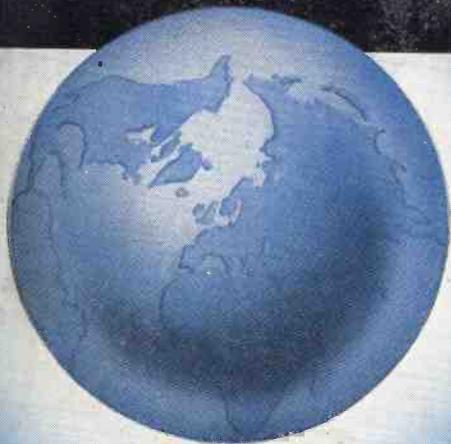


1/6

*The*  
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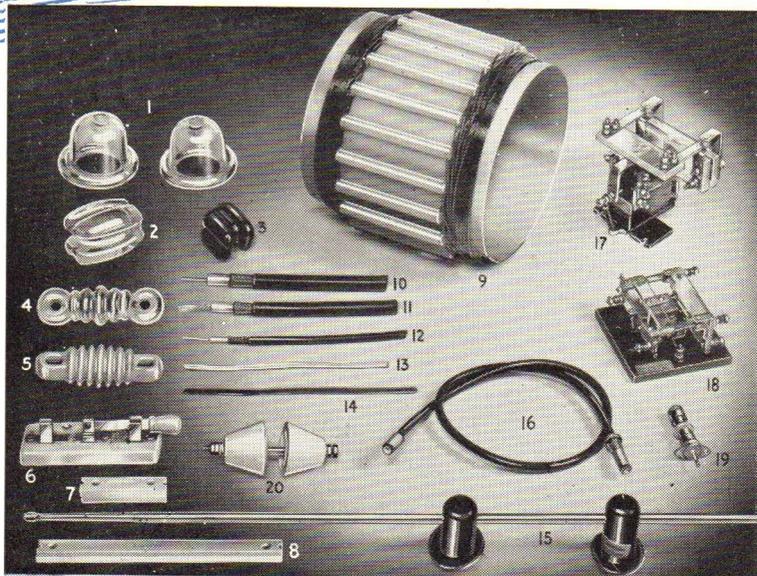


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**VOL. V No. 10 DECEMBER 1947**

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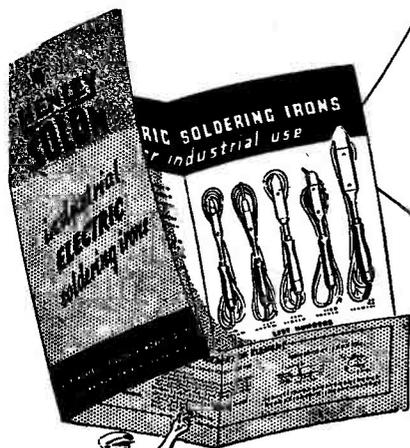
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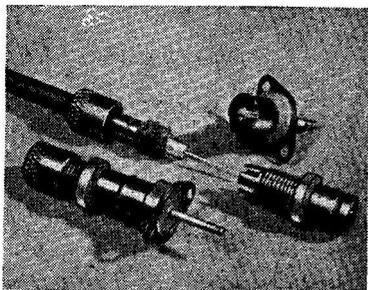
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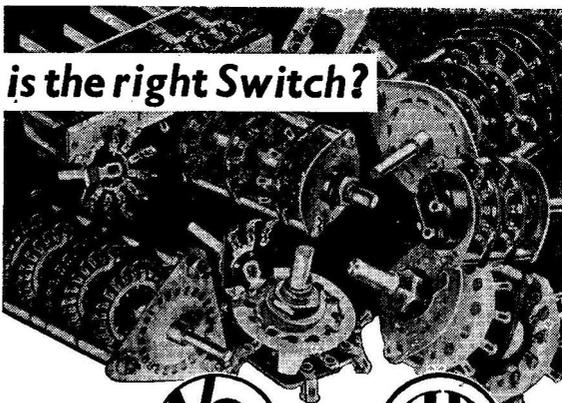
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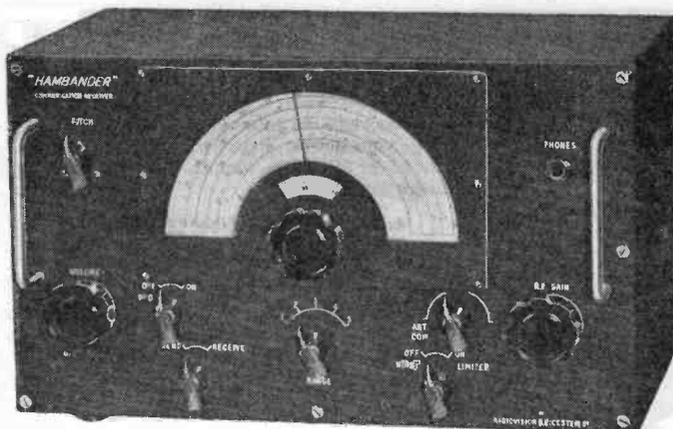
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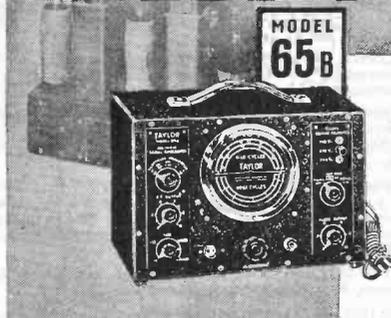
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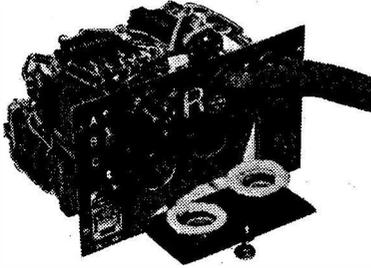
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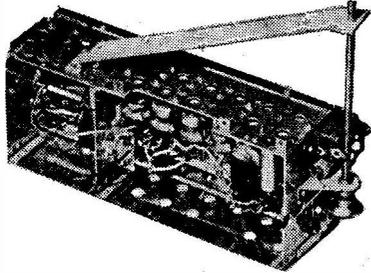
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# SHORT WAVE MAGAZINE

FOR THE RADIO AMATEUR AND AMATEUR RADIO

Vol. V.

DECEMBER 1947

No. 53

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5"	P5T	3.0		10,500	32,000	2W
6½"	P6Q	3.0	1"	8,500	26,000	3W
6½"	P6T	3.0		10,500	32,000	3W
8"	P8D	2.3	1"	6,200	24,000	4W
8"	P8M	2.3		8,000	31,000	4W
8"	P8G	2.3		10,000	39,000	4W
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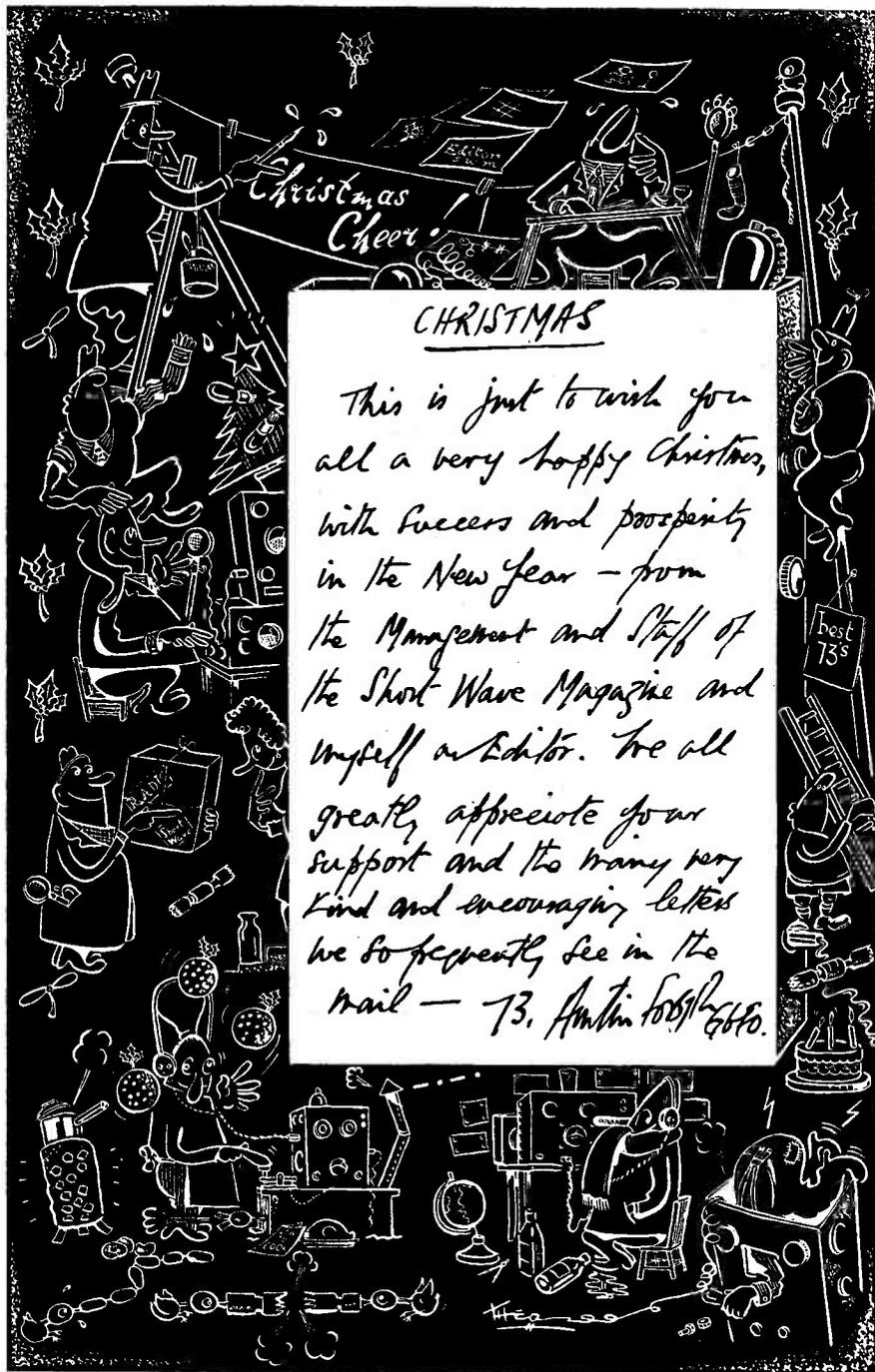
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# 100 Watts for Ten and Twenty

## A CW/'Phone Transmitter for the DX Bands

By A. B. WRIGHT (G6FW)

### PART I

*(This article gives complete details of the design, construction and operation of a full-power transmitter unit suitable for both CW and telephony operation on 14 and 28 mc. The modulator section will be covered separately in a later issue. The general arrangement will be of particular interest to those graduating from a Class-A licence to a 150-watt permit.—Ed.)*

**T**O the amateur whose main interest is in working DX, it will be agreed that the bands most suited to his requirements are 14 and 28 mc.

In order to obtain maximum efficiency it is desirable that the transmitter be designed solely for work on these frequencies, and it was with these points in mind that the transmitter to be described was evolved.

In the interests of economy it was decided to use a pair of 807's in push-pull in the PA stage. Many readers may have noticed (as has the writer) that although there are many circuits and designs using this deservedly popular valve as the output amplifier of an exciter, or perhaps a single 807 as a 25-watt PA, there is a dearth of practical data on the use of two such valves in push-pull as a final amplifier. This may be due to the fact that 807's have acquired a reputation for being difficult to manage when used in this way. One of the objects of this article is to outline such possible snags as are likely to develop, and to describe the methods by which the valves may be effectively "tamed" to make an efficient and trouble-free PA.

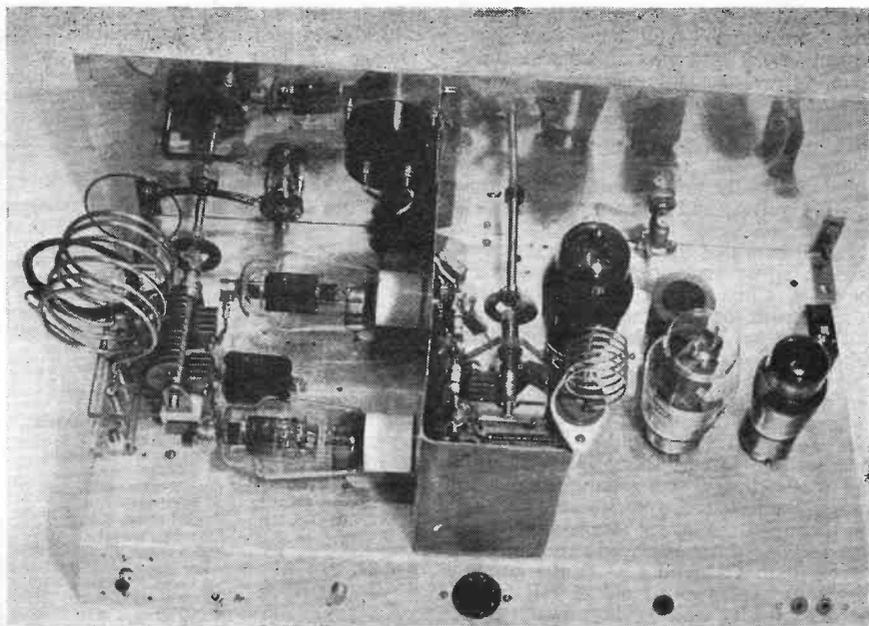
There seems to be a tendency at the present time to use high-voltage low-current valves, such as the 813 and PT15, in the final stage; whilst there are no doubt advantages to be obtained by using such valves, expense becomes a factor, since, apart from the high initial cost of valves in the 813 category, there is the question of replacements to be considered. More important still, 1,000-volt power packs rarely come cheaply—at least, not in the writer's experience! Rectifier valves, smoothing and by-pass condensers for high voltage working are all relatively costly as compared with their low-voltage counterparts.

There is also the newly-licensed amateur to be considered. When the time comes for him to invest in a 150-watt ticket he is confronted with a variety of alternative designs for his PA. It is felt that the PP807 transmitter to be described will meet his requirements adequately, as he will no doubt have on hand most of the required components, including the valves, so that a 500-0-500 transformer *plus* an 83 rectifier will enable him to put his 120/150-watt carrier on the air with a minimum of extra expense and trouble. Furthermore, should he by some mischance ruin his 807's or his 83 in the course of his 'prentice efforts, his replacement costs will not be heavy. If, however, he adheres to the design given, such an untoward situation ought not to arise!

### The Circuit

As mentioned previously, the transmitter has been designed for use on the 10- and 20-metre bands, but there is no reason why, by changing crystal and coils, it should not cover the 40- and 80-metre bands. Examination of the circuit will show it to be quite straightforward and free from unnecessary frills.

A 6V6 crystal oscillator on 40 metres drives a 6L6 or KT66 doubler on 20 metres, a further 6L6 being used to double to 10 metres. A tritet or regenerative crystal oscillator was not considered. In the first place, this would lead to complications when a VFO is used, and secondly it was considered that to effect a change from 20 to 10 metres would be more easily and efficiently managed if a further doubler stage were incorporated, rather than to have the tricky adjustment of a tritet circuit with which to contend. A further point is that if the Tx is to be used successfully on 10-metre 'phone it is as well to have a reasonable amount of drive in



General view of the chassis, showing layout. The 807's in the PA are mounted horizontally on the screen, giving the shortest possible grid and plate leads.

hand, and the extra doubler ensures this. Tritet and regenerative oscillators, especially in the hands of a beginner, are notoriously heavy on crystals, and in this respect the extra 6V6 as a straight pentode oscillator may be considered as a sort of crystal insurance policy!

The DPDT wafer switch S1 handles the exciter band-switching, serving to transfer the 20-metre output of V2 to the grid of V3. In the 20-metre position the switch by-passes V2, the 40-metre output of V1 being then taken direct to the grid of V3 for doubling to 20 metres. A second wafer switch S2 ganged to S1 cuts the screen voltage to V2 when using the transmitter on 20, thus effectively cutting out the extra doubler stage. V1 and V2 are both parallel fed, thus enabling the variable condensers C1 and C2 to be mounted directly on the metal front panel and eliminating constructional difficulties.

#### PA Input Circuit

The input circuit to the PP807's merits a little consideration. Originally, the transmitter was designed using separate coils for the anode of V3 and the grids of

the 807's, band switching being effected by means of a low-impedance link from each exciter stage to the PA grid coil. However, this arrangement meant an extra tuned circuit for V3 anode with attendant tuning complications; after some experimenting it was found that a capacity-coupled arrangement, as shown in the circuit diagram, considerably simplified tuning arrangements and enabled quite a compact layout to be achieved.

The wafer switch at S1 is of the Yaxley type, and although a bakelite switch is shown in the photograph, ceramic insulation is no doubt desirable from the loss point of view. It might be mentioned, however, that using the present switching, no losses are noticeable when a comparison with the low-impedance link switching is made. In fact, drive on 10 metres seems to be improved, although this may be because of the better layout due to the capacitive coupling to the final stage.

A single-ended condenser is used to tune the PA grid coil L3, grid circuit balance being maintained by the incorporation of parallel feed. Incidentally, it may be

mentioned that a split-stator condenser and centre-tapped coil have been employed in the grid circuit, with the link coupling arrangement mentioned above, and using conventional series feed, but a snag was experienced in that one of the 807's persisted in "glowing red." It was found that the trouble was due to unbalance in the grid circuit between the two PA valves, and a change to parallel feed effected a cure immediately.

It will be noted that no RF chokes are used in either grid or anode circuits of the 807's. Chokes were originally inserted in series with the grid leaks R13 and R14, and the usual anode choke in the high voltage lead to the PA coil centre tap. This combination of inductances in grid and anode circuits resulted, however, in LF oscillation due to the TPTG circuits thus formed. During the course of modifications to cure this defect, the grid and anode chokes were removed, and the transmitter functioned so smoothly without them and the layout was so compact, that they were not replaced; reliance is placed upon C22 and C23 in the anode circuit to bypass any residual HF from the HT positive lead to the power pack, and upon resistors R13 and R14 and condenser C20 to serve a similar function in the grid bias circuit.

But it is suggested that if the constructor experiences any trouble from feedback into the HT supply, the usual RF choke be placed in the HT supply lead, as shown in broken line in the circuit diagram.

A combination of battery and grid leak

bias is used on the PA, an arrangement which gives no trouble and enables quick change of bias to be effected when necessary. A small amount of cathode bias is sometimes used with 807's, but any bias thus obtained must be deducted

**Table of Values**

Fig. 1. 100 watt Transmitter for 10 and 20 metres

- C1 = 150  $\mu$ F variable
- C2 = 100  $\mu$ F variable
- C3 = 50  $\mu$ F variable
- C4 = 50  $\mu$ F per section split-stator, 1,500-volt spacing
- C5 = 500  $\mu$ F mica
- C6, C7, C8, C11, C12, C15, C16, C20 } = .01  $\mu$ F 600-volt working
- C9, C13 = .002  $\mu$ F mica
- C10, C14 = 100  $\mu$ F mica
- C17 = .02  $\mu$ F mica
- C18, C19 = 50  $\mu$ F mica
- C21, C23 = .0015  $\mu$ F mica, 2,000-volt working
- C22 = .002  $\mu$ F mica, 2,000-volt working
- C24 = .006  $\mu$ F mica, 2,000-volt working
- R1, R5, R9 = 100,000 ohms,  $\frac{1}{2}$  watt
- R2 = 400 ohms, 2 watt
- R3 = 40,000 ohms, 2 watt
- R4, R8, R12, R16 = Meter shunts—see text
- R6, R10 = 500 ohms, 5 watt
- R7, R11 = 30,000 ohms, 2 watt
- R13, R14 = 25,000 ohms, 1 watt
- R15, R17, R18 = 50 ohms,  $\frac{1}{2}$  watt
- R19 = 25,000 ohms, 10 watt
- R20 = 5,000 ohms, 3 watt
- RFC1, RFC2 = 2.5 mH RF Chokes
- S1 = Yaxley type DPDT switch
- S2 = Yaxley type SPST switch
- S3 = SPDT toggle switch
- Key Jack = Closed circuit, insulated type
- V1 = 6V6G
- V2 = 6L6G
- V3 = 6L6G
- V4, V5 = 807

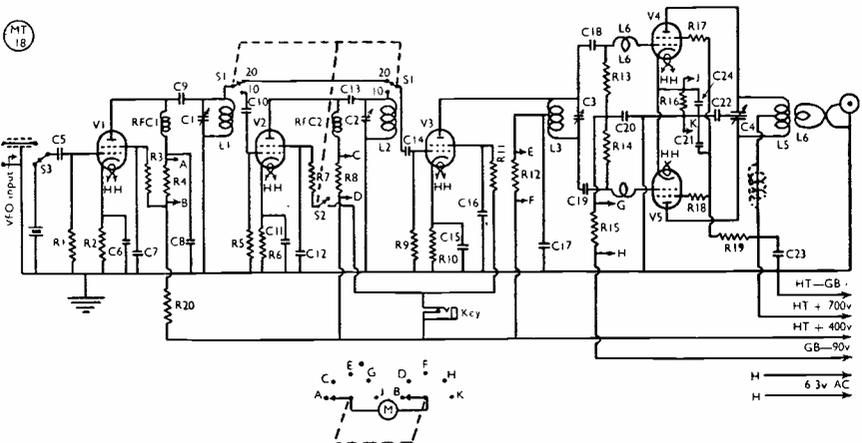
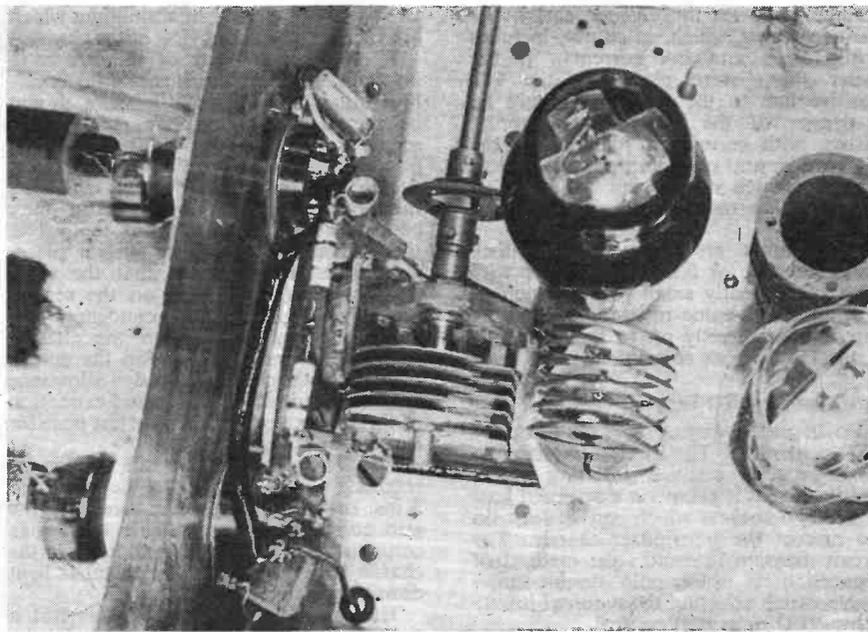


Fig. 1. Circuit of the RF section of the transmitter. The switching cuts out one intermediate driver stage on the lower of the two bands covered.



