

# R S G B

JUNE, 1958

## BULLETIN

2/6 Monthly

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

VOL. 33, NO. 12

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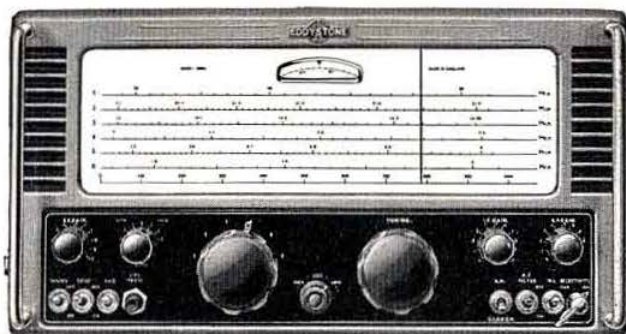
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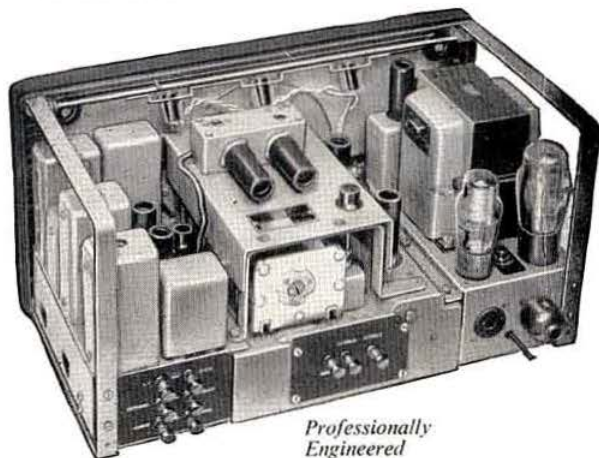
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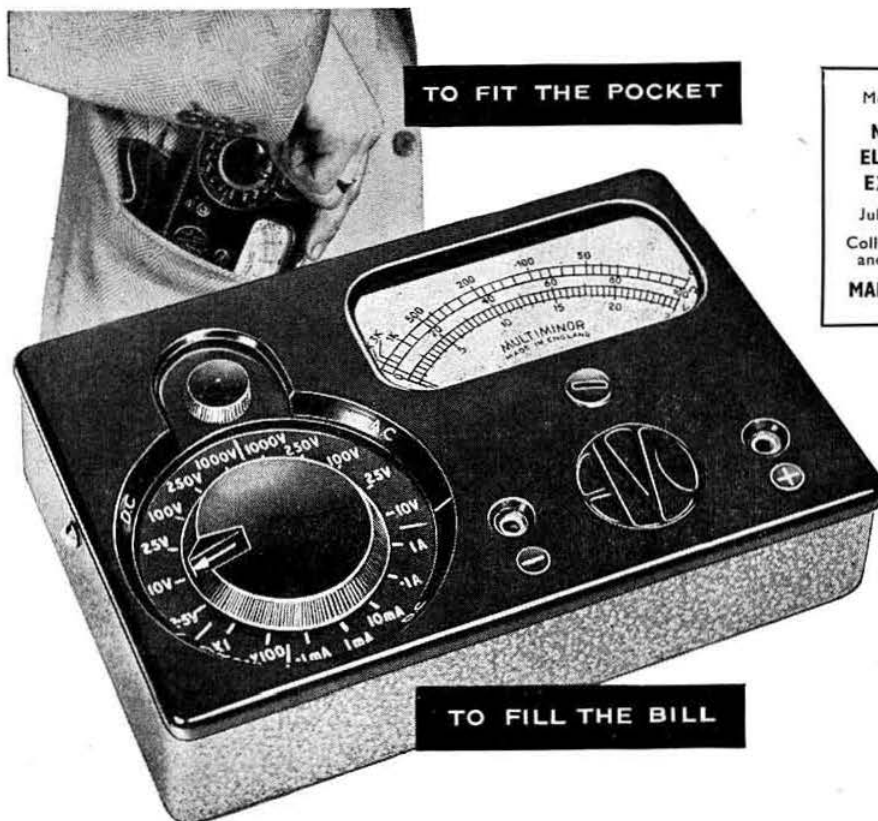
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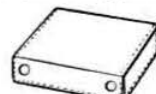
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0—100 V.	0—1000V.
0—250 V.	
0—1000 V.	
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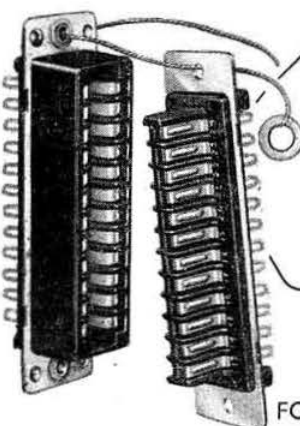
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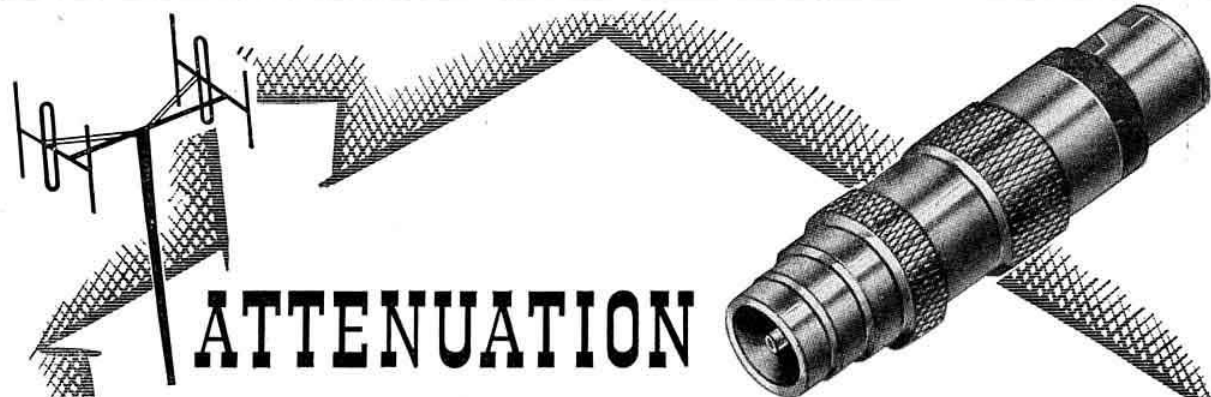
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# R.S.G.B. BULLETIN

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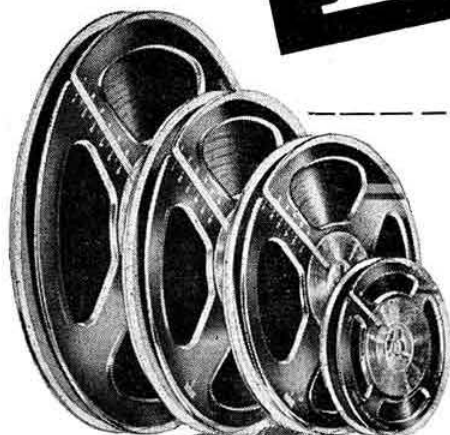
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# Current Comment

## News Bulletin Service

NEARLY three years ago the Post Office broke away from tradition and allowed the Society to broadcast news bulletins to its members. The first bulletins were transmitted on a single frequency (3.6 Mc/s) in the London area using both telegraphy and telephony. After a few months, and to meet increasing demands, the service was extended to the north of England. The transmissions then went out on two frequencies (3.6 Mc/s and 7.1 Mc/s) soon to be increased to three when a group of south of England v.h.f. enthusiasts pressed their claim for consideration. Last year the service was extended still further when a bulletin was radiated on 145.5 Mc/s in the north of England. At about the same time it was decided to dispense with the telegraphy transmissions.

There can be no doubt that the News Service is much appreciated by listeners who cannot take part in group activities, but there are times when those who prepare the material for the bulletins and those who broadcast them become a little dispirited at the apparent lack of interest on the part of members. It is not uncommon for there to be only a single outside contribution for the week's script when it is written on Thursday mornings.

Headquarters frequently wonder whether it will be possible for them to produce a bulletin at all, while the broadcasters never know whether they are addressing an audience of one or one thousand. Oft-times too, the bulletins are jammed by thoughtless individuals who have failed either to check their frequencies or their watches.

If the service is to increase in value, two things are essential—first, more items of news must reach Headquarters while they are still "hot"; second, jamming must be reduced.

The first essential should present no difficulties, yet it is a fact that only a few keen members take the trouble regularly to pass on to Headquarters information for the benefit and interest of us all. At this time of the year mobile rallies, garden fêtes and other outdoor activities where Amateur Radio plays a part, should provide plenty of material for brief reports to Headquarters, whilst news items of unusual DX heard or worked and reports of auroral openings should come along automatically.

The second essential—that jamming must be reduced—appears to present the greater problem of the two. But it *must* be resolved if the service is to succeed fully. For weeks past the 7.1 Mc/s transmission, in particular, has been ruined most weekends by the thoughtless few. Recently the Council gave notice that transmissions on that band would cease unless there was evidence to show that they were required. The evidence was not forthcoming, so the 7.1 Mc/s service has ceased—we

hope only for a time. It is certain that the falling-off of interest in the transmissions on that band was due chiefly to the fact that listeners were seldom able to receive the bulletins. Members who experience persistent interference from certain stations would be well advised to convey their displeasure in writing to the offenders.

R.S.G.B. news bulletins provide a most useful and valuable service to members; it is up to all who use the bands upon which the bulletins are transmitted to see that they are received properly in all parts of the British Isles.—J. C.

## Aerial Poles

SINCE the Town and Country Planning Act 1947 came into force, local authorities here and there have refused permission for a radio amateur to erect supports in his garden for an aerial system.

Recently an experienced Midlands amateur (Mr. F. E. Wyer, G8RY) applied for permission to erect two 40 ft. poles in the garden of his new house in Glenfield, Leicestershire. His application was supported by R.S.G.B. Headquarters who pointed out that the work done by radio amateurs is fully recognized by Her Majesty's Government who, through the Postmaster General, issue licences for the furtherance of that work. Attention was directed to the work being done by radio amateurs in connection with the International Geophysical Year and to the importance of the Radio Amateur Emergency Network. Reference was also made to the part played by radio amateurs during the 1939-45 war and to the value of the Amateur Radio movement as a whole to the community. Unfortunately these arguments failed to convince the local planning authority and the application was refused.

Mr. Wyer decided to appeal and by good fortune his case was presented by a solicitor who is himself a radio amateur.

After considering the views put forward on behalf of Mr. Wyer and by the local authority the Minister has allowed the appeal.

Of importance to all amateurs in the United Kingdom is the decision of the Minister that although the erection of supports for an aerial system requires planning permission, he is not satisfied that in Mr. Wyer's case the proposed development would cause such harm to amenity as to justify the withholding of such permission.

An outline of the arguments put forward by both sides at the inquiry appears elsewhere in this issue. Readers who are at the moment encountering difficulties with their local authority with regard to the erection of aerial masts, would do well to study those arguments carefully.—J. C.

# Some Aspects of High Level Modulation

THIS article describes a modulator for use with 150 watt amateur transmitters. It includes speech compression, explains its purpose, defines what it can do and what it cannot do. There is some controversy among writers on the nomenclature and it seems that speech clipping, compression, limiting, and the like, mean the same in some quarters and not in others. In this article the term compression is used to cover a process which limits the audio frequency range, reduces the average level of loud passages and clips instantaneous peaks.

The modulator includes a high gain speech amplifier for use with microphones which have a small output.

## The Speech Compressor

To clarify the purpose of speech compression a few words must be said on modulation. If a report of 80 to 90 per cent modulation is given, and it is assumed that the reporter has the necessary instruments to measure modulation, then this normally refers to instantaneous peak modulation. The average modulation of an uncompressed transmission is much lower, and 25 to 30 per cent is a more realistic figure. An estimate can be made at the transmitter end by watching the a.c. voltage across the modulation transformer. In the writer's case a sinusoidal audio voltage of 1,000 volts r.m.s. is required to modulate the transmitter 100 per cent. During normal speech the average voltage is only 250 volts, but the oscilloscope shows frequent peaks of nearly 1,400 volts, corresponding to short-lived r.m.s. voltages of about 1,000. Any increase of the average voltage produces over-modulation with consequent splatter. The quoted voltages are only approximate and for accurate measurements the peculiarities arising from the measurement of non-sinusoidal waveforms have to be taken into account, but that involves a lengthy discussion which is outside the scope of this article.

The purpose of compression is to increase the average voltage two or three times without producing over-modulation. This will increase the power in the transmitted sidebands four to nine times. The penalty to be paid for this tremendous increase in the intelligence-bearing power is distortion and an increase in the background noise.<sup>†</sup>

It must now be considered what use can be made of compression. First of all it can be said that if a signal is received at a genuine RS55 there is no need for compression and nothing is to be gained from it. Actually an originally perfect R5 signal will deteriorate with rising compression until it becomes painful to the ears of the listener. But if a signal drops into the noise, be it interference on the h.f. bands or receiver noise on the v.h.f. bands, and readability approaches nil, then the compressor comes into its own. It raises the signal by a few R points and an otherwise unreadable signal becomes intelligible. In such circumstances distortion is pardonable and the high background noise on the transmitter side disappears below the general noise level at the receiver end.

To study the process of compression it will be helpful to look at the general appearance of a speech wave form. It is difficult to watch "live" waves on an oscilloscope because the shape is constantly changing, and there is nothing to synchronize the time base. Therefore recordings have to be prepared. A repetitive sound such as a noisy motor or a chattering vibrator can be made to produce a stationary trace on a screen which is a useful substitute for a speech

By A. H. KOSTER, Dr. Ing (G3ECA) \*

wave train. Fig. 1 shows a somewhat idealized form of a voice trace. With a little imagination it is possible to recognize a fundamental frequency  $f_0$ , a higher frequency  $f_1$ , a still higher one  $f_2$  and several more. It must be appreciated that a wave train cannot be harmonically analyzed in such simple terms, but this presentation will serve to show how a mixture of frequencies gives the voice its characteristic colouring. The short-lived spikes are part of this colouring, and they represent the maximum voltage that may be applied to a transmitter, because for short spells they will modulate it 100 per cent.

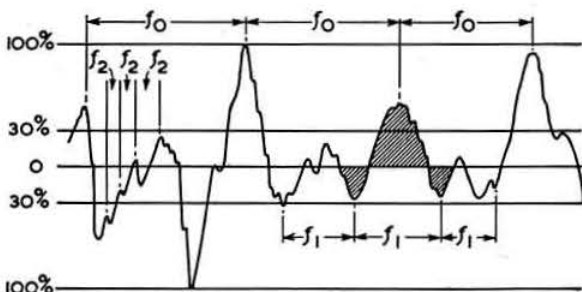


Fig. 1. Idealized form of a voice trace.

If provision is made to prevent these spikes from reaching the transmitter by cutting them off before modulation takes place, the remaining amplitudes can be increased until they in turn represent 100 per cent modulation.

This cutting-off or clipping can be done at various places in the speech amplifier or in the modulator itself. Furthermore there are two fundamental kinds of clipping which in turn can be done by various means. One kind is called unsymmetrical because it clips only those peaks which in the final stage would go in a downward direction and would drive the transmitter p.a. valve beyond cut-off. This kind of clipping produces an unbalanced wave form and it has to be done in a late stage of the amplifier chain. The clipping stage should not be followed by an RC coupled amplifier because the RC coupling changes the datum of the unbalanced wave and in the absence of d.c. restoration the following stage will create a new and varying datum which in turn may again lead to splatter.

The other type is called symmetrical because it clips both the upward and the downward going peaks. This type of clipping has been chosen for the equipment under discussion and Fig. 2 shows the curve to be expected after clipping at the 30 per cent line of Fig. 1 and expanding it to 100 per cent.

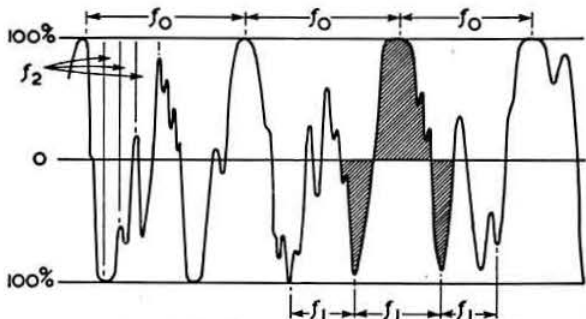


Fig. 2. Effect of clipping at the 30 per cent line in Fig. 1.

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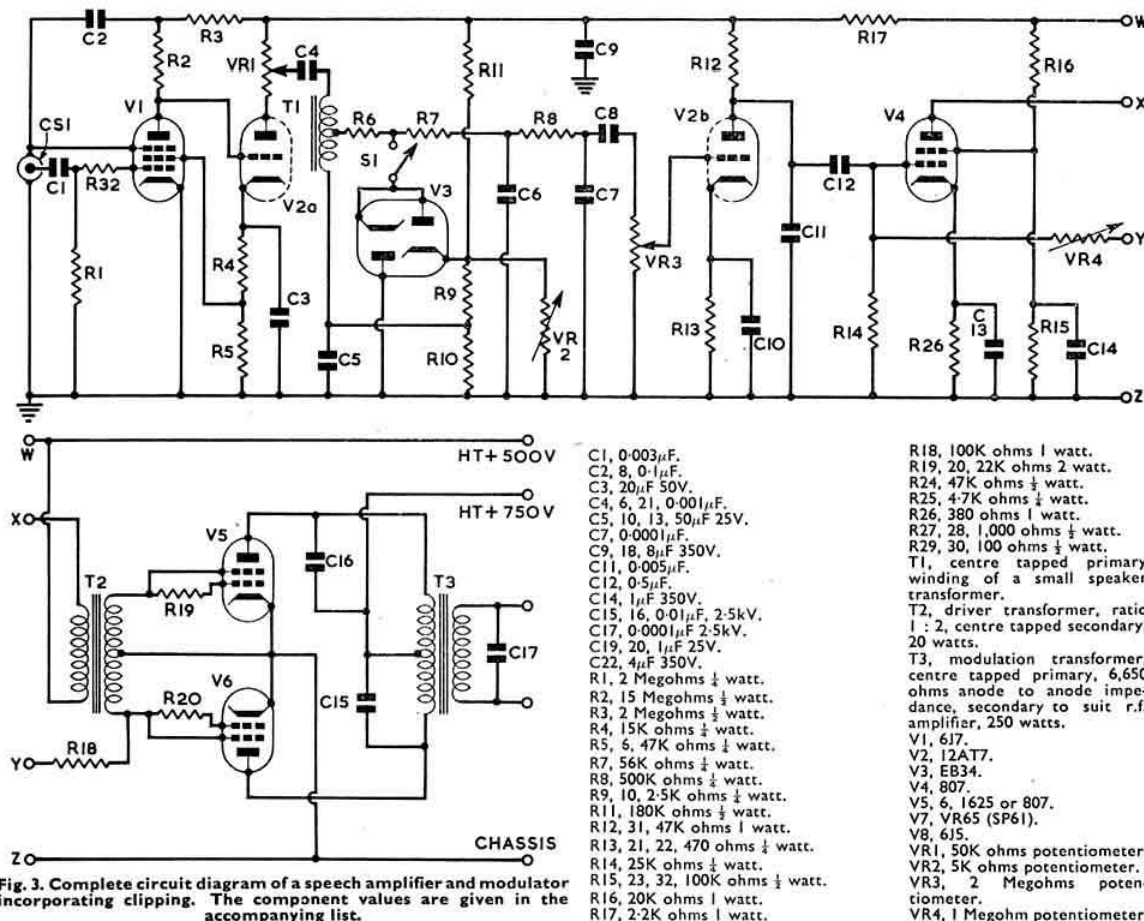
† Due to the amplification of low-level sounds which normally represent only a small fraction of the modulation power.



Clipping is achieved by means of some non-linear device such as a rectifier or a valve which becomes conductive or non-conductive, as the case may be, when a certain signal is exceeded. If such a device is arranged to cut off suddenly, it will turn a sinusoidal shape into a square wave with sharp corners and unless an efficient low pass filter is provided, splatter will occur in much the same way as with a c.w. transmitter which is being keyed without a key click filter. Efficient low pass filters take the form of composite LC filters with a fairly sharp cut-off for all audio frequencies above say 2.5 kc/s. If properly designed, and matched, these filters are an excellent solution. It must, however, be emphasized that the amateur designer frequently meets with difficulties which he cannot solve with his usual facilities and which are liable to bring compression as a whole into dispute. Such filters are particularly effective if the clipping process takes place in the modulator stage itself. In that case, voltages of the order of 1,000 volts audio have to be dealt with and of several thousand volts when the d.c. voltage and the back e.m.f. which originates in the inductances are added on. The design has to meet insulation and radiation problems and ringing of the filters. It is for this

RC filters are less effective than LC filters and therefore, more of them have to be employed. This necessitates taking the clipping stage away from the modulating valve and bringing it back to an earlier stage in the amplifier chain. There is, however, a limit to how far back it can be taken, because the inevitable RC couplings between valves bring a new difficulty in that the clipped and flat-topped wave forms begin to slope downwards. This introduces still more distortion which we want to avoid. The place chosen for V3 in the circuit (Fig. 3) is not free from this effect but it is the best that can be done.

The useful frequency range for speech transmission lies between 500 and 2500 c/s [5, 6]. To transmit frequencies outside this range is a waste of power and as far as the high ones are concerned they produce unnecessary sidebands which interfere with neighbouring channels. The response to low frequencies must be reduced in the early stages of the amplifier before clipping takes place and the high frequencies must be filtered out after it. No attempt should be made to limit the low frequencies after clipping. The reason is that an RC filter or a chain of RC filters does not produce a sharp cut-off, but an exponential attenuation of the unwanted frequencies, and for a filter to be effective it must inevitably have some reducing effect on the wanted frequencies. If the peaks of a low frequency of say 500 c/s are clipped, unwanted



**Fig. 3. Complete circuit diagram of a speech amplifier and modulator incorporating clipping. The component values are given in the accompanying list.**

harmonics of 1000, 1500, 2000 c/s etc., will be generated. Some of these are within the pass band of the amplifier and will suffer no attenuation, hence they are passed on as unavoidable distortion, whereas the wanted 500 c/s would be reduced if low frequency filtering followed the compression stage.

It is agreed that there is experimental evidence to show how a fundamental can be removed from a compound note without the listener knowing whether it is in or out. Furthermore efforts have been made to synthesize low notes from their harmonics for hi-fi purposes [3], though this practice has been severely criticized by the purists [4]. However that may be, the product of such analysis or synthesis bears a controlled relation to something which the originator of the sound put there in the first place. The case of clipping is rather different in that the original sound of varying intensity is forced through a distorting device which cuts some parts off and adds a lot of things that were not there to start with. If the badly mauled original is then attenuated by putting it through a high-pass filter, the remainder has little or nothing in common with what was there in the first place. The oscilloscope shows this very clearly as is reproduced in Fig. 4.

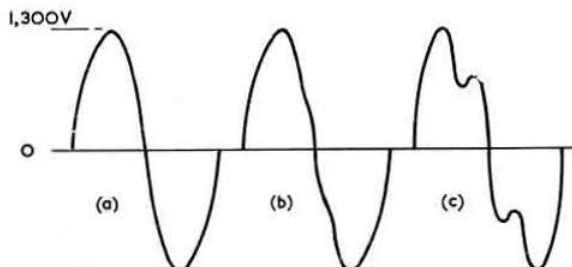


Fig. 4. (a) 20mV input at 500 c/s, not compressed. (b) 60mV input at 500 c/s, compressed but without I.F. filtering. (c) 60mV input at 500 c/s, compressed with I.F. filtering.

Since RC filtering is not as efficient as LC filtering, sharp and sudden clipping must be avoided. If a diode is biased to remain non-conductive until say 100 volts are exceeded it will produce a fairly sharply cornered square wave as shown in Fig. 5 (a). The corners will not be absolutely sharp because it takes a volt or so in excess of the bias for the diode to become fully conductive. If the same diode is biased by say only one volt or none at all and the applied voltage reduced accordingly then the resulting wave is no longer square but distinctly rounded as shown in Fig. 5 (b). The latter contains less harmonics of smaller amplitude. Filtering of the shape shown in Fig. 5 (b) is easier to achieve and is better suited to the potentialities of RC filters.

A diode which has a particularly gentle slope and requires no bias at all is the copper oxide instrument rectifier [5]. There are various types available and little to choose between them. The only disadvantage they have is that the effective

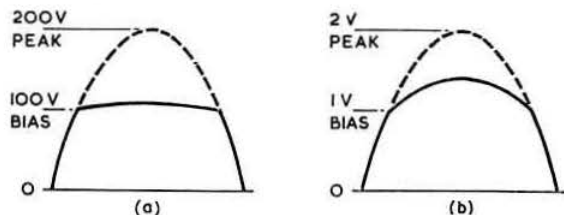


Fig. 5. Altering the bias on a diode clipper alters the shape of the resulting square wave. (a) Fairly sharply cornered square wave produced by biasing the diode so that it remains non-conductive until about 100 volts. (b) The same diode biased by only one volt produces a wave which is no longer square but distinctly rounded.

capacity of the uni-directional conductors is fairly high and they cut the high frequency content of the impressed audio wave before any clipping takes place. Fig. 6 (a) shows the trace of random noise from traffic outside the shack. Fig. 6 (b) shows the corresponding trace after addition of the rectifier, and it is clear that the high frequency content has been reduced. The reduction begins at about 1000 c/s and produces a bassy response. It can be improved by placing three or more rectifiers in series.

The alternative is to use a diode of the EB34 type which does, however, require a small bias. It is advisable to make this bias adjustable as shown in the circuit of Fig. 3. The bias is not very critical and one to three volts across VR2 will produce  $\pm 0.5$  to  $\pm 1.5$  volts on the diodes.

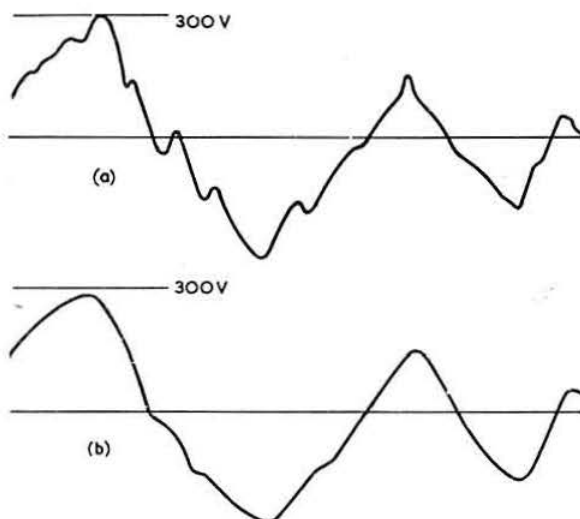


Fig. 6. (a) Trace of random noise. (b) Corresponding trace when using a copper oxide instrument rectifier as a clipper, showing the reduction in high frequency response.

### The Speech Amplifier

The output from good microphones is small and it is important to get as much gain as possible from the first amplifier.

Some representative figures are:—

Transverse current carbon microphone	with 30:1 transformer	— 0.2V.
Ribbon mike	with 10:1 transformer	— 0.03V.
Moving coil mike	with 40:1 transformer	— 0.3V.
Crystal mike	with no transformer	— 0.03V.

Microphones which require a step-up are prone to hum pickup in the transformer and means to dispense with it are a worthwhile feature. A circuit will be developed which gives an exceptionally high gain figure to permit such microphones to be used without their transformers.

