possible. BRS490 (through his C.R.) raises the question of a letter budget. If really desired and a sufficient number of enthusiastic subscribers are forthcoming, it might be launched once again. Please write your C.R. if in favour. G5FB and G2WJ have arranged to transmit Morse practice in November. G2WG observes signals from the opposite shore (Kent) show 25 per cent. increase in strength against those emanating from north and west. The "Men of Kent" observe a similar

pheonomenon in relation to Essex signals. Probably due to coast deflection. G2LZ is doing good DX but says he cannot discover the slightest influence of variations in weather or barometrical readings on signals! The following also report active: G2DQ, G2KT, G5OK, G6QO, G5VS, G6DH, and G5QV. Where are the Herts transmitters? Please make a note: Home Counties Conventionette is fixed for Easter at Clacton-on-Sea. Shall we bespeak the Blue Lagoon or the New Town Hall? Tell your DR.

DISTRICT 12 (London North).

The monthly meeting was again held at G6CW and proved a splendid success, being attended by 22. A very interesting talk was given by G5CD on the measuring of L.F. amplifiers for quality and the use of a valve voltmeter for measuring depth of modulation.

From now onwards will everyone send me their report not later than the 24th of the month, so that I can get copy for the BULLETIN; all reports received will be put together and circulated to those who send them.

DISTRICT 13 (London South).

My first report which should have appeared in the October BULLETIN was mislaid by our Editor, so herewith No. 2. [Sincere apologies to No. 13.—ED.]

A post card from the active stations before the 15th of the month regarding their pursuits will be welcomed as material for next month's report.

G5YH has reported that on October 17, 1931, at 19.45 G.M.T. he worked VK7JK on 7 M.C., getting QSA5 R5, and using 30 watts. He is getting out well, recently working a W5 on 14 M.C., and only awaiting cards for his W.B.E.

A monthly broadcast on 1,970 K.C. at 10 a.m. every third Sunday in the month will be commenced on November 15. Slow Morse practice will follow.

It has been suggested that we hold an area meeting monthly at a pre-arranged QRA. A post card from those who are likely to attend will be appreciated and also indicate what form of accommodation will be necessary. Further announcements will be made in the area broadcast.

Slow Morse practice will be given for ten minutes each Sunday on 1,970 K.C. at 10 a.m., and will be continued at 10.15 by G6QB on the same band for a further ten minutes. G6QB is still running the letter budget.

The writer wishes to make the acquaintance of all the stations in this area, both receiving and transmitting; it will be my duty and pleasure to help all, both newcomers and old hands, and any service that can be rendered will be most earnestly attended to.

DISTRICT 15 (London West, and Middlesex).

The attendance at the October meeting was very poor, ; only nine were present.

It has been decided to try a Saturday evening, and November 21 has been chosen for our next, with G6YK as host, at G6WN's QRA. On this occasion G5CV will give a paper on "Television." Make a note of the date and time—7.30 p.m.

Many members have this month taken advantage of the DX conditions prevailing on 7 M.C. Several have worked VK and ZL on this band and G5CV managed his first contact with the former by working a VK7.

It is proposed to hold an area rag-chew once a week or month, and I should like all members' views on the subject of waveband, etc.

We shall see an influx of members during the next few months and I want all members to help them feel at home by inviting them to their stations. It is only in this way we shall get to know some of them.

SCOTLAND.

Once again the Convention is over, and from reports I have received, was much enjoyed by those of us who could attend. Business always prevents the writer leaving Glasgow in September, and Scotland was therefore represented at London this year by Mr. Groom (G6RG). Mr. Groom did a good job, and I should like by medium of these notes to express to him our appreciation of his services.