Close-up of the grid side of the push-pull 807 PA in G6FW's 100-watt design.

from the available anode voltage to the PA, and as the power pack to be described delivers just sufficient voltage under load for the job in hand, cathode bias was not incorporated.

#### Parasitic Suppression

The small inductances L6 in the 807 grids are parasitic suppressor chokes, and used in conjunction with the stopper resistors R17 and R18 in the screens, were found very necessary in suppressing all trace of UHF parasitic oscillation, a trouble which has discouraged many from using 807's as PP amplifiers. Details of the chokes are given in the table of values.

Parasitic oscillation in the PA stage can readily be detected by reducing the bias until the PA draws, say, 100 mA with no grid drive. A neon bulb is then applied to the anode of each valve in turn, while the PA tank condenser is rotated from minimum to maximum. If parasitics are present the neon will glow. This test assumes, of course, that trouble is not being experienced from *self oscillation* of the PA, but if the layout shown in the

photographs is adhered to, no trouble should arise from this cause.

Fifty-ohm resistors were also tried in the grid circuit as suppressors, but it was noted that on 10 metres they were not completely effective, and had the effect of reducing the PA drive considerably. If these small chokes are made up and wired in exactly as shown they will prove to be a complete cure for UHF parasitics.

#### Metering

One 0-30 millimeter meters all necessary circuits, Shunts R4, R8, R12, R15, R16 are wound to increase the range of the meter according to the current flowing. Shunts R4, R8 and R12 adjust the meter reading to 150 mA at full scale deflection, shunt R16 giving the full scale range to 300 mA. The shunt in the grid circuit R15 is a 50-ohm resistor, and the meter is used on its normal 0-30 mA range to measure grid-drive, the high value of R15 having negligible effect upon the meter reading.

A two-pole multi-way Yaxley switch connects the meter in any desired circuit. It should be noted that the PA meter

reading indicates the *cathode* current of the two valves, which, of course, includes grid, screen and PA currents. If the meter shunt were placed in the HT positive line to the PA there would be a danger of the meter switch arcing across, with consequent damage to the HT rectifier and other components, unless a meter switch of superior insulation is used and the meter itself well insulated for safety.

The shunts are wound with either resistance wire or fine-gauge copper wire on a conveniently small former, such as a defunct high-value resistor, and can be wired either directly on to the switch or in the HT line, as convenient.

### Provision for VFO Input

On 10 and 20 metres the Tx is normally VFO-controlled. The VFO in use has two choke-capacity coupled isolating stages and its output is taken *via* a screened lead to the two sockets which can be seen on the rear of the transmitter chassis. The circuit diagram illustrates the method of connection, a single-pole double-throw toggle switch selecting the required input, either VFO or crystal control.

### Construction

The transmitter was originally designed to fit into a wooden cabinet with a sloping front panel, but the construction also lends itself to fitting into the usual metal or wooden rack. Panel and chassis are in aluminium of a fairly stout gauge, being cut to size by the supplier, who also gave the panel a finish of black crackle enamel at slight extra cost.

Panel dimensions are 21 ins.  $\times$  9 ins., and the chassis is bent to shape from a flat piece of aluminium 19 ins.  $\times$  11 ins. Construction follows normal practice, panel and chassis being marked out after the position of all valves, coils and the larger components has been noted. The panel is marked and all drilling done from the back to avoid marring the front surface, the meter hole being cut out by means of an adjustable tank cutter used in a carpenter's brace.

Incidentally, it will be noticed that the positions of the PA anode and grid tuning condensers are not quite symmetrical with regard to the meter. This is due to the fact that the Tx was originally built with the 807's mounted vertically, an arrangement which was eventually abandoned, resulting as it did in grid and anode leads of an awkward length for 10-metre work. This also explains the

two square "patches" of aluminium which are visible in the under view of the chassis!

If complete stability of the PA is to be maintained on the higher frequencies horizontal mounting of the 807's should be regarded as imperative. The metal screen supporting the 807's is of aluminium, its position on the chassis being decided by the diameter of the tank coil, the dimensions of the split-stator tank condenser and the length of the valves themselves, and to ensure correct placement it is recommended that the valve holders be first mounted on the screen, the valves inserted, tank condenser and coil placed in position on the chassis, and the mounting holes for the screen marked on the chassis, after due allowance has been made for insertion and extraction of the valves, and for the shortest possible length of anode leads.

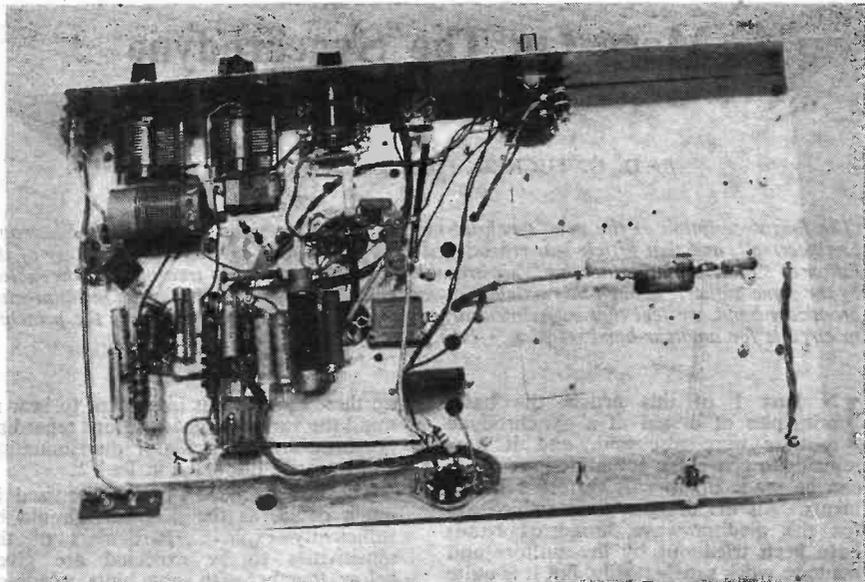
The rear portion of the screen is extended to run parallel to the panel for 3 ins. or 4 ins. to assist in screening the grid coil and condenser from the anode components. After drilling all holes in the chassis the rear edge of the metal is bent down for a length of 1½ ins.

The angle of this rear edge is not a right angle, for, as mentioned previously, the transmitter was originally meant to be mounted in a cabinet with a sloping front panel. If the more conventional method of construction is adopted, with

### Coil Table

#### 100 WATT TRANSMITTER FOR 10 AND 20 METRES

L1	CO 40 m Tank Coil	=	16 turns 22g enamelled on 1½ in. dia. former, 1½ in. long, bolted beneath chassis.
L2	1st Doubler 20 m Tank Coil	=	7 turns 22g enamelled on 1½ in. dia. former, 1½ in. long.
L3	2nd Doubler Tank Coil		
	20 metres	=	12 turns 16g bare copper, 1½ in. dia. 1½ in. long, centre-tapped, self-supporting.
	10 metres	=	6 turns 16g bare copper, 1½ in. dia., 1½ in. long, centre-tapped, self-supporting.
L4	PA Tank Coil		
	20 metres	=	12 turns ½ in. copper tube, 2½ in. dia. 3½ in. long, centre-tapped, self-supporting.
	10 metres	=	6 turns ½ in. copper tube, 2½ in. dia., 2½ in. long, centre-tapped, self-supporting.
L5	Aerial Link		
	10 and 20 m	=	2 turns 14g enamelled 2½ in. dia. (see text).
L6	Grid Suppressor Chokes	=	12 turns 20g tinned copper, ½ in. dia., spaced diameter of wire.



Underneath the chassis ; the CO anode coil is in the top left-hand corner.

the rear chassis edge at right angles, the overall width of the unbent metal should be increased by 1 in.

The chassis is bolted to the panel  $2\frac{1}{2}$  ins. from its lower edge by means of a small length of angle iron at the centre, underneath the chassis, two small steel angle brackets being mounted at each end of the front chassis to ensure rigidity. The PA tank condenser is raised slightly above the chassis to get short anode leads, the rotor being insulated from the chassis. An insulated flexible coupling is used to connect the dial shaft to the condenser rotor.

**PA Coil and Mounting**

The PA coil is of  $\frac{1}{8}$ -in. copper tubing for 10 and 20-metre operation, the actual dimensions being given in the coil table. The coil mounting is of perspex or other good HF insulating material, the sockets and pins being of large dimensions to ensure low losses and complete rigidity. Five pins are required to each coil, the outer pins connecting to the outer ends of the coil and the centre pin to the centre tap. The aerial link coil is wound to a slightly smaller diameter than the tank coil, using 14-gauge enamelled wire, and

is bound with insulating tape, leaving the ends about 3 ins. or 4 ins. long. The ends of the link coil are soldered to the remaining two pins, and the supporting wires bent so that the link can be inserted between the two centre turns of the PA tank. It will then be found that the link coil has sufficient rigidity to retain its position after the aerial coupling has been correctly adjusted for optimum loading. This adjustment is made for each coil used, thus rendering adjustment of the link from the panel unnecessary. The coil holder is supported at each extremity by small stand-off insulators.

*(Part II of this article, describing the power supply, operation and adjustment of the transmitter, will follow next month.*

—Ed.)

**R.C.M.F. EXHIBITION**

We are informed by the Secretary of the Radio Component Manufacturers' Federation that the next (fifth) annual private exhibition of British Radio, Television and Electronic Components and Test Gear will be held during the period March 2-4, 1948, at Grosvenor House, W.1.

# More On The Synchrondyne

## Some Practical Circuits

By D. G. TUCKER, Ph.D. and J. F. RIDGWAY

(The first description of the new 'synchrondyne' method of reception appeared in "Electronic Engineering", and that article was reproduced in our issue for May last. By courtesy of the Editor of "Electronic Engineering", we are able to present a further treatment of the subject by the same author. Though this article discusses the design of receivers for the medium-wave broadcast band, we feel that experimentally-minded readers will wish to apply the principle to circuits for amateur-band working.—Ed.).

IN Part 1 of this article the basic principles of design of a Synchrondyne receiver were discussed, and it now remains to give some actual designs which can be made up to suit various requirements. All the designs given (which are for the medium-wave broadcast band) have been tried out by the authors and made to work satisfactorily, but it is quite possible that they can be improved by careful thought and experiment. In setting

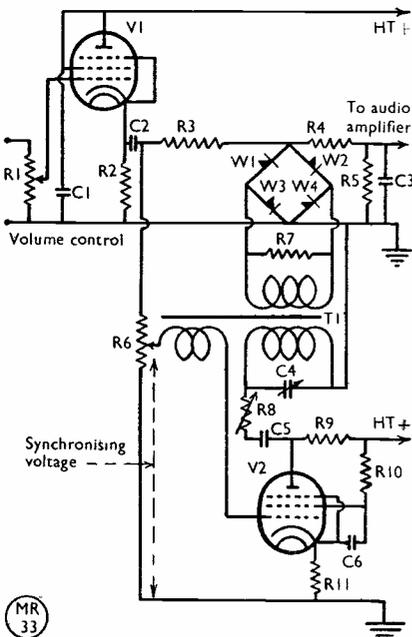
up these circuits it is important to bear in mind the various considerations regarding synchronisation, oscillator discrimination and linearity discussed in Part 1.

The circuits need not be discussed in much detail, as the diagrams should be sufficiently explicit. Particulars of the sensitivities to be expected are given below, together with some hints on adjustment. Three main circuits are shown :—

(a) The basic circuit shown in the preliminary article, using a Cowan demodulator with a cathode-follower input; this is a low-sensitivity receiver.

(b) A high-sensitivity circuit using two RF valve stages and a ring demodulator.

(c) A very simple receiver of medium sensitivity and less perfect performance, using a triode-hexode valve for demodulation.



### Table of Values

Fig. 1. Basic Circuit

- R1 = not critical, say 1,000 ohms potentiometer
- R2 = 300 ohms
- R3 = 5,000 ohms
- R4 = 2,500 ohms
- R5 = 2,500 ohms
- R6 = 10,000 ohms potentiometer
- R7 = 250 ohms
- R8 = 250,000 ohms variable
- R9 = 10,000 ohms
- R10 = 20,000 ohms
- R11 = 200 ohms
- C1 = 0.05μF not critical
- C2 = 0.05μF not critical
- C3 = 0.005μF
- C4 = 500μμF variable
- C5 = 0.05μF not critical
- C6 = 0.05μF not critical
- W1-4 = Silicon crystal Germanium crystal rectifiers or D1 diodes
- T1 = Tuned winding 100μH; Grid winding 10 μH; Demod. winding 1μH; Dust or air-core
- V1 } = Valves type SP41 or equivalent
- V2 }

Fig. 1. Basic circuit of the synchrondyne receiver.

MR 33

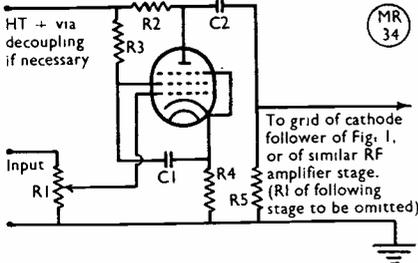


Fig. 2. An additional RF stage for the synchrodyne.

Fig. 2. Additional RF Stage

- R1 = not critical, say 1,000 ohms potentiometer
- R2 = 10,000 ohms
- R3 = 20,000 ohms
- R4 = 200 ohms
- R5 = 100,000 ohms
- C1 = 0.05 $\mu$ F, not critical
- C2 = 0.05 $\mu$ F not critical
- V SP41 or equivalent

**The Basic Circuit**

Fig. 1 shows details of this. As given, the sensitivity is low, a signal strength of about 50 mV being required to give good results. However, an additional RF stage is easily added, using the circuit of Fig. 2, and this should enable signals of about 2 mV to be satisfactorily received.

The feedback resistance R8 is the oscillator amplitude adjustment. This should be set so that oscillations are produced without any input signal, and the voltage developed across R7 should be about 2 volts.

The synchronising control R6 should be set at maximum if normally only fairly weak signals are received, but for very strong signals (say over 100 mV at the input of Fig. 1), a lower setting will be desirable. If on weak signals, however, the discrimination against other signals is not good enough, R6 may be turned down.

The audio output\* from the basic circuit is only about 1 mV when the input signal is 50 mV.

In the preliminary article, a low-pass filter was shown in the output. This has been found to be unnecessary in most practical cases, as the audio stages do not transmit the supersonic frequencies which the filter is intended to remove. The condenser C3 has some filtering action. If, however, trouble is experienced with supersonic signals becoming demodulated

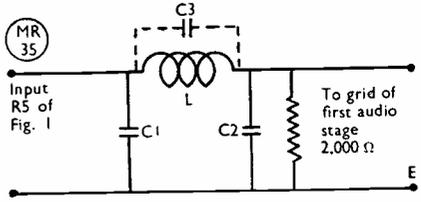


Fig. 3. Low-Pass Filter.

For cut-off at 10 kc in circuit of Fig. 1, with L untuned, L = 64 mH, C1 = C2 = 0.008 $\mu$ F.

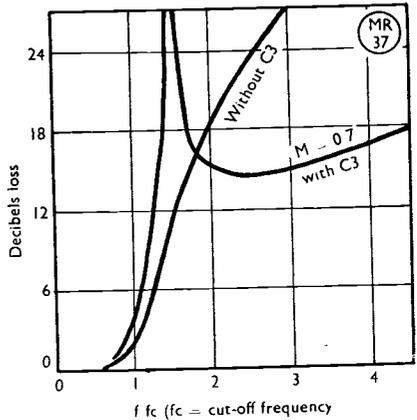


Fig. 4. The loss-frequency characteristics.

in the audio stages due to their slight non-linearity, a filter may be fitted, according to the circuit shown in Fig. 3. The loss-frequency characteristic is shown in Fig. 4; with just the basic filter (L, C1 and C2), the loss rises smoothly with frequency. Should there be present an interfering signal rather too close in frequency for this simple filter to be effective, C3 may be used, giving a peaked response as shown.

**High-sensitivity Circuit**

Fig. 5 shows a circuit which can receive signals down to 10  $\mu$ V. A two-stage RF amplifier is used with input tuning ganged to the oscillator tuning control. The input tuning is advisable when low-level signals are to be received, in case there are strong signals also present which might overload the amplifier. Overall negative feedback is provided, and this can be varied by adjustment of R9, which therefore serves as a volume control.

\* In all cases quoted, a 30 per cent. modulation of the input signal is assumed.

With an input signal of only 10  $\mu$ V, the audio voltage at the secondary of T3 is about 60 mV with the volume control at maximum setting. For stronger input signals, audio voltages up to about 1 volt are permissible.

The oscillator circuit is the same as before, except that only 1 volt is required across the modulator winding of T1.

**Simple Receiver Using Triode-Hexode**

Fig. 6 shows a circuit which has been designed for maximum simplicity. It can receive an input signal down to about 10 mV, and with this input voltage gives an audio output from the triode-hexode of about 1 volt. The oscillator must be adjusted by means of R10 to oscillate with a grid amplitude of 7-10 volts when there is no input signal. The discrimination against unwanted stations is not as good as in the previous circuits, but is probably adequate for ordinary purposes. The input volume control should be used to maintain a signal voltage of about 0.3-0.5 volt across R5.

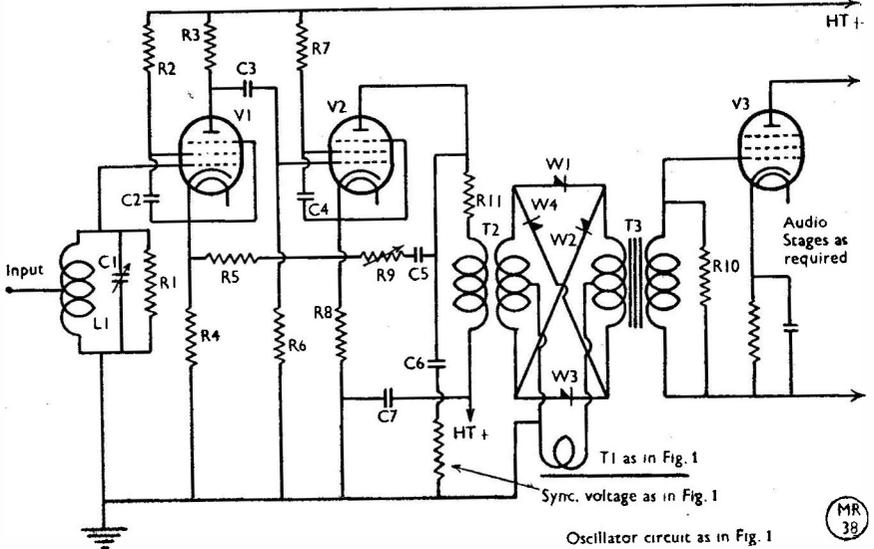
**Conclusions**

The three designs of receiver described in this article should have given the reader an adequate illustration of the way in which a synchrony receiver may be built up to meet varying requirements. It is hoped, therefore,

that readers will be able to prepare modified designs, if necessary, to suit their own individual requirements as to sensitivity, discrimination and simplicity. There is also ample scope for experiment in the application of the principle to short-wave and communication-type receivers.

