

THE T. & R. BULLETIN

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Honorary Editor :—

H. Bevan Swift (G2TI)

Vol. 10

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No. 6

LAGGING BEHIND

STATEMENTS in the American radio press and elsewhere to the effect that the new Acorn valves suitable for ultra high-frequency work, are available for amateur use, follow closely upon the news that the Bell Laboratories have produced commercial A.T. cut crystals, with zero temperature co-efficient. These announcements, and others of a similar nature, must arouse in the heart of every British amateur a feeling that our own commercial concerns are lagging behind.

Power pentodes and valves suitable for suppressor grid modulation are now coming to us from America, as are tubes capable of rectifying up to 2,500 volts at half an ampere—incidentally, the latter are being sold at a price approximately the same as that charged for a British rectifier giving only 1,000 volts at half the current.

It is probably no exaggeration to say that five out of every ten British amateurs are to-day using foreign-made valves of some sort or other in their transmitters and receivers. These men are not disloyal to their country, but are compelled to make this choice because no suitable British valves are available at a price which meets the limitations of their pocket books. More often than not, when British valves *are* available, they are unsuitable, a fact which was pointed out by the designer of the tri-tet push-pull transmitter described in our last issue.

We rather wish a meeting could be arranged between a group of our leading amateurs and representatives of the valve industry, for it would then be possible for us to indicate in a frank and friendly manner where we consider the trade is losing for itself both money and prestige by failing to appreciate that a demand exists in the home market for more and better valves suitable for amateur and general use.

But the lag is not only in valve research ; as an example, let us take the case of the single signal superheterodyne receiver, with its associated crystal filter, we find that although the fundamental principles underlying the circuit were developed by a British engineer, it was left to the American radio companies to adapt it for amateur work.

These conditions must be remedied if the amateur movement in Great Britain is to go forward under the banner of research and experiment. There appears to be only one method available of effecting an improvement. Our suggestion is that every member requiring a special valve or component, which is not obtainable in this country, but can be imported from abroad, should write to at least one British manufacturer and point out the facts of the case. We are fully aware that a large company cannot be expected to make valves in penny numbers, but a demand exists for quantities of small pentodes similar to the American

(Continued on page 240.)

PRACTICAL AMATEUR TELEPHONY

By A. E. LIVESEY, D.F.H. (G6LI)

This article was originally prepared for the second edition of "A Guide to Amateur Radio," but was unavoidably held over owing to lack of space. We are of the opinion, however, that such a valuable summary of amateur radio telephony practice should be made available to our members without delay.

The author is well known as the manager of the R.E.S. Transmitter Design Group.

What is Modulation?

It is intended that this shall be a short résumé of the practice of amateur telephone working, supported by just those figures and technical details needed to produce proper results.

A pure continuous carrier wave is an even train of waves of the same amplitude having sine formation. The wave-train is usually illustrated by two parallel lines—the shape being termed the "envelope." The simplest way to modulate the train is to cut it up into a series of dots or dashes each containing a certain number of cycles. A receiver listening to these would hear a continuous rippling sound whose frequency or pitch would be the number of signals or groups being emitted each second. This is square peak modulation. Hence it is seen that modulation is the variation of the power transmitted as opposed to zero power.

To modulate a transmission with a pure sine wave sound—say, 1,000 cycles/sec.—the power is caused to vary in accordance with the sine law, not abruptly, and we find the train of waves shaped as in Fig. 1, which is familiar to everybody, and we see also that the power has to be altered at the rate of 1,000 times per second.

Percentage Modulation.

The question arises—how great can the amplitude of the carrier become? A fully modulated carrier consists of a carrier and two equal but opposite-phased side bands. The amplitude of a side band is always half that of the associated carrier wave for full modulation. Hence it follows that carrier current alternately pulsates between zero and twice the unmodulated amplitude.

This is the limit to linear power variation—called 100 per cent. modulation.

What Does the Modulator Do?

The modulator is the term applied to the valve whose function it is to keep the carrier wave current altering in amplitude in exact accordance with the speech or music impulses that come from the microphone via the speech amplifier to its grid.

The modulator is a kind of "tap" controlling the outgoing power. Its anode is connected to some part of the transmitter, of which details are given shortly.

The size of the modulator depends entirely upon the power of the carrier to be modulated. The proportion is direct.

Telephony for Beginners.

Most beginners make their debut into the world of telephony without the use of a modulator. Simple grid modulation direct from a microphone transformer is usually effected.

Systems other than proper grid control are to be deprecated as they do not conform with modern

practice. They cause the carrier to shift and they give serious interference with other users of nearby channels. Choke control, grid control, etc., are applicable to frequency controlled transmitters and it is not recommended, in any case, that telephony experiments are made without the use of a controlled set. When the frequency is controlled, a modulator valve becomes necessary and consequently a good amplifier to precede it. This aims at far better quality, higher per cent. modulation and worthwhile results.

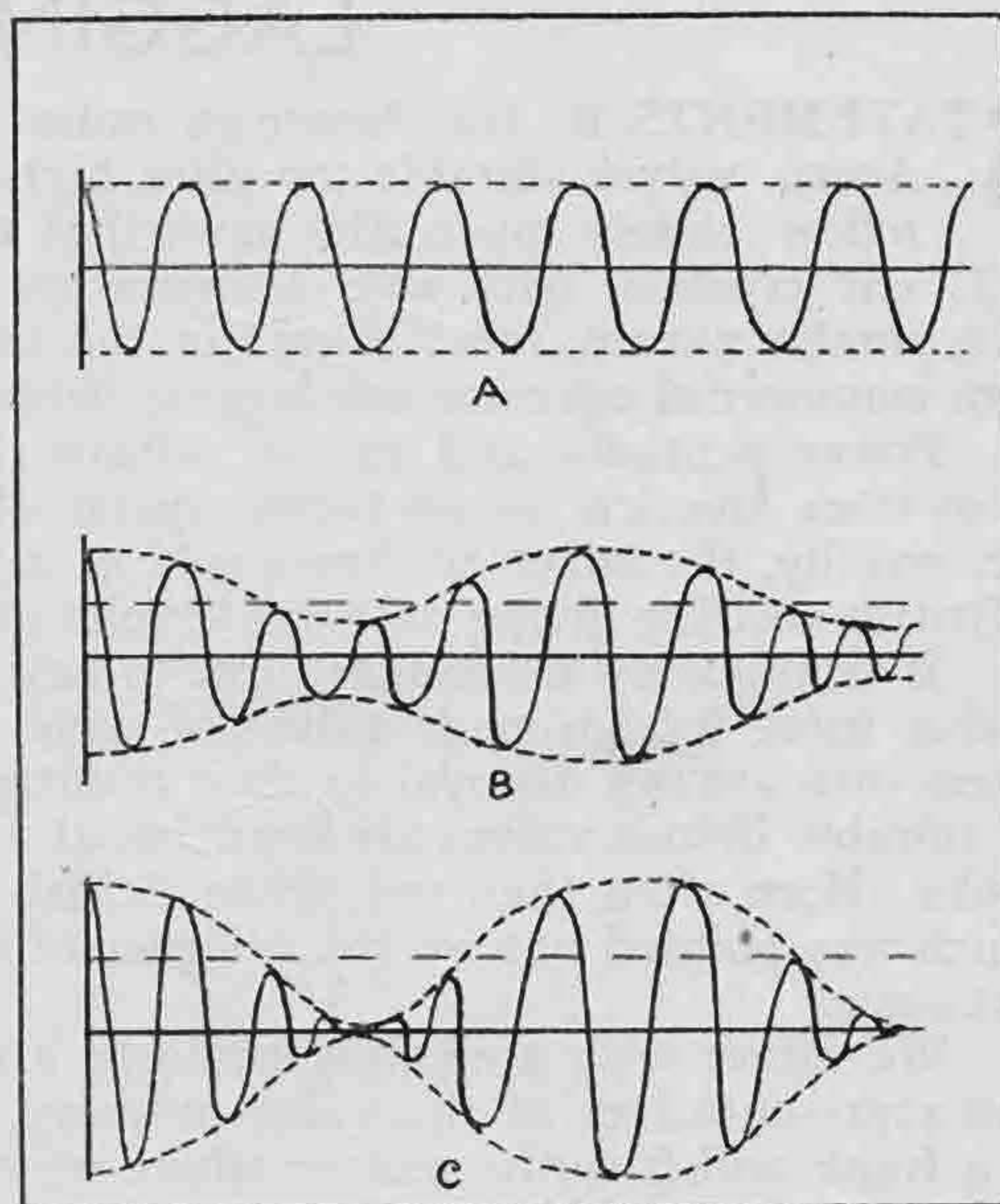


Fig. 1.
Aerial Current with (a) no Modulation; (b) 50 per cent. Modulation; (c) 100 per cent. Modulation.
Time Scale for Low Frequency equals 1,000 x Scale for High Frequency.

SYSTEMS OF MODULATION.

The following are the generally used systems of modulating, described later in detail, and here mentioned under their usual names:—

- (1) *Grid Modulation.*
 - (a) Self-excited circuit.
 - (b) Grid current, frequency controlled.
 - (c) Grid voltage or low-powered modulation with linear Class B Radio Frequency amplifier and either Class A or Class B modulator.

(2) *Anode Modulation.*

(a) Choke-fed modulator.

(b) Transformer or centre-tapped choke feed.

(3) *Screen-Grid Modulation.**System (1)a.*

Figs 2 and 3 show conventional methods for obtaining this rough form of telephony. In the first case, a microphone transformer is connected in series with the grid leak or bias lead. The anode current of the modulated valve is seen to fluctuate either up or down when the speech is impressed on the microphone. It is difficult to gauge the percentage of modulation. If this system is used, the microphone must be very sensitive and the average speech level kept as constant as possible. In the second case, a valve is arranged in series with the grid leak, and assumes the role of modulator. In its grid is the secondary of the microphone transformer or the output from a microphone amplifier. The grid of the modulator is biased either by battery or battery and potentiometer. Commencing at full negative voltage for the type of valve the bias is reduced until modulation begins

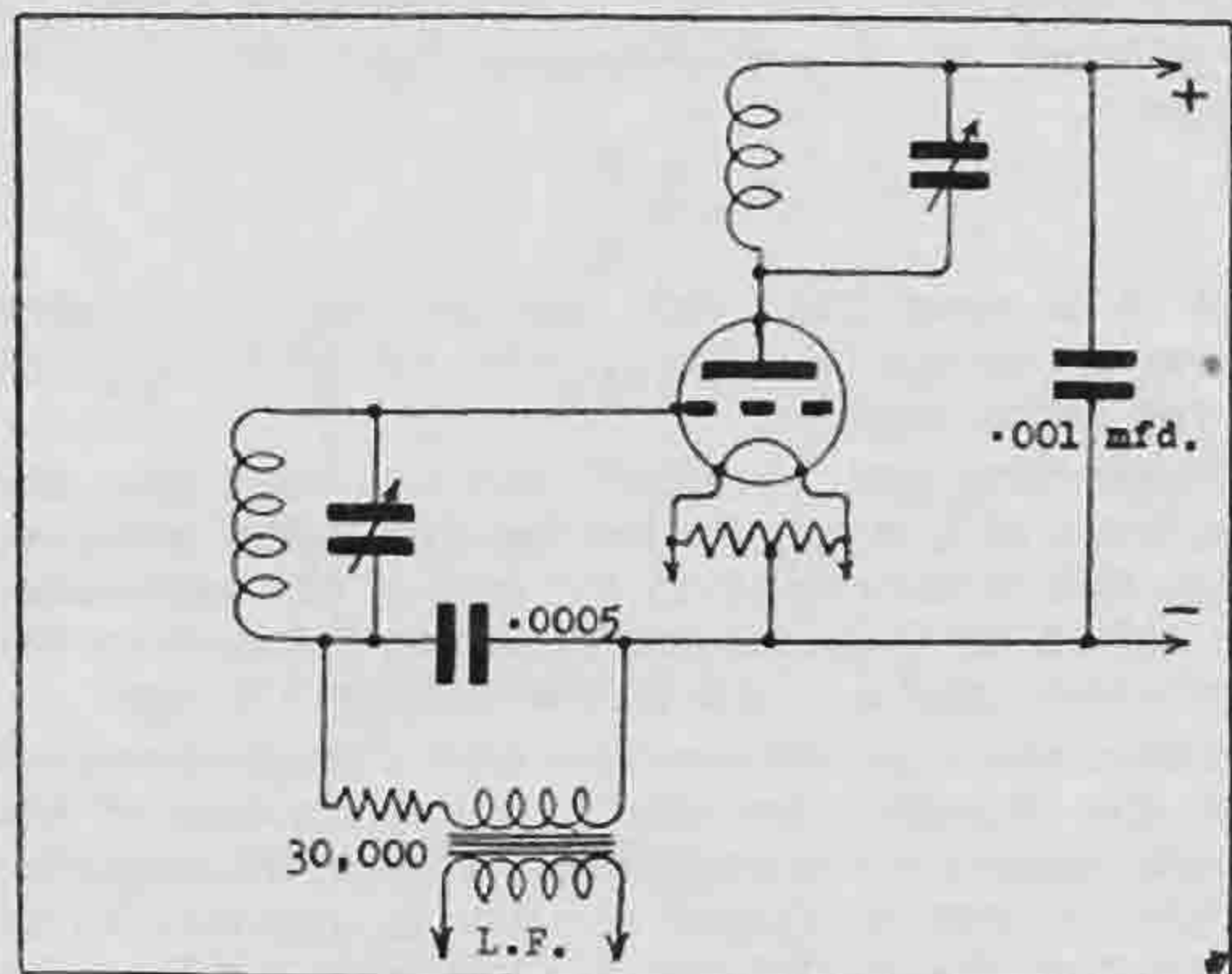


Fig. 2.
Simple Grid Modulation Circuit.

to appear in the amplifier and until about 22 per cent. increase is noticed in the aerial current when an average volume level is continuously sounded into the microphone. The anode current of the amplifier may move a little. The system is applicable to a controlled amplifier, when the audio output of the modulator should be about 3 watts for a 120-watt input to the R.F. amplifier. Approximately 1.5-watt audio output is required for every 50 watts of radio frequency carrier power, and the carrier should be set at about half the safe rated plate dissipation of the valve.

System (1)b.

A valve used as a modulator is connected to an output transformer of 1/1 ratio, the secondary of which is shunted by a loading resistance "R," in the manner shown by Fig. 5, the value of the resistance being approximately the optimum load for the modulator working as a linear audio amplifier. Speaking into the microphone actuates the modulator anode which causes the grid bias to the R.F. amplifier to vary. This varies the output to the aerial in direct accordance with the speech. The R.F. amplifier is only linear provided that no grid current is permitted to flow. From

Fig. 4, showing the supposed characteristic of the amplifier, it will be seen that we may only vary the grid bias between "O" and "B" on the grid volts base.

By biasing the amplifier back to "C"— $1\frac{1}{2}$ times the "cut-off" bias of the valve in question—and reducing the peak value of the drive voltage from the sub-amplifier to the value AC, we then arrange for the modulating voltage to move the point "C" back and forth from "D" to "B"—thereby causing the peak drive to shift its peak from cut-off to zero grid voltage.

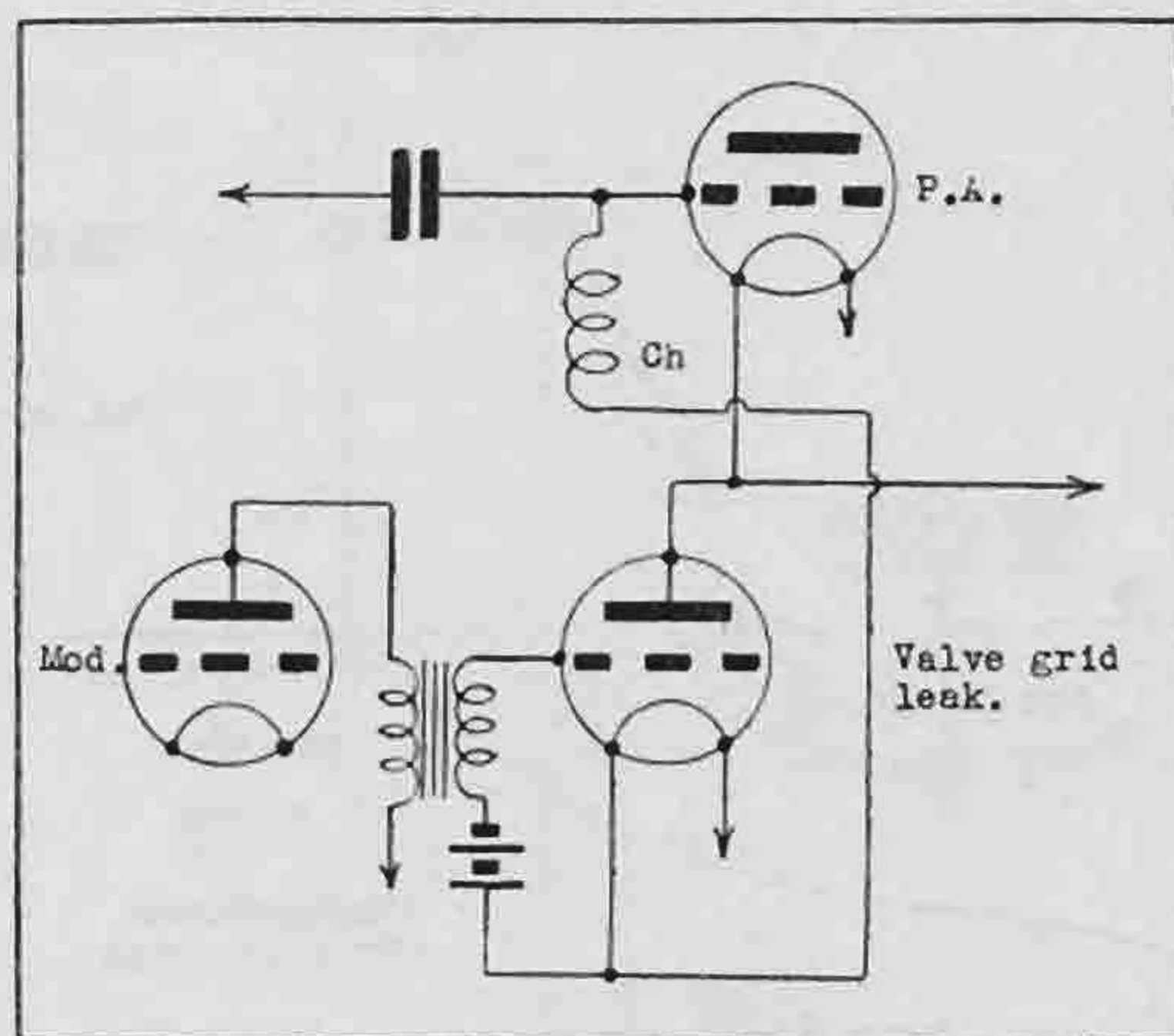


Fig. 3.
Another Grid Modulation arrangement using a Valve as Grid Leak.

It is observed that the highly useful portion of the curve of the valve lying at the other side of zero grid volts cannot be utilised and that the rating of the amplifier will be very much higher than that permissible for the carrier for modulation.

Very small drive is needed and about half this value of audio voltage.

The speech quality is quite as perfect as choke or anode control; the system is mathematically sound and recognised.

To operate, reduce the drive to the amplifier, after setting the bias to cut-off, until no grid current is seen to flow through the grid circuit. Then bias $1\frac{1}{2}$ times cut-off and apply modulating voltage until full modulation is indicated by the recommencement of grid current and perhaps distortion. This occurs when the modulation moves the drive peaks into the positive grid bias regions and when the power of the carrier suddenly rushes up.

No movement of the amplifier anode current is usual, but the aerial current rises with speech. The modulator anode current should not, of course, move. A valve of 100-watt input rating can be set to give a 10-watt or higher carrier and modulated 100 per cent.

The amplifier giving greatest output will be the one having lowest amplification factor combined with high mutual conductance.

The normal plate voltage is used to the amplifier—or one as high as possible. If the bias is reduced to twice cut-off and the modulating voltage increased to twice the amount, a system of semi-quiescent carrier is brought about, the carrier cutting off clean

when the microphone is not being used. Fig. 6 shows the connections to use for push-pull amplifiers, whose back-to-back operation obviates bottom

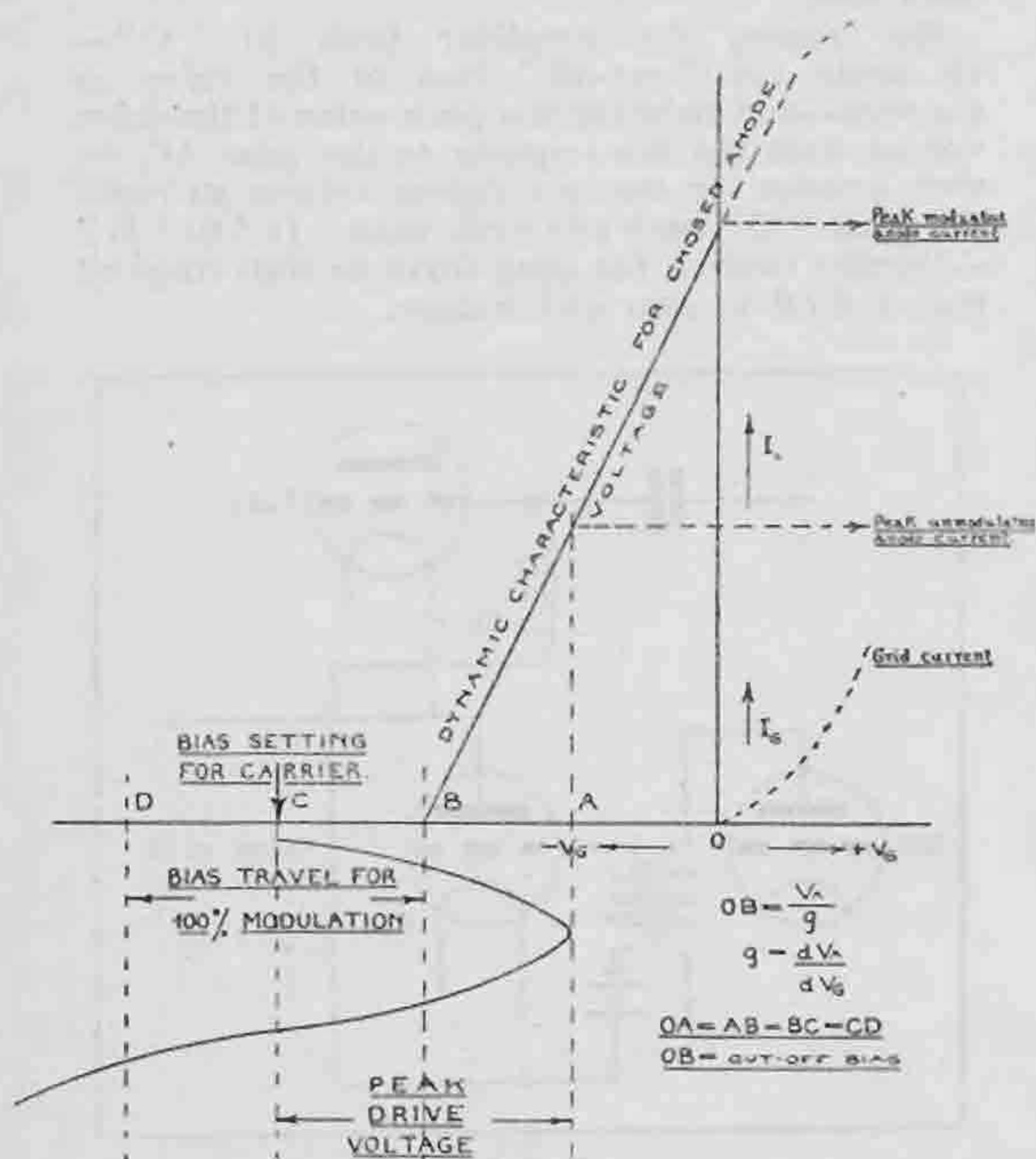


Fig. 4.

Static conditions for true Grid Bias Modulation. Battery Bias is recommended.

bend distortion and produces less second harmonic distortion. It is probable that the audio output rating of the modulator will require to be about the same as mentioned for the last system, but it is always best to have a watt or two in reserve for different kinds of valves.

System (1)c.

Low-powered modulation requires little explanation beyond the mode of operation. The drive is a modulated wave before it reaches the grid of the linear amplifier, having been modulated in one of the lesser stages by any of the well-known methods. The purpose of the linear amplifier is to pass on in a much-amplified form a truthful replica of the wave which it receives at the grid. To do this, it must be biased as a Class B amplifier—that is, set to a little less than cut-off bias. The drive should not swing the valve too far into the regions of positive bias or there will be curvature distortion due to saturation anode current peaks. Its output can be passed on to another Class B amplifier until the required output power is reached. Fig. 7 shows some variations which can be practised to overcome low percentages of modulation when the initially-modulated stage is not 100 per cent. controlled. By alterations in drive and bias it is observed that the output of the amplifier can be 100 per cent. modulated when only a 50 per cent. modulation exists at the input. In the choice of a valve suited to drive the amplifier one must be guided either by the characteristic curves or by the

amount of driving which the valve usually needs for C.W. working. It will, of course, be less than this latter, as a C.W. amplifier is biased to twice cut-off or more, and the drive is always much bigger as it has to swing from this region in order to "kick" the next stage almost into the saturation current regions. Push-pull linear amplifiers are an improvement over single-ended stages.

System (2)a.

We now arrive at the most important form of modulation—anode, choke or Heising control. Fig. 8 shows a conventional type of TPTG amplifier to which is coupled a modulator; its anode feed is in parallel with that of the amplifier but coupled to the supply through a low-frequency choke L. The grid of the modulator is connected to the microphone or source of audio supply.

Before proceeding to any practical operation, it is essential to understand something of the theory of working. The modulator is to function purely as a linear audio amplifier and the load presented to its anode is composed of the pure resistance V_1 in shunt with the capacity C. The resistance may be considered as a non-inductive load of constant shape:—

$$R_a = \frac{E_a}{I_a}$$

and it is clear that this can be varied in value according to the load imposed by the H.F. coupling to the aerial circuits.

Neglecting the capacity C and assuming that the reactance of L is infinite for the sine signal selected, when this is impressed on the grid of the modulator we obtain an in-phase anode current change in the modulator and an anti-phase voltage change.

The choke L prevents an average change of current and the change takes place at the expense of the anode current of the amplifier. Hence, the amplifier anode current is obliged to vary in opposite value to that of the modulator. This indicates that the supply voltage to the amplifier varies in accordance

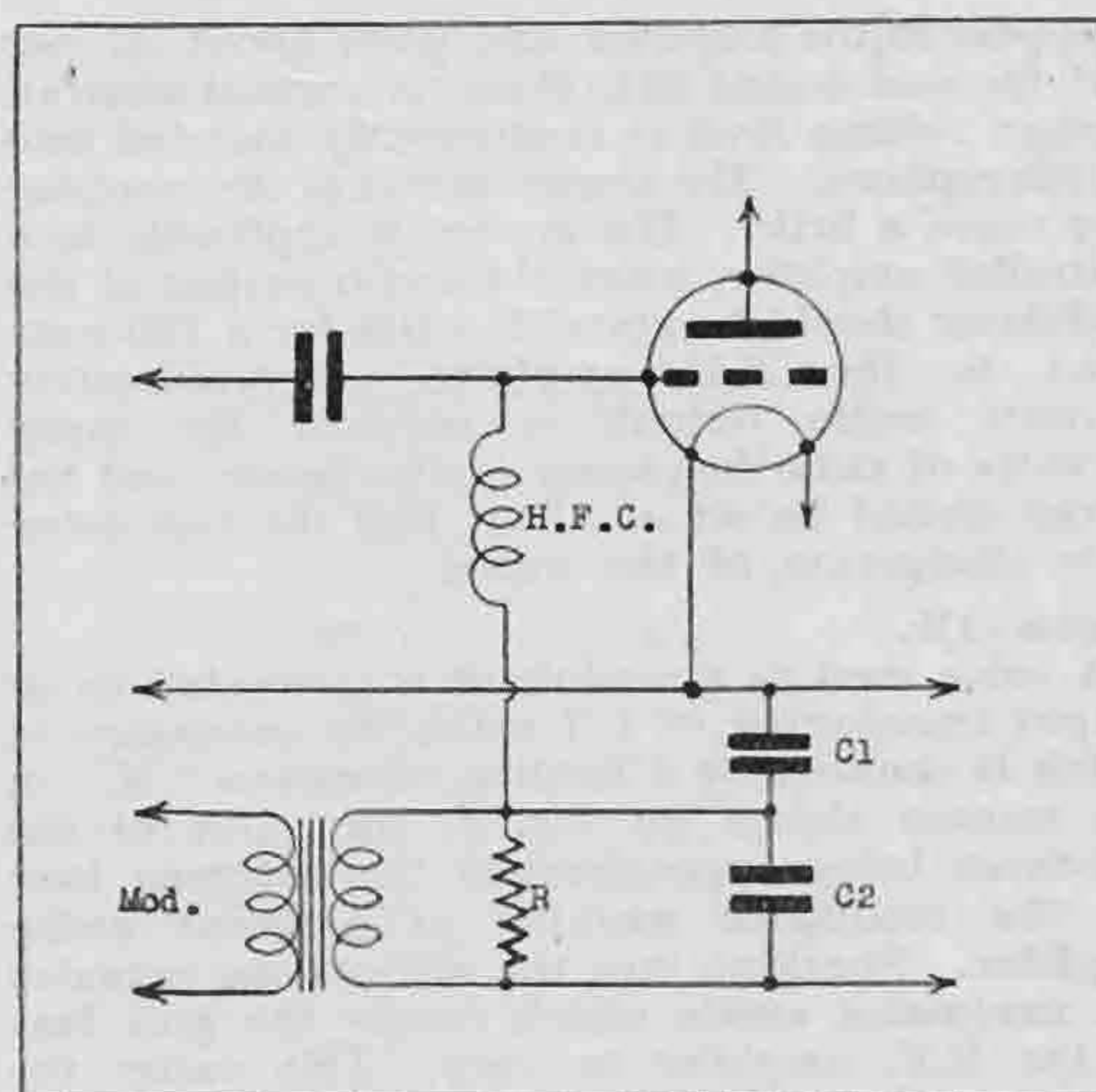


Fig. 5.

Application of true Grid Bias Modulation.

with the signals at the modulator grid, and carrier modulation at once becomes apparent.

Suppose that the modulator current rises, then the modulator anode voltage must fall. This therefore produces a fall in amplifier anode current and the amplifier has lost power at the expense of the modulator's gain. The reverse is also true and the two valves are continually performing a process of "give and take" in accordance with the input signals to the modulating grid.

