The SHORT WAVE Magazine

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VOL. V No. 4 JUNE 1947

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CONTENTS

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EDITORIAL

Menace

It can be said that broadcasting, and in particular long-range broadcasting on the short waves, owes a great deal to what in the early days was purely amateur activity.

But with the turn affairs are taking, what is supposed to be a potent factor for international amity has become a fearful weapon of propaganda, to such effect that HF broadcasting is now a menace to all other users of the ether.

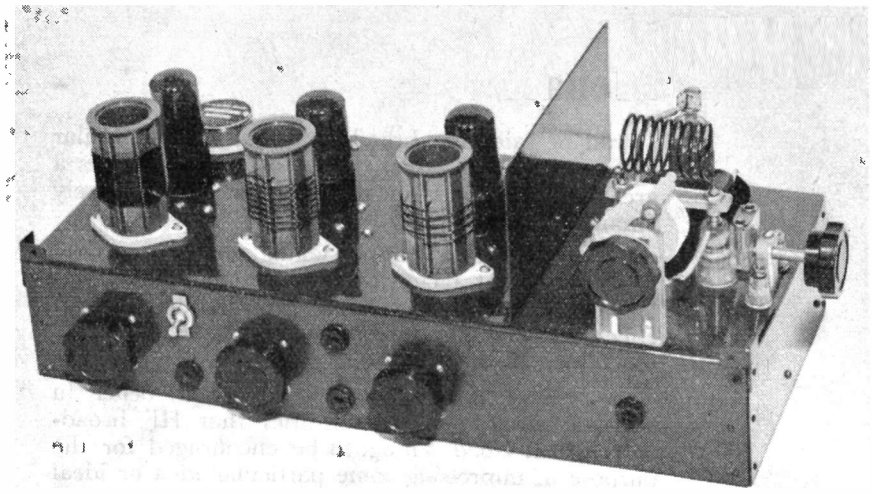
This springs mainly from a mistaken belief in political circles in all countries that HF broadcasting is a Good Thing, to be encouraged for the purpose of impressing some particular idea or ideal upon the listeners of other countries. So we find the short wave bands jammed from end to end with broadcasters of every race, creed, colour and political complexion, all engaged in operations suspiciously akin to trying to shout one another down.

True, their emanations are carefully studied by the press and propaganda services of the rival countries, and on them policies are based. But they make no impression whatever upon the mass of listeners *qua* listeners, since they do not listen.

The ambitions of the international broadcasting undertakings seem now to be based upon the sort of reasoning that says "By making as much noise as we can on as many different frequencies as possible, somebody somewhere is bound to be listening sometime."

All this may seem of little concern in our world of Amateur Radio. Not so; the very reverse is the case. It is due mainly to the pressure of HF broadcasting that all other services are being squeezed so much at Atlantic City. Since we as amateurs are now at the end of the line, we are in danger of suffering most in the squeezing process. Fortunately, we can rely on strong support from influential quarters in opposing this tendency.

Austin Forsyth G6FO.



5-10 Exciter/Transmitter Unit

Practical Design for 28 and 58 mc Operation

By **W. JOHNSON (G2IN)**

(This equipment, using standard components in a well-designed circuit, will interest many readers who want a low-power 10-metre transmitter which can later be used as an exciter for a full-power PA stage. As it stands the unit can be successfully operated on 5 metres with the output stage doubling.—Ed.)

NO difficulty should be experienced in the construction and operation of the transmitter described here, which will be found smooth and trouble-free in operation.

The first stage is a tetrode oscillator, using either a 6V6 or 6L6, as available ; the first doubler is a 6V6 or 6L6 with the two grids strapped together, operating as a triode at high efficiency. The second doubler operates under the same conditions. When using 6L6 valves the resistors R11 and R12 are not included in the circuit, and a greater output is obtained from these stages.

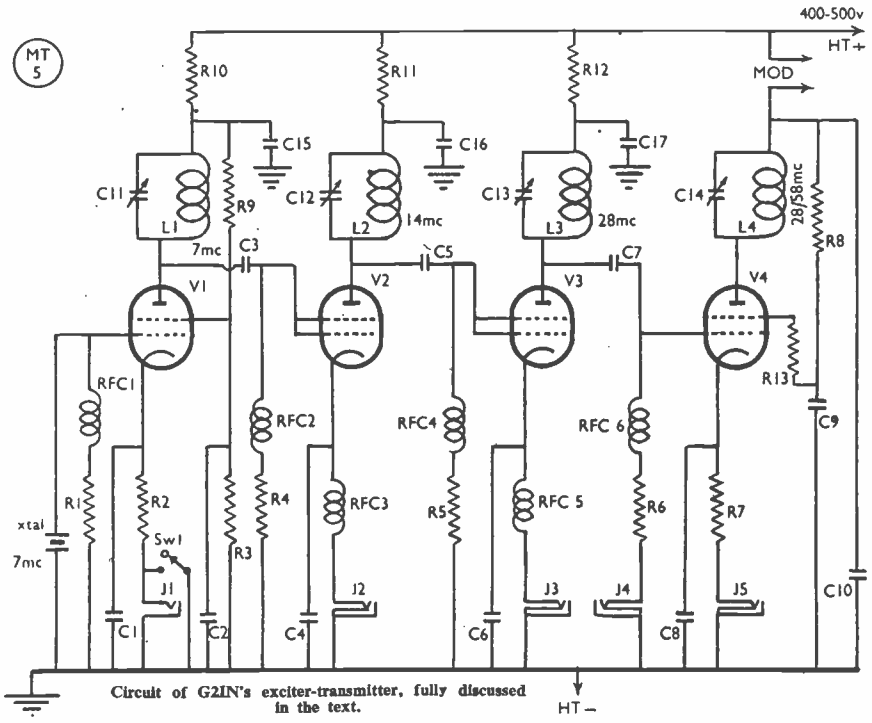
The final 807 stage works as a straight amplifier on 28 mc, and as a doubler on 58-60 mc, giving sufficient output to drive a succeeding final amplifier.

Crystal Oscillator

This is a conventional 6V6 or 6L6 tetrode oscillator using a 7 mc crystal. The plate coil is wound on a 1½-in. ribbed former, usually easily obtainable, and is tuned by a 60 $\mu\mu$F receiving type condenser. Full information on the construction of the coil will be found in the table of coil data. An open circuit jack in the cathode allows keying of the CO stage, and is shorted out by a switch when not required. This open-circuit jack is used instead of the closed-circuit type to allow a keying relay to be wired in permanently if desired.

First Doubler

With the 6V6 or 6L6 tetrode grids strapped together the amplification factor is high enough for the plate cur-



Circuit of G2IN's exciter-transmitter, fully discussed in the text.