**Fig. 5. High-Gain Receiver Using Ring Type Demodulator**

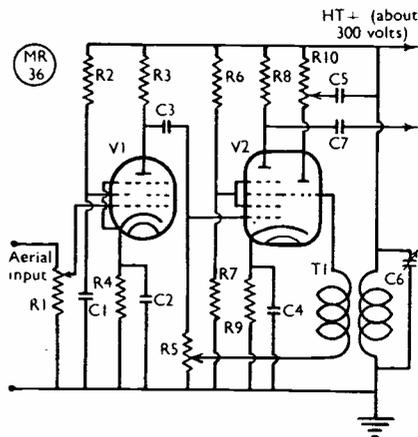
- R1 = as required
- R2 = 20,000 ohms
- R3 = 10,000 ohms
- R4 = 200 ohms
- R5 = 10,000 ohms
- R6 = 100,000 ohms
- R7 = 20,000 ohms
- R8 = 200 ohms
- R9 = Volume control, 250,000 ohms
- R10 = 200,000 ohms
- R11 = 5,000 ohms
- V1 = Valve type SP41 or equivalent
- V2 = Valve type SP41 or equivalent
- C1 = 500 $\mu$ F variable ganged to oscillator tuning condenser
- C2 = 0.05 $\mu$ F, not critical
- C3 = 0.05 $\mu$ F, not critical
- C4 = 0.05 $\mu$ F, not critical
- C5 = 0.05 $\mu$ F, not critical
- C6 = 0.05 $\mu$ F, not critical
- C7 = 0.05 $\mu$ F, not critical
- L1 = 100 $\mu$ H, tap at midpoint
- W1-4 = as in Fig. 1
- T2 = Preferably on small dust core (say T6 type) Anode winding about 7 mH Demod. winding in two balanced halves, about 1 mH total. Turns ratio 2.5:1
- T3 = Any good audio-frequency input transformer, step-up about 1:10. Primary in two balanced halves, total about 10 Henries



**Fig. 5. A high-gain receiver circuit, using the ring-type demodulator.**

Fig. 6. Simple Receiver Using Triode-Hexode Valve

- R1 = Not critical, about 1,000 ohms potentiometer  
 R2 = 30,000 ohms  
 R3 = 10,000 ohms  
 R4 = 300 ohms  
 R5 = 10,000 ohms potentiometer  
 R6 = 25,000 ohms  
 R7 = 30,000 ohms  
 R8 = 10,000 ohms  
 R9 = 200 ohms  
 R10 = 50,000 ohms potentiometer  
 V1 = Valve type SP 41 or equivalent  
 V2 = Valve type ECH 35  
 T1 = Tuned winding 100 $\mu$ H; Grid winding 10 $\mu$ H  
 C1 = 0.05 $\mu$ F, not critical  
 C2 = 0.1 $\mu$ F, not critical  
 C3 = 0.05 $\mu$ F, not critical  
 C4 = 0.1 $\mu$ F, not critical  
 C5 = 0.05 $\mu$ F, not critical  
 C6 = 500 $\mu$ F variable  
 C7 = About 0.1 $\mu$ F



## BIRTHDAY NOTE

The current (December) issue of our *Short Wave Listener* is No. 1 of Vol. II. The first year has been, we think, not unsuccessful, and the paper has established itself as a useful, informative, progressive and stimulating addition to the range of radio periodicals published in the English language. The *Short Wave Listener* is conducted by the staff of the *Magazine* and there is thus an identity of interest, with the same technical and literary standards.

At the same time, the appeal of the *Short Wave Listener* is to the SWL, and it is in the SWL interest that the *Short Wave Listener* exists. Its regular features—"Have You Heard?", for the amateur-band enthusiast, and "DX Broadcast", for the BC-minded listener—present the latest and most authoritative information in their respective spheres, and between them enjoy a very wide following. The "Calls Heard" section runs to a regular three pages per month, and WAZ (of the *Magazine*) is featured as "Heard All Zones." The general articles each month are such as to be of interest primarily to the SWL, with particular emphasis on the listener who is working up for his transmitting licence.

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## MORE LONELY CARDS

There are quite a number of addresses we want this month of G's, mainly operators recently licenced, for whom our QSL Bureau is holding cards. If you are in the list, please send a stamped addressed envelope, with your name and callsign, to BCM/QSL, London, W.C.1. This is a full and sufficient address for the Bureau. Your card(s) will follow on the next G clearance.

G2ADL, 2AMA, 2BTU, 2BWL, 2CFK, 2CKC, 2CQ, 2FIG, 2FLW, 2FOC, 2FRY, 2FSC, 2HZF, 3ACI, 3ACO, 3ACP, 3AM, 3AMC, 3AMH, 3AMM, 3AMO, 3AMW, 3ANE, 3ANF, 3ANX, 3AQA, 3ASX, 3ATZ, 3AUO, 3AUP, 3AV, 3AVV, 3AXT, 3AXW, 3AYO, 3AYU, 3AZS, 3BBY, 3BCH, 3BCQ, 3BDI, 3BEK, 3BGN, 3BHR, 3BHW, 3BIE, 3BIK, 3BKD, 3BKH, 3BLA, 3BLR, 3BMJ, 3BMV, 3BMY, 3BOB, 3BOS, 3BPZ, 3BQY, 3BRE, 3BTM, 3BUD, 3BVA, 3BWL, 3BWy, 3BYH, 3CAI, 3CBA, 3CBZ, 3CCN, 3CDQ, 3CDR, 3CEW, 3CFG, 3CLB, 3CLD, 3CLG, 3CMJ, 3CMZ, 3COA, 3FW, 3JV, 3LM, 3OD, 3QV, 3TP, 3ZC, 4DH, 4FG, 4HB, 4MM, 4RJ, 4RR, 4XA, 5BC, 5BW, 5GJ, 5SZ, 5WL, 6GA, 6II, 6KL, 6OY, 6PW, 6SP, 6VY, 8AV, 8CJ, 8DG, 8FC, 8HG, 8IB, 8IF, 8KX, 8KY, 8OQ, 8PT, 8TB, GC2FC, GM2BUD, 2YA, 3BLJ, 4AA, GW2ANT, 3AZQ, 3BYZ, 3CMR.

# Maximum Signal-To-Noise Ratio

## Factors Affecting the Design of Communication Receivers

By G. H. COX, B.Sc., A.R.C.S. (G3CCD)

(In this article the author discusses design only from the point of view of obtaining maximum signal/noise ratio, and makes a number of practical suggestions to that end.—Ed.)

**A**N analysis is made in this article of the noise developed in a radio receiver, and the procedure to obtain maximum signal-to-noise ratio is outlined. On this question, I cannot agree with the analysis set out by G6NC in his article ("Weak-Signal Receiver Design," *Short Wave Magazine*, October, 1947), although I do agree with many of the other points raised.

It will be shown that the first stage in a receiver is the most important, with the mixer stage coming second. Thus, noise in the first stage is amplified by the following stages together with the signal. For example, a noise-voltage of  $1 \mu\text{V}$  at the grid of the first stage gives a noise output of a volt or so, and will be comparable with the signal from a DX station. From this example it will be seen that noise voltages *must* be referred to a common point before a true comparison can be made.

### Shot Noise

The anode current of a valve is not completely uniform but consists of a stream of electrons, each being a separate unit of electricity. The anode current can be considered as a uniform current upon which is superimposed a random fluctuating current. This fluctuation causes a voltage to be set up in the anode load of the valve, thereby manifesting itself as the shot noise. This noise, by its random nature, is distributed over the whole frequency spectrum used, so that the total noise energy within a band of frequencies depends on the width of the band. It will therefore be seen that a selective receiver develops less shot noise than an unselective receiver. The shot noise is conveniently referred to the grid of the valve as the equivalent voltage which, when applied to the grid, would cause the same fluctuations in anode current. This can be done by dividing the noise current by the mutual conductance of the valve. The noise

voltage depends on the particular type of valve and circuit used but will be of the order of  $0.2\text{--}2.0 \mu\text{V}$  for an RF pentode. If this voltage is developed at the grid of the first RF stage it will be of the same order as that produced by a weak signal.

### Thermal Agitation Noise

Free electrons in a conductor have a random motion, thereby developing a random fluctuating current, producing noise within the conductor similar to the shot noise in valves. The extent of the noise produced depends upon the resistance of the conductor and the band width, being greater as the resistance is increased or as the pass band is widened.

In the case of a tuned circuit the noise can be regarded as being built up in the equivalent series resistance of the circuit. The thermal agitation noise is the limiting factor on long wavelengths but on short wavelengths the valve shot noise usually predominates.

### Noise After RF Stage

Mixer valves have a higher noise-factor than RF valves due to the lower conductance of the mixer; its higher noise constant (see appendix); and to noise introduced by the local oscillator. Thus a receiver starting with a mixer will have a poorer signal-to-noise ratio than one starting with one or more RF stages. Again, the mixer noise can be swamped by providing sufficient RF amplification, such that the amplified noise from the first RF stage is greater than the mixer noise. Also these random voltages cannot be added arithmetically; they must be added as the root of the sum of their squares.

An example will make the whole argument clear:

Suppose the RF stage has a gain of 20 and produces a noise of  $1 \mu\text{V}$  referred to its own grid, whilst the mixer produces a noise of  $5 \mu\text{V}$  at its grid.

Thus the noise from the RF stage at the mixer grid is  $20 \mu\text{V}$ .

$$\text{Total noise} = \sqrt{20^2 + 5^2} = 20.6 \mu\text{V}.$$

The increase in noise due to the mixer is therefore only 3 per cent. although the ratio between the amplitudes is 5 to 20.

It will be seen from this example that given sufficient RF gain, then the mixer will make only a negligible contribution to the total noise. The same consideration applies with even more force to stages following the mixer, since by then the noise from the RF stage will completely swamp any further contribution of noise. Thus the extent of IF and AF amplification is of little import from the standpoint of noise although sufficient amplification must be used to obtain a workable output. Also, the AF stages should not introduce hum or extraneous voltages. By careful design of the AF stages it is possible to avoid hum (*cf* microphone amplifiers) and since a fairly large signal is usually applied from the second detector to the AF stages, the extent of further amplification required is small.

#### Other Considerations Affecting Noise

In many communication receivers no provision is made for adjusting the aerial coupling, or perhaps only two couplings are provided—one for a dipole, the other for a random high impedance aerial. Except at certain spot frequencies, such coupling will not provide for proper

matching and optimum signal transfer, so that the overall signal-to-noise ratio will suffer. The solution to this problem is simple—provide either an aerial tuning network with a proper matching line, or some form of adjustable aerial coupling.

Furthermore, it is highly probable that the aerial will influence the ganging of the first tuned circuit, thereby causing loss of signal. Thus some form of tuning correction is also necessary.

Ganging of the tuned circuits causes loss of signal, since the oscillator and signal circuits are tracked in most receivers for only three points over the tuning range. The solution is to use some form of band-spread system with the band set adjustable for each circuit, or to provide correction for each circuit. However, this complicates handling since it increases the number of controls. In practice, if only the first tuned circuit is provided with correction then the drop in signal-to-noise ratio will not be serious; since, in fact, the greater part of the noise does arise in this stage.

It is, of course, assumed that high-Q tuned circuits with the minimum of stray capacity and the proper tuning capacity will be used.

The question of noise generated outside the receiver has not been considered, but external noise can be much reduced by the use of a proper aerial (with, if



The *Short Wave Magazine* Stand at the Amateur Radio Exhibition, where we had the pleasure of seeing old friends and welcoming new readers. Among the signatures in our Visitors' Book is that of Sir Stanley Angwin, who opened the Show, and many holders of well-known call signs.

## APPENDIX

## Shot Noise

This may be expressed as a component  $I_s$  of the direct anode current  $I_D$  of a valve as follows :

$$I_s = k \sqrt{I_D} \times df \dots \dots \dots (1)$$

where  $df$  is the width of the pass band in c/s and  $I_s$  and  $I_D$  are in amperes ;  $k$  is the noise constant and depends on the valve type. It has a value of  $0.4 \times 10^{-8}$  for normal RF pentodes but beam valves such as the EF50 and EF54 have a noise constant of about half this value.

The noise current  $I_s$  can be referred to the grid of the valve as the equivalent noise voltage  $E_s$  which when applied to the grid would produce the same noise current.

Thus

$$E_s = \frac{k \sqrt{I_D} \times df}{gm} \text{ volts } \dots \dots \dots (2)$$

where  $gm$  is the mutual conductance of the valve.

## Thermal Agitation Noise

The noise produced in a resistor of  $R$  ohms for a band width of  $df$  cycles per second is given by

$$E_s = 12.6 \times 10^{-11} \times \sqrt{Rdf} \text{ volts } \dots (3)$$

In the case of a tuned circuit the noise voltage  $E_s$  is given by

$$E_s = 12.6 \times 10^{-11} \times \sqrt{Z} \times df \dots \dots (4)$$

where  $Z$  is the impedance of the circuit at resonance.

The noise voltage of a valve is often expressed as the equivalent resistor  $R$  in which the thermal agitation noise produces the same noise voltage. Substitution for  $R$  in equation (3) will give the noise voltage at the grid of the valve.

necessary, a screened feeder). Noise interference and the like can be mitigated by using one of the well-known noise-limiting circuits, which enable a signal to be read through considerable interference of this type.

## Conclusions

Starting at the aerial terminal the procedure adopted should be as follows :

- (1) Provide proper coupling to the aerial.
- (2) Provide some form of tuning correction to the first tuned circuit.
- (3) Use high-Q tuned circuits with a low tuning capacity.
- (4) Use valves with a low noise-level and high gain in the RF stages. In this position the EF54, which is a beam valve and has a high slope with a low noise-factor, is to be recommended.
- (5) Use sufficient RF amplification to swamp the mixer noise ; two stages will be sufficient up to 60 mc.
- (6) Operate the first RF stage at full gain. Do not use AVC on this stage, but instead employ a manual control to avoid overload on strong signals.
- (7) Run the oscillator to provide the proper voltage for maximum conversion conductance. The oscillator voltage

should not exceed this and should have as pure a waveform as possible.

(8) Keep the band-width of the receiver just wide enough for intelligible communication. A band-pass crystal gate is recommended for telephony.

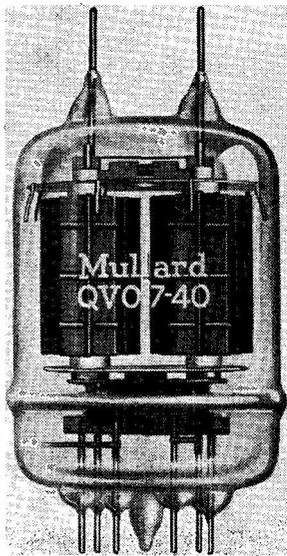
(9) Design the AF stages to avoid hum and amplitude distortion. A good top response is not necessary since the tuned circuits will not pass the high frequency side bands.

(10) Start again and see if the first stages can be improved !

## SOME MULLARD VALVES

The Mullard equivalent to the American 829B is the QVO7-40, capable of giving about 60 watts RF output on CW with a top frequency limit of 250 mc. This is a very fine valve, as the illustration suggests, and will stand up to much hard work in amateur service. It is a double beam-tetrode, requiring only a watt or so of drive for full output. Ratings are 750 volts on the plate, 160 mA plate current, with 40 watts anode dissipation for 87 watts RF output at up to 200 mc.

Another little job is the Mullard TYS2-250, a silica triode which will give just the half-kilowatt of RF on 75 mc, with several thousand volts on the plate and no trouble!



# Twenty-Metre DX Forecast

Predictions for December

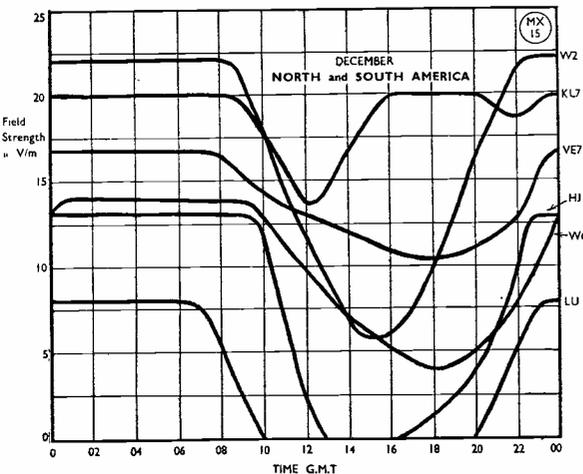
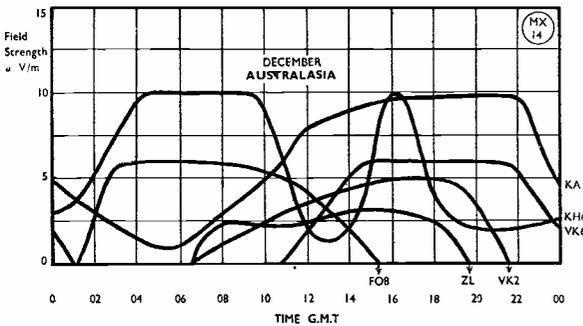
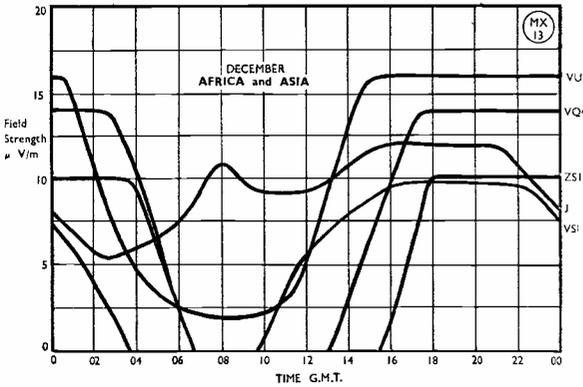
By I. D. McDERMID,  
A.R.T.C. (GM3ANV)

**A** GENERAL inspection of the curves for this month will show that there are few marked alterations now that the winter conditions have established themselves. The majority of curves do, however, show an increase in signal strength at their periods of minimum field strength, and the most marked changes are from those areas whose routes follow along the Auroral Zone regions.

KL7 shows a double minimum period due to the fact that the path for this signal passes virtually over the North Polar regions, resulting in rather unusual illumination effects by the sun on the total length of this route throughout the 24-hour cycle. This accounts also for the very marked double minimum or afternoon peak on the KH6 route as shown on the Australian curves, and which started to show itself last month.

The period of activity for ZL has contracted by about three hours, and the morning period of activity for both ZL and VK2 will be seen to have merged.

Finally, the only other feature of note is that the curve for KA is now wholly above the zero line and communication with this area should be at its best around mid-day, before the African and more Westerly Asiatic areas start to make themselves heard.



# DX COMMENTARY

## ON CALLS HEARD, WORKED & QSL'd

By L. H. THOMAS, M.B.E. (G6QB)

Greetings once more, after a month of good conditions, but a disappointing one for the DX man. (Yes—DX hunting is far more difficult when conditions are *too* good! This is the season for the leisurely rag-chewer and the worker of routine DX.) Nevertheless, there is no falling-off in the volume of our mail, and the quality improves all the time!

Just a glance at the WAZ List before we start. Look at those 40's now; G8KP has returned to the fold with a top score, G6BQ (Chatham) is a newcomer to the list and breaks right into the 40's, and G3AAM (Birmingham) has the distinction of being the first "three-plus-three" to make the top. But it seems pretty clear that we shall have to find something more difficult with which to test the DX Kings next year. We have already passed a Loose Minute to our tame Inquisitor but all that we have had back is a frivolous suggestion to the effect that the WAZ list for 1948 should be confined to the two top bands.

As a matter of fact we *do* neglect them; G2AJU (Ipswich) makes this point and says how much interest there is in working 1·7 and 3·5 mc. He has rolled in 15 countries with QRP on 3·5 mc, and has a few well-chosen words to say about the activities of the 150-watters on that band, mainly devoted to shouting the other man down. And here we agree—we don't see the necessity for more than 50 watts on 80 metres; at least, not for the purpose for which most of the 150-watt enthusiasts use it!

G2AJU continues "What about printing a few lists of Calls Heard on the LF bands by some of your readers in distant countries?" Simple answer to this one, 'AJU—if they send them in we're only too glad to print them; we would like more and more. Distant readers, please note.

### Are You DX-Crazy?

We were recently shown a shocking document from one of the W6 DX experts which threw some light on the way things go over there among the less balanced members of the fraternity. Whereas the average W6 is just as rational a being as

any other amateur (although he may run to a kilowatt), some of the types whom we should call Spivs resort to the most frightful tricks in their search for DX. Worse than this, more than one of them over there admits that the strain of chasing DX in the competitive manner has reduced him to a nervous wreck; he is on the verge of a breakdown and knows it, but still *has* to get that new country that someone else worked last night.

This is the old business of "Pleasant hobby *versus* full-time obsession" all over again. Now listen to G8KP (Wakefield) on the same subject: he says "I think there's a bit more in Amateur Radio than going mad for DX . . . DX working these days doesn't mean a thing, as with nearly any sort of gear it can be worked, and with any sort of aerial. I once remember, pre-war, working stacks of DX with an aerial that was blown down and buried under a foot of snow—so what?" This, of course, isn't a case of sour grapes, as 'KP has his 40Z anyway. Think it over; but we will put in one spoke before leaving the subject. It's true that almost any gear and any aerial will work DX—but only in the hands of a good operator. And there *is* a certain virtue in being a good operator, just as there is in doing anything well; if you only specialise in balancing a billiard-ball on your nose it's better to do it well than badly. But still you don't have to go mad over it!

So let us agree that there are three types of amateur to be catered for: Those who don't care for DX, those who are keen on it, and those who are crazy.

### DX of the Month

It seems that 14 and 28 mc have been sharing the burden pretty well this month, and it is impossible to separate out the letters into the two bands. G6BQ (Chatham) is one who makes full use of both. He heard the pack baying after C8YR and didn't know why! He says "I was woefully ignorant on DX topics, and it soon appeared that the reason for this deplorable state of affairs was that,



W4HRR's QSL card is a photograph of his outfit—the Tx is a Meissner 150 B and the receiver an HQ-129X.

for some time, I had neither seen *Short Wave Magazine* nor read 'DX Commentary.' He has remedied this, checked up his WAZ position and made 40 out of it, and is happily working again at his old QTH with a big Zepp and a folded dipole.

G6LX (Croydon) continues to knock them off on 28 mc 'phone, but has done a little 14 mc CW as well. He is doubtful about LZ1AB (28 mc) because he doesn't DF in the right direction. (We also have doubts.) G6BB (Streatham) has his QRO going (pair of 807's), and first DX QSO was W6BAX, last worked twenty years ago. VP8AI and several South Americans followed. 'BB says that W8BTI is very keen to find an amateur in Sinclair Gardens, London, W.14. If there is one, will he get in touch, please?