I am very sorry to say I have been greatly disappointed at the poor response evoked by Scottish Circular No. 25 relative to the annual B.E.R.W. Contest. Once again "D" District led the way, making the circular the subject of general discussion at one of their fortnightly meetings. The result is that I have received a unanimous opinion from the whole district, which is even more useful than isolated opinions. So much for "D" District. From the rest of Scotland I have received ONE reply. Seventy-two circulars were sent out; suppose we deduct "D" District from this total, 57 would be left, in response to which ONE reply was received. Anything more discouraging to the organisers I find it hard to conceive, and as the efforts were being made on your behalf, your silence is certainly not much to your credit.

"A" District monthly meetings were resumed at G5YG on Wednesday, September 30, when there was an enthusiastic turn-out of FOUR, two transmitters and two BRS men. I am sorry these meetings have apparently ceased to prove interesting, and unless October and November show a considerable improvement, they will require to be abandoned. Remember the last Wednesday of each month.

Since the last notes were published, a number of new members have been elected, and to such I would extend a warm welcome to the Society. Two new radiating licences are now functioning—G5IM, Mr. E. N. Black, 361, Brook Street, Broughty Ferry, Angus, and G5TS (ex 2AGM), of 106, Cloberhill Road, Knightswood, Glasgow. To each I would wish best of luck. Two of our latest BRS members in "A" District, Mr. Brown and Mr. Hunter, have gone forward for their A.A. permits, and will eventually join the ranks of the "radiators."

I understand that Mr. Dow, one of the earliest of the Scottish transmitters, now VQ5NTA, is presently at home in Blantyre, but I cannot say at the moment whether this QRA is permanent or temporary.

G2MA, G6RG, and G5YG have been appointed by Council as Empire Link Stations for Hong Kong and Malaya, and naturally will do all they can to prove worthy of the responsibility placed on Scotland by their appointment. Conditions so far have not favoured them, as the 14 M.C. band on which most E.L.S. work is done, has at the moment of writing almost entirely collapsed.

An interesting experiment is being tried in connection with "D" District. It is an experiment

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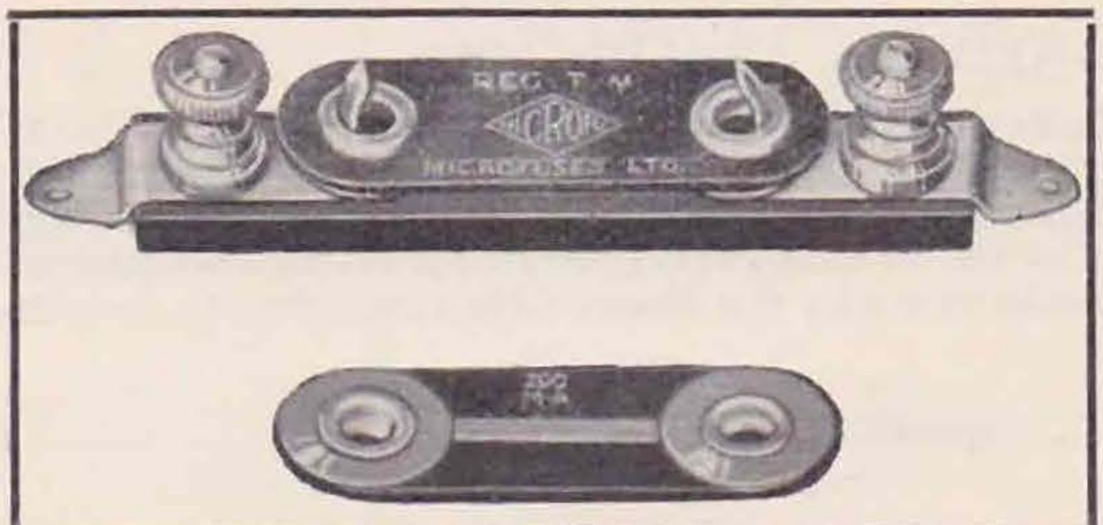