The gain of any valve is given by  $g = \mu \frac{R_L}{R_a + R_L}$  where  $R_L$  is the external anode load,  $R_a$  the internal anode impedance and  $\mu$  the amplification factor. It is obvious that  $R_L$  should be made large compared with  $R_a$ . With triodes, the case is fairly simple, e.g. for a 6J5  $R_a = 8000$  and  $\mu = 20$ ; it is customary to make  $R_L$  about 100 to 200Kohms. The actual value of  $R_L$  has little effect once it gets much larger than  $R_a$ . In all cases  $g$  works out to be approximately equal to 20. There is nothing more to be said except that there are triodes with higher  $\mu$  values and the best that can be done is to make the gain of the same order as  $\mu$ .

With pentodes conditions are different in many ways. Taking a well known type, such as the 6J7,  $R_a = 1.5$  Megohms and  $\mu = 1500$ . Now the ordinary  $R_L$  values are much smaller than  $R_a$  and the actual value of  $R_L$  has an overriding effect. For 100K ohms the gain becomes 150 and for 200K ohms it is 300. At first sight it would appear that  $R_L$  has to be increased more and more until finally the limit is reached where  $g = \mu = 1500$ . However, it does not work out that way for several reasons. One of them is that the anode voltage will fall and the screen current will rise excessively. The obvious thing to do is to drop the screen voltage. This changes the valve parameters, i.e.  $R_a$  and  $\mu$  go up. The process of dropping the screen voltage leads to arrangements which have become known as Starvation Circuits [1, 2]. The available gain figures are quite remarkable. The price to be paid is a limitation in the frequency response, which results from the increased Miller effect. The following table gives figures for a 6J7 running at 18 volts on the screengrid.

$R_L$	$g$	Frequency Limit	H.t.
120 Megohms	2500	1000 c/s	900 V
16 Megohms	1500	2000 c/s	400 V
5 Megohms	1200	5000 c/s	350 V
3 Megohms	1000	8000 c/s	350 V

With anode loads of several Megohms it is not practicable to RC couple to the following stage and d.c. coupling is the proper way. As shown in Fig. 3 the screen voltage is taken from a tap on the cathode resistor of the next valve which makes the whole circuit extremely simple.

This high gain input stage is, of course, not essential if normal input voltages are to be used as they appear after a step-up by a microphone transformer. In that case an orthodox triode stage can be used and the modified circuit for the first two valves is shown in Fig. 7. V7 is a triode-connected VR65, which requires only a small cathode bias resistor, so that there is less danger of hum pickup on the cathode. By letting C19 and C20 be only 1  $\mu$ F a better low frequency attenuation results.

High frequency attenuation after clipping is achieved by the combinations R7C6, R8C7 and R12C11. The last filter stage is not working at its best because of the low impedance presented by the following grid leak R14. 25,000 ohms is the maximum value recommended for the 807 and should not be exceeded. A noticeable, but not striking improvement of the oscilloscope trace is obtained by the insertion of a cathode follower between V2b and V4. Fig. 4 (b) shows the response without a cathode follower, and its addition slightly straightens the humps on the downward stroke. Fig. 8 shows the cathode follower circuit.

Apart from improving the filter performance the gain of V2b is increased from about 36 to 42 because, as far as the

valve sees it, R12 was by-passed by R14 which reduced the anode load to less than 25,000 ohms. Now it becomes truly 47,000 ohms. The steady voltage at the cathode of V8 is about 180. Most valves will accept 250 volts between heater and cathode. In this case a 6J5 has been used successfully.

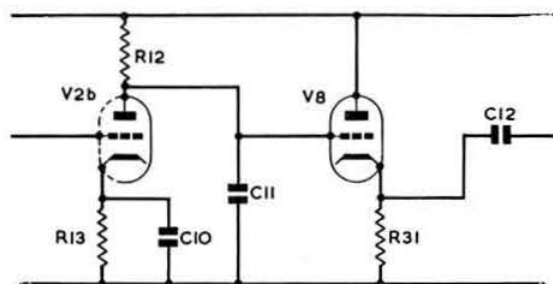


Fig. 8. Cathode follower stage for insertion between V2b and V4 in Fig. 3.

### The Modulator

The most popular valve for modulators of this size is the 807 or its 12.6 volt equivalent, the 1625. Two of these in push-pull with 750 volts on the anodes will deliver 120 watts of audio power. This is the figure given by the manufacturers and it assumes that the valves are properly operated. The h.t. supply has to be well stabilized, the transformers have to be efficient, the drive and bias conditions must be fulfilled, and the matching into the load must be right. Unfortunately the average amateur is rarely in a position to ensure such optimum conditions. On the other hand it is fortunate for him that he does not need 120 watts. He wants only 75 or

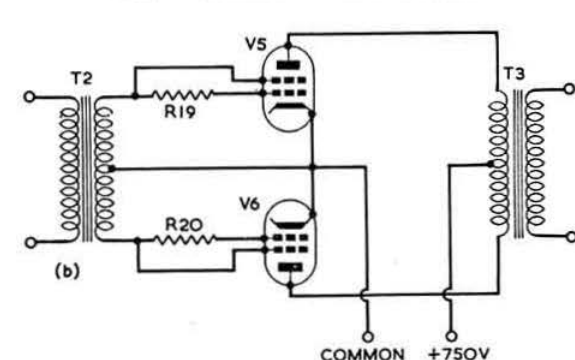
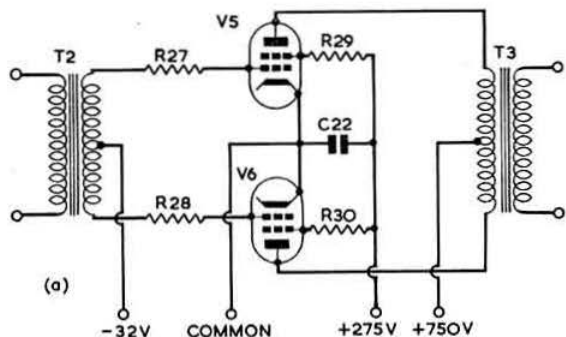


Fig. 9 (a) Class AB2 operation of 807s or 1625s. (b) Connections for class B zero bias.

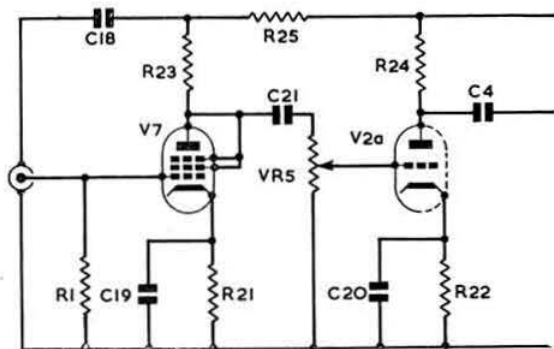


Fig. 7. Modified input stage to replace the first two stages of Fig. 3 when the high gain of a starvation circuit is not required.



perhaps a little more if he modulates the screens as well as the anodes. Assuming a case where the overall modulator efficiency is only 60 per cent, the power reserve of 120 will permit him to waste 45 watts and still leave him with the required 75 watts. Hence it is advisable to cater for 120 watts at the anodes. Fig. 9 shows two ways of operating a pair of 1625s to give this output, namely class AB2 and zero bias class B. There is not much to choose between them in respect of performance, but there are several things to be considered. The great merit of class B is its simplicity. The only d.c. requirement is a well stabilized supply of 750 volts to the centre of the modulation transformer.

Class AB2 requires the same 750 volts to the transformer, and in addition a well stabilized 275 volt supply to the screens and a fixed negative bias of 32 volts to the grids. It is not difficult to provide these extra supplies, but they involve additional work and take up more space. The AB2 arrangement forms a contrast when comparing it with the simplicity of the class B circuit.

This simplification is not gratuitous but has to be paid for by the drive requirements. The following table summarizes the relevant operating conditions.

	Class B	Class AB2
Peak grid-to-grid drive voltage	555	92
Drive power in watts	5.3	0.2
Quiescent current in mA	15	60
Peak current in mA	240	240

The driver stage for class AB2 can be a 6V6 or 6F6 with 300 volt h.t. working into a small driver transformer. On the other hand class B requires a 6L6 or, better still, an 807 with 400 to 500 volts h.t. working into a substantial driver transformer.

The circuit shown in Fig. 3 is a class B modulator and uses an ex-government driver transformer rated at 20 watts and a similar modulation transformer rated at 250 watts. With these components working into an accurately matched load consisting of a number of mains droppers in series the modulator will deliver 120 watts of sinusoidal audio at a frequency of 1000 c/s for hours without any sign of strain.

The driver stage has to work into a varying load depending on the modulation depth, therefore negative feedback is useful in reducing the output impedance of the 807 driver. The method shown consisting of R18 and VR4, is simple and since it has no capacitors in the feedback link it is very stable. Whatever surplus grid voltage there is from the preceding stage should be absorbed in this feedback circuit.

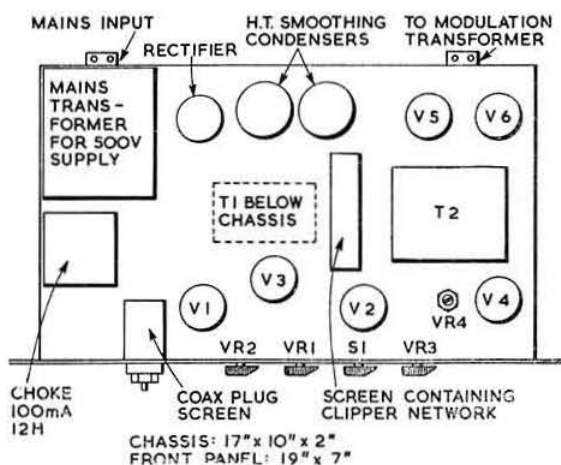


Fig. 10. Suggested layout for the 120 watt modulator shown in Fig. 3.

The modulation transformer is by-passed by small capacitors C15, C16 and C17 of 2500 volts working as are found in c.r.t. units. Their values should be chosen such that a just clearly noticeable drop in the amplitude of a 2500 c/s audio frequency is seen on the oscilloscope. These condensers in conjunction with the inductance of the transformer represent the last filter stage to remove clipper products or harmonic distortion which may originate in the class B stage itself.

#### Construction

The layout for an assembly to fit a standard 19 in. rack is shown in Fig. 10. It contains the amplifier as far as the push-pull valves V5 and V6 and it includes the 500 volt supply. The modulation transformer T3 is on a separate panel together with the 750 volt supply. T3 should be kept as far away from the grid of V1 as possible and the co-axial input socket as well as the lead to the grid must be completely screened. The clipper network is enclosed in a can made of tin plate which is soldered up along the edges. The leads from V5 and V6 to T3 and from T3 to the transmitter consist of pairs of  $\frac{1}{2}$  in. co-axial cable in which the inner conductors are used and the screens earthed.

#### Safety Precautions

In conclusion a word on safety may not be amiss. Audio frequencies at high voltage and considerable power are very dangerous. When using an oscilloscope the voltages must be reduced by means of potential dividers and connections to the 'scope should be made via high voltage condensers of the 2.5 kV type. Since the input to an oscilloscope is frequently condenser-coupled internally a leak should be applied to prevent any accidental charge from accumulating.

#### References

- [1] "Direct-coupled Amplifiers," *Electronics*, March 1951.
- [2] For applications of starvation circuits, see *Wireless World*, May 1953 and November 1954.
- [3] "Bass without Big Baffles," *Wireless World*, April 1951.
- [4] "Discussion on Bass without Big Baffles," *Wireless World*, June 1951.
- [5] *G. E. Ham News*, May-June, 1950.
- [6] *G. E. Ham News*, September-October, 1949.

## SECOND ANNUAL— RADIO HOBBIES EXHIBITION

ROYAL HORTICULTURAL SOCIETY'S OLD  
HALL, VINCENT SQUARE, LONDON, S.W.1

November 26-29, 1958

The Exhibition Committee invites members all over the country to offer for display equipment of every type from gadgets to complete transmitters and receivers. Offers only in the first instance should reach R.S.G.B. Headquarters by September 30, 1958. A Silver Plaque will again be presented in connection with the Constructors' Competition. Offers to do stand duty at the Exhibition should be sent direct to G. W. Norris (G3ICI), 134 Meads Lane, Ilford, Essex.

Enquiries regarding stand space should be addressed to the Exhibition Organizer, P. A. Thorogood (G4KD), 35 Gibbs Green, Edgware, Middlesex.

# A Simple Test Set for the Beginner\*

## Part 3—The Audio Oscillator and Resistance-Capacitance Bridge

By S. J. LLOYD (VK3AST)†

### The Audio Oscillator

THE audio oscillator is designed to provide a fixed tone, the amplitude of which can be varied by a built-in attenuator, for the testing of audio amplifiers and modulators, and to operate the bridge. It also serves to modulate the grid dip oscillator for receiver servicing, etc. The modulating inductance for the latter application is incorporated in the audio oscillator, the power supply cables being so arranged that modulation is automatically applied when the audio oscillator is connected between the grid dip oscillator and the power pack.

### Circuit

The 6J5 valve (V1) is incorporated in a simple oscillator circuit (Fig. 1) obtaining feedback through a small iron-cored transformer T1. Miniature 1:1 interval transformers suitable for this position are not easily available, and a simple but satisfactory substitute was improvised as described below.

A resistive anode load is provided for the valve by the potentiometer VR1 from which the a.f. voltage is tapped off by the slider and fed to the primary of the output transformer T2 through C3. T2 is a small "surplus" output transformer of 18:1 ratio. High impedance output is taken from the "hot" end of the primary to the output terminal A via the blocking capacitor C4; low impedance output from the secondary to terminal B. The primary winding carries the h.t. supply for the grid dip oscillator which is thus modulated by the a.f. voltage appearing across it.

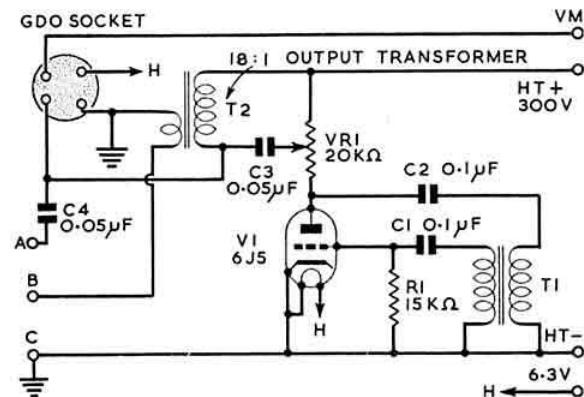


Fig. 1. The audio oscillator circuit.

### Construction

The chassis is built up in the same way, and to the same dimensions, as that for the power pack (q.v.). On top are mounted the valveholder and four-pin socket at one end, the attenuator VR1 at the other end, and the output terminals. The remaining components are mounted underneath as shown in Fig. 2. The output transformer tends to hum if fixed rigidly to the chassis deck, and its mounting screws are therefore set in rubber grommets: the holes for these are countersunk on both sides to accommodate them partly in

the thicknesses of the Masonite. All the condensers and resistors are mounted on a group board.

The feedback transformer T1 is made from two high resistance headphone bobbins, mounted on a core made from a strip of soft iron bent into a rectangle. The losses due to eddy currents in this core can be neglected in this particular application. Wire leads are soldered to the ends of the bobbin windings, and the whole assembly immersed in a small paper mould filled with molten paraffin wax. The resulting block is trimmed to shape with a knife and cemented to the chassis wall in the position shown in Fig. 2.

The power supply cable has a fourth conductor, in addition to those for h.t., l.t. and common negative, to connect the grid dip oscillator through to the valve voltmeter when the audio oscillator is interposed.

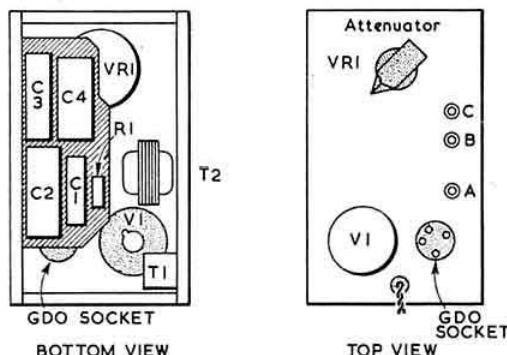


Fig. 2. Layout of the audio oscillator. The chassis is built up of four strips of 1/8 in. plywood 1 1/2 in. wide, two 6 in. and two 3 in. long, which are arranged to form a rectangle measuring 6 in. by 3 1/2 in. externally. The deck is covered with 1/8 in. Masonite.

### Adjustment and Operation

The only adjustment necessary is to obtain oscillation at a suitable frequency: if the unit does not at first oscillate at all, reverse the polarity of one winding of T1. The note produced depends on the actual inductance of T1 and the capacitance of C1 and C2: if it is not satisfactory it may be necessary to experiment with different values of C1 and C2, and of the gridleak R1. A condenser shunted across the primary or secondary of T1 will also alter the note, but may stop oscillation or reduce its amplitude. A frequency between 400 and 1000 c/s will be found most useful. The note will alter slightly when the instrument is working into any appreciable load.

To use the unit for testing amplifiers it is only necessary to connect a pair of test leads from the oscillator output terminals to an appropriate point in the amplifier input circuit, selecting the high or low impedance condition according to the amplifier requirements. The applied audio voltage must be checked with the valve voltmeter to ensure it is within the capabilities of the amplifier; if the output voltage of the latter is also measured, its voltage amplification can be calculated directly. The waveform of the audio oscillator is unlikely to be sufficiently sinusoidal for amplifiers to be checked for distortion or fidelity. The principal amateur use of this unit is to provide a steady signal for modulating a telephony transmitter under test, e.g. while measuring modulation percentage as described in the previous article. A useful accessory for this purpose is a length of flex termi-

\* Part 2 appeared in the May 1958 issue of the R.S.G.B. Bulletin.

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nated in a jack or plug to fit the modulator input socket in place of the microphone.

The oscillator can be used for Morse practice by connecting a pair of headphones in series with a key across the output: if it is likely to be used often for this purpose a keying jack can be incorporated in the cathode lead of the valve.

### The Resistance/Capacitance Bridge

This is the most primitive form of test bridge that can be contrived, but is capable of giving a useful approximation of resistances from 10 ohms to 10 Megohms and condensers from 10pF to 1μF. The range can be extended, and inductance measurements included, by using external standards. Because one side of the audio input to the bridge is earthed, the null indicating device cannot also be earthed, and so a headphone is used for this purpose instead of the valve voltmeter. For resistance measurements only, the bridge can be fed with a d.c. voltage; the null indicator being the d.c. Avomitor or other multimeter, used on its lowest current range. This method is less convenient, but more accurate, and is used for the calibration of the bridge. The bridge potentiometer can be used as a voltage divider or attenuator in addition to its primary function.

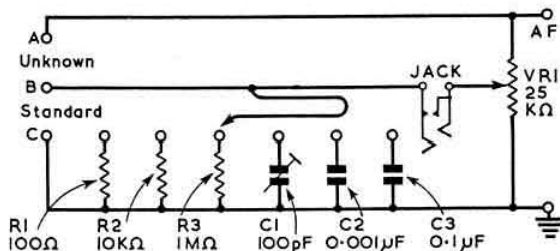


Fig. 3. Circuit diagram of the resistance-capacitance bridge.

### Circuit

The circuit (Fig. 3) is as simple as possible, consisting only of a potentiometer, a headphone jack, and six standards. Selection of ranges is by plug and socket, as in the valve voltmeter. The component under test is connected between terminals A and B, and the external standard, when used, between B and C.

The potentiometer VR1 is the most important component, but a proper instrument-type resistance would be out of place in such a simple device, and an ordinary carbon-track volume control is used instead. Small wire-wound potentiometers are not suitable, as the resistance characteristic often varies abruptly from place to place on the track, and the variations are insufficiently predictable to allow proper calibration. Carbon potentiometers, on the other hand, generally have a smooth resistance characteristic curve, although not necessarily a linear one; the one selected must fall right to zero at each end of the track. The non-linearity is taken care of by calibrating the scale directly from known resistances instead of by mathematical calculation.

The resistance standards, R1, R2 and R3, can be ordinary low tolerance resistors selected to be within 5 per cent of their nominal values. The 100pF capacitance standard is a 100pF compression trimmer, and is adjusted to compensate for the stray capacitances: methods of adjustment are set out below. The 0.001μF and 0.1μF standards can be stock components, as these ranges are only likely to be required for rough checking of unmarked condensers whose nominal capacity can be assumed to be the nearest round figure to that indicated.

The headphone jack is a closed-circuit type to maintain continuity when the unit is used as an attenuator with the headphone disconnected.

### Construction

The construction of the chassis is similar to that of the other units, except that the outside dimensions are only 4 in. by 4½ in. The range selector sockets, output terminals and potentiometer are mounted through the deck, with the headphone jack set flush in the side wall, as in the grid dip oscillator unit. The standards are all mounted on a group board underneath. Connection to the audio oscillator, or other voltage source, is made through a pair of flexible leads brought out through a hole in the chassis; these are distinctively coloured, or their polarity indicated in some other way. The layout is shown in Fig. 4.

The type of dial fitted to the potentiometer will depend on the characteristic of its track. The range of rotation to be provided for is that covering a resistance ratio from 10 : 1 to 1 : 10. Some potentiometers may cover this ratio in less than 180 degrees rotation, in which case a transmitting type direct drive dial can be used. If more than 180 degrees rotation is required, a scale must be drawn to suit, unless a 360 degree dial happens to be available. Direct calibration in resistance and capacitance is possible, but laborious: it is much simpler to use an arbitrary scale and calibration chart.

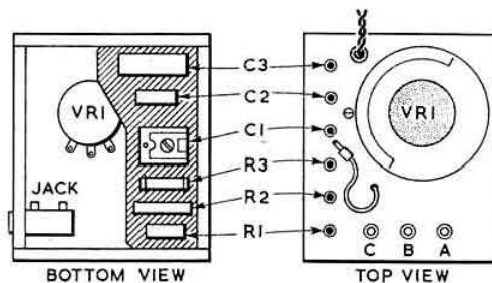


Fig. 4. Layout of the bridge.

### Calibration and Operation

Unless the track of the potentiometer is known to be linear, calibration cannot be done mathematically as it is in more elaborate bridges, and is therefore carried out by comparison with known resistance ratios. The resistance calibrations apply equally to capacitances, although in the reverse direction, and separate capacitance calibration is not required. Although an a.f. supply is normally used for measuring resistance as well as capacitance, the calibration can be done more easily and accurately with a d.c. supply and appropriate indicator.

The requirements for the calibration operation are as follows: a dry battery or other stable d.c. source of the order of 50 to 100 volts, a spare jack plug, and a d.c. multimeter such as the Avomitor; a number of resistances between 10 and 100 K ohms, selected within a few per cent of their nominal values, are also needed to provide known ratios. The actual values of the latter are unimportant so long as they can be arranged in suitable combinations to give an adequate number of different ratios. Suggested values are two of 25 K ohms, and one each of 10, 30 and 50 K.

The first procedure is to set the dial in correct relationship to the potentiometer track, which is most conveniently done by finding the mid-point of the range, i.e. that which corresponds to a resistance ratio of 1 : 1. Disconnect the internal standards by leaving the selector plug free, and connect the two equal resistors from the terminals A to B, and B to C. Set the multimeter to a range appropriate to the applied d.c. voltage and connect it across the headphone jack. Rotate the potentiometer until the meter reads approximately zero; shift the meter to its lowest current range, 0 to 3 mA in the case of the d.c. Avomitor, and readjust to the exact null



point. Without allowing the spindle of the potentiometer to turn again, adjust the dial and its cursor to indicate exactly half-scale. To check the accuracy of this setting, reverse the positions of the two resistors and again find the null point; if the resistors are well matched both readings should coincide, otherwise the correct centre-point is half way between the readings.

A suitable number of calibration points can now be determined in the same way, by connecting the known resistors to the "unknown" and "standard" terminals in different combinations, and noting each reading. For example, with 10 K ohms across A and B, and 50 K ohms across B and C, the null point represents a ratio of 1 : 5, whereas with the same resistors in the reverse positions it indicates 5 : 1.

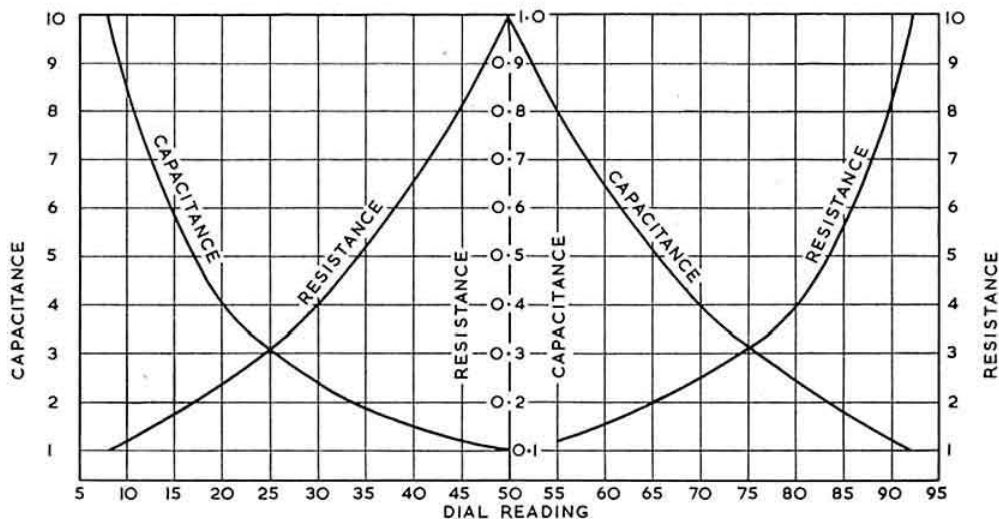


Fig. 5. A typical calibration curve for the resistance-capacitance bridge. The method of calibration is described in the text.

When drawing up the calibration chart, it will be found most convenient to express the ratios in decimals, from 0.1 to 10.0; the figure read off the chart can then be multiplied by the value of the standard in use to give the actual value of capacitance or resistance. The capacitance scale can be drawn on the same chart, using the reciprocal of each resistance ratio. The specimen calibration chart shown in Fig. 5 should make this clear.

The only necessary adjustment is the setting of the 100pF standard, C1. With an audio supply connected to the bridge, and the headphones plugged in, C1 is brought into circuit by the selector plug, and an accurately known 100pF condenser placed across the "unknown" terminals: C1 is then adjusted until the null point comes to the half-scale mark.

In ordinary use, the bridge is connected to terminals A and C of the audio oscillator, the appropriate standard selected by the wander plug, and the component under test joined by a pair of leads and alligator clips to the bridge terminals A and B. The audio attenuator is turned up to give a comfortable volume in the headphone, and the dial rotated to the point of minimum volume; if necessary the attenuator is turned up as the null point is approached. On the high resistance and low capacity ranges the null is not very sharp, and it may be easier to find two points of equal volume, one on each side of the minimum, and halve their difference.

To use the instrument as a voltage divider or attenuator, remove the headphone plug and connect the input leads to the voltage source; the maximum permissible voltage in this

application depends on the wattage of the potentiometer, and can easily be calculated. For a three watt 25 K ohms component as specified it should not exceed 270 volts. The variable voltage output is available across terminals B and C.

### The Case

The carrying case for the test set can, of course, be made from any material the constructor has the necessary skill and equipment for working in; e.g. sheet metal, wood or leather. Those without facilities for fabricating these materials, however, will find it quite satisfactory to make the case of thick cardboard treated inside and out, after assembly, with shellac varnish: if applied in suitable consistency, the shellac penetrates throughout the cardboard and confers on it much

of the toughness and durability of laminated plastic or vulcanized fibre.