G8VR (London, S.E.2) has collected a dozen new countries with an aerial consisting of "a piece of 18 gauge hanging on a tree," and has just made his Century. G8VG (Dartford) comes into the list with 33Z and 78C, using 60 watts to 807's and a half-wave Zepp only 24 ft. high. An interesting one from him was a QSO with VK3NC, the latter using six watts into a rhombic. G6XX (Howden) expresses full

agreement (as do several others, in passing) with last month's remarks about 'phone at the LF end of the bands. We had a large collection of letters about this, which we passed to our friend Arabackle Oblifork. All he said, however, was "I still prefer CW for the thrill of hearing my call-sign instead of nothing but handles." But then, with a name like that, what would you expect? (Whaddya say, Arabackle; take it away!)

G3BFC (Ferndown), after a visit from G3AAE, checked up on his scores and was astonished to find he had worked 33Z—so he goes into the list. His latest include ZC6AA, VU2RS, VQ8AF, CR6AI, VS6BA, PK6VK and many more nice ones—all 14 mc CW with two crystals. G2BXP (Birmingham) is another newcomer to Zones Worked; he has QSO'd M1A and sends the full QTH, together with some other useful ones.

G2AJ (Hendon), whose score is now 156C, has built it up with LZ, VP5, VP3, KZ5, J8, YS, ZS6 (Bechuanaland) and some other good stuff; he also enters the lists on 'phone only with 37Z and 121C. He now has a 2-element fixed beam for 14 mc, a new 3-element rotary for 28 mc, and a 50 mc beam stacked above the latter!

We don't boast many rhombic farms in this little country, but we can show some good collections of rotaries.

G3CKO (Burton-on-Trent) spends a lot of his time flying to South Africa and the Far East, but was still able to work KP6AA, KM6AB, W3ETD/KG6, also KS4AC, C6HH, VS9ET and a few more! He sends a copy of *Radio-ZS*, an interesting little publication from down there, for which he has been asked to write a DX Column, as apparently no ZS can be found to take on the job. (No, 'CKO, it's not all potatoes, even writing a DX Column!)

G5RV (Chelmsford) worked the notorious LU1ZA (South Orkneys) in Spanish and remarks that he seems to be genuine all right. 'RV is another 'Phone-and-CW man who strongly advocates band-planning—compulsory, if need be. G2WW (Penzance) had his aerials damaged by gales, but managed to put his total up a little higher, with the help of PX1C on 7 mc. We hope this one is genuine, but of course we just don't know until the card turns up.

G2PL (Wallington) spent a while as G2PL/A at Cambridge, where he found 60 watts and an indifferent aerial produced far better results than his 140 watts at the home station will bring in. He has gone to the head of the list again, but he does remark that if G6ZO had been at home during the month he would probably have made the 200 mark by now! New ones on CW for 'PL were HE1EO, VS9ET, PX1C, FU8AA (first QSO with Europe).



I still think it's the one they use for advertising . . .

## WORKED ALL ZONES LISTING

Station	Zones	Countries
'Phone and CW		
G2PL	40	183
G6ZO	40	180
G5DQ	40	160
G8KP	40	156
G2AJ	40	151
G5YV	40	151
G6QB	40	147
G2WW	40	147
G6BQ	40	140
G3AAM	40	126
G5VU	40	124
G3DO	39	142
G3FJ	39	139
G2VD	39	132
G5RV	39	132
ON4JW	39	129
G3AAK	39	122
G8RL	39	120
G3QD	39	116
G3TK	39	114
G8IL	38	131
G6LX	38	126
GW3AX	38	123
G5CI	38	115
G6PJ	38	74
G4AR	37	108
G4CF	37	106
G3AAE	37	95
G2CNN	36	114
G2AKQ	36	104
G2AO	36	100
G5MR	36	98
G8IP	36	97
GW4CX	36	92
GM2AAT	36	75
G8VR	35	100
G5LP	35	96
G2AVP	35	89
G8RC	35	78
G3BDQ	35	74
G6XX	34	89
G6XX	34	110
SV1RX	33	91
G8KU	33	85
G2LC	33	78
G8VG	33	77
G3BFC	33	77
G5OQ	31	78
G6BB	31	74
G2HFC	30	81
G2VY	30	76
G3AGN	30	63
'Phone only		
G6LX	37	124
G2AJ	37	121
G3DO	37	114
G2PL	36	128
G6BW	36	115
G5YV	36	106
G6WX	36	105
G3FJ	35	115
GM2UU	35	107
G8QX	33	100

The latter is on every morning on about 28010 and puts in a marvellous signal, but is much chased by VK's and ZL's.

G6ZH (Devizes) worked CM9AA, describing himself as "Mobile Police Radio, Havana, using 20 watts," who said 'ZH was his *first* amateur contact—28 mc 'phone. G5MR (Felpham) collected Zone 39 with VQ8AF, on 14110 at 1630 GMT; 'MR still lacks four zones, but seems to have most of the difficult ones. G3DAH (Herne Bay) winkled out HH2ME (28500) who asked for it to be made known that he is there, with 30 watts to an 807, looking out for G's but *not* listening on his own frequency. HH2ME is on every evening from 2000 to 2200 GMT—QTH in list.

GM6LS (Edinburgh) worked W2JXH, whose QTH is on Park Avenue, in the middle of New York City, and 'LS remarks that he wonders just how these chaps do it, surrounded by man-made and amateur QRM beyond anything we can imagine, not to mention the buildings. GM6LS is now using a 3-element rotary on 28 but still suffers badly from ignition QRM.

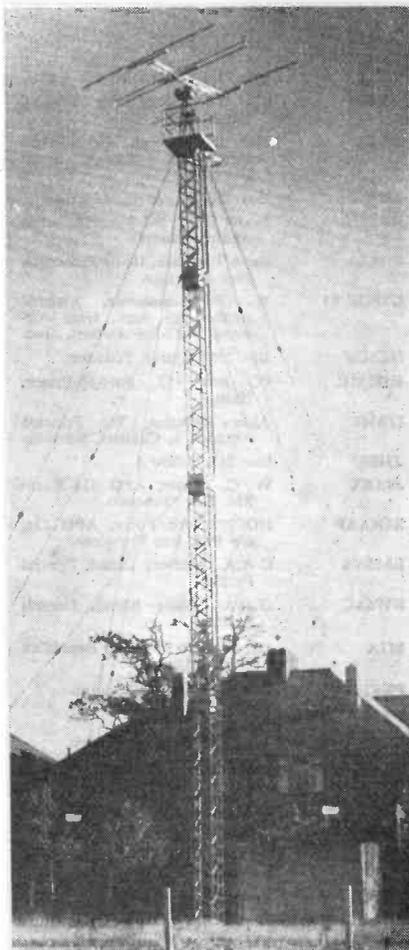
G8UT (Dartford) had a nice four-way with W2AMT, W6HJT and NY4AE, and he sends a few notes about W6AM as a matter of general interest. Don Wallace, W6AM, has two stations, one at his residence at Rolling Hills (1 kW, three 90-ft. masts, two rotaries and nine fixed beams) and the other at a ranch ten miles away. This second station has *thirty-three* 80-ft. poles with nine rhombics and two V-beams on a 1200-ft. hill overlooking the Pacific, but only uses 500 watts. (Never mind, we keep a sked with W6 on our pair of 807's and the one and only Windom!) We are trying to get a first-hand story from W6AM, though—his is reputed to be one of the best equipped amateur stations in the USA.

G3TB (Sheffield) recently worked W6WCN/KG6 on Saipan, and says the latter thought it was the first post-war contact between Saipan and G. But we can't allow that, because on our wall is a card from W9HJW/Saipan, dated March 13, 1946! 'TB also collected VS6BA and CN8EF—QTH's of them all in the list.

G3AAE (Bournemouth) climbs rapidly up the ladder with the help of KP6AA, UAØKQA, VP4TZ, ZC1AL, VQ5JTW, PK3JF, but is somewhat hurt by a QSO with XZ2PQ, who gave him "RST 233"! Later additions still are CR6AJ, C1DK, HE1EO, HH3L and EL3A.

#### 7 mc Band

Very scanty news about 7 mc this month—*one* or two correspondents remark about



The very fine 10-metre rotary beam on its lattice tower, recently put into operation at G2AMJ, Willerby, E. Yorks. A full description of his installation will be appearing in a later issue.

PX1C, and others have worked UF6 of the band. However, G3RB (Ossett) seems to have been doing quite well, with six districts of USA *plus* ZD3B, ZC6BK, VE 1 and 2, UAØLN—and the inevitable PX1C. 'RB would like to voice a protest against the increasing prevalence of bad notes—even among G stations. Must be this VFO craze—people sling one together and put it on the air, all excited, and never take time off to make the thing work

## DX QTH'S

C8KY	Box 73, Lanchow, Kansu, China.
CN8EF	C/o US Naval Air Station, Casablanca.
D5AA	Gabriel Migeon, SP 76422-BPM 451, French Zone-Germany.
EL3A	Box 98, Monrovia, Liberia.
ET3AH	Frank Frost, PO Box 858, Addis Ababa, Ethiopia.
FU8AA	Rene Thevenin, Ile-de-Pentecote, New Hebrides.
G2FDF/YI	W. F. Limehouse, Vickers' Armstrongs Rep., Iraqi Airways, Baghdad Airport, Iraq.
HC1CF	Box 2850, Quito, Ecuador.
HH2ME	PO Box 153, Port-au-Prince, Haiti.
IIAHK	Aldo Ravenna, Via Principa Amadeo 8, Cagliari, Sardinia.
J5HS	Box 515, Tokio 4.
J9ABX	W. C. Baxter, APO 331-3, c/o PM, San Francisco.
KG6AAF	HQ 20th Air Force, APO 234, c/o PM, San Francisco.
KM6AA	C.A.A., Midway Island, Central Pacific.
KW6AC	C.A.A., Wake Island, Central Pacific.
M1A	Dr. Corrado Francini, Republica di San Marino.
PK6TO	Box 76, Macassar, Celebes.
PX1C	Box 66, Andorra.
VOZAT	APO 863, PM, New York.
VO6Y	Pan-Canada Air Lines, Goose Bay, Labrador.
VP5AS	APO 861, c/o PM, Miami, Fla.
VP8AI	Pebble Island, Falkland Islands.
VS2BU	Sgt. Morgan, RAF Butterworth, Penang, Malaya.
VS2CB	c/o Telecoms Dept., Kuala Lumpur, Malaya.
VS6BA	109 Austin Road, Hong Kong.
VS7PS	No. 1 A.W.B.S., c/o GPO, Colombo, Ceylon.
VS9AF	c/o A. Besse & Co., Aden.
W2WMV/C9	Box 10, Navy 3930, Fleet PO, San Francisco (Station at Mukden, Manchukuo).
W6WCN/KG6	NAS Kobler, Navy No. 957, US Naval Air Station, Saipan, c/o Fleet PO, San Francisco.
XAFG	Radio Officer, VG Police, Trieste.
XAFQ	US Army, Free Territory of Trieste.
ZC6MF	c/o X Branch, HQ Palestine.
ZC6SX	B. P. Knight, Belmore, Seagrave Road, Sileby, Loughborough.
ZS6OL	c/o RAF, Gaberones, Bechuana-land Protectorate.

properly. If you use a VFO and your note is not T9, for the love of Pete *do* something about it, even if you miss a QSO or two. G8JC (Droitwich) also brings up the subjects of PX1C and Bad Notes; in detail, he says "there are altogether too many T5's on 7 mc."

## Gen. Department

G2CNK (Doncaster), who operates CW only, was literally "speechless" to hear himself on 'phone recently. . . . So he asks us to say that if anyone hears G2CNK talking drivell on 'phone, it is *not* the genuine article but just a common pirate. . . . G3LP (Cheltenham) says that VU2RS (RAF Mauripur, Pakistan) particularly wants to find an amateur in Lincoln, who should look for him on 14125 CW. . . . Best time is 1830-1930 GMT. . . . VU2RW also operates from the same QTH.

David Mitchell of GW6AA is leaving the country and will have no fixed address for the next few months. So he asks for all cards and other communications to be addressed to him at BM/GAA, London, W.C.1. His old friends will all want us to wish him Good Luck, which we are glad to do. . . . G4CY (Henley) asks us to pass on the fact that the QSL Manager for N. Rhodesia is now VQ2DH, at Box 93, Livingston.

GM2UU (Stanraer) remarks "How to find out if 14 mc is dead. . . . listen on 3.5 and see who's on." . . . G2VV (Hampton) endorses our plea for more time Off the Air, and is showing willing by doing a big rebuild. But he says "Dare not listen on 14 mc or I'd find myself building a Doubler/PA for my 7 mc transmitter!" He shames us heartily by saying that his 1.2 watts in a recent QRP Contest got the same report from an OK on 3.5 mc as our own QRO (15 watts).

## 2000 Years of Amateur Radio

We have been repeatedly asked over the air to do something about getting the Old Timers together into a Club. (This is what comes of working on 3.5 mc.) Well, we are altogether in favour, and we have recently worked enough stations who have been on the air for more than 20 years to be quite certain that we could get together 100 members—probably from readers of this column. So let's go to it, here and now. Will everyone reading this who held a transmitting licence more than *twenty* years back from the present date please drop a card, marked *Old Timers' Club*—and give the date of their first licence.

What a Club! No responsibilities, no

subscription, but an occasional night on the air, and above all things, an Annual Dinner. We *must* have an Annual Dinner, and what a night that will be! Never mind whether you have a long beard or not—if you have been on the air, or held a licence over the stipulated period, you are eligible—so pile in those cards right away.

#### From Overseas

MD2C (Tripoli) will shortly be changing his call, as MD2 prefixes are now reserved for the military; he thinks his new prefix will be "ICK," followed by a number and a letter, or a letter only. MD2C uses 22 watts to a 2-element fixed beam directed to the UK, and prefers working G's to chasing DX. . . . G3CDR (aboard H.M.S. *London*) sends lists of Calls Heard on 3.5 and 7 mc from various places, and promises to do still more. . . . G3CJG (ex-VU2JG) is shortly sailing for VQ3 and VQ4, and hopes to meet old friends from there.

G2FDF/YI (Baghdad) says he heard some G's as soon as he got his rig going, and called them, all hopeful like, but couldn't raise anything. It was some time before he found that a coolie had tied his aerial to a hangar instead of to the insulators! He says it is nice to be in great demand but very annoying to have flocks of stations calling one in the middle of a QSO. He will be in Iraq about six months and has 600 QSL's, so all genuine QSO's will get one (Spivs keep off!).

ZC6SX has gone QRT and will be home at Loughborough shortly, if not by now. During five months on 14 mc he worked 84 countries with 30 watts into an 807, from near Nazareth. He reminds us that no ZC6 stations are *official*, but that the QSL Bureau is efficiently run by ZC6AA from Box 4150, Tel Aviv. And we also understand that ZC6BK works lots of DX on 7 mc and is preparing a list of G Calls Heard on 3.5 mc. ZC6SX's "G" QTH is in the list—if he has slipped up on any QSL's, please contact him there.

S/Ldr. Hedgeland

(Kings Lynn) sends some news of the ST station. Active are ST2JF (ex-ZC6JF), ST2FT, and ST2MP, on 28 mc. ST2AM, the RAF Club Transmitter, is on 14 mc. We have since been told over the air by ST2FT that ST2RL is also on 14 mc CW.

G2AJU (Ipswich) asks for the status of German nationals, as he has heard D4AC and D4CN on 3.5 mc, both giving full addresses. G3AGP (Morden) has worked the former, who told him that certain German nationals are now permitted to operate transmitters. On the other hand, we have a letter from Waldemar F. Kehler (Schleswig), who says that in the American Zone stations are licensed only with calls from D4AAA to D4AZZ and that all others are pirates except D5AA in the French Zone! The Deutscher Amateur Radio Club is permitted in the British Zone—receiving only—and there are three amateur clubs in the American Zone. Personally, we think that probably a few selected German amateurs have been given licences and allowed to transmit once more. We should be glad of further news, however.

#### Late Items

ON4JW (Brussels), sending in his new WAZ claim of 39Z and 129C, says, "I



Another old timer outfit—G2NS in 1933. He ran a crystal-controlled SP55R-SP55R-LSSB transmitter, with an AR4100-PT25 modulator; the receiver was the ubiquitous 1-V-1, using PM12-HL210-PM22.

wish that all stations would co-operate with your suggestions for radio-etiquette; I have lately had several examples of bad behaviour from two well-known DX stations and others." 'JW adds that all pre-war amateurs in Belgium have been asked by the GPO to pass an examination before having their licences renewed for 1948. . . . What an idea!

G6ZO writes quite a pathetic letter from Beirut, Lebanon, which bears out much of what we have said about 40 metres. He has managed to get on there with 5 watts on 7 mc, all anxious to give some of the boys a new country, but he writes, "What a response! Not a soul paid the slightest attention! Everyone was engrossed in working S9 plus signals down the street, or bawling his head off with an 'Appelle generale' on spitch. . . . How I wished some of the DX gang had been on—they would have heard me all right." Jim has forwarded a list of Calls Heard on 7 mc, just to point his remarks.

G5DQ (Cambridge) has worked all districts USA, VK, ZL, VS9, ZC6, KZ5 and ZS—all on 7 mc with a dipole 20 ft. high! He has been almost exclusively on 40 metres during the past month.

SV1RX (Greece), one of the SV1 operators who went voluntarily off the air last April owing to political conditions, is back on again and says that the matter of issuing licences officially will be cleared up

very soon. He adds that the G's in Greece have been getting together and now run fortnightly meetings; he sends some nice photographs taken on the Acropolis, which will be appearing here in due course.

G3BI (Seer Green, Bucks.) has been doing great things with a 2-section E-W 8JK, having tuned feeders. This aerial, which he recommends as an all-purpose radiator for 14 and 28 mc, has been bringing him in some of the best of the stuff on both bands.

### 1948 Marathon

A final reminder that we shall run the British end of CQ's 1948 DX Marathon, and that those of you who feel like throwing away your post-war scores and starting again on January 1 should send your 1948 scores along each month for tabulating in this column; they will also be forwarded to CQ.

And, last of all, a Very Happy Christmas to all readers—DX-crazy, DX-keen, DX-apatetic and even Spivs, in the hope that the season of good will may induce the latter to mend their ways. But we do mean what we say: Very many thanks for your splendid support and continued help in running your own Commentary. Keep it up, and the very Best Wishes.

Let's hear again by first post on December 15—and, you Old Timers, do let us see how many we can muster. 73, BCNU, and Mri Xmas.

## CALLS HEARD

Please arrange all logs strictly in the form given here, in numerical and alphabetical order and on separate sheets under appropriate headings, with call sign and address on each sheet.

### 3-5 mc

G3CDR at Malta, October 5, 1947.  
G3AKU (44), 3BWQ (46), 4QD (44), GM4MF (45), GW8SU (34).

### 7 mc

G3CDR, Malta, October 5, 1947.  
G2CKN, 5FA, 6BKK (?), 8HX, GM3BZU 4AZ.

G3CDR, Indian Ocean, 9°31' N., 65°40' E.

E19J G3AHH (439), 3BHS (449), 3CGD (439), 5FA (439), 6BG (439), 6RB (329).

G3CDR, Malay Straits, 03°47' N., 99°46' E.

G2HFP (449), 3AZL (449).

GW3ALX, S.S. City of Derby, Bitter Lakes, Nr. Suez, Egypt.

G2OU (45), 2PL (56), 3APH (45), 3ARL (45), 3CMJ (45), 3CSD (44), 4AY (55), 4QD (55), 5DQ (55), 5LP (56), 5LR (45), 5VB (55), 6HC (46), 6LX (55), GM4NR (45), 8RU (34). (November 14 1900-2000 GMT: RS in brackets: Receiver—Marconi CR300.)

G6ZO at Beirut, Lebanon.

G2DPP, 3BLZ, 4GF, 4JV, 5CH, 2HR/A, 3AKY, 3CGB, 3COX, 3OF, 5FW, 5MY, 8DR, 8MU, 8FX, G12BZV, GW2CSX, G2DPP, 6TN, GW3AKU. (Period October 28-30.)

### 14 mc

VK3CX, 8 Mangarra Road, Canterbury, E.7, Victoria, Australia.

G2AAN, 2AIW, 2CXO, 2HFO, 2HKU, 2HKW, 2LU 2NS, 2SA, 3AAE, 3ADG, 3BI, 3BVK, 3CN, 3GY, 3PD, 3SJ, 3SR, 3UA, 4AR, 4CP, 4GI, 4GR, 4KI, 4NS, 5KT, 5RZ, 5SR, 5TL, 5UB/1, 5UB/2M6, 5WI, 5XW, 6DX, 6KA, 6KU, 6NG, 6OY, 6QN, 6RB, 6SS, 8II, 8KV, 8LO, 8RL, 8TK, 8TR, GM3AJY, 3UM, GW2XZ, 3ASW, 3ZV, 8MQ, 8NP.

GW3ALX, S.S. City of Derby, Bitter Lakes, Nr. Suez, Egypt.

G2AS (57), 2AJF (55), 2BAB (57), 2DC (57), 2YF (45), 3AAM (58), 3ABG (56), 3AGF (45), 3BAQ (56), 3BBE (58), 3BLG (58), 3CFK (45), 3CNW (56), 3SR (56), 4IC (57), 5BZ (58), 5YV (57), GW2XZ (58); (November 14 1730-1900 GMT: RS in brackets: Receiver—Marconi CR300.)

### 28 mc

A. L. Thorley, VQ3ALT, Aerodrome, Dodoma, Tanganyika.  
G2BYJ, 2CV, 2DN, 2KU, 2LB, 2PN, 3AQ, 4IF, 5RP, 5RY, 8KF, 8KV, 8VV.