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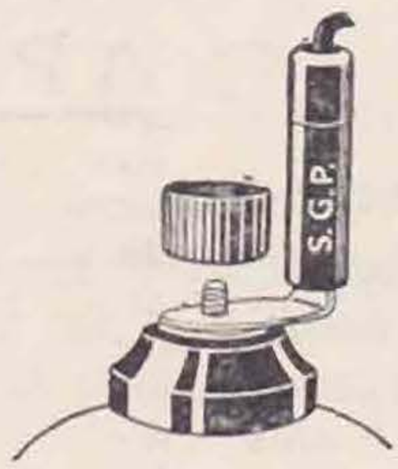

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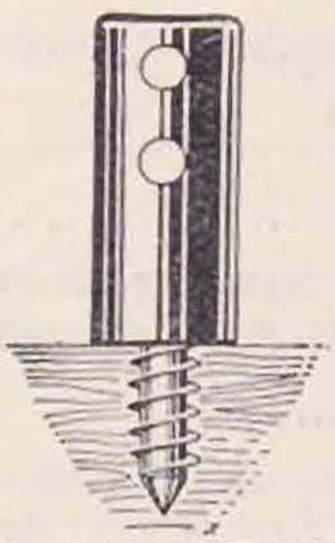

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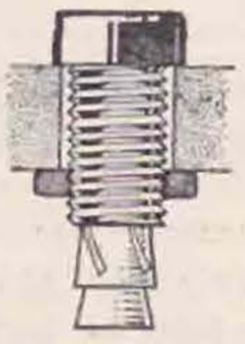

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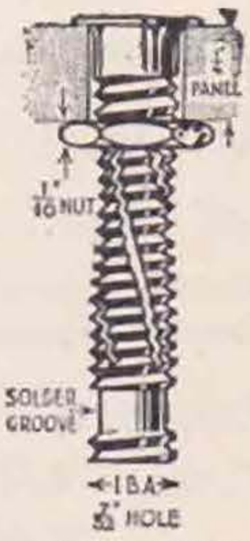

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The Hon. Secretary,

Sir,—I beg to make application to be enrolled as a member, and shall be obliged if you will submit my name to your Council. I agree, if elected, to act and abide by the Rules of the Society as expressed in its Articles of Association and By-laws.

Signature.....

Name in full (please use Block Letters) .....

Address (to which all communications may be sent) .....

Nationality..... Age (if under 21).....

Call Sign.....

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Proposed by..... Seconded by.....

NOTES.—*Applicants who do not know any member may accompany their forms by references in writing by persons to whom they are known. Such persons should be householders, and should state profession and length of acquaintance with applicant.*
The Council reserve the right to refuse any application without reason.

UNDERTAKING TO BE SIGNED BY APPLICANT.

I, the undersigned, agree that in the event of my election to membership of the INCORPORATED RADIO SOCIETY OF GREAT BRITAIN, I will abide by and observe the Rules, Regulations and Articles of Association of the Society, and that in the event of my resignation from the Society given under my hand in writing, I shall, after the payment of all arrears which may be due by me at that period, be free from this obligation. I further agree to observe strictly the terms of any licence issued to me by the responsible authorities to operate transmission or receiving apparatus.

Witness my hand this.....day of..... (*signed*).....

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which can only prove successful if ALL the transmitting amateurs in a district agree to fall into line. Briefly it is this. The office of Hon. District Repesentative will be held for 12 months only by any one individual, and at the expiration of a tour of duty the retiring Representative will immediately be succeeded by the next transmitting amateur on the roster. In pursuance of this scheme, Mr. Bamford, G5JB, retired at the end of September, and was succeeded by G6SR, Mr. Sidney Rowden, who will remain in office till the end of October, 1932. I approve heartily of the idea, for this reason, that no individual should be required to stay in office until he gets disheartened or sick of it, and consequently goes stale. I commend the idea to the other Districts, but would point out that the scheme is NOT feasible unless the transmitting amateurs in each District accept the idea and obligation *in toto*, Let me hear from you, "A," "B" and "C" Districts. I should like very much if Scotland would apply this system to the appointment of Hon. Scottish Manager also, for really, in the interests of the Society, the writer has held this office far too long. Perhaps you will consider this when next election comes round.