Table of Values

5-10 Exciter/Transmitter Unit

R1 = 5,000 ohms, 1-watt
R2 = 400 ohms, 10-watt
R3 = 15,000 ohms, 3-watt
R4, R5 = 25,000 ohms, 1-watt
R6 = 10,000 ohms, 1-watt
R7 = 600 ohms, 10-watt
R8 = 25,000 ohms, 10-watt
R9 = 20,000 ohms, 3-watt
R10, R11, R12 = 5,000 ohms, 10-watt
R13 = 100 ohms, ½-way
R13 = 100 ohms, ½-watt
RFC1, 2, 3, 4, 5, 6 = 1·25 mH, SW RF chokes
C1 = ·01 μF mica.
C2, C9, C10, C15, C16, C17 = ·001 μF mica.
C3, C5 = ·0001 μF mica.
C4, C6, C7 = 50 μμF mica.
C8 = ·002 μF mica.
C11, C12 = 60 μμF receiving-type
C13 = 40 μμF receiving-type
C14 = 20 μμF double-spaced receiving-type
X = Crystal holder
J1 = Open-circuit jack.
J2, J3, J4, J5, = Closed-circuit jacks.
SW1 = On-off switch.
Octal valve holders, ceramic; three.
807 5-pin ceramic valve holder; one.
Large feed-through insulators; four.
Earth terminal; one.
Ribbed coil formers, threaded, 1½ in diameter; three.
Small stand-off ceramic insulators; seven.

Valves

6V6GT, 6L6G, or metal, three.; one 807.

rent to fall to a reasonable value when the drive from the oscillator is removed, and cathode biasing is not required. If desired, keying may be carried out in this stage. The plate coil is wound on a 1½-in. former, and is tuned by a 60 μμF condenser. Information on this coil also will be found in the table.

Second Doubler

The 6V6 or 6L6 tetrode grids are likewise strapped in this stage, which

is identical with the first doubler, with the exception of the different coil value and tuning condenser capacity, details of which will be found under their respective headings.

807 Output Stage

The 807 stage is quite conventional. A combination of grid leak and cathode biasing is incorporated, which proves to be highly satisfactory. The 100-ohm resistor included in the screen circuit is a precaution against spurious oscillation.

If it is desired to modulate the 807 this may be carried out by removing the link from the two ceramic feed-through insulators mounted on the rear of the chassis (which can be clearly seen in the photograph) breaking the HT feed to the plate and screen of the 807. This allows the secondary of the modulation transformer to be placed in the HT feed. The coil details will be found under Coil Data.

As in the circuits already described keying may be carried out in this stage if desired.

Metering

Current readings for all stages may be taken by plugging in to the jack in the cathode circuits, but it should be borne in mind that the readings are for the combined grid, screen and plate current, for which due allowance should be made.

Power Supply

The power supply used should give an output of from 400 to 500 volts, with a current capacity of 200 mA. The heater requirements will be 6·3 volts at 2·25 amps when using 6V6 valves in the CO, 1st FD, and 2nd FD, and 6·3 volts at 3·6 amps when using 6L6 valves.

Constructional Details

The chassis consists of 16-gauge aluminium 16 in. long, 7 in. wide and 3 in. high, with a 3½ in × 7 in aluminium screen placed 5 in. from the right-hand edge of the chassis ; as shown in the photograph, this is supported by the ½-in. lip at the base of the screen.

A 2¾-in. diameter cup is sunk into the chassis with the centre 2¼ in. from the rear edge and 2½ in. from the right-hand edge. This cup is 2¾ in. high, and when in position ¾ in. protrudes above the chassis, with 2 in. below. These dimensions place the 807 correctly, and provide adequate screening. The ceramic valve holder is mounted from the inside of the cup.

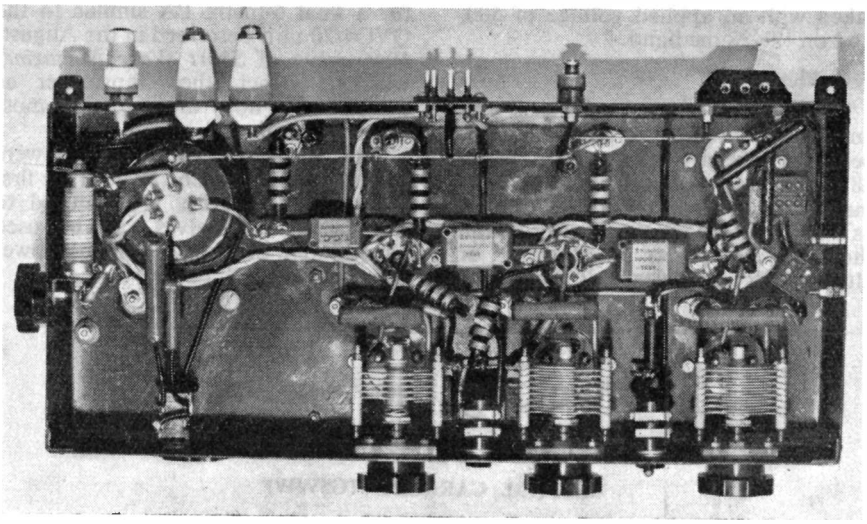
As will be seen from the photograph, the variable condenser is mounted on insulating material (in this instance, distrene) at the front and in the centre of the amplifier section. Immediately to the rear of the condenser is the tank coil, also mounted on distrene, or any other good insulating material. Sockets are incorporated in the stand-off insulators, allowing rapid change of band. A variable coupling mount is shown in the photograph, which takes a two-turn link, for connecting a co-axial feeder, but of course need not be included if any different method of feed is desired.

The three coil holders are mounted with centres 1¾ in. from the front edge of the chassis, and are positioned as follows :

CO Coil ; 1st from left, 2 in. from left-hand edge.
1st Doubler coil, 5½ in. from left-hand, edge.
2nd Doubler coil, 9 in. from left-hand edge.

The valve holder centres are positioned 3½ in. from the front edge, in line with their respective coils, and the crystal unit is immediately behind the CO valve, the centre being 1½ in. from the rear edge of the chassis.

The variable condensers for the CO, 1st doubler and 2nd doubler are mounted under the chassis, immediately beneath and in line with their respective coils, which gives extremely short leads. One-inch holes are cut in the front edge of the chassis, and are covered from the inside with good insulating material, each piece being 1½ in. square, and carrying the variable condenser for the respective stages. Spaced equidistant between the condensers can be seen the jacks and switch.



Neat under-chassis appearance of the transmitter, with the 807 28/58 mc output stage at top left. The feed-through insulators are for bringing in the modulator.

With regard to wiring, keep all RF leads as short as possible with the wiring as suggested in the photograph, and no trouble of any sort should be experienced.

Tuning Procedure

Take off the link from the two feed-through insulators at the rear of the chassis, thus removing plate volts from the 807. Place the meter plug in the jack of the CO stage and tune to resonance. The reading will dip to approximately 30 mA. Now plug the meter into the 1st doubler jack ; on tuning to resonance the meter will dip to about 34 mA.