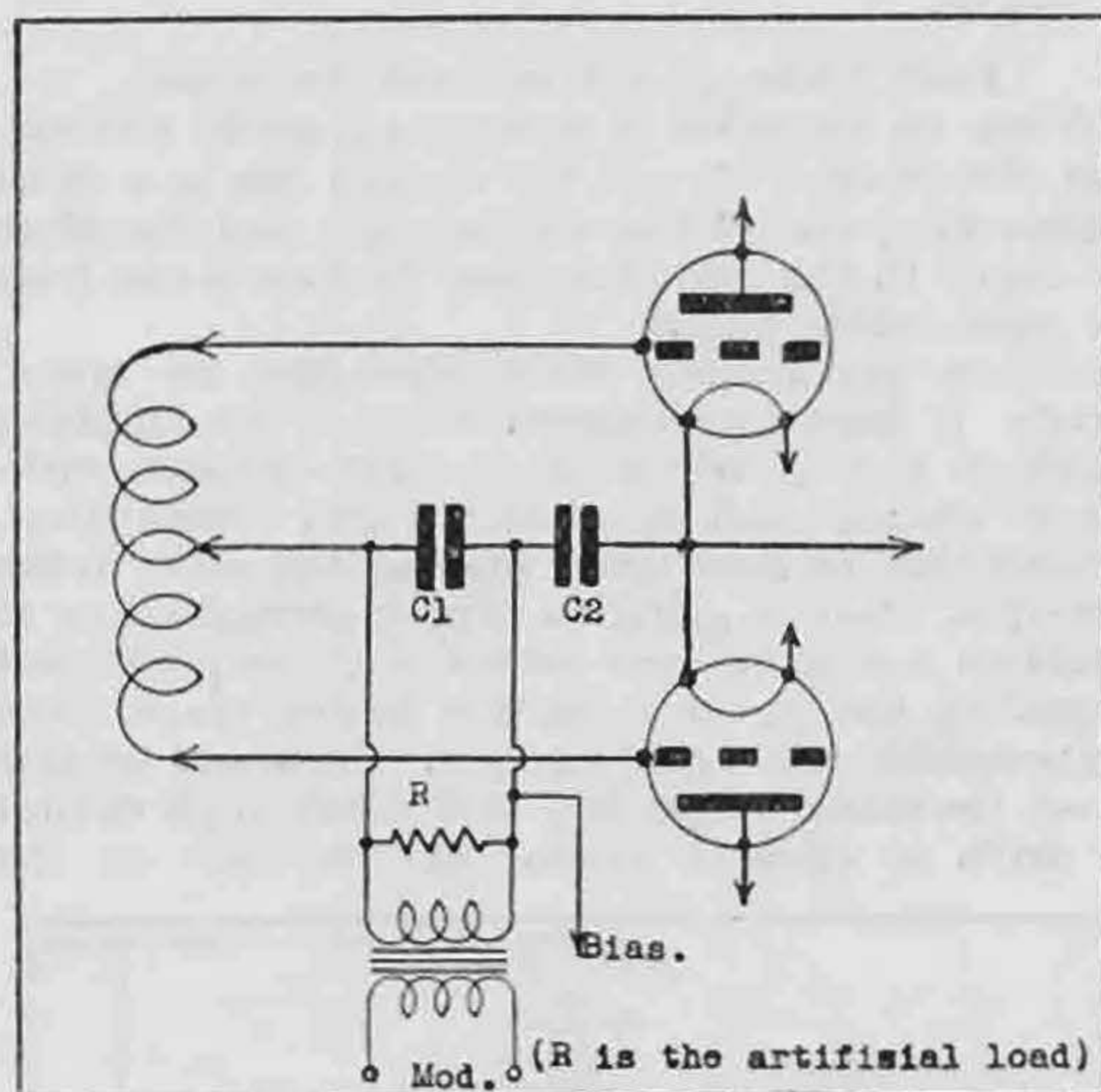


Fig. 6.

A Push-pull arrangement of Grid Modulation.

The actualities of practical modulation do not permit the full swing of voltage from twice the static value to zero on account of the limitations of grid current and bottom bend curvature in the modulator, consequently 100 per cent. modulation is not possible with this elementary circuit without distortion. However, it gives sufficient modulation for amateur purposes.

Next, the load line presented to the modulator anode is not straight as in theory, but curves away at the low-frequency end when choke reactance begins to approach the pure anode resistance of the amplifier. At the high-frequency end the load line is affected by the relatively low reactance of the different capacities. Consequently modulation is always bound to fall off at the extremes of the audio register.

The evidence of modulation by anode control is not to be found in the anode current meters and only in the aerial current meter.

For full modulation the sounding of a pure sine wave into an ideal telephone transmitter should raise the aerial current from unity to 1.23, a 23 per cent. increase.

System (2)b.

We proceed rapidly to the next method, since the mode of operation is the same for both, although the arrangement is slightly altered. Further, the scheme to be described is more flexible and more modern in practice than the old system using a rather doubtful choke.

We have in this case a circuit identical excepting for the absence of the choke L. This is replaced by transformer ABCD, as in Fig. 9. The modulator and the amplifier feeds are arranged to pass in opposite directions in the windings, and the fields so formed cancel out each other to the extent that saturation of the core does not arrive until the resultant field is of sufficient magnitude to cause this undesirable state.

Now another interesting point comes to light. We have seen that the virtual anode resistance of the amplifier may be altered by the aerial loading, and it is clear that this should be of such a value that the modulator may produce in it the greatest power, which state is brought about when the resistance becomes equal to the "optimum load" of the modulator—a factor stated always by the valve makers, but a value which may generally be round about twice the anode A.C. resistance of the valve. Now, continuing on this line of thought, it will be understood that it is often convenient to arrange the carrier power to some value which does not satisfy the equation—"amplifier anode resistance equals modulator optimum loading."

Having now arranged in the two anode circuits the equivalent of an auto transformer or tapped choke, we are in the position of being able to match up the anode resistance, whatever its actual value, to the virtual value needed for the modulator.

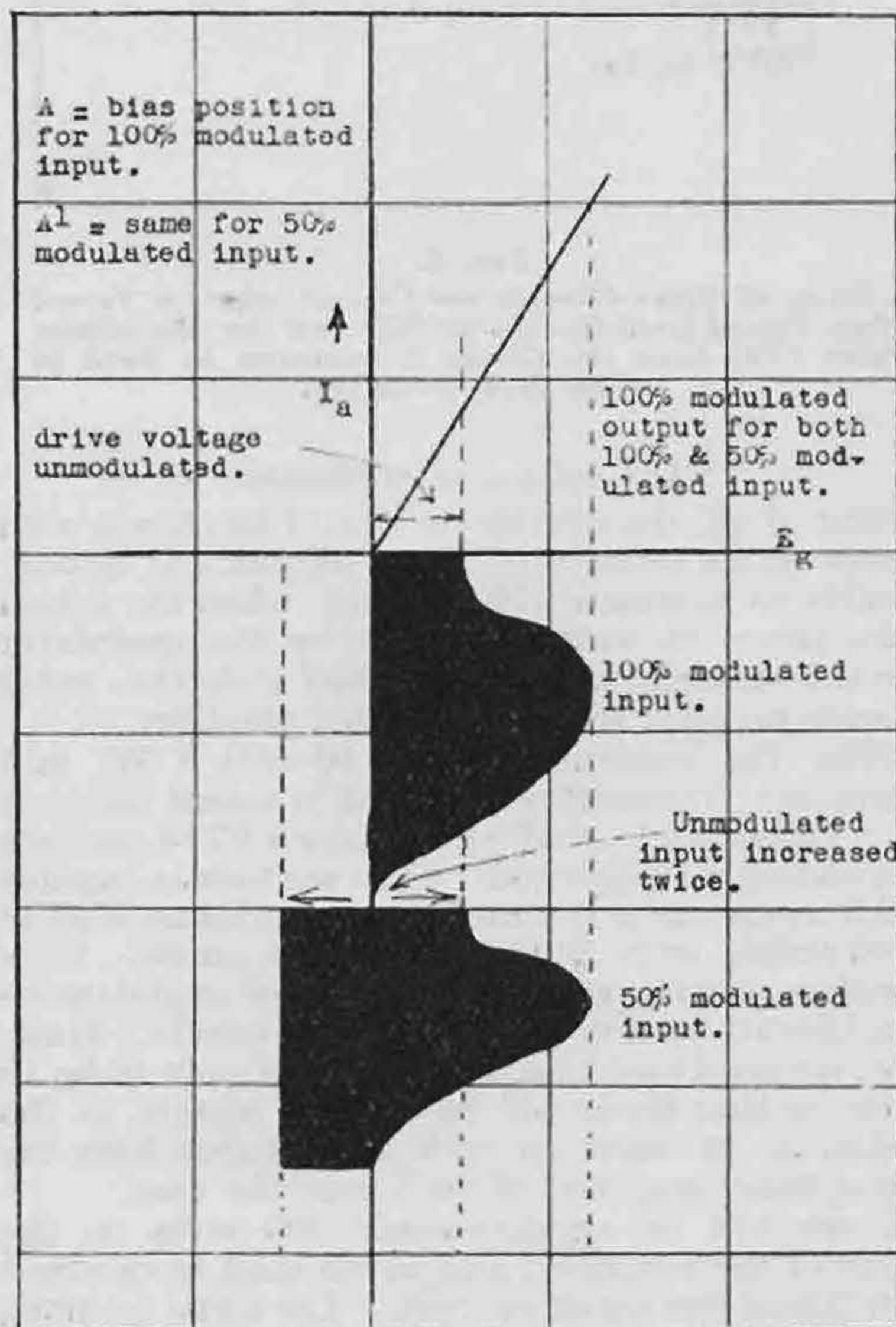


Fig. 7.

Illustrates Graphically that 100 per cent. Modulated Output is not a function of Input Control.

(In this diagram the symbol A should appear at the base of the main vertical and the symbol A1 at the base of the left-hand dotted line.)

The Practice of Schemes (2)a and (2)b.

It is necessary to comprehend the need of matching the load on the modulator. It should be clearly understood that the modulator delivers nothing but audio power and that it is working either as a class A amplifier or a class B amplifier in push-pull. It can only deliver its proper power into its optimum load whilst it uses the same input power irrespective of the load value. Hence it is obvious that careful calculation must be made before anode modulation is attempted in any transmitter.

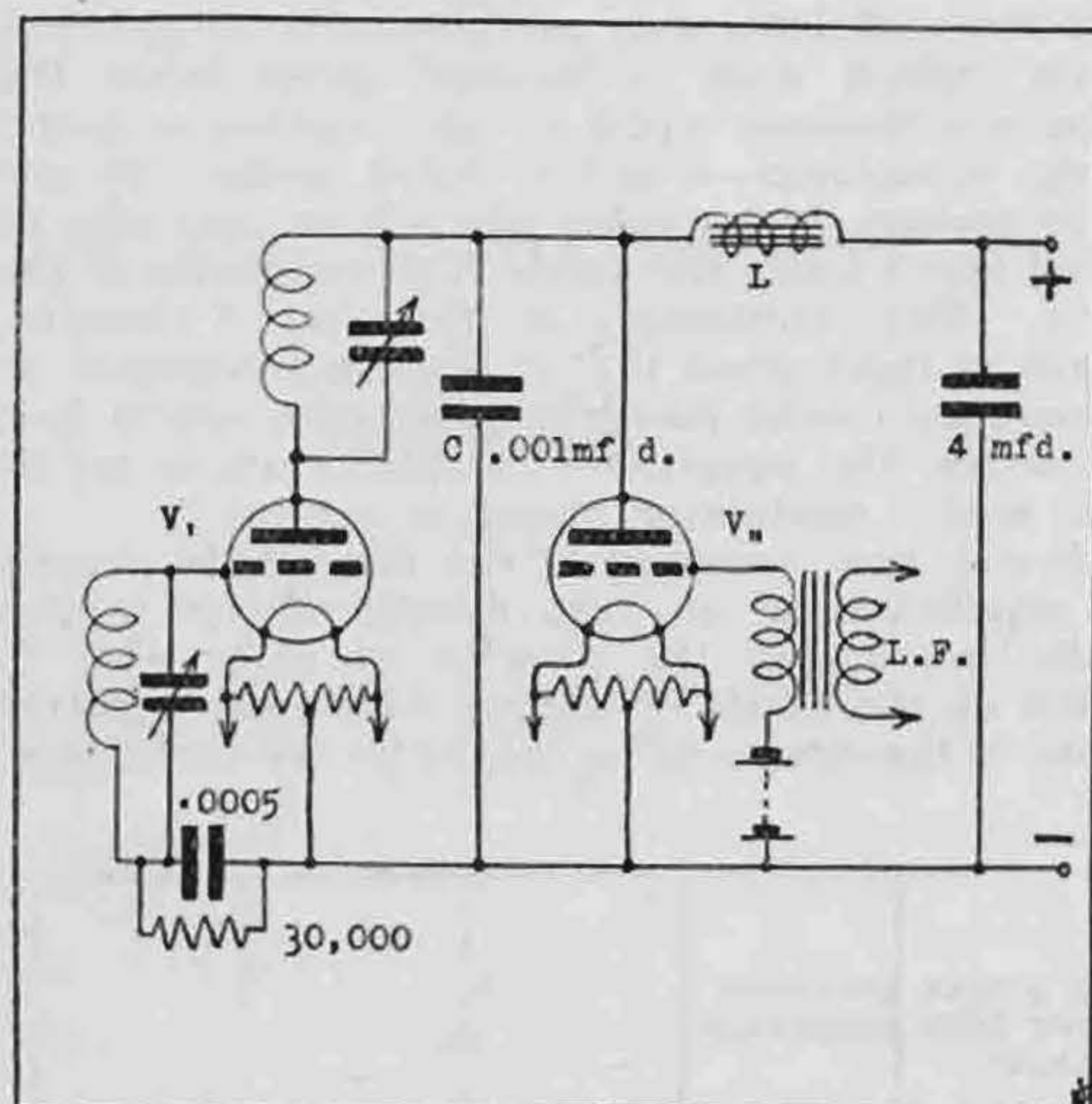


Fig. 8.

A form of Plate Modulation Circuit where a Tuned Plate Tuned Grid Oscillator (V1) and the Modulator Valve (V2) have the Choke L common to both in their H.T. supplies.

The Choice of a Modulator.

First of all, the modulator should be chosen with a view to its undistorted A.C. output. It is only possible to modulate 100 per cent. when the actual audio power in watts delivered by the modulator into the working load is equal to half of the D.C. input in watts supplied to the modulated amplifier.

Take the example of the 10-watt C.W. and Telephony Transmitter described in recent issues of the "BULLETIN," in which we have a PT16 pentode modulating a PX25 triode. The pentode is capable of 6.3 watts audio output into an optimum load of 5,000 ohms, with 300 volts on the anode. It is therefore safe to assume that we may modulate up to a 12-watt carrier with reasonable results. However, we are aware that the carrier is only to be 10 watts, so that there will be a good margin in the modulator to allow for lack of excitation from the microphone amplifier, if such was the case.

There will be approximately 300 volts on the anode of the amplifier, and so we shall have about 33 milliamperes anode current. The aerial coupling will be altered until this current is passing.

This shows that the anode resistance to D.C. is approximately 9,000 ohms, and we know already that the pentode must work into 5,000 ohms if it is to deliver proper power output. One is now only faced with a simple problem of matching impe-

dances in order to work out the correct ratio for the coupling transformer between amplifier and modulator.

$$\text{Ratio} = \sqrt{\frac{9,000}{5,000}}$$

which is 1.34 to 1.

If the coupling to the aerial was increased until the PX25 drew 60 milliamperes instead of 33 milliamperes, then the anode resistance would have dropped to 5,000 ohms and a 1 to 1 ratio only would be needed.

Peak Values in a Modulated Amplifier.

When an amplifier is undergoing anode modulation, the anode volts and the current rise to a value approaching double the normal rate and therefore the input to the amplifier rises by four times over the modulation peaks.

Certain precautions must therefore be taken. Firstly, it must be reckoned whether the amplifier is able to supply the necessary extra emission without saturating—falling off as the grid current rises. It must then be questioned whether the valve in the preceding stage is going to supply enough drive to maintain a proportionate output over the peaks, not forgetting the power reduction taking place when the amplifier takes grid current. It would be safe to set the driver stage to a sufficiently high output to drive a 40-watt carrier in the case of the

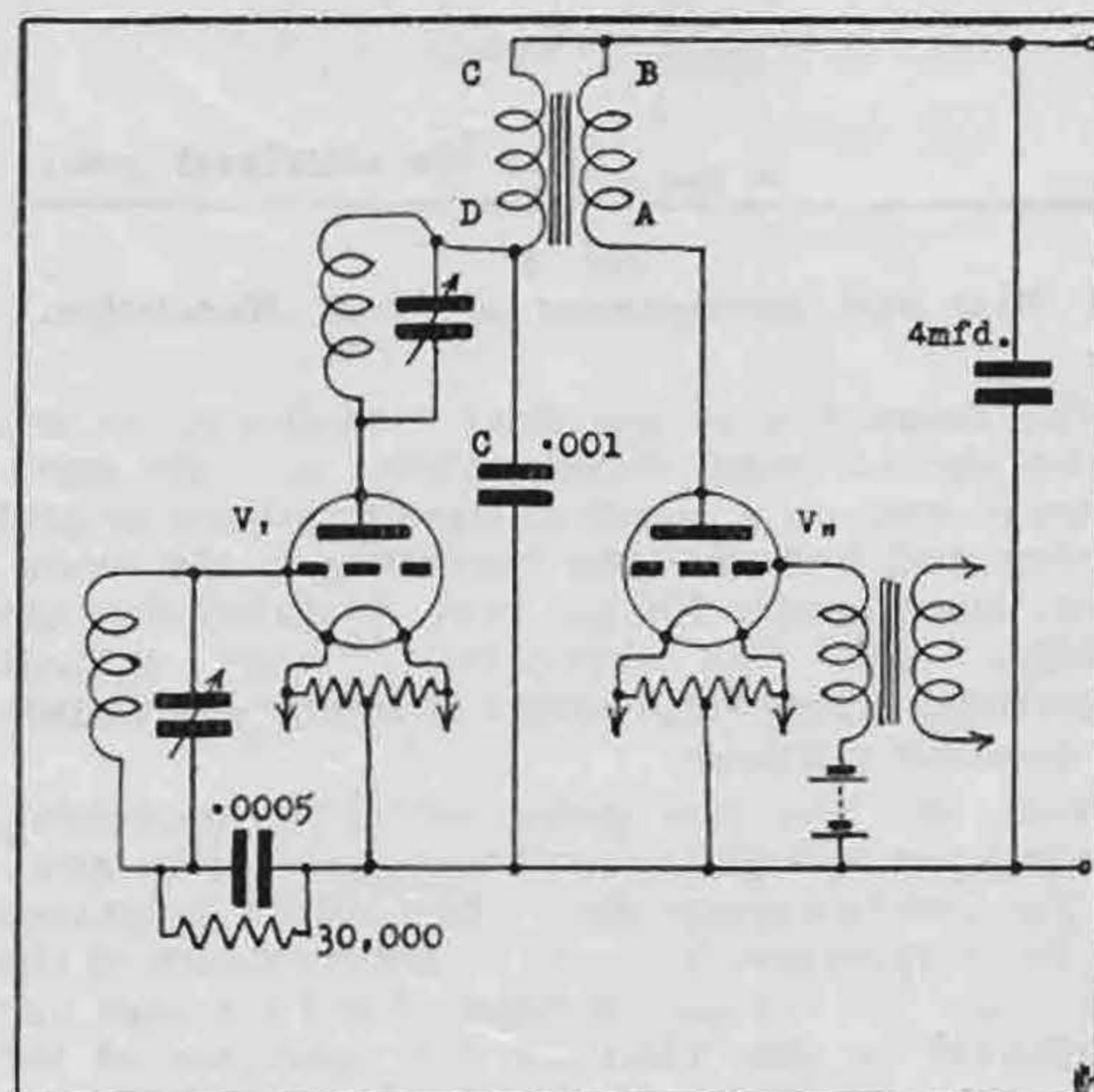


Fig. 9.

A Circuit using Transformer Feed. The windings AB, CD, must have very High Inductances whilst carrying the respective Anode Currents passed by V1 and V2.

10-watt unmodulated carrier. The average value of the fully modulated carrier power would, of course, be 15 watts.

The peaks of modulation are only able to show effect in the aerial or H.F. output, which will rise by 23 per cent. at 100 per cent. modulation.

The anode current of the amplifier and that of the modulator must not move.

Setting the Amplifier Bias.

The amplifier bias must be set so that the output can be varied linearly. That is, set for class C operation with a grid bias of twice cut-off value.

Tuning and Setting Up the Telephone Transmitter.

Assuming that the audio side of the equipment is in proper working order, fully excited by the microphone amplifier and working without audible distortions, the transmitter is tuned and neutralised carefully in the ordinary way. The aerial is then coupled up until the correct anode current is being taken—no notice is taken of aerial current readings at this stage. The microphone gain control is then advanced until over-modulation is reached and the anode currents of amplifier and/or modulator begin to fluctuate. The control is backed off again until this stops. In the unmodulated state the drive is strengthened until the aerial current stops increasing. About 5 or 6 watts input to the drive may be needed for a 10-watt carrier in the final stage.

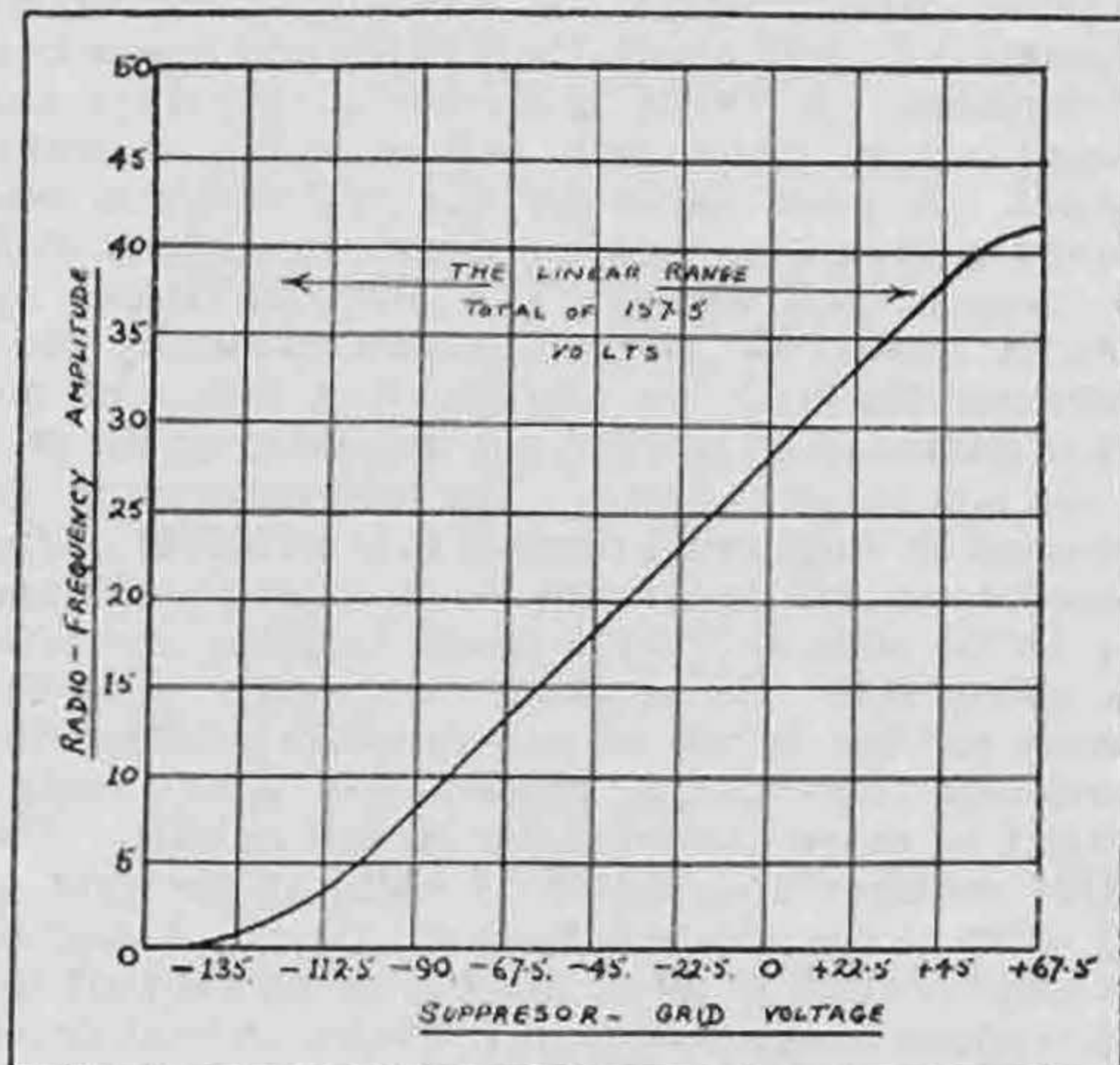


Fig. 10.

Typical curve of an American Type 59 Pentode, suitable for Suppressor Grid Modulation.

System (3)—Screen-Grid Modulation.

At the present time it is regretted that the home market does not furnish a valve suited for amateur screen-grid modulation requirements.

As far as the amateur is concerned, it is impossible to modulate directly a screen-grid amplifier of the ordinary type via the anode or the screen alone. A combination modulation has to be effected simultaneously and not without less variations at the screen-grid than at the anode.

However, the introduction of pentodes of the H.F. type for use as radio frequency amplifiers has made possible the use of a system known as suppressor-grid modulation.

The suppressor grid is a small electrode situated between the anode and the screening grid, and its primary function is the prevention of secondary emission at the anode. It is therefore usually connected inside the base of the valve to either the cathode or the negative side of the filament.

Certain pentodes have the suppressor grid brought out to a terminal, in which case the new method of modulation may be applied. An example is the "Mazda" AC/S2/Pen—a small H.F. pentode of the indirectly heated type.

In the United States experiments have been made with the Type 59 pentode. Fig. 10 shows a curve typical of this valve in which suppressor-grid bias

is plotted against R.F. output amplitude. It is seen from this that there is excellent linearity over about 157-volt swing or variation, but that the prevailing bias is on the negative side. This linearity is unaffected by large variations in excitation, control grid bias and load-impedance values.

Results that Generally Appear.

It is found that the output power is approximately around that delivered by a linear class B amplifier, but higher by a very appreciable amount than that obtained from a grid bias modulated stage operating at the same anode voltage.

The peak output for a given anode voltage is about the same as the carrier output would be for a similar choke modulated class C stage. The modulator needed to do the work is, however, very small and its capacity is estimated when it is known what sort of voltage swing is needed at the suppressor grid.

The speech quality delivered is perfectly faithful, and very simple couplings only are needed between the modulator and the suppressor grid.

Practical Details.

Irrespective of the kind or size of the pentode used, all that one needs to know is the range of voltage variation at the suppressor grid over which linear output is maintained, from which an idea of the correct static bias is obtained and the swing required at the modulator anode.

Fig. 11 shows the American circuit used normally. It is noticed that the anode voltage is about 700 volts at the maximum in this case, and we find that 50 milliamperes is the rating of the anode current with the aerial connected and the amplifier operating class C fashion for C.W. This represents 35 watts input maximum. For telephony this is reduced to half by putting negative bias on to the suppressor grid until the anode current falls by half. (This reduces the output power to about one-quarter.)

It is seen from the figure that the modulator anode is connected to an ordinary audio output transformer having a 1/1 ratio and a loading resistance across the secondary of value equal to the optimum load of the particular type of modulator employed.

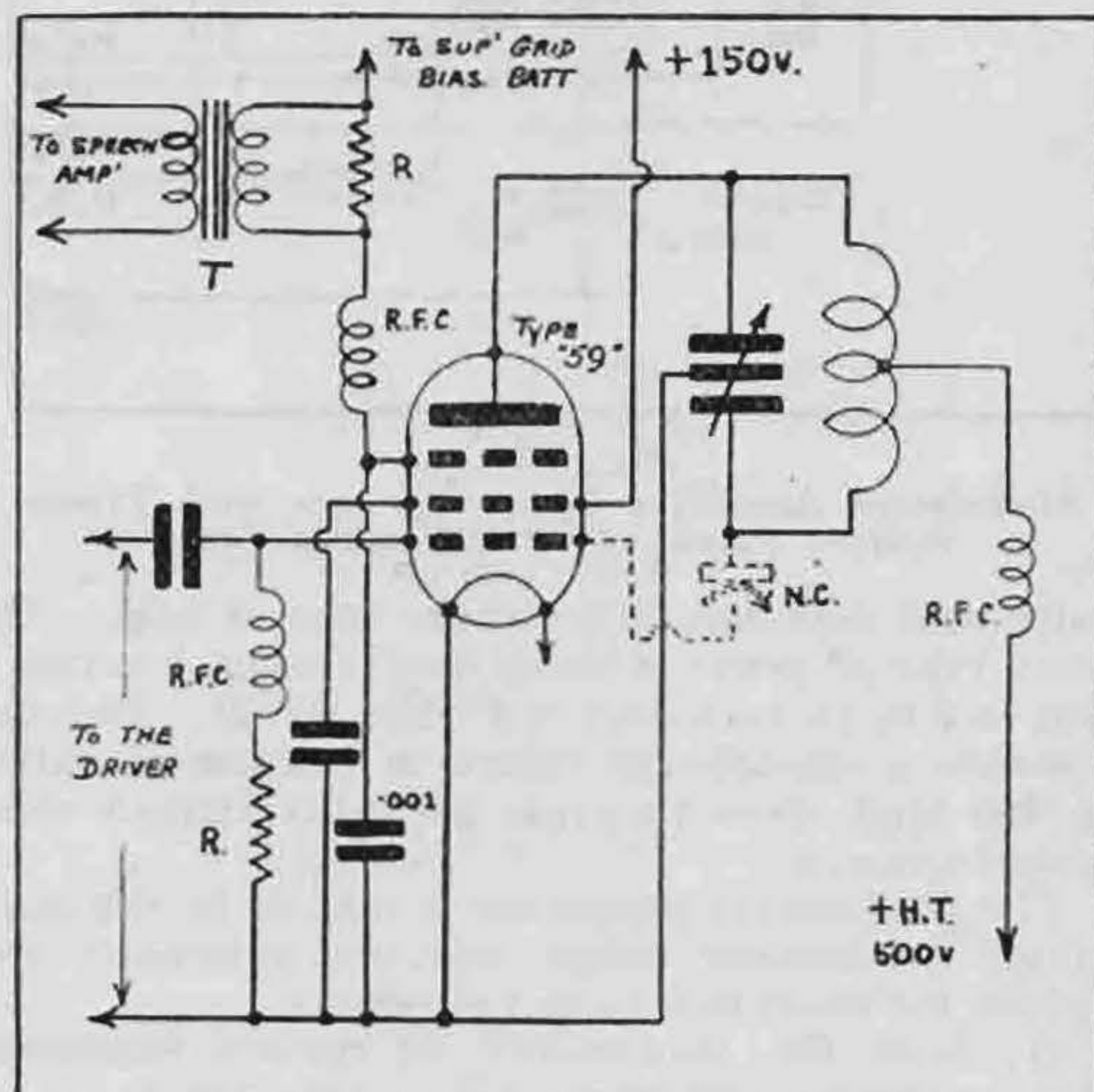


Fig. 11.
An American circuit used for Suppressor Grid Modulation.

MODULATION SYSTEMS FOR 56 MC. TRANSMITTERS.

By J. N. WALKER, G5JU.

THIS article deals with some recent 56 mc. experiments conducted by the author which may have an interest for others working on these frequencies.

When operating from a fixed address unlimited power up to the licensed limit is invariably available and telephony then becomes a practical proposition, at any rate as far as local contacts up to, say, 5 miles are concerned. For field day work, however, matters are a little more difficult, for then power supplies are limited and for obvious reasons it is desirable to keep down the weight of the gear as much as possible. These disadvantages go against obtaining satisfactory contacts over considerable distances, which is generally the aim of all field day operators, though the fact that unlimited space for aerial experiments becomes available somewhat offsets these difficulties.