I was interested to get a letter from G2QO, who is still pounding brass at sea, and consequently is unable to function from an amateur point of view.

Comment must be made on the G.P.O. Agreement to expand our tolerances. It is certainly, while a splendid testimonial to the general behaviour of the British amateur, also a triumph for our late President, Mr. Gerald Marcuse, and we extend our best thanks to him for his work on our behalf.

A list of radiating stations definitely known to be active at the moment, is appended. Anyone who is active, and not included, might please drop me a line.

"A" District.—G2MA, G5CL, G5YG, G6MS.

"B" District.—Nothing definite is known *re* this District.

"C" District.—G5IM, G5NW, G6KO.

"D" District.—G6FN, G6RG, G6UU, G6SR.

NORTHERN IRELAND.

There are signs of renewed activity over here. GI6YW is working on 7 M.C. with crystal control, and GI6HI is still busy on 28 M.C. GI5MO hopes to be in the air at new QRA early in November. The annual general meeting of the Radio Transmitters' Union was held on October 10, and we were very pleased to welcome G6QJ and hope to see him back here soon again. It was unanimously decided that associate membership of the Union should be open to all those interested in amateur radio transmission, and not solely to transmitters as heretofore. It was also decided to run a competition for both transmitters and BRS stations in December, details to be arranged by the committee, in order to arouse some enthusiasm. GI6YW, GI5DU, and GI5MO have been busy practically all summer installing "Wireless for the Blind Fund" sets, and have travelled all over Northern Ireland at this work. There are still some to be installed yet, and I will be very glad if some of the country members will help. Please write to GI5MO.

* * *

The Editor regrets that the Notes for District 14 were received too late for insertion.

(*Continued from page* 170.)

VU2JP, South India, isL working Z and PK stations, employing 1.5 watts output.

VS7GT is now working CC—output 6 watts, and is doing excellent work.

NEW ZEALAND

By ZL3AR via G6XQ.

The ZL QRP contest was won by ZL4CA. Power was limited to 45 volts on one tube and the 3.5 M.C. band was used. Four code words were supplied to each entrant and these had to be received correctly for QSO to count. Points were awarded on the miles per watt basis ; some excellent work was done.

NIGERIA

By ZD2A.

There has been a slight improvement in conditions during the last month, but DX is still difficult to maintain. At the beginning of the month Central European stations were coming through well on 14 M.C., but during the latter part of the month only South American stations have been heard. We are glad to welcome three new members, two of whom now have BERS numbers, and it is hoped to have a good group going soon.

NORTHERN INDIA & BURMA

By VU2DR.

Conditions in Northern India and Burma have improved during the last month, particularly in Nos. 1 and 3 Districts, but reception on the plains is still seriously impeded by interference from electric fans, some of which have ranges of at least half a mile.

The outstanding characteristics of all district reports is the re-appearance of African and/or Australasian signals. Stations situated in these continents have been inaudible since the beginning of the Monsoon season.

Mr. W. G. F. Wedderspoon (VU2JB), who is the only active member of the B.E.R.U. in Burma, is to be congratulated on his fine advertising work on behalf of the Union. He has circularised thirty different individuals and clubs, and it certainly seems that he does not intend to remain the sole representative of the Union in his district for very long. We wish him every success in his most commendable efforts in this direction.

The following stations report that they are active : VU2AH, VU2DR, VU2FX, VU2JB, VU2KT, BERS14, and BERS19.

SOUTH AFRICA

By ZT6X.

I must begin by thanking Dr. Walters, ZU1D, for carrying on these notes in the past when I was too busy to do them myself.