Carry out the same procedure in the 2nd doubler stage, when the meter reading should be approximately 36 mA. In this stage the dip will not be as pronounced as in the 1st doubler stage. Switch off the HT and replace link on the two feed-through insulators.

Switch on HT and tune the 807 stage. If this circuit is off tune one can expect a reading of 100 mA. On tuning to resonance the meter reading will dip to 25 or 30 mA. On loading the plate tank, after final adjustment readings in the neighbourhood of 90 mA will be obtained, with corresponding RF. output. The current in the grid circuit of the 807 will be between 3 and 5 mA, depending on the activity of the crystal and the drive, which will be more than sufficient excitation for the 807.

The readings quoted above were

COIL DATA

5-10 Exciter/Transmitter Unit

Oscillator Tank Coil (Using 7 mc crystal).—16½ turns, 20 SWG, spaced diameter of wire.

First Doubler.—8 turns, 20 SWG, spaced twice diameter of wire.

Second Doubler.—4 turns, 20 SWG, ⅛ in. between turns.

All above wound on 1½ in. formers

807 Output Stage

10-Metre Coil.—9 turns, 14 SWG, spaced diameter of wire.

5-Metre Coil.—4 turns, 14 SWG, spaced twice diameter of wire.

Both these coils wound to 1 in. diameter

taken with an applied voltage of 500, and on the 28 mc band.

Five Metres

On 58 mc the transmitter is used with an applied voltage of 400, when it behaves in exactly the same way as on 28 mc, but with correspondingly lower output. It gives ample RF to operate as a complete 58 mc transmitter within the 25-watt power limitation, or alternatively provides full excitation for a final 5-metre PA similar to the QVO4/20 unit described in the August, 1946, issue of *Short Wave Magazine*, which in fact the transmitter as described is now driving with most excellent results.

The test conditions as set out were taken when using 6L6 valves in the first three stages. With HT reduced to 400 volts, 6V6 valves can be used equally well, though with slightly lower RF output.

Checking the Speech

Practical Data on Telephony Monitors

By P. M. CARMENT (G5WW)

IN these days when telephony appears to be the rule rather than the exception, it is surprising that so little information is available on suitable monitors. Furthermore, on questioning the operators of a large number of telephony stations, the author was at first somewhat surprised to find that the majority had no means of monitoring their signals other than with the main station receiver or with a standby receiver. This state of affairs is quite unnecessary and probably contributes very considerably to the number of poor telephony signals that are heard nowadays, particularly on the DX bands. Maladjustment, or for that matter maloperation of a telephony transmitter can cause an enormous amount of interference to other users of the band.

It behoves telephony operators thoroughly to check the setting up of their transmitters. Correct modulation is of just as great importance as frequency stability and the removal of key clicks on a telegraphy transmitter. One cannot entirely rely on reports from other stations because distance frequently masks faults or introduces non-existent defects. This is particularly the case on the 80-metre band under conditions of selective fading, when the sidebands fade at a different time from the carrier.

In passing, it is worth while mentioning that a number of operators seem to be under a misapprehension regarding the behaviour of the receiver S-meter. It is amazing how many people think that the meter should kick up when a station using 100 per cent. modulation is being received! If the S-meter kicks either up or down something is wrong at the transmitting end. Whilst on this subject of kicking meters, the aerial ammeter and PA plate current meter might be mentioned. Aerial current should increase 22·5 per cent. on 100 per cent. modulation. But this only applies when the modulating signal is a sine wave of steady amplitude. On speech waveform the movement should be very slight. The plate current of a modulated stage should remain dead steady up to 100 per cent. modulation irrespective of the modulating system used. The only exception is a controlled carrier system.

Oscilloscope Check

The CRT is coming into increasing use as a means of measuring modulation percentage and will also show up various forms of distortion which might go unnoticed on an aural monitor; on the other hand, it cannot let you *hear* the signal being radiated. Various forms of distortion can be present in the speech amplifier which will not show on a CRT when set up for measuring modulation percentage.

In this article it is only proposed to deal with aural monitors. The simple types can easily be constructed from odds and ends out of the junk box. Once you have tried continuous monitoring you will never again be without an aural monitor, even if you do possess an oscilloscope.

Simple Speech Monitors

The simplest type of telephony monitor is shown in Fig. 1. The inductance will depend, to a certain extent, on the frequency in use, but it will generally be found that only a few turns are needed. It is necessary to couple L to the plate or aerial coil sufficiently tightly to give a signal of the required strength in the headphones. This circuit is not recommended for serious work. Fig. 2 shows a modification which will enable the monitor to be placed at any convenient position relative to the transmitter and requires no direct coupling to it. L and C may be any suitable values that will tune to the transmitter frequency. The rectifier may be either a "Westector" or one of the so-called crystal valves which are used extensively in centimetric radar equipment. The milliammeter is a refinement, but is extremely useful for comparative readings when the monitor is working as a field strength indicator in the vicinity of the transmitting aerial. A 0-3 mA milliammeter

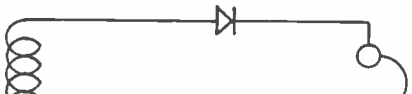


Fig. 1. Simplest speech monitor circuit.

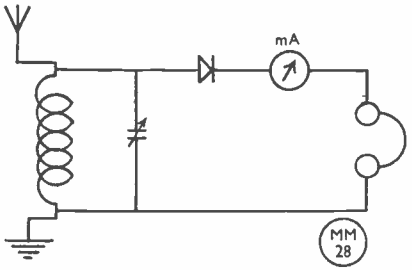


Fig. 2. Practical arrangement of a simple but effective 'phone monitor. The 0-3 mA milliammeter is a useful refinement. The rectifier element is a Westector.

is suitable. An adequate headphone signal is obtained with a deflection of about 1·5 mA. The length of the pick-up aerial should be adjusted to give this value, or alternatively, a long aerial may be used with a variable series condenser to adjust the level.

The meter will also indicate positive-peak overmodulation. The pointer should remain dead steady until 100 per cent. modulation is exceeded, when it will kick upwards on a transmitter of good modulation capability. It is a simple matter to elaborate on this circuit and introduce wave-change switching so that the monitor may be used on any band without coil changing. A diode can be substituted for the rectifier. Those that have been tested are EA50, D1, 6H6, DD41, 2D4A. If a diode is not available, practically any small receiving valve strapped as a diode may be used. The MH4, 6J5, SP41 and EF50 have all been tried with success.

The circuits so far described suffer from a theoretical defect, inasmuch as the rectifier or diode is not working into its correct load. This is of little consequence for the purpose in hand and it will be found that monitors of this type give a remarkably faithful impression of the radiated signal.