With these thoughts in mind the author set about the task of obtaining contacts by means of well-modulated c.w., as this has the definite advantage of producing an extremely good type of signal. Successful results, however, when this method is used, depend upon obtaining the correct depth of modulated wave, for if modulation is too great the transmitted wave does not get a chance to build up and has very little effect on the quench of a super regenerative receiver. If, on the other hand, modulation is too low, the signal cannot be heard through the receiver background noise. In the event of the station which is being worked reporting strong i.c.w. signals, then it may be desirable to use telephony, and the circuits to be described are arranged for this with the minimum amount of trouble.

Fig. 1 shows a pentode used as modulator, the valve being a *Mazda Pen.220* and the oscillator a *Mullard PM2*; this circuit requires a special input transformer, which can be easily constructed from an ordinary L.F. transformer providing there is sufficient space on the bobbin for a winding of 200 turns 20 s.w.g. enamelled copper wire to be overwound. This transformer will suit most carbon type microphones. Keying can be effected in the H.T. positive lead to the oscillator, providing this does not effect the load voltage of the supply, but as a general rule the method illustrated is to be preferred and a resistance of 60,000 ohms across the key is suggested, although this varies for best results with different types of valves. Attention to this point will help towards the production of a cleaner signal. The volume control acts on both speech and i.c.w. The oscillator is of the ordinary series tuned variety adjusted to maximum efficiency; the microphone must be disconnected when i.c.w. is used.

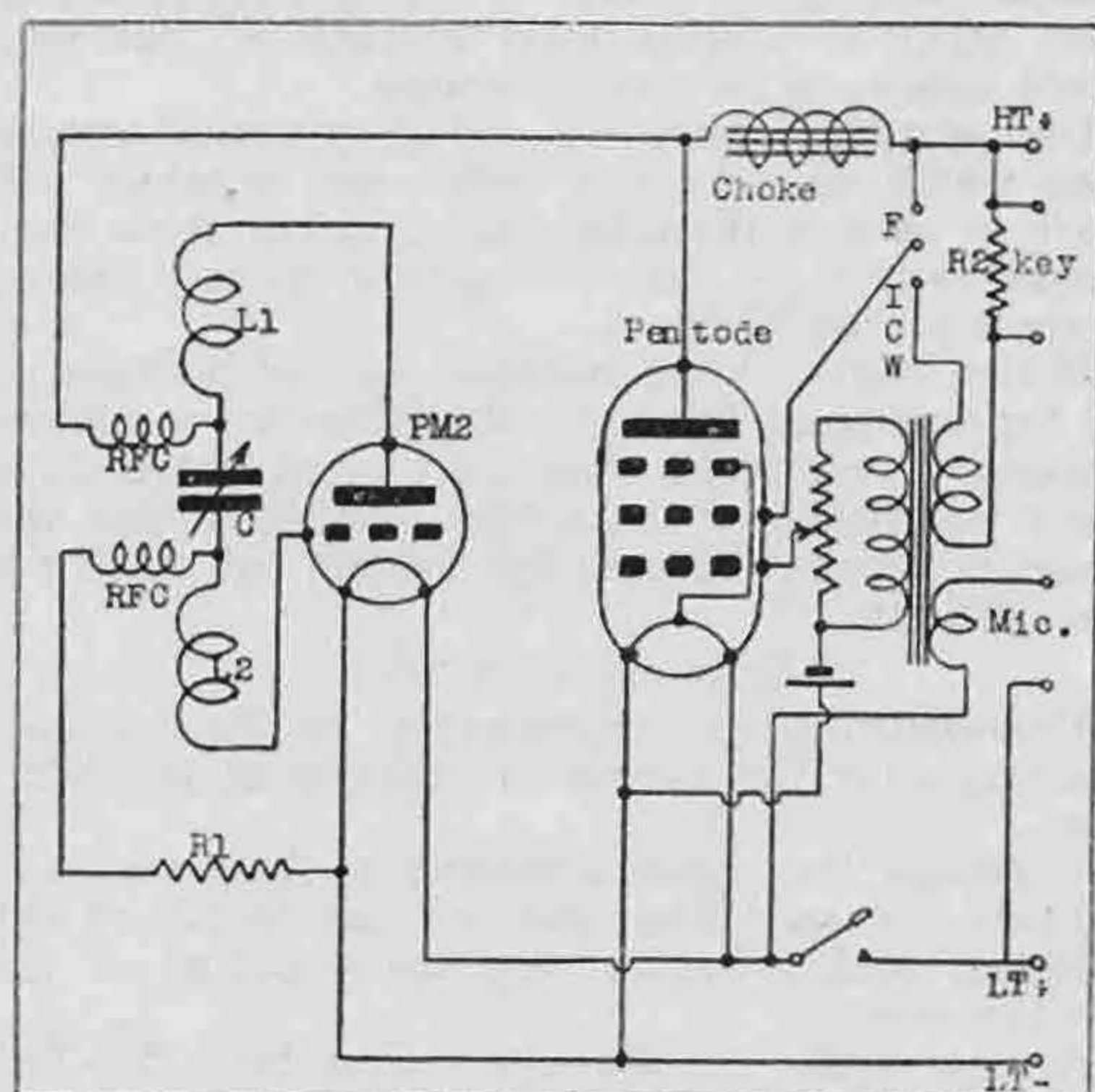


Fig. 1.

Modulation circuit for 56 mc. transmitter.

C .0001 mfd. condenser.
L1, L2, 3 turns 12 s.w.g. copper 1-in. diameter.
R1 25,000 ohms. See text.
R2 60,000 ohms. See text.
Modulating choke, 30 henries.

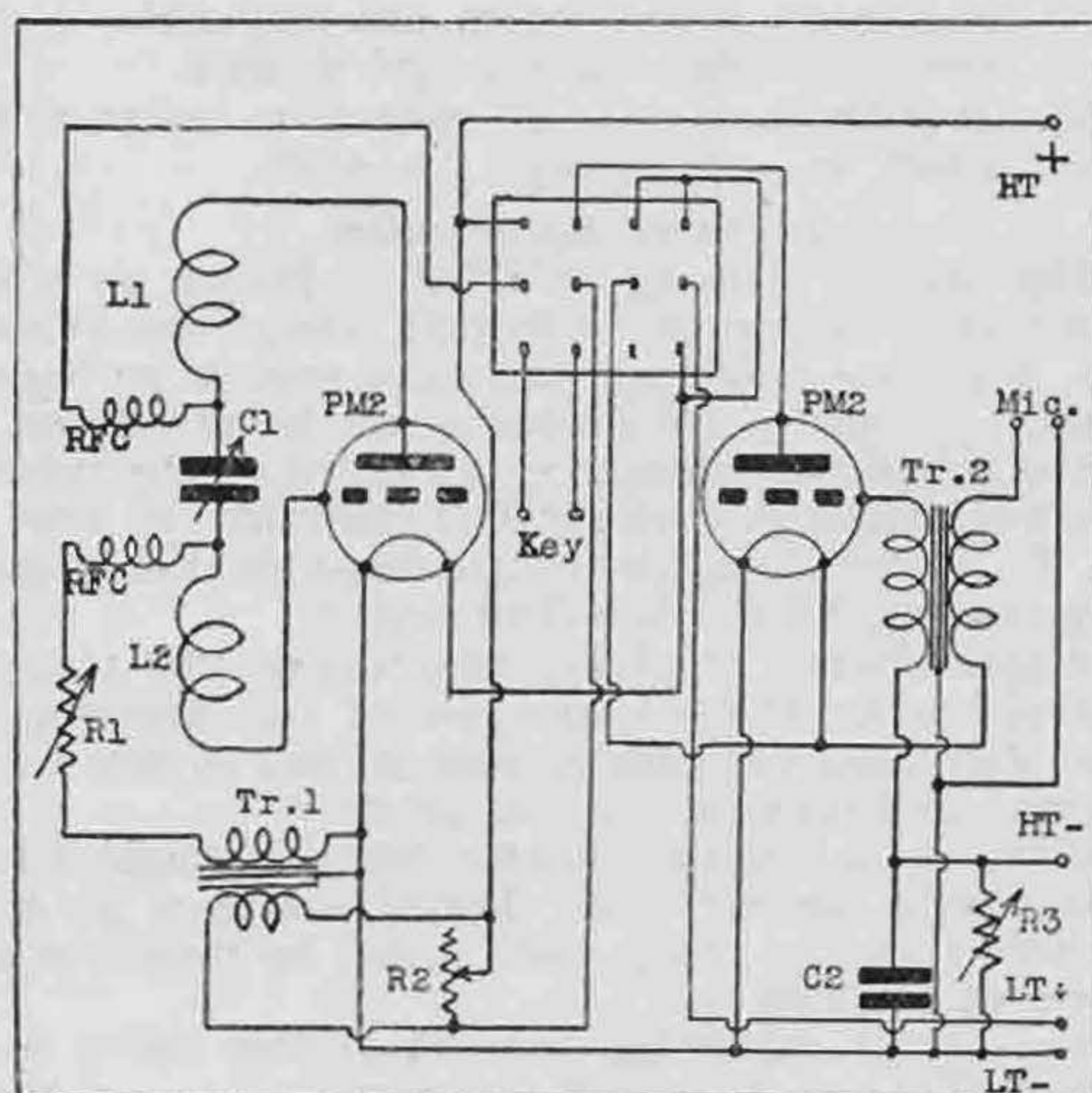


Fig. 2.

Another modulation circuit developed by G5JU and G6FO.

C1 0.0001 mfd. variable condenser.
C2 50 mfd. electrolytic condenser.
L, L2, as for Fig. 1.
R1 25,000 ohm variable.
R2 50,000 ohm variable.
R3 400 ohm variable.
TR1 3-1 intervalve transformer.
TR2 Microphone transformer.

The second circuit, Fig. 2, is the outcome of a suggestion made by G6FO at the last Newport Convention, when he gave it as his opinion that it would be feasible to make a transmitting valve modulate itself at low frequencies in a similar way to that in which a combined quench and detector valve works in a super-regenerative

(Continued on page 240)

THE 14 MC WINDOM

(With Some Notes concerning its Use on other Amateur Bands.)

By LIEUT.-COLONEL W. L. PALMER (G2BI).

Who has not heard of, or used, the so-called G2BI antenna? It is with much pleasure that we have persuaded its originator to tell us the story of its development.

THIS article is prompted, firstly by the fact that, in the writer's opinion, the Windom is one of the best of all amateur aerials, provided the conditions necessary to its proper use can be, and are, complied with, and secondly, because it is known, from personal correspondence, that many are using, or desire to use this system, but are doubtful on several points concerning it.

The following are some of its good features:

- (a) It is one of the very few radiators which carries a perfect current distribution curve, and a radiator which does not do so is, at best, only a compromise.
- (b) It is fed by a single feeder, which is non-radiating, whose losses are negligible, and which can be of any length desired.
- (c) It is the simplest of all systems to design and erect, except perhaps the AOG.

Origin of the Windom.

The original article, on what is known as the Windom aerial, appeared in *QST* about five years ago, and since many will not have seen it, perhaps a short *résumé* of its contents will be of interest.

The actual experiments were carried out by three electrical engineers, under the direction of Prof. W. L. Everitt, of the Department of Electrical Engineering, Ohio State University.

A special experimental station was erected at the University for the sole purpose of this investigation, and special apparatus was devised to measure current distribution, etc., accurately.

First, a half-wave radiator with a single-wire feeder was erected, with feeder attached about six feet from the centre, and tuned by means of a meter at the centre.

Tuning for maximum current at the centre resulted in a greatly distorted current curve on the radiator, and a bad standing wave on the feeder. Various lengths and feeder positions were then tried, with the same results. It was thus abundantly proved that the method of tuning a single-feeder Hertz, by means of a meter, or lamp, at the centre of the radiator was *wrong*, and should not be used.

Then somebody had a brain-wave!

Two equal-reading ammeters, as close together as possible, were placed in the radiator at a random point (anywhere between the centre and the end) and the feeder connected between them. The transmitter was then tuned until the two ammeters read exactly the same. A perfect current curve on the radiator resulted.

Different lengths of radiator were tried, and the result was always the same, *i.e.*, a perfect half-wave current distribution curve, thus showing that the radiator was being energised at its fundamental.

A further series of tests were made, and it was found that the fundamental was approximately 2.07 times the length in metres, *i.e.*, $\lambda = 2.07L$.

There were still standing-waves on the feeder, so the next step was to try and get rid of them. Starting with the feeder near the centre, current curves for it were taken as it was moved outward. As it was changed, the standing-wave on the feeder began to disappear until, at a very definite point, the feeder curve became a straight line. Beyond this point, standing-waves again began to appear.

A number of similar tests were made, with various lengths of radiator, and it was found that this definite position of the feeder from the centre was a fixed ratio to the length of the radiator. It was also found that the position of the feeder had no effect on the fundamental of the radiator, and that the length of the feeder was immaterial for all normal operation.

The above has been dealt with at some length in order to show with what care and precision the tests were made, and the formulæ evolved, and, therefore, how chary we should be of departing from them.

In fact, it is maintained they should always be rigidly adhered to.

Some users want to adjust both the length of the radiator, and the position of the tapping point, to meet what is termed local conditions, but this would appear to be entirely wrong.

Undoubtedly, there are certain essential conditions which must be met before the Windom will function as it is intended to do, but if these conditions cannot be met, one cannot by any means produce a true Windom.

If the length of the radiator, or the position of the tapping point (given by the formulæ for a given frequency) be altered, then the current distribution curve will no longer be a true sine-curve, nor the feeder non-radiating, and the system will not be a true Windom.

Essential Conditions.

The following are considered to be the essential conditions for the proper functioning of the Windom:

1. Design the system according to the formulæ.

There are only two, one for the length of the radiator, and the other for the position of the tapping point.

Always work out the dimensions from the formulæ, and do not attempt to use a graph, unless you make a large-scale and accurate one of your own. All those seen by the author are on too small a scale, and absurdly inaccurate.

Measure the length of the radiator from the first bend round the insulators at each end, and keep

the return, necessary for making fast, as short as possible.

2. *The radiator must be in free space—that is to say, uninfluenced by the earth or surrounding objects.*

Opinions differ with regard to this point; but it is considered that the condition will be satisfied if all parts of the radiator are a half-wave-length in the clear.

In the case of the 14 mc. Windom, this necessitates a minimum height of, at least, 33 ft., and a minimum distance between aerial supports of about 100 ft.

(For a 7 mc. Windom, these measurements will, of course, require to be doubled.)

The radiator and feeder must both be of round, solid copper wire.

3. *The feeder must leave the radiator at right-angles for a distance of, at least, one-third the length of the latter, otherwise the current distribution will be affected.*

The feeder, after dropping away from the radiator at right-angles, should run in a gradual curve to the amplifier coil. On no account should it contain angles, or sharp bends.

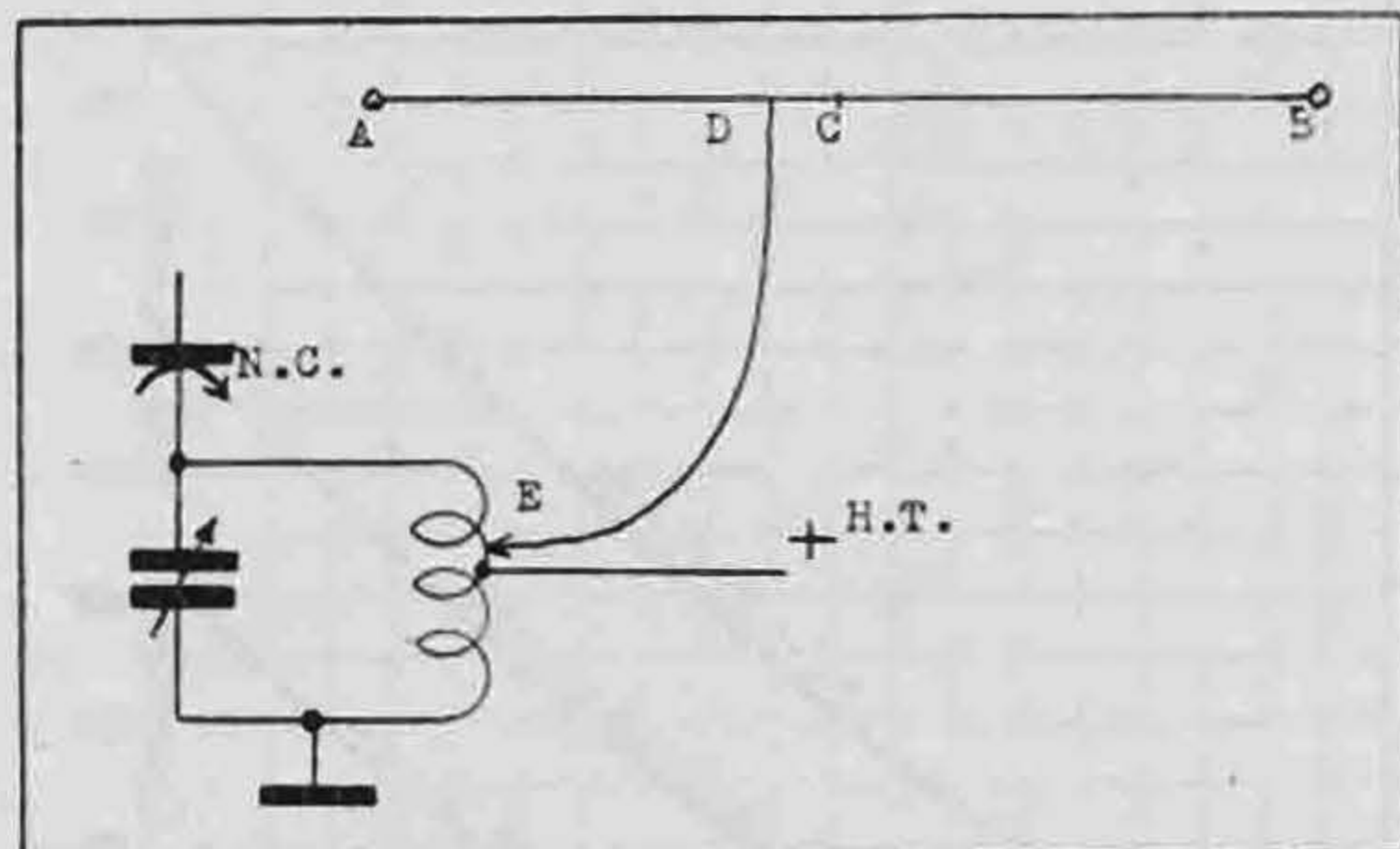


Fig. 1.
The G2BI Aerial for 7 mc. operation.

Practical Application.

When using the Windom it is most desirable, and easier, to adjust the transmitter to the frequency for which the radiator is cut, *before* connecting the aerial system.

If the transmitter is crystal controlled there will, of course, be no difficulty, but in other cases there may be, unless an accurate wave-meter is available.

To adjust the transmitter to resonance with the Windom radiator, after the latter has been connected, the best method is, undoubtedly, that referred to earlier in this article, *i.e.*, to place two matched ammeters, or flash-lamps, in the radiator, as close together as possible, one on either side of the feeder, and tune to equal readings or brilliance.

This device might also be used when the transmitter is crystal controlled, to give visible indication of correct working.

There are also other methods, notably G6JX's, referred to later on in this article.

Finally, there is one most important adjustment to be made, and that is the position of the feeder-tap on the tank-coil of the transmitter. It is really extraordinary what a different to output and efficiency its correct location makes.

This position should be such that the impedances are matched, and is best determined as follows:

By means of two equal leads, temporarily clip an ammeter, or flash-lamp, across two, three or in

the case of low powers, even four feet of the radiator, at its centre. The transmitter should now be started, and accurately adjusted, with the feeder disconnected.

Attach the feeder in an approximately correct position, *i.e.*, on 14 mc., about $1\frac{1}{2}$ turns from the H.T. centre-tap on the side remote from the plate. The flash-lamp should glow, or ammeter show a current.

Now adjust the position of the feeder-tap on the coil until the glow, or reading, is a maximum, and the job is done. Note the location of the tap, and remove the flash-lamp or meter.

No adjustment or re-adjustment of the transmitter must, on any account, be made during the process, and it is absolutely incorrect to tune by a lamp or meter in the centre of the radiator.

The G2BI Aerial.

So much for the true Windom, of which the 14 mc. variety forms the basis of what is known as the G2BI system.

This system was developed in order that the writer, who desired a really good aerial on the 14 mc. band, could also work on the other bands without having to shift aeriels, or make complicated adjustments.

The system has been found to work excellently on all the amateur bands, but it should be understood that no *special* efficiency is claimed for it on any but the 14 mc. band.

7 mc. Operation.

Referring to Fig. 1, the feeder ED is cut to such a length that the total length EDB is the fundamental wavelength of the frequency desired in the 7 mc. band. EDB is then used as an end-on half-wave Hertz, and is tapped direct on to the output tank coil of the transmitter.

It has been found that the portion AD of the 14 mc. radiator has little or no effect on this arrangement. Since, however, the radiator EDB is no longer wholly in free space, the formula will not give the absolutely correct length, and it will be necessary to adjust it by the cut and try method.

A method of doing this, described by C6JX in THE BULLETIN last July* seems excellent, and exceedingly simple.

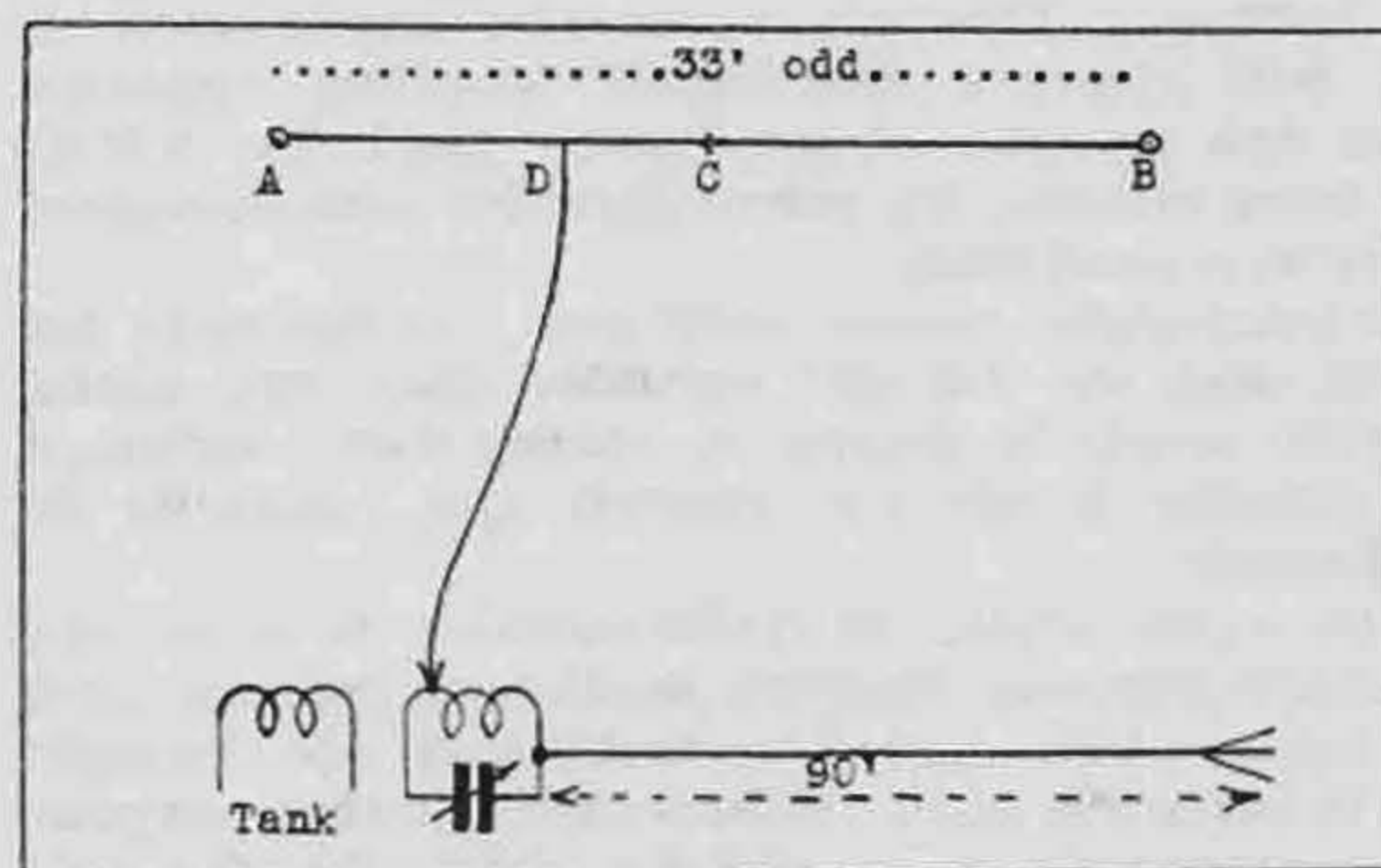


Fig. 2.
The G2BI Aerial for 1.7 and 3.5 mc. operation.

NEW VALVES REVIEWED.

WE are pleased to announce that Mr. D. N. Corfield, G5CD, head of the Valve Research Section of R.E.S., has arranged to review new types of valves each month. His first report which follows, deals with the Mazda types VP215 and AC2/Pen/DD, manufactured by the Edison Swan Electric Co., Ltd.

These reports will be entirely unbiased, and will contain the following information:—

- Characteristic curve or curves, either the manufacturer's published curve or our own.
- Static constants. These will be given as quoted by the maker, and as taken by us. The latter will be the constants obtained under operating conditions, and as such they will give useful data for calculations of stage gain, etc.
- General comments.
- Suggested uses, apart from the purpose for which the valve was primarily designed.

Mazda VP215.

This is a battery type variable-mu R.F. pentode fitted with a 7-pin base, a push-on type top cap and a metalised bulb. The characteristics make it in every way suitable for use as an R.F. amplifier, or an I.F. amplifier in a super-heterodyne receiver, with manual or automatic volume control.

Characteristics.	Makers	Measured Samples
Filament volts ...	2.0	2.0
Filament current (amps)	0.15	0.165
Anode and screen volts (max.)	150	—
Mutual conductance (ma/v)	1.4 *	1.06†
Amplification factor ...	—	1,200†
Impedance (ohms) ...	—	1,150,000†
Anode current (m.a.) ...	—	1.1
Screen current (m.a.) ...	—	0.3

* Taken at anode and screen voltage 100, grid volts 0.

† Taken at anode volts 150, screen volts 60, grid volts —1.5.

The makers recommend that the screen voltage of 60 be obtained by dropping through a resistance from the H.T. rather than by using a tapping on the battery. This will economise anode current, and will improve the signal handling capacity when the grid has been biased back by A.V.C. For these reasons, the characteristics were measured under this condition.

Characteristic curves were not supplied with the valve, and we did not consider that any useful purpose would be served by taking them, although the general shape was plotted and found to be satisfactory.

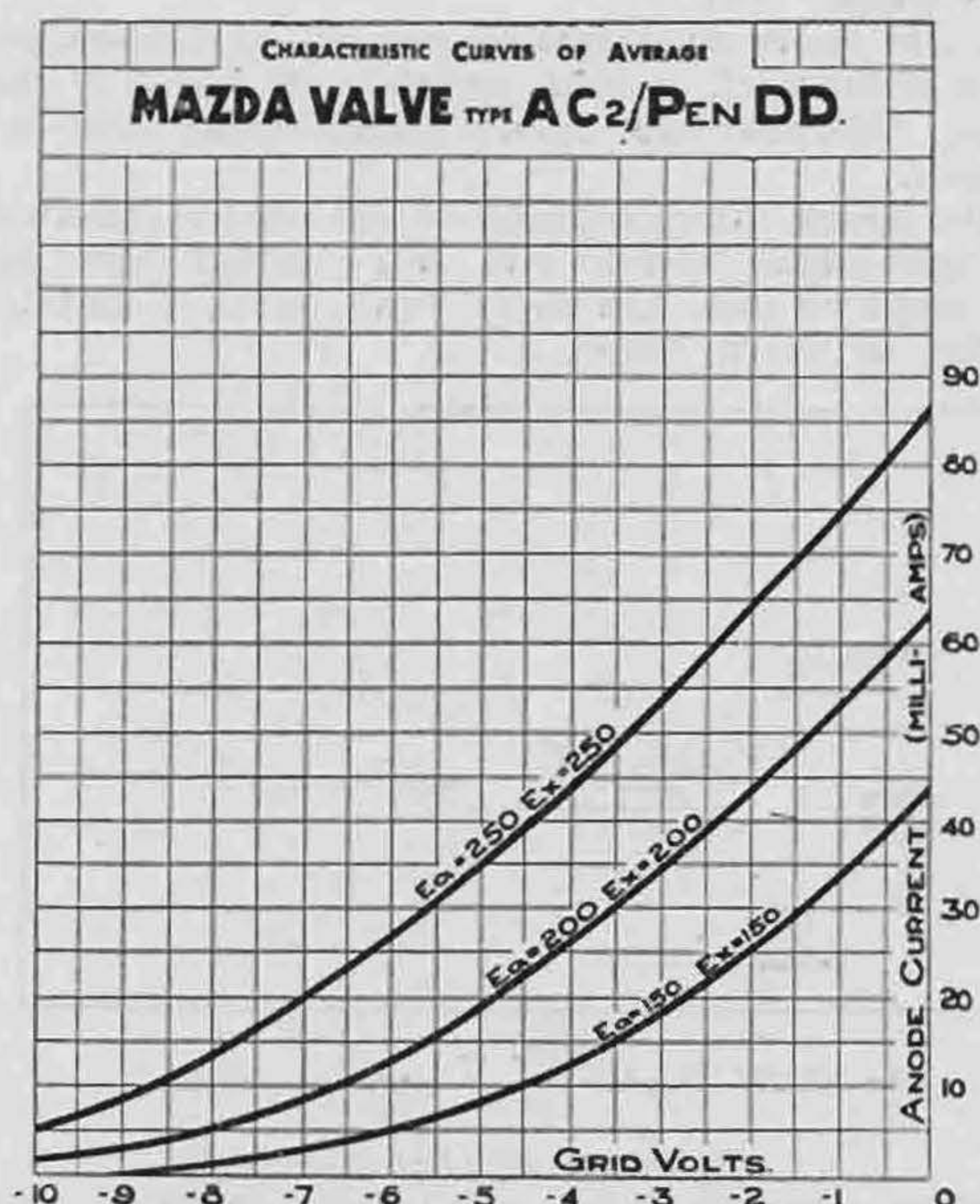
The valve would be quite suitable as a battery operated electron coupled oscillator, because both the screen grid and the metalising are brought out to separate pins. When used for this purpose, the screen voltage should be about 60, the grid condenser .0001 mfd. and the grid leak 100,000 ohms.

Mazda AC2/Pen/DD.

This is an indirectly heated four-volt double-diode output pentode, fitted with a 7-pin base, a push-on type top cap, and a bulb partly coated

with aquadag. The characteristics of the pentode portion are remarkable, having an extremely high slope and amplification factor, which makes it suitable for operation directly from the double diode rectifiers contained within the bulb.

The diodes are mounted around a common flat cathode, but are screened from the pentode. They may be used either as half or full-wave rectifiers in a super-heterodyne receiver with delayed A.V.C. The leaflet sent with the valve shows a suitable circuit.



Characteristics.	Makers	Measured Sample
Heater volts ...	4.0	4.0
Heater current (amps.) ...	2.0	2.0
Anode and screen volts (max.)	250	—
Mutual conductance (m.a./v.)	8.0*	9.4†
Amplification factor ...	—	930†
Impedance (ohms) ...	—	91,500†
Anode current (m.a.) ...	—	30†
Screen current (m.a.) ...	—	6.3†
Optimum load (ohms) ...	6,700	—
Anode dissipation in watts (max.) ...	8.0	—
Auto bias resistance (ohms)	140	—

* Taken at anode and screen volts 100, grid volts 0.