Conditions have changed a great deal this year, but, strange to say, during the past three months DX on 7 M.C. has been fairly good. The W.I.A. arranged a series of tests during the month of August with the members of the S.A.R.R.L., and a number of our members enjoyed their first contacts with Australian hams. Ceylon, India, Java, Philippine Islands and North America have maintained contact with South Africa.

Our rainy season in the highveld is close at hand, with resultant severe lightning QRM.

Our postal authorities have been on the warpath, and when we apply for a renewal of our licences we have in future to give details of experiments

carried out, stations worked, and the proposed lines of future experimentation. Needless to say, a number of licences have been cancelled.

SUDAN

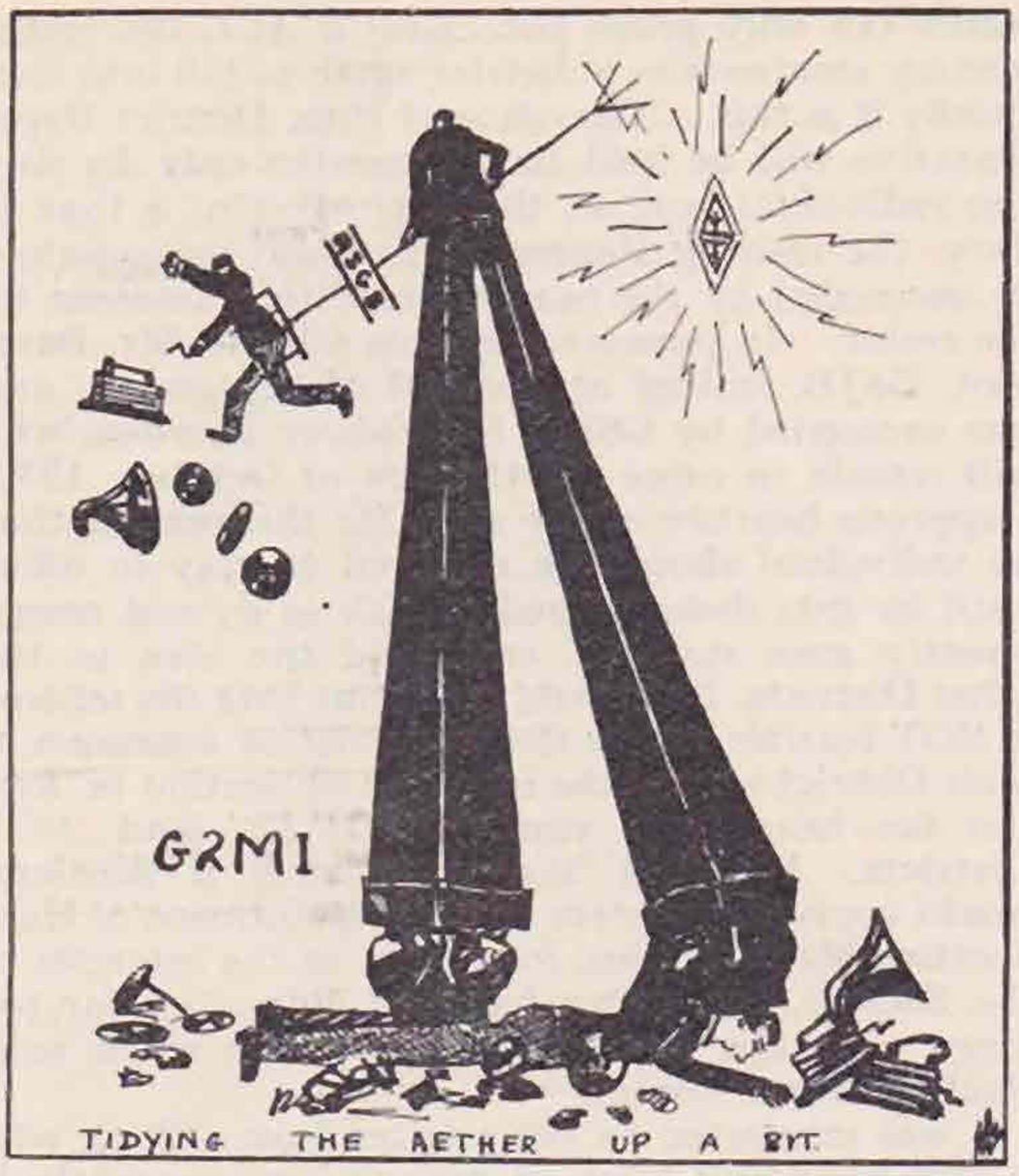
By ST2D via G6WN.