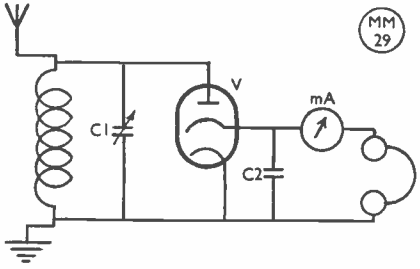


Fig. 3. Using a diode instead of a crystal type detector. Values for C1, L and V are discussed in the text. C2 should be ·002 μF.

Improved Circuit

It is now proposed to discuss a more ambitious circuit which will work on any frequency without wavechanging and which can also be relied upon as an accurate indicator of positive-peak overmodulation. The circuit is given in Fig. 4. It will be seen that the delightful simplicity of the previous arrangements has been lost because a power supply is now necessary. The detector is followed by an audio amplifying stage. In view of this amplification it is possible to get a good signal with a very small input to the detector, consequently the tuned circuit can be dispensed with and a resistor substituted, thus getting aperiodic operation. For this purpose it is convenient to use a carbon track potentiometer and thus have a means of adjusting the input. It will be noted that the diode is working into a 1 megohm load and a potentiometer is again used as a

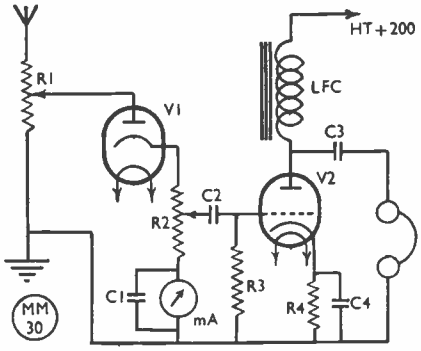


Fig. 4. A more elaborate 'phone monitor. Since the pick-up or input voltage is developed across R1, no coil changing is required. The meter will indicate over-modulation. R2 adjusts the LF gain.

Table of Values

Fig. 4. Two-Stage 'Phone Monitor

C1	=	·002μF
C2, C3	=	0·1μF
C4	=	25 μF
R1	=	50,000 ohms, carbon track
R2	=	1 megohm
R3	=	100,000 ohms
R4	=	200 ohms
LFC	=	LF choke
V1	=	EA50
V2	=	6J5
M	=	0-100 microammeter

convenient means of controlling the input to the audio stage.

An 0-100 microammeter is included in the earthy end of the diode load and acts as a positive-peak overmodulation indicator. The meter is also a very useful indication that the transmitter is radiating normally in cases when an aerial ammeter is not used or when the operating position is remote from the transmitter. With the audio gain set about half-way a strong headphone signal will be received with a reading of 25 microamps. on the meter. On a correctly adjusted transmitter, the meter will give a steady reading until over-modulation takes place. The length of pick-up aerial will depend on its position with respect to the transmitting aerial. A few feet is all that is generally necessary to give an adequate signal on all bands from 10 to 160 metres.

The aerial potentiometer will probably require slight adjustment on changing bands, but the audio control can be preset once it has been adjusted to suit the operator.

By substituting a high-grade tuned circuit for the aperiodic aerial resistor, the instrument may be used as an accurate absorption wavemeter provided that a means of calibrating it is available. The author prefers separate instruments for each job, though in cases where space or other reasons dictate, a multi-purpose instrument is very useful.

Built-in Monitor

Another circuit is illustrated in Fig. 5, which is suitable for incorporation into a multi-band transmitter. The tuned circuit to which the monitor diode is connected may be either an aerial tuning circuit or the PA tank circuit. If the latter is used, it must be parallel-fed so that no high voltage DC. is present in the tuned circuit. The values given are suitable for a 20-watt transmitter and the tapping

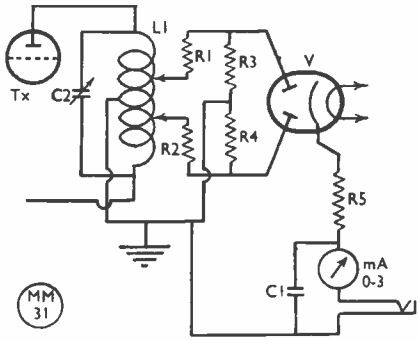


Fig. 5. Circuit for a 'phone monitor built into the transmitter. The diode rectifier presents a high impedance across a low-impedance portion of the transmitter tank circuit, so that power loss is negligible.

Table of Values

Fig. 5. Built-in 'Phone Monitor

C1	=	·002μF
R1, R2, R3, R4, R5	=	2,000 ohms
V	=	DD41 diode
M	=	0-3 mA meter
J	=	Headphone jack
L1, C2	=	See text

points will have to be determined experimentally. The amount of energy consumed will be negligible, as the device offers a high input impedance compared with the low value appertaining at the centre of the tuned circuit.

No difficulty should be encountered in modifying this circuit for use with a half-wave diode and single-ended RF circuit.

Design For Multi-Band Aerial

Combination System for All-Band Operation

By G. P. MORGAN (G8DV)

DURING the past few months a rather unorthodox multi-band aerial has been in use at G8DV, and the interest shown by a number of fellow amateurs has encouraged the writer to prepare the following notes on it.

When post-war aerial experiments were commenced the following were set as the requirements for the ideal multi-band aerial :

(*a*) It should be capable of efficient operation on all bands from 28 to 3·5 mc,

(*b*) As far as possible it should be omni-directional on all bands,

(*c*) It should give low-angle radiation for DX working on 14 and 28 mc.

(*d*) It should be simple and easy to adjust,

(*e*) Local conditions gave limitations of 70 feet as maximum length and 34 feet as maximum height. (This precluded the use of the 132-ft. Zepp, or the "W3EDP".)

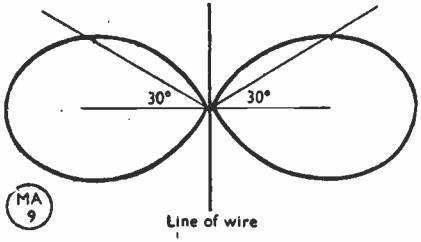


Fig. 1. Horizontal polar diagram, two co-linear half-waves.

Initial Tests

A number of aerials were tried, of which the most promising for multi-band use was the 66-ft. centre-fed, with tuned feeder. In spite of the fact that the top is but quarter-wave in length on 3·5 mc, and the radiation resistance correspondingly low, the aerial appears to radiate well on this band, and also on 7 mc.

The polar diagram on 7 mc at a vertical angle of 30 deg. (generally considered optimum for this band) is very nearly circular, and in practice this also appeared to hold for 3·5 mc. On 14 and 28 mc the 66-ft. centre-fed aerial falls short of requirements rather seriously, the reason being apparent when the polar diagrams are examined. It should be noted that the P.D.'s shown are for radiation in the horizontal plane, but they will not be much different at 9 deg. and 15 deg. to the horizontal—these being the optimum radiation angles for 28 and 14 mc, respectively. It will be seen that, particularly on 14 mc, the coverage is very limited.