† Taken at anode and screen volts, 250, grid volts —6.

The sample tested appeared to have anode currents slightly in excess of those shown in the published curve, consequently a slightly higher grid bias was required to keep within the dissipation figure of 8 watts. Under auto bias conditions this point would be unimportant.

(Continued on page 211).

SOLILOQUIES FROM THE SHACK.

By UNCLE TOM.

(*Though the old walrus may be no Clark Gable, yet he has a considerable fan-mail—or so he says!*)

What a mail, nephews (and nieces—AHA!)! And *what* a hope! Still, one never knows. And so to business. My tirade (I think that's the correct word?) against the hero-worship of pirates, together with the quotations from the letter of my admirable correspondent, has borne fruit.

Here, for instance, is a suggestion from a reader in Boscombe: "The next pirate should be led in a shirt, bare-footed, and head covered with a black veil, to a place of execution, and exposed to public view from the scaffold, while a B.B.C. official reads aloud the sentence to the public. The condemned shall then be put to death in whatever manner the official shall choose."

But why, oh why, a B.B.C. official? They're much too kind and human. Why not a secretary of a radio society, or some similar person in whom all the finer feelings have been dead for some years?

Then here's a letter from Fulham, more on the serious side, the writer of which has been cramming hard at a special advanced course in radio and can't find a job anywhere. As he says, in the meantime, "some unmentionable little boulder without a pennyworth of knowledge blurbs out gramophone records, gets caught, and promptly has a job thrown at him by somebody." He's right—it is a bit 'ard.

And now here's a BRS with a different grouse. He says: "In case you have not a specimen of the following in your collection, I have captured a particular variety that was rushing about all hot and bothered. No wonder, for it was putting out the following all in one breath until it disappeared round the corner: Cheromgncqccqccqcc Whoops! Well, it may seek you, but whoever it was seeking, there is one who would be hiding timidly round the other corner, and that is . . . Yours sincerely, BRS"

Freely translated, of course, the above means: "Dear, dear old man, good night, gercher, where's somebody else to blab at for a bit?"

And now, brother hams, whether you collect foreign stamps or merely cigarette-card versions of

film stars, look at the advertisement below. It concerns you intimately and may turn out to be a means of making money. Happy Christmas to you all.

BROTHER HAMS!!

Do you need convincing that the collecting of QSL CARDS is a profitable hobby?

LOOK AT THIS!

Our General Simplified Catalogue, price 5s., is hot off the press.

Do you require complete sets for WAC and WBE? We have them!

Do you want the rare "errors" (R9 and T9) from Fiji Islands, Samoa, Calamazoo and Mbonga-Mbonga? We have them!

THE ORIGINAL G2TI CARD (very rare)

Early varieties of G2NM, G2OD, G2KF, F8AB, etc., from £2

Modern French Spitch-cards in mint condition

The well-known Russian Bolonioff variety, unused

**ANY CALL-SIGN FILLED IN TO ORDER
ANY RARE FORGERY OBTAINABLE**

Stock your walls with our guaranteed cards, and you will

Never need to come on the air again

Apply: **The Shack,
Nertsville,
Punkshire.**

NEW VALVES REVIEWED.—continued from p. 210.

The diodes appeared to have adequate emission, the figure being around 2 m.a. for a 10 volts drop. The power output was found to be sufficient for ordinary purposes, being approximately 3 watts. Accurate figures of harmonic distortion were not taken.

The pentode construction and characteristics are similar to those of the AC2/Pen, and the valve has the suppressor grid connected internally to the cathode, so that it would not be suitable for an electron coupled oscillator. Care should be taken to prevent parasitic oscillation due to the high slope, and a precaution to avoid this would be to use a 50-ohm resistance connected to the anode pin, or a grid stopping resistance.

REPORTS WANTED

G5KY (Chelsea) on his 7 and 14 mc. transmissions.

* * *

G2PL (Cambridge) on his 7 and 14 mc. transmissions from South and West America.

* * *

G5ZT (Preston) on his 1.7, 3.5, 7 and 14 mc. c.w. and telephony transmissions.

* * *

G6LH and G6GH (Boston) on their 7 mc. transmissions. The latter is using an indoor aerial for both receiving and transmitting.

* * *

VS6AQ (Hong Kong) on his 7,151 kc. telephony transmissions at 19.00 G.M.T. on Monday evenings.

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.

THE R.S.T. CODE.

To the Editor, T. & R. BULLETIN.

DEAR SIR,—I read with interest Mr. Arthur Braaten's article on "A Standard System of Reporting Signals," but regret to say that I totally disagree with his views.

In the first place, any tone code is absolutely useless to the amateur. This follows from the fact that "Distance lends enchantment to the view." I have checked this out by using a heavily modulated signal. Following a report of R3, in practically every case a T9 report has been received, while with the same adjustment I have received "500 Cycle I.C.W." with an R9 report.

It is obvious, then, that reports on the tone of a signal vary considerably with signal strength, and so such reports are useless. Furthermore, practically all amateurs monitor their transmissions and know the purity of their signals without obtaining reports from other stations. If a report on tone is required, the correct procedure is to obtain it from a station giving a report of R9.

Also any indication of whether a station is crystal controlled or not is unnecessary.

Consider the present amateur QSA and R code. In 1929, when the new QSA code came into being, the amateur realised that the QSA code alone would not suit his needs, and, consequently, the QSA code was used to indicate *readability* alone and the R code retained, to indicate signal intensity.

Mr. Braaten has fallen into the error of assuming that the amateur uses the QSA code as an indication of signal strength, but this is not a fact, and the average amateur's interpretation (in the British Empire) of the example given (QSA 3, R7) is, "Your signals readable with difficulty; strength good."

The inference to be drawn by the amateur from this report is that QRM or other interference makes the signals difficult to copy. If the report, "QSA 3, R7-3," is given, the receiving station immediately knows that reception is difficult owing to fading.

Personally, I fail to see how this system could be improved. Mr. Braaten's suggestion really "boils down" to an alteration of the present code, and the omission of the letters QSA and R.

Now the R code at present consists of nine divisions. With present-day amateur receivers, this gives a gain of approximately 6 db per division. Now the minimum change the ear can detect is about 3 db; this means that one R division represents two increases in volume to the ear. For this reason, nine divisions often do not seem to be enough, and we get reports like "R5-6," which, when translated, mean "3 db up on R5."

Reducing the intensity code to five divisions would mean roughly 11 db per division, which is somewhere between three and four increases in strength to the ear, and consequently would be hard to determine. Also a genuine experimenter would have little idea of the intensity of his signals at the receiving station; his reports would jump in steps of 11 db, which would be very unsatisfactory.

With the present R code an intelligent experimenter can obtain comparisons of his signal intensity at different times to within an accuracy of 6 db. It is essential that nothing should be done which will prevent the majority of amateurs from amassing useful data.

Mr. Braaten states that under the present system the report given depends to a large extent upon the receiver used by the reporting station. A few paragraphs later, with true American impetuosity, he asks us to believe that this problem will be overcome by using a similar code with five divisions instead of nine.

Truly, as Mr. Braaten states with his suggested code, "A sender is more likely to receive identical reports, regardless of the receiver used." The reason is that there are only five figures to choose from, and consequently reports of three or four will practically always be received. As an example, the average report I give G6WY varies from R5-8, under the present code, but under Mr. Braaten's system, I would be compelled to report him strength four most nights. Actually his signal strength varies about 18 db, but he would be given no indication of this fact.

Now Mr. Braaten's objection to the present code is that, as listed by A.R.R.L., R8 represents, "Heard several feet from phones, etc." This list, of course, was drawn up using an o-v-l as a standard, and was intended more as a guide to beginners than as an actual standard to go by. Of course, some amateurs may place the phones on the table and dash to the other side of the room before giving a report, but I am convinced that the average British amateur has sufficient intelligence to use the R code as an indication of signal intensity, and not of the audio output of his receiver.

In certain parts of the world, however, the R code is much abused. Numbers of these amateurs (the "Pse QSL," "How do my signals compare?" type) have for their motto: "As I sow, so I reap," and consequently scatter, "QSA5 R9" reports to all and sundry in the hope that the next mail will bring shoals of R9 reports to confound his fellow hams. I suggest that Mr. Braaten's aversion to the R code rises from reports from such pests.

Mr. Braaten also says that a code for "Frequency and amplitude variation" is not necessary. Now every station has a certain amount of frequency variation. With the average amateur crystal-controlled station, this is comparatively slight, but as the selectivity of our receivers increases, it becomes more apparent. While there is no need for a frequency stability code, I think the following Q signal would be useful—QSF, "Your transmissions are not stable enough to permit the use of full receiver selectivity and interference may be expected."

The use of quartz crystal filters in modern receivers also makes the use of another Q signal very helpful—QSC, "It is impossible to read your keying on full receiver selectivity, please QRS." A quartz crystal filter tends to round the keying slightly, and excessive rounding of keying peaks,

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The TYPE 87

These condensers have been specially developed to safeguard apparatus subjected to sudden overloads. For normal working of 450 v. they are tested to 1,500 v. D.C.

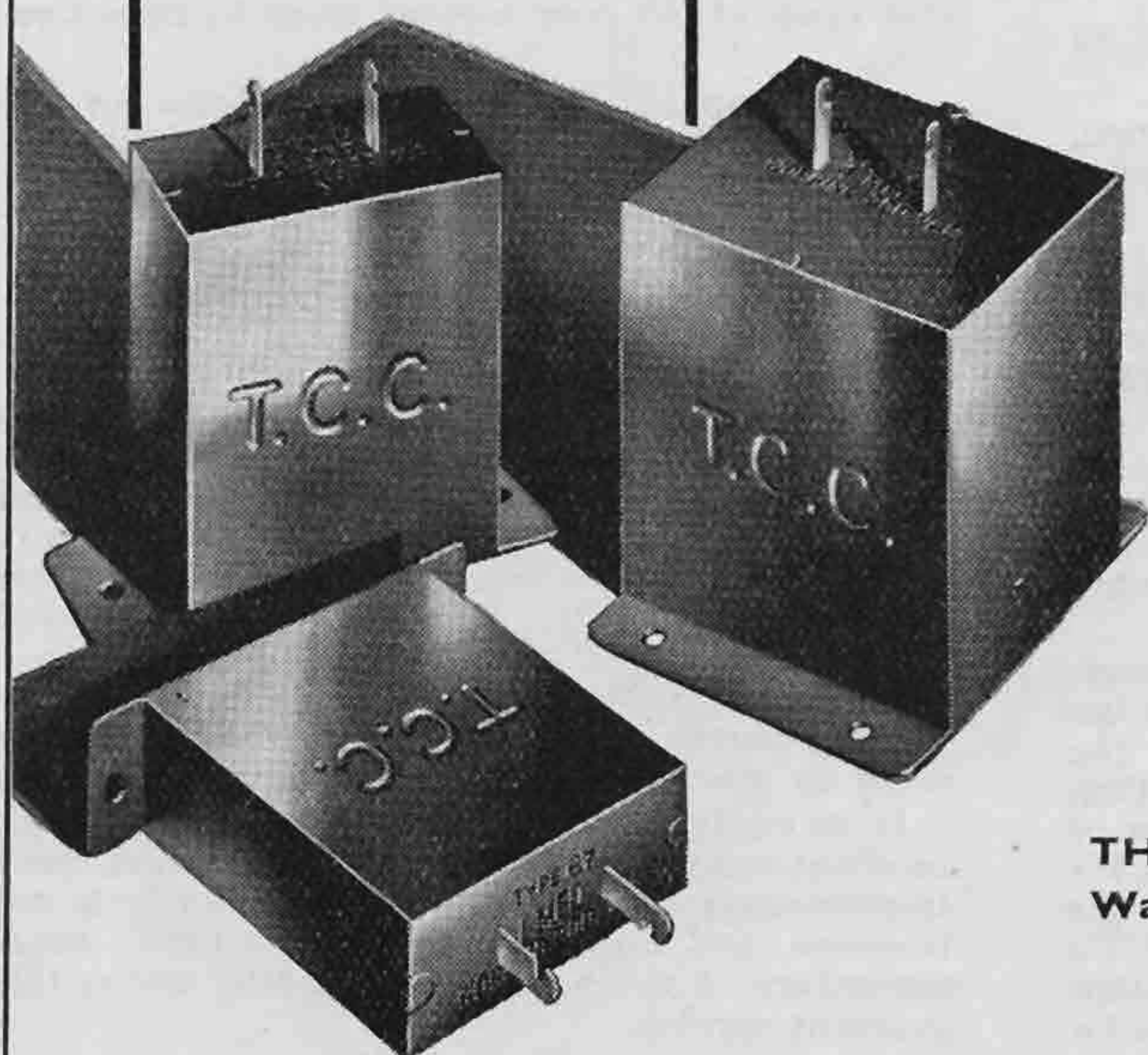
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of
650
VOLTS.

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may make a signal which is just readable without the filter in circuit, unreadable on full selectivity.

In conclusion, may I suggest that the R.S.G.B. retain the present system of QSA and R codes, but drops the now useless T code.

Yours sincerely,

G. G. SAMSON (ZL4AI).

Copied by G6WY from ZL4AI on November 24, 25 and 26, 1934.

Editorial Note :

Since Mr. Braaten's article, describing the new R.S.T. Code, appeared in the October issues of the T. & R. BULLETIN and QST, amateurs the world over have been weighing up its pros and cons. The Council of the R.S.G.B. are at the moment open-minded but invite responsible members with some years of active amateur experience to contribute views. It is not anticipated that we shall find space to publish all of these letters, but the opinions expressed will prove of value to the Council in their deliberations.

Measurements of Ultra-Short Wavelengths.

To the Editor, T. & R. BULLETIN.

DEAR SIR,—The following formula can be derived from the method of least squares suggested for the above purpose by Mr. Clacy (G6CY) in the October BULLETIN. I think it is easier for practical purposes as it involves less arithmetic. It is :

$$t = 6 [(n-1)(x_n - x_1) + (n-3)(x_{n-1} - x_2) + \dots] / n(n^2 - 1),$$
 where n is the number of observations and $x_1, x_2, \dots, x_{n-1}, x_n$, are the F/M wavelengths. Incidentally, in this method, n should be even, because if it is odd, the middle observation will be neglected in the calculation (whether by formula or by 6CY's suggested method). In 6CY's example the formula is applied as follows :

$$t = 6 [7(185.8 - 148.9) + 5(180.2 - 154.2) + 3(174.9 - 159.2) + 1(169.5 - 164.4)] / 8 \times 63$$

$$= (7 \times 36.9 + 5 \times 26 + 3 \times 15.7 + 1 \times 5.1) / 84 = 440.5 / 84 = 5.24.$$

Formulae are apt to be disliked by practical men, but in this case the steps are written down rather than calculated.

This method of determining wavelength is undoubtedly very interesting and useful, but what is the objection to the use of Lecher wires? I have always found that this system provides the simplest and most direct method, capable of any required degree of accuracy.

Apparently the amateur couples the Lecher wire system with a professional laboratory and a lot of mathematical theory, whereas in practice, it is only a matter of elementary measurement.

When the accuracy of the two systems is compared, some surprising facts come to light. If the accuracy of the frequency-meter used in the harmonic method is assumed to be $\frac{1}{2}$ per cent., then in measuring wavelength which is of the order of the 30th harmonic of the F/M range (as in 6CY's method), the accuracy is not likely to be better than 6 per cent. It is doubtful whether 6CY's results are any better than this. Such a standard of accuracy is of little practical value, and it is for this reason that I deprecate the use of the method, despite its apparent simplicity.

Lecher wire systems, on the other hand, have none of these disadvantages, and, in fact, the only one is the rather unwieldy nature of the apparatus on 5 metres. This is more than counterbalanced, however, by the accuracy of the results, and the directness with which they are obtained. Further, if continual measurements are being made, an absorption wavemeter can be made and calibrated once and for all from Lecher wires.

Yours faithfully,

A. H. MOWATT (BRS877).

RECEPTION CONTEST.

To the Editor, T. & R. BULLETIN.

DEAR SIR,—I notice from the November issue of the BULLETIN that only seven members had expressed their intention of taking part in the Reception Contest. I am of the opinion that this state of affairs can be attributed to one or other of the following reasons :

- (1) Lack of time.
- (2) Apathy.
- (3) Insufficient knowledge of the morse code.

In regard to the latter point, I believe a number of members are, like myself, learning the code, but because our receiving speed is not sufficiently high, we feel it is of little use taking an active part in the tests.

Several of these members will, I am sure, be participants in future contests when the code has been thoroughly mastered.

Yours faithfully,

M. GEDDES (BRS1431).

[We are pleased to give publicity to the above letter, but feel justified in pointing out that out of every 1,000 QSL cards received from home members, over 60 per cent. are from BRS or AA members reporting the reception of c.w. signals.

We are inclined to the view that apathy is the root cause of the poor support given to these Contests.

We anticipated that the reduced hours for this season's series of tests would have produced a bigger entry.—ED.]

OUR CALIBRATION SERVICE.

To the Editor, T. & R. BULLETIN.

DEAR SIR,—I was sorry to see, in the Calibration Section notes last month, that only *one* member appears to be making use of the Society's standard frequency transmissions. As I am at present away from home, I have been unable to utilise these transmissions recently, but last winter I received a number of them, and was able to maintain a useful and accurate check on the calibration of an electron-coupled master oscillator, which I was then using to drive a three-stage QRP transmitter.

It certainly does not seem fair that Mr. Gay's excellent work in checking and maintaining these transmissions should be greeted with so little enthusiasm, and I should like to see a much larger percentage of the membership making use of this excellent service.

Yours truly,

W. S. TURPIN (G6YT).

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R. A. FEREDAY (PAOFY), Reinkenstr, 40, The Hague, Holland.

No. 7: RECEIVER DESIGN

E. N. ADCOCK (G2DV), 206, Atlantic Road, Kingstanding, Birmingham.

No. 8: TRANSMITTER DESIGN

A. E. LIVESEY (G6LI), Stourton Hall, Horncastle, Lincs.

No. 9: AERIAL DESIGN

F. CHARMAN (G6CJ), Orchard Cottage, Wexham Street, Stoke Poges, Bucks.

No. 10: VALVE RESEARCH

D. N. CORFIELD (G5CD), 10, Holders Hill Gardens, Hendon, N.W.4.

No. 11: 28 MC. WORK

W. A. CLARK (G5FV), "Lynton," Hull Road, Keyingham, Hull.

No. 12: AUXILIARY EQUIPMENT

A. O. MILNE (G2MI), "Southcot," Larkfield, Kent.

I have an important announcement to make this month concerning the appointment of an Assistant Manager of R.E.S. The work of the Section has grown considerably, and unfortunately my spare time has not increased in the same proportion. I am pleased to be able to announce that Council have agreed to my choice of Dr. Bloomfield (G5MG) as my assistant. I have every confidence in him, or I should not have chosen him, and it is my sincere desire that you will all show to him the same goodwill that you have shown to me in the past.

The appointment of an assistant manager does not mean that I am going to lean back in my arm-chair and let him do all the work. R.E.S. has grown so much—we have nearly three hundred and fifty members now—that it calls for much more time than one man can possibly give to it. The addition of another man will make it possible for us to give better service in the future than has been possible in the past. We shall be able to turn our attention to new schemes, too. There are several ideas we should have liked to try out in the past, but had not the time to tackle. Now, perhaps, we shall be able to do so.

Now a few words regarding the duties G5MG will undertake. He will take charge of the records, and attend to the issuance of new members' certificates; this means that the G.M.'s will now look to him to find them new material and advise him of changes in their personnel. You will find his address at the head of these notes.

By far his most important duty will be that of editing these Notes each month. In future, therefore, the Group Managers must send their notes direct to him not later than the 20th of each month.

Communications concerning the organisation or policy of the section should still be addressed to me, and I shall be pleased to receive letters of enquiry from those seeking advice as hitherto.

G6PA.

1.75 and 3.5. MC. Group (No. 1).

Group 1A.—G5UM has been keeping a schedule on Monday nights at 20.15 with G6FA, of Liverpool. On 1.7 mc. conditions vary in inverse ratio to the

atmospheric temperature (which is, of course, a quite usual phenomenon). On 3.5 mc. it is impossible to make contact owing to the long skip distance (about 400 miles at present). The schedule, incidentally, demonstrates the practicability of 1.75 mc. CW work during B.B.C. hours. Group 1A members themselves also keep 1.7 mc. schedules during broadcasting, and meet on the air at 22.00 G.M.T. every Friday. The co-operation of any other interested amateurs would be welcome in these tests.

Group 1C.—The "harmonic-overtone" debate continues. EI2B sends a long letter on the subject, the essence of which is that electrical circuits may be said to produce harmonics, but not overtones, and that certain mechanical systems produce overtones which are not strictly harmonics. Frequencies such as f over 2, f over 3 and so on are usually referred to as sub-multiple frequencies, and the term, "sub-harmonic," sometimes used in this connection is not regarded as justifiable.

Yes, but how are sub-multiple frequencies generated? An answer to that question clears up the whole matter.

G2CF says: "As I see it, the question is, can a receiver tuned to a band in harmonic relationship with a band on which a transmitter is working receive that transmitter? The answer appears to be "Yes." If the transmitter is tuned to 1.75 mc. and is heard on 3.5 mc., I think the receiver definitely picks up a harmonic. But when a 3.5 mc. transmitter is heard on 1.75 mc. I think the 1.75 mc. receiver picks it up in the same way that a 1.75 mc. aerial can be used for the higher frequency bands, although an aerial will not work on a lower frequency than that to which it is tuned."

VP3E, of Malta, joins the discussion with the following remarks: "An overtone is a note riding a fundamental note and as such it can only be of a higher frequency and, therefore, a harmonic. (If it were possible for the overtone to have a lower frequency then this 'overtone' would be the fundamental of the whole series.) Of course, a transmitter cannot produce frequencies lower than its fundamental.

"For the sake of completeness, however, it may be added that a full-wave antenna (say, 21 metres

long, working at 14 mc.) can be made to emit a feeble 7 mc. wave through 'shock excitation' and a consequent natural oscillation, if a coupling, sufficiently loose to allow it, exists. This, however, although experimentally possible, in practice is highly improbable.

"The reception of 3.5 mc. on 1.7 mc. receiver tuning is quite a common occurrence, but this is usually possible only on relatively near and strong signals. The statement 'relatively near and strong' is made advisedly, as on short waves 100 miles might sometimes appear to be further away than 1,000 miles, due to skip. This 'half-frequency' reception is, of course, again due to shock excitation of the receiver's initial tuned system, which thus receives two correct impulses in a cycle for every two incoming waves when accurately tuned to 'half frequency.'"

BRS1173 and BRS207 report remarkably good 3.5 mc. conditions, the latter having heard Americans even when they were strong on 14 mc.

G2CF has been conducting quality tests, and says that very good results are obtained when a large variable ratio moving-coil microphone is used in conjunction with a small carbon type that reproduces the high notes only. (*This is rather interesting, because the B.B.C. have been testing mc. microphones and found them bass heavy. The use of one of these side by side with the well-known carbon type, which reproduce practically no low notes, would appear to give particularly faithful reproduction.*—G.M.)

G5UM.

[EDITORIAL NOTE.—G6CL heard U.S.A. stations at mid-day on 3.5 mc. during the Contest. Calls were difficult to read on an 0-V-1, but probably QSA 4 to 5 on a SG receiver.]

Artificial Aerial Group (No. 3)

Group 3B has been reorganised, with G5SO as G.M. We welcome 2BXT as a new member.

It is thought that a brief resumé of the results of discussions in our Letter Budget may be useful to potential A.A. experimenters. A.A. equipment can be divided into three sections: the coupling arrangements, the energy dissipator and the measuring equipment; the first two will be described this month; the measuring equipment will be left over till next month; however, as a start,

the diode as described in the Guide has much to recommend it.

Coupling to the P.A. by the condenser method described in the Guide is the simplest and simulates the troubles obtained with tapped on antennæ very well; it is thought, however, that inductive coupling, either direct between P.A. and A.A. coils, or intermediately by feeders and link-coupling, is better; the latter is preferable, as the energy dissipator is more portable and re-radiation can be better combated either by using fieldless coils or by complete screening.

The energy dissipator consists of inductance capacitance and resistance in series. For 10 watts, normal receiver components can be used (QRO has not yet been considered). Six-pin coils (or four-pin if one side of each winding is returned to earth), or fieldless coils, are suitable. C can be 500 mmfd. variable for tuning purposes (inductance of L depending on band used). The Resistance R dissipates most of the energy and can have values between 10 and 100 ohms, and must be of negligible temperature coefficient if the measuring equipment is to work satisfactorily. The question of whether it should be non-inductive has been debated, but no definite results obtained. There seems to be no reason why it should be non-inductive, but the G.M. and others have a feeling that it ought to be; if so, the methods of construction shown in the Guide and in the figure are satisfactory. Incidentally, the method shown in Fig. 1 is most satisfactory, even if an inductive resistance is contemplated, since it is both easy to construct and wind, and also has a large air surface for cooling purposes; the slight extra bother of winding it non-inductively does not seem worth considering. Incidentally, there are several ways of winding on this former for obtaining a non-inductive resistance; that shown is probably the most efficient.

G2KV.

Atmosphere and Fading Group (No. 4).

All groups have reported active this month.

4A have continued routine observations, and are co-operating with 4C by supplying the latter with material taken from their log books. An interesting discussion is anticipated in the group letter budget.

4B, confined to members living abroad, receives the usual excellent log from BRS209, stationed in Malta. He makes the following observations:—

(1) When low-pressure areas in the vicinity of Malta move east to west, QRN seems to result.

(2) A low-pressure belt extending north and south of Malta and moving east gives good conditions and western DX.

(3) High pressure to the south of Malta gives poor conditions and deep fading.

(4) If there are high-pressure areas to the south and low to the north, conditions for DX reception are good.

4C contribute their usual report on thunderstorms. The G.C. writes: "The theory of best results from the direction opposite to which the storm lies has been partially confirmed and also the good conditions after a storm has passed over has been confirmed. These results should be treated with a certain amount of reserve, as other phenomena may be present which are not taken into account."

4D report all active and routine observations have been continued.

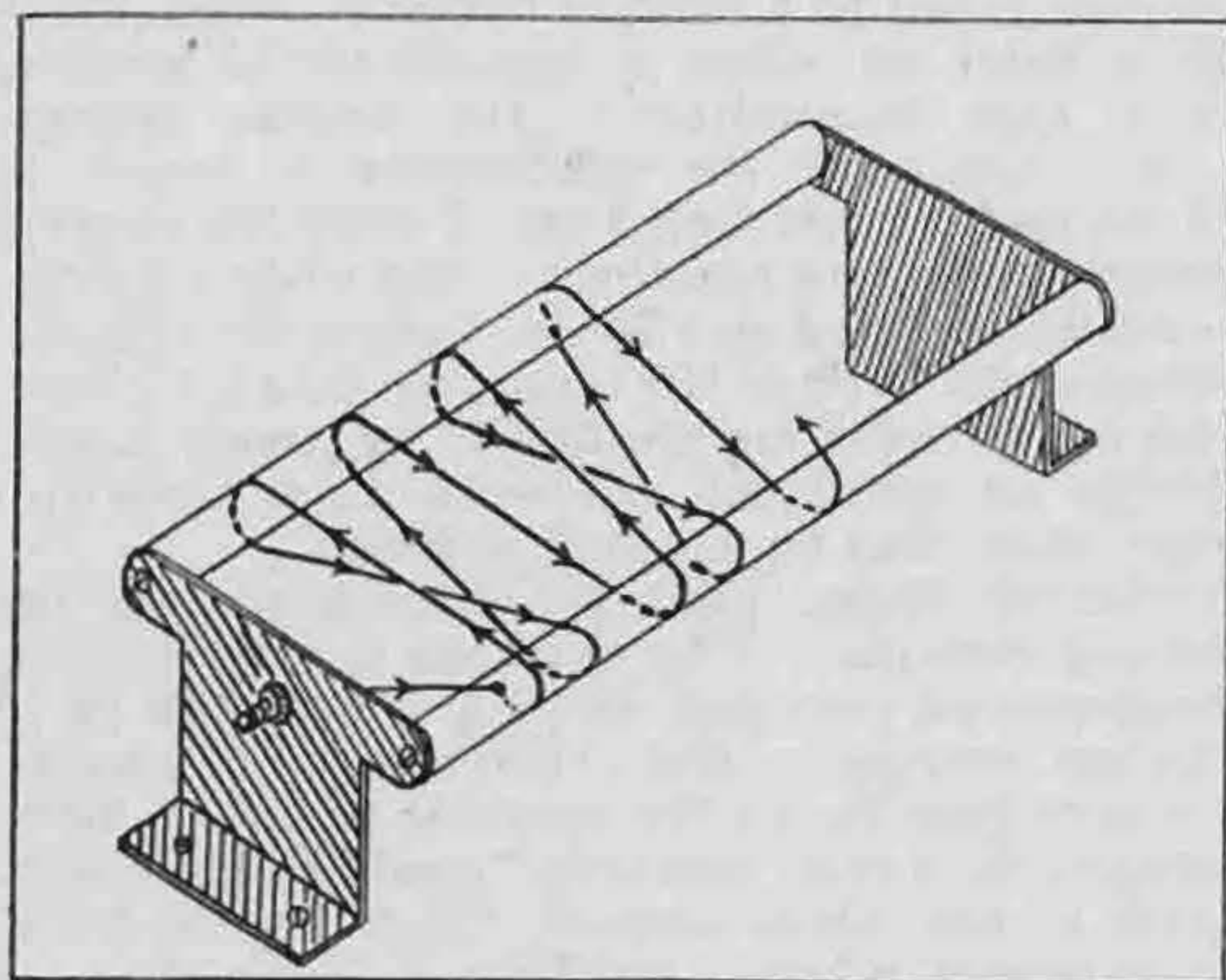


Fig. 1

Method of constructing a resistance for dissipating energy in an artificial aerial.

4E.—This group is now under way and collecting information on sunspots.

4F.—This group is also making progress.

Letters from other members include one from BRS207, in which he says: "I have found repeated instances of the application of the Isobar Theory on 3.5, 7 and 14 mc. across Europe and the Atlantic, according to the time of day and wavelength."

G5AM writes: "I would like to mention a phenomena which I have several times experienced, namely, fading of a station which is well within

and 18.00 G.M.T. at Tiree, and on the two previous days in the north. G2GD.

Television Group (No. 5).

G5VO reports that he will shortly be testing a transmitter on A.A., using disc scanning. He is at present using a mirror screw and has added a synchronising gear using the 50-cycle mains, and finds this holds the screw O.K. Is now building a "Stenode" receiver in the hopes of getting more "punch" from London National.