## FIRST CLASS OPERATORS' CLUB

PRESIDENT : GERALD MARCUSE, G2NM

HON. SECRETARY : CAPT. A. M. H. FERGUS, G2ZC

Membership of the Club now stands at over 90, and there is increasing interest in F.O.C. activities in many unexpected quarters. An anonymous well-wisher has presented the Club with a magnificent silver cup, to be competed for annually in the Marathon Contest. It will be this year's prize for the membership Contest still in progress ; arrangements are being made for a suitable medallion to be presented to all holders of the cup, which will thus be an annual challenge trophy.

All log-entries for the Open Contest recently concluded on the 7, 3.5 and 1.7 mc bands must be in the hands of the Honorary Secretary (address below) by December 12 latest ; it is hoped to be able to announce results in the January issue of the *Short Wave Magazine* and the February *Short Wave Listener*.

As a matter of interest, the Rules of the First Class Operators' Club are reprinted herewith, for the information of those wishing to seek membership.

## Election Notice

In accordance with the Rules, the following have been elected to active membership of the F.O.C. :

L. W. Lewis, G8ML (Cheltenham) ; W. Jones, GW6OK (Colwyn Bay) ; J. W. Hogarth, G3ACK (Blyth) ; F. A. Jeffries, G8PX (Oxford) ; C. Grover, G4AU (London) ; C. A. Harnwell, G5NB (Bridge-water) ; A. Mears, G8SM (East Molesey) ; A. Ogden, GW5OD (Penrhyn Bay) ; P. M. Trowbridge, G3BLN (Lymington) ; and F/Lt. R. Tillyard, G3CAF (Honington).

All correspondence regarding the F.O.C. should be addressed to the Honorary Secretary, Capt. A. M. H. Fergus, G2ZC, 89 West Street, Farnham, Surrey. (Tel. : Farnham, Surrey 6067.)

## THE FIRST CLASS OPERATORS' CLUB

## Rules

- (1) The Club will be known as the First Class Operators' Club (F.O.C.). Its aim will be to foster and encourage a high standard of operating ability and behaviour on all amateur bands.
- (2) The F.O.C. will be managed by a small committee elected by the membership. The Editor of the *Short Wave Magazine* (or his representative) will be an ex-officio member of this committee.
- (3) Membership of the F.O.C. will be limited to those who
  - (a) Can send and receive Morse at not less than 18 w.p.m.
  - (b) Can work break-in on at least two amateur bands, with ability to QSY as necessary. Break-in *single-channel* working with VFO is desirable but not obligatory.
  - (c) Are prepared over the air to assist and advise newcomers to Amateur Radio.
  - (d) Agree strictly to observe all conditions of the licence.
- (4) Operators will be elected to membership on the recommendations of at least three sponsors, who are themselves already F.O.C. members and have been in contact with the applicant over the air.
- (5) The F.O.C. "club wave" will be the 3500-3635 kc section of the 3.5 mc amateur band.
- (6) Club periods each week will be as under :
  - (a) Wednesdays, 2000-2200 clock time.
  - (b) Sundays, 1200-1330 clock time.
- (7) F.O.C. members operating on this band during these periods should always sign "F.O.C." after the call. This will identify them and enable prospective members to QSO with a view to obtaining a recommendation for election. In the general interests of the Club, the use of "FOC" after the call is always desirable on any band.
- (8) Upon election, an entry fee of 3s. will be payable. Elections to membership will be notified periodically in the *Short Wave Magazine*, and no claim to membership will be valid unless so notified.

## AMATEUR TRANSMITTING VALVES

A new and well-produced Mullard pamphlet, entitled "Transmitting Valves for Amateurs" is now available ; it contains abridged data and prices for Mullard transmitting valves and rectifiers, also base connection diagrams and dimensions.

It can be obtained on request, of the Mullard Wireless Service Co., Ltd., Transmitting Valve Dept., Century House, Shaftesbury Avenue, London, W.C.2. Be careful to quote reference MV.121 when writing.

# How Not To Climb A Tree

## Or, Fixing an Aerial

By L. H. THOMAS, M.B.E. (G6QB)

(This is his story, and he's sticking to it!—Ed.)

**T**REES—nature's substitute for aerial masts—have one major disadvantage.

When your halyard breaks you simply *can't* lower a tree and re-erect it; not even with the help of all the local gang.

We know all about this; y (my transmitter and I) have two trees whose duty for some time past has been to support various types of aerial system. Living near the coast, we suffer from sudden and violent gales, and though most of them would have no effect on a well-erected aerial between two poles, they can play tricks with the trees. The favourite one is to set them swaying violently, knowing that sooner or later they will get out of phase. Then the 67-foot length of wire between them has two alternatives—to become 69 feet long for a short period or to break. It always does the latter.

Last time it did this we found that we had not got a continuous halyard at one end, and the shorter of the two broken bits was way up the tree, well out of reach. Our local professional monkey no longer wished to risk his life; and in any case one could only climb the tree by lopping it steadily away as one went upwards. So we didn't climb the tree. We sat down and thought.

Eventually we produced the following mixed bag: One dog's ball (hard synthetic rubber), one ball of string, one considerable length of No. 24 enamelled wire, 100 feet of 7/22, and an 80-foot length of barrage balloon cable.

By now you may have guessed what we are driving at. If your tree is of the tall and slender variety, without knobs or other protuberances near the top, don't bother to read on. If, like ours, it resembles a gollywog, carry on—there's hope yet.

### The Method

Using the ingredients listed above, the recipe proceeds roughly as follows: Bore a hole through the dog's ball (lock the dog up while you do this); tie the string firmly to it; uncoil about 100 feet of string and lay out carefully on the lawn, at a point from which you think you can perform a good "sling" over the tree.

Seize the ball, let it dangle on about four

feet of string, whizz it violently in a circle (lock the dog up while you do this) and let go. Then inspect the neighbour's greenhouse, apologise and start again. You didn't lay the string out loosely enough on the lawn. Do it nicely this time (lock the dog up while you do this).

Right! Off we go. Pity about those telephone wires. Don't try to pull the dangling ball *upwards* over them, or it will skirl madly round and tie them firmly together (Number Unobtainable!) Persuade the darn thing to slide down to ground level and cut the string. Then pull the rest of the string over the wires, tie up and start again. (If you have shutters to the windows, use them.)

### Keep Trying!

Eventually (it took us fourteen throws) you will get the ball clear over a limb near the top of the tree. But it won't come down the other side unless you are *very* lucky. Pull it back and start again; if it won't come, just start again, with another ball. After two afternoons of this we got it over the top and it *did* come down within reach. We don't recommend tying 7/22 on to the string and trying to haul that over; ours went up to the top, but then the string and the 7/22 came down on opposite sides. Hence the 24 enamelled (which cost us an old transformer). This should go up and come down nicely; it should bear the weight of the 7/22, as well.

Now for the balloon cable. Undo the coil (lock the dog up while you do this) and when the wire has finished leaping round the garden, fix a large shell insulator on the end. Through this pass your permanent halyard, whether of wire or rope, and haul the whole contraption up the tree with the 7/22. Make the end of the balloon cable fast round a convenient point at the bottom, and you have an aerial again. If you make the halyard continuous, further breakages should not worry you, because it won't be the balloon cable that breaks.

Final Note: If your garden is full of apple trees, rose bushes and similar spiky objects, remove the lot before you start—you'll finish by doing it, anyway!

# Here and There

## The Eddystone 640

If you would like the chance to win one of these excellent receivers outright, ask Stratton & Co., Ltd., Eddystone Works, Alvechurch Road, West Heath, Birmingham, 31, to send you the details of their essay competition. There are three subjects of Amateur Radio interest from which to choose for your effort, which need not exceed 1,500 words in length.

## Canadian Generosity

VE2KS, president of the Montreal Amateur Radio Club, notifies us of their intention to run a food-parcel scheme for the benefit of operators signing the G prefixes. The method of allocation will be to choose consignees by ballot from the cards of those G's who QSL the M.A.R.C. membership either by direct mail, through the VE2 bureau, or to the Club at P.O. Box 1, Station D, Montreal, Canada. This is to ensure parcels going to active G's who have had some personal contact with the Montreal boys—and a very good idea, too.

The M.A.R.C. has no less than 290 members and they are very anxious for G contacts. We should like to add our thanks to the Montreal Amateur Radio Club for this exceedingly generous and friendly gesture, which will be greatly appreciated over here.

## Crystal Exchange

The month's offerings are as follows :

**G2DC, J. M. Drudge-Coates, Southern Command Signal Regt., Figsbury Barracks, Winterbourne Dauntsey, Salisbury, Wilts.**

Has Valpey 1000 kc crystal in holder. Wants 3500-3520 or 7000-7040 kc crystal.

**G8UA, 406 Higher Brunshaw, Burnley, Lancs.**

Has 3635 kc crystal in holder. Wants 1800-1900 kc.

**G8WN, 30 Ransome Road, Ipswich, Suffolk.**

Has 7136 kc crystal. Wants frequency between 3500-3600 kc.

## Chance for Someone

We are informed by G2NU that an opening exists for a really smart amateur operator to go with a small yacht leaving London shortly to cruise in South African

coastal waters. The trip will be an interesting one, as it is proposed to visit Tristan da Cunha and calls may also be made at Ascension and St. Helena. Write G2NU at Willowmay, Hythe End, Staines, Middlesex, or ring him on Wraysbury 120.

## May R.A.E. Results

We have just seen the results of the May 1947 Radio Amateurs' Examination from the Department of Technology, City & Guilds of London Institute.

There were no less than 326 candidates, of whom only 120 passed, giving a failure figure of 63 per cent., or twice the "failed" proportion for the November 1946 sitting.

The Examiner's report states, *inter alia* "... the majority of entries were of an extremely low standard. From the phraseology and vocabulary used, it is apparent that a large number of entrants ... had received little or no coaching ... The use of abbreviated and corrupt English such as is commonly used by Amateur Radio operators is to be deprecated for examination purposes. ... Some of the answers were of a flippant nature and there appeared to be a tendency to treat the Examination as a not very serious matter. ..."

This is a most disturbing report from all points of view, and on the face of it suggests that some of the candidates who failed (and are now complaining to us that the questions were "unfair") have only themselves to blame.

## Obituary

With the passing of Air Commodore H. Leedham, C.B., O.B.E., RAF Signals personnel of all ranks will feel that they have lost an officer who did much for the Signals Branch of the Service. A/Cdre. Leedham, who was well known to many of an earlier generation, retired from the RAF in 1945 to become Managing Director of Ericsson Telephones, Ltd. During the war, he was successively Deputy-Director of Radio Research and Development at the Air Ministry and Director of Radio Production at M.A.P. He was a man of quite exceptional technical capacity and experience, and was extremely popular in the Royal Air Force.

## NEW QTH's

This space is available for the publication of the addresses of all holders of new call signs, or changes of address of transmitters already licensed. All addresses published here are automatically included in the quarterly issue of the Call Book in preparation. QTH's are inserted as they are received, up to the limit of the space allowance. Please write clearly and address on a separate slip to QTH Section.

- |         |   |         |  |
|---------|---|---------|--|
| G2AKQ   | F. B. Jones, Heathlands, Ashley Heath, Ringwood, Hants.   | G3BKQ   | D. Dryden, 76 Hillsborough Road, Glenhills, Blaby, Leicester.                                    |
| G2AQB   | W. Jardine, 10 Hill Close, Chislehurst, Kent.   | G3BKS   | J. Duckworth, 546 Plodder Lane, Farnworth, Bolton, Lancs.  |
| G2AYZ   | S. J. Ayers, 27 Garibaldi Street, Grimsby, Lincs.   | G3BNJ   | F/O R. F. C. Winzar ( <i>ex-VS1AL</i> ), 39 Sycamore Terrace, York.                              |
| G2BDP   | A. Berry, 8 Denzil Road, Guildford, Surrey.   | G3BPT   | P. Balestrini ( <i>ex-PK1AM, ex-VS1BT</i> ), 2 Macctusfield Road, South Norwood, London, S.E.25. |
| G2BLU   | A. H. Bird, 191 Tonbridge Road, Maidstone, Kent.  | G3BQC   | W. H. Plant, 19 St. Laurence Avenue, Warwick.  |
| G2CDN   | R. J. Toby ( <i>ex-SU1CX, ex-ZC1AR/ZC6</i> ), Treetops, Charlton Road, Kenton, Middx. (Tel.: North 1358.) | G3BTL   | J. Tulman, 64 Mayfield Avenue, Southend-on-Sea, Essex.   |
| G2CPS   | F. G. Marshall, 92 Flemingate, Beverley, Yorks.   | G3BTU   | H. White, 39 Trent Street, Retford, Notts.   |
| G2DHM   | W. D. Andrews, 4 Steep Street, Chepstow, Mon.   | G3BUR   | J. F. Collett, L.A.C., Transmitters, c/o P.O., Bassingham, Lincs.                                |
| G2DLO   | P. W. Green, 32 Valence Road, Leicester. (Tel.: Leicester 34633.)   | GM3BYK  | F. Baillie, 8 Loreburn Street, Dumfries.   |
| G2FBP   | H. Gregory, 63 Milton Street, Palfrey, Walsall, Staffs.   | GW3BZH  | G. F. Wilson, 118 Cardiff Road, Llandaff, Cardiff.   |
| G2FXA   | J. Q. Davies, 35 Kensington Road, Stockton-on-Tees, Co. Durham.   | G3BZK   | C. Ulyyatt, 20 Addiscombe Grove, Croydon, Surrey.  |
| G3ABN   | L. C. Cox, Rear Flat, 28 Zulla Road, Mapperley Park, Nottingham.  | G3BZW   | R. H. Horner, 48 Consort Road, Peckham, London, S.E.15.  |
| G3ABR   | L. D. W. Fensome, 20 Cassiobridge Road, Watford, Herts.   | GW3CAY  | F. Sully, 15 Llwynfedw Gardens, Birchgrove, Cardiff.   |
| G3AEF   | D. J. Pool, 22 Halsall Lane, Formby, Liverpool.   | G3CFC   | A. Wood 24 Muriel Street, Redcar, Yorks.   |
| G3AGF   | R. Edginton, 27 Grove Street, Retford, Notts.   | G3CFO   | G. F. Painter, 3 Diamond Terrace, Greenwich, London, S.E.10.                                     |
| G3AGW   | H. A. Edwards, 104 Holly Hedge Road, Charlemont, West Bromwich, Staffs.                                   | G3CFR   | J. H. Jowett, 28 Solent Road, Southbourne, Bournemouth, Hants. (Tel.: Southbourne 1648.)         |
| G3AGX   | L. D. Colley, Conniston Bungalow, Hollym Road, Withernsea, E. Yorks.                                      | GM3CGA  | A. L. Stevenson, 37 Bearford Drive, Hillington, Glasgow, S.W.2.                                  |
| G3AHX   | G. H. Banner, 6 Coppice Drive, Oswestry, Salop.   | G3CGH   | H. Thorpe, 5 Kingsway Avenue, West Point, Manchester, 19.  |
| G3ALK   | E. J. Holmes, 19 Rosemary Drive, Ilford, Essex.   | G3CHY   | H. Hunter, 144 Broadoak Road, Ashton-under-Lyne, Lancs.  |
| GM3ALZ  | B. McK. Davidson, 50 Anderson Avenue, Aberdeen.   | GW3CIJ  | W. R. Petheram, 7 Tynyrheol Avenue, Tonna, Neath, Glam.  |
| G3AMR   | G. J. Stuck, 70 Friar's Street, Sudbury, Suffolk.   | G3CJC   | Lt. K. M. McGowan, R.N., 3 Birdwood Grove, Fareham, Hants.                                       |
| G3AVR   | R. G. Warren, 10 Barnet Way, Mill Hill, London, N.W.7. (Tel.: Mill Hill 2991.)                            | G3CJG   | J. R. Farr ( <i>ex-VU2JG</i> ), Whingreen, Cornwood, S. Devon.                                   |
| G3AVR/A | R. G. Warren, c/o Radio Dept., Northern Polytechnic, Holloway, London, N.7.                               | G3CKQ   | B. C. Oldham, 25 Bowen Road, Rugby. (Tel.: Rugby 2086.)  |
| G3AWK   | R. F. Gough, 79 Hall Drive, Chilwell, Notts.  | G3CLA   | J. L. Matthews, 206 Union Road, Leytonstone, London, E.11.                                       |
| G3BAF   | P/O J. W. Carter, Fairway, Minster Road, Ramsgate, Kent.  | G3CLO   | T. H. Wright, 59 Bury Green Road, Cheshunt, Herts.   |
| G3BCA   | F. B. Travis, 54 South Park, Lincoln.   | G3CNS   | W. E. Fowler, 97 Prince Street, Leek, Staffs.  |
| G3BCU   | W. G. Ward, 55 Naunton Way, Cheltenham Spa, Glos.   | G3COR   | D. Cornish, 13 Connaught Avenue, East Barnet, Herts.   |
| G3BEY   | R. L. Mailey, 1 Pinfold Lane, Tickhill, Doncaster, Yorks.   | G3COT   | S. D. Marshall, 56 Trafford Road, Barnet, Herts.   |
| GW3BHA  | N. S. Taylor, c/o 30 Dimond Street, Pembroke Dock, S. Wales.  | G3COY   | W/O V. J. Reynolds, RAF, University of London Air Sqdn., Exhibition Road, London, S.W.7.         |
| G3BKM   | R. Ellis, 34 Booth Street, Cleckheaton, Yorks.  | G3COY/A | W/O V. J. Reynolds, 2 Langdale Crescent, Courtney Drive, Sneyd Green, Stoke-on-Trent, Staffs.    |

G3CPC	R. D. Charlton, 68 Harrow Drive, Romford, Essex.	GM2DRB	G. H. Heppel, H.M. Coastguard Station, Helmsdale, Sutherland.
G3CPM	D. G. Ingram, 49 Lime Tree Avenue, Broadway, Worcs.	G3AAL	B. H. Miles, 105 Little Common Road, Bexhill, Sussex.
G3CPY	J. K. Piggott, 29 Gregory Street, Ilkeston, Derbyshire.	G3ARB	W. F. Brittle, 31 Ashfield Avenue, Kings Heath, Birmingham, 14.
G3CQJ	J. Bessell, 237 Avonvale Road, Barton Hill, Bristol, 5.	G3BHD	R. H. Whitley, 136 Lincoln Road, Peterborough.
G3CRK	A. W. Watkins, 2 Cranleigh Gardens, Southall, Middx.	G3IL	W. R. Parker, Cambrian Lodge, Battery Road, Portishead, near Bristol.
G3CRP	R. J. Pigou ( <i>ex-VS1CC</i> ), Moor Lodge, Hawkhurst, Kent. (Tel.: <i>Hawkhurst 268</i> .)	G3UZ	F. G. Sadler, 154 The Guinness Trust, Stamford Hill, London, N. 16.
G3CSE	C. W. Smith, 568 James Reckitt Avenue, East Park, Hull, Yorks.	G5UM	J. Hum, Wyldes, 1 Burnham Lane, Bulls Green, Knebworth Herts.
G3CSL	W. W. Jones, 18 Leinster Road, Old Swan, Liverpool, 13.	G5VS	V. A. Sims, Redlands Lodge, Maidenhead Court, Maidenhead.
G3CSP	E. Brown, 89 Tideswell Road, Sheffield 5, Yorks.	G6MU	W. J. Munt, 71 Whitley Avenue, Raynes Park, London, S.W.20.
G3CTZ	A. Jones, 55 Markham Crescent, Staveley, Derbyshire.	G8RY	F. E. Wyer, 315 Stafford Road, Oxley, Wolverhampton, Staffs.
GM3DYM	Capt. F. Dymond, R.Sigs., Signal Unit, Glasgow University Contingent, Senior Training Corps, University Avenue, Glasgow, W.2.	<b>CORRECTIONS</b>	
G3ZY	J. R. Tweedy, Conway Cottage, Rothbury, Northumberland.	G3AH	J. D. Wightman, 45 Davyhulme Road, Urmston, Manchester.
<b>CHANGE OF ADDRESS</b>		G3AII	H. W. Brunton, 26 East Parade, Whitley Bay, Northumberland.
GC2AWT	R. H. Groome, BM/1154, London, W.C.1. ( <i>Station in Jersey</i> .)	G3BFZ	Willesden Radio Club, 51 Dudden Hill Lane, London, N.W.10.
G2DC	Major J. M. Drudge-Coates ( <i>ex-VU2FO, ex-JAAC</i> ), Southern Command Signal Co., Figsbury Barracks, Winterbourne Dauntsey, near Salisbury, Wilts.	G3QI	R. Bean, 20 Grafton Square, Wetherby Yorks.
		G8QD	F/L G. Horton, Kya Lami, 21 Chepstow Road, Felixstowe, Suffolk.

**INFORMATION WANTED**

G2AVW, 6 Bothal Terrace, Stakeford, Choppington, Northumberland, asks for the IF of the AR-88LF, which is believed to be different from other models in the AR-88 series, and also data on the CRT 1810 PL and CRT9(VCR-193A).

G3XK, 22 Kirkgate, Burnley, Lancs., says he is "desperate" for help with the Type G.73 Admiralty pattern wavemeter, fitted with the G.42 crystal calibrator. Can anyone spare the circuit diagram and operating instructions?

**STATISTICAL NOTE**

For those interested in figures, the Radiolympia attendance for the ten-day period was 443,433, the previous highest total having been 238,285 in 1934! On the second Saturday alone 55,748 people packed themselves into the Exhibition. The general opinion of the Trade is that the foreign business done was most satisfactory, and the radio industry feels itself within sight of the £12 millions per year export figure for which the Government has asked.