The 14 M.C. band still retains its peaceful aspect, and only a few east coast American stations appear after 18.30 G.M.T. The only other DX is PK during late afternoon.

No South African signals have been received, but they are on the air as many of the Europeans have been heard calling them. A few harmonics have been heard on 28 M.C.

EUROPEAN NOTES.

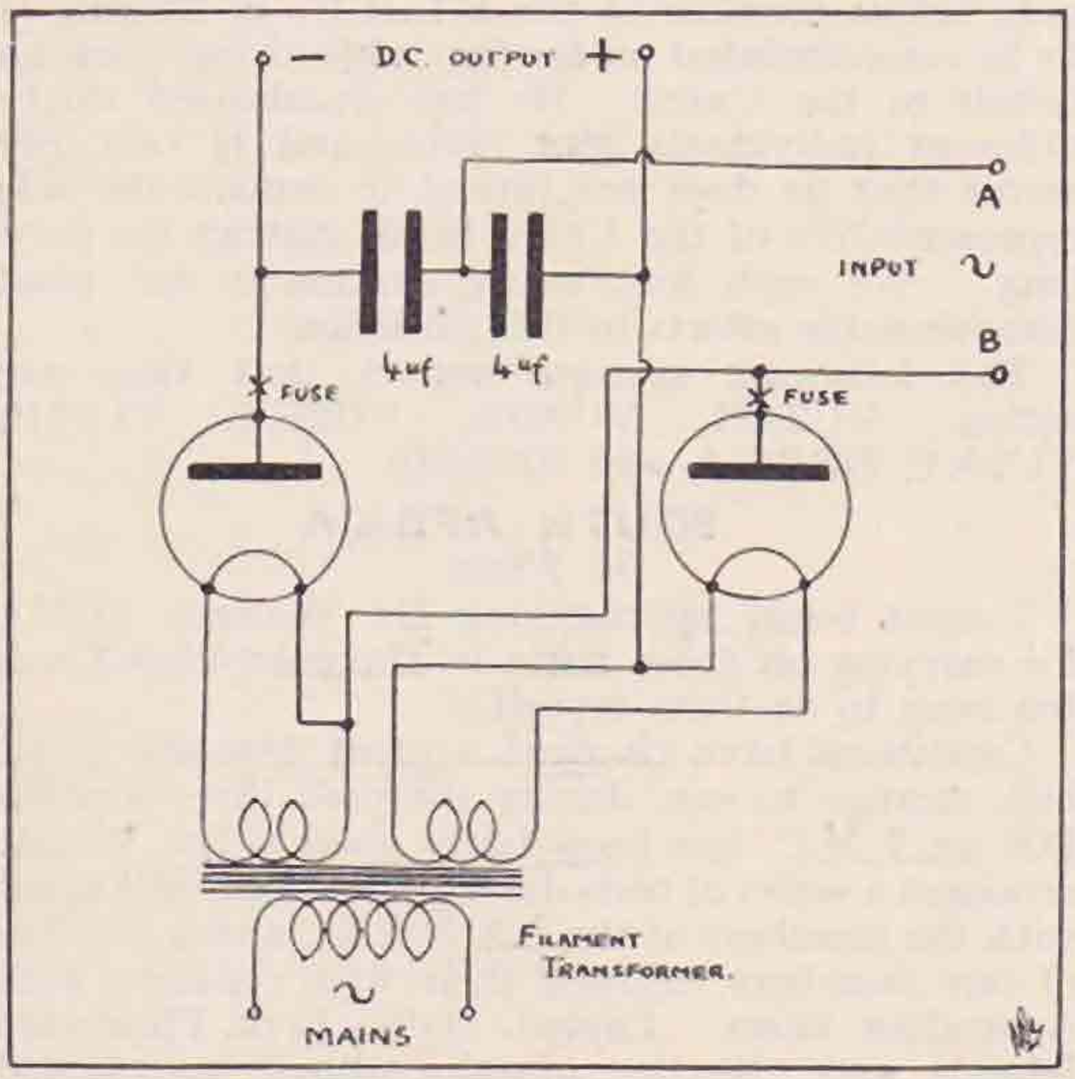
Amateur radio in Czechoslovakia is growing remarkably. The number of licensed stations is now 50. 3.5 M.C. has much popularity in our country and very interesting tests were established during summer time on near distances and in local work. 7 M.C. had improving conditions last month so that some DX contacts with ZL, VK, AU, VU and KA were made by our DX stations. We must note plenty of raw tones on this band. All except five licensed stations in Czechoslovakia are using C.C. 14 M.C. band changes from day to day. In some periods of 4-5 days it was possible to WAC in two hours. 28 M.C. has been very interesting here for local work, but no contacts were made with other countries.