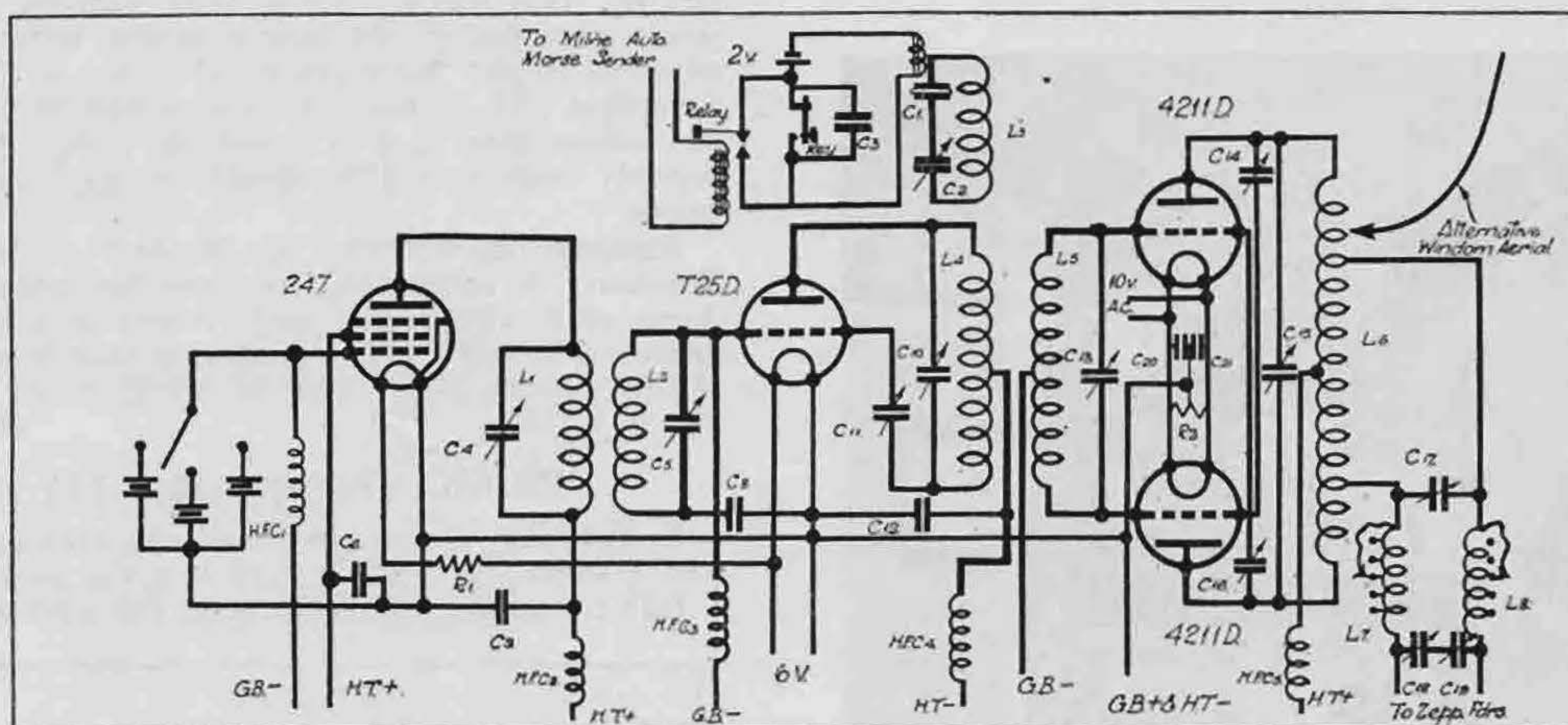


Fig. 2.

Circuit of 28 mc. Transmitter used by G5FV

L1, L2—7 turns
L3, L5—3 turns
L4, L6—2 turns
L7, L8—35 turns tapped 2 turns from end nearest C17 (See QST article on Collin's antenna coupler)
C2, 4, 5, 10, 13, 17, 18, 19—.00025 mfd.
C11, 14, 15, 16—.0001 mfd.
C8, 9, 12, 20, 21—.002 mfd.

C3—2 mfd.
C1—Specially built condenser (See March, 1934, Bulletin)
C6—.005 mfd.
HFC 1, 2, 3, 4, 5—200 turns on 1 in. glass test tubes
R1—2.33 ohms
R2—400 ohms

the skipped distance. In July, at about 17.00 B.S.T., it was noticed by G5CW and myself that there was very definite fading on G2QV, who was only 4 miles distant, similarly G2QV reported G5CW as QSB. This was on the 7 mc. band. An even more striking case was noted by me on October 27, at 11.30 a.m., when G2VD, at a distance of about 1½ miles, was fading from R5 to R4, apparently fairly regularly, with a period of about 8 secs. Similarly, G2VD reported my signals as QSB from R6 to R4. Shortly after 14.15 G.M.T., I noted that G6XX, distance about 4 miles, was fading from R9 to R7 (G6XX is a QRO station; the fading was confirmed with antenna off the RX, when it was more easily noticeable R5-R4).

There are only two possible explanations: (1) that the ground wave itself fluctuates in intensity, (2) that, although the incident ray is nearly normal, a ray is reflected from one of the layers; that is to say, "skip" has virtually shortened to zero. If such reflection does take place, ionisation must be abnormally high." (I hope that by the time these notes appear in print, one of the groups will be taking up this question of short-distance fading.—G.M.) It is interesting to note that on the day in question, October 28, Group 5C reports thunderstorms between 13.00

2AUN reports that the experiments at his station have been confined to the new "T.I." lamp, but trouble has been present practically the whole of the month. Several images have been well received at nearly ½-plate size, and most of the trouble has been with the motor.

2AUN reports that the lamp is rather difficult to modulate, even with about 2½ watts output, and a lamp potential of about 320 volts.

2AUN also reports on the new "Dr. Lemon" white tube recently described in *Television*, and finds that the output would not be suitable for screen projection in conjunction with a disc. He would very much appreciate reports from other users of this lamp.

BRS1098 reports that he will shortly be taking the pictures from B.B.C., but has been held up for a resistance for the mains supply.

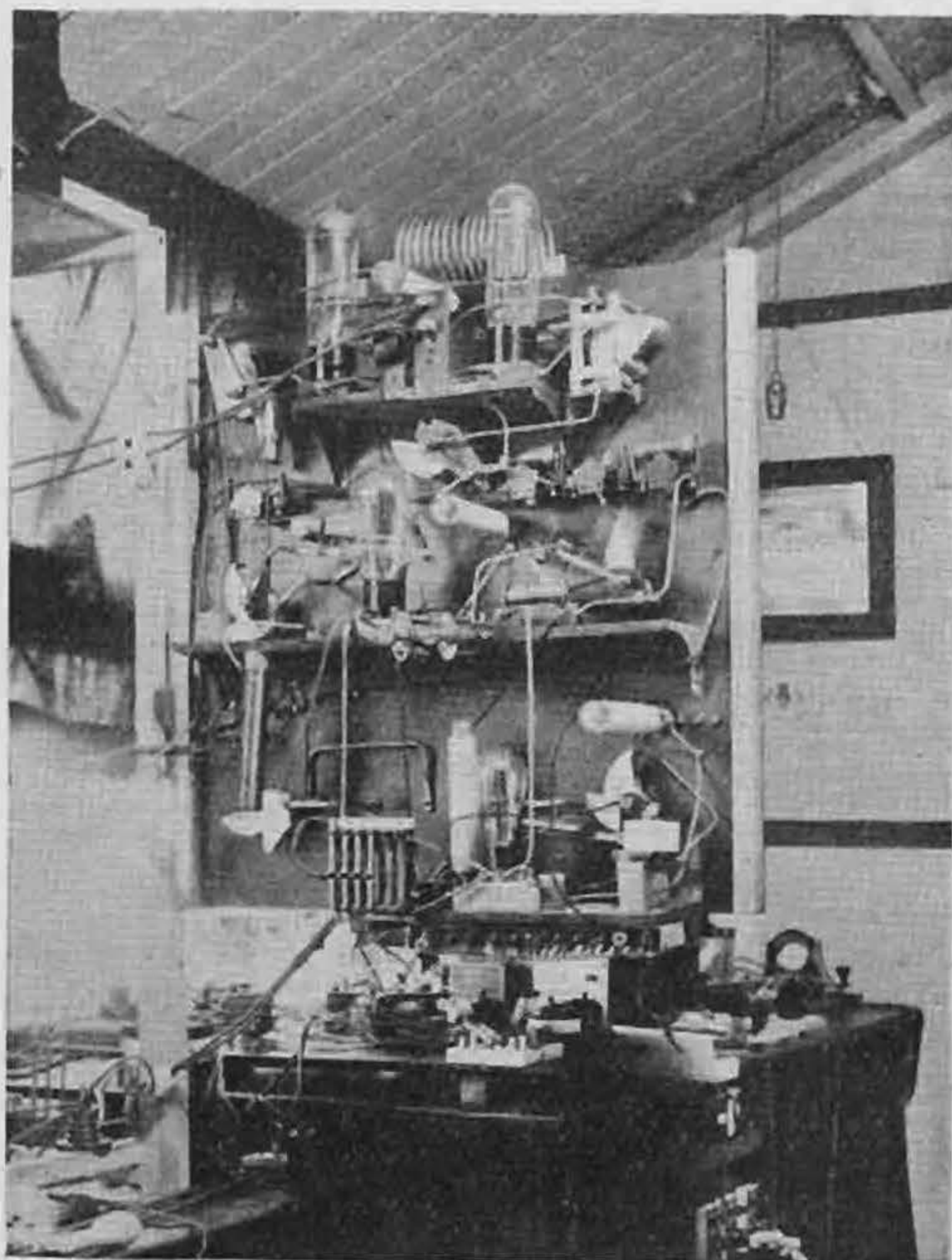
BRS1472 is now 2AOT and reports active. G5JZ is rebuilding the amplifier into SG, anode bend detector, and 3 RCC and hopes to have same going by the time these notes are in print. A separate tuning arrangement is being fitted in order to tune down to 10 metres for G2AO.

G5JZ.

[Can we have an article for the BULLETIN describing recent television developments?—Ed.]

Receiver Design Group (No. 7).

I regret to report that nothing has been heard from Groups 7A and 7C for three months in spite of enquiries; 5TL (G.C. 7B) also complains of absence of reports. Reorganisation is therefore imperative; will those who are interested in and can get down to real research problems please communicate with me as soon as possible? It is hoped that we may then obtain a very small group of enthusiastic technical men who will be able to do some work together.



Rear view of transmitter used by G5FV.

2BNL (individual member) sends a report on a short-wave receiver he has constructed on lines similar to the *Wireless World* single span. A doublet with twisted wire feeders is employed for pre-selection. Further work on this is promised—BULLETIN article, please. An interesting letter from G2OD gives some useful suggestions on the recently-published battery single-signal receiver. He points out that the condensers C15 in the circuit diagram may not be truly non-inductive at the higher frequencies, and that it might be preferable to add shunt condensers of mica and foil construction of .01 mfd. It is also suggested that the control of the critical selectivity potentiometer R6 would be improved by placing a fixed resistance of 50,000 ohms in series with it. Builders please note!

G2DV.

Aerial Group (No. 9)

The absence of notes from this section lately has not been entirely due to lack of material, though the section is still not quite in full swing. Aerial tests take time, because it is often necessary to

extend them over months before enough contacts have been made to demonstrate their properties.

The horizontal aerial was always considered to radiate nil in the direction of the wire, but the evidence of members appears to point to the fact that in conjunction with ground reflection the aerial can radiate well in all DX directions, provided the height is sufficient. For a 66-ft. top, the minimum height seems to be about 40 ft.; this may be critical and dependent on the nature of the soil.

An interesting aerial was recently erected by G6QB. This was a vertical 33-ft. radiator with a single wire feeder, the length of the latter being adjusted to put the whole in resonance for 7 mc.; a vertical 2BI, in fact. It is excellent for 14 mc., but suffers from lack of height on 7 mc. With a suitably high pole this should be good on both bands.

Rumours exist that "up North" a "crossed Windom" is being used, i.e., two horizontal Windoms, each with feeder, and crossed at a suitable angle. The G.M. will be pleased to hear from users of this system, and to discuss it with them.

G6CJ.

28 MC. Groups (No. 11)

Both the 28 mc. groups are now in working order and a summary of their work is given below.

G2YL is using a CO, FD, FD, FD with a T61D

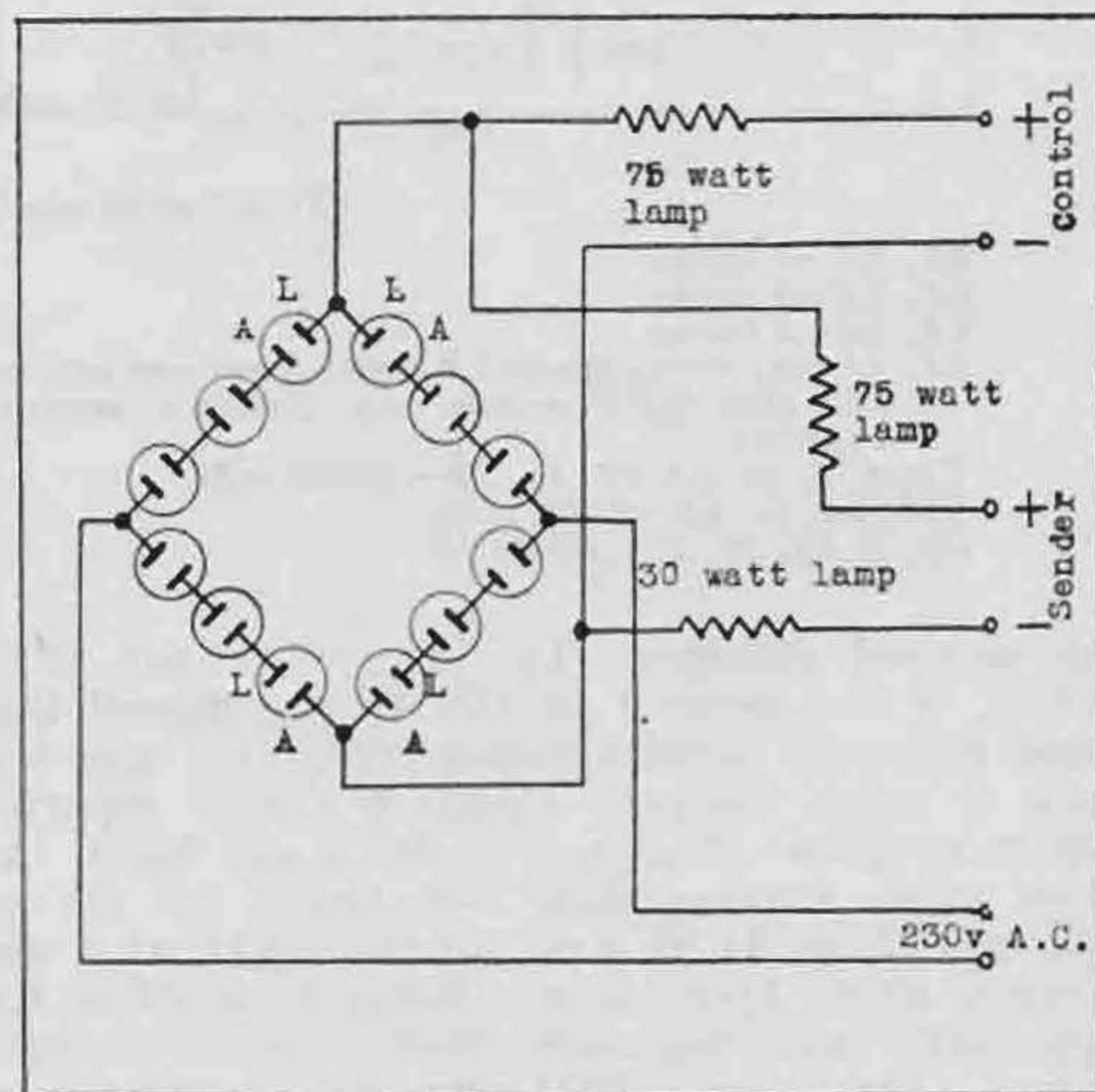


Fig. 3.

Rectifier for uni-selector auto-sender used by G5FV.

valve in the final stage and a 66-ft. Zepp. with 49-ft. feeders. She is to be congratulated on hearing a harmonic of WQU at 08.15 G.M.T. on October 21, 1934, at R6-3. Harmonics of CUC and SPW were also heard.

G2NM is investigating the use of single-signal supers on this band. He is to use a 100-watt transmitter with a matched impedance antenna. Mr. Marcuse points out that very little progress has been made in amateur receiver design (other than S.S. supers) for the last ten years, and that there is a great deal of work to be done on this subject. He draws attention to the fact that in their present form the screened grid valve circuits

preceding the detector stage are most inefficient below 3.5 mc.

2BIW is experimenting with receiving aerials and a new receiver is contemplated.

G2HG is using CO, FD, FD with a locked T.P.T.G. coupled to an end-on 66-ft. Hertz. The input to the final stage is about 30 watts. Harmonics of GOS, EAM, CUC, UIBW and HAF8D have been heard. He is interested in directional properties of receiving aerials and is carrying out tests to overcome these.

G5SY and G2XS do not report.

Schedule.—G2HG on Saturdays, from 14.30 G.M.T. to 18.00 G.M.T. Sundays from 10.00 G.M.T. to 18.00 G.M.T. Test calls will be radiated at the hour and half-hour throughout this period.

Only two members of Group 11B have reported this month. G6ZV has nearly completed his C.C. transmitter and hopes to be on the air soon. He proposes to use a Mullard T25D valve as frequency doubler.

BRS1515 has constructed a super-regenerative receiver and has been checking the wave-length, using the Lecher wire method.

G2HG has consented to act as G.C. to Group 11A, but no reports from the group are yet to hand.

loosely coupled to the final push-pull amplifier. This type of coupling has always been used at this station, as it has been found that a greater transfer of energy is obtainable than that of capacitive coupling and also a greater degree of flexibility. A Mullard T25D serves very well in the second stage, using inputs from 30-40 watts, high bias being necessary for reasonable efficiency. The position of the neutralising tap on L4 is very important, even when working as a multiplier to obtain the highest efficiency. The final stage makes use of two 4211D valves in push-pull, this arrangement being found the most stable and efficient. High bias is again essential to keep the circuit stable.

The method of coupling the output tank to the twin feeder line is the Collin's Matched Impedance Coupler, which was described in detail in recent issues of *Q.S.T.* This type of coupling gives improved results on 7 and 14 mc., and it is hoped that similar benefit will be evident on "ten" when conditions improve. Keying is introduced in the second stage, using the absorption method described in the March issue of the *BULLETIN*.

The Milne Auto Morse Sender is used for the Test Schedules and can be seen below the panel in the photograph showing the transmitter in its open position.

A Bruce Receiving Antenna is in the course of erection, and its dimensions have been chosen for wave-lengths of 14 and under. Results on this aerial will be given next month.

G5FV.

Auxiliary Equipment Group (No. 12)

Judging from the letter budget which has just arrived back, it would seem that the group is at present intrigued by the Auto Sender idea.

G2DQ describes his tape machine sender, which sends "Test" three times and the call sign three times. The Morse characters are cut out in empire tape, which is driven as an endless belt by a small motor, contact being made for the keying relay by a spring-loaded point, which makes on a polished metal drum as the Morse cuts pass between. He thinks the "Uniselector" switches rather complicated.

GI2SP uses a metal disc on a gramophone turntable with Morse cut round the edges, the projections being the Morse characters. These make contact with a roller. This has the disadvantage of having the whole thing at high potential unless a keying relay is used. Herr Meisner, of Germany, in a letter, suggests the use of an old gramophone record instead of the metal disc operating a pair of contact springs. He has promised to describe his "Receiver-coil-revolver" in the near future. He expresses surprise at the smallness of the group.

G5FV describe their rectifier for the Uniselector Auto Sender. It is a 12-jar electrolytic bridge. The arrangement may be seen quite clearly in Fig. 3.

The Group Manager has now slowed his Auto-Sender down and made the speed variable by using two old totalisator relays connected as in Fig. 4. The contact A2 takes the place of the interrupter springs of the sender switch in the original circuit. The adjustment of the two variable resistances makes the relays interact at variable speeds, and this controls the stepping of the sender switch.

(Continued on page 240)

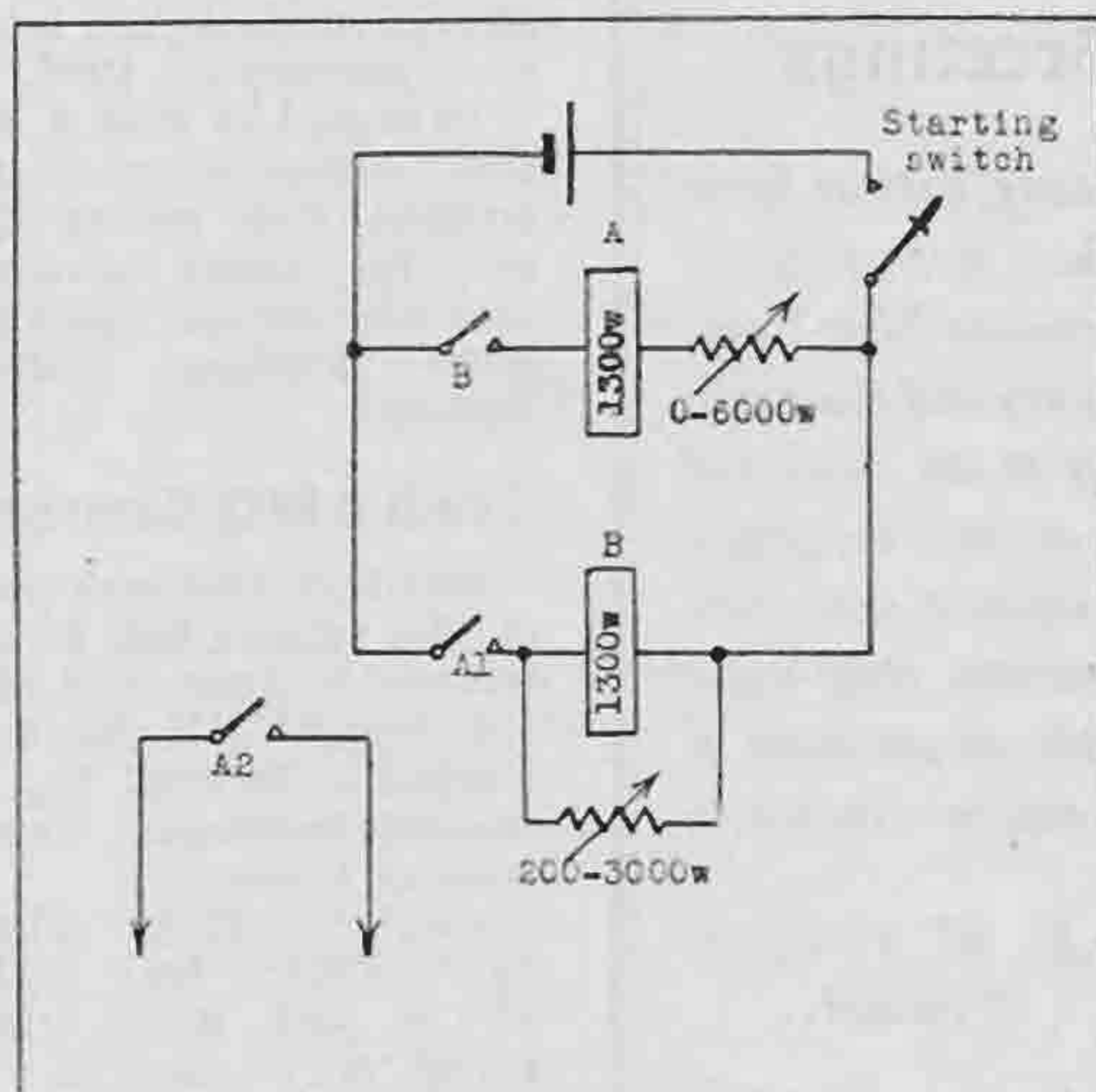


Fig. 4.

Speed regulator used by G2MI for auto-sender.

The G.M. has been on 28 mc. at week-ends, but has found things very quiet, no amateur signals or even commercial harmonics being audible at any time. Regular test calls using 100 watts C.C. are transmitted, however, in accordance with the schedule published last month.

A few details of the transmitter might be of interest to the membership. The circuit is as shown in Fig. 2, and the photograph gives the practical arrangement of the transmitter. A 247 valve is used in the C.O. stage, as this type of valve is most efficient, and is in every way suitable when using a 14 mc. crystal. The anode and screen voltages are 300 and 150, respectively, and inputs vary from 6 to 9 watts. To obtain the same output using a triode, an input of approximately 20 watts is necessary. This stage is loosely coupled to the frequency multiplying stage, which is in turn

HIC ET UBIQUE.

Meetings—Appointments—Contests—Calibration—Q.S.L. & Q.R.A.
Sections—Slow Morse—Reception Tests.

I.E.E. Meetings.

The annual general meeting will take place on Friday, December 28, at the Institution of Electrical Engineers, London. Tea will be served from 5.30 p.m. and the meeting will commence promptly at 6.15 p.m.

Following the business proceedings, Mr. J. L. Howard, of the G.P.O. Research Section, will lecture on "The Properties of Wireless Aerials."

We are pleased to announce that Mr. John Grierson will deliver a lecture at the January meeting to be held on the 25th of that month. It will be remembered that several members co-operated with Mr. Grierson during his recent flight from Ireland to Canada.

New Appointments.

Council have pleasure in recording the following new appointments:—

Assistant R.E.S.

Manager: Dr. George F. Bloomfield, G5MG, 34, Morton Way, London, N.14.

E.L.S. Supervisor: Mr.

H. A. M. Whyte, G6WY, 9, The Mead, Beckenham, Kent.

No. 4 District Representative: Mr. H. B.

Old, G2VQ, 3, St. Jude's Avenue, Mapperley, Nottingham.

Joint No. 13 District Representatives: Mr.

H. D. Price, G6HP, 12, Hillcrest Road, Sydenham, S.E.26;

Mr. J. B. Kershaw, G2WV, 6, Quentin Road, Lewisham, S.E.13.

Joint D.R.'s for South London have been appointed because it is felt that the present area is too large to be adequately covered by one person. The division between the two sections will be arbitrarily fixed at an early date by the two D.R.'s.

R.E.S. Awards.

Council have pleasure in announcing that R.E.S. awards for the current year have been made to the following members:—

Messrs. E. N. Adcock, G2DV, and S. A. Taylor, G5TL, for their article entitled "The R.E.S. Single Signal Superhet."

Mr. A. E. Livesey, G6LI, for his article "Practical Radio Telephony."

Mr. E. A. Dedman, G2NH, for his article "Directional Aerials for 56 mc."

Messrs. G. W. Thomas, G5YK, and H. C. Page,

G6PA, for their article "Some New Ideas on Master Oscillators."

Mr. A. D. Gay, G6NF, for his article "The H.F. Pentode as a Frequency Divider."

These awards have been based upon articles published in the Society's Journal during the year 1934.

The awards, which in all cases take the form of certificates, will be presented at the annual general meeting.

Reception Contest.

In order to clear up any misunderstandings that may have arisen, we wish to emphasise that this Contest will be judged on the points scored during

both the 3.5 and the 1.7 mc. Transmitting Contests. Entries, therefore, should reach us not later than January 27, 1935.

In regard to Rule 4 for this Contest, entrants are advised that points can only be claimed for overseas and foreign stations heard working British Stations.

The 3.5 MC. Contest.

Members who took part in this contest will be interested to know that Mr. I. E. Hill (SU6HL) has forwarded a detailed log of the calls he heard. These were as follows:

G2JL*, 2LR, 2VQ, 5JU*, 5MR*, 5NF, 5VU, 5YU*, 5ZT, 6IZ*, 6OM, 6RB*, 6YJ*, G6TK.

* Denotes QSO.

Further details can be

obtained on request from Headquarters.

A report dealing with the Contest will probably appear in our next issue.

Entrants for the Receiving contest are requested to retain their entries until after the 1.7 mc. event.

B.E.R.U. Junior Contest.

Members possessing 10-watt permits who wish to be recommended for the use of 25 watts during the B.E.R.U. contests in February are requested to make application to the Secretary not later than January 15, 1935.

No application can be considered after the above date.

International 28 MC. Contest.

G2HG reports having worked G2YL, 2ML, 5OJ, 6NF and 5BY, and heard G5VB and 6CL. His signals have also been received by 2AJW.

Presidential Greetings

To all members of the Society, both at home and overseas, I send my best wishes for a happy Christmas and a prosperous New Year. To all the officers of the Society and those who have contributed in any way to the successful year we have had, I wish to express my grateful thanks for their loyal support, and hope that they will be able to continue their work during the coming year for the advancement of Amateur Radio in general and our Society in particular.

ARTHUR E. WATTS,
President.

December, 1934.

Harmonics of 26 G's working on 7 or 14 mc. have been logged. G2YL heard an harmonic of WQU on October 21.

Tests between G2YL and 2HG have shown that if the former uses an aerial running N.N.E.—S.S.W. for receptions, the latter's signals are R8 (QRB 14 miles), but if the aerial is changed to E.—W., signals are only just audible.

G6CL reports hearing G5BY (QSA5 R5) on November 18 at about 15.30 G.M.T.; the note was slightly chirpy.

G6YL and 5QY after some tests on a lower frequency changed to 28 mc. and maintained 100 per cent. contact at high QRK, the distance being about 15 miles.

Directional Aerials for 56 MC.

The second part of Mr. E. A. Dedman's article will appear in the January issue. Owing to pressure of business the author was unable to complete this instalment in time for inclusion this month.

County Representatives, 1935.

Mr. H. Wilkins advises us that the nomination received on behalf of Mr. G. Exeter (G6YK) was for the position of West London C.R., therefore no election for Middlesex was necessary, Mr. Lewer (G6LJ) having been correctly nominated.

CALIBRATION SECTION FEES.

CRYSTALS, 1s. 6d. each; FREQUENCY METERS, 2s. 6d. for five points, plus 6d. for each additional point. These prices do not cover cost of return postage, which must in all cases be remitted as a separate amount.

Crystals and frequency meters should be sent for calibration, at owner's risk, to Mr. A. D. Gay, 49, Thornlaw Road, West Norwood, London, S.E.27.

Mr. H. W. Stacey (G6CX) has been elected C.R. for West Lancs. and West Cheshire.

The following additional C.R.s have been nominated, and take office as from January 1 next:—

Wiltshire: Lieut.-Col. W. L. Palmer (G2BI).

Kent: Mr. A. Chapman (G2IC).

Northants.: Mr. R. J. Pankhurst (G5YF).

Notts.: Mr. J. Lees (G2IO).

Flintshire: Mr. J. H. Wood (BRS1211).

Lincolnshire: Rev. L. C. Hodge (G6LH).

In the case of counties from which no nominations have been received, the existing C.R. will continue in office unless advice to the contrary is received by Headquarters prior to December 31, 1934.

A.R.R.L. Handbooks.

Headquarters have now a stock of the new 12th Edition of the Handbook. The price to members remains at 4s. 6d., post free.

Radio Amateur Call Book.

We have been advised that the price of the Winter Edition of the Call Book is to be advanced to 1 dollar 35 cents, owing to the ever-increasing number of new call signs listed.

The R.S.G.B. price for this edition will be 6s. to members and 6s. 6d. to non-members, post free in both cases.

Important Notice.

RE OPERATION ON 3.5 MC. BAND.

We have been advised by the G.P.O. that great care must be exercised by British amateur stations operating on 3530, 3542 and 3580 kc., as these frequencies are used by Government wireless stations.

We recommend that members refrain from using crystals with fundamentals or harmonics falling on these frequencies, and suggest to manufacturers that they cease supplying such crystals.



A new cartoonist makes his bow with a seasonal message.

For 1.7 MC. Listeners.

Several East Coast American stations will be transmitting telephony from 05.00 to 07.00 G.M.T. on December 16, with the special object of being heard in Europe. They will be operating between 18.00 and 20.00 kc. and reports can be forwarded either to WIDBM, Phil Rand, of North Falmouth, Mass., or via R.S.G.B. Headquarters.