The best type of cardboard for the purpose is that used for packing X-ray films; it is approximately  $\frac{1}{16}$  in. thick, sufficiently absorbent to take up the shellac well, and obtainable in flat sheets of convenient size. Any hospital X-ray department will be able to provide the quantity required. The board must be scored to a depth of half its thickness at all bends and folds, using a sharp knife or razor blade; a metal straight edge is essential to guide the blade for straight cuts. The outside of all

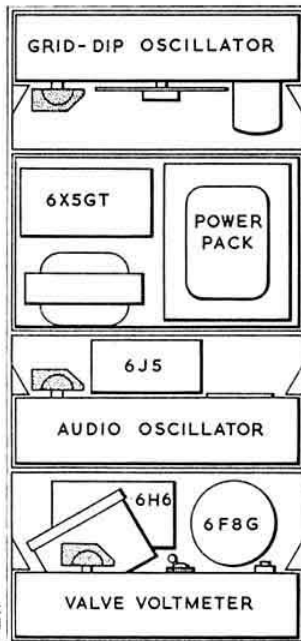


Fig. 6. Arrangement of the box for the simple test set described in the three articles by VK3AST.

bends should be reinforced by a strip of gummed paper tape (not cellulose tape) after assembly. Cellulose cement should be used for making joints, in preference to gelatine-based glues, which tend to become unstuck in damp weather. The shellac varnish for impregnating is made by dissolving flake shellac in sufficient methylated spirit just to cover it. It is painted on, inside and out, with a soft brush, and allowed to dry between coats: several coats are needed, but it dries very quickly and the whole process can be completed in a day.

The design of the case can be seen in Figs. 6 and 7, with the positions of the test units; dimensions are not given, as they will necessarily depend on the exact construction and sizes adopted for individual units, which may differ from the original in order to accommodate available components. The four largest instruments are located in compartments with their long axes across the box, the power pack upright and the remainder on their sides. The valve voltmeter, being the largest, occupies an end compartment the full height of the box; the others only occupy the lower half, and are surmounted by a removable tray containing the smaller items and accessories.

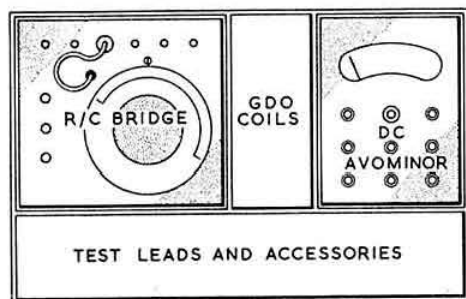
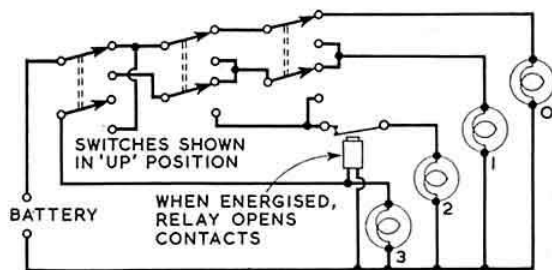


Fig. 7. Plan of the tray for the simple test set.

The three units which are stowed vertically are held in place by runners made of cardboard folded into a triangular section and positioned as shown. The valves, removed from their sockets and slipped into their protective sleeves, can be fitted into the same compartments as their respective units. The tray has compartments for the R/C bridge and the d.c. Avomator, and sections for the grid dip oscillator coils and the test leads and other accessories. The lid is made large enough to be an easy sliding fit over the box, and is 2 in. deep; it is fitted inside with pockets to hold the calibration charts.

#### Tech-Teaser No. 1

HERE is the solution provided by GM3BDA to the circuitry brain teaser published in the May issue of the BULLETIN. Did you solve it?



## Aerial Poles

### Minister allows Appeal against decision of Leicestershire County Council.

SOME months ago Mr. F. E. Wyer (G8RY) of Glenfield, Leicestershire, was refused permission by the Leicestershire County Council to erect two 40 ft. poles in his garden as supports for a transmitting aerial. Mr. Wyer appealed against this decision to the Minister of Housing and Local Government and an enquiry was held last January in Narborough.

Mr. R. G. Frisby (who is himself a radio amateur) in presenting the case on behalf of Mr. Wyer, pointed out, *inter alia*, that (i) an efficient aerial system was necessary for effective transmission, (ii) the appellant had held a G.P.O. transmitting licence for 20 years (iii) the proposal did not constitute development, because it was not a building operation within the meaning of the Town and Country Planning Act 1947, (iv) the poles were identical with flag-poles and would be less harmful to amenity than television aerials, both of which were commonly erected without planning permission.

For the local planning authority the main points put forward at the enquiry were that (i) planning permission was required; the erection of the poles came within the meaning of development as defined in Section 12 (2) of the 1947 Act; it was not permitted development under the First Schedule of the General Development Order 1950. (ii) they had had regard to the high standard of development throughout the estate and the amenities of the surrounding district. (iii) the position of Mr. Wyer's house on rising ground would make the poles a prominent feature; his garden was small and the poles would be very near to neighbouring houses.

#### Minister's Decision

The facts of the case, as brought out at the enquiry, have now been considered by the Minister who has expressed the opinion that the erection of 40 ft. poles, as supports for Mr. Wyer's aerial system, is a building or engineering operation which involves development within the meaning of Section 12 of the 1947 Act. On the other hand these poles are not buildings within the meaning of Class I of Part I of the First Schedule of the 1950 General Development Order, the erection of which would not require permission. The Minister is not satisfied, however, that the proposed development would cause such harm to amenity as to justify the refusal of planning permission. The Minister has accordingly allowed the appeal and has granted permission for the erection of the two 40 ft. poles in accordance with the plans which were submitted with the application.

#### Brigadier E. S. Cole, C.B.E. (G2EC)

THE *London Gazette* of April 15, 1958, announced that Brigadier E. S. Cole, C.B.E. (G2EC, ex-SU1EC), has been appointed Director of Telecommunications, The War Office, and has been granted the temporary rank of Major-General.

#### New V.E.R.O.N. Officers appointed

MR. J. EVERS (PA0CX), has succeeded Mr. A. N. Nolke (PA0NU) as Honorary Secretary of V.E.R.O.N., and Mr. L. Van de Nadort (PA0LOU), has succeeded Mr. N. Smit (PA0LR) as Traffic Manager.

Mr. Nolke and Mr. Smit were no longer able to spare the time to continue in office.

All correspondence, whether concerning secretarial or traffic matters, should be addressed to the appropriate officer, c/o V.E.R.O.N., Post Box 6011, The Hague, The Netherlands.

# The Shunt Selectoject

By J. W. MATHEWS, Assoc. Brit. I.R.E. (G6LL)\*

THE crowded conditions of the amateur bands have long been an accepted fact, and constant efforts have been made to find techniques for improving reception so that a contact, once established, shall not be lost due to interference from stations operating close to the frequency in use. Several methods are employed to achieve this, the most popular being the use of a crystal "gate" which has the effect of sharpening the i.f. response of a receiver very considerably. Another version of this is the crystal band-pass filter, where the i.f. response may be varied in accordance with the frequency difference between two crystals to produce a pass-band of predetermined width.

These systems are excellent, but sometimes the need for some further selectivity is felt and so attention has been turned to the audio section of the receivers. For the c.w. man an audio filter which can be made very sharp indeed is an extremely useful addition, since it enables him to pick out more readily the note it is desired to read. Several types of audio filters have been described in the past, from a simple tuned choke to a more elaborate device using one or more valves.

Some years ago *QST* published details of a device

produced. This merely required to be fitted in parallel with the audio part of the receiver and no alteration to the normal wiring was necessary.

In practice, the Selectoject described here is connected either to the grid or anode of the first audio stage by means of a short length of screened wire.

## The Circuit

The circuit employed is shown in Fig. 1 from which it will be seen that although it is essentially an audio amplifier that is connected in parallel with an audio stage of the receiver, it may be considered as a frequency selective positive or negative resistance in shunt with the first audio amplifier. It will be found that the addition of the Selectoject affects only slightly the audio gain of the receiver at frequencies other than the selected one, and can easily be compensated for by a small increase of audio gain.

The amplifier is regenerative in its boost position, and being frequency selective, it will impart this characteristic to another amplifier in parallel with it. In this manner it is able to select a given c.w. note and amplify it considerably above any others that may be simultaneously audible. The circuit shown gives a constant absolute bandwidth in the "boost" position, and this minimizes "ringing" whilst receiving c.w. In the "reject" position constant percentage bandwidth is employed because it provides the narrowest

possible band, and hence only removes as small an amount of the received intelligibility as possible.

It will be found in practice that rejection is only really effective on a pure sine wave; since most heterodynes encountered on the amateur bands are rarely so, the rejection will be only partial. Nevertheless, its addition on occasions will be found useful.

Two points of importance should be stressed here: the first that the unit must be connected to a point of high impedance in the receiver, anything between 50K and 200K ohms being satisfactory. It will be found that the performance may vary somewhat depending on the impedance of the circuit to which it is connected. The second point is that the input voltage should not exceed about 1 volt. Overloading the Selectoject will invariably lead to disappointment.

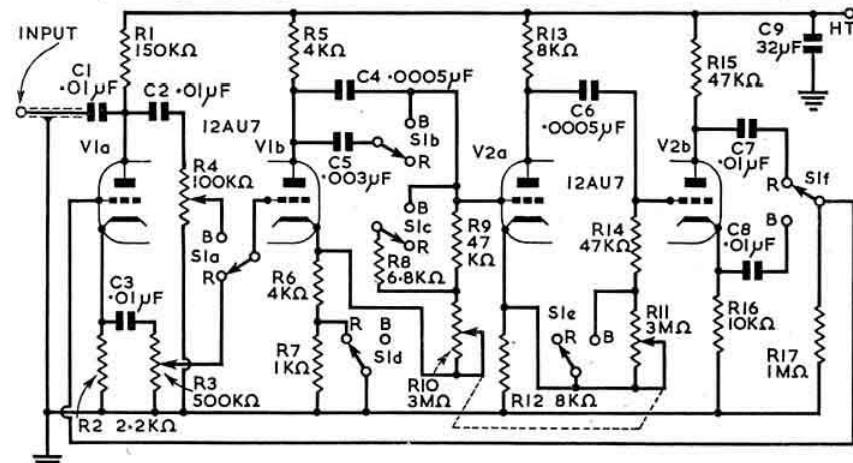


Fig. 1. Circuit diagram of the shunt Selectoject. C1, 2, 3, 7, 8, 0.01µF T.C.C. type 346; C4, 6, 0.0005µF T.C.C. type 543; C5, 0.003µF T.C.C. type 543; C9, 32µF T.C.C. type CE19LE; R1, 150K ohms ½ watt (Erie); R2, 2.2K ohms ½ watt (Erie); R3, 500K ohms variable (Reliance); R4, 100K variable (Reliance); R5, 6, 4K ohms high stability 1 per cent (Erie); R7, 1000 ohms ½ watt (Erie); R8, 6.8K ohms ½ watt (Erie); R9, 14, 15, 47K ohms ½ watt (Erie); R10, 11, 3 Megohm potentiometer (Reliance type SG square-law); R12, 13, 8K ohms high stability 1 per cent; R16, 10K ohms ½ watt (Erie); R17, 1 Megohm ½ watt (Erie); V1, 2, 12AU7 (Brimar). All switches are ganged and are of the standard wafer pattern.

which, when fitted to the audio section of a receiver, enabled a given c.w. note to be selected and amplified with a consequent improvement in readability. In addition it also provided, as an alternative, for the rejection of an unwanted note, thus enabling the 'phone man to reduce or remove an unwanted heterodyne. This device was called the Selectoject and as such has become quite widely known.

The earlier type was designed to be fitted in series with the audio section of a receiver, normally between the first and second a.f. stages or between the detecting diode and first a.f. This was a disadvantage to people owning expensive communications receivers, since many did not feel inclined to dig sufficiently deeply into the wiring to make the necessary alterations. Some while later a "shunt" version was

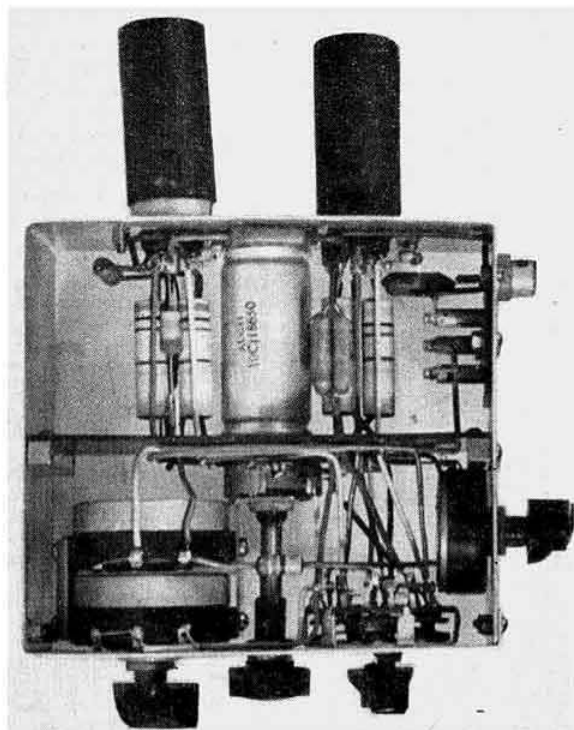
## Construction

The actual design and layout is a matter for the individual constructor. The unit illustrated was made so that it would fit into a space beneath the writer's receiver, which is raised 2 in. above the table top for convenience. The frame measures 5 in. by 4½ in. by 2 in. deep, and its design has the advantage that all the components are readily accessible, and at the same time compactly arranged. A strip of Bakelite, measuring 5 in. by 2 in. by ⅛ in. is mounted midway across the frame; the various resistors and capacitors are mounted between the valveholders and this strip, suitably placed small holes having been drilled previously. The 32µF condenser will be found to mount conveniently in the space between the strip and the two valveholders. The gain control should be of the "midget" variety and may be

\* 90 Tolmers Road, Cuffley, Hertfordshire

mounted on a small brass bracket screwed to the side of the ganged potentiometer in place of one of the holding strips. A standard co-axial socket is used for the input while the power leads can be terminated in any convenient manner.

The anode and cathode resistors of V1B and V2A are of the high-stability type to ensure a uniform and constant performance. The remainder of the components are normal, except that some difficulty was experienced in obtaining a 3 Megohm ganged potentiometer, there being only one firm apparently producing such a component in this country.



The complete unit. The "reject" depth control which, once set, does not require readjusting, is mounted at the side of the frame. The other controls on the front are, from right to left, the boost-reject switch, gain control and frequency control. The co-axial socket at the right is for the input.

It is not easy to miniaturize the layout appreciably since the governing factor is the physical size of the components, which, by their very nature, are comparatively large. The power requirements are modest and can usually be supplied from the receiver's normal power pack. It will be found that an h.t. voltage of 150 to 200 is all that is required for the anode supply.

#### Performance

The following figures were obtained by measurements made on the model described.

Insertion Loss = 10db

On "Reject"	On "Boost"
500 c/s -17db	500 c/s +15db
1000 c/s -15db	1000 c/s +12db
1500 c/s -15db	1500 c/s +12db
2000 c/s -20db	2000 c/s +15db
5000 c/s -12db	5000 c/s +15db

## Eastern Regional Meeting and Mobile Rally

SUNDAY, JUNE 29, 1958

THE SHIRE HALL  
CASTLE HILL, CAMBRIDGE

#### Programme

Assemble	- - - -	11.00 a.m.
Lunch	- - - -	12.30 p.m.
Business Meeting	- - - -	2.30 p.m.
Tea	- - - -	4.30 p.m.
Raffle, etc.	- - - -	5.00 p.m.

There will be an organized tour of the Colleges for all who are interested. Ample parking space will be available for cars and it is hoped to award a prize for the best mobile rig. Demonstration of Amateur Television.

Rally stations will operate on Top Band and 2m with the call-signs G2ALL/A and G3GGJ/A respectively.

Tickets, price 12/6d. inclusive, may be obtained from the R.R., Mr. T. A. T. Davies (G2ALL), Meadow Side, Comberton, Cambridge, or from the Cambridge T.R., Mr. H. Waton (G3GGJ), Arkengarthdale, New Road, Barton, Cambridge. Council will be represented by Messrs. J. H. Hum, G5UM, A. O. Milne, G2MI, and John Clarricoats, G6CL (General Secretary).

The use of The Shire Hall Grounds is by the courtesy of the Cambridgeshire County Council and the use of the inside accommodation by courtesy of The Staff Canteen Committee of the County Council.

## West of England Regional Meeting

SUNDAY, JUNE 29, 1958

COLSON'S RESTAURANT,  
HIGH STREET, EXETER

#### Programme

Assemble	- - - -	11.30 a.m.
Lunch	- - - -	1.0 p.m.
Photograph	- - - -	2.30 p.m.
Business Meeting followed by a talk on "Radio Interference" by Phil Crouch (G3GBK)	- - - -	2.45 p.m.
Ladies' and Children's Special Feature	- - - -	2.45 p.m.
Buffet Tea followed by Draw for prizes	- - - -	5.0 p.m.

Tickets, price 15/6 for adults and 7/6 for Juniors (12 and under) are available from the Organizer, Mr. B. Munro, G3FLK, C.R. for Devon, 43 Prospect Park, Exeter, or from Mr. W. J. Green, G3FBA, Region 9 Representative, 82 Bloomfield Avenue, Bath (Telephone: Bath 3861). Council will be represented by Messrs. C. H. L. Edwards, G8TL, E. W. Yeomanson, G3IIR, and John A. Rouse, G2AHL (Deputy General Secretary).



# Mobile Whip Aerial for Top Band

## High Efficiency Loading Coil Wound with Litz Wire

By P. J. H. MATTHEWS (G3BPM)\*

**D**URING the building of a portable all dry battery Top Band transmitter/receiver the need for a readily tunable whip aerial became apparent, and as a result of various experiments the aerial described in this article was evolved.

The basic arrangement is a centre loaded whip with a tapped loading coil (Fig. 1). The various taps are selected by miniature wafer switches mounted within the ends of the loading coil former, the switch spindles forming robust aerial attachments to the loading coil. The switch at the top of the coil selects the coarse adjustments and the lower switch the fine adjustments. To change frequency, the loading coil is merely rotated in relation to the lower section of the whip after the upper switch has been set to suit the particular type of vehicle on which the aerial is mounted. The lower switch alters the resonant frequency of the aerial by approximately 20 kc/s per tap. The aerial will operate effectively over a bandwidth of approximately 10 kc/s. In this way virtually continuous coverage is possible on Top Band.

Fig. 1. General details of the centre-loaded mobile whip aerial described in the text.

In view of the low power available in portable and mobile installations, it is most important to reduce the losses inherent when the whip aerial is short in relation to the wavelength used. The radiation resistance of such an arrangement is extremely low, often below one ohm, and a large proportion of the power available can easily be dissipated as heat instead of being usefully radiated. With this in mind it was decided to wind the loading coil with Litz wire to reduce the r.f. resistance. The actual coil consists of 290 turns of Litz wire wound 25 turns per inch on a 1½ in. diameter paxolin tube. The wire was obtained from a variometer from a TU26B tuning unit.† There are 10

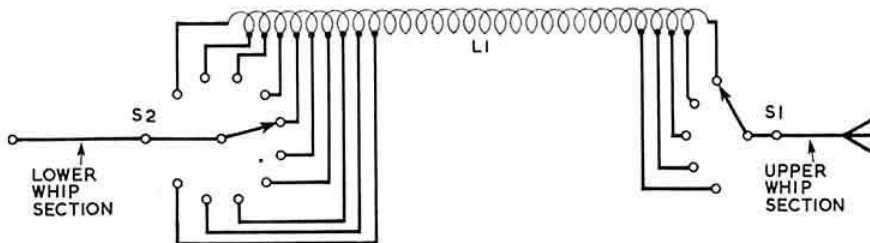


Fig. 2. Arrangement of the switching in the loading coil.

\* 18 Kings Avenue, Sunbury-on-Thames, Middlesex.

† A suitable Litz wire 3/3/3/0032 is available from the London Electrical Wire Co. and Smiths Ltd., Leyton, London, E.10.

taps of 5 turns each at the lower end and 5 taps of 20 turns each at the other. The arrangement of the switches is shown in Fig. 2.

### Construction

First, drill the coil former as shown in Fig. 3 and prepare the end plates from ¼ in. thick paxolin. These end plates must be a good fit into the ends of the coil former, as they carry the switches S1 and S2. It is important that use be made of the switch locating spigots as it is easy to break off the coil taps should the securing nuts work loose.

The coil is wound tightly, the taps being fed into the centre of the former and brought right up to the switch tags. They need not be cut. Systoflex sleeving is slipped over each pair of tap leads to prevent them shorting when the switches are fitted into position.

To clean the Litz wire, use a small flame and heat the area to be soldered until it is red hot, then quench in methylated spirit. This cleans the wire completely and enables a perfect joint to be made. It is best to practice this operation a few times with a small piece of wire before tackling the coil itself. Care must be taken as the methylated spirit may possibly burst into flame.

When all the joints have been soldered, carefully slide the switches and end plates into the coil former, ensuring that the leads are not twisted, and secure each end plate with six brass screws and washers. After assembly, dry the coil unit in a warm cupboard or dry room for 24 hours and then carefully cover with several coats of polystyrene varnish or shellac, making certain the end caps are completely sealed.

The whip attachments consist of standard brass ¼-in. spindle couplers soldered on to the ends of the aerial sections and secured to the switch spindles by means of screws. The switch spindles can be either drilled and tapped or they may merely have a small indentation drilled on the flat side in which the securing screws can be set.

For reference purposes a small scale can be engraved on the end plates and the whip securing screw heads used as indices. This simplifies returning to a previous frequency if any large change has been made.

The whip aerial itself can be of many different forms, but the stronger types of ex-government aeriels are most satisfactory provided the dimensions are suitable.

### Using the Whip

The settings of the coil switches for any particular frequency cannot be given as the amount of inductance required varies with the type of vehicle and the position in which the aerial is fitted. Suffice to say that it is possible to mount it anywhere on almost any car and get it to load in a few seconds by means of the coarse adjustment. The prototype described was in fact fitted to several different vehicles in one day and in each case loaded straight away. This is a useful feature for R.A.E.N. use or where a portable rig is used in a car or boat.

Various arrangements such as sliding coils and rotating coils, variometer style, were tried before the present idea was evolved. It has now been used with a hand carried portable in a dinghy and with mobile gear. It has proved most satisfactory and has enabled frequency changes to be made quickly and easily. The results obtained have been excellent. With a transmitter input of ¼ to ½ watt, ranges of 10 miles have been regularly achieved as a mobile installation using

phone and up to 40 miles on c.w. Stations all over the country are easily received. Even with a transmitter power input as low as ¼ watt it is possible to light a neon lamp adjacent to the upper section of the whip.

The efficiency of the aerial is believed to be largely due to the use of Litz wire in reducing the r.f. resistance of the loading coil and the fact that no "lossy" material passes

caps instead of end plates to fit over the coil former for about 1 in. However the writer's method of construction can be easily carried out in the average workshop.

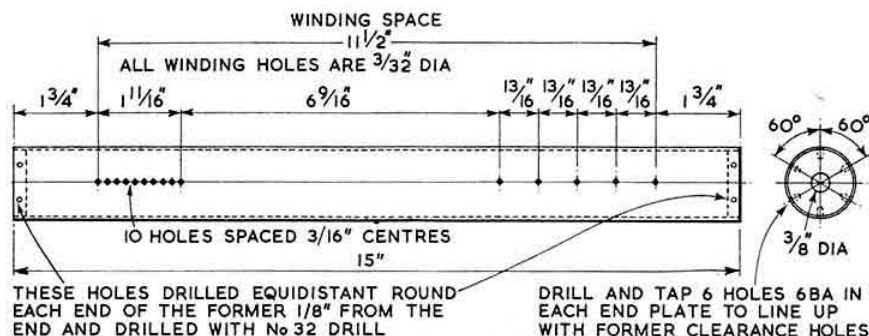


Fig. 3. Details of the former for the loading coil.

through the centre of the coil to give mechanical strength to the whole assembly. Many variations of this basic arrangement are possible and it should be quite easy to build an aerial for several bands using this type of construction. Anyone who has access to a lathe will be able to improve on the end plates and produce a stronger assembly by making end

The aerial will give excellent local coverage if used at home and will out-perform a short length of wire in a small garden.

As this aerial possesses virtually no horizontal component very little fading or interference due to more distant stations is experienced in local contacts.

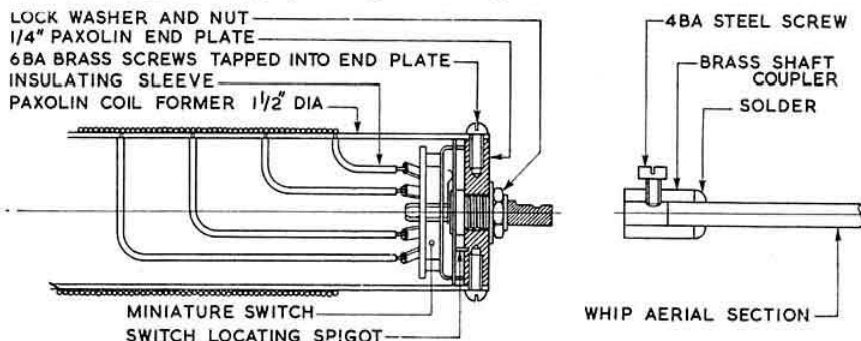


Fig. 4. Mounting of the switches on the end plates and the method of connecting the loading coil to the whip sections with shaft couplers.

#### Ordinary Administrative Radio Conference

IN accordance with a proposal put forward at a recent meeting of the Administrative Council of the International Telecommunication Union, the next Ordinary Administrative Radio Conference is now expected to open in Geneva on August 17, 1959 and not, as stated earlier, on July 1, 1959. The Plenipotentiary Conference is expected to open on October 14, 1959.

The I.T.U. Conferences will be preceded by the IXth Plenary Assembly of the International Radio Consultative Committee (C.C.I.R.) which will open in Los Angeles on April 1, 1959.

#### R.S.G.B. News Bulletin Service

THE R.S.G.B. News Bulletin Service is now radiated at the following times on Sundays:

10.00 B.S.T. 3600 kc/s. South of England (Operators: G2MI, G3IIR, G5LC, G6MB and G8TL).  
12.00 B.S.T. 3600 kc/s. North of England (Operators: G2ACD, G2YS, G3DQ and G5VO).  
11.15, 11.30 and 11.45 B.S.T. 145.55 Mc/s. North of England (Operator: G5YV).  
12.00 and 12.15 B.S.T. 145.5 Mc/s. South of England (Operators: G3FZL, G3GHI and G5KW).

## TELEVISION INTERFERENCE— ITS CAUSES AND CURES

By PHIL RAND, WIDBM

**Price 15/6 post free**

FROM R.S.G.B. HEADQUARTERS

#### CONTENTS:

- Sources and Types of TVI.
- Locating TVI.
- The TV Receiver.
- The Radio Transmitter.
- Shielding and Filtering.
- Special V.H.F. Problems.
- Design and use of High and Low Pass Filters.
- External Harmonic Generation.
- Industrial, Medical, Public Utility TVI.

**56 LARGE PAGES**

# FOUR METRES



# AND DOWN

By F. G. LAMBETH (G2AIW)\*

## International V.H.F./U.H.F. Convention — Field Day Conditions

ABOUT 120 visitors attended the Fourth International V.H.F./U.H.F. Convention held in London on May 17, 1958. At the Lecture Session in the afternoon Dr. T. R. Kaiser (a one-time VK3) of the University of Sheffield and an acknowledged authority, gave an excellent lecture on "Auroral Propagation." Dr. Kaiser, a most enthusiastic speaker, has a flair for explaining his subject, and his talk was voted an outstanding success. The second speaker, Dr. Saxton of the Radio Research Station (D.S.I.R.), gave an admirable talk on "Some Problems of U.H.F. Broadcasting." Finally, C. de Leeuw (PA0BL), one of the operators of PE1PL and V.E.R.O.N. V.H.F. Manager, gave an outstanding lecture and demonstration entitled "V.H.F./U.H.F. R.F. Amplifiers and Mixers."