Further Notes on Voltage-Doubling in Valve Rectifiers.

By E. L. Owen (G2OW).

AS the writer has received several enquiries for further information to supplement the rather sketchy article on voltage doubling which appeared in the June, 1930, Bulletin,



it seems desirable to add some further details of the circuit used.

To recapitulate: The device enables one to obtain a D.C. output from a rectifier at approximately double the A.C. input voltage. The circuit consists of the usual bridge, but with valves in place of electrolytic or metal rectifiers. (See diagram.) In the case where the A.C. is about 230 volts, a suitable output is obtained by using the main directly applied to AB, as well as to the primary of the filament transformer, thus eliminating any H.T. transformer.

In this case care should be taken not to use a direct earth on the transmitter, as it is against most power companies' regulations to earth any portion of their system, and would, moreover, short-circuit one rectifier.

The valves used for the writer's main voltage doubles are Triotron G 24's, used with plates strapped, each valve acting as a half-wave rectifier. One of the original pair is still in service and in good condition; the other only expired on accidental application of H.T. to its filament.

A second low power voltage doubler supplies H.T. to the crystal and frequency doubler. Here any valves seem to work; at present a DE5 and a CT25+ are in use.

Input is 150 volts, and D.C. output about 250 volts at 20 milliamperes. 2μF condensers are used in the bridge.

To summarise: The chief advantage is that no centre-tapped H.T. transformer is required. Disadvantages are: Use of two valves, slightly poorer regulation than with normal rectifier circuit, and use of double-winding L.T. transformer.

The writer will be pleased to give any further information to those who may desire to use the system, and would be glad to hear from anyone who has tried it out on powers above 50 watts.

A curious feature has been noticed when using the writer's unit with an output above 70 milliamperes; namely, that the flash-lamp fuses in the plate circuits of the rectifiers begin to light. These lamps do not light on D.C. under about 90 or 100 milliamperes, and it would seem at first sight that the plate currents of each valve should be half the output current, but this is apparently not so in practice.

DISTRICT 2 CONVENTIONETTE

November 28, 1931

The Guildford Hotel, The Headrow, Leeds.

Assemble between 3 and 3.30 p.m.

Discussion.

Tea at 5 p.m., then rag-chew ad infinitum

All details from G6PY, D.R.

Stray.