Bulletin Diagrams.

To conform with standard practice all future circuit diagrams appearing in this Journal will show "cross-overs" where no connection is made, as intersecting lines. All connections will be shown as a spot.

Tri-Tet Push Pull Transmitter.

In the circuit diagram for this transmitter, which appeared on page 164 of our last issue, three blocking condensers in the Tri-Tet section were not designated. The condenser connected to the plate of the C.O. is C16, that from the lower grid of the amplifier valve C17, and that from the plate of this valve C19.

Mr. McLean Wilford, the designer, will be glad to receive suggestions or criticisms regarding this transmitter, and will answer questions, providing they are accompanied by a stamped addressed envelope.

Electron-Coupled Transmitter.

Mr. J. MacIntosh (VS2AF) asks us to point out that the lead from the top end of L.C. in Fig. 2 of his article published in the September, 1934, BULLETIN should be connected to the second grid. The first grid should be strapped to the filament.

Calibration Section.

Manager: A. D. GAY (G6NF).

Calibration Fees.

It appears to be an impression among some of our members that the calibration services should be made free. If the writer could be certain that an inundation of junk would not occur, there would not be the slightest objection to the idea. A good crystal or well-constructed frequency meter is worth a small expenditure for its calibration. If the service was given free there would be nothing to deter anyone from sending apparatus of faulty construction time after time or on each occasion the calibration was found to have altered.

Unusual Calibrations.

The Society's calibration service was organised for the calibration of members' apparatus used in the reception and transmission of signals on amateur bands of frequencies. For this purpose a frequency meter was designed and constructed to cover the range of frequencies from 1,700-2,000 kc. with harmonic coverage of other bands. At times we have been asked to calibrate on other frequencies; for instance, a valve oscillator was recently calibrated in 1 kc. steps, having a frequency range of 100-115 kc. The requirements for this calibration were obviously not covered by the Society's frequency meter and the necessary apparatus took a whole evening to erect in the laboratory. While we are willing to accommodate our members if possible, consideration of time often makes such calibrations as these impossible. An enquiry, containing a stamped addressed envelope, is advisable before sending any unusual crystals or oscillators for calibration.

Standard Frequency Transmissions.

Since last month's notes were written, four further reports have been received on the calibration transmissions from G6NF. This makes a grand (?) total of 5! Thank you—G6QA, G6GZ, BRS250, G2ZC and G6PF.

QSL Section.

Manager: J. D. CHISHOLM (G2CX).

Last month we pointed out to some of our members who seemed unaware of it the service which the QSL section offers. This month we would like to address a few remarks to a far larger section of the membership, i.e., those who are aware of their privileges and abuse them.

For some considerable time those who have the responsibility of the conduct of the QSL Section have been greatly concerned as to the enormous waste of time and money which is involved at present. Figures have been taken to discover what percentage of cards arriving here are eventually claimed, and various other checks have been made by the secretary. These figures show that more than half the Society's work is absolutely wasted, and many other grim facts emerge as a result of the investigation.

The Council will consider the matter fully at their next meeting, and whilst nothing can be stated definitely until after that date, it is certain that some action will have to be taken to simplify matters.

You may be sure that whatever course is decided upon, it will be with the best interests of the Society in view and only after the fullest consideration has been given to all the factors concerned.

The matter of unclaimed cards and of "mass-production" listeners' reports has been referred to time and time again in these notes, and yet there seems to be no diminution of the trouble from these sources, whilst the number of cards dealt with monthly is steadily increasing. The Society is in no position to employ further clerical assistance to deal with this, and unless something is done to improve the position, it looks as if the staff are going to be overworked sorting cards which in six months' time have to be destroyed as unclaimed.

QRA Section.

Manager: M. W. PILPEL (G6PP).

A MERRY CHRISTMAS AND HAPPY NEW YEAR TO ALL MEMBERS.

NEW QRA's.

- G2AT.—REV. A. B. TREWIN, 133, Bethune Road, London, N.16.
- G2MG.—MAJOR C. C. MILLAR, Lynwilg, 61, Dalziel Drive, Glasgow, S.1.
- G2MV.—S. MARTINGELL, "Haycott," Homefield Road, Wimbledon, London, S.W.20.
- G2QR.—C. H. RODDIS, 88, Kent House Road, Beckenham, Kent.
- G2TP.—C. W. ANDREWS, "Hame," Ruden Way, Epsom Downs, Surrey.
- G2VD.—L. F. VINEY, 5, Twyford Avenue, Fortis Green, London, N.2.
- G5DJ.—D. C. JARDINE, 7, Colne Road, London, N.21.
- G5JW.—J. T. STUART WILLIAMS, 16, Dunstall Road, London, S.W.20.
- G5KY.—F. GORDON KAY, 62, Sydney Street, Chelsea, London, S.W.3.
- G5TL.—T. CALDICOTT, 60, Abbey Road, West Bridgford, Nottingham.

- G5XH.—L. W. HOOKE, 27, Godson Road, Waddon, Croydon, Surrey.
 G5YA.—A. W. LEITCH, The Dragon, Boreham Street, Hailsham, Sussex.
 G6AU.—C. C. ALGAR, 63, Margery Park Road, Forest Gate, London, E.7.
 G6BC.—C. S. ANDERSON, Glen Innes, Mill Bank, Fulwell, Sunderland, Co. Durham.
 G6BI.—D. N. BIGGS, 44, Pooley Green Road, Egham, Surrey.
 G6GO.—J. GOODACRE, The White House, Ashby Parva, Rugby.
 G6QF.—A. M. ROBERTSON, c/o GOULD, 61, Glenapp Street, Glasgow, S.1.
 G6RJ.—A. ROBINSON, 23, Moorlands Drive, Chapel Allerton, Leeds, 7.
 G6VC.—V. H. S. CURLING, 175, Dover Road, Northfleet, Kent.
 G6WO.—L. G. WATTS, 817, Oxford Road, Reading, Berkshire.
 G6XN.—L. A. MOXON, 13, Mandeville Rise, Welwyn Garden City, Hertfordshire.
 G6XR.—H. V. COOK, 78, Wyken Avenue, Wyken, Coventry, Warwickshire.
 G6ZU.—R. H. JACKSON, 54, Prince's Street, Stockport, Cheshire. Station at Dodge Hill House West, Dodge Hill, Stockport. (This corrects the address given in last month's list.)
 2AAV.—C. H. HOPWOOD, M.B., B.Ch., Calstock, Cornwall.
 2ABI.—P. C. HEATH, Mill House, Broad Oak, Heathfield, Sussex.
 2ACB.—M. C. CROWLEY-MILLING, Radley College, Abingdon, Berkshire.
 2AGW.—B. E. P. SADLER, 40, Loxley Road, London, S.W.18.
 2ALM.—H. G. G. CHANDLER, "Hayward House," Hartford Bridge Flats, Blackwater, Hampshire.
 2AMQ.—W. LORD, Birch Villa, Lulworth Road, Birkdale, Lancashire.
 2ANV.—R. N. LAWSON, Firlands Glen, Middle Gordon Road, Camberley, Surrey.
 2AUR.—N. T. HODGSON, Scarbrough House, Mareham-le-Fen, Boston, Lincolnshire.
 2AVG.—P. H. TRAFFORD, Elmira, Ratcliffe Road, Sileby, Loughborough.
 2AZX.—P. SEYMOUR, 32, Married Quarters, R.A.F. Base, Gosport, Hampshire.
 2BJH.—W. SULLIVAN, 36, Waverley Drive, Bangor, Co. Down, N. Ireland.
 2BVI.—L. F. S. PARKER, 16, High Street, Wellingborough, Northampton.
 2BXL.—H. J. WESTON, 15, Byron Street, Redfield, Bristol, 5., Somerset.
 The following are cancelled: 2AMV, 2ASG, 2BJK, 2BKN, 2BLG, 2BPR, 2BVH, 2BVJ.

A Correction.

Under QRA Section notes last month the statement was made that the prefix UK is used by Radio Clubs and Societies in the United States; this should have read U.S.S.R.

NEW MEMBERS.

HOME CORPORATES.

- T. MOOR (G2AG), 122, Roe Lane, Southport, Lancs.
 W. SMITH (G5WZ), High Dock House, West Holborn, S. Shields.
 W. L. JOHNSON (2ABQ), Kilvonia, Baytree Road, Milton, Weston-super-Mare, Somerset.
 R. M. HERBERT (2AJW), The Nook, Smitham Downs Road, Purley, Surrey.
 H. WILLIAMS (BRS1602), Flat 5, 21, Britten Street, Chelsea, S.W.3.
 R. D. STILES (BRS1603), 2, St. Peter's Street, Ipswich, Suffolk.
 F. H. LEDGER (BRS1604), 27, Denmark Road, Wimbledon, S.W.19.
 J. M. RAILTON (BRS1605), 35, Priory Road, Loughton, Essex.
 G. BLACKAH (BRS1606), 7, Queen's Road, Shipley, Yorks.
 V. BLOOR (BRS1607), 26, Leveson Road, Hanford, Stoke-on-Trent, Staffs.
 P. T. BROWN (BRS1608), Nantygwreiddyn, Senny Bridge, Brecon, S. Wales.
 J. WILSON (BRS1609), 36, Woodburn Terrace, Edinburgh 10.
 C. A. STEVENS (BRS1610), 60, Newcombe Road, Southampton, Hants.
 A. G. LAWS (BRS1611), Dean Road, Plymstock, Nr. Plymouth, Devon.
 J. E. MAXWELL (BRS1612), 3, King's Crescent, Belfast.
 S. G. LEWIS (BRS1613), 49, Clifton Road, Tuebrook, Liverpool 6.
 T. G. MERCER (BRS1614), 32, Cumberland Road, Urmston, Manchester.
 H. L. PHILLIPS (BRS1615), 4, Radford Road, West Hoe, Plymouth.
 F. MCCORMICK (BRS1616), 20, Allworthy Avenue, Antrim Road, Belfast.
 C. M. HUNTER (BRS1617), Clivemont, East Newport, Fife, Scotland.
 DR. H. BUNTING WRIGHT (BRS1618), 3, St. James Terrace, Clonskea, Dublin.
 F. W. BENSON (BRS1619), 55, Corona Drive, Thorne, Near Doncaster.

- J. G. HAMPSHIRE (BRS1620), 29, Denmark Avenue, Wimbledon, S.W.19.
 M. H. MURPHY (BRS1621), c/o 27, Bushey Road, Hayes, Mdx.
 J. C. WITTICH (BRS1622), 14, Charles Street, Leigh, Lancs.
 W. O. WRIGHT (BRS1623), 53, Wellington Lane, Hull, E. Yorks.
 A. W. GODDEN (BRS1624), 24, Lammis Park Road, Ealing, W.7.
 R. BEALE (BRS1625), 44, Tom Lane, Sheffield 10, Yorks.
 H. G. COTTIS (BRS1626), 2, St. Mary's Cottages, Church Road, Thundersley, Essex.
 W. G. HALL (BRS1627), 6, Brunswick Road, S. Tottenham, N.15.
 R. H. DAVIES (BRS1628), 7, Tyisaf Road, Gelli, Rhondda, Glam.
 J. E. PURSER (BRS1629), Clapton Hill, Portishead, Somerset.
 F. H. BROWN (BRS1630), 271, Well Street, South Hackney, E.9.
 C. E. RICHARDS (A), 33, Bronson Road, Raynes Park, S.W.20.

DOMINION AND FOREIGN.

- J. LIPS (HB9J), Klosbachstrasse 87, Zurich, Switzerland.
 W. F. JACOT (PAOASD), c/o Van Klaveren & Co., Nassaukade 93, Amsterdam, Holland.
 C. WOODWARD (VK3YO), 2, Wattle Grove, Moreland N.13, Victoria, Australia.
 B. S. ROGERS (VK5FG), Wallace Street, Balaklava, S. Australia.
 I. THOMAS (VK5IT), 15, Eynesbury Avenue, Mitcham, South Australia.
 A. R. STANSFIELD (VOSY), Corner Brook, Newfoundland.
 H. G. GRAY (VS5AC), Kuching, Sarawak, Borneo.
 G. G. STOPANI-THOMSON (VS6AS), c/o The Hong-Kong Electric Co., Hong-Kong.
 W. J. DOHERTY (W1BRB), 10, Ogden Street, Dorchester, Mass., U.S.A.
 P. D. WAINSCOTT (BERS259), c/o Imperial Bank of India, Bombay.
 R. E. MIDDLETON (BERS260), Scotland Street, Balaklava, South Australia.
 J. K. HEISCH (BERS261), 1st Bn. Royal Scots Fusiliers, Nelson Lines, Moascar, Ismailia, Egypt.
 J. W. CORVE (BERS262), 1, Belle Vue Place, Unley Park, South Australia.
 R. K. BALIJA (BERS263), Badri Villa, Kalasipaliam, Bangalore City, S. India.
 C. DAVIES (BERS264), 2 Coy., 2nd Ind. Divisional Signals, Quetta.

R.S.G.B. Slow Morse Practices

Slow Morse practice times for December-January will be found below. As usual, Test matter will be taken from recent issues of the T. & R. BULLETIN; the page number and month of issue will be given at the end of each test. Reports will be appreciated, and are desired in order to ascertain range of transmissions and numbers utilising the service. If a reply is desired, please enclose stamped envelope or postcard. Stations willing to assist on 1.7 mc. band should get in touch with Mr. T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4. At the request of the G.P.O., Slow Morse Transmissions on the 3.5 mc. band have been abandoned.

SCHEDULE OF SLOW MORSE TRANSMISSIONS.

Date, 1934.	G.M.T.	kcs.	Station.
Dec. 23 Sunday	0030	1820	G2OI
" 23 "	0930	1828.3	G2II
" 23 "	1000	1815	G2DQ
" 23 "	1030	1911	G2JL
" 23 "	1100	1.7 mc.	G2UV
" 30 "	0030	1820	G2OI
" 30 "	0930	1828.3	G2II
" 30 "	1000	1815	G2DQ
" 30 "	1030	1911	G2JL
" 30 "	1100	1.7 mc.	G2UV
1935			
Jan. 6 Sunday	0030	1820	G2OI
" 6 "	0930	1828.3	G2II
" 6 "	1000	1815	G2DQ
" 6 "	1030	1911	G2JL
" 6 "	1100	1.7 mc.	G2UV
" 13 "	0030	1820	G2OI
" 13 "	0930	1828.3	G2II
" 13 "	1000	1815	G2DQ
" 13 "	1030	1911	G2JL
" 13 "	1100	1.7 mc.	G2UV

R.S.G.B. Reception Tests.

Below will be found full information relating to Series 31, Reception Tests. Information required by new participants will be found on page 143 of the October, 1934, issue of the T. & R. BULLETIN. On request new members will be sent this information.

At the conclusion of the Tests, logs should be sent to Mr. T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4. The closing date for Series 31 is January 21, when all logs and letters received will be circulated to all participants in the form of a budget. Several logs on the 28 mc. band were received for the Series 29 Tests, proving interest on this band despite the results being negative. PAOFB, a Dutch member, is trying out directional aerials trained on England, so that 56 mc. logs from the Eastern and South Eastern coastal districts will be appreciated. It therefore behoves the many BRS and other members interested to enter these tests.

		SERIES 31.			
Test Letter.	Date	Period	Band		
	1934.	G.M.T.	mc.		
A	Sunday, Dec.	23	0800-0900	7	
B	" "	23	1000-1100	56	
C	Tuesday "	25	0900-1000	14	
D	Wednes. "	26	0900-1000	3.5	
E	Sunday "	30	1000-1100	1.7	
F	" "	30	1830-1930	28	
1935					
G	Tuesday, Jan.	1	2130-2230	3.5	
H	Thursday "	3	2130-2230	7	
I	Sunday "	6	1000-1100	28	
J	" "	6	1600-1700	14	
K	" "	6	1830-1930	56	
L	" "	6	2230-2330	1.7	
M	Tuesday "	8	2030-2130	28	
N	Sunday "	13	0800-0900	1.7	
O	" "	13	0930-1030	56	
P	" "	13	1100-1200	7	
Q	" "	13	1830-1930	3.5	
R	Wednes. "	16	1930-2030	14	

BOOK REVIEW

MAKING AND REPAIRING RADIO SETS. By W. Oliver. 124 pages and 30 illustrations. Published by W. Foulsham & Co., Ltd., London. Price 1/- net.

This little publication is number 5 of the series "Foulsham's Wireless Guides," and is of pocket size and bound in cloth.

The early part of the book is devoted to a description of the various components in a set. Accessories are described at some length, and many practical hints are given with regard to earths, batteries, loud-speakers, etc.

Set designing is allowed nine pages, including several diagrams, and is mainly concerned with the lay-out of the components. "Set testing simplified" gives many easily applied tests for the more common troubles in a receiver, and this subject is treated in greater detail in later chapters which deal with faults, repairing and overhauling sets. A chapter is devoted to accumulator charging at home, and another to A.C. and D.C. mains sets.

The book is evidently intended for the non-technical reader, and should be useful as a "first-aid" manual to broadcast listeners with home or factory-built sets. It is of necessity brief in treatment, but the broadcast listener who takes an interest in his set, and who can read a circuit diagram, will get good value for his shilling.

T. P. A.

TRADE NOTICE

Messrs. Cossors have sent us a copy of their new publication, "The Cossor Wireless Book." This is one of the most comprehensive efforts we have seen, comprising about 40 pages of useful information. A copy will be sent post free to members mentioning this Journal.

THAMES VALLEY AMATEUR RADIO AND TELEVISION SOCIETY

At the recent annual general meeting of the above Society the following officers were elected: Chairman, Mr. Crocker (G2NN); Joint Honorary Secretaries, Messrs. S. Smith (G2LA) and J. N. Roe (G2VV); Honorary Treasurer, Mr. F. Wadman (G2GK); Committee, Messrs. Billison (G6GB) and Biggs (G6BI).

Meetings are held at least once a month and the annual subscription is 3s. 6d. Visitors are especially invited to attend meetings and full details will be forwarded upon request to either G2LA, 303, Staines Road, Twickenham, or to G2VV, 27, Baronsfield Road, St. Margarets-on-Thames.

The Secretaries will be pleased to hear from any R.S.G.B. member willing to give a lecture.

E.L.C. Radio and Television Society

Mr. C. R. Stoner, B.Sc., A.M.I.E.E., will deliver his Vice-Presidential address to the above Society on January 29, 1935. We understand he will discuss a topic of general short-wave interest. The meeting will commence at 5 p.m. in the Electrical Lecture Theatre, East London College, Mile End Road, E.1.

REPORTS WANTED

G2XV invites DX reports on his 7 and 14 mc. telephony.

G6ZU.

Mr. R. H. Jackson asks us to point out that his station is now being operated at Dodge Hill House West, Dodge Hill, Stockport, Cheshire, but all correspondence and enquiries must, as hitherto, be directed to his home address at 54, Prince's Street, Stockport.

A Useful Hint

A simple wave-trap in the aerial lead close to the receiver and tuned to the frequency of HAT2, will eliminate almost completely the QRM caused by the spreading of this commercial station over the 7 mc. amateur band.

It will also be found effective for overcoming "wipe-out" from a nearby transmitter.

G5FB.

DX CHARTS

It has been felt for some time that a chart of DX conditions would prove of considerable assistance to our newer members, inasmuch that it would enable them to know when, and where, to locate stations they are looking for, but seldom hear. Furthermore, many transmitting members are anxious to conduct experiments with countries not often heard, and as their time is often limited, it is believed that a chart would enable them to select the best periods for their tests. Finally, the charts would enable overseas members to know when their signals stand the best chance of being heard in this country.

It is realised, of course, that a chart forecasting such events would be invaluable, but as short waves are at times little more reliable than the British weather, we think it desirable to go slowly at first.

We are therefore commencing with a chart of recent conditions, which will, in time, itself act as a forecast.

We are indebted to G5BD, G5KU and 2BWP for their assistance in the production of this chart, which covers the area between the Humber and the Channel. With the help of these members, it is hoped to continue for 12 months and then "take stock." Incidentally a few additional helpers would be welcomed, particularly those who use or listen on the 7 mc. band regularly.

Particulars of DX stations heard or of unusual conditions on any of the other bands would also be appreciated as well as comments or constructive criticism. The organiser is Mr. H. W. Sadler (G2XS), Redways, Wootton Road, Gaywood, Kings Lynn, Norfolk.

DX CONDITIONS, OCTOBER 15—NOVEMBER 15, 1934.

G.M.T.	14 mc.	7 mc.	3.5 mc.
0000	LU3, 4; PY1	W1	
0400			W1, VE1
0500			W1, VE1
0600			W1, VE1
0700	LU; PY	ZL1; VK3	
0800	PY	ZL1; VK7, 2	
0900	PY	ZL	
1100	VK4; VP5		
1200	VK4, 2; W2		
1300	VK1, 2, 3, 4; W1		
1400	VK3, 5; W1		
1500	VK3; ZL2; VP4; W6; VE3; W1		
1600	W6, 1; VP4, 5	KA1; ZL4; VK	
1700	W5, 6, 1; VP5; ZT2		
1800	W1, 6, 7; VP5; VQ8; VE2		YI
1900	W1; VE3; VQ4; ZS1	VU2	
2000	W1, 7; ZS1; PY2; LU9; VQ4	VK3, 4; ZS; ZU; LU; PK; ZL	
2100	W1; LU6, 9	VK2, 3, 4; ZU; ZS; LU; W1	
2200	LU, 6, 7	VK; ZU; LU; W1	
2300	PY1; LU, 1, 4, 6	W1	
2400	PY1	W1	

NOTE.—(a) W1 signifies 1, 2, 3, 4, 8 and 9. (b) Italics indicate weak signals.

Empire Calls Heard.

G6YL, Felton, Northumberland, October, 1934 :—
7 mc. : vk, 2da, dr, er, fy, kb, mr, vg, xu, 3gu, gq, hl, jq, lq, mr, ox, 4ju, ry, 7jb, rc, rt, zl, 2ab, az, fr, 3dx, gw, 4ai, zs, 2a.

14 mc. : ve, ldr, gi, 2bb, ca, 3jz, lu, 4du, ox, vk, 2lz, rk, xu, 3jj, 5gw, vp, 4aa, 5jb, pz, vq, 4crl, crp, 8a, vu, 2bl, ze, ljf, jj, zs, 1h, lp, 2a, 4u, 6al, zt, 6m, 6s, 6w, zu, 6p.

By R. W. Rogers, BRS1492 (Southport), from October 6, 1934, to November 18, 1934 :—

7 mc. : vk2cs(3), xi(3), zc(4), hy(3), cy(4), xu(5), lz(5), er(4), ae(3), oc(4), dp(3), zw(3), da(4), kj(3), ev(3), kb(4), vq(3), oj(4), xo(3), nj(3), uy(4), 3gq(4), bq(4), dt(3), kx(3), mr(4), hk(5), bw(3), ml(4), dg(3), jo(4), hl(4), uh(4), wq(3), eg(4), hg(4), dm(3), bx(3), ox(4), jq(5), zb(4), bj(3), rj(3), rw(4), jj(3), 4bb(4), ei(3), 5wj(4), my(4), wr(3), wp(3), hg(4), cr(3), 6mn(4), 7nc(3), jb(5), rc(4), kv(4), vs6aq(4),

7gj(4), vp4aa(4), 9r(5), zl3ax(3), an(4), 4gz(4), bq(3), su2ga(3), ve9sj(6), zslm(4).

14 mc. : veldw(7), bv(5), dr(5), 3ja(3), 4du(4), vk2lz(4), xu(4), 3mr(4), 4gb(2), bb(4), ei(3), 5go(3), su(3), pm(3), wj(4), sulec(6), vp5jb(5), pz(5), mu(4). Figures in brackets are R strengths.

I. V. Miller (VK3EG), Tallangatta, Victoria, From September 11 to 15, and between 16.00-19.00 G.M.T. :—

g2qo, tm, zq, 5nw, wq, yh, 6hb, os, gi5aj, vq3bal, 4crl, vs6ag, ah, aq, 8aj, su2ga, 5nk, vplah, lam, lan, 4aa, 5ab, pz, vu2df, fy, lz, 7fy, vs3ac, vs7gt.

By R. J. Lee, BRS1173, Heathfield, Sussex, October 22 to November 24 :—

7 mc. : sulec, nh, kg, sc, sg, ve2fg, vk2da, 3dp, gq, vp5a, vq3bal, zl1dq, gq, gx, hy, 2ab, bc, bh, bn, bu, bz, cc, cp, cy, fr, gm, hq, kj, lb, mr, 3al, an, ax, az, bj, bs, dj, dx, fg, fl, fp, gm, hk, ja.

14 mc. : sulro, vex, ldr, vk3mr, vo8h, vp5jb, 5pz, 6yb, vq8a, xzn2c, zl3an, zslp.

NOTES and NEWS



BRITISH ISLES

DISTRICT REPRESENTATIVES.

DISTRICT 1 (North-Western).

(Cumberland, Westmorland, Cheshire, Lancashire.)

MR. J. NODEN (G6TW), Fern Villa, Coppice Road, Willaston, near Nantwich, Cheshire.

DISTRICT 2 (North-Eastern).

Yorkshire (West Riding, and part of North Riding), Durham, and Northumberland (Middlesbrough is in this district.)

MR. L. W. PARRY (G6PY), 13, Huddersfield Road, Barnsley, Yorks.

DISTRICT 3 (West Midlands).

(Warwick, Worcester, Staffordshire, Shropshire.)

MR. V. M. DESMOND (G5VM), 199, Russell Road, Moseley, Birmingham.

DISTRICT 4 (East Midlands).

(Derby, Leicester, Northants, Notts.)

MR. H. B. OLD (G2VQ), 3, St. Judes Avenue, Mapperley, Nottingham.

DISTRICT 5 (Western).

(Hereford, Oxford, Wiltshire, Gloucester.)

MR. W. B. WEBER (G6QW), 2, Balmoral Road, St. Andrews, Bristol.

DISTRICT 6 (South-Western).

(Cornwall, Devon, Dorset, Somerset.)

MR. W. B. SYDENHAM (G5SY), "Sherrington," Cleveland Road, Torquay.

DISTRICT 7 (Southern).

(Berkshire, Hampshire, Surrey.)

MR. E. A. DEDMAN (G2NH), 63a, Kingston Rd., New Malden, Surrey.

DISTRICT 8 (Home Counties).

(Beds., Bucks., Cambs., Herts. and Hunts.)

MR. G. FEATHERBY (G5FB), 30 Lindsey Road, Bishops Stortford, Herts.

DISTRICT 9 (East Anglia).

(Norfolk and Suffolk.)

MR. H. W. SADLER (G2XS), Redways, Wootton Road, Gaywood, King's Lynn, Norfolk.

DISTRICT 10 (South Wales and Monmouth).

MR. D. LOW (G5WU), "Nantissa," Westbourne Road, Penarth, Glamorgan.

DISTRICT 11 (North Wales).

(Anglesey, Carnarvon, Denbighshire, Flintshire, Merioneth, Montgomery, Radnorshire.)

MR. T. VAUGHAN WILLIAMS (G6IW), "Malincourt," Grosvenor Ave., Rhyl, Flintshire.

DISTRICT 12 (London North).

MR. S. BUCKINGHAM (G5QF), 9, Brunswick Park Road, New Southgate, N.11.

DISTRICT 13 (London South).

MR. H. D. PRICE (G6HP), 12, Hillcrest Road, Sydenham, S.E.26, and MR. J. B. KERSHAW (G2WV), 6, Quentin Road, Lewisham, S.E.13.

DISTRICT 14 (East London).

(East London and Essex.)

MR. T. A. ST. JOHNSTON (G6UT), 28, Douglas Road, Chingford, E.4.

DISTRICT 15 (London West and Middlesex).

MR. H. V. WILKINS (G6WN), 81, Studland Road, Hanwell, W.7.

DISTRICT 16 (South-Eastern).

(Kent and Sussex.)

MR. A. O. MILNE (G2MI), "Southcot," Larkfield, Kent.

DISTRICT 17 (Mid-East).

(Lincolnshire and Rutland.)

MR. A. E. LIVESY (G6LI), Stourton Hall, Horncastle, Lincs. (acting D.R.) REV. L. C. HODGE (G6LH), The Bungalow, Skirbeck Road, Boston, Lincs.

DISTRICT 18 (East Yorkshire).

(East Riding and part of North Riding.)

MR. T. WOODCOCK (G6OO), 8, George Street, Bridlington.

SCOTLAND.

MR. J. WYLLIE (G5YG), 31, Lubnaig Road, Newlands, Glasgow.

NORTHERN IRELAND.

MR. W. GRAHAM (G15GV), 5 Ratcliffe Street, Donegal Pass, Belfast.

NEW MEMBERS ARE CORDIALLY INVITED TO WRITE TO THEIR LOCAL DISTRICT REPRESENTATIVE.

DISTRICT 1 (North-Western).

THERE was a fair attendance at the meeting of the Liverpool area in November, but unfortunately the excellent support which was given to the first few meetings about twelve months ago has not been maintained, and it is rather disheartening to those who are anxious to further the interests of the Society in and around the Liverpool area. Many of the local members have not attended any of the meetings for several months, and this can only be due to lack of interest. Quite a number of these absent members are quite active on the air, and the C.R. will be glad if they will turn up and help to make the meetings a success. If any of the members have any ideas to put forward for making the meetings of greater interest, will they please turn up at the next and bring them up for discussion. Three members from No. 11 District attended the last Liverpool meeting, and were very welcome supporters. If these men can take the trouble to come up from North Wales, surely some of the locals can go to a little trouble to attend.

The suggestion to hold a joint Conventionette

in 1935 at Blackpool in conjunction with the members of No. 11 District and of No. 2 District was again discussed, and the three members present from No. 11 District were in sympathy with the general opinion of the Liverpool members that Conventionettes should be held alternatively in Liverpool and Manchester, and it is understood that this is the general view of the other North Wales members.

One or two of the members mentioned the fact that the publication of reports of individual activity had resulted in personal contact and enquiries from members in other districts, which seems to be a complete justification of the new policy adopted in respect of District Notes.

The individual reports for November are as follows:—G2RF has now rebuilt his transmitter, using 59 Tritet successfully on 7 and 14 mc. He is also active on 5 metres, with able co-operation from BRS1395. G2OA has returned to 1.75 mc., after an absence of three years on this band, using a single-valve Pentode transmitter, but will not be active on 14 mc. until the end of the year on account of rebuilding. G6TT is active on 14 mc.

and also showing interest in 28 mc. G5GY, who was a welcome visitor after many months' absence, records the loss of his modulator valve, and for the time being is using an LS5 on 7 and 1.75 mc. G2KZ comments on the poor condition of the various bands, but they cannot be printed! G5CX has completed his new 14 mc. transmitter, and is building a new rig for 1.75 mc. Other members have been heard working, but have not reported.

Nineteen members attended the last Manchester meeting, and enjoyed an excellent talk by G6JN on direction finding, who explained in detail with the aid of innumerable drawings how the different systems operate. A very interesting subject, ably described by the lecturer, to whom the thanks of the meeting were extended.

The usual junk sale was held at the conclusion of the meeting, which added further cash to the section's funds. The members are now in the happy position of having a banking account in the name of the section.

G6JN is dispensing with LF amplification; he finds that HF scores against LF as regards signal strength to noise ratio. 5ZN reports that he is working again on 7 mc. after being off the air for a few years, G5ZT reports working W on the

STANDARD FREQUENCY TRANSMISSIONS.