At G8DV the aerial was erected with a "line of shoot" of 243 deg.—063 deg. on 14 mc, and a glance at a Great Circle map will show that with this arrangement no coverage is obtained of North America, the Near East, Africa, North Island of New Zealand and the Pacific Islands. In addition to this, on 28 mc the polar diagram has gaps which, at G8DV, cut off most of Africa and Australia. Altogether, rather serious shortcomings when it is desired to raise 14 and 28 mc DX.

The "T" Aerial

The old 66-ft. centre-fed aerial was then scrapped and all available literature combed for an idea. This was unearthed in a pre-war article by G3JR on a "T"-shaped aerial of his own design. Very briefly, this consisted of a 66-ft. top and 33-ft downlead attached to the centre of the top, both being very carefully trimmed

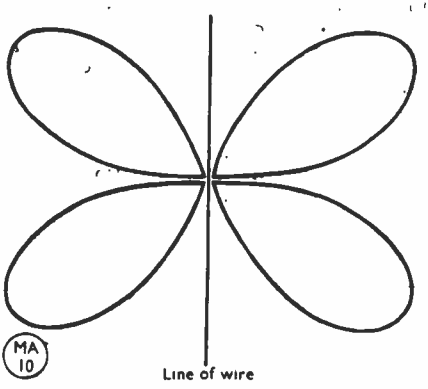


Fig. 2 Horizontal polar diagram, 66-ft. centre-fed on 28 mc.

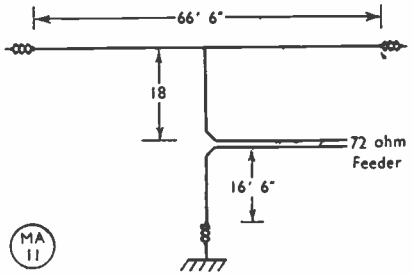


Fig. 3. The "G3JR" T-aerial. Dimensions are approximate, since this aerial must be trimmed to resonance.

to resonance, the downlead being centre-fed with 72-ohm line as in Fig. 3. It should be noted that the G3JR aerial is essentially a one-band affair; 14 mc with the given dimensions.

It was decided to give this aerial a trial but first an alteration was made to the design, tuned feeder being substituted for the 72-ohm line. Although not as efficient as the 72-ohm line, the tuned feeder possesses one advantage as explained below.

It was quite impossible for the writer to embark on a programme of "cut-and-try" with this aerial, as, due to local conditions, each time the aerial was lowered it took a full 30 minutes' hard work to haul it up again!

As is well known, when a tuned feeder is used, exact tuning of the radiator is unnecessary, any deficiency or excess in length being taken up in the tuned feeder. This, then, was the reason for using tuned feeder—to avoid the laborious trimming to resonance. When tuned feeder is used with this aerial the only adjustment which it is necessary to find experimentally is the electrical centre point of the top, and if the aerial is fairly well in the clear the physical centre may be taken as correct.

Results with the "T"

This "T" aerial was found to be a really good all round low-angle aerial on 14 mc, and also on 28 mc. It did not give the gain of the previous 66-ft. aerial (2 co-linear half-waves on 14 mc) *in the favoured direction of the latter*, but enabled DX to be raised from all points of the compass.

The "T" was tried on 7 and 3·5 mc but, as would be expected, gave results much inferior to those attained with the 66-ft. centre-fed aerial.

The Combination Aerial

It seemed from these experiments that

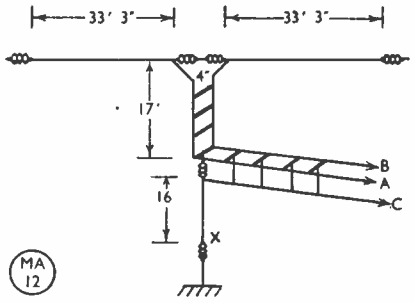


Fig. 4. The "G8DV" combination aerial. The point X may be close to the ground, but a good insulator must be used.

both aerials were required—and then came the brainwave. Why not combine both aerials so that one could be converted to the other at will? The design was soon worked out and the final arrangement was as shown in Fig. 4.

It will be seen that the aerial starts as a 66-ft. centre-fed with twin tuned feeder. This latter is run vertically for a quarter wavelength (17 ft. at 14 mc) where it joins another feeder taken to a 16-ft. vertical wire. The difference in length here is due to end effect.

When it is desired to use the aerial as the centre-fed, then the third feeder (C) is left floating and the coupler connected across A and B. When the aerial is to be used as a "T," then A and B are joined together at the station end and the coupler connected between their junction and C.

Construction

The spacing of the top portion of twin feeder is 4 in. or 6 in. The triple section of feeder is mounted on home-made spreaders, either of straight or "T" form as in Fig. 5. Where the straight type is used feeder C should be run in the centre.

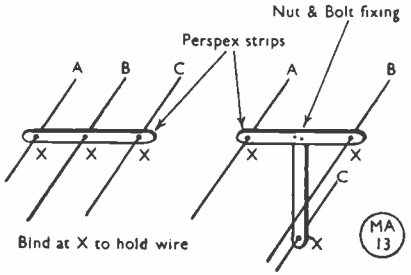


Fig. 5. Alternative methods of making up three-way spreaders for the "G8DV" feeder.

In the writer's case the spreaders are made of perspex strip, the sections of the T-shaped spreaders being held together by 6 BA nuts and bolts. Any of the standard methods of attaching the feeder wires to the spreaders may be used.

The triple feeder can be almost any length (but should be kept as short as possible), though if the aerial refuses to load up on any band a small alteration in feeder length may cure the trouble. At G8DV the triple feeder is 11 ft. in length and loads up quite well on all bands.

Aerial Coupler

This is a simple affair consisting of two variable condensers and a 4-pin coil holder, just as would be used for a Zepp aerial. Flexible leads are arranged to switch the tuner from series to parallel tuning, or if desired this function may be performed by switches. The aerial coil is link coupled to the PA and each coil (the writer uses three) is provided with a shorting clip to adjust the inductance to the correct value to tune the system.

It is unnecessary to lay down rules as to when series and parallel tuning should be used, but the accepted methods of operating tuned feeders apply.

The following notes indicate the methods of operation on the various bands. No mention is made of aerial coil size or whether series or parallel tuning is used, as this depends on the length of triple feeder in use.

OPERATING NOTES

1·7 mc

Feeders A, B and C paralleled and aerial loaded up as a Marconi against a 100-ft. counterpoise.

No special merit is claimed for the aerial on the top band, as in common with all short aerials (in which end loading is not used), the radiation resistance is too low for really efficient operation. However, it works moderately well.

3·5 mc

Feeders A and B are used, C being left floating. The aerial works better like this than as a Marconi against counterpoise. Although the radiation resistance is low, the aerial appears to radiate well in most directions.

7 mc

Feeders A and B are used, C being left floating. Here the aerial becomes a simple half-wave, centre-fed with tuned feeder.