As a result of a very generous donation by Marconi Instruments Ltd. it was possible to give five prizes for the best items shown in the Convention Exhibition. The winners were F3SK for the fine transistorized equipment mentioned last month, G3HBW for some beautifully engineered 1250 Mc/s gear, G5OX for a 72 Mc/s v.f.o. (to be described in a forthcoming BULLETIN article), G5CD and G3HWR. The judging was carried out by Dr. Smith-Rose and Dr. Saxton.

Before the Convention Dinner began, Austin Forsyth, O.B.E. (G6FO) spoke a moving tribute to the late Arthur Simons (G5BD), which was followed by a short silence in G5BD's memory.

The toast of the R.S.G.B. was proposed by Phil Thorogood, to which the President (Mr. L. E. Newnham (G6NZ)) replied. The toast to "The Visitors," was replied to by Jacques Montagne (F9CQ) and Dr. Smith-Rose, who afterwards presented two International V.H.F. Society trophies on behalf of Harry Wilson (EI2W), who was unable to be present. The Irish Perpetual Trophy went to G6NB for his work on v.h.f. over the past years, and the Millan Trophy to G3HBW for his experimental work on the v.h.f./u.h.f. bands.

After Dr. Saxton had presented the exhibition prizes, the draw for gifts donated by the radio industry and press took place. All those who received gifts are asked to write to the donor firms in acknowledgment, as without their generous help these happy events would be impossible to arrange.

Visitors came from far and wide, including ZS1PM, W5ARQ, GW8MQ, GW8SU, GW3MFY, GM3DIQ, EI4E, F3SK, F8MX, F9CQ and PA0CK.

The Convention was organized by members representing the Society's V.H.F. Committee and the London U.H.F. Group.

### Band Conditions and Station Reports 2m

From the reports received, it is evident that the First 144 Mc/s Field Day on May 4 enjoyed very good conditions in most directions but after that date conditions fell off with the collapse of the anti-cyclone and since then have only been average to poor. The "grand opening" is still not with us.

\*21 Bridge Way, Whitton, Twickenham, Middlesex.

B.R.S. 18572 (Mitcham) was very pleased with the Field Day activity, which was the best for some time and produced the calls heard list. Conditions were not first class, but it was one of the best days '18572 remembers. B.R.S. 19162 (Dewsbury) is out of hospital again and doing a little listening. Conditions have been poor, however, except for an occasional break-through from GB3IGY. The best DX has been G3HYN and G3IRS; on the night of May 17 G5DW (Bridgwater) was heard weakly on c.w. B.R.S. 20133 (Melton Mowbray) heard 42 stations during Field Day. The regular report from '20133 says PE1PL has put in a remarkably good appearance once or twice during the month. G3JWQ and G3APY are on every lunchtime, and both have worked the Dutch station.

G5MR (Hythe, Kent) worked 12 French stations during the R.E.F. Contest. Several G portables were heard on May 4, G5PP/P (Coventry) being the best one worked and G3MNM/P (near Crewe) heard. G3GRA (Plymouth) did very badly on May 4, no stations being worked or heard despite CQ calls. G3GRA suggests a fixed beam contest with southern stations beaming north and northern stations beaming south during the morning, followed in the afternoon by stations east and west beaming towards each other. (The east to west division through Birmingham and north to south through Edinburgh.) Another idea to help isolated stations would be to make the Monday night activity objective a different county and see who could raise most contacts in that county. A third idea is a relay contest, but we mentioned it once before and nobody seemed to want it. Any comments on these, please?

G3JR (Barnes) worked G3JZG (Willenhall) on c.w. on May 3, and during the contest was very pleased to get RS 56 (phone) from GW2HCJ/P in Radnor. G3JR's total on 2m is



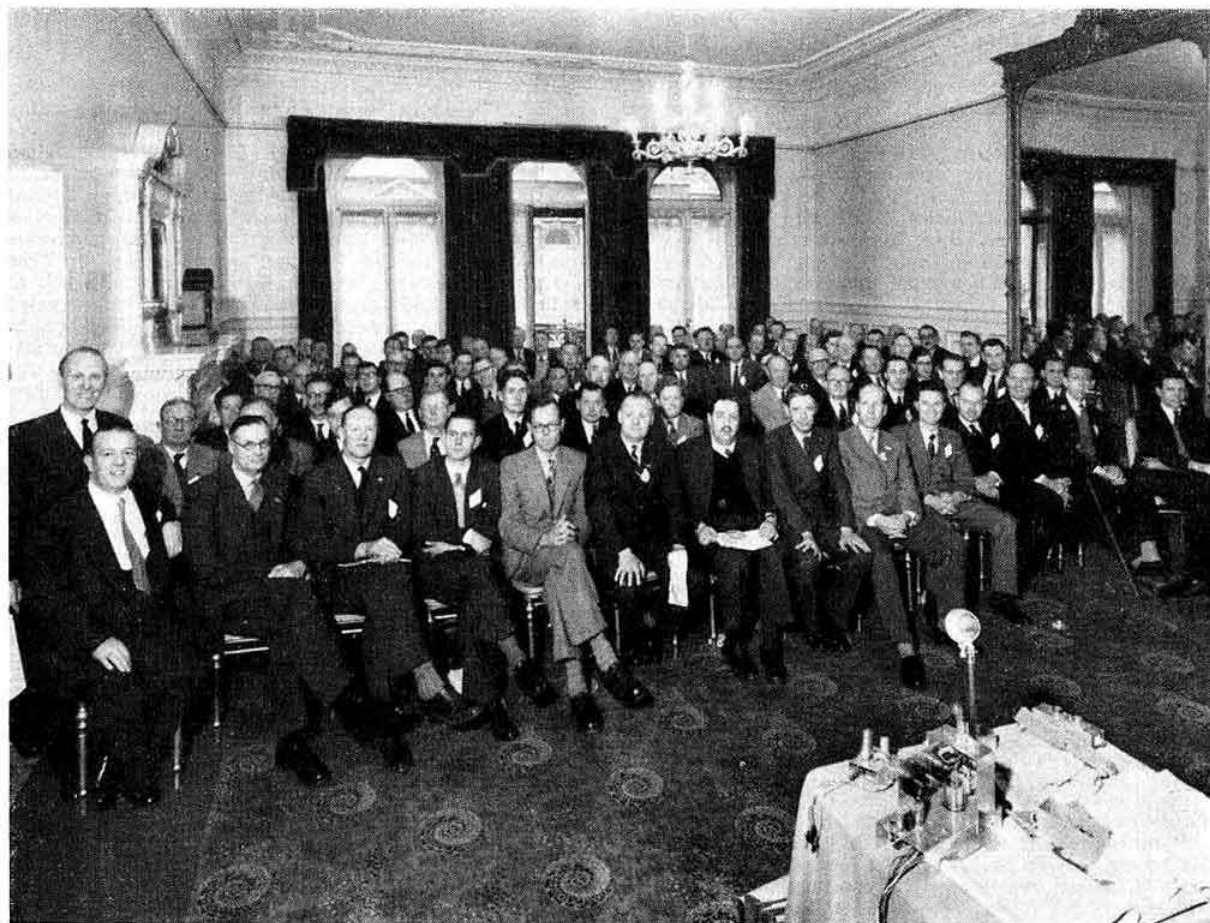
PA0BL lecturing at the Fourth International V.H.F./U.H.F. Convention in London on May 17, 1958. The lecture will be published in the R.S.G.B. Bulletin shortly.

now seven countries and 33 counties. Experiments are going forward with a two element bisquare quad, but no considered results are yet available, although the aerial appears promising. **G8VZ** (Princes Risborough) found conditions fair at times, with Field Day giving a "flip" to activity. On April 18/21 conditions were good but QSB was still noticeable on signals at any distance. Some very good contacts were made with **GW3FKO/P** (Cardigan). On May 3 conditions were very good to the north and west, many stations being worked at good strengths. Early on Field Day signals were very good for about two hours, then fell off slightly although still good; **G8VZ** does not think the portables would have noticed this owing to their better locations. The strength of the portables and mobiles were about the best **G8VZ** has noticed. Numerous **GW** portables were worked, the outstanding one being **GW2HCJ/M** who was good throughout the day. Portables were heard working continentals, none of whom, however, were heard at Princes Risborough. From April 5/14 signals fell off and remained "around average."

**G3FKO** (Nr. Bristol) is sorry he had to come back from Cardiganshire on May 2, thus missing Field Day from there. The new transmitter was operated with improved results from the Quantock Hills seven miles north-west of Taunton. This transmitter had been tested with **G8VZ** and several other stations from Cardiganshire at the end of April. In order to prove that a path exists from Cardigan to the Home Counties,

**G3FKO** and **G8VZ** will be looking for each other nightly between 20.30 and 21.00 B.S.T. during the first half of July, as **G3FKO** hopes to operate the second 2m Contest from there. **G3FKO** is going to Adelaide for three months in late July, and promises us reports on 2m conditions out there in due course. He may take his 2m portable with him. **G3JGJ** (Paignton) now has the 2m gear fixed up at his new address which is about 450 ft. a.s.l. Although the four element Yagi is only barely at roof level, a CQ call on May 4 brought back **G4DC** and a very good phone and c.w. contact resulted. On May 12 **G2RY** (Bridport) and **GC2FZC** (Guernsey) were worked, the latter being the first sked appearance since **G3JGJ**'s removal and incidentally for some months. As **G3JGJ** hopes to be on 2m every evening seven days a week and on Sunday mornings around 10.00 B.S.T., any stations are welcome to drop in and QSO. Another possible sked time is between 07.00 and 08.00 every morning, when CQ will be called.

**G8LN** (Plumstead) still manages his sked with **G3ANB** which has been going on for a long time now. **G8LN** gives a tip for simple matching coax—put odd lengths on Belling Lee plugs and adjust until standing waves disappear! **G8LN** says it's as easy as it sounds! At any rate the standing waves are lowered to a respectable amount. **G5DW** (Ashcott) says his sked with **G2NY** has only failed once since March 1 which surely proves it is worth while being on the band otherwise



The audience during the Lecture Session at the V.H.F. Convention in London on May 17, 1958



than during "openings." On May 4 conditions were good to the west, anything from North Lancashire to the Channel Islands being S9 during the morning.

**G3IRS** (Locking) who thinks G3GNS may have done very well in Field Day with a claimed score of over 14,000 points, told G2AIW at the Convention that he had worked PE1PL four times during the week ending May 17. On May 4 F3LP, F8MW, F9EA/P (Dieppe), F9DQ and G13GXP were worked. On such a foundation, it is easy to see where the colossal score came from!

**E12W** tells us he has the 16 element stack to end all 16 element stacks. We trust it will work out as successfully as Harry hopes—in any case look out for heftier signals from Dublin.

**G3BGL** (Woolhampton, nr. Reading) is on 2m from 20.00/20.45 most evenings with 7½ watts. G3BGL is our old friend Paul Sollom.

We were very pleased to hear from **G3HHY** who is now in Montreal and hoping soon to become a VE2, when portable and mobile 2m operation will be the order of the day. The little "ex-Vespa" mobile equipment (½ watt) arrived safe and sound. G3HHY expects to have something to report on 2m activity in Canada soon, if he doesn't grind out as many unanswered CQs as he did in the U.K. G3HHY sends greetings and best wishes to all, especially the Bristol area 2m stalwarts G3KHA, G3FIH and G3FKO who are thanked for many happy v.h.f. days.

**F9CQ** (Paris) reports his experiences in the Coupe du R.E.F. (V.H.F.) on May 4. Many contacts were made, and F3YX/P (on the Grand Ballon d'Alsace) was heard, as well as a station believed to be HB1AY. Many of the other French stations contacted these two, but not F9CQ, who, however, raised G2JF, G6NB and G3DIV/P. LX1SI and two DLs were heard.

#### Scottish News

**GM2FHH** was on during Field Day but says 2m has been pretty quiet at Aberdeen. Edinburgh and Glasgow are better with GM3LAV, GM3FCJ, GM3DIQ, and GMJWS very active. The Dundee area is alive with GM4HR, GM3HLH and GM3KYI on most evenings. GM3GUI (Frickheim, Angus) is using 10 watts to a four element Yagi every evening.

**GM6WL** (Glasgow) says there is rather less activity, but a few interesting items. GM5VG and GM3DIQ continue their QSOs with GM3DDE and occasionally with GM6SR. GM3EGW may often be heard during his skeds with G2NY. GM6WL himself continues his skeds with G15AJ on Saturdays at 23.00 B.S.T. and it is seldom they miss, even in bad conditions. May 3 was better than average, and phone was used. (G15AJ S7/9, GM6WL, S5, no fading). GM6ZV also contacted G15AJ immediately afterwards. On May 15, GM3NG (Carlisle) heard G15AJ. GM6WL adds his tribute to the memory of G5BD, who was a contemporary of his at the beginning. Indeed Arthur will be sadly missed.

#### Scottish Beacon Station

Preparations are being made by the Rolls-Royce (East Kilbride) Amateur Radio Society to operate a 144 Mc/s beacon station on behalf of the R.S.G.B. with the generous co-operation of Rolls-Royce Ltd.

#### Activity Nights that Work

Although there have been few references lately in this feature to "Monday Night on Two," the regular activity period every Monday evening continues to thrive.

Those who may be new to it are reminded that this activity period runs from 8 p.m. to 10 p.m. every Monday, and the objective is to keep QSOs fairly short in order to distribute contacts to as many stations as possible.

The Welwyn Garden City Group commence each Monday activity night with a get-together of members on 145.8 Mc/s, where they are joined from time to time by stations in the

South London Group led by G3GHI. Later, all go their separate ways lower down the band. Operators are well advised to search right up to the top end of the band when tuning.

#### Six Metres

**G4LX** is permitted to operate 24 hours daily, subject to causing no TVI but is only allowed to beam *westerly* which puts skeds with Rhodesia and South Africa out of the question. Moreover the licence expires before the North Atlantic path reopens. Sounds like a mixed sort of blessing, doesn't it? **G3IUD** (Wilmslow) is still looking for a QSO from anyone at all!

**VE7KX** (Richmond, B.C.) says duplex is not permitted below 51 Mc/s in Canada and quotes the relevant regulations. It will be remembered that in the January BULLETIN it was stated VEs were allowed to use duplex.

**E12W** (Dublin) who did much successful experimental work on F2 layer propagation on 6m, points out that his best results were with a tilted aerial (60°). Harry wonders whether a division of the F2 layer is taking place and whether a new layer is forming above this and becoming increasingly ionized. This is suggested by the long distances achieved with the tilted aerial—E12W was the only station in Europe, he says, to work both W6 and W7 districts, and 6,000 odd miles is a very long haul on this band. It has, of course, been bettered by multiple hop working, but the idea of a new layer is worth considering. Possibly F2 has in fact divided and signals are being reflected by a higher layer. In any case, something has possibly been discovered through the "tilted aerial" experiment.

#### Four Metres

**G5MR** (Hythe, Kent) says that conditions have greatly improved and that during the R.E.F. Contest of May 3/4 four French stations were worked and many others heard. G3CLW (Bromley) was worked for the first time on April 23.

#### Seventy Centimetres

During the course of a contact on 70cm with G5UM, **G2WJ** said that he had been in communication with Mike Barlow (ex-G3CVO) via VE2CB on 21 Mc/s, and he had learned that he was busy starting an Amateur TV group in Montreal.

There have been good turnouts for the unofficial "Saturday Night on Seventy" when many of the Greater London operators meet on the 435 Mc/s band between 7 and 8 p.m. This is usually followed by a 144 Mc/s session which helps maintain activity throughout most of Saturday evening.

**G3JGJ** (Paignton) will soon be active on 420 Mc/s with a 16 element beam and listener reports will be welcome from any distance. Regular skeds will be fixed up with anyone interested.

**GM6WL** reports the addition by GM3NG (Carlisle) of a QV06/40 p.a. following his 832A tripler, resulting in a noticeably stronger signal in Glasgow. As modulation has not yet increased, however, some people might be forgiven for thinking that no change has occurred. This will shortly be remedied however.

**GM4HX** (Paisley) heard GM3NG for the first time recently, and on April 27, after receiver improvements, received GM3NG S5 on phone. GM4HX gets GM5VG at S9 off the back of his beam when facing Edinburgh. Scottish stations active on 70 cm. include GM3GUO, GM6KH, GM3NG, GM4HX, GM5VG, GM6WL, GM6XW and GM3DDE.

An experimental set-up in the i.f. pre-amp at GM6WL is using a single 6J6 neutralized in p.p. on 24 to 25 Mc/s. This is a narrow band device covering about 0.5 Mc/s and involves re-tuning when moving more than that amount; this is easily arranged by having proper condensers with spindle and knob accessible, instead of the screwdriver or cup adjustment: the idea is to get a better signal/noise ratio, and it seems to work.

Look out for 70cm mobile with G3IUD, G3BAK and G3FDU, which is promised shortly.

#### Twenty-Three Centimetres

GM6WL has been experimenting with a 2C39A with a view to getting more crystal controlled power on 23cm and accidentally landed also on the fourth and fifth harmonics of the 432 Mc/s drive, i.e. 1728 Mc/s and 2160 Mc/s. The latter is quite near the 2300/2400 Mc/s band; indeed, by using an 8-6 Mc/s crystal GM6WL hopes to get into the 2300 Mc/s band. The 2160 Mc/s harmonic lighted a sensitive pea lamp to about the same brilliance as the initial 23cm 446A lighthouse p.a. did in 1956.

More news received over the air by G5UM is to the effect that G5DT, who has for many years acted pretty well as a beacon station for 70cm operators in the London area, is prepared to offer similar facilities on the 23cm band.

Any member who is seriously interested in 23cm work should get in touch with him if a signal is required on the band. G5DT operates on 1298-6 Mc/s most nights between 10 p.m. and 10.30 p.m. with 30 watts input. He is in regular contact on this band with G8RW near Bromley over an eight mile path which is not line of sight. He has been received at S7 by G3HBW at a distance of 24 miles.

#### B.B.C. Band V Transmissions

On May 5, the B.B.C. started a series of high-power experimental television transmissions on u.h.f. in Band V (610 Mc/s-960 Mc/s) from the Crystal Palace. The purpose of the transmissions is to test the suitability of these frequencies for television broadcasting and will continue for three months, using the Western European standard of 625 lines. The results will be compared with those obtained in the recent 405 line tests. It is hoped that the tests will throw some light on the problems which would be encountered if it were decided to use the 625 line standard for a television service on Bands IV and V.

The experimental transmissions are on 654.25 Mc/s (vision) and 659.75 Mc/s (sound). As in the first series the transmissions will be in black and white only.

#### Italian Activity during 144 Mc/s Contest

A group of Italian amateurs, including I1BG, I1PAC, I1CEF, I1FHN and I1DM will be operating three stations from Monte Serra (3,200 ft.), 6 miles from Pisa, from 17.00 G.M.T. on July 5 to 17.00 G.M.T. the following day. Inputs of 20 to 25 watts will be used with 6 to 12 element rotary beam aers. The group is hoping that it may be possible to make contact with British stations but listener reports will be equally welcome.

#### Vacancies at the Radio Research Station

It is understood that various opportunities exist for v.h.f. enthusiasts to work at the Radio Research Station, Ditton Park, Slough and anyone who is interested should communicate with the Director, Dr. Smith Rose.

#### Mobile in Scotland

Just a last note; G3FZL and 3IWA will be in Scotland between June 22 and July 7 inclusive working /M and /P. If the conditions are right this could be quite an event.



Deadline for the next issue is June 23, and for the August issue July 11. The very early date for August is due to the fact that the writer will be leaving for the Regional Conference in Bad Godesburg on July 16.

#### Amateur Television in Wales —First Two-way Contact

ON April 13, GW3JGA/T (Prestatyn) and GW3FDZ/T (Llandudno) had a two-way television contact on 70cm over a distance of 18 miles. Good pictures were received from both stations.

## Worked and Heard on V.H.F.

### Two Metres

**B.R.S. 20133** (Melton Mowbray) March 17-April 15.

Heard: G2FMO, 2FNU, 3APY/M, 3BA, 3CKQ, 3EHK/M, 3FUW, 3GFD, 3GHI, 3GSO, 3JWQ, 3JXN, 3KQF, 3KUH, 3NAT, 4MK, 5CP/A, 5KG, 5YV, 6NB, 6XM, 8CZ, 8VZ, GB2RS, GB3IGY.

**GBVZ** (Princes Risborough).

Heard: G3ENY, 3FKO/M (S. Glos.), 3GSO, 3IOO, 3JWQ, 3JWQ/P, 3KHA/M (Glos.), 6XM, GW5MA/P (Brecknock). Heard: G2FNU, 3FAN, 3FIH, 3IKV, 3IRS, 3JZG, 5YV.

**B.R.S. 18572** (Mitham) May 4, 1958.

Heard: F3LP, 9EA, G2AK/P, 2CD, 2FM, 2JF/P, 2RD, 2TP, 2XV/P, 2AHP, 2ANT, 2DSW/P, 2DTP/P, 3FD/P, 3FP, 3JR, 3PV, 3XC/M, 3APY/P, 3AYV/P, 3BII, 3BRR/P, 3BVR/P, 3CGQ/P, 3DFF/P, 3DUS/M, 3DIV/P, 3DUV/P, 3EEQ/P, 3ERD/P, 3ERN/P, 3EVV, 3EYV, 3FEF, 3FIH, 3FQS, 3GBC, 3GGR/P, 3GHI, 3GNS/P, 3GOP/P, 3GOZ, 3GSE, 3GVC, 3GZJ/P, 3HBW, 3HCJ/M, 3HDJ, 3HKD/A, 3HZJ/P, 3ION/P, 3IUD/M, 3JBV/P, 3JMA/P, 3JTO, 3JWQ/P, 3KEQ/P, 3KLT/P, 3KMT/P, 3KQC, 3KSR/P, 3LHA/P, 3LOA, 3LOK, 3LTF, 3LZP, 3MAR/P, 3MLS, 3MNM, 3MNR, 4DC, 4JJ/P, 5BM/P, 5DT, 5KG, 5LK, 5LM/P, 5PP/P, 5MA, 5NF, 5VW, 5YV/P, 6AG/P, 6HH/P, 6NF, 6XM/P, 6YP, 8AL, 8DR, 8LM/P, 8LN, 8QY/P, 8SB/P, 8SC/P, 8VZ, GW2HCJ/M, 3YZ/P, 5SA/P, 8UH/P.

**B.R.S. 20133** (Melton Mowbray, Leics.) April 15-May 12.

Heard: G2ACV, 2AHL/M, 2ANS, 2ANT, 2BVW, 2FMO, 2FNW, 3APY, 3APY/M, 3APY/P, 3AYT/P, 3CGQ/P, 3CRH, 3DBM, 3DVK/P, 3EEQ/P, 3ELG/P, 3ENS, 3ERD/P, 3FAN, 3FDF, 3FUI/P, 3FUW, 3GGR/P, 3GNS/P, 3GSO, 3GZJ/P, 3HBW, 3JBN/P, 3JMA/P, 3JWQ, 3JWQ/P, 3JZJ, 3JXN, 3KQF, 3LHA, 3LKV, 3MAR/P, 3MNM/P, 4JJ/A, 4MK, 5CP/A, 5KG, 5JU, 5MA, 5PP/P, 5YV, 5YV/P, 6XM, 6XM/P, 8CZ, 8SB/P, 8VZ, GB2RS, 3IGY, GW2HCJ/M, 3ATZ/P, 3BOC/M, PE1PL.

**B.R.S. 21476** (Penarth) May 4.

Heard: G2HDR, 3FIH, 3FKO/P, 3GNS/P, 3ION/P, 3IRS, 3KHA, 3KMZ, 3MKT/P, 5BL/P, 5BM/P, 5DW, 5MA, GW3YZ, 3HAW, 3MFY, 8UH/P.

**G3GRA** (Plymouth) May 2-4, 1958.

Worked: G3KHN. Heard: G3FKO, 3KHA, 3KHN.

**GBVZ** (Princes Risborough) April 18-May 14.

Worked: G3ENY, 3GSO, 3IRS, 3JWQ, 3JZG, 3KFT/P, 3KHA, 3LHA/M, 4MK, 5DW, 6XX, GW2HCJ/M, 3FKO/P, 3YZ/P, 5SA/P, 8UH/P.

Heard: G2ACV, 2ANT, 2FMO, 2FNW, 2PTO/P, 3APY/P, 3AYT/P, 3CRH, 3DBM, 3DVK/P, 3EEQ/P, 3ELG/P, 3ENS, 3ERD/P, 3FDF, 3FUW, 3GGR/P, 3GNS/P, 3GZJ/P, 3HBW, 3JBN/P, 3JMA/P, 3JWQ/P, 3LHA/P, 3MAR/P, 3MNM/P, 4JJ/A, 4MK, 5CP/A, 5JU, 5KG, 5MA, 5PP/P, 5YV, 5YV/P, 6XM/P.

**GM2FHH/P**

Worked: GM3FGJ, 3GUL, 3JWS, 3KYI, 3HIA/A, 3LAV, 4HR. Heard: G3DVK/P, 3ENS, 3JWS, 3MNM/P, 6XM/P, 8SB/P, GW3JGA/P.

### Seventy Centimetres

**B.R.S. 18572** (Mitham) May 18, 1958.

Heard: G2RD, 2FCA, 3FP, 3ECA, 3EGV/P, 3EYV, 3GDR, 3HBW, 3JQN, 3KEQ, 4KD, 5DS, 5DT, 6NB, 6NF, 8AL, 8RW.

### Can You Help?

● H. L. Clarke (G3DQA), "Westaway," Lower Lane, Newton, Kirkham, Lancaster, wishes to borrow a band switched-table top transmitter and not a Top Band transmitter as stated in the May issue. Mr. Clarke is a sightless semi-invalid amateur.

● E. A. Bovey (B.R.S. 19530), 1 Chapel Lane, Dartmouth, Devon, who requires information on the conversion of the surplus f.m. receiver type ARR3 to cover the B.B.C. channels in Band II?

● R. W. Harris (B.R.S. 4027), "Dungarvan," 7 Burleigh Lane, Plymouth, Devon, who urgently requires the technical manual for the Canadian Reception Set R103 Mark 1? Information on the coils and power supply is particularly needed.

● James W. Gould (A.1477), Atomic Energy Research Establishment, Harwell, Didcot, Berkshire, who wishes to obtain information on the R1149 receiver?

### VHF ACTIVITY NIGHTS

MONDAYS FROM 8 TO 10 ON TWO  
WEDNESDAYS FROM 8 TO 10 ON FOUR

See how many stations you can work, and report the results to G2AIW (V.H.F. Editor).

# THE MONTH



DATE TIME	FREQ.	STATION CALLED	CALLED BY	STATION HEARD OR WORKED			IF QSO RESULTED			REMARKS	
				R	S	T	KC/S OR DIAL	MY SIGS.	TIME OF ENDING QSO		
								R	S	T	

ON THE AIR

# ON THE AIR

By S. A. HERBERT (G3ATU) \*

ONLY a few years ago anyone tuning the DX bands around the period of late Spring or early Summer would have been somewhat shaken if he heard anything but some very occasional DX. Ten metres was dead as can be, fifteen was nearly as bad and even twenty was in no condition to arouse more than an occasional faint cheer. But what a difference the sun-spot cycle has made in this year of 1958! Even now, some DX creeps through on ten. True, the east-west path over the Atlantic will yield little or nothing until Autumn, but DX from the south—Africa in particular—still appears quite regularly. As to the other bands—well, despite intruders, outrageous noises, short skip and all the other nuisances—they are in a healthier condition by far than many of us, way back in 1954, would have dared to hope!