**SWL REPORT SERVICE**

If you want SWL reports on particular transmissions or experiments, let us have the details for inclusion in the "Pse QSL" feature in our *Short Wave Listener*. Insertions are made on the clear understanding that all reports received will be acknowledged by QSL card; the information we want from you is call sign, address for reports, the band(s) or frequency(ies) on which transmissions are to be made, whether 'phone or CW, the distances from which reports are required, your normal operating periods in GMT, and any particular information you want with regard to the transmission.

The *Short Wave Listener* regularly carries a full page of such requests, averaging 40 insertions each month, and the service is now being used by transmitters all over the world; most of the present series of insertions are for overseas amateurs who want British SWL reports.

Requests received as a result of this notice will appear in the *Short Wave Listener* dated February, due out on January 15.

# FIVE METRES

By E. J. Williams, B.Sc. (G2XC)

*Six-Metre Activity*

*Summary—*

*Many Successful DX*

*Contacts—*

*G Station 50 mc Firsts—*

*Individual Reports—*

*Contest Note*

**R**ECORDS ! And yet more records ! What a month ! Again we find ourselves with a spate of six-metre news—so much so, that we may well have to look for another title for this feature !

As many of our readers will already know, permission to operate the 50-54 mc band, with certain restrictions, was granted to a limited number of G stations on November 5. The present intention is that the licences expire on December 31. A few well-known VHF stations were omitted from the first list but we believe most of this has now been remedied. For obtaining this privilege from the GPO licensing authorities, our thanks must go to the RSGB for their perseverance over a period of some weeks at what appeared to be a difficult problem. The action of the Post Office in granting this concession is also greatly appreciated and says much for the standing of amateurs in the eyes of the authorities. It is, further, worth recording that had it been necessary certain high-standing scientific organisations would have been prepared to support the application from a research point of view. These same organisations have been finding the amateur results on 50 mc of considerable value in providing a check on their MUF forecasts.

## Individual Reports—6 Metres

Details of the work done at some of the more active stations are given in the Summary of Six-Metre Results herewith. Of all concerned in the great work, G5BY has probably put in most hours on the band. His enthusiasm seems to know no limit, and the results he has obtained are a fine reward for his unflagging energy. During the night of November 5/6 he built a 6-metre Tx, completing the job at 0400 GMT. This was after 10 hours operating the previous day ! He was up again at 0715 and at 0845 put out his first 50 mc CQ and ZS1P came back ! Up to November 5, G5BY had worked on 28/50 crossband 'phone, stations in W1, 2, 3, 4, 8, 9 and VE1, 2, 3, in addition to ZS1 and MD5. Between October 26 and November

5 he had no less than 125 cross-band contacts. On 6 metres he started VFO but is now CC on 50016 kc. G5BY comments that the opening E-W on Sunday, 16th, was most interesting—there were no indications of high MUF on the 44-50 mc band, either here or in the States ; but W1HDQ was S9 on 'phone, chatting to a local and telling him the band was tight shut. Hilton also remarks that W5JLY, worked by him on that day at 1530, is probably the first W5 to be heard in Europe on six metres.

Another indefatigable worker has been G6DH, whose many years of research into ionospheric propagation problems have received their reward in these last few weeks. Assisted by an equally enthusiastic XYL and his brother, regular and almost continuous observations have been made on MUF, and having seen some of the graphs he has compiled we realise how arduous this task has been. From all this G6DH has evolved some interesting theories. He remarks on the suddenness of the rise in the MUF in the mornings after sunrise. When he made the first G/MD5 contact with MD5KW on November 10, the MUF had been up to 53 mc for the S.E. from 0830, and a hectic 20 minutes was spent on 28 mc calling MD5KW. The latter was at work, but hearing of the high MUF sped over to his Tx 5 miles away and started up at 0850. MD5KW reported G6DH at 20 dB over S9 on 'phone, while MD5KW's CW was S9 plus in Clacton. For this contact and the first G/W 2-way on six metres, G6DH was using push-pull HK24G's in the final with a new aerial—a 3-element beam with  $\cdot 1\lambda$  and  $\cdot 2\lambda$  spacing. He considers spor-E has assisted some of his contacts and this view is supported over in the States.

G5BD has also been putting in some long hours on the band and had his reward by making the first G/VE 2-way on 50 mc. He has been using a vertical dipole but the last we heard from him he had hung up a "string and wire" beam on his Zepp. He promised to let us know if it works ! His nightly schedule with G8JV has now been



The J9'ers Radio Club on Okinawa, many of whom are active on 50 mc. J9ABX (back row, right) and J9AAO (third left, second row) are two well-known 6-metre men who have been breaking records just lately.

transferred to six metres, and amongst the G's he has heard are G3APY, G6OS and G6VX.

G5PY found the change to 6 metres easy. All his circuits, except the PA anode, tuned, and that one did after the turns of the coil had been pressed together a little. Thus, a switch from 50 to 60 mc or *vice versa* is simplicity itself.

G5BM (Cheltenham) is another who has succeeded in working 6-metre W's both crossband and 2-way on 50 mc. His first QSO was with SU1HF, followed closely by MD5KW, both giving him S9 'phone reports. Later the same day he worked W4, and at 1530 heard the well-known "hissing phenomenon" on 6 metres. There has previously been some sugges-

tion that this hiss and spor-E are liable to simultaneous occurrence, but in this case it is probably simply due to both the hiss and the high MUF being results of intense sun-spot activity. He found the period from November 9 to 15 poor, hearing only G5MQ. G5BM has a 3-element 50 mc beam in use, which he has made by modifying his 58 mc beam, so he will be off 5 metres until January.

G2ADZ (Oswestry) has heard the W's on 50 mc using his usual 0-V-1 Rx and 58 mc 3-element beam, which he says works FB. He can only manage to be on at the right hours at week ends. Another of the northern group to participate in the DX is, as might be expected, G5MQ (Liverpool) who received his 6-metre permit at 1330 on November 7, and made

### **Flash—Six-Metre Opening, November 20-23**

During the period November 20-23, the 50 mc band gave several openings, promising good conditions for the week to November 30. VE1QZ was worked by G5BY, G5MQ and G6DH, and W7FS/MM, 1,000 miles East of Cape Hatteras, by G5BY and PAØUN. On the afternoon of the 22nd, G6DH had a splendid contact with VE1QZ on 6 metres—the transmission was relayed to the Amateur Radio Exhibition, and VE1QZ was able to exchange greetings with those at the show. By 1540 that afternoon, G6DH had worked nine W's, and several other G's are also known to have had a very successful session. G5ZT had 35 two ways with W's on the 23rd.

his first contact at 1350 with W1CGY. the band only opening for ten minutes! He is using a dipole 25 feet high, although a beam is ready to go up as soon as the weather permits. It is interesting to note that the DX is being received at the more northerly stations, although no reports have come in from Scotland. Is this due to lack of listening or lack of signals? G6DH has noticed several times that DX signals are well received by G5BY, 100 miles further south, when they are completely inaudible at his QTH. The afternoon of October 26, when the W's first broke through, was an instance. While G5BY and G2BMZ were cross-band working and other southern stations, such as G6LK, hearing many W's for quite a long period, G6DH received W1HDQ alone and that for a short period only. The results obtained on other days appear to rule out any possibility of the equipment being at fault. This same date the PA stations heard nothing of the DX. Whether this is a latitude effect or due to some critical distance is not certain.

G6FO (Buckingham) has also found time to listen on 50 mc and do some cross-band working. Since getting his 6-metre permit, however, he has been unlucky in the times he has listened and has heard nil. He remarks on the high peak level of the W signals on November 4, and judging by the number of reports received for this day, it must have been one of the best. G6FO had his first cross-band with W1HDQ during this opening and they worked duplex 'phone, W1HDQ also retransmitting G5BY's own 28 mc 'phone back to G6FO! A cross-band daily check with ZS2CI has so far yielded no positive results. The latter sends auto on 50-152 mc daily. G5BY has been reported heard in ZS6, while ZS2CI also receives the Alexandra Park transmissions very well, and on one occasion found an American BC station on 48 mc, but the N-S path seems to have been open only on fleeting occasions for a few moments, in spite of the consistency of the E-W paths.

G5WP and G6LK are two more enthusiasts who have erected 6-metre beams and been rewarded with some fine DX contacts, in spite of somewhat limited hours of operation.

G2AJ (Hendon) with S27 Rx, and 829B in the Tx, with a 6-metre beam erected above his 10-m array, has heard MD5KW, and worked many G's.

Major K. E. S. Ellis, R. Signals (MD5KW) has sent details of his results from October 14 to November 12. In addition to those mentioned in our sum-

mary last month, MD5KW was heard by PAØUN on October 17 and 19. On the latter day his signals were logged several times by ZS6HS (Pretoria), while G5BY heard them on October 21, 23 and 25. On November 12, MD5KW had a field day during the period 1500-2145 GMT, working three different ZS stations and VQ2PL several times—see Summary.

The equipment at MD5KW is S27 Rx, 4-element close-spaced rotary beam 35 feet above ground, and 6V5 ECO-6L6 and 807 doublers—HK54 power doubler. Input to the aerial is about 35 watts. Both manual and auto keying are employed. The QTH is at Fayid, near Great Bitter Lake, 100 feet a.s.l., the soil being sandy, and the country to the east and south-west hilly. He is on 50 mc daily sending auto for about 8 hours, and listening at a remote site. MD5KW is anxious for reports and will QSL all received.

Several stations, including ourselves, have employed their 5-m. beams on 6-m. as a temporary expedient. The results are better than might have been expected, the beam acting in reverse! The 5-m. reflector makes an admirable 6-m. director, while the 5-m. director just becomes an odd piece of metal which can be neglected (or can it?) The main discrepancy, of course, is in the length of the energised element. Using this, we have had a 100 per cent. contact with G5PY (Clapham Park) who was using a similar arrangement himself, the distance being nearly 70 miles. These results are superior to those obtained using a 6-m. dipole. No DX has been worked (or heard) from G2XC. We had breakfast and lunch during the two openings on November 16—the first since we got going on six. (Openings, not meals!)

Others who have sent useful lists of calls heard on 6 metres include G3BKF (Witham, Essex), G2CIW (Brentwood) and SWL's A. Bannister (Manchester) and Boedo-Yanez (Banwell, Somerset). To these and all the others who have sent reports, many thanks.

#### Forecast

The forecast for the future would appear to be a chance of good conditions from November 22 to 29, after which there will probably be a fall in the MUF during mid-winter and another peak in February and March. In order that the picture may be as complete as possible we ask everyone who is listening on 50 mc to send full details of everything heard—and don't forget that reports of days with *negative* results are equally as important

as the super-DX reports the no peak periods.

#### News from Elsewhere

The good conditions on 50 mc have been world-wide and we are grateful to CQ for the following highlights of the activity in more distant parts.

Contacts have been made between W and LU, OA, CE, XE and KH6, while J9 and ZK1 have been heard in California. The leading W is W5VY in Texas, with six countries worked.

W7ACS/KH6 at Pearl Harbour knocked off 20 W's in Districts 5, 6 and 7 on October 12. One of these was W6QXB who was using 3 watts input to a Tx in his car, with a vertical whip aerial!

W7QLZ received the London Television Video signal on October 7 at 0945 and 1100 his time, peaking S9—BBC, please note.

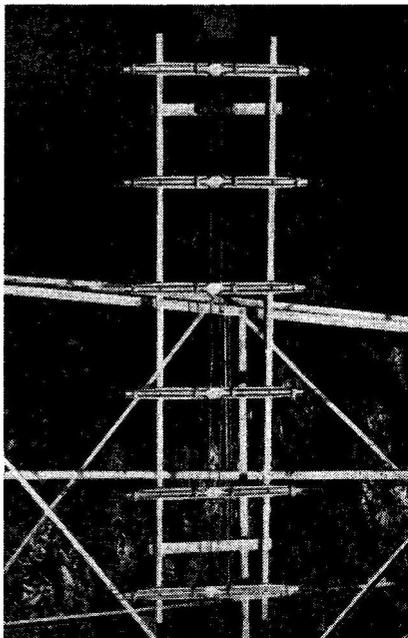
Further information on the record J9/CE contact reported last month is contained in an airmail to us from J9ABX on Okinawa. He reports that on October 18, at 1000 their time, J9AAO worked CE1AH for about five minutes; CE1AH was R5/S7 with 75 watts input, and was operated by the XYL. J9AAO was using 60 watts into a modified American Navy transmitter, with two 3-element wide-spaced beams, respectively 50 and 27 feet above ground. These beams are 100-ft. apart, fed 90 degrees out of phase, and are tuned up for 50.004 mc. As J9ABX puts it, "the distance Okinawa-CE1AH is roughly 11,250 miles, and is quite a hop in any language"! J9AAO reports hearing ND5KW several times—we have passed this on to MD5KW!

J9AAO, who is probably the present holder of the world's 50 mc DX record (though we may not be quite up-to-date on this) is running a regular schedule with PAØUN. Thanks, Bill Baxter, and good luck to you all on Okinawa; we shall be sending this to the addressees you request.

For those interested in studying propagation we note that when XE1KE worked W5VY on October 14, he had to point his beam on South America, while the OA stations have reported that the band openings fit in very well with the magnetic warnings from WWV.

Finally, from CQ, we take the following list of DX active on 50 mc, just to whet your appetite! CE1AH, KP4AL, LU4CD, LU5CK, LU7AZ, LU9AS, OA4AE, OA4BG, PY2QK, TG9JW, W7ACS/KH6, XE1KE, ZK1AA.

Finally, while on the subject of DX, W6IFE has worked 150.7 miles on 3370 mc from a QTH 5,000 ft. high . . . is there to be no end to these new VHF records!



Close-up of the 166 mc series-phase 6-element section of VK3KU's composite beam assembly, illustrated on p.547 of the November issue.

#### Sporadic-E

Pursuing the subject of the effect of sunspot cycle on spor-E, both our experts, British and American, are agreed that there is no evidence to show that there is any *direct* relationship. It would appear, however, that there is a difference of opinion whether there is an *inverse* variation. This is apparently due to different results obtained from observations made at several research stations in widely separated parts of the world. Measurements made at Washington, particularly midnight readings, did show an inverse variation, and it was to those that Ferrell of CQ was referring. However, according to our British authority, an analysis made in this country from 1941 to 1945, showed that "no decided long-period trends were observed, at least over these 5 years". 1944 was, of course, a sunspot minimum.

This conclusion is supported by H. W. Wells in *Proc. I.R.E.*, for December, 1946, when some American observations at Watheroo, Australia, for 1938-1944, were analysed. The article said "These results

## SUMMARY OF SIX-METRE ACTIVITY

## Extracts from Station Logs

October 28

PAØUN QSO W1HDQ 1245. G5BD heard VE1QZ, W8MVG, 8RLT and 8SFG (1350-1425). G6XM heard W1CLS, 1HDQ and 8RLT (1335-1345).

October 29

G5BD heard VE1QZ, W1COW, 2AMJ, 2RND, 3CGV, 8MVG, 8RLT, 9HGE (1245 on). G5MQ heard W1BJB, CGY, CLS, HDQ, HMS, 2AMJ, 3CIR/1, 3MKL, 8MVG (1300-1500). G6DH heard W1CLS, 1HDQ, 1HMS, 2AMJ, 3CIR/1, 3MKL, 8MVG, 8RLT, 8SFG (1230 on, with peak 1225-1245). G6XM heard VE1QZ, W1CLS, 1HDQ, 3CIR/1 (1330-1445).

October 30

G5BD heard VE1QZ, W1CLS, 1HDQ, 1KCO, 2AMJ, 2BYM, 3CIR/1 (1250-1425). G6GM heard W1CLS, 1HDQ, 2AMJ (1320-1345). G6XM heard VE1QZ, W1CLS, 1HDQ, 1LLL, 2AMJ, 3CIR/1 (1305-1430).

October 31

MD5KW heard weak CW calling G5BY (1341). G5BD heard W3CIR/1 (1320 for few minutes).

November 1

MD5KW heard BBC television sound S9 *plus* 20 dB, but no 50 mc sigs. G5BD heard *nil*.

November 2

MD5KW heard by G5BY, G6XM and G8JV (0900-1040). G6FO heard W1AF, 1HDQ (1620-1635).

November 3

MD5KW MUF 46 mc. G5BD heard W1HDQ, 1JLK, 1LLL, 2AMJ, 8MVG, 8NOD, 8PUK, 8RLT, 9ZHL (1325-1535). G5BM heard W1HDQ, 2AMJ, 8MVG, 8RLT. G6DH heard W1HDQ, 1LLL, 2AMJ, 8MVG, 8RLT, 8SFG (1318-1500). G6XM heard W1HDQ (1335—"a super-sig").

November 4

MD5KW heard W2AMJ, 1HDQ (1325-1342) and heard by G5BY (0900-0950). G2ADZ heard W1ATP, 2AMJ, 2IDZ, 2KNQ, 3OR (1440-1530). G3WS heard W1ATP, 1HDQ, 2AMJ, 2RND, 3OR (1447-1505). G5BD heard MD5KW (0930), VE1OD, 1QZ, W1ATP, 1CGY, 1DBM, 1HDQ, 1JLK, 2AMJ, 2BYM, 2BYW,

2IDZ, 2KZQ, 3OR, 4HVV, 8RLT (1310-1720). G5BM heard W2AMJ. G3BKF heard W1ATP, 1HDQ, 2AMJ, 2RND, 3OR (1440-1530). G6DH heard VE1QZ, W1ATP, 1CLS, 1HDQ, 1KMQ, 1LLL, 2AMJ, 3OR, 8RLT. G6FO heard W1HDQ, 2AMJ, 3OR (1430-1630). SWL Boedo-Yanez (Somerset) heard VE1QZ, W1APP, 1HDQ, 2AMJ, 2ITX, 3OR, 5BSY/MM (1522-1642).

November 5

MD5KW heard by G5BY, 6DH and 6LK (0915-0940). F8ZF heard W1HDQ (1315). G3BKF heard W1HDQ (1300-1330). G5BD heard PAØGN, ØUN (1045) QSO VE1QZ, W1AF, 1CLS, 1HDQ, 8MVG, and heard W2AMJ (1345-1630). G5BM heard W1AF, 2EUI. G6DH MUF 53 mc at 0900. QSO W1HDQ, 1AF, 1LLL, 2AMJ and heard 1CLS, 3BGT, 8FSG.

November 6

MD5KW heard W1HDQ (1402), ZSIP(?) (1720). G6DH and G6FO heard W1HDQ (1420).

November 7

MD5KW MUF 46 mc. G5BD and G5BM heard W1HDQ, 2AMJ. G5MQ QSO W1CGY (1350).

November 8

G5BY worked W5BSY/MM in position 28°N 64°W.

November 10

MD5KW MUF 51 mc 0700 to 0800, QSO G6DH, 6LK and 5WP. Heard by G5BY and G4CG (0850-0930).

November 11

MD5KW QSO PAØUN (0850), then G5BY, G2MR and G6LK.

November 13

G5BY worked ZSIP.

November 16

MD5KW QSO G5BM, G5BY, G5WP, G6LK, and G6XM. SUIHF QSO G5BM, G5BY, G5ZT, G6LK, G6XM and several others (0905-0940). G5BM and G6LK QSO W4 (1500-1600). G5BY worked W2BYM, W4HVV, W4WMI and W5JLY (1530-1600).



Glad I'm getting out to-night, OM. . . . .

indicate that no relationship with sunspot numbers, either positive or negative, holds for the Southern Hemisphere."

Thus to summarise: Our first authority says "Spor-E certainly does not vary *directly* with sunspot number. There is some evidence that it varies *inversely* with it (at least in the Northern Hemisphere) but this evidence is inconclusive", while our second expert, O. P. Ferrell, says, "That the occurrence of spor-E does vary *inversely* with sunspot numbers has been known for a number of years. There is some question whether this effect applies to 5 and 6 metres".

And there we leave the subject as an interesting field for further investigation by VHF workers.

### Tropospheric Conditions

In general, GDX conditions have deteriorated considerably, but the lack of activity has made observations difficult. The falling off in conditions is almost certainly due to two main causes. First, the less settled weather means turbulent air and mitigates against the formation of suitable humidity and temperature gradients, and secondly, the lower temperature of the atmosphere, with its correspondingly lower saturated vapour pressure, makes the possibility of the occurrence of large humidity gradients less likely.

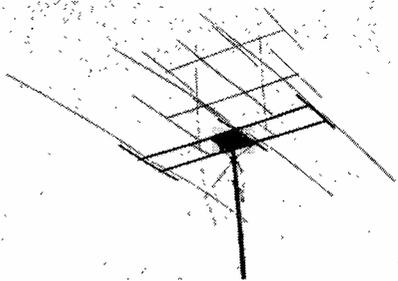
The mass migration to six metres reduced the level of activity on five to an even lower level than before, but a number of signals have been heard on the band in Southern England most nights and your conductor—who has endeavoured to keep going on both bands—has been hard put to it trying to explain to the remaining 5-metre habitués how some of us came to receive permits for 50 mc and others did not! We think most of those we contacted in time obtained the permits on application to the correct quarter, although one or two may have been too late.

Judging by the mail, even if activity seems low, interest is as high as ever and it is remarkable how almost without exception everyone asks the same question, namely, where is everybody else? So maybe it's conditions after all!

### Newcomers

Haslemere, in S.W. Surrey, produced two new signals on five—G2CWL and G3VB. The former is 700-ft. up on Woolmer Hill, in an aluminium pre-fab estate. There should be no doubt of the high conductivity "earth." What its effect is on the vertical polar diagram of his aerial remains to be seen, but his signals are S9 plus in Portsmouth. G2CWL'S Tx is 6SN7 CO and FD, 6L6 FD, and 815 push-push doubler, with 20 watts. On the Rx side he has a modified HRO, with an EF54 RF stage, while the aerial is an E-W dipole slung between two trees 30 ft. high. G3VB is using his 20-metre aerial at present, but hopes for something better soon.