14 mc

When working stations within 30 deg. of the perpendicular to the line of the aerial, feeders A and B are used, C being left floating, when the aerial becomes two co-linear half-waves. When working stations outside this area feeders A and B are connected together, feeder C being taken to the other side of the coupler.

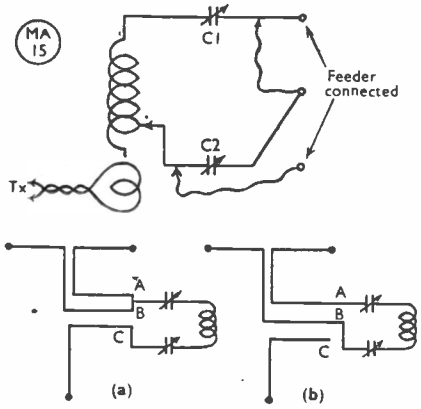


Fig. 6. Aerial coupler, arranged for parallel tuning. C1, C2 are 350 μμF, and C1 has a vane bent to give a short circuit in the maximum capacity position. Using the aerial as a "T" (a), and as two co-linear half-waves (b). Series tuning is assumed and in the latter case feeder C is left floating.

Typical examples of the two methods of operation using series tuning are shown above ; a simple switching circuit may be used to change from "T" to co-linear systems.

28 mc

Aerial connections as for 14-mc operation except that the "T" is now used when working stations both perpendicular to and in the line of the wire. On both 14 mc and 28 mc the aerial which gives a better signal from the desired station on the receiver will also give better results on the transmitter and this fact should be used to determine when to use the "T" rather than the centre-fed system.

Results

In the short time the aerial has been in use at G8DV, it has given very satisfactory results.

On 1·7 mc the usual GM, GC and GI contacts have been worked from near London, as has a ship station 300 miles west of Land's End.

On 3·5 mc and 7 mc, Transatlantic QSO's have been made quite often with 25-35 watts input, in spite of the QRM.

On 14 mc the aerial functions far better

than any the writer has previously tried. There do not appear to be any blind spots and DX can be raised right "off the ends."

No point would be served by a catalogue of DX worked as, in the writer's opinion, provided the gear and operator are efficient, the "countries worked" total is merely an index of time spent on the air. Suffice it to say that DX has been raised far more easily with this aerial than with any previous one, and that the writer is satisfied that with 25-35 watts, given average 14 mc conditions, a signal may be put into any part of the world. Very little time has been spent on 28 mc, but stations have been raised from all continents, which tends to indicate that the aerial functions quite well and that the coverage is adequate. The aerial has been used on 58 mc but, of course, does not compare with a simple beam on this band.

Conclusion

Finally, the writer would like to pay tribute to G3JR, whose aerial gave the germ of the idea for this one. In fact, it is the writer's opinion that G3JR's aerial is probably better than the one described if 14 mc work only is contemplated. However, the particular advantage of the aerial discussed here is that it is an all-band affair.

It is not claimed that this aerial is an "ultimate," but it is hoped may give other experimenters ideas for further developments along the same lines.

Noise Limiter for the HRO

Circuit Adaptable to Any Similar Receiver

By J. OSTLE (G2DYV)

MUCH trouble has been experienced by the writer with noise on the 10-metre band, and it was decided to add a noise limiter to the HRO to overcome the nuisance.

After various experiments, the choice was for one of the series limiter types which would automatically adjust itself to the carrier level; this obviates the necessity for drilling a hole in the panel to accommodate a control. The circuit eventually used was selected because it called for the minimum of change to receiver and left the AVC of the HRO to work as before.

Action of Limiter

The operation of the limiter is as follows. Referring to Fig. 2, the cathode of the limiter diode is held at a negative potential proportional to the carrier level, the voltage being applied *via* R6 and R7. Due to the long time constant of R6/C7, this voltage will not be affected by any change in the modulation of the signal. The carrier level will produce a voltage across R2a and R2b, half of which is tapped off and applied to the diode anode. Any variation

Table of Values

HRO Unmodified, Fig. 1.

C1	·00025 μF.
C2	·0001 μF.
C3	0·1 μF.
C4	10 μF.
C5	·01 μF.
R1	50,000 ohms.
R2, R3, R5	500,000 ohms.
R4	800 ohms.
R8	250,000 ohms.

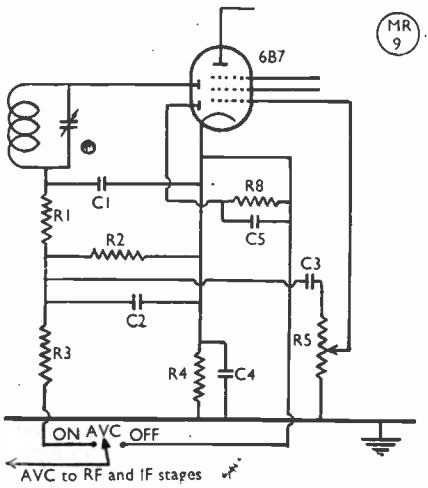


Fig. 1. Circuit of that section of the receiver affected by the modification.

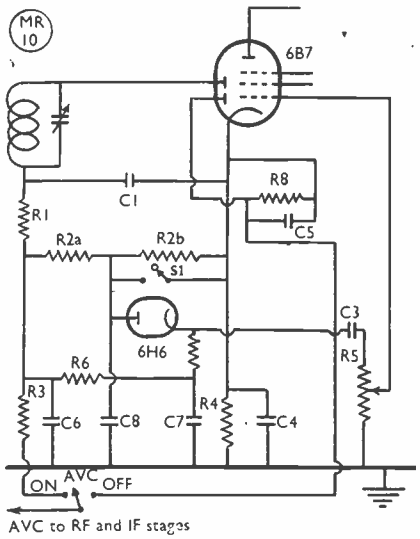


Fig. 2. The modification as applied by G2DYV. Values are given below. Very effective noise-silencing, with but slight drop in audio output, is claimed for this arrangement.

Table of Values

HRO Modified, Fig. 2.

C1	·00025 μF.
C2, C6, C8	·0001 μF.
C3	0·1 μF.
C4	10 μF.
C5	·01 μF.
C7	·05 μF.
R1	50,000 ohms.
R2a, R2b, R8	250,000 ohms
R3, R5	500,000 ohms.
R4	800 ohms.
R6	1 megohm.
R7	820,000 ohms.

in the signal will then produce a change in the current passing through the diode ; this will be felt as a change of voltage across the volume control, R5. Now, if a pulse of noise is received the anode is driven very negative with respect to the cathode, the diode ceases to conduct and so cuts off the noise peaks ; the cathode is unable to follow the sudden change because of the long time constant of R6/C7.

Circuit Arrangement

With regard to the alterations necessary to the HRO, the only components affected are R2 and C3 in the original circuit as shown in Fig. 1. The circuit finally resulting is shown at Fig. 2 and the modifications necessary can best be followed by referring to both diagrams. R2 is removed and replaced by the two resisters R2a and R2b which add to the same value as R2. C3 is removed from the junction of R1 and R2 and joined to the cathode of the diode limiter. Additional components necessary are R6 and R7, C6 and C7 and S1, as given in the circuit diagram.