G6TV writes regarding morse lessons and says that in the L.C.C. area this should present no difficulty as a radio course, including morse practice, is provided at most of the L.C.C. Men's Evening Institutes at a small fee of 1s. per term. At one mentioned by him three students have recently passed their morse test and now possess transmitting licences.

Eddystone S.W. Variable Condenser.

Messrs. Stratton & Co. have produced a variable condenser for short-wave work which is of entirely new design. They have obviously gone to a great deal of trouble in making it extremely low loss, while maintaining rigidity. It is of brass construction throughout, and the heavy brass vanes are sweated at the joints. It is constructed for one-hole fixing and the spindle is ¼ in. There is no pig-tail, but the rotor is supported at one end only in a taper cone bush 1¼ ins. long, which, while holding the rotor rigidly, gives a large contact surface. The stators are carried on a spider of three strips of ebonite, which make a long leakage path, and these strips are fixed to small brass plate at the front of the condenser. The tension of the rotor is adjustable.

It seems, from tests, that this condenser can safely be used on transmitters where the H.T. voltage in its circuit does not exceed 700 V.D.C. (say, 2,000 volts R.F.).

The maximum capacity is 160 mmfds., the minimum 3.5 mmfds., and the price is 10s. 6d.

Notice to Contributors.

The Editor is pleased to have manuscripts submitted to him for publication, but would remind contributors that, owing to lack of space, a delay often elapses between the receipt of the MS. and the date of its appearance in these pages. All matter intended for publication should be written on one side of the paper only and preferably typewritten (double spaced). Diagrams should always be shown on separate *sheets. Rough sketches can be re-drawn by our draughtsmen. Photographs, if any, should not be smaller than ¼-plate as otherwise the reproduction will be poor.*

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Rates 1d. per word, minimum 1/6. First line in capitals if desired. 2d. per word where all capitals are required. Minimum 3/-.

SW9 dissipates 70 watts on 56 M.C.; double-ended; brand new, never been used; £5 (cost £8 10s.). Also 10-in. R-K Loud-speaker, 200 v. 50 m/a. field, £2 10s.—G6CJ, 96, Cotswold Gardens, London, N.W.2.

WESTON METERS.—Model 506, brand new; original cartons; never used; list price 35s., my price 18s. in the following calibrations (separate instruments) :—0-300 m.a., 0-10 v., 0-20 A., all D.C. Terms C.O.D. No reply means sold out. Inquire other bargains used but sound components. —J. P. J. CHAPMAN, The Huon, Branksome Hill Road, Bournemouth.

G6XC is disposing of spare Transmitting Gear at amazingly low prices: H.T. and L.T. Transformers, Milliameters, Condensers; all bargains for the modern ham.—A complete price list will be sent on application to 14, Mead Walk, Anlaby Park, Hull.

FOR SALE, 600 v. 30 m/a Evershed Generator, good order; geared or direct. Offers.—G5CY, Sutton-on-Sea.

CHRISTMAS QSL Cards. Send one to your ham friend overseas. Station call in large letters given free with every 100 cards.—G6MN for good QSL's.

BRS366 For QSL Cards, Log Pads, also special line in Ham XMAS Cards; samples on application.—QRA: "Inglenook," Orlando Drive, Carlton, Nottingham.

FOR THE NEATEST AND SNAPPIEST QSL CARDS TRY G6MN. ON THE JOB FOR THE LAST 10 YEARS.

TANTALUM AND LIONIUM.—Make your own Battery Chargers for alternating current. Simple, reliable. Lionium Rectifying Electrodes, 2-4 amps., 10s., 5-10 amps., 15s. Also Transformers, Blue Prints, 1s. each, and complete Chargers.—BLACKWELL'S METALLURGICAL WORKS LD., Liverpool.

EXPERIMENTAL work of all kinds. Television discs; Kinema projectors; Models for demonstation.—JOHN SALTER (Est'd. 1896), Featherstone Buildings, High Holborn, W.C.1.

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