## From Far and Wide

**Singapore:** Ron Perks (G4CP) passes some interesting snips from VS1FW/2FW who is also one of the operators at VS1HU. Firstly, **Maldivé Is.** activity started by VS1BB/VS9, who was there for some three weeks, is being continued by VS1JF/VS9, who is expected to be on the islands for six to nine months. He uses a v.f.o. rig on all the usual bands, so there should be no future worries as to QSOs with Gan, especially as his relief will probably have an amateur licence. VS1FW says that CR10AA awaits the arrival of a new rig and that ACSPN is on again, but only very occasionally. CIA has been heard, beaming a rhombic from Peiping towards the U.S.A. and telling the Ws that there are 135 amateurs in China now. (VS1FW can't find any: he says they must all operate on different frequencies to the rest of us!) ZC3AC is still active, but XV5A is missing, so it looks as if his 90 day permit has expired. KB6BJ (ex-W3PZW/KB6) is often heard and he will be on Canton Is. for three years. KP6AL is believed to have closed down. The VS1HU gang are still adding to their DX score, which now is up to 167 C—all on 14 Mc/s and all but two (VS5JL and BV1US) on c.w.

**Christmas Is.:** Derek Cox (G3KHZ) was due to be posted to the islands for a spell of some twelve months and he will do his best to acquire a VR3 call at the earliest opportunity.

**VP2VB/MM.** G3CHM passes the news that VP2VB is to be heard again as Danny set sail in *Yasme II* last April. Bad luck still dogs his footsteps and various storms and accidents delayed him somewhat, but he was due to leave Spain for Madeira during May, prior to sailing to KV4AA in the Virgins. Danny keeps in touch with G2DC, G3CHM and KV4AA on 14002 kc/s (other stations should refrain from interrupting this sked). KV4AA regularly transmits the latest position, etc., of *Yasme II*.

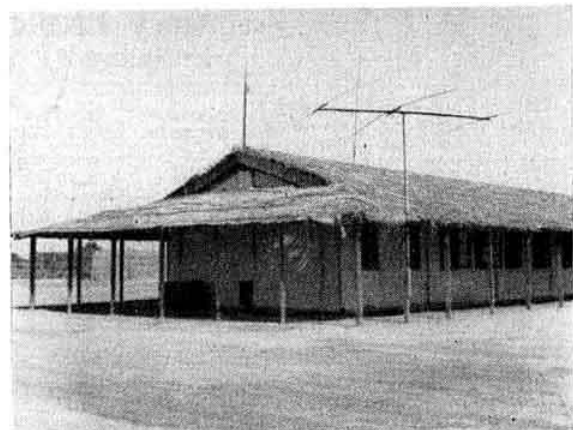
**Andorra:** Arthur Milne (G2MI) hears that DL4LJ (ex-W7KUS), is planning an expedition to Andorra for July or August. He would like to hear from anyone interested in joining him and he may be reached via either DL4CAV or DL4AYA, which are club stations. Late news arrived of a

further trip to be made by F8JD, F9RS and ON4AU, who were due to put PX1FC on the air during the first week in June, using 3-8 to 28 Mc/s. F8JD proposed to try 72 and 144 Mc/s also. QSLs will be sent only in return for cards sent to the U.B.A. Bureau, while a s.a.c. plus an I.R.C. will produce a direct reply.

**Ascension Is.:** Stan Crow (ZD8SC) emphasises that the only amateurs on Ascension are himself and John Packer (ZD8JP), so that the ZD8LN who has recently been around is up to no good and should be ignored. At present ZD8SC operates only on 21 and 28 Mc/s, while ZD8JP operates only on 7 and 14 Mc/s, but Stan leaves the island in the near future. When he does, John will take over the ZD8SC rig, which is capable of 120 watts on A3—something of a change from his own B2 transmitter. As to ZD7SA, Stan confirms that he is quite authentic. His full QTH is Bobby Freese, c/o Cable & Wireless, Ltd., St. Helena and he is at present on 28 Mc/s c.w., though R/T is in the offing.

**Alaska:** VE7KX relays the news that the British Columbia Amateur Radio Emergency Corps will provide communications for an expedition which is to climb Mt. Fairweather, on the VE/KL7 Border. The call-sign VE7BCC will be used and the Base station will sign /KL7 at Moine Bay, Alaska. The R.C.A.F. will fly the expedition to Base on June 13 and they will leave on July 14.

**Lebanon:** G3MU has been asked by OD5BN to protest to certain G stations who use the 28 Mc/s band for local QSOs while DX is coming through and to appeal to them to



From this building in Aden VS9AP operates on the DX bands using a ground plane for 14 and 21 Mc/s and the three element beam aerial shown for 28 Mc/s. The transmitter is an Explorer while reception is taken care of by a Minimitter converter feeding into an 85 kc/s i.f. strip. VS9AP is also licensed as G3MLL and was at one time ZB1LQ. Other stations operating from Aden are VS9AC, VS9AD, VS9AJ and VS9AO.

\* Roker House, St. George's Terrace, Roker, Sunderland.



have the good sense to move to a band where they will not do harm to DX circuits.

**Cape Verde Is.:** The Praia City Council offer the *Praia Centenary Award* to commemorate the first centenary of that city. The P.C.A. will be given for stations who worked three CR4s in Praia between 00.00 G.M.T. on May 14 and 24.00 G.M.T. on June 13 on any band on c.w., phone or both. QSLs should be sent to CR4AO, P.O. Box 13, Cidade da Praia, Cabo Verde, with a post-mark before July 15 and with two I.R.C's. The CR4s in Praia are 'AD, 'AE, 'AM, 'AN, 'AO, 'AQ and 'AU.

**Northern Ireland:** G12DZG/A and G13FJA/A were active on May 16-17 from Tyrone and Fermanagh. All QSOs will be verified.

**SM1BVQ** states that he will be active from Gotland Island from now until August 20 with the object of giving SM1 contacts to as many stations as possible in connection with the WASM award. On Tuesdays, between 21.00 and 23.00 G.M.T., SM1BVQ will be on 3550 and 7025 kc/s; on other days, activity will be on the other h.f. bands, principally 14 Mc/s.

Ham Whyte, VE3BWY (Toronto) known to many old timers as G6WY, is now up to 155 countries with JT1AA, KR6, KP6, YJ1, DU7, KB6, ZK2 and ZC4AF among his latest catches on the four bands in current use. On May 8, 1958, VE3BWY worked VK5QR and VK5MY in consecutive QSOs on 21 Mc/s. During his contact with VK5MY he mentioned that he had operated for many years as G6WY; VK5MY thereupon turned up his records and found that he had worked G6WY on March 1, 1937. Later in the day VE3BWY turned up his own pre-war log and discovered that not only did he work VK5MY that day but his very next contact was with VK5QR. Twenty-one years separated the coincidences! The 1937 QSOs were, of course, made on 14 Mc/s as the 21 Mc/s band was not then an amateur allocation. VE3BWY hopes soon to apply for his second EDXC. The first was obtained under his G call more than 10 years ago.

#### The Twenty Metre DX

Twenty still provides the biggest selection of DX, especially for c.w. types and G3KZR (Cambridge), who is at the University, found inter-TV periods in the afternoons produced an outstanding crop of stations. Some, like

FB8ZZ, KP6AL and UJ8KAA just would not respond, but UH8KBA, XW8AI, VS9AD (11.30), VS6EC (Ted, at R.A.A.F., Sai Wan), VK and PY were worked on the key. Ian thinks it would be of great help if international contests were included in *Contests Diary*. Not only would this obviate the need to sort through masses of BULLETINS, but the announcement could act as a salutary warning to non-interested members that either the phone or c.w. bands were going to be cluttered up on such a date, thus enabling them to take appropriate action!

**G3FPK** (London, E.10) had a go at the P.A.C.C. Contest and the "M" affair. He has polished off the W.A.S.M. 11, concerning which he says that those needing Orebo, Lan "T," should look out for SM4BDX. New ones on c.w. were JT1AA (RST 589, 22.45), CT3AB and K5HYB (Arkansas), with TF3AD/3 (Addi, an 18-year-old at a Reykjavik Radio School.) 4S7KD was a welcome QSO at 22.30. Ken is at R.A.F. Negombo and is looking for Gs.

**A.1399** (Prestwich) logged XZ2KN (20.40) at S9 plus and he heard HZ1TA and KG11B, both on s.s.b., while **B.R.S. 20106** (Petts Wood) enjoyed the voice of YL UB5KCA (Sasha); he mentions KH6KH, who uses a three-element quad. On s.s.b., interesting ones were KH6AJF, KL7AFR, VS4JT, VS2DT, 9K2AM and VE3MR/HR (who has also probably been signing /HK0 by now). On c.w., Norman was pleased to pull through VS1BB/VS9 and, at last, the difficult ZC3AC—two new ones for him. FB8XX had an echo on him at 11.15Z on May 3. Also on c.w. were ZD7SA (so apparently he is widening his scope, or is it just another misguided imitator?) KX6BG (16.00), VK0TC (19.00), KP6AL (08.15), KW6CO and KW6EVK (09.00), ZM6AS, ZK1AK, VQ8AJC (15.30), FO8AC, DU1RTI, CR9AH (21.00) and FB8YY (07.40, high end), making as nice a collection as one could wish. **B.R.S. 20317** (Bromley) had a wonderful month, with four new ones. Bill's additions on 14 Mc/s were VS1BB/VS9, ZC3AC (108, 15.50 to 17.00) and VR3A (020 and 032, 11.00 and again at 17.30), while he too logged ZD7SA (092, 19.15), CP3CD, ET3PRS (17.10), FZCA/FC, FL8AC, FP8AP, FO8AC, HSIC, UA1KAE/6 (Vostok Base, Antarctica), VP8BJ (S. Georgia) and ZK2AD (075, 18.00) help to show how Bill has 40Z-190C on 14 Mc/s c.w. only this year. (And his grand total is now some 247 C.). **B.R.S. 20104** (S. Harrow), another expert decipherer of Morse, logged ZC3AC and already has his

## Frequency Predictions for July 1958

PREPARED BY J. DOUGLAS KAY (G3AAE)

BAND	NORTH AMERICA East Coast	NORTH AMERICA West Coast	CENTRAL AMERICA	SOUTH AMERICA	SOUTH AFRICA	NEAR EAST	MIDDLE EAST	FAR EAST	AUSTRALIA	ANT-ARCTICA
M.U.F.	22.5 Mc/s 2100	19 Mc/s 1900	27 Mc/s 2000	28.5 Mc/s 1900	30 Mc/s 1400	27 Mc/s 0630	26 Mc/s 0800	24 Mc/s 0800	25 Mc/s 2215 LP	28 Mc/s 1900
29 Mc/s	2100	1900	2000	1800/2030	0830/1830	0630	0800	0800	2215 LP	1900
21 Mc/s	1700/2330	1900	0600/0230	1030/1200 1800/0200	1330/2300	All Day	0500/0630 0930/2300	1100/2100	1000/1300 SP 2200/0000 SP 0600/0930 LP 2130/0130 LP	1700/2200
14 Mc/s	2100/1130	0630/0830	2200/0830	2300/0900	1700/0500	1500/1000	1630/0100	1700/2300	0000/0900 LP 1500/0000 SP	2130/0000
7 Mc/s	0500	0800	0500	0400	0000	2000/0400	0000	0000	2000 SP	0400
3.5 Mc/s	0500	0800	0500	0400	0000	2300/0100	0000	0000	2000 SP	0400

These predictions are based on information provided by the Engineer-in-Chief of the Post Office. All times are G.M.T.



QSL, via Frank of VS1FJ. Incidentally, VS1FJ, with 25 watts to a ground plane, is only one S point weaker than another VS1 who runs 450 watts! Apart from the ZC, Goff heard KP6AL, FB8XX ('030, 1620), KX6BP ('110, 15.30), KB6BJ ('080, 11.00, RST339) and ZS2MI ('100, 16.30, RST588). ZC3AC was on about 14110 c.w. and phone, but the A3 was unreadable. Other gossip is that VK9XM may possibly be on ZC3; PY0NA (Trinidad) is pending; C3AL is reported on Formosa and KP6AK on Jarvis. Finally, Goff says certain foreign stations should be asked to pass a "Listener's Test" before their licences are renewed! We agree, but we wouldn't confine it to foreign stations, either!

**B.R.S. 21279** (Birmingham) goes to 39Z-185C with no "phonies and no Z19 UAs," as he puts it! Big event of the month was the arrival of HVICN's card and a QSL arrived from GB3SP, dated 31.7.58, a credit to Martin's crystal ball front-end! News is that the PY0NA trip is postponed but that a ZL2 is going to Kermadec and that VK2AR is going to Lord Howe Is., which now counts for DXCC. **A.1416** (Bristol), who is but 14 years old, logged 3A2BF, HZ1SN, KG4AA, VK5, VK7, KH6 and ZL on A3. Julian says ZL1ABX seems to be on the band with a weak signal. (Weak or no, if he's there, he'll surely be heard!) **B.R.S. 21762** (Loughton) reports the V.O.A. floating radio station *s.s. Courier*, which is based on Rhodes, is ready with a shore-based amateur transmitter for QSOs and, of course, traffic! Vernon hears from an ex-EA9 that some EA9s—at least those in Tetuan—have become CN9s, owing to a change in territorial government. 4UZA, the new U.N. station in Geneva, may be given country status. (We most certainly hope not—Ed.) The operators can work only from the U.N. Building.

**A.1373** (London, N.W.7) is up to 91C confirmed on phone, and is looking forward to his 100 shortly. Meanwhile he hears *s.s.b.* from KC4USA, 'USK, 'USV, 'USW, 9G1BF, VQ4EO/MM, ZS1 and W7QES, '7JOE. **B.R.S. 2292** (Hounslow) remarks on the W6 and W7 signals during early mornings. VE7 and 8 are there on c.w. and additionally Charles logged XQ8AG (06.00), CR4AH, XE3BL (06.00), with lots of VK, ZL, KH6 and KL7.

#### The Fifteen Metre DX

Phone still holds something of a lead here, and **G3BHJ** (Norwich) worked VS1BB, VQ3DQ, VP8CQ (Deception Is.). VP4MM, VP6 etc., plus some c.w. in JT1AA, '1YL and KR6AK. One solid QSO was with MP4BBL. Not only did he sound as if he was in the shack—he was in the shack, while visiting his native Norwich. Gerry is returning to Bahrain, full of praise for *s.s.b.* and he swears that future MP4BBL QSO's will be c.w. or *s.s.b.* only!

**G3FPK** settled for new ones UD6DD and a YO, for a band total of 62, then copied *Sputnik III* sending "L" (RST326!).

**G3ATU**, who has an intense dislike for long calls (and callers), raised CR9AH with a "one times one" and is now feeling delightfully smug!

**B.R.S. 20106** heard KW6CB (1045), KB6BJ (14.16) and VR3A (08.30) for good ones on the key, then turned to phone for KX6AF (12.00, waiting for the rain to stop!), ZS81 (17.40) and HL9KT (09.00). **B.R.S. 20317** heard VR3A on c.w. and phone, logged ZS81 for a new one, then heard FB8XX ('080, 11.30), KM6BK, VR2DG ('060, 08.30) and VK0AT on c.w. **B.R.S. 21279** logged new ones SV0WN (Crete), PZ1AG and VS1HX on A3, while that mode netted **B.R.S. 20135** (Newport, I.O.W.), HS1E, VP8DG, '8DK, '8CQ, FB8BL, DU7SV, YS1MS, VS1, VK and ZL. **B.R.S. 21762** heard KM6BK, KL7WI and OH0NA (Aaland Is.) on A3, and **A.1373** logged VU2LQ, VP8CQ and HL9KT. **B.R.S. 2292** found ET3XY, VP2KM, '2GC, VK, VQ2, '3 on phone and he pulled in EL1S, FB8XX, HR1VS, OR4OR, VS9AO and lots more on c.w.

#### The Other Bands

This time we can group ten with "the others" and so to **A.1399**, with 9K2AP, VS9AP and VU2CQ on ten. **B.R.S. 20135** tuned ten phone for VP3HAG, ZL, VK, VU2PS, W2DUM/MM (Bay of Bengal), VE3BQL/SU and VP8s 'CC, 'CV and 'DE. **B.R.S. 21762** logged 15PH on ten and **A.1373** used the band to hear CR9AK, UA0LA, EL1G and ZD3.

**B.R.S. 3003** (Battle) noticing the dead E/W path, benefited from openings to CR6CA, VP8CV (Box 182, Port Stanley, Falklands, heard at 20.00), VK9BS (16.30), KR6SO (09.00), ZS8O (14.00), ZD2NNW and ZD3E, all on A3.

**B.R.S. 20317** logged CE3AG (00.15)—on 3501 kc/s, that's DX, while **B.R.S. 2292** heard YU1IJK and some OKs on one-sixty (20.30—21.30 G.M.T.). Interesting.

**G3BHJ** missed ZS81 on ten phone. He called "CQ" and some ZSs remarked on the colossal G QRM calling him, but CT2AH, DU6IV, VK9DB, VS1AF, EA8, OD5, OQ5 and ZL were worked, as also was ZS6OY on *s.s.b.* The ZS says he does not get many customers on ten metres *s.s.b.* **G3BHJ** finds a move into the U.S. phone band pays when the DX is working Ws. VQ3DQ (who said "brave man") and VP4MM were both worked by this subterfuge.

Finally to **G3FPK**, who worked an EA2 on eighty, then moved to forty for new ones OX3AY, YK1BA (a good catch) and a GC.

So ends a *M.O.T.A.* which shows the seasonal trend towards fifteen and twenty which will doubtless continue for a month or two—then watch out. When ten opens in the Autumn, things should hum as never before. Meanwhile, good hunting to you all and please mail reports for the July issue to arrive by June 18 and for the August issue by July 10 if at all possible. Cheers and 73.

#### LONGLEAT MOBILE RALLY

Longleat House, near Warminster, Wiltshire

(Entrance 2 miles west of Warminster on the A362 Warminster-Frome main road)

Sunday, June 15, 1958

Full details in May issue

Organized by the City and County of Bristol R.S.G.B. Group.

#### HARLOW MOBILE RALLY

Magdalen Laver Village Hall, near Harlow

Sunday, June 22, 1958

Refreshments available. Car Park.

#### RALLY STATIONS

G3ERN/P—1980 kc/s G3JMA/P—144.8 Mc/s

Organized by Harlow and District Radio Society.

#### STOCKPORT AND SOUTH MANCHESTER RALLY

Capesthorpe, near Wilmslow, Cheshire

(Seven miles south of Wilmslow on the main London-Manchester A34)

Sunday, July 13, 1958

Capesthorpe Hall, a house in the Jacobean style, is the seat of the Bromley-Davenport family. The apartments contain a wealth of paintings, china, silver and Americana, Greek vases and Etruscan jewellery. There is a special exhibition of Lilian Lunn Miniature Figures. Luncheons and teas available in the verandah café.

#### RALLY STATIONS

will be in operation on Top Band, 80 and 2m.

Organized by South Manchester and Stockport Radio Clubs



# I.G.Y. News

## Sputnik III

THE third Russian earth satellite was released on May 15, 1958 and placed in an orbit inclined at approximately  $65^\circ$  to the equator. *Sputnik III* weighs about  $1\frac{1}{2}$  tons, is cone shaped and said to be 11 ft. long and 5 ft. in diameter. From a photograph published in *Pravda*, the satellite appears to have four "hand rail" type aerials projecting from the sides of the cone. There are several other protruding rods that could be radio aerials but so far no definite information is available on the radio/telemetry equipment carried.

The R.S.G.B. programme covering *Sputnik III* was decided in advance, following consultations with The Royal Society I.G.Y. Artificial Satellite Subcommittee. The intention of the programme was to concentrate only on recording telemetry signals and the reception of beyond-the-horizon signals. For this purpose two tape recording groups were formed, one in London and the other in Wallasey. It was assumed in advance that the telemetry would be of the simple dashing form used in *Sputniks I* and *II*. It was decided that this telemetry would be recorded and reduced to sets of figures indicating dashing rates and mark/space ratios. The information would then be sent through The Royal Society to the World Satellite Data Centres in Washington and Moscow.

In point of fact, a new form of telemetry has been used in *Sputnik III*. The signals being radiated on 20.005 Mc/s sound, if equated to Morse characters, like L or E R or F depending upon the individual observer's interpretation. It is not known if this is, in fact, telemetry or whether it is only an identification signal. Certainly there appear to be variations in the keying, but this could be due to the mechanism. It has been suggested that there may be a command-type telemetry equipment installed which transmits information back to earth only when interrogated by a ground station. An attempt has been made through official channels to seek further information which at the time of writing, is not available.

One of the first observers to hear *Sputnik III* was G3GQK of Forest Hill, London, S.E., who received signals at about 10.30 a.m. and had a tape recorder working by early afternoon. Immediately the London and Wallasey recording groups were alerted and the following observers have been taking recordings.

London:—G3GQK, G3HSC and G3IIR.

Wirral:—G2AMV, G2HOF, G3AKW, G3BOC, G3FRT and G3LCI. G2FNI has commenced transmitting recordings on to paper tape to enable initial measurements to be made. A full analysis of the recordings will be commenced as soon as further information is available.

## U.S. Satellites

From Peter Carey, ZE5JJ (Salisbury, Southern Rhodesia) come details that several local amateurs have been receiving signals from the three U.S. Satellites, *Explorer I*, *Vanguard I* and *Explorer III* when over Capetown some 800 miles away from Salisbury. The equipment employed is generally a low-noise converter feeding into a communications receiver with aerials varying from dipoles to six element Yagi arrays.

By G. M. C. STONE (G3FZL)\*

R.S.G.B. I.G.Y. Co-ordinator

The Salisbury group has collected a considerable amount of data and taken Doppler measurements. Ranges up to 4,000 miles have been achieved. One error in the March BULLETIN concerned the operating frequency of the U.S. satellites. The two transmitters carried radiate on 108 and 108.03 Mc/s (not 108.3 as stated previously), the 108 Mc/s transmitter being high power (about 60 mW) and the 108.03 Mc/s being low power (about 10 mW) and used for tracking purposes. The low power transmitter in *Vanguard I* is operating from solar batteries and will therefore operate indefinitely when in sunlight. This satellite is not expected to enter the Earth's atmosphere before 1963 and will thus be responsible for some "space QRM" (already experienced in America) for many years to come. (For details of all satellites placed in orbit to date, excluding *Sputnik III*, see *Discovery*, May 1958.)

According to PA0BL, PE1PL (The Hague) has also been receiving satellite signals on 108 Mc/s and some very interesting anomalous propagation has been observed when a satellite has been beyond line-of-sight. These remarks should provide sufficient encouragement to U.K. amateurs to take part in what ZE5JJ describes as a most absorbing field of investigation.

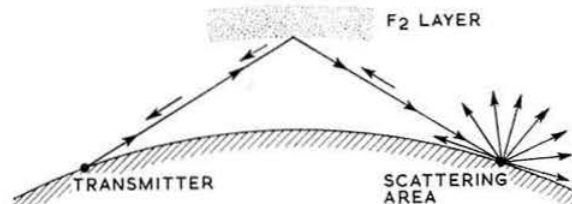


Fig. 1. F<sub>2</sub> layer back-scatter.

## Aurora

At the V.H.F. Convention held in London on May 17, 1958, Dr. Kaiser, a leading authority on radio auroral phenomena, gave a most interesting lecture on his experiences at Jodrell Bank and Sheffield University concerning aurorae since 1949 to the present day. He has found that the seasonal variations of the radio aspects of aurora show a very pronounced peak period in September/October, with the expected peak around the Spring equinox non-existent. At present there does not seem to be an explanation for this, but the fact has been observed consistently since 1949. Dr. Kaiser also feels that the visual auroral frequency curves due to Fritz (see R.S.G.B. BULLETIN December 1957) are subject to wide variation since there is a tendency to record impressive visual phenomena rather than the average.

These results align very well with the experiences of amateurs in the past year. There are indications that the peak auroral activity during September 1958 will be even greater than last year and it is therefore essential that as many observers as possible take part in, and report on, these expected aurorae. The results obtained by amateur communication are particularly valuable since all the official studies of radio

\* 10 Liphook Crescent, Forest Hill, London, S.E.23

auroral propagation in the U.K. are being made with radar type equipment which, of course, means that the receiving and transmitting sites are one and the same. However, amateur results provide additional information on the nature of the aurora in that the signal spread, both North/South and East/West may be observed. It is particularly important to try to find the beam heading for optimum signals. Results to date indicate that for early morning aurorae beam aeri- als need to be pointed West of North, whilst for afternoon and night time aurorae beam aeri- als need to be pointed East of North. Daily variations indicate that times of minimum auroral activity are around midday and 9 p.m. in the evening whilst maximum activity occurs during the late afternoon and just after midnight. Dr. Kaiser has found that maximum visual activity occurs around the time of minimum radio auroral activity, i.e. around 9 p.m. only (since aurorae cannot be seen in daylight).

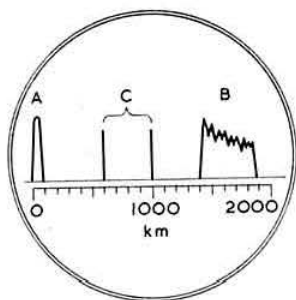


Fig. 2. Cathode ray tube display of auroral echo. A—transmitter pulse; B—F<sub>2</sub> back-scatter echoes; C—region where auroral echoes will be observed since they occur in the E region of the ionosphere i.e. around 100 km in altitude.

Apparatus for continuous monitoring for aurora has been set up at Sheffield. This equipment consists of a pulse transmitter operating in the 18 Mc/s band having a repetition rate of 25 p/s. and a pulse width of 100  $\mu$ -secs., a stable communications receiver and continuously photographed cathode ray tube display. The station is usually unattended and thus the results are checked when each roll of film has been developed. The aeri- als used are either a half-wave dipole mounted one half-wave above the ground, beaming North/South, or rhombic aeri- als pointing North. Under normal atmospheric conditions F<sub>2</sub> layer back-scatter is present at ranges of about 1500 km. Meteor and auroral echoes show up in the space on the cathode ray tube between the transmitter pulse and the F<sub>2</sub> return (see Figs. 1 and 2). Of particular interest to observers is the fact that it is possible to tune in to these transmissions, and employing apparatus no more complex than a good communication receiver and an oscilloscope with time base suitably adjusted, a check can be kept for auroral propagation. Such apparatus is shortly to be set up in London, but observers in the Sheffield area are in the best position since they will be able to receive the transmitter ground wave and use this to trigger the time base of an oscilloscope, this having an excellent "A" type radar display. In practice the transmitter is adjusted in frequency to find a "hole" in the 18 Mc/s band, and therefore a little searching will be necessary to find the signal. Reports will be welcomed of any results achieved in this way.

(Editor's note: Dr. Kaiser has agreed to write an article for the BULLETIN on Auroral Propagation).

#### V.h.f. Beacon Stations in Holland

PA0BL, of PE1PL, who was also present at the V.h.f. Convention, spent the following day discussing many different aspects of v.h.f. radio with G2FKZ, G3FZL and

G3HBW. It is apparent that many Netherlands amateurs feel that there is very poor activity within the United Kingdom in the same way that U.K. amateurs do not often hear PA0 amateurs. However, PA0BL has given details of three v.h.f. beacon stations operated by the Dutch Post Office in the 2m band basically for propagation experiments with PE1PL. If these stations can be received in the U.K., it should also be possible to contact PA0 stations since each beacon transmitting power is of the order of 40 watts and aerial gain 10 db. The particulars of these stations are:—

Call-sign	Location	Frequency
PA5A	Hengelow	145.805 Mc/s
PA5B	Nr. Groningen	145.965 Mc/s
PA5C	Nr. Maastricht	145.898 Mc/s

The operating schedules are as follows:

09.30—10.15	} Central European Time. (i.e. same as British Summer Time) 7 days per week.
11.30—12.15	
15.30—16.00	

The stations do not radiate a call-sign, hence accurate frequency measurement is the only means of identification. However, this can be accomplished by using, for example, a BC221 frequency meter. Reception reports should be included on the usual I.G.Y. reporting forms.