The pilot lamp and holder were removed from the front panel of the HRO and the hole used for S1, which shorts out the diode when not required. The leads to the pilot lamp were pulled back through the chassis and used for the heater of the diode (6H6), which is mounted underneath the chassis on the back panel. Twin screened lead is employed to connect this switch to the diode.

Results

By using the circuit as described no loss in AVC was experienced but a slight loss in audio output was noted : this however was not serious and normal volume could still be easily obtained by turning up the audio gain.

Results obtained are very satisfactory and even with a car some 15 yards away a signal of S3 could be read with ease with the limiter in circuit. No trace of the same signal could be found with the limiter switched out.

Although this article deals with adding a limiter to the HRO the circuit adopted is equally applicable to any other similar type of receiver.

HOW THINGS GET ABOUT

We are interested to see that the Mexican Amateur Radio publication, *Onda Corta*, is running a series of articles by an American contributor on the application of Radio Countermeasures—of which the R.A.F., and in particular Bomber Command, made good use during the war. It is irrefutable that the British originated RCM warfare—which became a very important factor in our operations—and, indeed, did most of the development work in connection with it. The problem was, roughly, the jamming or otherwise rendering unusable of all enemy frequencies between 10 cm and 200 kc without affecting the operational efficiency of our own radio and radar services. As it happens, a member of our own staff was closely connected with this work, from both the technical and operational aspects, throughout the war period,

The Transitron Oscillator

Theory, and Applications in the Amateur Station

By H. DE LAISTRE BANTING (G3BQ)

(The negative-transconductance or transitron oscillator is one of the lesser-known high stability primary generating circuits, capable of being used either in AF or RF service. It is of obvious interest as a VFO and is easy to set up. This article is a general introduction to the subject of transitrons.—Ed.)

THE transitron is an oscillator of great simplicity, flexibility, and stability of operation. Furthermore, it is almost entirely independent of any change of valve characteristics due to the ageing of the valve. In this way it is infinitely superior to the well-known dynatron, which is very susceptible to the changing of the secondary emission characteristic of a screened-grid valve during its life, although satisfactory in other respects. In addition, the transitron is not critical in adjustment even when great purity of waveform is required, such as with an audio frequency sinoidal oscillator.

As will be shown later, the method of operation may be applied to an RF oscillator with either a sine waveform output or one rich in harmonics, with the circuit elements consisting of L and C; or, if desired, in an RC circuit capable of operation up to several megacycles.

Another feature of the transitron is that the output voltage may be controlled by three main methods, one of which (negative bias on the control grid) does not affect the frequency, though the other methods can do so under certain conditions.

Principle of Operation

The negative-transconductance (transitron) oscillator operates by virtue of a property common to most pentodes in which an increase in suppressor voltage causes a decrease in screen current, and thus an increase in screen voltage. This effect, whereby the suppressor voltage increasing has a *greater* effect on screen current than the screen voltage itself, will only occur over a limited range in which the screen exhibits this negative resistance characteristic.

Referring to Fig. 1, the suppressor is biased to the point "A" where the negative slope is obtained. If an impedance is connected in series with the element exhibiting negative resistance (and depending upon whether DC or AC coupling is used between suppressor and screen) the circuit will oscillate freely or as a triggered circuit. Oscillation can only be maintained as long as the positive *plus* negative resistances are zero or less. (See Fig. 2.)

Minimum Harmonic Content

In order to keep the harmonic content small we must arrange for a very small

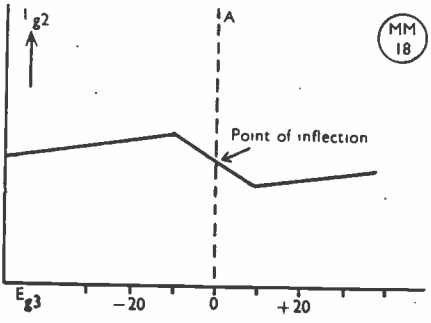


Fig. 1. Suppressor bias condition to produce free oscillation. The value may vary with different valves.

amplitude of oscillation; that is, the oscillations must not build up very much. This is accomplished by arranging the point of inflection (Fig. 1) to occur where the dynamic negative impedance increases with amplitude. If we start off with a static negative impedance just small enough to

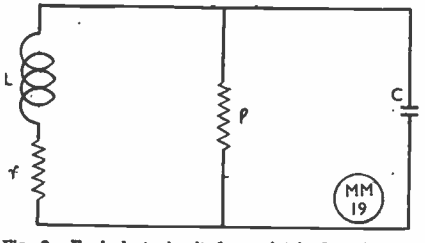


Fig. 2. Equivalent circuit for maintained oscillation, discussed in the text, where $\frac{r}{L} + \frac{1}{\rho c} > 0$

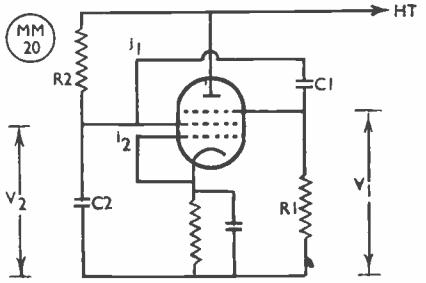


Fig. 3. The RC transitron oscillator.

permit oscillation this arrangement will prevent oscillations building up much, due to the increasing effective damping as the amplitude increases. The particular point required is usually that of maximum slope, as the essential requisite is that the above-and-below points across which the valve is swung must have a lower slope than that at the point of inflection. In the case of an oscillator employing an L/C circuit, it is found that the best waveform is obtained by lightly coupling direct into that circuit.

The RC Transitron

It is now proposed to deal briefly with the RC version, which is most useful for the lower frequencies, and which is not usually treated in any detail. The principle is no different, merely being a specific case in which we can use a frequency selective network.

From an analysis of the basic circuit and Fig. 3 it can be shown that, first

$$f = \frac{1}{2\pi\sqrt{R_1R_2C_1C_2}}$$

which in the special case where we make $R_1 = R_2$ and $C_1 = C_2$, then

$$f = \frac{1}{2\pi RC}$$

Secondly, that the condition for maintenance of oscillations,

$$\left(\frac{R_1}{R_2} + \frac{C_2}{C_1} + 1 - \propto R < 0\right)$$

is independent of C_1 C_2 provided that the ratio $\frac{C_2}{C_1}$ is constant.

Practical Forms

There are certain obvious limiting factors to be considered: R_1R_2 may not be much higher than 0·5 megohm unless abnormal DC conditions are used; also, due to difficulty in obtaining ganged potentiometers that track properly, when one wishes to vary the frequency over a wide range it is better to use a two-gang condenser to vary C_1C_2. This does, however, have the disadvantage that C_{min} to C_{max} for, say, an average 500 $\mu\mu$F two-gang condenser may be 12·5-500, or 40:1, whereas if we do have a good pair of ganged 0·5 megohm potentiometers we should do better.