SUNDAY,
December 30th, 1934

0930 GMT.	3525 KC.
0940 GMT.	3625 KC.
0950 GMT.	3725 KC.

Accuracy within 0.01 per cent.

3.5 band on fone. (F.B. om., have you got confirmation?) G6QA and G2OI have been working duplex on the 1.75 band with fine results—the difference in wave-length is 100 kc. and the two stations about 14 miles apart. 6QA uses a modified century super-het, and 2OI uses a single signal super. A very interesting test took place on November 17, when partial results with triplex telephony were obtained by 6QA, 2OI and 2HL, the latter using a 10-valve super. On Sunday, the 18th, 2HL was heard relaying 2PO on the top band, so 2OI successfully relayed 2HL, and 2PO was then going out from three stations simultaneously. This note is given in case anyone was puzzled at receiving 2PO in three places on the band on that particular night; 6QA and 2OI would appreciate reports on their duplex tests.

The following stations report active on the various bands:—2KY, 2BC, 2DH, 2OI, 2WQ, 2BK, 2HL, 5YD, 5US, 5WR, 5XM, 5ZN, 5ZT, 6AX, 6GV, 6GX, 6JN, 6ZU, 6ZS, 2BVP, 2ACP, 2BHF, 2BGK, BRS770, 1114, 1502, 1504, 1549.

DISTRICT 2 (North-Eastern).

From information received it appears that activity is up to the average, though we should like to hear a little more of the doings of the Newcastle and Middlesbrough members.

The stations are active, and interest is maintained, as this is shown by their presence at conventions, etc., and we should like to see these activities reported.

From the Sheffield area G6PJ reports that the last meeting was attended by G5HK, 6PJ, 2AS, 2JY, and BRS1409, 1512, 1468, when the discussion centred round forthcoming contests and transmitter design.

BRS1468 is applying for A.A. licence. G2JY has gone over to Goyder lock on 7 mc., and has worked his first "W," whilst G2AS has overcome his trouble on this band by erecting a new Zepp. G5HK is interested in telephony, and hopes to soon have his transmitter working with 50 watts.

G6PJ's new 1-SG-1-1 receiver is working satisfactorily, and he would like to have reports on his signals from "W" stations. These will all be acknowledged.

The Sheffield monthly meeting will not be held in December, owing to the proximity of the Christmas holidays, the next one being fixed for the third Friday in January, at 7 p.m., at the Angel Hotel.

We learn that G5LT is recuperating from an illness, and offer him our sincere wishes for a speedy recovery to health.

From the Bradford area we are pleased to record the addition of two more members to our ranks, the first being G5QC, a well-known transmitter, now residing in Leeds, who has been heard putting out some good fone to "W" on 14 mc., whilst the second is a new station G6RJ, ex 2ASC, also of Leeds. To both we extend our best wishes, and hope to see them regularly at our meetings.

BRS1151 reports active, and is rebuilding when time permits. On November 21, at the Bradford Radio Society, an excellent discussion on the use of rectifiers for making measurements of A.C., with D.C. meters, was given by G6BX.

From a QSO with G6XL we hear that he has worked VK, and is only requiring an Asia contact for WBE, whilst G6KU is seeking an LU or PY contact for WAC. The latter has no difficulty in working U.S.A., but says he cannot even hear South America.

Some good duplex has been done on 1.7 mc. by G5TQ and G6BX, with only a small kilocycle separation, using superhet receivers.

G6PL and G5SZ have also been heard on the same band, the latter station's musical transmissions having a high standard of quality.

At the meeting held at G6NP on December 1 the Christmas season festivities were given an early start in the shape of a turkey dinner, which was provided by our host. Fourteen members were present, including our D.R. and C.R., when all the usual subjects were discussed, and a very enjoyable evening was spent.

Members will be notified of the next meeting, which will be held early in the New Year, and, as this is the last report this year, we will finish with good wishes and compliments of the season to all.

DISTRICT 3 (West Midlands).

G6XJ reports working at irregular times on 7 and 14 mc. with 30 watts C.W., but finds DX conditions very poor in common with most other local stations. It is interesting to note that a recent copy of "CQ," the organ of the D.A.S.D., gives a photographic place of honour to G6DL, G5BJ and G6XJ in an excellent article by D4BPU. G6XJ is spending a lot of time talking "Ham Radio" to local clubs, Scouts, etc.

G6XQ has not been very active since the Melbourne Tests, but several very good VK contacts were made during these tests, both on 7 and 14 mc. especially on the latter band, where three or four fone contacts were made with VK2 and VK5. G6XQ and G5BJ both hold the Quadruple Award, WBE and WAC on C.W. and fone. A new S.S. is being installed for the 1935 B.E.R.U. contest. G5BJ reports having rebuilt both Xmitters, and has linked coupled them. He finds this a very great improvement, and gets 10 per cent. extra output for the same input. In winning the Desmond Cup in the M.A.R.S. Contest, he worked 47 stations, including all W districts.

DISTRICT CALENDAR**December, 1934/January, 1935**

- DEC. 17 District 14 (Eastern).—Supper, 2s. 6d. 7.30 p.m. for 8 p.m.; details from D.R. or 2APS.
- DEC. 19* District 15.—7.30 p.m. at G6LJ, 17, Norval Road, North Wembley. Questions and Answers night.
- JAN. 2 District 1 (Manchester Section).—7 p.m., at Brookes Café, 1, Milton Street, off Oldham Street, Manchester. Open night for discussion.
- JAN. 3 District 5 (Bristol Section).—7.30 p.m. at Full Moon Hotel.
- JAN. 6 District 7.—2.15 p.m. at Pitcher's Café, High Street, Guildford.
- JAN. 15* District 12.—7.30 p.m., at "The Ark Café," Temple Fortune.

**Members' disused apparatus will be disposed of at this meeting.*

Trying push-pull doublers and link to other stages. G2DV is getting information on directional effects with new antennae. G6KI is inactive for a short time. G5TL is still improving his S.S. super. BRS1593 is noticing directional effects on his Dipole. 2ANT is hearing W 1, 2, 3, 4, 8, 9, 3.5 mc. fone on his Comet Pro.

G2LB is active on 7 and 14 mc. and had W.B.E. on QRP. The Warwickshire C.R. reports having heard G6AG, 2AK, 2DK, 5ML, 6YU active, but no reports. Please, OM's!!! G5NI has not been on much owing to business QRM. G6DL is active at odd times. His 14 mc. final is giving up the ghost, and he is looking for a T6ID! G2WD is building a S.S. super for B.E.R.U., and is doing a little DX when time permits. G5VM is on at odd

moments, but is about to rebuild the whole outfit. All best wishes to the District from the D.R. and the C.R.'s for a very Happy Christmas and New Year.

DISTRICT 4 (East Midlands)

Mr. J. Lees, G2IO, advises us that Nottingham County meetings will take place at the Reform Club, Nottingham, fortnightly.

A Christmas Dinner will follow the next meeting, to be held on Thursday, December 20. Tickets, price 3s. each, must be obtained from Mr. Lees, at least two days before this date.

The first meeting in the New Year will take place on Saturday, January 3, at 5 p.m.

G2WS, late of Leeds, now in Ilkeston, suggests that as many No. 4 members are interested in 56 mc. work, the period 14.00-14.30 G.M.T. Sundays should be set aside for work on this band. Co-operation from non-transmitting members is solicited.

Activity in Northamptonshire seems to have increased with the advent of G5KN, the station of the Kettering Radio and Physical Society. The transmitter which has been built by about ten members of the Kettering Society, each member being responsible for a given section, is installed at their permanent club-room in Pollard Street, where members are free to go in at any time. Enthusiasm waxed high when the first Test Call raised a U.5, who gave R6. Reports of G5KN will be welcomed on any band.

G2NJ and 5NX, at Peterborough, report that they are getting out well on phone. BRS1340 has left us for the north, but Peterborough boasts of a new member in the person of BRS1562. 2BXG, BRS1251, 1491 and 5YF have been helping at 5KN.

DISTRICT 5 (Western).

The Gloucester and Bristol C.R. reports many members active. G6VK has an all A.C. Single Signal Super working well on 7 mc., and is busy making coils for use on other bands. G6JG also has a S.S.S. working, which probably explains his long absence off the air. G5JU is using a T 25 D as a F.D. output on 28 mc., with excellent results, and has spent some time on that band, but has only heard harmonies.

G5WI is putting out a very healthy signal on 7 mc. G6RB is working ZL, W6, etc., on 14 mc. G6TO built a very fine D.F. receiver, and gave valuable help to G.P.O. by tracking down a local pirate. It is hoped that a BULLETIN article will be appearing later with details of this receiver. G2GQ is back on the air for the winter, with a much improved note. Monthly meetings are held in this section, and the C.R. who is trying to arrange a lecture for the next meeting trusts that as many members as possible will attend these meetings. The Oxfordshire C.R. reports that activity is well maintained, and most stations report active. Regular meetings are held twice a month at various members' homes. It is hoped shortly to arrange co-operation with the Reading Group in meetings, rag-chews, tests, etc. We are pleased to welcome to Oxford W9FHP, who is at the University. Congratulations to 2AKB on obtaining his AA call sign.

The last number of the Wilts. letter budget was

the Fourth Birthday number, congratulations to G2BI. This is a really fine letter budget, and much useful information, especially on electron coupled oscillators, has been given in it.

DISTRICT 6 (South-Western).

Winter activity appears to be in full swing, and practically every member in the District shows interest in some form. There is to be a definite alteration in budget arrangements, owing to the fact that the number of members wishing to join in makes it absolutely impossible to stick to the old method of one book only with a monthly circulation. Accordingly, G6XD, the C.R. for Devon, has very willingly agreed to take on a second book, which will be used for the Plymouth and Cornwall area mainly. This will relieve the congestion further up the District and enable us to take in more members. It speaks well for the keenness of the members, and also for the increase in membership, that it should be necessary to take these steps. Actually there will be about three times the number of contributors that there were when the budget was first started about two years ago. Even

DISTRICT 7 (Southern).

The January meeting will be held at Pitchers Café, High Street, Guildford, on Sunday, January 6, at 2.15 p.m. The November meeting at G2YL attracted the largest attendance of the year, over forty sitting down to tea. The NFD films were shown, but unfortunately, Mr. Cooper was prevented from giving his talk, due to illness. We hope to include this talk in one of our future programmes. In Mr. Cooper's absence, the D.R. gave a talk and demonstration dealing with crystal gate S.S. receivers.

We are very sorry indeed to lose G2DC from the district, due to his transfer to Liverpool. (All in No. 7 District wish you the best of luck in the new job, Jack.)

Mr. G. Marcuse (G2NM) has agreed to take office as C.R. for Berkshire, and in conjunction with the other members in the Reading district, is already holding monthly meetings. Any Berkshire member who has not yet received particulars of these meetings should get in touch with Mr. Marcuse.

The question of the letter budget has come up for review. Mr. Neale feels that the budget has

**The Editor and Headquarters Staff wish all Members a
Merry Christmas and a Happy New Year**

with the two budgets on the go there will not be any spare time, so the D.R. appeals to all contributors to make a point of forwarding the book with as little delay as possible.

We are sorry to learn that G2FN, our very old friend, has now left the District. We have all felt the benefit of his scientific ability and sound common sense, and will undoubtedly miss him considerably. The District wishes him the very best of good luck in his sphere of activities, and there is no doubt that every member in the District would experience a special thrill at making contact with him over the air at some distant QRA.

Regarding individual activities, it seems that 3.5 mc. DX are the chief centres of interest. 5VL, 5YR and 5SY have all effected some good QSO's on the band, and 5SY is pleased to be able to state that the A.C. Single Signal Superhet is doing its job excellently, especially on 3.5 mc. fone.

14 mc. DX is good in parts! ZL's, etc., come in mornings now very well indeed, according to the logs of 5QA, 5QS, 5WY and 5SY.

6RP has got over his operation, and is now back on the job again. We hope he will continue in good health. He is constructing a portable 40-ft. mast for District affairs.

An old member, G5RN, has returned after a long absence abroad, and we hope to hear a great deal from him soon.

There have been further increases in membership and one or two possibly to come. The District is most decidedly growing, and the D.R. thanks all who are helping in this great increase of enthusiasm.

now served its original purpose in getting our members together, and although it is as well supported as ever, he feels that with the number of meetings being held in different parts of the district, it is imposing an unnecessary task on members to contribute to the budget each month. The letter budget has been in being now for a number of years, and it seems a pity to drop it, if one looks at it from a sentimental point of view, but, at the same time, it takes up a very large amount of Mr. Neale's time, and he feels that the budget should retire now on the crest of its wave of success, instead of being allowed to dwindle away!

Therefore we ask, "if any of you know any just cause," etc. Failing an overwhelming number of requests for its continuance, the last number will be the January issue. Talking of just causes, congratulations to G2MR, who joins the benedicts on the 23rd of this month. We understand that the new QRA is extremely favourable from a radio point of view, and that the length of the garden exceeds 66 ft. 6 ins. Finally, a happy Christmas to all, and plenty of DX in 1935.

DISTRICT 8 (Home Counties).

The number of members who took sufficient interest to comment on the absence of these notes last month came as a surprise to the D.R. If they are to continue regularly it is up to each of you to keep in the limelight.

Practically all those who do send in reports are genuine QRP men, several of them only getting their full tickets during 1934. Included among the latter are G6WA, G5RL and G2PL, all of whom have been getting out very well, using Windoms.

The activity of other members is as follows:—G5VT busy changing over from batteries to A.C.; G2RL, getting good 'phone reports and building new RX; G2XV rebuilding at new QRA for DX 'phone; G6XN getting good DX at new QRA, and busy with aerials; 2AZD manages to find time for C.R. business in spite of R.N.W.A.R. duties, plus a second-hand car; 2ACX, 2ASP and BRS 1452 also report. The Cambridge Group are alleged to be very active, but seem loathe to tell anybody about it. Several members are keenly interested in R.E.S.

A vote of thanks to G2HJ for his successful editorship of the letter budget has been proposed, and is herewith seconded with pleasure by the D.R. The current number of the budget contains the amusing suggestion that the shorter hours for next B.E.R.U. contest are due to a mass attack on headquarters by angry O.W.'s!

Talking of the opposite sex reminds us of certain rumours about several well-known members of the Society, long regarded as confirmed bachelors. The funny part of it is that they are busy doing all those things that they used to laugh at us for doing years ago!

In conclusion, a Merry Christmas to you all from G5FB.

DISTRICT 9 (East Anglia).

It is with regret that we have to begin with a grouse this month; but the truth is that the active members (except in two cases) have failed to report—so how can we produce proper notes? This refers to Norfolk only, for the Suffolk C.R. would receive a severe shock if anyone reported to him!

Anyway, it is good to know that many of our stations are quite active even if they do not report.

G2UT has not been able to spare much time owing to the arrival of a "junior op" (congratulations), but all the same his telephony is working well.

G2MN is busy on an amplifier.

2BSO has been installing an M.G.; 2BGO is to be granted a licence so soon as he has passed the Morse test, and BRS1401 has obtained an A.A. We are glad to hear that G5UD is now getting something in the aerial—at least the neighbours seem to think so. G2JS has finished rebuilding!

DISTRICT 10 (South Wales and Monmouth).

The monthly meeting held at the Queen's Hotel, Newport, did not receive the support anticipated, and, having in mind that these notes are the last to be published this year, your D.R. would like to thank those members who have given consistent support to these meetings, and extends a hearty welcome to those previously unable to attend to give their support in the coming year.

In the Newport-Cardiff areas the following members are active: G6YJ, 2JL, 5KK, 6PF, 5FI, 5BI, 2PA, 5WN, and 2APF, the latter anticipates his two-letter call sign shortly.

All the Swansea members are active, and 2UL, who is still pursuing his aerial activities, has been successful in working ZL and PY stations.

The keen interest on the part of the majority of A.A. and B.R.S. members gives every indication of more stations on the air in this District next year.

The intimation in previous notes has now been

confirmed in the allocation of the call sign 2BRF to the Blackwood Radio Society, and it is hoped this is merely the stepping-stone to a two-letter call sign in the Club's activities.

Congratulations are extended to G2JL on his appointment to C.R. for Monmouth for the ensuing year. Your D.R. wishes to thank G2XX, who relinquishes this office, for his co-operation and assistance throughout the year.

We welcome the support in this District of G2OP, Capt. G. C. Price, now resident at Pembroke and C.R. for that area.

In closing these notes may I be permitted to make a personal note and extend to one and all heartiest season's greetings and every success in our united efforts in the coming year.—G5WU.

DISTRICT 11 (North Wales).

The first meeting of the season was held at G2II on Sunday, October 7, and was attended by G2II, 6IW, 6OK, BRS1156, and 1211. The next meeting took place at G6IW and was attended by 13 members, a record for the District. An excellent talk was given on 56 mc. work by G2II, in which he touched all branches of the subject.

FORTHCOMING CONTESTS

JAN.	12 & 13	...	1.7 mc. Transmitting.
FEB.	2 & 3	}	Senior B.E.R.U.
	16 & 17		Transmitting.
FEB.	9 & 10	}	Junior B.E.R.U.
	23 & 24		Transmitting.
FEB.	2 & 3	}	B.E.R.U.
	9 & 10		Receiving.
MAR.	30 & 31	...	Low Power Transmitting.

The Rules for these Contests were published in the November issue of this Journal.

G2II has been keeping skeds with G6GL (24 miles) and G6DO (31 miles) on 56 mc. and receives them at excellent strength. He has also been using portable gear at various points on the North Wales coast, and has worked four continents on 7 and 14 mc. G2II and G6OK are building new 56 mc. gear and the Prestatyn BRS members have receivers in action. Members active on this band are G2II, G6IW, G6OK, 2ALX, 2BKH, BRS1156, and BRS1211.

G5FU and 2ALX are busy on television, and the three-letter men are doing good work on transmitters and modulators.

We have pleasure in welcoming a new member, Mr. Crowley Milling, who has just obtained his AA licence with the call 2ACB.

Will all members please note that the monthly meetings are held alternately at the QRA's of G2II and G6IW; the meeting for January will be held at G6IW on Sunday, the 6th, at 18.00 G.M.T. All meetings are held on the first Sunday in the month, and commence at 6 p.m.

DISTRICT 12 (London North).

The District continues to be well represented on the air, mainly on 7 mc., where both local and DX stations are being worked. G2QY is working break-in, and G5AM, 5NM, 2VD are getting out well with QRP. G5WW is doing extensive work on 1.7 mc., and obtaining excellent results with suppressed carrier fone, G6BG, after a long spell of inactivity, has returned to the band. G5CW, using 10 watts, has worked VK, and is experimenting with receiving aerials for DX. G5BO and 5DV are rebuilding. G6WU worked VS6 on 7 mc., and then blew up his H.T. pack; since then he has spent his time listening to VK on the loud-speaker from his Single Signal. G5QF is building a new Radio shack. G6CL used his "bean stick aerial" during the 3.5 mc. Contest with reasonably good results.

Some 20 members gathered at the Bull and Butcher Hotel, Whetstone, on Saturday, December 1, when the first district 12 dinner was held. The D.R. was supported by Mr. E. D. Ostermeyer, G5AR (Vice-President), and Mr. A. W. Hartley (C.R. for North London).

The success of the evening was largely due to Mr. J. Goddard (2AHM), who officiated on the "ivory keys," and to Messrs. Clark (G6OT), Wilson (G5CW), Boa (G5BO), and Carment (G5WW), who gave interesting talks dealing with radio subjects.

It is regretted that so small an attendance was present considering the size of the District.

During the evening G6CL announced that Dr. G. F. Bloomfield (G5MG), a member of the District, had been appointed Assistant R.E.S. Manager. He also appealed to those present to support meetings held in other parts of London, mentioning that at the moment District 12 was inclined to remain insular.

Thanks are due to Mr. Hartley for assistance in organising this event.

DISTRICT 13 (London South).

News from S. London this month is certainly of a more cheerful tone than of late, and we hope that recent developments will help the District to regain its old enthusiasm and activity.

The letter budget which has been in abeyance for some time has now been revived, and any district member not at present contributing will be gladly added to the list on receipt of a postcard. Credit is due to G2GZ and G2WV for their efforts in this direction.

The S.L.D.R.T.S. is in a flourishing condition, and has now grown to such proportions that it has been found necessary to increase the accommodation at the West Norwood Brotherhood Hall to deal with the congestion. As there was no alternative hall available on Thursday evenings the meetings now have to be held on the first Wednesday in each month at 8 p.m. sharp. *Please take a note of this change.*

The South-Western part of the District has always been a source of worry to us, and if there are any members in this area who are willing to co-

operate in forming a fresh letter budget for this district we shall be glad to hear from them.

Members are probably aware that the London area north of the Thames is divided into three districts, whilst No. 13 covers the whole of the S.E. and S.W. postal areas. In order that the work shall be more evenly divided, Council have decided to appoint G2WV as a joint D.R. for this district, and in future reports may be sent either to him or to G6HP.

We are glad to welcome G2FS to the S.E. District, and hope that he will soon make himself at home amongst us. G6HM is compiling a crystal register, and would be glad of any information from district members.

Owing to the large amount of space already devoted to our notes this month, it will be impossible to give a detailed account of the individual activities, but we are grateful for reports from the following:—G2FS, 2GZ, 2HG, 2JB, 2PT, 2WV, 2YG, 5JW, 6CB, 6CS, 6HM, 6QB, 2AFK, 2AGW, 2BKT, 2BUW, BRS901, 1357, 1417.

DISTRICT 14 (Eastern).

At the November meeting held at G6CT only eight members were in attendance. Conventionettes were discussed, but no final decision was arrived at. All members of the District will be sorry to hear of the accident to G5UK while on survey work on a ship at Dartmouth; they will be very pleased, however, to hear that he has now left hospital, and will wish him a speedy recovery. The East London Section held another successful Field Day at Rookwood Hall, Abbess Roothing. A separate account of this is being prepared by a well known fiction writer! At the November meeting at G6LL the 14 members present discussed Conventionettes, and have also arranged for a supper party, details of which can be obtained from 2APS or the D.R. As numbers may be limited an immediate application for tickets should be made. BRS565 is taking on band monitoring; useful work this. Congratulations to 2BVH now G6AU. Several new members have joined up, and BRS1605, of Loughton, has already got in touch. Several local members are appreciative of the Slow Morse Transmissions from G2DQ.



This is what happens during District 14 Field Days—G6CJ and G6LL in harness. The cart wheel reminds us of some of the aerial designs submitted to Charman in his capacity as R.E.S. Aerial Group Manager—neither work!

DISTRICT 15 (London West and Middlesex).

Despite bad fog on three previous evenings twenty members ventured forth to attend the November meeting, and were amply rewarded by a most interesting lecture given by G5KU. He introduced us to some of the points of manufacture which may never have been noticed, and imparted information as to which types of valves can be run with their anodes red hot and those which should be treated in a more gentle manner!

We were pleased to welcome G2LD of No. 2 District to the meeting, and hope that he enjoyed the evening.

It was suggested that "junk sales" be held at these meetings in the future, and the first of these will take place this month. (See District Calendar for date.) A small percentage of the proceeds will go to a district fund to which Mr. Wilberforce (G2IY) has been appointed treasurer. He is also open to receive subscriptions towards N.F.D., and all such contributions will be credited to the account of persons concerned to cover their own expenses during that week-end.

The December meeting will take the form of a "Questions and Answers" night, and all are invited to bring along a query. These can be written on a piece of paper and handed to the D.R. on arrival, who will place them in a hat so that no one will know the identity of the writers!

G5KU will be pleased to entertain BRS and AA members at any time, providing they notify him of their intended visit.

Offers of QRA's for future meetings will be welcomed by the D.R., as will also suggestions for short talks, discussions, etc.

Congratulations to Mr. Odle, who is now 2BAJ. G6WN has a new transmitter using Pentodes in both CO and FD stages, and finds them very efficient.

DISTRICT 16 (South-Eastern).

Nothing very unusual has happened in the District this month. G6WY still continues to send traffic to E. L. S., which no one else seems able to hear!

On November 28 the Medway Amateur Transmitters' Society held their annual dinner at Chatham. The Editor of the *Chatham Observer* presented the *Observer* trophy to G2MI and G6VV, joint winners in the recent local contest. He spoke very highly of the Amateur Movement, and the work which amateurs have done and are doing in radio research.

G2MI is holding the trophy for the first six months of the ensuing year.

The usual activity is reported from Folkestone. G6XB and 2VI have been working fone on 7 mc., but 2IC is hoping to get them safely on to 1.7 mc., and get them to stay there! G2IC has just finished his 50-watt R.I.G., and has had good results. 6CH has tried grid modulation, which his crystal seems to "iron out" very effectively.

G2KJ is the only member to report from Ashford. In Tunbridge Wells the BRS are as busy as ever: 1505, 1555, 2BFJ and 2BPJ have logged some impossible sounding DX, whilst G5OQ and 2BFJ are endeavouring to wind their first mains transformer.

G5MR reports from Dover that he has worked Mauritius on 7 mc. He reports pronounced echo effects on 14 mc.

North Kent and Gravesend have not reported. There is also no report from Sussex.

It is proposed to hold a joint Kent-Essex Conventionette at Larkfield next year. Will the various groups discuss this amongst themselves and let the D.R. have their views?

DISTRICT 17 (Mid-East).

As recorded in last month's issue, G6LI has gone off for a voyage to South America, and during his absence G6LH has been asked to be his deputy. He feels somewhat diffident in taking the place of the D.R., but hopes that he will be able to give satisfaction to members. Anyhow, he means to try.

Firstly, may we all bid a sincere "Bon Voyage" to G6LI, and hope that he has a thoroughly good time. We shall all await with interest the result of his listening on 28 mc. aboard ship. Secondly, may we bid glad welcome and congratulations to G6GH (old 2BDA), G2VY (old 2BIH), 2AUR (old BRS1311), 2BQR (old BRS1317), and to BRS1560, 1590, who are new members of the Society.

The Acting D.R. wishes to thank those members who replied to his appeal for reports. Activity in the District seems to be well maintained.

G2LR reports that he has now erected a Zepp, and has been working DX on 14 mc. G6AC has recently come to R.A.F., Cranwell, from Salisbury Plain. Welcome, OM!

G5BD reports that he is assisting G2XS in the preparation of the DX charts for the BULL, which are likely to prove a most valuable feature. He has, however, found time to work 40 W6's during the afternoons this autumn on 14 mc. 2ARR has built a new CO-FD-PA, with grid modulation and is also building a battery operated television receiver.



DISTRICT 17 MEET AT BOSTON.
Seated G6LI, 5BD, BRS406 and G5CY. G2XS (D.R. No. behind G6LI and G2LR behind BRS406.

G5XL is moving his QRA, and hopes soon to be active again with a new TX on A.C. mains. 2BSI is studying for A.M.I.E.T.; good luck, OM!

2BQR has built a TPTG, but at present is bus with a single-signal superhet, and has his eye on the next B.E.R.U. Contest: BRS1515 active on 56 mc. and 28 mc., and seeks co-operation with transmitting members on these frequencies.

BRS1487 is "swotting" Morse, and submits a good log of DX fone heard.

At Boston G6GH has been doing excellent on a temporary indoor aerial, with 10 watts CO-PA, and has worked 17 countries. 2AUR is building a CO-PA. BRS1044 and 1560 are both polishing up their Morse. G6LH has just worked his first W on 7 mc. He has taken out a 56 mc. permit, and is making preparations for tests across the Wash to G2XS at King's Lynn. The new QRA of G6HL is next door to the Workhouse! Meetings are held in Boston every Thursday at the QRA of G6GH, and visitors will be welcomed.

Other members have not reported, but many of these are known to be active.

Finally may the acting D.R. wish all members a Happy Christmas, and may he suggest that among their good resolutions for 1935 they will include many that will be to the good of Amateur Radio?

DISTRICT 18 (North-Eastern).

2AUN is welcomed as our new C.R. Congrats, OM! He is working on Television gear with T.I. lamp screen projection with lens, but is having trouble modulating tube owing to fading from London National. Tried out Lemon lamp and found same was unsuitable for screen projection with a disc, but should give good results with direct vision. Joined R.E.S. Group No. 5. 2AMM experimenting with mikes and L.F. amplifiers. Purchased a full Baird Television outfit and Lemon white modulating lamp. 2ADY built CO-PA, testing indoors on mains supply, applied for full ticket and now awaiting Morse test.

BRS1480 logged HI7G fone on 14 mc., using tuned S.G. stage. Also CM, VE, OA, all on fone.

BRS1420 finished new receiver, untuned SG-HF stage, also built new Pen-Det converter. BRS1210 is working on pick-ups and PA's.

BRS1316 is learning Morse after making up air-spaced grid condenser, which was found to be far superior to mica dielectric. Value for receiver is about 5 mmfds.

5GI is building new receiver, as the old one is not selective enough for this District. Worked W1 and W3.

2QO testing Collins low-pass aerial filter and modulating 180 watts during fone tests on Sundays, using grid modulation of sub-amplifier and linear implication on the output stage. DX worked 10 VK's, 6 ZL's, and ZT.

5GC obtained encouraging results with fone, testing out Collin's aerial coupler, etc.; also aerials, using single-ended amplifier in output stage.

6OY busy with secretarial duties of Hull Short Wave Society.

2BPY has been granted new licence, but awaits all sign; intends making tests with Collin's coupler and QRP gear early in December.

2AVR rebuilding gear in the form of racks to economise in space, has been measuring available land at the rear of shack for future aerial experiments. The C.R. has been warned not to tell the near neighbours.

5FV has had two QSO's with Madagascar and one with S. Rhodesia on 14 mc.; also had the pleasure of hearing that his 28 mc. ground wave has been received by G6LI, about 40 miles away, at R5-3 QSA.4 T8 over fairly level ground with

one small range of hills intervening. Fixed up the Bruce aerial but not tested out properly yet.

6UJ is mostly busy on 3.5 mc., using fone and C.W., and did well in the tests. 6OO is also on this band, but not very lucky in the tests owing to fone QRM.

No other stations have reported.

SCOTLAND

Several new faces were in evidence when the members of "B" District visited Scottish Headquarters on November 4. G6JX, a sometime "B" District member, now of "D," came through from Edinburgh specially to meet his former associates. The northern party included G2MJ, who is only recently licensed. Mr. Will (G2MJ), although not yet a member, is joining the Society at an early date.

For the 3.5 mc. Contest, the known entries were from G6IZ, G6FN, G6MF, G5NW, and G5YG—in short, "the old gang."

All the scores are now available, save that of G5NW, who, it is thought, could not find time to complete the course. The scores are as follows:—G6IZ=48 contacts in 18 countries, or 864 points, his best DX being SU6HL; G6FN=58 contacts in 13 countries, or 780 points, with a DX contact (not stated) yielding 3 points; G5YG=51 contacts with 12 countries, or 612 points, but no real DX; G6MF=16 contacts with 8 countries, or 128 points, and no DX.

The first two scores are really excellent, and represent a good piece of work. We are, of course, unable to say anything as to ultimate results, but should imagine "IZ's" prospects were bright. G5YG began famously, but struck a very bad patch on the Sunday, when both crystal frequencies available were consistently under "spitch" QRM. Still, that is all in the game, and the fun was good.

At the October Meeting of "A" District, the outstanding event was the showing of the N.F.D. film. It was run off on the 9 m.m. projector of Mr. Mackie, BRS1392, who was also responsible for the production of the "A" District Section. The members were regretful that the Scottish "C" District episodes were not available, owing to the fact that this section of the film required a 16 m.m. projector. District Officers desiring to exhibit the main film to their districts are advised to write to Headquarters to reserve a date for them.