#### V.h.f. Beacon Stations in the U.K.

Plans are being made, subject to G.P.O. approval, to set up one or two beacon stations in addition to GB3IGY. GM3DIQ has almost completed arrangements for a beacon to be operated from the Rolls Royce works at East Kilbride, Lanarkshire. Such a station will be invaluable for both auroral and tropospheric propagation experiments and further details will be published later.

It is hoped to set up stations, in the West Country and another in Scotland. This complete system of beacons will provide a service to the greater part of the U.K. and should result in greatly improved v.h.f. activity.

#### Late News

The Royal Society has received a cable from the Soviet I.G.Y. Committee Vice-president (Professor Boulanger). This cable suggests that the signals on 20.005 Mc/s contains all the telemetry information being transmitted. More details will be published next month.

An auroral opening took place on May 31/June 1 between 22.00 and 02.30 B.S.T. G3JZG (Willenhall) contacted GM3EGW and GM3HLH/A but reported that in general activity was low. No I.G.Y. alert was in force at the time.

#### Not Original

MR. J. M. GALE (G3JMG) points out that the verse entitled "Don't Fool Around with H.T." and credited to B.R.S. 21236 which was published in the May number of the BULLETIN appeared many years ago in *Practical Wireless* under the title "Epitaph."

#### Taylor Electrical Instruments Ltd. Price Correction

THE price of the Taylor Electrical Instruments Ltd. Model 122A Universal Testmeter advertised on page 498 of the May number should have read £9 5s.—or nine equal monthly payments of £1 3s. 2d.

#### Royal Signals Hamfest

AN informal Hamfest is to be held during the Royal Signals "At Home" and Old Comrades Reunion at Catterick Camp, Yorkshire, on June 28 and 29, 1958. Those interested in the proposal are invited to write immediately to F. Allan Herridge (G3IDG), 95 Ramsden Road, London, S.W.12.



# Better Efficiency from Multiplier Stages on 10 metres

By D. T. BRADFORD (VQ4EV, ex-G3GBO)\*

THE transmitter at VQ4EV started life using a chain of 5673s as frequency multipliers from 7 Mc/s crystals or a v.f.o. with output on 3.5 Mc/s. Adequate drive was obtained on all bands, with the exception of 10m. On this band there was a considerable reduction in grid current to the 829B final, the tetrode sections of which are in parallel. The original circuit used is shown in Fig. 1. All stages are broadly pre-tuned, with the exception of the p.a. grid, which is peaked by means of a small variable condenser brought out to the front panel.

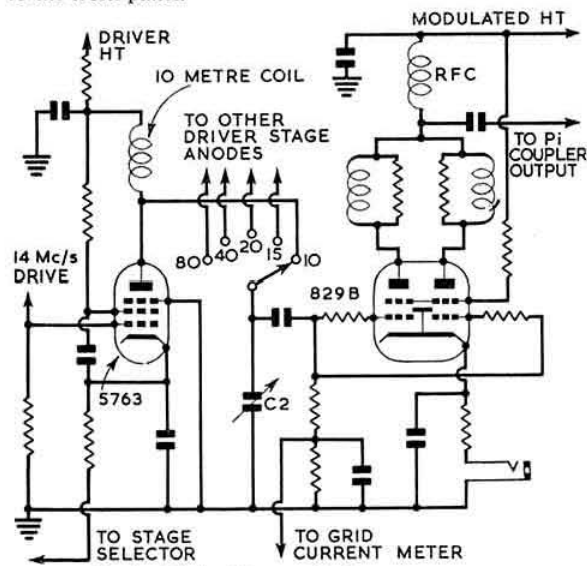


Fig. 1. Original 10m. multiplier and p.a. stage.

The lack of drive was caused by two factors, the first being plain h.t. starvation when all exciter stages were running. Now this may sound like bad design, but it should be remembered that in Kenya good mains transformers are not quite so readily available as in London, and it was a case of using what came to hand! This point may seem irrelevant, but as frequency increases, valves become more noticeably affected by small changes in supply voltages. This is particularly the case with heater supplies. The second cause was poor circuit design. (After working on v.h.f. one becomes rather blasé about "i.f." band coils!) On careful examination it was revealed that the 10m p.a. grid (doubler anode) coil was about the same size as the 2m final coil for a QQV06-40, so it was resolved to apply v.h.f. techniques to the problem in an attempt to get greater efficiency from the doubler stage.

The first idea was to use a split stator tuned circuit, but this would have tended to be unbalanced by the p.a. grid tuning condenser. The natural evolution of this idea was to use a pi-section coupling between the doubler anode and final grid. This proved most efficient. C1, a 50 pF pre-set variable condenser, was connected from the 5673 anode to earth, while the existing p.a. grid capacitor formed the

"output" condenser of the pi network. (See Fig. 2.) By juggling with the two variables a position was found giving maximum grid current on 29 Mc/s. C1 in the 5673 anode was then left pre-set whilst C2, the p.a. grid tuner, was peaked at the various frequencies in use. The coil was just about double the size required for the original arrangement and the grid current into the 829B was nearly doubled! Furthermore, the tuning system in use on the other bands was not affected in any way. Another slight improvement in drive was obtained by making all earth returns between the 5673 and 829B of copper tape to reduce stray lead inductance.

This method of coupling has also been tried out on 15m with a 5763 trebler from 40m. While the increase was not so spectacular, it was of the order of 50 per cent greater than before and well worth while in any transmitter lacking drive on 21 Mc/s.

No tests regarding TVI have been carried out, although it is quite probable that pi-section interstage coupling would

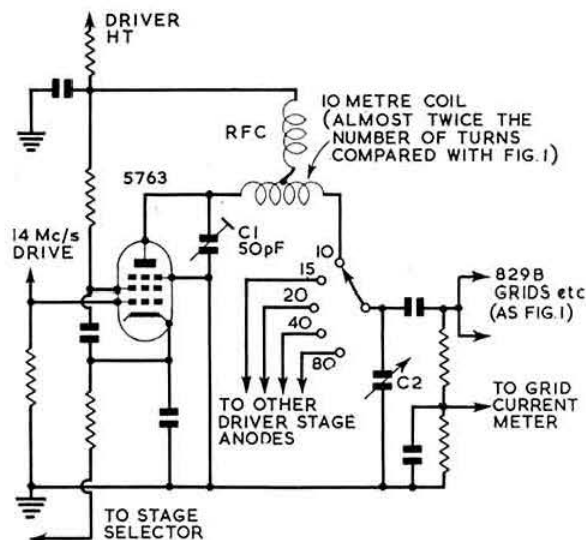


Fig. 2. Modified circuit to provide pi-coupling between the stages.

considerably reduce the harmonic output of a multiplier stage when compared with ordinary conventional parallel tuned circuits and coupling condensers.

It is possible that the reader's driver stage is not so inefficient on 10 or 15m as in the case of the writer, but even so, if you are a bit short of final grid current, this method may well show a desirable increase in drive for very little trouble.

## GUIDE TO BROADCASTING STATIONS

Lists Long- and Medium-Wave European Stations, Short-wave Stations of the World by Frequency and Geographical Location, U.K. Television and V.H.F. Sound Transmitters, Standard Frequency Transmitters. Other useful information includes a Standard Time List, International Allocations of Call-signs and Short-wave Broadcasting Bands.

Available from

**R.S.G.B. HEADQUARTERS**

Price 3/- Post free

\* P.O. Box 30175, Nairobi, Kenya.



# Society News and Proceedings

## Bulletin Technical Articles New Reprint Service

ARRANGEMENTS have been made with the Elmbridge Duplicating Service of Surbiton Hill, Surrey, to reproduce by a special duplicating process certain outstanding technical articles which have appeared in back issues of the R.S.G.B. BULLETIN now out of print.

The following articles are now available:

"Improving the War-surplus HRO Receiver," by E. H. Trowell, G2HKU. Price 1/- post free.

"The R.S.G.B. Two Metre Converter," by W. H. Allen, M.B.E., G2UJ. Price 1/3 post free.

### R.S.G.B. QSL Bureau—Important Notice

The R.S.G.B. QSL Bureau will be closed from Friday, July 18, to Tuesday, August 12, inclusive. Members are asked not to send cards or correspondence to the Bureau which would normally be delivered between these two dates. Envelopes for the collection of incoming cards should be sent direct to the appropriate Sub-Managers as usual.

### Region 8 Representation

THE Council has been pleased to appoint Mr. E. R. Dolman (G2DCG), 20 Canterbury Road, Westbrook, Margate, Kent, to the vacant office of Region 8 Representative. Region 8 comprises the county of Kent outside the London Region and Sussex.

Mr. Dolman, who has been a member of the Society for more than 20 years, is currently Vice-Chairman of the Isle of Thanet Radio Society. He has in past years served as the R.S.G.B. Representative for the Isle of Thanet.

### The Scheme of Representation

THE Council has decided to place on record that they agree in principle with canvassing at elections and for that reason they do not wish to lay down rules governing the election of representatives which would forbid canvassing.

The Council has decided, however, that voting cards shall not be returned to the candidate for bulk posting to Headquarters.

### Badges for County Representatives

THE Council has agreed that a distinctive lapel badge shall be made available to County Representatives. The badge will include the member's call-sign (or B.R.S. number) and the words "County Representative." C.R. badges can be ordered from Headquarters price 8s. each, post free.

### "A Guide to S.S.B."

THE General Secretary will be pleased to hear from any technically competent member who would be prepared to undertake the preparation of material for a new Society publication to be called *A Guide to S.S.B.*

There is an increasing need for authentic information on single sideband operation, especially among more recently licensed amateurs. An up-to-date Guide to S.S.B., based on British practices would go far to satisfy that need.

### TVI/BCI Committee

IN the list of members of the TVI/BCI Committee published in the May issue of the R.S.G.B. BULLETIN, Mr. D. Deacon's call-sign should have read G3BCM.

## Old Timers' Dinner

FURTHER to the announcement published in the April 1958 issue of the BULLETIN, arrangements have now been made to hold an Old Timers' Dinner at The Horse Shoe Hotel, Tottenham Court Road, London, W.C.1, on Friday, October 10, 1958. The Horse Shoe Hotel was the venue chosen for the 1948 dinner.

The cost of the dinner, including service, will not exceed 25/- and lounge suits will be worn. The dinner will be open to any radio amateur who has held a full licence issued by the United Kingdom Postmaster-General continuously, including the war years, since January 1, 1933.

Those who wish to attend the dinner should send a stamped addressed envelope to Mr. John Clarricoats, O.B.E. (G6CL), 16 Ashridge Gardens, Palmers Green, London, N.13, for further details. Mr. Clarricoats is arranging the dinner in his private capacity but with the knowledge and approval of the President of the R.S.G.B. (Mr. L. E. Newnham, G6NZ).

Mr. Newnham and seven past Presidents are among the 60 old timers who have already expressed their intention of attending the dinner.

## Overseas Licences

HEADQUARTERS is often asked for information on obtaining amateur licences in Commonwealth countries and in the colonies. In order to augment and correct information already on file at Headquarters, overseas members are invited to write to the General Secretary giving details of the procedure in their countries, indicating particularly the name and address of the licensing authority and whether or not British subjects are eligible for licences; if so, whether possession of a U.K. licence is sufficient qualification.

## National Radio Show 1958

THE Exhibition Committee will be pleased to hear from members willing to do stand duty on the Society's stand at the National Radio Show to be held in London from August 26 to September 6. Offers, indicating dates and times available, should be sent direct to G. W. Norris (G3ICI), 134 Meads Lane, Ilford, Essex.

## Mr. H. A. Bartlett (G5QA)

AS from June 30, 1958, the address of Council Member Mr. H. A. Bartlett (G5QA) will be "White Ladies," Cheyney Gate, Pinhoe, near Exeter, Devon. Mr. Bartlett's new telephone number will be Stoke Canon 345.

## MSF Transmissions

MEMBERS may obtain copies of a new leaflet describing the standard frequency transmissions from M.S.F. by sending a stamped addressed envelope to the Director, National Physical Laboratory, Teddington, Middlesex.

## Changes of Address

When notifying Headquarters of a change of address, Society Representatives should state clearly that they are Representatives. Frequently a change of address is received and entered on a member's record card but as no mention is made in the notification that he is a Representative the master file of Representatives is not corrected.

**Present:** The President (Mr. L. E. Newnham, in the Chair); Messrs. H. A. Bartlett, N. Caws, C. H. L. Edwards, W. J. Green, J. H. Hum, E. G. Ingram, W. R. Metcalfe, A. O. Milne, W. A. Scarr, A. C. Williams, E. W. Yeomanson, John Clarricoats (General Secretary) and John A. Rouse (Deputy General Secretary).

**Apologies for Absence.** Apologies for absence were submitted on behalf of Messrs. W. H. Allen and F. Hicks-Arnold.

**Absent:** Messrs. D. A. Findlay, R. H. Hammans and H. W. Mitchell.

#### **Finance**

**Resolved** (i) to receive and adopt the Cash Account for March 1958 as prepared and submitted by the Secretary; (ii) to receive the Financial Statement for the nine months ended March 31, 1958, as prepared and submitted by the Honorary Treasurer.

#### **Reports of Committees**

**Resolved** (i) to receive as Reports the Minutes of Meetings of the Contests, Membership and Representation, TVI/BCI, and Exhibition Committees and the Handbook Sub-Committee. (ii) to accept recommendations of the Contests Committee in respect to various contests; to request the Contests Committee to consider arranging an all-bands short duration transmitting Contest for the benefit of members who have been licensed for not more than two years. (iii) to consult the Society's legal advisers in regard to the interpretation of Article 13 of the Society's Articles of Association (Admission of Members). (iv) to make a payment of twenty guineas to the artist responsible for preparing an essay and finished drawings for the production of blocks for the Handbook jacket cover. (v) to approve terms of reference for the TVI/BCI Committee. (vi) to accept recommendations of the Exhibition Committee in respect to the Society's participation in the National Radio Show and the Radio Hobbies Exhibition; to authorize the Committee to prepare suitable technical data sheets for sale at forthcoming exhibitions.

#### **Membership**

**Resolved** (i) to elect 162 Corporate members and 20 Associates. (ii) to grant Corporate membership to three Associates who had applied for transfer.

The Secretary reported that 94 of the 675 members whose subscriptions became due on January 1, 1958, became 3 months overdue on March 31, 1958, and that 18 of the members concerned had written to resign.

#### **Application for Affiliation**

**Resolved** to grant affiliation to the Aldershot and District Amateur Radio Society.

#### **O.R.M.s.**

(a) **Resolved** (i) to authorize the Region 5 Representative to hold an O.R.M. in Cambridge on June 29, 1958. (ii) to authorize Messrs. Hum, Milne and Clarricoats to attend the O.R.M. as representatives of the Council. (iii) to authorize the Region 5 Representative to organize a raffle in connection with the O.R.M.

(b) **Resolved** (i) to authorize the Region 2 Representative to hold an O.R.M. in Bridlington on September 21, 1958. (ii) to authorize the Region 2 Representative to organize a raffle in connection with the O.R.M.

### **Representation**

THE following is an addition to the list of Regional Representatives published in the December 1957 issue:—

#### **REGION 8**

E. R. DOLMAN (G2DCG), 20 Canterbury Road, Westbrook, Margate, Kent.

The following are additions to the list of County Representatives published in the December 1956 issue:—

#### **REGION 3—STAFFORDSHIRE**

C. D. BARLOW (G3HGI), "Domus," Moss Grove, Kingswinford.

#### **REGION 9—DORSET**

A. A. BARRETT (G5UF), "Glenelg," Radio Station Houses, Dorchester.

The following are additions to the list of Town Representatives published in the December 1957 issue.

#### **REGION 5—HERTFORDSHIRE**

Stevenage & District  
V. CUNDALL (G3FAU), 23 Shackledell, Stevenage.

#### **REGION 6—BUCKINGHAMSHIRE**

High Wycombe  
P. M. CARMET (G5WW), Nethercote, Totteridge Lane.

#### **REGION 6—GLOUCESTERSHIRE**

Cheltenham  
J. J. YEEND (G3CGD), 30 St. Lukes Road, Cheltenham.

#### **News Bulletin Service**

After the Secretary had reported upon certain difficulties which had arisen in connection with the operation of the News Bulletin Service, it was

**Resolved** (i) that Mr. Metcalfe should invite Mr. B. O'Brien (Region 1 Representative) and Mr. J. R. Petty (Region 2 Representative) to suggest the names of qualified members in their respective Regions to operate the North of England 3-6 and 7-1 Mc/s News Bulletin Service on rota with the members already appointed. (ii) that Messrs. Milne and Yeomanson should consult together with a view to suggesting the names of qualified members in the London Region to operate the South of England 3-6 and 7-1 Mc/s News Bulletin Service on rota with the members already appointed.

It was also agreed to enquire from two members in the London Region whether they would be prepared to join the rota of operators for the South of England V.H.F. News Bulletin Service.

#### **I.E.E. Lecture Programme**

**Resolved** that a lecture programme be arranged at the Institution of Electrical Engineers on similar lines to previous years.

#### **Annual General Meeting Venue**

**Resolved** to hold the Annual General Meeting on Friday, December 12, 1958, in the St. Andrew's Hall of the Over-Seas League, Park Place, St. James's Street, S.W.1.

#### **Mullard Ltd.**

**Resolved** to authorize the Secretary to organize a DX Convention at Mullard House, London, during October 1958, subject to suitable accommodation being available in the near vicinity of that building for the provision of luncheon and dinner.

#### **I.A.R.U. Region 1 Division Contribution**

**Resolved** to authorize the payment to I.A.R.U. Region 1 Division of the Society's contribution for the year 1958.

#### **Scottish I.G.Y. Station**

The Secretary reported that Rolls-Royce Ltd., East Kilbride, Lanarkshire, had agreed to allow the Rolls-Royce Amateur Radio Society to use the 100 ft. mast at their factory as a support for a v.h.f. aerial; the society having agreed to operate a v.h.f. station in connection with the R.S.G.B. I.G.Y. programme.

**Resolved** to authorize the Secretary to apply to the G.P.O. for the necessary authority which will enable the Rolls-Royce Amateur Radio Society to take part in the Society's I.G.Y. programme.

#### **Nottingham O.R.M.**

The Secretary was instructed to bring to the notice of the Council at its May meeting any matters of policy that were discussed at the Nottingham O.R.M.

#### **Bristol Meeting**

A resolution passed at a recent meeting of Bristol members concerning a *Current Comment* published in the April 1958 issue of the BULLETIN was submitted.

The Secretary was instructed to bring the resolution to the notice of the Council at its May meeting.

*The meeting terminated at 10 p.m.*

#### **CHANGE OF ADDRESS**

The address of Mr. T. Darn (G3FGY) representative for the county of Derbyshire is 44 Laurel Avenue, Ripley.

### **Affiliated Societies' Representatives—List No. 6**

THE following Corporate Member has been nominated to serve as Affiliated Societies' Representative for 1958:

NEWBURY & DISTRICT AMATEUR RADIO SOCIETY: E. Smith (G3JMT), 29 Donnington Square, Newbury.

### **PUBLICITY POSTER**

Members with a flair for poster design are invited to submit sketches for a new Double Crown Society poster. The design should focus attention on the main advantages of membership and should embrace the badge and the address of the Society.

The accepted design will be printed in two or three colours.

# The Twenty-First B.E.R.U. Contest 1958

## ZS6DL Wins Senior Event—ZC4IP Second

THE coming of age of the B.E.R.U. Contest was celebrated by amateurs throughout the Commonwealth on January 25-26, 1958 in no uncertain manner. More came on the air, made more contacts and sent in more logs than last year which was considered to be among the most successful of all previous contests. There was a rise of 25 per cent in the number of logs received, all the increase being supplied by overseas stations, the entries from U.K. operators actually being smaller than last year, in spite of the fact that nearly 350 stations in the British Isles were recorded in the logs. Canadian stations also turned out in force with over 150 on the air.

McVicar (VE2WW), was fourth with 3,339 points. The next eight places were filled by Gs, led by F. J. U. Ritson (G5RI) and D. L. Courtier-Dutton (G3FQP) with 3,165 and 3,104 points respectively.

In the Low Power Section, J. C. van Wyk (ZS6R) of Germiston, South Africa, continued his winning way with a score of 2,538 points from 264 contacts, 62 of which carried a bonus. The fight for second place resulted in D. C. Piccirillo (ZD2DCP) in Lagos, who finished 14th last year, beating E. D. Wills (ZB2I) in Gibraltar by 48 points. ZB2I, operating on 14 and 21 Mc/s only, had 288 contacts against the 203 contacts of ZD2DCP on all bands. However,

### HIGH POWER SECTION

Posn.	Call-sign	Pts.	Contacts	Posn.	Call-sign	Pts.	Contacts	Posn.	Call-sign	Pts.	Contacts	Posn.	Call-sign	Pts.	Contacts
1	*ZS6DL	4669	570	31	G3BKF	1785	109	61	VE3PE	1140	112	91	VK2AYA	785	53
2	*ZC4IP	4145	531	32	G2QT	1775	123	62	G3VW	1133	68	92	G2AOL	780	44
3	*VE3KE	3977	477	33	*VE7KX	1734	176	63	GSMR	1130	62	93	G3LET	695	31
4	*VE2WW	3339	355	34	*MP4BBE	1730	166	64	VE3IR	1130	110	94	G3VA	670	50
5	*G5RI	3165	248	35	G6GN	1675	107	65	VK5MY	1120	96	95	G6VC	655	39
6	*G3FQP	3104	242	36	G6ZY	1665	125	66	ZB1CR	1115	119	96	VE3ADV	655	51
7	G5DQ	3018	232	37	VE2DR	1661	225	67	VE2PZ	1108	108	97	G3ISV	648	38
8	G3FXB	2841	221	38	G5CP	1593	107	68	VE7MD	1096	112	98	G8DI	628	38
9	G6CJ	2698	204	39	G13AXI	1545	105	69	G3AGN	1080	80	99	VK9JF	620	36
10	G2DC	2685	197	40	GM3EOJ	1515	91	70	ZE3JO	1075	123	100	ZS4MG	590	62
11	G3HCL	2640	208	41	G2TH	1513	87	71	G2JN	1060	60	101	G2WQ	585	33
12	G3FKH	2568	166	42	VQ2AS	1500	156	72	VK2PV	1055	95	102	G3JVJ	550	30
13	*VK2GW	2475	242	43	ZL4BL	1500	212	73	G8QZ	1010	50	103	VE1YB	510	62
14	G5WP	2363	175	44	G3GGS	1475	87	74	VK2BA	1005	93	104	G3DVQ	500	32
15	*VOIDX	2350	309	45	VE1EK	1455	203	75	G3KSH	1000	60	105	G3EDJ	470	22
16	VE3API	2130	214	46	ZL1APM	1445	121	76	ZL1BJ	998	100	106	G3ASG	465	25
17	G6RH	2115	143	47	VE1PA	1420	176	77	G6GH	965	45	107	G8KU	411	29
18	G3JZK	2013	123	48	G3HZL	1350	82	78	G2PS	955	59	108	G2ZR	395	27
19	G5RP	2003	133	49	ZE5JE	1348	150	79	G3GUP	935	79	109	VE3DDU	391	35
20	VE2YU	2000	204	50	VE2AYY	1325	141	80	G3APN	915	80	110	G5IV	390	26
21	VE2NV	1995	259	51	GM3CIX	1315	94	81	VE4MF	890	50	111	G2BLA	380	16
22	G5HZ	1989	135	52	G5ZK	1255	86	82	G2AJB	890	50	112	VE5AT	370	38
23	*DL2Y	1952	221	53	G3FK	1243	65	83	ZL1RD	890	91	113	G3WP	315	15
24	G5IU	1882	122	54	G3KAD	1241	72	84	G6PJ	850	42	114	VO2AA	285	33
25	G3GKI	1870	122	55	VE1EP	1235	119	85	GM3EDU	840	80	115	VK4XW	210	10
26	VE2WA	1863	193	56	G3DBJ	1230	93	86	VE4SX	840	80	116	VK2HZ	150	10
27	G3GFG	1830	138	57	G3HBR	1210	78	87	Z56BJ	835	67	117	ZS1O	138	8
28	*VQ2RG	1829	179	58	G2DU	1188	78	88	VE3AVS	825	73	118	VE6GN	25	1
29	G3KKP	1813	135	59	VK2APK	1145	105	89	G3IQE	805	45				
30	G3EYN	1801	125	60	G3AAE	1143	73	90	ZC5AL	800	56				

### LOW POWER SECTION

Posn.	Call-sign	Pts.	Contacts	Posn.	Call-sign	Pts.	Contacts	Posn.	Call-sign	Pts.	Contacts	Posn.	Call-sign	Pts.	Contacts
1	*ZS6R	2538	264	8	VS1HX	1450	99	14	*VE7BS	950	99	20	GM4GK	441	29
2	*ZD2DCP	1994	203	9	*DL2UY	1340	148	15	*VK3ZC	920	56	21	ZC4PN	410	33
3	*ZB2I	1946	288	10	*VQ4KP	1233	87	16	*ZL1MT	775	43	22	G3LHJ	355	19
4	*GW3AHN	1735	131	11	*ZE6JE	1140	64	17	G3GNS	768	50	23	VO1DS	310	30
5	*VQ3SS	1690	182	12	VO2AB	1050	125	18	*G1BQ	755	67	24	G3GYD	275	15
6	*VS1FJ	1603	109	13	VS1HQ	1015	60	19	ZC4IK	715	102	25	VS6DX	215	31
7	*VO2NA	1508	182												

### RECEIVING SECTION

Placing	Call-sign	Points	Placing	Call-sign	Points
1	*BRS.20317	3181	7	G3EUE	2225
2	*G3JFT/HN	3119	8	BRS.21624	1775
3	BRS.19107	2819	9	BRS.2292	1720
4	BRS.20206	2550	10	BRS.19771	1525
5	BRS.15822	2515	11	BRS.20570	1280
6	BRS.6604	2395		BRS.195	795

\* Certificate Winners

† Invalid—no declaration.

### The Leading Stations

The High Power Section was won this year by R. G. Henwick (ZS6DL) of Pretoria, South Africa, with a score of 4,669 points. To gain this total he made 570 scoring contacts, 92 of them carrying bonus points. He had a lead of 524 points over G. F. Barrett (ZC4IP) who was third in 1957. Last year's winner, Victor Williams (VE3KE), was third with 168 fewer points while another Canadian, Don

ZD2DCP managed to collect 49 bonus contacts against 26 by ZB2I. T. Higginson (GW3AHN) was fourth with 1,735 points from 131 contacts on the three h.f. bands.

The Receiving Section provided a close finish with W. E. Wilkinson (B.R.S.20317) of Bromley, Kent, winning by 62 points from B. R. Dare (G3JFT/HN), stationed in Iraq with scores of 3,181 and 3,119 points respectively.

## Equipment

Once again it seems that aerials play a very great part in amassing large scores in the transmitting sections. All the leading stations have an aerial for each band, many of them rotary. As regards transmitters and receivers it is the same mixture as before: 813s or 807s still produce the energy to feed the aerials and the HRO, usually modified and with various converters for the higher frequency bands made the most of the signals picked up by the same aerials. However, it was pleasing to note that several stations had home-made receivers that gave a good account of themselves.

## Conditions

On the whole, conditions were reported as favourable. It would be very difficult, and would take up too much space to try to give details of conditions in various parts of the world as deduced from the logs but from a selection of U.K. logs it appears that 3.5 Mc/s provided very few contacts and while 7 Mc/s was a little better, activity was very low. 14 Mc/s was the mainstay of the early hours of each morning and the early evening up to about 20.00. Contacts on 21 Mc/s were made from 07.00 to 19.00 each day while 28 Mc/s was open between 09.00 and 17.00 on both days.