G2DC (Salisbury) recently returned from Japan, hoped to be on 58 mc early in November. He proposes using a Japanese exciter, driving a pair of 807's in the final, with a 4-element beam. For Rx he has a Super-Pro with a type A27 convertor, and has heard G5BY on an AOG indoor aerial, roaring in. He reports considerable activity on six metres in J when he left.



PAØUN, Eindhoven, the well-known Dutch 50 mc station, has a composite 14-50-58 mc beam aerial array. The 14-mc section can be operated as a wide-spaced 6-element job on 28 mc.

G6GM (Holsworthy, Devon), another newcomer to 58 mc, for a start has worked G2BMZ and G5BY with a 8 ft. 1 in. aerial poking out of the shack window down the lane! His Rx is the R.208 with 138-ft aerial. WNW-ESE. The Tx aerial is only 16 ft. high and is energised from a 6V6-6L6-807-807 transmitter. G6GM reports that his brother G6NC (Dartmouth) is likely to be active before long.

### Some of the Regulars

G3BXE (West Wrating, Cambs.) fears that the petrol rationing will restrict his 5-metre activities, as he is dependent on a petrol-electric set for power. He has completed a Tx for 144 mc, and is eliminating the teething troubles from the Rx for that band. He corrects us on a point in last month's notes. His 30th county was Gloucester, not Devon, as stated. He had already collected Devon. Sorry OM!

G4LU (Oswestry) has a new 2-element beam, with remote electrical control, fitted in the loft, with which he hopes to hit the dead spots of his previous 33-ft. doublet. Some initial difficulty with matching was found to be due to a poor coax feeder. He now uses lead-covered cable and is wondering how long it will stand the rotation wear-and-tear. He appeals for a contact with the County of London. So what about G3CCD, G5PY and G8KZ? The disappointment of the month was failure to raise G2XS in Norfolk, who was putting a good signal into Shropshire. G4LU's near neighbour G2ADZ still continues to call regularly on 58 mc, but does not hear much these days. He guarantees to be on every night. Once again, no listener reports have been received in Oswestry. G2ADZ works only

on five metres and says he wrote to several GDX stations, enclosing a stamp for reply, asking for schedules, but four of them have just not bothered to reply! G2ADZ also bemoans, once again, the small percentage of QSL's received; he QSL's 100 per cent himself.

G6XM (Farnborough) having moved temporarily to 6 metres, nevertheless writes to report good 5-metre GDX on October 20 and 21, when he worked G3ZK (Halifax) amongst others. G6XM now has a 6-metre, plumbers' delight variety, to add to the arrays in his garden, and remarks that he has no more space in which to put the 144 mc beam!

G3WS (Gidea Park) has a new 2-element close-spaced job, using folded dipole feed. He is restricted for space and can only manage 15-ft. of height. We think his worries regarding the match to his 80-ohm cable were the result of undue pessimism, to judge by the signals we have heard from him recently.

SWL L. Boedo-Yanez (Banwell) has been overwhelmed with enquiries about the conversion of his RAF R1147B receiver, following the publication of his Calls Heard in our September issue. He is unable to deal with all these enquiries due to lack of spare time and suggests those interested should write to the Supervisor, Air Publications and Forms Store, Royal Air Force, Kidbrooke, London, S.E.3, who, for 1s. 8d., will supply the technical data on the receiver. This receiver was intended for the reception of supersonic modulated VHF signals and the BFO is arranged to beat with this supersonic note to produce an

audio-frequency. Thus, the receiver is unsuitable for use without modification. The RF unit is easily removed, and might well be used as a convertor.

While on the subject of RAF receivers, G3YH provides some useful information on the conversion of the R1132A for 5 and 6 metres. He also has been inundated with enquiries. To quote him, "Remove existing RF coils. Use coils 1½-in. diameter, as follows:—

Aerial coupling	3T	spaced	$\frac{1}{8}$ in
RF grid	3T	"	$\frac{1}{2}$ in
RF plate (untuned)	2T	"	$\frac{1}{2}$ in
Mixer grid	3T	"	$\frac{1}{2}$ in
Oscillator coil	4T	"	$\frac{1}{2}$ in

60-50 mc covers about 20 to 125 deg. on the dial; 60-58.5 mc about 20 to 30 deg. The RF plate coil is untuned, the plate tuning condenser being disconnected."

We should be pleased to hear from any one who has tackled the selectivity problem on this receiver. As used in the RAF, the response is 6 dB down 75 kc off resonance, which is hopeless for 'phone operation in congested areas. Removing the damping resistances from the first IF does not improve matters very much. Returning to G3YH he operates most evenings with his beam W. and S.W., 1930-2000; S.E., S. and E., 2030-2100; N., 2200-2230; E. and N.E., 2230-2300. He has had no QSO's since October 16, when he worked G2XC!

G5GX (Hull) puts in a very welcome appearance once again; he remarks that 58 mc activity in the area is rather sporadic and that he and G6OS were ready for 50 mc—though not invited to participate! They have heard many W's on the band.

## FIVE-METRE CALLS HEARD

**G2ADZ**, Lloft Wen, Ardmillan Lane, Oswestry.

**G2NM**, 2XC, 3BXE, 4IG, 5MA/P, 5PY, 5XB, 6KB, 6OH. (All over 150 miles.)

**G2AK**, 2CLS, 3BY, 5BM, 5JU, 8KL, 8QS, 8WL. (All over 50 miles.) (Period October 20-November 14.)

**G4LU**, Avalon, Pant, nr. Oswestry, Salop

**Worked:** G2AOK/A, 2CIW, 2MV, 2XC, 3APY, 3BK, 3BLP, 3BXE, 4AP, 4OS, 5BD, 5BM, 5IG, 5MA, 5WP, 5XB, 6MN/A, 6OH, 8KL, 8UZ.

**Heard:** G2FKZ, 2XS, 3ABA, 3DH, 3MA, 5BY, 5JU, 6LK, 6LL, 6XM, 8JV, 8KZ, 8QM/A. (Period October 9-November 15.)

**G3YH**, 24 Hall Street, Bristol, 3  
**Worked:** G2XC, 3BXE, 3MA, 5JU, 5WP.

**Heard:** G2MR, 4AP, 5BM, 5MA, 6VX, 6XM, 8KZ. (Period September 16-October 19.)

**Heard:** G2AOK/A, 2JU, 2XO, 5MA, 6VX. (October 20-November 16.)

**G5BY**, Resthaven Hotel, Thurlostone, S. Devon.

**W1AF**, 1ATP, 1CAU, 1CGY, 1CLH, 1CLS, 1DBM, 1FZ, 1HDQ, 1HMS, 1JLK, 1KCQ, 1KUD, 1LLL, 1PEA, 1PNB, 2AMJ, 2BQK, 2BYM, 2BYW, 2EUI, 2IDZ, 2IQQ, 2RGV, 2RTX, 2CGV, 3HC, 3CIR/I, 3MKL, 3OR, 3RE, 1KMZ/3, 4HVV, 4JML, 8KQC, 8MVG, 8NQD, 8NZ, 8PUK, 8QYD, 8RLT, 8SFG, 8ZVY, 9AB, 9ALU, 9HGE, 9OCY, 9ZHL, VE1QZ, 2GT, 2KH, 3BQF. (All worked 50/28 mc cross-band, October 26-November 5.)

**VE1AYL**, 1EA, 1FL, 1OY, 1WEYM, 1HIL, 1LSN, 1NF, 1NWL, 1PUJ, 1TFB, 2KNQ, 2KZG, 2OUS, 2PKZ, 2RND, 2SYR, 3BGT, 8TDJ, 9ZHB, ZSIT, 4H. (All heard 50 mc only, October 26-November 5.)

The Hull boys are very interested in 144 mc and are developing ideas on equipment for that band when we get it. G5GX/G6OS have made the R.1132A perk on 144 mc with one-turn coils of  $\frac{1}{2}$ -in diameter in each stage, the oscillator coil being slightly larger than the others.

G5PY (Clapham Park) has completed his re-build, which included boxing in the CO and doublers in an attempt to reduce television interference. The first night it worked, only to reappear as before on the second!

G8LY (Lee-on-Solent) has persuaded her Tx to work on AC mains, after years of operation on her own generators, and with a beam only a few feet high, has been getting out up to 50 miles—considering her sea-level location and the screening range of hill not so far distant, it is very good going.

G2CIW (Brentwood) is another who, in spite of poor conditions, has been on the band most evenings. His last GDX was, on October 18, when he worked G5BM and G4LU. Since then, he has heard nothing from over 60 miles except ourselves.

From Switzerland comes an interesting letter from HB9BZ, who says that with the disappearance of spor-E DX they are now trying for HBDX over their mountains! A first contact between Berne and Zurich (110 km) was established by HB9CD and 9AT on October 16. Some other useful distances have been covered, which is all very creditable considering the mountain barriers that intervene along most of their paths. No six-metre signals have yet been logged, but November 5 showed signs of high MUF.

#### Contest—Advance Notice

We are proposing to run a five-metre contest in January from the 10th to the 18th, further details of which will be given next month. The rules will be very similar to those of the *Magazine* Contest in

### SIX METRES

#### FIRST CONTACTS

The following have been claimed or reported as first two-way contacts with the countries or districts named—American and Canadian licensing areas counting as "countries" for this particular purpose. They are printed subject to any amendments that may be received making prior claims, cross-band working not counting.

G6DH/W1HDQ	Nov. 5	1302 GMT
G5BD/VE1QZ	Nov. 5	
G5BY/ZS1P	Nov. 6	0847 GMT
G6DH/MD5KW	Nov. 10	0855 GMT
G5BM/SU1HF	Nov. 16	0906 GMT

November, 1946, which met with such success. It will *not* be a relay affair, however! We know that this period is not likely to be one for outstanding GDX, but for that reason DX contacts will be worth struggling for—so please book the dates and urge all the five-metre chaps to come on and enjoy the fun.

#### Counties and Countries

This month the changes in the tables are few, mainly stations bringing their scores up to date. G3BXE remains unchallenged at the head of Counties. It looks as if we ought to compile a *Countries Worked* on Six table! At least six countries have been workable, so let us have your figures for this, cross-band working not to count.

#### In Conclusion

We deeply appreciate all the kind messages which have reached us on taking over this feature in the *Magazine*, and are very grateful for the mass of reports which have come in. For the next (January) issue, closing date for reports is December 19. Write to E. J. Williams, G2XC, c/o *Short Wave Magazine*, 49 Victoria Street, S.W.1.

#### USEFUL GADGET

A device known as the Fisk Solariscope is being offered to amateurs by the Amateur Radio Division of E.M.I. Invented by Sir Ernest Fisk, of E.M.I., and himself a well-known radio pioneer and experimenter, it enables the daylight-darkness condition between any two places on the earth's surface to be easily and quickly determined for any period in the 24 hours. Hourly time differences can also

be obtained and rough distances ascertained. The method of use is extremely simple and the instrument is very well made; it is supplied with a comprehensive instruction book and gazetteer of the world's short wave BC stations. The price is one guinea complete of the Amateur Radio Division, E.M.I. Sales & Service, Ltd., Hayes, Middlesex, or through local dealers.

# The other man's station G8PP

This is the very nice living-room layout at G8PP—L. Parnell, 36 Darenth Road, London, N.16—where of necessity the gear has to be accommodated in one corner of the dining-room, since at present G8PP is not fortunate enough to have a separate radio room available.

The 3-tier rack-built transmitter is laid out as follows: Bottom section, 350- and 500-volt power packs and heater supplies for exciter and PA; centre section, modulator with power supply; top section, 6L6-tritet and 807 PA. The modulator is 6SJ7-6C5-6SN7-P/P 6L6's, Class-AB1, for a moving-coil type microphone.

Metering arrangements are conventional, the lower one reading PA HT, centre the 6L6 modulator plate current, and the top three are tritet plate, PA grid and PA anode respectively. The receiver is a Hammerlund HQ-120X,



and is used with a pair of moving-coil headphones, or a speaker.

Operation is chiefly on 14 mc, using an E-W half-wave dipole, the DX so far recorded being 79 countries in 28 zones.

Readers will agree that the station is an excellent example of a neat and workmanlike installation to which even the most unenthusiastic XYL should eventually get accustomed!

*For the Best Information on the Latest News, Read the  
Short Wave Magazine Regularly*

# THE MONTH WITH THE CLUBS

## FROM REPORTS

By the time this appears in print, the Contest on the Top Band will have been fought out by twenty-three Clubs. The final entry comprised the 22 call-signs listed on this page last month with the single addition of the Midland Amateur Radio Society (G2CNW).

This time we are inclined to tip one of the GM stations as the winner; but who knows? At all events it is obvious that the fun on 1.7 mc will be fast and furious.

Reports appear from 23 clubs this month, many of those entered for the Contest having failed to send in their usual script! If this indicates a period of intense activity immediately before the Contest, we are not surprised.

### Reports for January

The deadline for next month's reports is first post on December 15; they should be addressed to "Club Secretary," *Short Wave Magazine*, 49 Victoria Street, London, S.W.1. And deadline does mean deadline—we invariably receive a few reports up to three or four days afterwards, often worded "Hope you can squeeze us in." Sorry, but we can't! And, please do not forget that photographs of meetings, groups of members, club rooms and so on are always welcomed for publication.

And to Secretaries of the Clubs entered in the Contest—please remember December 5 and Rule 8!

A very happy Christmas to all my correspondents from he who is responsible for this section of the *Magazine*—we look forward, with you, to a prosperous and successful New Year.

**Birmingham & District Short Wave Society.**—The local transport strike upset the November meeting and caused a change of date; it was eventually held, however, in the new club room. The A.G.M. (December 1) will have been held before this appears, but details of the 1948 programme will be ready next month.

**Coventry Amateur Radio Society.**—From December 8 onwards the new HQ will be in use, at the BTH Social Club, Holyhead Road, and refreshments will be available at all meetings. At a recent meeting a discussion on "My Ideal Station" was followed by a "BBC Jubilee" talk, including a demonstration of an old two-valver with swinging coils and "R" valves! The recent Receiving Contest was well supported, and a "3-Letter Call Contest" is being run in December.

**Luton & District Radio Society.**—This club, formed in April, has a membership of about 30. The Chairman is G2COU, and his call, G2COU/A, is used by the club at Surrey Street Schools. Meetings are held on the second Monday of the month, 7.30 p.m., and the coming season's programme includes lectures by visitors and members. Morse and technical classes are also being run, together with the inevitable "junk sales." The Secretary (QTH in panel) will be delighted to welcome new members.

**Worcester & District Amateur Radio Club.**—Membership is increasing and larger premises are now being sought, together with workshop facilities. A competition is being held for the design of a club lapel badge. The next meeting is on December 4 at 7 p.m.—new members will be welcomed.

**Sutton & Cheam Radio Society.**—At the November meeting RAF communications were described and discussed, including Radar, which was so heavily staffed by pre-war amateurs. G6KP described a contact with the South Orkney Islands—definitely one of the more out-of-the-way places. Prospective members are welcome on alternate Tuesdays at Ye Olde Red Lion, Cheam Village.

**Edgware & District Radio Society.**—Recent events have included a Junk Sale and the demonstration of a 60 mc Concentric Tube Oscillator by G3HT. There will also have been a talk on BBC Transmitting Equipment by one of the Corporation's engineers. The Club's Annual Dinner will be held late in January.

**Grimsby Amateur Radio Society.**—The club transmitter, G3CNX, is now on the air with a T1131 on 'phone and CW. Lectures by club members form the bulk of the programme of the weekly meetings—Thursdays, 7.45 p.m., at 115 Garden Street. Visitors will be welcomed.

**Radio Society of Harrow.**—A lecture on Magnetic Recording was given in November by a member of the BBC staff, and a demonstration of a wire recorder followed. The future programme includes a series called "Around the Shacks." Membership exceeds 70 and all meetings are well attended, being held on alternate Tuesdays. Refreshments are available.

**Surrey Radio Contact Club.**—A full house at the November meeting heard a talk by W/Cdr. F. Butler on "Modern Developments and their Applications to Amateur Radio." New designs of CO and adaptations of the Franklin Oscillator for VHF were described and discussed. The Club Social takes place on December 16 at Purley Hall,

Banstead Road, Purley; YL's and XYL's welcomed—tickets 3s. 6d. from the Secretary. The next regular meeting is on December 9 at the Blacksmiths Arms, as usual.

**Cheltenham Amateur Radio Society.**—The new HQ is at the St. Marks Community Centre, Brooklyn Road, and fortnightly meetings are still going strong. The idea has been adopted of a different Chairman for each meeting—made responsible for the lecture or whatever follows the Club business. The Stroud and Gloucester clubs were invited over for a recent meeting, when PAØMM talked of his wartime experiences. A "Twenty Questions" session held recently also sounds like a rather bright idea for club meetings.

**Wolverhampton Amateur Radio Society.**—Recent meetings took the form of lectures on The Fundamentals of Radar, and Developments in Valves and CRT's. Meetings are held on alternate Mondays—note new secretary's QTH in the panel.

**Bradford Amateur Radio Society.**—Two recent talks were on The Amateur Licence (G6KU) and Five Metres (G6BX). There is to be a discussion on December 9, and a Social on December 23. The time of both is 7.30 p.m., and new members will be especially welcome.

**Wirral Amateur Radio Society.**—On December 3 there will be a junk sale, and on December 17, another meeting for which the programme has not yet been arranged. G3AKW is running slow Morse transmissions at 7.30 p.m. on Fridays, and the "Club Net" comes on the air on 1.7 mc afterwards.

**Neath, Port Talbot & District Amateur Radio Club.**—The winter programme is well in hand, with a special three-way exchange of talks by members of the Cardiff, Swansea and Neath clubs. Meetings are held every Wednesday, 7 p.m., at the Dock Hotel, Briton Ferry, the next two being on December 10 and 24. There are now 17 transmitting licences among the Club members.

**Stourbridge & District Amateur Radio Society.**—A talk on High-Fidelity Amplifiers was given in November, and the gear used will be demonstrated at a future meeting. Club membership is now 53, with 28 transmitting licences..

**Harrogate & District Short Wave Radio Society.**—This club has now obtained new premises at the rear of 31 Park Parade, Harrogate, and meetings will be held in future on every Wednesday at 7.30 p.m.

**Slade Radio.**—The A.G.M was held on November 28, and the next meeting, on December 12, is a "DF Night"; the meeting place is the Parochial Hall, Broomfield Road, Slade Road, Erdington—8 p.m.

**North West Kent Amateur Radio Society.**—The November meeting took the form of a Brains Trust and "Stump Speeches." It is recorded that some voluble 'phone operators were notably silent in the latter! Next meeting is on December 5 at 8 p.m.

Following are the names and addresses of the Secretaries of the Clubs whose reports appear in this issue. They will be pleased to welcome new members and to give every assistance to anyone interested.

- BIRMINGHAM.** N. Shirley, 14 Manor Road, Stechford, Birmingham 9.  
**BRADFORD.** W. S. Sykes, G2DJS, 287 Poplar Grove, Great Horton, Bradford.  
**BRIGHTON.** J. R. D. Sainsbury, G8HV, 80 Lansdowne Place, Hove.  
**CHELTHENHAM.** H. Brislin, 52 Cleevemount Road, Cheltenham.  
**COVENTRY.** J. W. Swinnerton, G2YS, 118 Moor Street, Coventry.  
**EDGWARE (G3ASR).** R. H. Newland, G3VW, 3 Albany Court, Montrose Avenue, Edgware, Middx.  
**EXETER.** E. G. Wheatcroft, 34 Lethbridge Road, St. Loyes, Exeter.  
**GRIMSBY (G3CNX).** R. F. Borrill, G3TZ, 115 Garden Street, Grimsby.  
**HARROGATE.** K. B. Moore, 2a Wayside Crescent, Harrogate.  
**HARROW.** J. F. A. Lavender, G2KA, 29 Crofts Road, Harrow, Middx.  
**HOUNSLOW.** A. H. Pottle, 11 Abinger Gardens, Isleworth, Middx.  
**LUTON.** W. C. Green, G3QG, 158 Westmorland Avenue, Limbury, Luton, Beds.  
**NEATH.** S. Roberts, GW4NZ, 29 Chestnut Road, Cimla, Neath, Glam.  
**NORTH WEST KENT.** B. A. M. Herbert, 18 Leamington Close, Bromley.  
**NORTH WEST MIDDLESEX.** R. W. Ward, 16 School Lane, Pinner, Middx.  
**ROMFORD (G4KF).** R. C. E. Beardow, 3 Geneva Gardens, Whalebone Lane North, Chadwell Heath, Essex.  
**SLADE.** C. N. Smart, 110 Woolmore Road, Erdington, Birmingham 23.  
**STOURBRIDGE.** W. A. Higgins (G8GF), 35 John Street, Brierley Hill, Staffs.  
**SURREY.** L. C. Blanchard, 122 St. Andrews Road, Coulsdon, Surrey.  
**SUTTON AND CHEAM.** R. G. Finch, 26 Sunnymede Avenue, Carshalton Beeches, Surrey.  
**WIRRAL.** B. O'Brien, G2AMV, 26 Coombe Road, Irby, Heswall, Ches.  
**WOLVERHAMPTON.** H. Porter, G2YM, 221 Park Road, Fallings Park, Wolverhampton.  
**WORCESTER.** D. Jones, 30 Oakland Avenue, Droitwich, Worcs.

**Brighton & Hove Group.**—At a recent meeting G6QB gave a talk on "Twenty-Five Years of Amateur Radio"; the A.G.M. was held in November and the next meetings are on December 1 and 15, 7.30 p.m., at the Golden Cross Hotel, Western Road.