The showing of the film was preceded by a debate on the merits and demerits of the QSL system, but, due to the wide divergence of opinion, no definite conclusion was reached.

Mr. Adams, of Hamilton, formerly 2BXX, has been assigned the call G5KF, and is now on the air.

Further applications for full licences are being submitted this month by 2BYP, of Callander, and BRS1466, of Stranraer, while BRS1446, of Greenock, goes forward for his "A.A." permit.

G6ZX, operating on 7 mc. in the early morning, was recently called by X1AA, of Mexico, on phone, the Mexican station being reported as R7. "ZX" uses 9-odd watts. He has also been carrying out tests on 56 mc. in conjunction with the members of a local radio club.

G5TA is also observed to be very active with 7 mc. phone, and is putting out a splendid signal.

So far as we are aware, G6MF is the first amateur in Scotland to experiment with a directional aerial for 56 mc. Any improvement in radiation remains to be noted, as the ultra S.W. receivers in Edinburgh and District appear to have been shelved for the time being.

The final score achieved by G5YG, in the recent Melbourne Centenary Contest, was 2,200. This total appears meagre when compared with VK3GQ's 109,000, but, of course, the VK stations had a tremendous advantage in that their possible multiplier was much greater than that of extra-VK stations, also it was possible for the VK's to work right through the 24 hours, while the time available for "G" stations was definitely limited.

Apropos the foregoing, we have just had a visit from G2TM, and apparently our recent comments in last month's circular, relative to his activities, were correct. Actually, he had about 24 VK contacts.

On a recent Sunday we were pleased to observe G6KO again active on 7 mc.

Northern Ireland.

Due to a printer's error, the R.T.U. Committee was incorrectly stated in my last notes. The officers are: GI6TB, Mr. J. A. Sang (chairman); GI5HV, Mr. W. H. Martin (hon. treasurer); GI5GV, Mr. W. Graham (hon. secretary); GI2CN, Mr. C. B.

Cleland, and GI5UR, Mr. R. Barr. The N.F.D. film has proved to be greatly in demand, but it is hoped to be able to screen same at the January meeting.

Mr. Fenwick has been granted his A.A. licence, but his call sign is not yet to hand. He is busy swotting Morse, and hopes to have a full ticket in the not too distant future.

We had a pleasant, though all too short, visit from BRS1414, L.-Cpl. H. Swift, a few days back, who, though an Army operator, spends much time on the amateur bands. Stationed at Ballykinlar camp, he is in the shadow of the famous mountains of Mourne, and he tells us that when rain is about atmospheric conditions make short-wave listening well-nigh impossible, static being of the R9 variety.

GI6YW has been rather inactive this month, but reports contacts with VK, FC4CJJ, OZ7ESK in North Greenland, VP5 and W6. He also reports what appears to be a "bootleg" station using the call VS7AB, his signal being R7, with an R5 spacer wave.

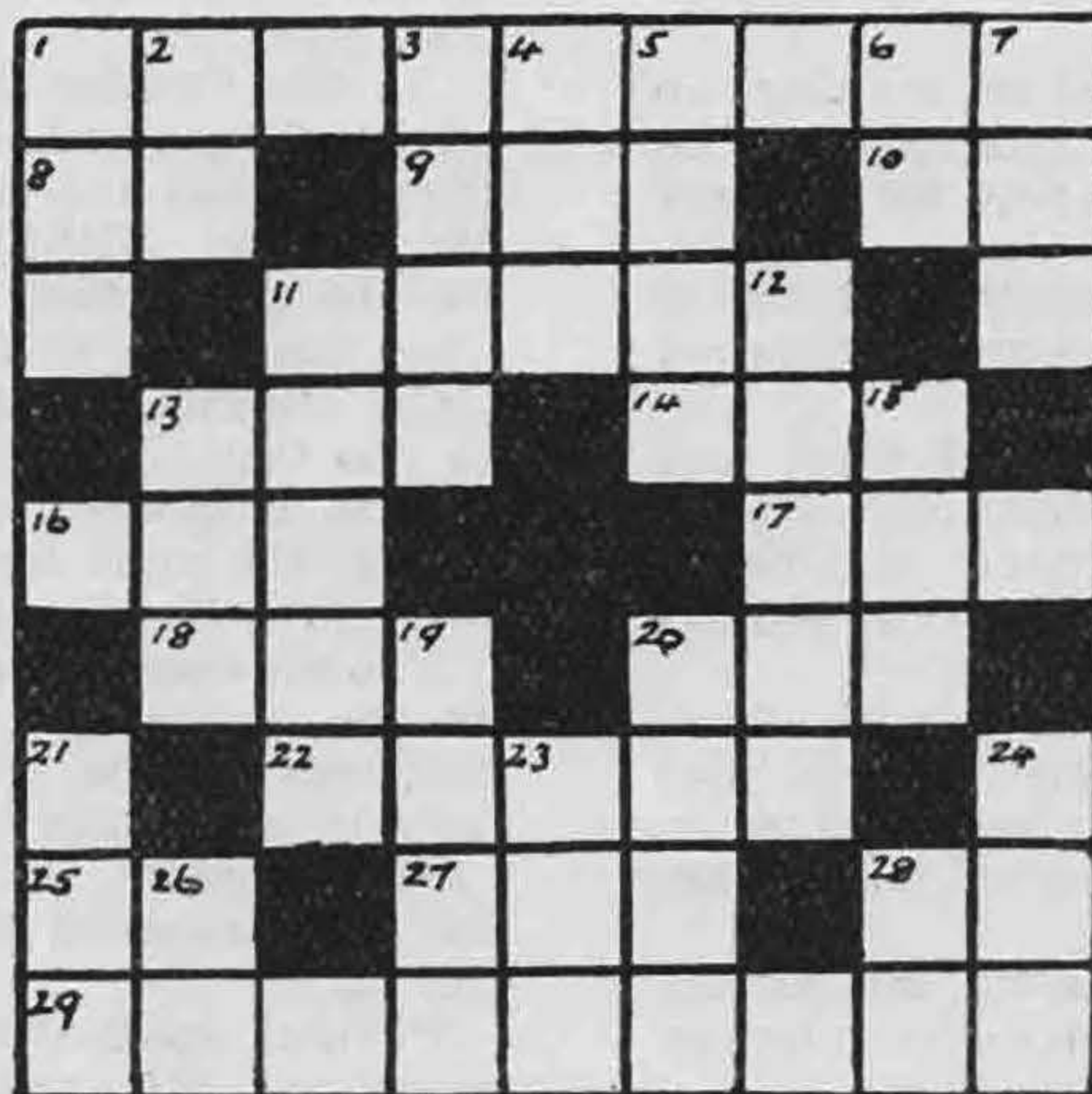
By the time these notes are in print the festive season will be almost upon us, and the D.R. takes this opportunity to wish everyone a Happy Christmas and a Prosperous New Year. He hopes the New Year will produce R9 resolutions to support these notes by reporting frequently, and that these resolutions will be "duly observed and performed."

AN AMATEUR RADIO CROSSWORD PUZZLE

Submitted by F. H. Jackson (G2KZ),
(Solution next month).

ACROSS

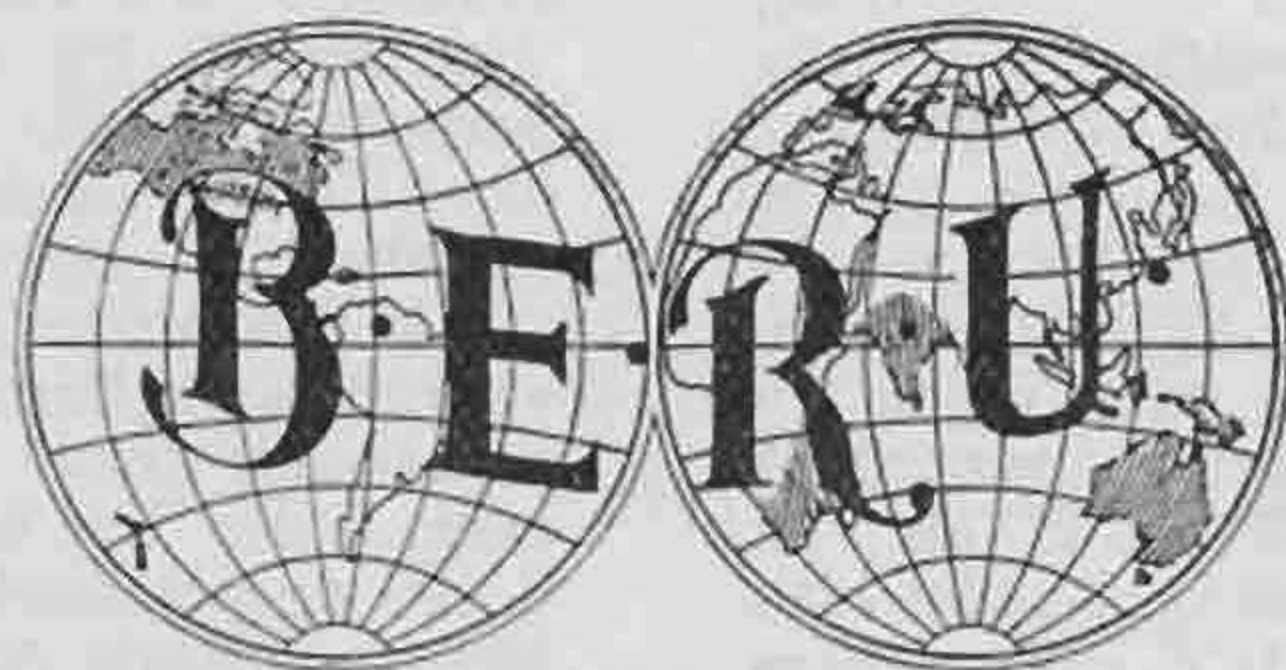
1. Best DX for G's.
8. Short for 1 Across.
9. A Ham's "Cud."
10. A beheaded negative in their language gives their prefix.
11. Maybe "FA Cup" or "PA Bottle."
13. Few Hams can state it.
14. A bulky piece of wood is a record.
16. "OK in CL Buk?"
17. A mixed control is feline.
18. Cockney for what a hen should do.
20. A "W" who co-operates with the Army.
22. What an "F" might call "Ur Crd."
25. "I tink I go 'OME."
26. A mixed title shews an apology.
28. YL's say it's outsize.
29. Is useful for DX and watchmakers.



DOWN

1. Helpful when receiving amateur fone.
2. A British abbreviation used as a prefix by some U.S.S.R. Hams.
3. How a Lancashire lad might say "My Transmitter."
4. A mixed idea of President Roosevelt's makes the call of a U.S.S.R. Commercial.
5. One way of saying "YL."
6. Leaves U out of debt.
7. This insect radiates.
11. French "tube."
12. Not DX.
13. Bees always are.
15. A type of supply which should help rag-masticating.
19. A Spaniard and compass point make for repose.
20. For VU's, U9's and J's, etc.
21. Praise or blame W2BSR. for this.
23. Not used often enough by CQ hounds, etc.
24. A mixed Spanish station, partly unknown, makes a tool.
26. A Ham Possesses.
28. A Ham Intends.

Empire



News.

B.E.R.U. REPRESENTATIVES.

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

Bahamas, Bermuda and the Eastern Part of the West Indies.—P. H. B. Trasler, (VP4TA) No. 2 Mess, Pointe à Pierre, Trinidad, B.W.I.

Burma.—W. G. F. Wedderspoon (VU2JB), Government High School, Akyab, Burma.

Canada.—C. S. Taylor (VE1BV), Stewiacke, Nova Scotia; R. Prissick (VE2CX), 27, Bellevue Avenue, Westmount, Montreal, P.Q.; W. P. Andrew (VE3WA), 1337 Dougall Avenue, Windsor, Ont.; A. E. Howard (VE4CJ), 2401, 25th St. West, Calgary, Alberta; and A. L. Cusden, (VE5HJ), 1465, 17th Avenue, New Westminster, British Columbia.

Ceylon.—G. H. Jolliffe (VS7GJ), Frocester, Govinna, Ceylon.

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

Egypt, Sudan and Transjordan.—Lt. E. S. Cole (SU1EC), Haking House, Abbassia, Cairo, Egypt.

Hong Kong.—C. EMARY (VS6AX), R. C. Signals, Hong Kong.

Irish Free State.—Col. M. J. C. Dennis (E12B), Fortgranite, Baltinglass, Co. Wicklow.

Jamaica, British Honduras, Turks Island and Cayman Island.—C. M. Lyons, (VP5MK), P.O. Box 36, 12, Port Royal Street, Kingston.

Kenya, Uganda and Tanganyika.—W. E. Lane, (VQ4CRH), P.O. Box 570, Nairobi.

Malaya.—T. G. Laver (VS3AC), Government Electrical Power Station, Johore Bharu, Johore.

Malta.—H. G. Cunningham (BERS.161), H.M.S. "Royal Sovereign," c/o G.P.O., London.

Newfoundland.—E. S. Holden (VO8H), Box 650, St. John's, Newfoundland.

New Zealand.—C. W. Parton (ZL3CP), 69, Hackthorne Road, Cashmere Hills, Christchurch.

North and South Rhodesia.—J. W. Mavis (ZE1JE), P.O. Box 160, Umtali, South Rhodesia.

North India.—J. G. McIntosh (VU2LJ) Baghjan T. E. Doom Dooma P.O. Assam.

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

South India.—J. Shepherd Nicholson (VU2JP), c/o Kanan Devan Hills Produce Co., Ltd., Munnar, Travancore.

Australia.

By VK2HC, via ZL4AI AND G6WY.

Apart from local VK contacts, 28 mc. has not yet yielded anything this season. Reports to hand give VK4BB 12 points, with VK2LZ and VK2HY 6 points each, in the international 28 mc. contest. Conditions on both 14 and 7 mcs. are very patchy at present.

A forecast of Centenary Contest results is impossible yet, but stations VK2XU, VK3GQ and VK3MR appear to have accumulated good scores. During the Centenary Celebrations, the VK3 Division of the W.I.A. Convention was held at Melbourne, when an attractive programme was arranged. The annual W.I.A. Convention is fixed for January 26, 27 and 28, 1935. The third section of the Fisk Trophy Competition will take place from December 15 to 23, in the form of a six-point relay.

Canada (Third District).

By VE3WA, via G5BJ.

It is hoped to give information regarding the DX activities of the Ontario amateurs in the next series of notes.

During the Australian Contest VK's were heard from 07.30 G.M.T. to 14.00 G.M.T., but contacts from this district were scarce, due to U.S.A. QRM.

Ceylon.

By VS7GJ.

October witnessed the change in monsoons and the Isle of Static has been "enjoying" almost daily, heavy thunderstorms!

During the Melbourne Centenary International Contest, VK's were heard in hundreds, where they all come from goodness only knows! Every note from T1 to T9 was on the air, in fact the musical discord made one wonder if the Aussies were holding a mass band of "T's."

Egypt.

By SU1EC via G6WY.

November has been a splendid DX month, and conditions would have been perfect had it not been for considerable QRN. Contacts with ZS, VQ4, CR7, and VK show that they also are experiencing the same trouble. SU1EC finds the tone control on his receiver a great aid in working through QRN. 7 mc. only has been used; this is by far the best band, and all the amateur world from W5 in the early mornings to W6 in the evenings can be heard. Best times during November and December, 04.00 to 07.00 G.M.T., W1 to W5. 14.00 to 20.00 G.M.T. for VK, ZL, VF, ZS.

SU amateurs are picking up considerably in activity. In Cairo SU1RO is still awaiting his

crystal for completion of his outfit. SU2GA, 6RM, and 1JL are different calls emanating from the same QRA of SU2GA. SU1EC has had two different aeriels up again in the space of a fortnight, and is now using old 66 ft. off centre tap fed, and is attempting to run ZS, VS, and VQ4 schedules. SU6HL is working self-excited rig with T8 to T9 note; his gear is almost completely dismantled preparatory to repatriation. BERS252, Mr. R. Keating, in Port Said, will be working shortly with 10 watts c.c., probably using SU1CK call. There are, I believe, no YI amateurs working at present, and the only ZC stations on the air are 6CN and 6FF.

In Alexandria, SU1TM is active, using a three-stage crystal rig with 50 watts input to final. SU1SG is also active with a similar three-stage outfit, using 50 watts. SU1WEM is still using self-excited rig. SU1KG is a new amateur starting out with 45's final push-pull.

Gilbert and Ellice Islands.

By VP3AM via ZL3AN, ZL4AI AND G6WY.

The Gilbert and Ellice Islands are situated about 2,000 miles north of New Zealand, and lie across the equator. At present, there are seven stations in the various islands of the group. At Funafuati, in the Southern Ellice, VP3AO (D. G. Kennedy), to whom we all owe our start, built the first transmitter, several years back, when sent to an outlying island with no other European residents. Since then, others have taken up the hobby, mainly to keep themselves informed as to Group news and shipping, which brings them their infrequent mails.

VP3AK, VP3AL are at Tarawa in the Central, and VP3AO at Beru (hi) in the Southern Gilberts. VP3AJ uses home-made accumulators, charged from his lighting plant, whilst the others rely on dry batteries. Ocean Island, a phosphate island included in the group, has 110-volt A.C. for its three amateurs, VP3AM, VP3AN and VP3AP. Circuits in use are Hartley, push-pull, and a three-stage crystal. All operating to date has been on 7 mc., which has proved satisfactory. Native boys trained by VP3AJ, make efficient operators at some of the stations.

DX worked from Ocean Island, includes VK, ZL, VE, W, K6, KA, OM2, PK, AC and LA.

Hong Kong.

By VS6AX, via VS6AQ, ZL3AN, ZL4AI, G6WY.

Conditions on 14 mc. during VK Centenary Tests were good. 7 mc. conditions were fairly good, except for very heavy static at times. During these tests VS6AH made 238 QSO's with seven districts, and VS6AQ 233 QSO's with six districts. VS6AX has been active on 56 mc. phone, using QRP. It is hoped to open up this band for local work. Mr. Thomson is now VS6AS. VS6AQ has received a QSL from South America, and qualifies for W.A.C. VS6AH and 6AQ continue phone work on 7 and 14 mc. with great success, and VS6AX intends installing phone rig. Active stations are VS6AQ, 6AH, and 6AX.

Irish Free State.

By EI2B.

I regret that, as I was away from home at the end of last month, I was unable to send any notes,

although the material for them was of the scantiest. This month the only station which has reported activity is EI9D; not a single line from anyone else! Notes cannot be written without material for them, so do please wake up, OMs.

At the writer's station conditions have been very bad on both 7 and 14 mc., the latter being practically dead. Within the last few days, however, 7 mc. has become normal again, with half a dozen deeply modulated R9 R.A.C. 'phone carriers blocking nearly half of the band at times!

Malta.

By BERS201.

Spells of humid and bad weather this month were generally responsible for DX dropping off compared with October. W and VE calls were heard for short periods on 14 mc. during late afternoons until dark. ZL and easterly DX on 14 mc. until about 10.00 G.M.T. was good.

Bright periods of all-round DX on 7 mc. usually around 20.00 G.M.T. VP3E is reported active, but 3C having trouble with his power supply. BERS253 is welcomed as a new member. Our best wishes are conveyed to Mr. Vaughan, now in England.

Northern and Southern Rhodesia

By ZE1JE.

During the past few weeks activities, which are on the increase, have been centred in the 14 mc. band, and some good DX QSO's have been reported. Owing to the almost entire absence of QRN and QRM, this band is the most reliable in Rhodesia at this time of the year.

A welcome is extended to three new members, viz.: L. R. Arnott (ZE1JO), Box 341, Salisbury; A. H. Ridley (BERS243), Umtali; and P. L. Louth (BERS245), c/o Mann, George & Co., Ltd., Beira, Portuguese East Africa.

ZE1JF is very active on 14 mc., having installed the new pentode type screen-grid valve RK-20 in the final stage. This valve, in conjunction with link-coupling between all stages, is bringing in some excellent DX reports, both on 'phone and code.

ZE1JM, whose QRA is now 136, Victoria Street, Salisbury, is again active on 7 mc., with a crystal-controlled, three-stage outfit using low power at present.

ZE1JO reports good progress on both 7 and 14 mc. He is using a Colpitts circuit, with two 45's in p.p., with 12 watts input from an M.L. Converter. His DX QSO's include SU, VS6 and VK all districts during the VK Centenary Contest, which is a very creditable performance. He intends to increase power shortly, having acquired a larger converter not having access to power lines.

BERS245 has sent in his first report from Beira, which states that QRM and QRN are very prevalent on 7 mc. He submits the following list of stations, logged on 14 mc., from October 31 to November 11, between 16.00 and 17.00 G.M.T.:—G2MS, 2OA, 6HP, 6KU, 6QX, 6RY, 6XN; VE2EE, 2FQ; and VU2FY. His receiver is S.G.-det.-L.F.

The festive season will soon be with us again, and this opportunity is taken to wish all B.E.R.U. members a Merry Christmas and a Bright and Prosperous New Year.



ELECTRADIX RADIOS OHMMETERS, MEGGERS AND BRIDGE MEGGERs. Cheap.

We have the transmitting keys and relays you want.

CIRCUIT BREAKERS replace fuses now. Magnetic Trip Overload Switches, A.C. or D.C. mains, 2 to 15 amps., from 7/6 each. Trips may be remote controlled. Illus. shows with cover removed. D.P. 20/- and Triple pole

27/6. Cheap. Reyrolle Power Plugs, 15 amps., shrouded panel wall, two pairs on iron box, unused, 10/-.

DYNAMOS, CHARGING OR LIGHTING. 240-watt enclosed Dynamo, 12/20 volts 12 amps., ball bearings, "V" Pulley, type C. Marine Type Switchboard with ammeter max. and min. auto cut-out mains switch and fuses, field regulator, etc., 50/-.

SWITCHBOARDS. Full auto cut-out and -in, field reg. switch, meter, fuses, etc., from 22/6. Let us quote you.



LESDEX BATTERY CHARGERS. Latest designs, all steel cases, meter per circuit, enclosed slide controls, armoured plugs and 25 types for 2 to 200 cells. Prices from 35/-.

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and
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By ZL1AR via ZL4AI and G6WY.

The 7 mc. band is very active, and in spite of heavy QRN and QRM, usual at this time of the year, good DX is being worked. On 14 mc. South American stations are good, but European QSO's are rather patchy, though G stations are of excellent strength on good nights. On 28 mc. nothing but local QSO's have been reported, although the band is still active.

The headquarters of the N.Z.A.R.T., during 1935, will be at Wellington, and the following officers have been elected:—President, N. Edwards, ZL1AA; Vice-President, First District, R. Sherson, ZL1AZ; Second District, W. M. Hall, ZL2BH; Third District, C. J. Banwell, ZL3AD; Fourth District, R. Stroud, ZL4AP. The postal address for

all communications for the Hon. Secretary of N.Z.A.R.T. after December 31, 1934, will be: P.O. Box 489, Wellington, N.Z.

Southern India.

By VU2JP via VU2BL, VU2CD, SU6HL and G5VQ.

VU7AB is once more on the air with very QRP after a change of QRA; he is carrying out tests on directional aeriels and will welcome reports. A letter budget is being run and copies have been sent to more than 20 members. All known B.E.R.U. members have been circulated with a view to arousing interest and activity. VU2BL and VU2BN have logged harmonics of SU1SG and VU2BY on 28 mc. Ex-VU7FV has returned from leave in G and is now in this district, and hopes to be active soon and to test on 56 mc. with VU2JP.

CHRISTMAS AND NEW YEAR GREETINGS.

From Australia, via ZL4AI and G6WY:—

The Christmas Season is with us again, and on behalf of the Council and members of the A.R.A. and W.I.A., I convey to all in our Society best wishes for a Merry Christmas and Happy New Year.

(Signed) CARTER (VK2HC).

From Canada via G5YH:—

On behalf of R.S.G.B. members in Canada, I wish to extend heartiest season's greetings to the Society and fellow-members in Great Britain.—

(Signed) EARLE TURNER

From Canada via G5YH:—

On behalf of myself and Ontario amateurs, I extend to the council and Home members of R.S.G.B. best wishes for a Merry Christmas and Prosperous New Year.—(Signed) W. ANDREWS.

From Egypt to G6UN, via SU1EC and G6WY:

All members of R.S.G.B. living in Egypt thank you for your message of greetings and offer sincerely their own best wishes in reciprocation.—

(Signed) COLE.

From Hong Kong, via G2QO:—

Members of Hong Kong Amateur Radio Transmitting Society send greetings to all members of R.S.G.B. and B.E.R.U. at home and abroad.

(Signed) EMARY (VS6AX).

From New Zealand, to G6UN, via ZL4AI and G6WY:—

I acknowledge and reciprocate heartily your good-will message. The evidence of mutual esteem existing between the amateur societies of Great Britain and this country gives promise of even fuller co-operation than has obtained in the past, and indicates an extension of the good feeling and personal friendships started by members of our respective societies. May I extend to you, and to your officers and members, on behalf of N.Z.A.R.T., seasonal greetings and 73?

(Signed) WILLIAM G. COLLETT (ZL4BP).

From North and South Rhodesia to G6UN, via ZE1JF, ZS1H, SU1EC, and G6WY:

Many thanks for message conveying good wishes, which are greatly appreciated and heartily reciprocated.—(Signed) MAVIS.

Belgium.

Mr. J. Mahieu (ON4AU), the new Traffic Manager for Reseau Belge, reports that he is now using an input of 250 watts to his main 3.5 mc. transmitter, and 4 watts to a midget set which is regularly in contact with FM and other countries. This QRP transmitter employs a 247 as C.O., which is fully modulated by two PX4 valves in push-pull. ON4AU is using 550 watts on 28 mc., and mentions that he often transmits simultaneously on this frequency, and on one of the lower frequency bands. He is thus in a position to accept calls from stations working on either band.

Another Pirate!

G6PP reports that his call is being poached by someone who turns out "spitch" on the 7 mc. band. No telephony transmissions have taken place from G6PP for a number of years—furthermore, this station will be inactive until the middle of January, 1935.

Anybody hearing transmissions purporting to come from G6PP before the date mentioned will be listening to the effusions of an unlicensed station, and are asked to get into touch with G6PP immediately. Address: 7, Woodberry Down, Finsbury Park, London, N.4. Telephone number: STAmford Hill 4482.



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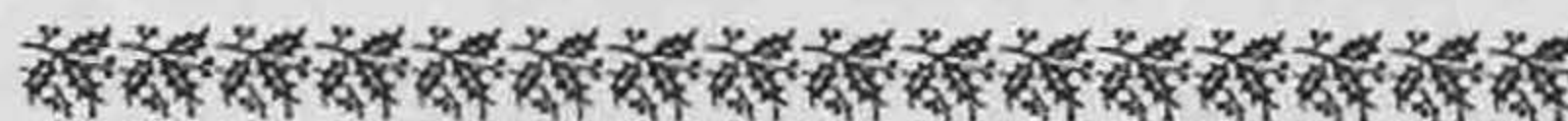
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EDITORIAL.—(Continued from page 199.)

59, for power pentodes similar to the RK20, for cheap mercury vapour rectifiers and, above all, for valves of the Acorn class.

The question of prices also needs consideration, for it is of little use British manufacturers producing new valves and components, if the retail prices are to remain as at present, far in excess of those asked for a foreign article equally suitable.

British radio manufacturers must be made to appreciate that the short-wave amateur movement, which includes television enthusiasts, is growing, and growing fast, and if they wish to retain the support of this large group of experimenters, they must immediately take steps to meet their requirements. The industry itself is blessed with all the skilled technicians it requires; it is our duty, therefore, to see that these men get a chance to retrieve the position before the lag becomes even more serious than it is at present.

MODULATION SYSTEMS FOR 56 MCs.—

(Continued from page 207.)

receiver. This surmise was found to be correct although it should be pointed out that the adjustment is somewhat delicate if satisfactory results are to be obtained. When the first tests were made it was noticed that extremely high peak voltages were produced; the tuning condenser, which was a *Bulgin* baseboard neutralising type sparking over with 120 volts H.T., whilst a long arc was produced when the voltage was increased to 200 volts. It is essential, therefore, in using the circuit shown to use a widely-spaced condenser. The circuit is self-explanatory, and it will be seen that the modulator valve filament and microphone are open circuited when i.c.w. is being used. The volume control functions on both i.c.w. and speech and the setting appears to vary with both systems. Best results with i.c.w. have been obtained by advancing the volume control to the point where the valve just breaks into low-frequency oscillation, it having been found detrimental to allow violent L.F. oscillation to occur. A variable grid leak adjusts the bias on the oscillating valve to an optimum value when speech is used.

High-frequency oscillators, aerials and coupling systems have not been mentioned, as these special modulating circuits can be applied to any transmitter. Details of the component parts used are given beneath the diagrams for the benefit of those who wish to follow the design closely. The author will be interested to hear from other members who test out these systems, and will be pleased to compare results with them.

THE 14 MC WINDOM.—

(Continued from page 209.)

1.7 AND 3.5 MC. OPERATION.

The 14 mc. Windom is used exactly as it stands, with the addition of a single-wire counterpoise, 90 ft. long, and a tuned coupling coil. See Fig. 2.

A variable condenser of .0005 mfd. capacity, and a 4 in. diameter coil of about 16 turns is suitable for both bands.

FORMULÆ.

The formulæ are as follows:

Length of radiator, AB (Fig. 1),

$$L = \frac{474150}{f \text{ (kc)}} \text{ feet.....(1)}$$

Distance of feeder tapping point from centre, CD (Fig. 1):

$$X = \frac{L(\text{feet}) \times F}{180} \text{ feet.....(2)}$$

Formula (1) is derived from the equation

$$\lambda = L \times 2.07$$

The factor F in Formula (2) varies with the diameter of the wire used.

For wire 80 mils diameter (14 S.W.G.), F=23.2

For wire 20 mils diameter (16 S.W.G.), F=25.0

For wire 12.4 mils diameter (25 S.W.G.), F=30.0

From these values it is easy to construct a graph for solid copper wire of any other diameter.

R.E.S. NOTES.—(Continued from page 219.)

It will be seen that when the switch is on A relay operates. A operates B at A1. B, in operating, disconnects A, which, in releasing, releases B. B1 falls back and re-operates A and so on. It is possible to slow the sender right down to about two words a minute!

The brothers 5FV have promised to send along details of their crystal oven and peaked audio device soon.

G5AR and G2AF have nothing to report at present.

STRAYS

Mr. F. A. Robb (G6TK) would appreciate reports on his 3.5, 7 and 14 mc. transmissions from DX transmitting and receiving stations. Schedules are wanted with Asia or Oceania. All reports acknowledged.

Mr. C. R. Handby, c/o The United African Co., Ltd., P.O. Box No. 5, Warri, West Africa, will shortly be operating under the call sign ZD2F and would appreciate reports.

Mr. J. W. J. Tyrrell (VU2BM) has now returned to England and hopes to be on the air with a G call shortly. He wishes to thank all Empire and foreign stations for their QSO's with him.

Ham Parodies No. 4.

(WITH APOLOGIES).

This is why I'm lonely,
This is why I'm blue,
Not a bit of luck has come my way,
Can't think what has happened
But I couldn't work a soul to-day.
Pulled the gear to pieces,
Built it up anew,
Thought and thought until I'm nearly grey.
Calls are all in vain though
And I couldn't work a soul to-day.
Stations there are plenty
Working on the air,
(And DX is really fine),
Eighty, forty, twenty,
Anywhere,
Answer every call but mine.
Valves are all in order,
Juice is coming through,
And the old antenna seems O.K.
Gee! It's got me guessing,
'Cause I couldn't work a soul to-day.

"PIPS."