## HOW THE LEADERS MADE THEIR SCORES

Call-sign	Bonus Contacts per Band (3.5—7—14—21—28 = Total)	Transmitter(s)	Receiver	Aerials
ZS6DL	0—13—30—26—23 = 92	Common Exciter to separate finals on each band with 813 p.a. (100W)	NC100 (modified) with RF24 for 14, 21 and 28 Mc/s	5 element rotary (28); 4 element rotary (21); 6 element rotary (14); 2 element rotary (7).
ZC4IP	2—7—26—27—13 = 75	Command types (3.5, 7 and 14). Similar home built (21 and 28). Final two 1625 in parallel (140W) p-p. HK54's (300W)	HRO (modified)	137 ft. end fed; 14 and 21 Mc/s dipoles; rotary cubical quad (28).
VE3KE	3—8—31—25—14 = 81		SX-16	$\frac{3}{4}$ vertical (3.5); three $\frac{3}{4}$ in phase (7); 3-el. rotary (14); Bi-squares (21); stacked Bi-squares (28).
VE2WVW	2—10—29—24—13 = 78	Collins KWS1 (3.5, 7 and 14) (500W) Collins KWM1 (21 and 28) (150W)	NC 300 and KWM1	5-el. rotary (28); 3-el. rotary (21); 3-el. rotary (14); $\frac{3}{4}$ dipole (7); $\frac{3}{4}$ dipole (3.5).
G5RI	5—11—30—28—22 = 96	LG300 (mod.) (813 p.a.) (150W)	HRO (modified) with converters for 21 and 28 Mc/s	2 Vee beams and Rhombic (all bands). 275 ft. Zepp (3.5).
G3FPQ	4—8—31—30—22 = 95	813 p.a. (140W)	Double super	272 ft. centre-fed Zepp (all bands); Rhombic and 2-el. beam (14); cubical quad (21); ground plane (3.5).
ZS6R	1—5—16—28—11 = 61	VFO—Doublers—807 (24W)	RF24 (3500 kc/s I.F.)—NC200 (456 kc/s I.F.)—BC453 (85 kc/s I.F.)	Folded dipoles (7, 14, 21 and 28). 7 Mc/s aerial Marconi-tuned on 3.5 Mc/s.
ZD2DCP	1—4—19—17—8 = 49	807—807—ATP35 (3.5, 7 and 14) (25W). 6V6—807 (21 and 28) (20W)	BRT 400	Folded dipoles (7, 14, 21 and 28). 138 ft. long wire.
ZB2I	0—0—11—15—0 = 26	VFO—FD—BA—PA (25W)	HRO (Pre-war)	"ZL Special" and dipoles.
GW3AHN	0—0—10—27—17 = 54	EF91—12AU7—12AU7—807 (20W)	Eddystone S.640	G4ZU Minibeam and 21 Mc/s vertical dipole.
VQ3SS	0—0—13—15—11 = 39	VFO—807 (25W)	HRO	G4ZU Minibeam.
VS1FI	0—4—28—21—0 = 53	QVO6-20 p.a. (25W)	Eddystone 888	G5RV dipole.

Call-sign	Bonus Contacts per Band (3.5—7—14—21—28 = Total)	Receiver	Aerials
BRS.20317	6—12—35—30—22 = 105	BC348 + RF26. Converter 21/28	Windon 68' NE/SW (all bands).
G3JFT/HN	1—8—27—30—13 = 79	SX28	Dipole (14). 60 ft. wire.



## Comments

The high reputation of B.E.R.U. in its standard of operating appears to have been maintained though there were a few complaints about queue jumping on the rarer DX stations.

The logs on the whole reached a satisfactory standard but a few competitors could have been more helpful. The Contests Committee did not appreciate the 7 ft. long log from one station nor the carbon copy on each side of *thin* paper from another. The new scoring system introduced last year was again welcomed and understood by most entrants and only four or five logs had to be re-scored.

Top scoring station in the High Power Section was ZS6DL of Pretoria, South Africa. The receiver is a National NC100 converted to a double superhet with an RF24 unit preceded by two r.f. stages of another RF24. Transmitter band changing is automatically controlled by the receiver wave change switch. The transmitter, not shown in this picture, employs a common exciter with a choice of v.f.o. control or one of 14 crystal frequencies. Separate 813 finals running 90 to 100 watts input are used for each band. The latter are tuned to the middle of the c.w. portion of their respective bands and need no adjustment when the frequency is changed. Rotary aerials are used on 7 Mc/s (two elements), 14 Mc/s (four elements), 21 Mc/s (five or seven elements) and 28 Mc/s (two or eight elements).





### Check Logs

Check logs are gratefully acknowledged from G2DUP, G3CXM, G3EEM, G3FIU, G3GSZ, G3JUL, G3KAB, G6RC, G6XA, GB2SM, GM3UU, VE1DB, VE1OM, VE2RL, VE2AKF, VE3BWY, VE3BXF, VE3DLS, VE6VO, VE8AT, VE8ML, VE8OM, VK2OW, VK3HL, VK3XB, VK5JT, VQ2FC, VQ3CF, VU2JA, VU2MD, ZC4WV, ZD3G, ZL1HY, ZS2U and YO2-1584.

ZC4IP moved up to second place in the High Power Section this year, using the equipment shown in this picture. On the desk (left to right) are the BC221 frequency meter, National HRO receiver and 85 kc/s i.f. unit. To the left of the knee-hole of the desk is the v.f.o. The transmitters are on the right of the picture. The rack on which they stand houses the power supplies and modulator. On the wall are the aerial switching and aerial tuning units.

In the Receiving Section, the Contests Committee was pleased to record two more entries than last year. Once again there was evidence of carelessness in recording call-signs and also which group of figures belonged to which call-sign.

The Contests Committee takes this opportunity of thanking the many operators that sent their good wishes and also for the several offers of help in checking the logs which, for various reasons, it was not possible to accept.

### London Members' Luncheon Club

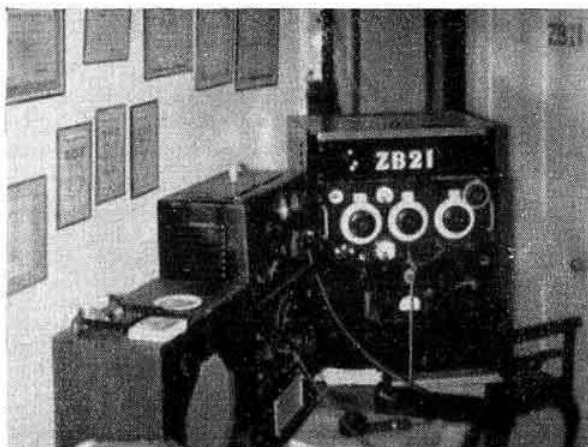
MR. DOUGLAS BOWIE, VK3DU (Federal Secretary, W.I.A.) and Mrs. Bowie were among the seven overseas visitors present at the meeting of the Luncheon Club held on May 16 at the Bedford Corner Hotel, Tottenham Court Road, London, W.C.1. Mr. Bowie brought greetings from W.I.A. and spoke of his recent meetings with representatives of the Malaya and India Amateur Radio Societies. F9CQ, accompanied by his wife and brother F8MX, were in London for the V.H.F. Convention. Other visitors included ZS1PM and ZS6AFJ. The Chair was taken by Stanley Vanstone, G2AYC. The Club is due to meet again on June 20, when a cordial welcome will be extended to visitors from the provinces and from abroad. Reservations should be made to G2FUX (Ruislip 2763) or R.S.G.B. Headquarters (HOL. 7373) by 12 noon on June 19.

### Worthing Bucket and Spade Party

THE annual Bucket and Spade Party organized by the Worthing and District Amateur Radio Club will take place this year on June 22. The meeting place will be the raised promenade, south of Beach House, Worthing, within easy reach of the Children's Playground, Boating Pool and Town Centre. G3GVM/A will be standing by on Top Band and 80m from 11.00 to 13.00 B.S.T. to guide in visiting mobiles. The local police and A.A. patrols have been informed that the event is taking place and will be able to direct visitors. Further information may be obtained from the Honorary Secretary, J. Toothill, 113 Kings Road, Lancing, Sussex.

### Hospitality in Germany

SGT. DEREK LEESE (DL2BJ) of the Royal Dragoons, B.F.P.O. 15, offers hospitality to any British radio amateur or shortwave listener passing through or on holiday in Germany. Anyone who has not received DL2BJ's QSL for a contact or report is asked to write to the address given above.



ZB21 was third in the Low Power Section of the 1958 B.E.R.U. Contest. The equipment shown in this picture comprises the transmitter on the right consisting of an 807 v.f.o., 807 buffer amplifier and a pair of 807s in the p.a. running 25 watts input. Higher power will be used when a suitable power transformer is obtained. The speech amplifier-modulator stands on top of the receiver, a modified war-time National HRO. Aerials in use are a fixed ZL Special for 21 Mc/s and half-wave dipoles for 14 and 21 Mc/s.

# Mobile Column

BY JOHN A. ROUSE (G2AHL/M) \*

LAST month the highly successful Midlands Mobile Rally at Trentham Gardens on April 20 was only briefly mentioned but an excellent report from G2DRG has now been received. Good weather helped to swell the attendance and before the day was over 200 cars were neatly parked in the rally car park. As visitors arrived they were asked to sign in and were presented with call-sign badges the colour of which indicated their own main interests (v.h.f., l.f., TV, etc.). These colour coded badges helped considerably to break the ice and to introduce those who had previously met only on the air. Mobiles were talked in on Top Band 80 and 2m and all three transmitters were kept busy.

One of the highlights of the event was the continuous coverage of the proceedings by cameras of the Midland Group of the B.A.T.C. including the "roving eye" demonstration provided by G3KBA/T, G3LGI/T and G3LNN. An interesting innovation for this type of function were lectures on different aspects of mobile work given by G2ATK, G3EN and G3APY.

One facility which proved particularly useful in helping to make the event such a success was the availability of a room large enough to accommodate all present. Although the weather did not make this really necessary until the raffle (which was watched by about 500 people) when a light shower drove most people indoors, it did provide a useful venue for an exhibition of equipment and gifts donated by manufacturers as well as the rally stations.

Prizes for mobile installations were awarded to G3KHE (Concours d'Elegance), G3IJC (Best Top Band), G3CLG (Best 80m), G3JGY (Best 2m), G3ATL (Best All Band), G8SB (Special certificate for 10 and 15m installation), G3LDY (Best Motor Cycle 2m), G3GXZ (Special certificate for outstanding portable equipment).

From this account from G2DRG and from verbal reports from others present it is quite clear that the organizing societies, Midland Amateur Radio Society, Stoke-on-Trent Amateur Radio Society and British Amateur Television Club (Midlands Group), did an outstanding job in making all the arrangements. It is to be hoped that next year they will hold another rally on similar lines.

## Cheltenham Mobile Rally

Montpellier Park was the venue of the first mobile rally organized by the Cheltenham Amateur Radio Club and R.S.G.B. Group on May 11. According to G3BCC, nearly 50 mobiles attended, about 15 per cent of them operating on 2m, the total number of amateurs present being approximately 100. The youngest mobile of all (G8ML's grandson) had a fine whip mounted on the rear bumper of his pedal-driven car!

The control stations were G3GPW/P on Top Band who had a 70 ft. "Unimast" loaned by Francis & Lewis Ltd. of Cheltenham in use as a vertical radiator. Mobiles reported that the signal from this station was audible over a considerable distance! And there is no doubt that the mast made most of the visitors green with envy. G3CWV/A assisted G3GPW/P on Top Band. G3YZ/P was the 2m control station, who early in the day had the assistance of G5BM/M located on a high point overlooking the town to work stations from farther afield. A running buffet was open throughout the rally. A raffle for gifts donated by radio manufacturers and others brought the proceedings to an end.

\* R.S.G.B. Headquarters Staff.

## Bournemouth Mobile Rally

Attendance at the third annual rally arranged by Bournemouth Amateur Radio Society was somewhat down on last year but nevertheless 16 mobiles were safely guided in by G2HIF/P on 2m and G3HLW/P on Top Band. The reduced numbers were probably due to two causes—some mobiles reported that weather was poor on the way to Bournemouth and despite plenty of advance publicity other rallies were taking place on the same day. Those present included G3BMO, G3JQP, G3LLK, G3LIL, G3JEQ, G8ML, G3JFH, G3CQN, G2BCX, G2CDN, G2FIX, G3ENG, G3HCK, G3JSJ and G3UK.

## Mobile Group to be Formed

Interest in mobile work is growing so quickly in the Home Counties that plans are being made to organize an informal group to be run on somewhat similar lines to the highly successful London U.H.F. Group. The aim will be to arrange meetings of mobile enthusiasts, not necessarily of the rally type, at which mobileers can exchange ideas and discuss problems of mobile operation. Those interested are invited to write to Headquarters.

## Whips for 10m

One of the advantages of 10m mobile operation is that broadcast whips can be used as aerials. Such aerials are commonplace and excite no particular interest on the part of the general public, while fixing them to a car does not affect its value adversely. The most suitable type is 100 in. long (a quarter wavelength at 28 Mc/s), but a source of supply has been a difficulty—very few dealers seem to have heard of them! However, a suitable four-section whip, price 45/-, is available in the Elpico range and may be obtained from R. H. Newland (G3VW), 10 Holmstall Avenue, Edgware, Middlesex.

\* \* \*

Contributions for *Mobile Column* are invited, particularly those which give information on mobile operation which is likely to be helpful to those just sampling the particular problems and satisfaction of operation on the move. If only 10 per cent of the 500 licensed mobiles would send in reports, more than enough information would be available to make the *Column* a regular feature. We just do not believe that new ideas are lacking in any branch of Amateur Radio.

## Lincolnshire Hamfest and Mobile Rally

MORE than 120 visitors attended the Lincolnshire Hamfest and Mobile Rally at the George Hotel, Spilsby on May 18 which was organized by Norman Hodgson (G2ABK). Twenty-two mobiles from as far afield as London, Burnley and the Midlands were present; the competition for the most attractive home-built mobile rig (judged by G6GH and G2LR) resulted in a tie between G3BG/M of Derby and G3ATL/M of Coalville, Leicestershire. Visiting mobiles were guided in by G3ANM/P. The R.S.G.B. was represented by Dr. E. S. G. K. Vance (G8SA), Region 4 Representative.

One of the highlights of the meeting was a highly successful Junk Sale conducted by G3BCA.

## S.R.J. Convention

A CORDIAL invitation is extended to amateurs of other countries to attend the Annual Convention of S.R.J. which is to be held in Ilidza near Sarajevo (capital of Bosnia and Herzegovina) from July 12 to July 15, 1958. A comprehensive programme is being arranged to cover a wide range of interests.

Further details can be obtained from the Vice-President of S.R.J. (YU1AX), c/o P.O. Box 324, Belgrade, Yugoslavia.

## R.A.E.N. Notes and News

By E. ARNOLD MATTHEWS (G3FZW)\*

THE latest amendment to amateur licences will be received with much satisfaction. It has justified the hard work and confirmed the belief of members that amateurs can give a valuable direct service to the nation. It is noteworthy that the initial approach in this case was made by the police, much preliminary work having been done by the Chief Constable of Leicestershire and Rutland, who has given support to R.A.E.N. in his area for some years. The Postmaster-General did not, however, accede to the Home Office request for the amendment of the licence without first ascertaining the wishes of the amateurs by an approach to the Society.

Several County Controllers have now had discussions with their Chief Constables, and it appears that the amateurs' ability to work from emergency power supplies and from county to county is of particular interest. Thus portable and mobile equipment becomes of even greater importance and members are urged to ensure that such equipment is always maintained 100 per cent. serviceable. If any areas have no emergency equipment it is suggested that first priority be given to remedying the defect.

To give some idea of how the police value possible R.A.E.N. aid, the following passage is quoted from a letter from Somerset C.C., G5TN, "... the police are of the opinion that in certain circumstances ... we would be expected to operate a comprehensive service for them."

In the flurry of this new activity existing commitments to the B.R.C.S. and S.J.A.B. must not be forgotten. Indeed it is very necessary to ensure that R.A.E.N. nets can handle simultaneously the traffic from the three bodies for whom we are authorized to work. To help this a new procedure leaflet which aims at a simplification of the existing methods is being prepared. Familiarisation exercises should be held on a small scale, and should not be run in conjunction with joint B.R.C.S., S.J.A.B. or police schemes.

### Around the Groups

Thanks to the generosity of Glamorgan Branch of the B.R.C.S., it is now possible to install a TVI-proofed transmitter in London B.R.C.S. HQ. The London C.C. (G3IIR) is hoping to get an aerial erected very shortly, and power points, etc., have already been arranged.

With no prior notice Exercise "Surprise" was sprung on members of Essex group on May 18. There was an excellent turnout for this county-wide scheme based on a story of supposed flooding of coastal areas and subsequent evacuation of refugees and casualties. The results prove that the group is ready for instant action at any time, and G8TL has a group to be proud of. On May 17 the West Essex section gave a demonstration to a S.J.A.B. review in Barking Park. Highly impressed senior officers immediately asked for a further meeting to discuss details of R.A.E.N. work.

Norfolk are to run a series of schemes during the summer involving B.R.C.S. and S.J.A.B., and are likely to be called into a large-scale "escape" exercise, organised by the R.A.F., to provide communications for the police. Suffolk.—The Felixstowe group held a meeting to enable G2CPL to sum up local resources, and are exploring the possibility of establishing a link with Bury St. Edmunds where a B.R.C.S. HQ is located.

Belfast Group took part in an exercise arranged by B.R.C.S. to coincide with the North-West 200 Motor Cycle Race. C.C. G13BH reports that five stations participated and all went as planned.

\* 1 Shortbatts Lane, Lichfield, Staffs.

Worcester have been overhauling their portable and mobile equipment, whilst field strength tests are going on in Middlesbrough and Ilford. At Shrewsbury the local group put on a very successful demonstration at the B.R.C.S. exhibition held on May 18. Staffordshire C.C. G3DML, and A.C. G3UD assisted, whilst G3KYU accepted a message from the Staffordshire B.R.C.S. President and relayed it to the Shropshire County Director, who was at the exhibition with Gen. Daunt, the B.R.C.S. Home Controller. A reply was sent via a Staffordshire station which passed it to the B.R.C.S. HQ.

### Region 3 Meeting in Birmingham

ABOUT 55 members attended the West Midlands Regional Meeting at the Digbeth Institute, Birmingham, on May 11, 1958. At the business session in the afternoon, the President (Mr. L. E. Newnham, G6NZ) recalled that his first licence was issued to him while he was living in Birmingham long before the last war.

The General Secretary (John Clarricoats, G6CL) surveyed a number of Amateur Radio matters, some of the subjects mentioned being the close liaison maintained by the Society with the G.P.O., Society finances, R.A.E.N. and amateur work during the International Geophysical Year. There followed a lively discussion period.

The Chairman was the Regional Representative, Alec Higgins (G8GF) who had the support of Council Member C. H. L. Edwards (G8TL) in addition to the President and General Secretary.

After tea, Mr. H. V. Simms, a B.B.C. Senior Engineering Lecturer, gave an excellent talk on aerials, illustrated by working models. The lecture was televised on a closed circuit by the Birmingham Group of the B.A.T.C. Exhibitions of amateur equipment were provided by the South Birmingham Group, Bourneville, Slade and Midland Amateur Radio societies. Coventry Group provided a Top Band station to "talk in" the mobiles.

After the meeting, visits took place, including one to the B.B.C.'s Sutton Coldfield Television Station.



Mr. Simms of the B.B.C. who lectured on aerials at the Regional Meeting in Birmingham.

### Oxford D/F Event

THERE were 13 entries in D/F Qualifying Event on May 4, 1958, organized by J. Hickling and the Oxford and District Radio Society. The following qualified to take part in the National Final on September 7: E. L. Mollart (B.R.S. 10977) of Marlow who found the hidden transmitter at 15.23 B.S.T., J. K. Finch (B.R.S. 15688) of High Wycombe who arrived at 15.32 and R. N. Grubb (G3FNL) of Upminster who found the transmitter at 15.55.



## Book Reviews

**THE RADIO AMATEUR'S HANDBOOK.** (Thirty-fifth Edition, 1958.) By the Headquarters staff of the A.R.R.L. 630 pages, 1,350 illustrations and some 500 valve-base diagrams. Price 34/- from R.S.G.B. Sales Dept.

Somewhere in this edition will be the three-millionth copy of a remarkable publication which has brought reliable theory and design to Amateur Radio men all over the world, and to many professional engineers too. Few books of any sort have had such continuity of success and the editors at A.R.R.L. have earned the thanks of generations of amateurs.

As in all new editions of the Handbook, there have been many modifications and improvements. The earlier chapters now include a condensed treatment of high-, low-, and band-pass filters: the basic circuit configurations are shown alongside the relevant formulae in a whole-page display. The chapter on semiconductor devices now includes short treatments of bias stabilization, oscillators, and mixers. This subject might well be given even more detailed treatment in view of its unfamiliarity and importance.

The receiver section has an interesting 455 kc/s Q multiplier using a *p-n-p* junction transistor, and the transmitter section has a new three-band crystal-controlled transmitter, including a keying monitor, with 30 watts input on 3.5, 7 and 21 Mc/s. There is wider treatment of voltage stabilization, and some information about electronic transmit-receive switches. Teletype details have now been included, and a short description of frequency-shift keying. The mobile man gets a new converter for 3.5 to 28 Mc/s with plug-in assemblies. There is also a new mobile transmitter which can be adapted for any band from 3.5 to 28 Mc/s by soldering in an appropriate set of coils.

There seems to be a slip on page V29 where footnote 13 should read "Chapter 11, Table 11-1"; to find a slip in the Handbook is the rarest of experiences, and almost entitles one to a "certificate!"

T. P. A.

**Television Interference, its Causes and Cures.** By Phil Rand (WIDBM). Available from R.S.G.B. Headquarters, price 15/6, post free.

Although this book is written entirely from the American viewpoint it contains a wealth of general information on TVI that can be of considerable help in clearing up local complaints of interference. It not only deals with methods of cleaning up a transmitter but also with various other sources of TVI and advice on how to identify it, so that an amateur may be able to assist his neighbours in tracing interference, and thus maintain their goodwill.

One chapter is devoted to the television receiver with information on the likely sources of trouble to be met and their cure. Considerable information on screening and filtering transmitters is given and a chapter deals with special v.h.f. problems.

It is perhaps inevitable that the low- and high-pass filters described are only suitable for use with the types of feeders that are standard in North America, but the formulas are given and values could be worked out for use with feeders of impedances common to U.K. stations.

The book includes two pages of information on interference from external harmonic generation, sometimes known here as contact rectification, and some very helpful suggestions are made for the tracing of the source of this type of trouble.

Altogether a very useful book to have at hand and one that should have a wide appeal.

J. W. M.

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## Second 144 Mc/s Field Day, July 6, 1958

R.S.G.B. members throughout Europe are again invited to take part in this contest, the details of which are given below. The attention of non-transmitting members is drawn to the proposed award of a certificate of merit for the best check log.

**When:** 10.00 G.M.T. to 19.00 G.M.T. on Sunday, July 6, 1958.

**Sections:** (a) Portables must operate from the same site throughout the contest.

(b) Mobiles must quote the location from which each contact is made.

**Eligible Entrants:** All fully paid-up members of the R.S.G.B. resident in Europe. Multiple-operator entries will be accepted provided only one call-sign is used.

**Contacts:** May be made on A1, A2 or A3 with an input not exceeding 25 watts to any stage in the transmitter.

**Scoring:** Points will be scored on the basis of one point per mile for contacts with fixed stations and two points for contacts with other portables or mobiles.

**Contest Exchanges:** RST (RS) reports followed by the band identification letter A and the contact number and location (e.g. RST559A001 SNE Luton).

**Logs:** (a) Must be tabulated in columns headed (in this order) "Date," "Time (G.M.T.)," "Call-sign of Station Contacted," "My Report on his signals and Serial Number sent," "His report on my signals and Serial Number received," "Location of Station Contacted," "Distance," "Points Claimed."

(b) The cover sheet must be made out in accordance with R.S.G.B. Contests Rule 5 and the declaration signed.

(c) Entries must be postmarked not later than Monday, July 21, 1958.

**Awards:** At the discretion of the Council, a miniature cup will be awarded to the winner and certificates of merit to the runner-up and to the leading mobile station. A certificate of merit will also be awarded to the non-transmitting member submitting the best check log in the opinion of the Contests Committee.

The General Rules for R.S.G.B. Contests published on page 437 of the March 1958 Bulletin apply to the contest. A copy of the General Rules may be obtained by sending a stamped addressed envelope to Headquarters.

## D/F Qualifying Event

DETAILS of the South Manchester qualifying event are as follows:

**Sunday, July 13**

**Organizer:** C. M. Denny (G6DN), 18 Willoughby Avenue, Fog Lane, Didsbury, Manchester 20.

**Frequency:** 1820 kc/s.

**Call-sign:** G3FVA/P.

**Map:** Ordnance Survey, New Popular Edition, Sheet 110.

**Assembly Point:** N.G.R. SJ 33/845727. This is the main entrance to Capethorne Hall on the A34 road between Monks Heath and Siddington, Cheshire. Capethorne Park is the site for the South Manchester and Stockport Mobile Rally arranged for the same date. Intending competitors should remain on the main road.

**Assembly Time:** 13.30 B.S.T.

**Entries and Tea:** Intending competitors should notify the Organizer at least seven days in advance, stating the number in their party requiring lunch and/or tea.

## Contests Diary

1958

- |                |   |
|----------------|---|
| June 21-22     | - First 70 Mc/s Contest <sup>1</sup>                    |
| June 22        | - D/F Qualifying Event <sup>2</sup>                     |
| July 6         | - Second 144 Mc/s Field Day <sup>3</sup>                |
| July 13        | - D/F Qualifying Event (South Manchester) <sup>4</sup>  |
| September 6-7  | - European V.H.F. Contest and National V.H.F. Contest   |
| September 6-7  | - 420 Mc/s Contest                                      |
| September 6-7  | - 1250 Mc/s Tests                                       |
| September 7    | - D/F National Final (organised by Slade Radio Society) |
| September 14   | - Low Power Field Day                                   |
| September 28   | - R.A.E.N. Rally  |
| October 4-5    | - Low Power Contest                                     |
| November 8-9   | - Second 1.8 Mc/s Contest                               |
| November 15-16 | - Second 70 Mc/s Contest                                |
| November 22-23 | - 21-28 Mc/s Telephony Contest                          |

<sup>1, 2</sup> See page 532, R.S.G.B. Bulletin, May 1958.

<sup>3, 4</sup> Details in this issue.



## Regional and Club News

**Aldershot and District Amateur Radio Society.**—Two amateur stations were operated during the Jamboree-on-the-Air at the 8th Farnborough Scout Group Headquarters. Meetings are held on Wednesday evenings at "The Cannon," Victoria Road, Aldershot. *Hon. Secretary:* S. E. Hume, 25 Kingsway, Aldershot.

**Bristol.**—More than 70 members were present on May 16 to hear Dr. H. F. Kay lecture on "Modern High- and Low-k Dielectric Materials." The Mullard films *The Principles of the Transistor* and *The Manufacture of the Junction Transistor* were shown at a joint meeting with the Wells Centre of the R.T.R.A. later in the month. Members with newly constructed transmitters and other equipment of general interest are invited to bring them to the meeting on June 20 and to participate in the discussion which has been arranged. *Hon. Secretary:* D. F. Davies (G3RQ), 51 Theresa Avenue, Bishopston, Bristol 1.

**Cheltenham Amateur Radio Society.**—Film shows and lectures have been well attended and a number of outdoor events arranged. A report on the Mobile Rally organized in conjunction with the local R.S.G.B. Group appears in *Mobile Column* in this issue. Activity Field Weekend during which members operated on 160, 80, 20 and 2m proved very satisfactory. The society has also held its first D/F event; two others are to follow. The member with the best score will receive the G5BK Memorial Cup. Meetings are held on Wednesdays at 8 p.m. at St. Mark's Community Centre and visitors and prospective members are always welcome. *Hon. Secretary:* C. Wallis (G3CWV), 147 Hales Road, Cheltenham.