**Exeter & District Radio Society.**—This club now meets every Thursday at Mount Pleasant Chapel Schoolroom; note, also, the secretary's change of address. More than 50 members have attended recent meetings; the juniors are being encouraged with Morse classes, and a member gives practice transmissions over the air. Application has also been made for a Club transmitting licence.

**Romford & District Radio Society.**—Meetings are now held on Tuesdays at 8 p.m., at the YMCA, Western Road, and not on Mondays at Mawneys Road Schools, as previously. On the second Tuesday of each month an RSGB meeting is held at the same time and place.



Some of the members of the Neath, Port Talbot and District Amateur Radio Club, at a recent meeting.

**North West Middlesex Radio Club.**—This new club has recently been formed in the Ruislip, Pinner and Northwood area; membership exceeds 30 and an interesting programme is being arranged. Junk sales, lectures and general discussion have been held, and meetings take place on Thursdays at the Oddfellows Hall, Waxwell Lane, Pinner.

**Hounslow & District Radio Society.**—Recent meetings, which have been well attended, have included an exhibition of members' gear, a junk sale and a series of lectures by the secretary on Electron Theory. The A.G.M. will be held on January 7, when the setting up of a Club transmitter will be discussed and the new officers will be elected. Next regular meeting is on December 10.

#### THE DX ZONE MAP

All who are interested in DX working and who aspire to a place in the "Zones Worked List" need our DX Zone Map. The projection is great circle, centred on London, and the Zone areas are delineated in red, with a list of prefixes in each Zone shown in tabular form down the side of the map. Accurate beam alignments, time differences and rough distances are also obtainable off the map, which is in two colours, 21-ins. by 35-ins. in size and intended for wall mounting.

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#### 'WHY NOT 'G' DISTRICTS?'

We have had some interesting correspondence on the subject of G2YS's article in the October issue, which it is hoped to summarise in the January *Short Wave Magazine*. We ourselves are keeping an open mind on the subject.

#### REPRODUCING MAGAZINE ARTICLES

We have a steady demand for back numbers and for information which has appeared in back number articles. Since the whole of the 1946 issue of the *Short Wave Magazine* is now out of print and only few copies of odd issues in the 1947 series remain available, we have instituted a service whereby out-of-print material can be specially reproduced to individual requirements.

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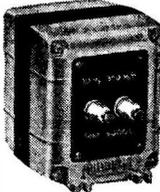
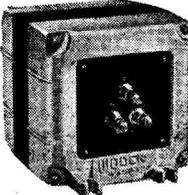
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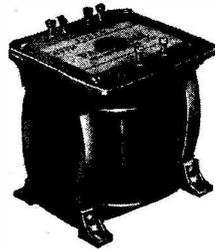
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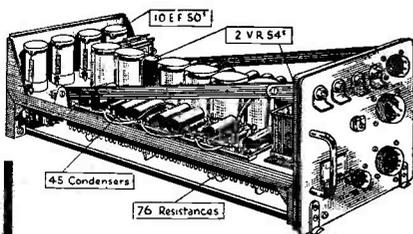
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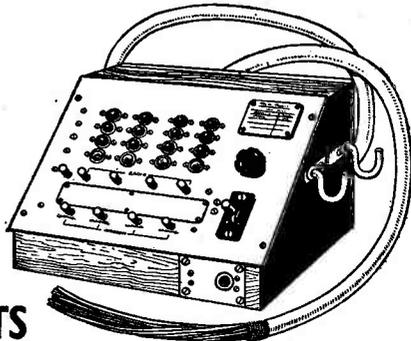
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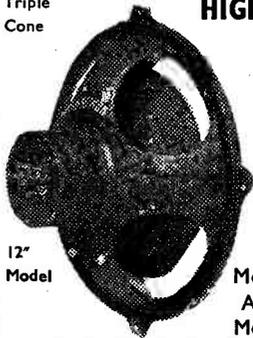
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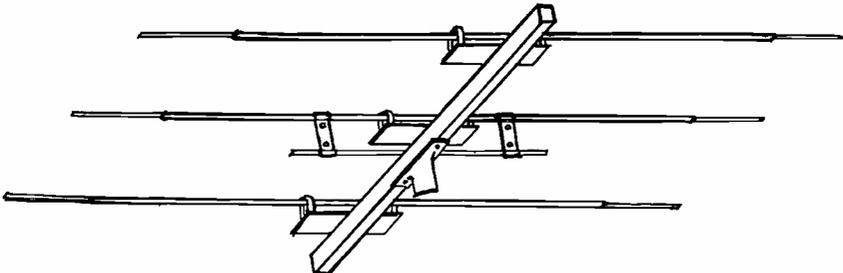
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**HALLICRAFTER S27c**, Ultra High Receiver, 14 Tubes, Covers New 144 mc Amateur Band, 2 RF, 3-1F Stages, 4 Acorns, Noise Limiter, AM/FM, S-Meter, Coverage 220-130 mc 115/250 v. AC. Nearest £25. Consider exchange BC-348 or similar.—75 Edgehill Road, Winton, Bournemouth.

**WANTED**—HRO Coils, to cover 14m bands. State condition and price.—Box 183.

**HAM Surplus.** All new, unused. Guaranteed perfect. 6L6G (2), 10/- each; 6N6 (1), 5/4 (2), 6F39 (1), 7K76m (2), 5P41 (2), 6K7G (2), OZ4 (1), 6AG6 (3), 1/6 each. U14 (2), 12Q7 (1), 615G (2) 84 (2), 6Q7G (2), 5/- each. Canned electrolytics 32 µF 500v. (2), 5/- each. G3BBA, 225 Watling Street West, Towcester, Northants.

**EDDYSTONE 504 Receiver** New Condition. Sell best offer.—Write, Box 184.

**NEW R.C.A.** Ribbon Microphone with built-in transformer and grip switch on desk stand, with cable, £7/10/-.—Strouds, Pangbourne, Berks.

**A**PAIR of new American Dural Sectional Aerial Masts, 21-ft high x 14 in dia. (or would make one 40-ft.), weight only 7 lb. each, complete with guys and ground pegs and 66-ft copper doublet and lead-in, with fittings all made up ready for use and of best quality, £5/15/-; several available.—Strouds, Pangbourne, Berks.

**P**OCKET SW Receiver, as used by Resistance Movement in Holland, all-dry, as new.—Messon, 5 Macclesfield Road, Buxton, Derbyshire.

**WANTED**—HRO Coils, 3-5-30 mc, perfect condition essential.—BM/XBX London, W.C.1.

**B**.28 Receiver. Excellent condition, £30. Delivered free, West Riding.—Hooper, 24 Blacker Road, Huddersfield. Phone 5966.

**HALLICRAFTER SX28** for sale in perfect condition, £55. Pair 813's, new, £3/10/-.—Box 186.

**QUICK SALE**—Going abroad. R1155 with some modifications inc. provision S-Meter, etc. 6V6 and parts for further mod. W.B. Cabinet Speaker, M/Coil 'phones, power pack, £22/10/- . Q-Max Converter, no cabinet, needs attention, £4. Good parts, tubes going cheap. Evenings after 7, or stamp.—Burrage, 47 St. Paul's Avenue, Willenden Green.

**SUPER-PRO**, Rack Model, 18 valves, 100-400 kc, 1-5-20 mc. Separate Power Pack, 110-250 v. Recently overhauled professionally. With handbook. Offers over £32.—Box 185.

**WANTED Urgently**—829B Valves, as new. Write or 'phone, 87 Ennerdale Road, Richmond, Surrey (R.C. 1708).

**FOR SALE**—Two pairs 813, 40/- each, seven 1619's, 15/- each, two 866's, 15/- each, two 832's, 30/- each, Mostly new. Guaranteed.—G3ARE/A, 16 North Road, Salthouse, Cornwall.

**WANTED**—R.1116 Receiver complete, with or without valves, also any spares for same.—C. T. Dowson, 4 Melrose Street, Scarborough.

**HALLICRAFTERS S40**, new; £50. SX28, £60. S20, £25. NATIONAL 1-10 complete, £25. RAF 1132, 60 mc, with pack, £10. Modulator, 75 watt, complete, xtal mlke, £30. Stamp full particulars.—GM3OC, Westland, Pleasance Avenue, Dumfries.

## SMALL ADVERTISEMENTS.—continued.

## READERS'—continued.

**SALE**—Marconi Aircraft Transmitter AD.67A. SECO, 2 PT15's, PA, CW, MCW, phone. Suitable 80, 40; 4 pre-set channels, £7/10/-. Also SW.130 UHF communications receiver, 27/130 mc, acorn RF's, £25.—126 Uxbridge Road, Kingston.

**LABGEAR** Electronic Fault Trace-Signal generator, L signal tracer and C/R bridge in one instrument, £22. Also Taylor Model 30 Oscilloscope, 3 in tube with deflection amplifiers and time base, £21.—Dryden, 53 Mount Avenue, Ealing, London, W.5.

**MATEUR** CLEARANCE OSCILLOSCOPE, UNUSED, AC MAINS, READY OPERATION, 6 in tube. First reasonable offer. Transformers 230v. 250-0-250, 15/-; American Communication Rx 21-1600 metres. Brand new, modified, ready operate, HT 230v. LT 6-3v. First £5/5/-. Also one 38-572 metres, £4/4/-. HRO Tube coils.—Box 188.

**WANTED**—HRO Coil Sets, Type E-900 to 2050 and F-480 to 960 kc.—Wood, West Lodge Park, Hadley Wood, Herts.

**GOOD** price given for panoramic adaptor, suitable for HRO, preferably commercial job, Hallicrafters, etc.—G3BGX, 120 Cheviot Road, West Norwood, S.E.27.

**XTALS**—Be ready for 154 mc. etc. Xtals mounted X-7270 kc-7290 kc, 2/- each. Xtal Blanks for re-grinding. Freqs. 7330, 8478, 8020, 8272, 7450 kc, 1/3 each. Xtal units, octal base in heat-insulated cans, with thermostatic control, contains two Xtals 7275 and 7290 kc, 4/- each.—S. Thomas, GW3AX, 494 Mumbles Road, Mumbles, Swansea, Glam.

**BC312**—Brand new, £24 BC342, £22. Also BC-603, 10-valve, 20-28 mc, FM Receiver, Built-in Speaker, New, £8. Also Marconi B28 (CR100), 60 kc-30 mc, £32. Wanted, SX28A or Super-Pro.—Taylor, 75 Edgell Road, Winton, Bournemouth.

**HALLICRAFTER**—£20 for sale. Offers over £18. R. Rackett, 38 Boulton Road, Southsea, Hants.

**MIDWEST-16**, Chassis, speaker, new valves, needs alignment, £23. DB-20 Pre-selector, £16. Cash.—Ritchie, 76 Hirst Grove, Bedford.

**SURPLUS GEAR**—Transformers 1,000v., 250 mA, 50s.; 7-5v., 8 amp 17/6; Two 0-100 mA Meters, 3 in, flush, new, 18/6 each. Following new Valves, two of each available: 811, 35/-; 6L6, 9/6; 6N7, 8/6; 9001, 7/6; 6B7, 7/6. Other TX gear, send for list.—G8UA, 406 High Burnshaw, Burnley, Lancs.

**NEW** unused Sprague Condensers, oil-filled, 3/4F, N4,000VW, 2 x 8/4F, 1,000 VW, 7/6; 8/4F, 1,000 VW, 5/-; New boxed 10, 10 x 30 x 30 1/2 electrolytics, metal case, 4/-; Mica 2 x 05 1/2 1/2 6d. Tubular paper, 001 to 5 1/2F, 350VW to 1,000VW, 2d. to 6d. HF Chokes, all types, 9d. Bleeder variables, 150-watts, 2/6. Potentiometers, 500 ohms, 15 ohms, 75 watts, 3/6. Volume controls, 6d. Crystal Earphones, 10/-. Yaxley two-bank switches, 2/-; ceramic, 3/-. Toggle Switches, all types, 2/-; Receiver Valves, new, 3/-; TV's Transmitter. Radio gear too numerous to mention. Must sell. Send for list.—Box 189.

**100/250** Watt all-band 'Phone/CW Transmitter, built of finest components, in 6-ft enclosed rack. Units comprise 1,500 v. power pack for PA, 1,000v. pack for modulator, 450v. pack for exciter, bias pack. Modulator 65J7-6J5-6L5-PTZ40. Exciter 6L6 triode-807, driving PA using 813 with fixed bias. All stages continuously metered in both grid and anode circuits. Total cost of parts over £250. Will accept nearest offer to £120 for quick sale.—Box 192.

**R.M.O.** EF50, 6J7, P P 6J5, P P 807, 3 Power Supplies, Relay Operated, 6 Meters, £30, or offer. Tx Coaxial 72 ohm, 6d. yd, plus carriage.—G3FT, 3 Geneva Gardens, Chadwell Heath.

**HALLICRAFTERS** Sky Champion, New, 1939. Stored during war. Absolutely like new both appearance and performance, in makers' carton. Instruction Manual, Circuit. First nearest genuine offer to £30. New Edystone 5-10 Metre Converter complete. Offers welcomed.—S.A.E. for details.—Box 191.

**WANTED**—Rotary Conveyor 240v. DC Input, 230/50 volts, 50-cycle, output 100 watts. Must be reasonable.—RH, 27 Shrubland Road, London, E.8.

**RCA** AR88 for Sale. Good condition, with handbook, near £55.—Box 190.

**FOR SALE**—Ex-WD Mobile Station 1-9-5 mc Power Supply 1,100 v., 200v.; Rotaries, 12v, Input Reg.; 8 valves; 1 SF Stage, 2 IF Stages, 1 AF Stage; all details; £20 or sep.; 161 lbs.—Box 193.

**1084** EX-RAF Receiver. Coils, spare valves, calling condition. £10.—G3BNZ, 132 Elgar Avenue, Tolworth, Surbiton, Surrey (ELM. 6931).

**ADMIRALTY** 6665C Communication Receiver, A Covers 1-22 mc in 6 bands, with four coil turrets, 4-EF50 and 4-ML6; re-aligned and in excellent order. £12/10/—131 Church Lane, Handsworth, Birmingham.

**WANTED**, really good Communication Rx; 1155, etc., not considered.—Full particulars and price to Box 194.

**SALE**—VHF Gear. SCR.522/100/160 mc radio telephone, £6; R.1481, £5; R.1147, 37/6; BC.1032 Panadaptor, 8 valves and self-contained mains pack but less 3BP1 scope, £5/15/-; BC.211 Wavemeter, in case with calibration but less Xtal and valves, £2; USW Collins Rx, 1-5-12-0 mc, 7 valves, £6.—Kimber, 7 Van Mildert Terrace, Stockton, Co. Durham.

**SALE**: Vibrator Power Pack for Canadian Mk. 58 transceiver. Two new accumulators. £4. London. Box No. 195.

**POWER** Pack, 350v., 4v.; Milliammeter 0/100 Xtal (7 mc) -7090 kc. Morse key; AC valves, details, offers. G5VJ, 80 East Bawtry Road, Rotherham.

**HALLICRAFTER** SX24, Excellent Condition, Spare Tubes, Manual, £24, SW. Box No. 196.

**805** 804, PT15, 832, 3A4, SWAP for small camera, etc., or sell. 24 Melmore Gardens, Cirencester.

**HRO** Senior Wanted; Coils for Ham Bands, Power Pack—G4GJ, Mayfield, Wagon Lane, Bingley, Yorks.

**BARGAIN**—4 Aerial 0-2 ammeters, 5 in, dial, 10/- each. 4 ex-RAF 33-ft. tubular masts complete with stainless guys, anchors, coax connector, etc., in carrying bag. £4. Ideal for beams.—Mortimer, Dore, Sheffield.

**FULLY GUARANTEED** items surplus to requirements. All reasonable offers accepted. TRANSFORMERS 1000-0-1000v. 200 mA, terminal panel, £3. 750-0-750v. 250 mA flying leads, £2/10/-; 2-5v. CT. 10 amp Woden de luxe, New, £1/15/-; FILTER CHOKES. Pair American Kenyon, fully shrouded, swinging 5-15H, smoothing 15H, 300 mA DC 5000v. insulation, £5/17/6. TUBES. Pair Taylor 866, £1/7/6. Pair Tungsram RG250/3000, new, £1/15/-; STC 4052A, Suppressor, Modulated Pentode, £2/10/- (exchange latter for STC 4304 CB).

**RECEIVERS** RAF 1147B, new, seven valves & circuit, £1/10/-; HALLICRAFTER 1939 SKY BUDDY, four bands 540 kc-44mc, bandspread, £14/10/-; SUNDRIES. NATIONAL HRO 4-gang tuning condenser 160 1/2F each section. Assembled, complete with dial and 20:1 SM gear-box, £7/10/-; S.A.E. with enquiries, please.—J. L. FREEMAN, G3AOE, No. 1 ESSEX ROAD, LONDON, E.4.

**UNUSED** EF50—6/- each, or 6 for 30/-; and 807's, 15/- each. Postage Paid. Apply F. G. Pearce, Myrtle Cottage, North Street, Lostwithiel, Cornwall.

**RCA88** Communications Receiver 540 kc-32mc, perfect condition. Offers over £55.—97 Peter Street, St. Helens, Lancs.

**TBY1** Trans-Recr., 26-80 mc. Complete Instructions spare valves and xtal. Offers or exchange for Tester 74A.—Radio G2NX, 46 Oak Drive, Oswestry.

**FOR SALE**. Avo Model 7 (50 range) perfect order, requiring only test prods, £12.—N. Edwards, 9 The Chase, Boundary Road, Chatham, Kent.

**R1155** Condensers, Transformers, Resistances, Etc. Etc. Worth £60. The Lot, £45, or will separate.—J. Williams, 2 Airlie Grove, Tuebrook, Liverpool 13.

**PHILLIPS** Communication Receiver, 6-Valve Super-het with Rola energised speaker. 5-18 mc, 190-570 metres, 850-2700 metres. Power pack giving 350v. at 100 mA. Also T.1154B transmitter with DC power pack giving 1200v. at 200 mA. A complete station for £35.—Griffiths, Carhampton, Nr. Minehead, Somerset.

**R109T** 8-valve communications receiver, built-in speaker, internal power pack, 6v. or 230v. Brand new with technical handbooks, £7/15/-.—Potts, 54 Pinnerfields Road, Wakefield.

# A Ready-to-use 2-valve Battery-Operated MORSE OSCILLATOR

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Incorporates note selector control, volume control, phone, key and interference jacks. Size 9" x 8" x 8½". Power supply required HT 60v. GB 4½v. LT 2v. Provision for these inside cabinet. Unit as illustrated, 15/-. Complete with 2 valves, types PMILF and LP2, 27/-. Pair of HR or LR phones (only if supplied with unit), 5/-. Heavy duty morse key, 2/6. Transit case, 2/6. A complete kit as described above, 32/-. **AS USED FOR R.A.F. TRAINING.**

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**UHF COMMUNICATIONS RECEIVERS.** R.A.F. TYPE R1359. A brand new, precision-made instrument covering 130-520 megacycles in two bands. Finished in grey stove enamel. Complete with 7 valves, less power supply. B.F.O. incorporated. Valve line up 4EF50, 1E1231, 2VR65. £13. 13. 0. (Carriage and packing £1.)

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**POWER UNITS, TYPE 532.** Comprising a small compact unit 80v. input, 230v. output, complete with 5Z4G and SU2150A valves. New and unused. Only 9/11 each. (Carriage and packing 1/1.)

**POWER UNITS, TYPE 32.** Comprising a 240 watt motor generator with full smoothing, in a fine black metal cabinet. Input 12v. D.C. gives 1200v. 200 m/a output. Only 15/- each. (Carriage and packing 5/-.)

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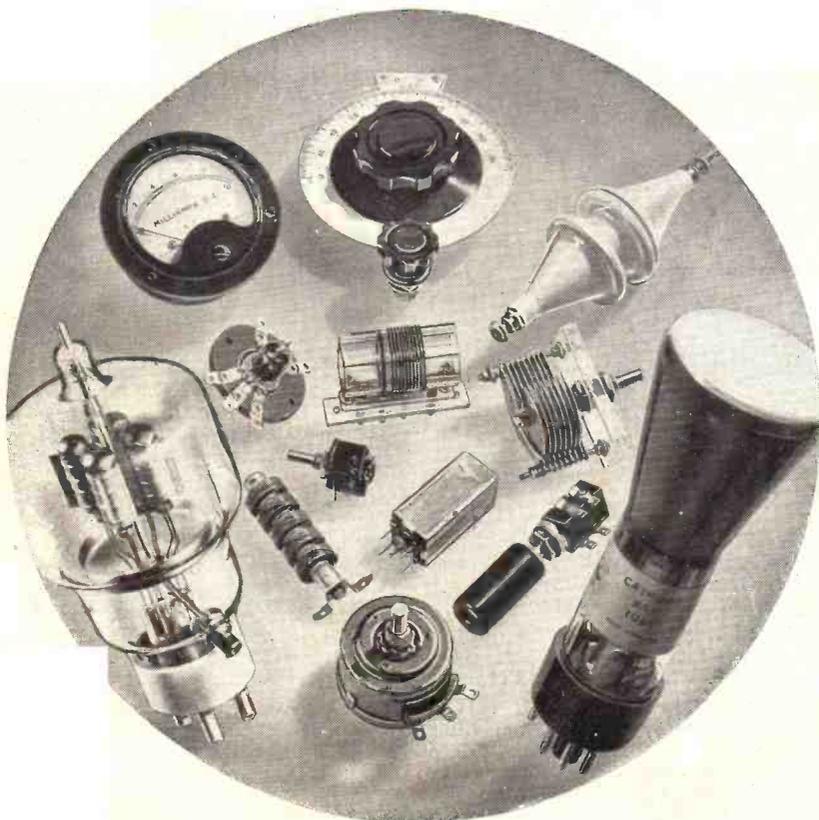
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