**Cornish Radio and Television Club.**—There was a large attendance on May 7 to hear Richard Cock (G3BHC) give his talk entitled "Introduction to Aerials." Future lectures include "An Introduction to S.s.b." and "Licence Regulations." The next two meetings will be held at Falmouth and Redruth respectively as part of the club's policy of arranging meetings in various parts of the county. A recent event was the playing of a humorous tape compiled by G2FQD and entitled "The Conquest of Space." G2AYQ has donated a Shield for competition by members. *Hon. Secretary:* J. Brown (G3LPB/T), Marlborough Farm, Falmouth, Cornwall.

**Grafton Radio Society.**—The Top Band Contest for the G2AAN Cup resulted in a tie for first place between P. Bernal (G3KQZ) and A. Mulcahy (G3LBM), winners of the c.w. and Phone Sections respectively, with H. Lassman (G3JZY) close behind. The award for the highest placed newly licensed member was taken by G. Gordon (G3MGV). Thanks are expressed to all non-members who so kindly provided contacts. *Hon. Secretary:* A. W. H. Wonnell (G2CJN), 145 Uxendon Hill, Wembley Park, Middlesex.

**Flintshire Radio Society.**—At the May meeting, a demonstration of Amateur Television was given by GW3JGA/T and GW3FDZ/T. This followed a successful two-way contact on April 13 between GW3JGA/T (Prestatyn) on 432.6 Mc/s and GW3FDZ/T (Llandudno) on 432 Mc/s, the first of its kind in Wales. *Hon. Secretary:* J. Thornton Lawrence (GW3JGA), Perran Porth, East Avenue, Prestatyn.

**Stockport Radio Society.**—Attendance at recent meetings has been good, outdoor activities playing a large part in the programme. During the First 144 Mc/s Field Day, the society operated G3AYT/P. On July 13 the society is helping to organize the Mobile Rally at Capethorne Hall, details of which appear elsewhere in this issue.

**West Middlesex Tape and Recording Club.**—Details of membership of this new club, the inaugural meeting of which took place at the Uxbridge Council Offices on May 13, may be obtained from the *Hon. Secretary:* H. E. Saunders, 20 Nightingale Road, Hampton.

**Whitchurch (Salop) and District Radio Club.**—The first meeting of this new club was held on April 22 with an attendance of 12. The following officers were elected: *Chairman*—E. H. Williams (G3DUC); *Hon. Treasurer*—W. L. A. Thomas (G3LJI); *Hon. Secretary*—D. Earnshaw (G3LHP). Future meetings will be held at The School Hall, Old Grammar School Buildings, Whitchurch. All interested in Amateur Radio are cordially invited to obtain further information from the *Hon. Secretary*.

### R.S.G.B. QSL Bureau—Important Notice

The R.S.G.B. QSL Bureau will be closed from Friday, July 18, to Tuesday, August 12, inclusive. Members are asked not to send cards or correspondence to the Bureau which would normally be delivered between these two dates. Envelopes for the collection of incoming cards should be sent direct to the appropriate Sub-Managers as usual.

### National Field Day

The Editor will be pleased to consider for publication photographs taken during N.F.D. Week-end. Set groups and dark interiors are not required.

### Coronation Trophy

ONLY two East London groups competed in the contest for the 1958 Coronation Trophy. Chingford were successful for the first time with a score of 188. East Ham making 166 points. East Ham Group congratulate the winners and hope that 1959 will see entries from more groups in the area.

### New Calls

In the list of new calls published last month, G13MER should have read G13MEB.

## Silent Keys

### L. GROVES (G4GT)

It is with regret that we record the death after a long illness of Mr. L. Groves (G4GT) of St. Albans, Herts. Licensed in 1938. Mr. Groves had operated at one time or another on most of the amateur bands. He was a first class technician in the field of electronics, a keen R.S.G.B. man and well-known to a great many amateurs in the London area. Some years ago he acted as T.R. for St. Albans.

To his widow and 16-year-old son we extend our deepest sympathy.

### GEORGE A. HUME (G5UX)

The death occurred on May 5, 1958, of George A. Hume (G5UX) of Wandsworth Common, London, at the age of 50.

First licensed in 1927 as 2ASL, George operated almost exclusively on the DX bands. He held confirmations from almost 200 countries and had qualified for WAS, WAC and WBE. At the time of his death he was serving his second year as Chairman of the Mitcham and District Radio Society.

Among those who attended the funeral at Wandsworth Cemetery, on May 9, were G6CB, G8QV, G3IDF, G3IDG, G3KIK and ex-2BOQ. A floral tribute was sent on behalf of the Mitcham and District Radio Society.

Mr. Hume is survived by his widow and three children to whom our sympathies are extended.—F. A. H.

### ARTHUR SIMONS (G5BD)

His many friends in the Society will be deeply grieved to learn of the death at the age of 60 years on May 2, 1958, at his home in Mablethorpe, Lincolnshire, of Arthur Charles Simons (G5BD). His interest in Amateur Radio dated back more than 30 years and his activities ranged from 7 to 1200 Mc/s.

Towards the end of the First World War Arthur Simons joined the 4th Lincolns in which regiment he performed signal duties. His stay in France only lasted a few months for he lost his right arm from the shoulder joint when a trench mortar exploded killing those around him. He also suffered from the effects of a gas attack. His handicap never daunted him but seemed rather to urge him towards ever-advanced feats of single-handed construction. Old timers will remember in particular his persevering determination in the "gaslight" days of the early 1920s, seated high on an office stool, turning with his feet an ancient hand generator, a Morse key strapped close to his left hand, pedalling his 10 watts into the fresh new world of DX.

Arthur Simons again served his country during the Second World War, yet he found time from his business to act for the Society, first as County and later as District Representative.

He was a regular visitor to prewar London Conventions and to postwar Provincial and V.H.F. Conventions.

In recent years he had devoted much of his spare time to the v.h.f. and u.h.f. bands.

In November of last year he married for the second time. To his widow and his family we extend sympathy and understanding.

Among the many mourners at the funeral were John Marlow (G2FT) (Arthur's brother-in-law), William Grieve (G5GS), Geoff Hutson (G6GH), Len Hodge (G6LH), J. B. Bedford (G3BIW), J. E. Cory (G5CY) and A. H. Lunn (G5LL).

A. E. L.

## New Members

The following were elected to Membership at the April 1958 meeting of the Council.

### Corporate Members, Home (Licensed)

G2DON †F. E. Gorse, 51 Saltwells Road, Quarry Bank, Brierley Hill, Staffs.  
G2DXH †R. H. Hespley, 11 Ranelagh Road, Blakenhall, Wolverhampton, Staffs.  
G2FGB †S. R. Minson, 3 Brecon Road, Fulham, London, W.6.  
G2HNL †A. R. Glover, Richmond Road, Catterick Camp, Yorks.  
G3BOD †C. D. Jones, 25 Chetwynd Road, Wolverhampton, Staffs.  
G3CDM †H. W. Gardner, 17 Whitwell Road, Darlington, Co. Durham.  
G3DPJ A. E. Smith, 28 Delamare Crescent, Croydon, Surrey.  
G3GAG †W. Eckersley, 50 Chaddock Lane, Boothstown, Walkden, Manchester.  
G3GSN T. N. Reekie, 153 Cannock Road, Stafford.  
G3GWW †A. Stenhouse, 20 Overslade Lane, Rugby, Warwick.  
G3HBI †R. J. Brooker, 25 Wigmore Road, Tadley St. Mary, Basingstoke, Hants.  
G3IRQ †P. M. Rackham, Bounds Farm, Ardleigh, near Colchester, Essex.  
G3JUV E. P. Wootton, 15a Langdale Road, Wallsey, Wirral, Cheshire.  
G3JUY 4110357 Sgt. A. Mallinder, Sgts. Mess, R.A.F. Topcliffe, Thirsk, Yorks.  
G3KMO M. A. Birch, 34 Church Lane East, Aldershot, Hants.  
G3KZC R. F. Harknett, 25 High Street, Hanham, Bristol.  
G3LLX L. R. G. H. Reeve, 33 Cray Road, Fooks Cray, Sidcup, Kent.  
G3LMF C. A. Buckley, 6 Keats Way, Croydon, Surrey.  
G3LVX E. Derrick, 407 St. Helens Road, Bolton, Lancs.  
G3LYU D. T. Price, 29 Pytchley Road, Rugby, Warwick.  
G3MAA †E. Pearson, 1 Cowper Avenue, Clitheroe, Lancs.  
G3MBM D. Masters, 117 Park Road, New Barnet, Herts.  
G3MCD K. O. Holland, 10 Parkdale, Crescent, Worcester Park, Surrey.  
G3MCO †W. C. Mills, 65 Queens Road, Chelmsford, Essex.  
G3MCK G. P. Stacey, Ivy Cottages, Hoyland Common, Barnsley, Yorks.  
G3MCR J. Hurst, 46 Red Lane, Bolton, Lancs.  
G3MCM B. A. Vaughan, Bernor, Mengham Avenue, Hayling Island, Hants.  
G3MDC †G. H. Taylor, 80 Grosvenor Road, Rugby, Warwick.  
G3MDB D. A. Greer, 26 Elmswood Road, Aigburgh, Liverpool 17.  
G3MEO/T †J. E. Cronk, 93 Thurlow Street, Walworth, London, S.E.17.  
G3MFG D. A. Close, Cycle Stores, Collyweston, Stamford, Lincs.  
G3MHQ †E. W. Holt, 26 Beethoven Street, London, W.10.  
G3MIJ D. T. Campbell, 24 Ashbury Road, Shrirenham, Swindon, Wilts.  
G3MIY R. E. Page, 202 Old London Road, Hastings, Sussex.  
G3MIL M. J. Leahy, 5 Whitehall Road, London, W.7.  
G3MJR B. P. Robinson, 152 Silver Road, Norwich, Norfolk.  
G3MJS E. C. Long, 27 Margarite Way, Wickford, Essex.  
G3MIU M. A. Stott, 6 Preston Road, Southport, Lancs.  
G3MKH G. Rooney, 270 Spital Road, Bromborough, Wirral, Cheshire.  
G3MKK G. V. Gadd, 42 Park Avenue, Oswestry, Shropshire.  
G3MKU A. F. J. Bower, 17 Lower Street, Dartmouth, Devon.  
G3MLC †S/Ldr. K. B. Pearce, 48 Barry Road, East Dulwich, London, S.E.22.

G3MMC R. H. Smart, 7 Brook Gardens, Chingford, London, E.4.  
G3MMR H. P. Bradley, 488 Binley Road, Coventry, Warwick.  
G3MMS G. A. Whiting, 5 Spilsby Road, New Leake, Boston, Lincs.  
G3MNM G. R. Baines, Hawthorn Cottage, Top Road, Kingsley, via Warrington, Lancs.  
G5VB †A. F. E. Bott, 17 Amis Avenue, West Ewell, Surrey.  
G6DO †W. H. Glen Dobie, Rake Hey, Redhill, Bexington, Cheshire.  
G8BP W. H. Hill, Newin House, Uplands Avenue, Wolverhampton, Staffs.  
G13CDF †L. Lyske, 63 Church Street, Portadown, Co. Armagh.  
G13MKG Sgt. D. T. Grafham, Sgts. Mess, R.A.F. Aldergrove, Crumlin, Co. Antrim.  
G13LKG A. C. Gemmell, 10 Windhill Place, Manswood, Glasgow, S.3.  
G13LVS J. C. Downie, 219 High Street, Methil, Fife.  
G13MKJ A. Gillies, 83 Curle Street, Whiteinch, Glasgow, W.4.  
GW3AJZ †N. McKechnie, 5 Trewern Estate, Welshpool, Mont.  
GW3HCH F. J. Church, 5 Sullivan Close, Countisbury Estate, Llanrumney, Cardiff.  
GW3LPR J. W. Rastrick, 34 Graigwen Penygraig, Llwynhendy, Llanelly, Carmar.  
GW3MIW J. Robinson, Bronheulog, St. David's Road, Caernarvon.

### Corporate Members, Overseas (Licensed)

EA7IR M. Lopez Garrido, Gobernador Alonso, 5 Huelva, Spain.  
DJ25Y N. E. M. Fuchs, Letmathe-Untergrunde, Grudene 8, Germany.  
DL2YY Sgt. G. T. Howse, c/o Sgts. Mess, 12 Wireless Squadron, Royal Signals, B.F.P.O. 37.  
K2MGE Dorothy M. Strauber, 12 Elm Street, Lynbrook, New York, U.S.A.  
K4LOL J. G. Shultz, 404 South Olander Avenue, Goldboro, North Carolina, U.S.A.  
K4QJL J. M. Yount, P.O. Box 271, Newton, North Carolina, U.S.A.  
K4QLH R. L. Titus, 147 Frazier Road, Warren, Virginia, U.S.A.  
K5EHK R. R. Artigo, Box 1001, Groves, Texas, U.S.A.  
K6GJS L. L. Roberts, 4223 Camino Real, Los Angeles 65, Calif, U.S.A.  
K6JBP H. P. Layton, 11341 Tiara Street, North Hollywood, Calif, U.S.A.  
KL7CDO T. R. Murray, General Delivery, Anchorage, Alaska.  
K8CFU A. C. Doty, Jr., Box 573, Franklin, Michigan, U.S.A.  
ON4ZX J. F. Verborcht, Aartshertogstraat 7a, Ostend, Belgium.  
VE1EP A. S. G. Grant, 66 Lemarchant Street, Halifax, Nova Scotia, Canada.  
VE1HY Rev. C. H. Boudreau, 68 Normandy Drive, Halifax, Nova Scotia, Canada.  
VE4MF J. M. Fraser, Box 95, Binscarth, Manitoba, Canada.  
VE5TK R. H. Smith, 1161 Wolfe Avenue, Moose Jaw, Sask, Canada.  
VE7KX J. T. Hepburn, 864 General Currie Road, Richmond, British Columbia, Canada.  
VPIDL D. F. Owen-Lewis, Punta Gorda, British Honduras.  
VPINW N. Wakefield, c/o The Citrus Co. of Br. Honduras Ltd., Poma, Stann Creek, British Honduras.  
VP8CC C. Johnson, c/o Mr. L. Hill, 12 Greencourt Road, Petts Wood, Kent.  
VP8CI H. E. Dyer, c/o Westminster Bank Ltd., 12 High Street, Southampton.  
W1FSE B. C. Howard, 64 Midian Avenue, Windsor, Conn, U.S.A.  
W1GLF V. B. Cushman, 27 Tremont Street, Kingston, Mass, U.S.A.  
W1WU F. E. England, R.F.D. 1, Lakeside Avenue, Box 566, Middleboro, Mass, U.S.A.  
W2HOD V. P. Piermatie, 43 Squaw Brook Road, North Haledon, Paterson 2, N.J., U.S.A.  
W2SGE/CN8IF E. Ritchie, Sunset Trail, Medford Pines, N.J., U.S.A.  
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W3DZP W. F. Klueber, 1545 Brookline Blvd., Pittsburgh 26, Penna, U.S.A.

W3OUA R. J. Platek, 429 Orchard Spring Road, Pittsburgh 20, Pa, U.S.A.  
W3PHT A. H. Goldstron, 2404 W. Rogers Avenue, Baltimore 9, Maryland, U.S.A.  
W6GUO C. M. Sorvaag, 11620 Highland View Ct., Los Altos, Calif, U.S.A.  
W6IQJ/W7NVV A. W. W. Brothers, 13300 So. Central Avenue, Los Angeles 59, Calif, U.S.A.  
W9OVH T. L. Emry, 4413 Washington Street, Downers Grove, Ill, U.S.A.  
W0NCT R. Beck, Rt. 1, Box 140, Independence, Miss, U.S.A.  
W0TGO/K0A0 Lee F. Blodgett, 747 Grant Street, Iowa City, Iowa, U.S.A.  
XZ25Y †Bo Joe W. P.O. Box 833, Rangoon, Burma.  
YNIAA J. W. Parker, P.O. Box 227, Managua, Nicaragua.  
ZBIDS R. A. Strafford, 2 Patricia Flats, Zabbar Road, Pawla, Malta.  
ZC4FL 3504986 Cpl. D. R. Britton, 264 Signals Unit, R.A.F., B.F.P.O. 53.  
ZE2JK T. S. Yon, P.O. Box 99, Umtali, Southern Rhodesia.  
ZS1CY W. D. Pitchford, 43 Dreyersdal Road, Bergvliet, C.P., South Africa.  
ZS5QR J. L. Douglas, 41 Hutchinson Road, Pietermaritzburg, Natal, South Africa.  
ZS6ARX D. R. Forte, P.O. Box 3093, Johannesburg, South Africa.  
ZS6AUN T. Harvey, 3 Abercorn Avenue, Craighall Park, Johannesburg, South Africa.  
9K2AN N. H. Khan, P.O. Box 736, Kuwait, Arabia.  
9K2AP W. S. Stewart, Box 65, Kuwait, Arabia.

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21829 J. R. Pledge, 61 Lutterworth Road, Blaby, Leicester.  
21830 W. J. Robinson, 296 Myton Road, Warwick.  
21831 J. Jones, 51 Geldeston Road, Upper Clapton, London, E.5.  
21832 L. H. Rogers, 2 Oxford Road, Farmoor, Oxford.

21833 S. E. Phillips, 113 Coppetts Road, Muswell Hill, London, N.10.  
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21853 A. J. Payne, 4 Wyatts Road, Chorleywood, Herts.  
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 976 P. J. Poole, J.A.T.C.C. Royal Air Force, Seletar, Singapore 28.  
 977 N. V. Smith, 267 Carling Street, Exeter, Ontario, Canada.  
 978 M. L. Creighton, 46 HAA Regt., R.A., B.F.P.O. 53.

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 291 N. A. Andreas, A/2c AF13594418, Box 201, 3115 Ammo Sup. Hon., R.A.F., Welford, near Newbury, Berks.

### Associates

1603 W. K. Niemann, 29 Talma Gardens, Twickenham, Middx.  
 1604 N. O'Dwyer, 136 Kilburn Lane, Queen's Park, Paddington, London, W.10.  
 1605 P. Fielding, 17 Leaford Avenue, Denton, Lancs.  
 1606 J. R. Orford, 48 Greville Road, Walthamstow, London, E.17.  
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1608 G. Wright, 1 Standfield Gardens, Wardley, Gateshead 10, Co. Durham.  
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 1621 D. Morton, 226 Poulton Road, Wallasey, Cheshire.  
 1622 A. R. Thackery, 8 Warley Drive, Bradford 3, Yorks.  
 1623 H. T. H. Cromack, Laing's Nek, Ledge Hill, Market Lavington, Devizes, Wilts.  
 \* Denotes transfer to Corporate Grade.  
 † Denotes previously a member.

### Correction:

The address of Mr. M. C. Pavey (VQ4CW) published in the February issue should read: c/o The Standard Bank of South Africa Ltd., P.O. Box 30001, Nairobi, Kenya.

## Forthcoming Events

Details for inclusion in this feature should reach the appropriate Regional Representatives not later than the 18th of the month preceding publication. T.R.s and club secretaries are reminded that the information submitted MUST include the date, time, venue of meeting, name of lecturer or details of any other special event being arranged.

### REGION 1

Blackpool (B. & F.A.R.S.).—June 18 ("Transmitter Design and TVI," recorded lecture by N. Shires, G3BTM); July 2 ("Crystal Controlled Converters" by H. Fenton, G8GG); July 16 ("Receivers" by R. H. Hamman, G2IG), 7.30 p.m., Gadsby Street, Nelson Road.  
 Bury (B.R.S.).—July 8 ("Natter Night"), 8 p.m., George Hotel, Kay Gardens, Bury.  
 Manchester (M. & D.R.S.).—July 7 ("Test Gear" by K. Brockbank, G3JST), 7.30 p.m., Brunswick Hotel, Piccadilly, Manchester.  
 Stockport (S.R.S.).—June 18 ("Car Suppression" by R. Hobson, G3JHQ); July 2 ("Mobile Working" by M. Denny, G6DN); July 16 ("Receiver Alignment" by A. Smith, G3AYT), 8 p.m., Blossoms Hotel, Buxton Road.  
 Wirral (W.A.R.S.).—June 20 ("NFD Post Mortem"), July 4 (Junk Sale), 7.45 p.m., No. 4 Hamilton Square, Birkenhead.

### REGION 3

Birmingham (Slade).—June 20, 7.45 p.m., Church House, High Street, Erdington ("Criss Cross Quiz").  
 Coventry.—June 27, 7.30 p.m., Vine Street School (Formal Meeting).  
 Stourbridge & District (S.T.A.R.S.).—June 20, 8 p.m., "White Horse," Ambecote (Informal "Rag Chew"); July 1, 8 p.m., Brotherhood Hall, Scotts Road ("Operating" by W. A. Higgins, G8GF).

### REGION 4

Derby (D. & D.A.R.S.).—June 18 (Lecture on Radio Control); June 25 ("Radio Telescope" by T. Stevens); July 2 (Surplus Gear Sale); July 9 (Open Evening); July 16 (R.S.G.B. Tape Recorded Lecture—"World-Wide Communications"), 7.30 p.m., Room 4, 119 Green Lane, Derby.

### REGION 7

London (L.M.L.C.).—June 20, July 18, 12.30 p.m., Bedford Corner Hotel, Bayley Street, Tottenham Court Road, W.C.1.  
 Acton, Brentford & Chiswick.—June 17 (N.F.D. Inquest); July 15 (Discussion on Beams), A.E.U. Rooms, 66 High Road, Chiswick.  
 Barnet & District.—June 24, 7.30 p.m. (Junk Sale and "Amateur Radio" by J. Douglas Kay, G3AAE), No. 1374 Squadron, Air Training Corps, Gloucester Road, New Barnet.  
 Bexleyheath (N.K.R.S.).—June 26 (Junk Sale); July 10 (Film Show), 7.30 p.m., Congregational Hall, Chapel Road, Bexleyheath.  
 East Molesey (T.V.A.R.T.S.).—July 2 (Visit to Quartz Crystal Co. and talk by E. Dedman, G2NH), Carnarvon Castle Hotel, Hampton Court.  
 Holloway (G.R.S.).—Mondays and Wednesdays (R.A.E. and Morse), Fridays, 7 p.m., Montem School (ex-Isledon School), Hornsey Road, N.7.  
 Kingston.—Thursdays (R.A.E. and Morse Classes), 8 p.m., 5 Penryn Road, Kingston.  
 Norwood & South London.—June 21 (Junk Sale), Windermere House, Westow Street, Crystal Palace.

### REGION 8

Brighton (B. & D.R.C.).—June 17, 8 p.m., "Eagle Inn," Gloucester Road (Junk Sale).  
 Worthing (W. & D.A.R.C.).—June 22 ("Bucket and Spade" Party); July 10 (Slow Morse), 8 p.m., Beach House.

### REGION 9

Bath.—June 23, 7.30 p.m. ("Any Questions?"), G2ZR, 12 James Street West.  
 Bristol.—June 20, 7.15 p.m. (Amateur Transmitter Design and Construction Exhibition and Discussion), Carwardine's Restaurant, Baldwin Street.  
 Exeter.—July 12, 7.30 p.m. ("Testing and Alignment of Communication Receivers, A. J. White, G2FCI and J. D. Forward, G3HTA), Heavitree Social Centre, Wingfield Park.  
 Yeovil.—June 25, 7.30 p.m. (Visit to B.B.C., Rampisham Downs. Details from D. L. McLean, 9 Cedar Grove, Yeovil).

### REGION 10

Port Talbot.—July 1 (N.F.D. Post Mortem); July 15 (R.A.E. Instruction), 7.30 p.m., 14 Holland Street.

### REGION 11

Prestatyn (F.R.S.).—August 4, 7.30 p.m. (Top Band D/F Hunt), Railway Hotel, Prestatyn.

### REGION 12

Aberdeen (A.A.R.S.).—June 20 ("A Quiz—On Tape" by W. Beaton, GM3DWW, and W. Whyte); June 27 (Mullard Film Show); July 4 (Junk Sale); July 11 ("Mobile Operation" by G. T. Donaldson, GM3FKS), 7.30 p.m., 6 Blenheim Lane, Aberdeen.

### DATES FOR YOUR DIARY

June 15.—Longleat Mobile Rally.  
 June 20.—London Members' Luncheon Club.  
 June 22.—Worthing Bucket and Spade Party.  
 June 22.—Harlow Mobile Rally.  
 June 29.—Cambridge and Exeter O.R.M.s.  
 July 13.—Stockport and South Manchester Mobile Rally.  
 July 21-26.—I.A.R.U. Region 1 Conference, Bad Godesberg, Germany.  
 August 26-September 6.—National Radio Show, Earls Court, London.  
 August 31.—G6UT's Annual Ham Party.  
 September 14.—Woburn Abbey Mobile Rally.  
 September 21.—Bridlington O.R.M.  
 September 21.—Lincoln Mobile Rally.  
 October 25.—Aberdeen O.R.M.  
 October 26.—Edinburgh O.R.M.  
 November 26-29.—Radio Hobbies Exhibition, Horticultural Society Old Hall, London.  
 December 12.—Annual General Meeting.





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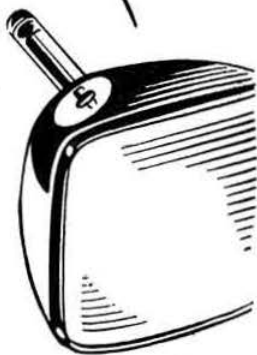
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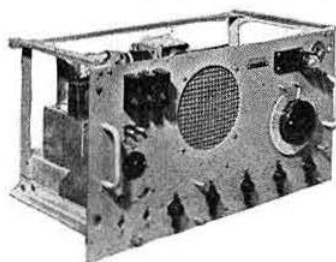
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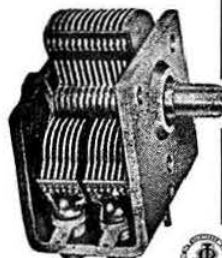
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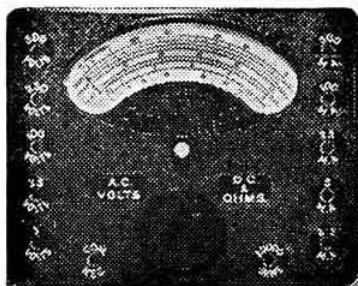
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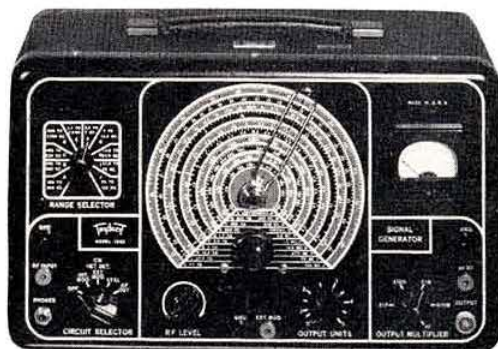
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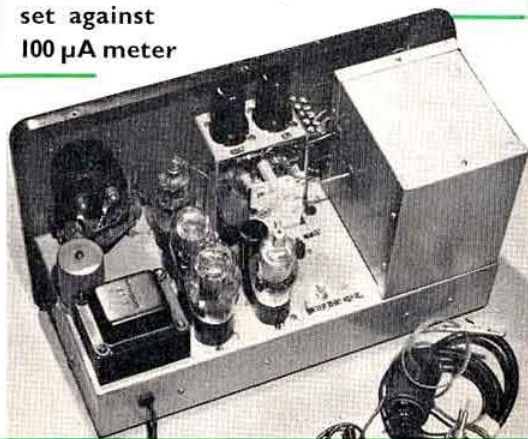
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