When investigating the possibilities of a valve of unknown suppressor/screen characteristics, it is advisable to have a suppressor bias control capable of a wide range, say ± 100 volts, or at least +10 v. to −50 v. It is always helpful to take the actual curve by plotting screen current against suppressor volts, feeding the screen from a fixed HT rail *via* a dropping resistor of the order that would be used in practice.

One method of amplitude control is to

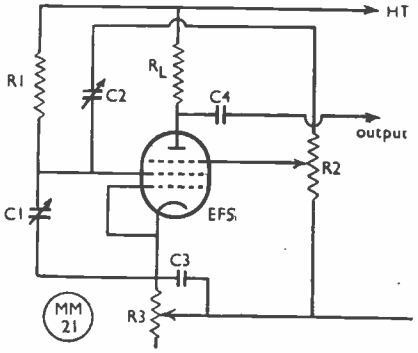


Fig. 4. Example of practical oscillator illustrating some principles mentioned in the text. If C1, C2 is a twin-gang condenser of 500 $\mu\mu$F, and R1, R2 are 0·5 megohm, then the frequency range is approximately 650 to 1,600 cycles. R3 should be 25,000 ohms, C3 0·5 μF, and C4 0·1 μF.

vary the coupling between g_2 and g_3 as in Fig. 4, or by achieving the same effect by changing the ratio C_1C_2. Generally speaking (particularly where the oscillator is not required to gate RF) it is preferable and more convenient to use control grid bias for amplitude control. A further point of interest is that any resistor placed in the anode tends to stop the circuit functioning, unless it is de-coupled, but under certain circumstances may be used where satisfactory operation can be achieved.

Another useful application of this circuit (Fig. 4) is that it may be used to provide tone modulation of RF by replacing R_L by a suitable RF choke, placing another RF choke in the grid and simply feeding RF in at the grid and taking modulated RF out of the anode.

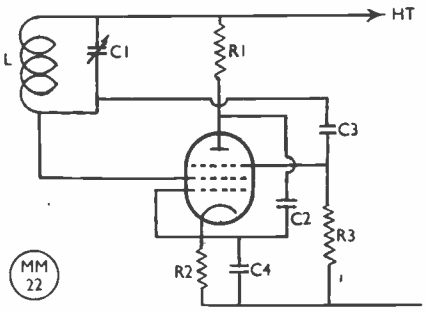


Fig. 5. Standard transitron circuit. R1 drops the plate voltage to 20-50v., C2 is RF decoupling, R2 provides suppressor bias, and C4 decoupling. C3 must have a low reactance compared with R3 at the resonant frequency of LC.

Although the matter of harmonic content has been mentioned, it is important to point out, particularly for those who wish to make up a switched frequency audio oscillator, that it is necessary to use large (but low leakage) condensers C_1C_2 for the purest waveform. Under these conditions quite large outputs of pure sine waves are obtainable; values up to 0·5 or 1 μF can be used in these positions. Further, if a very small variation of frequency is desired, it may be accomplished by varying one R or C only.

The circuit may also be used for the production of sawtooth and square waves. This will not be treated in detail here, except to mention that (sawtooth waveforms excluded) outputs of over 100 v. may be obtained.

The LC Transitron

In most RF applications it is preferable to use the LC version both for convenience and the greater stability of the frequency determining circuit (Fig. 5).

Although perfectly successful this arrangement has the disadvantage that the tuned circuit has DC on it, preventing the use of an earthed rotor type condenser, with several other inconveniences. The author prefers to have one end of the tuned circuit at DC earth as well as AC earth and this is possible by placing the tuned circuit in the suppressor (Fig. 6). Furthermore, when changing the frequency range (which simply requires the changing of one coil), one is less likely to receive a shock !

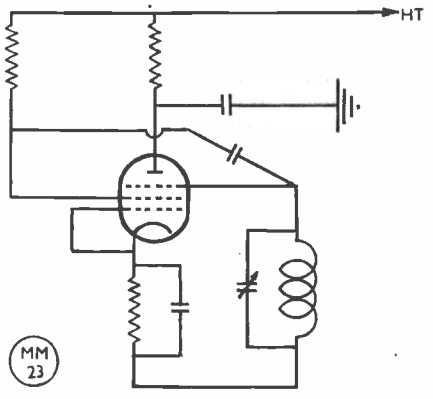


Fig. 6. Improved circuit, rearranged to earth one side of the tank.

Constructional details of an oscillator suitable for frequency measurement or a signal generator may be of interest. The requirements were stability of operation and a small tuning range. In the circuit of Fig. 7 the amplitude control may be omitted, unless one is anxious to reduce the harmonic content to a minute amount, since an oscillogram reveals no *perceptible* distortion when the control is at maximum. The output voltage is 18 volts peak-to-peak, and constant over the range 3·390 kc to 3·940 kc. The valve chosen, a Mullard EF39, had its negative slope mid-point at a little under −2 v. on the suppressor on the sample measured, and the effect of shifting the point of inflection down the slope very slightly by operating at 0v. on the sup-

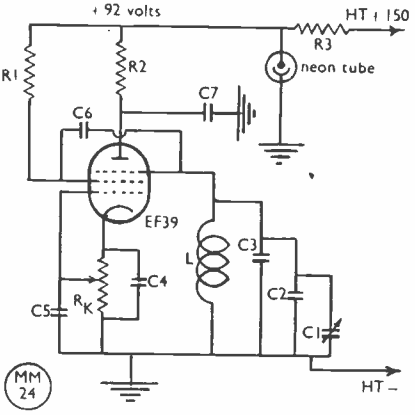


Fig. 7. Grid and cathode may be earthed if amplitude control is not required; this will give about 18 volts output peak-to-peak. Rk 500-2,500 ohms; C1 160 $\mu\mu$F; C2 50 $\mu\mu$F, negative temperature coefficient; C3 400 $\mu\mu$F silvered mica; C4, C5, C7 ·01 μF; C6 500 $\mu\mu$F; R1 10,000 ohms; R2 22,000 ohms; L 18 turns 18 SWG, 2-ins. long on 1-in. dia. ceramic form.

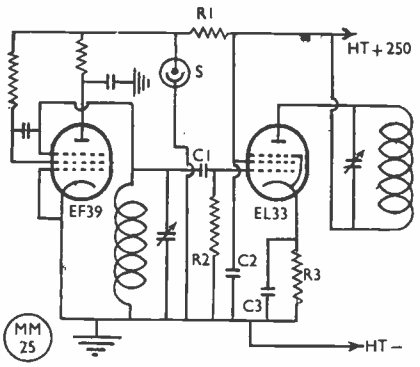


Fig. 8. Grid current will not start till EL33 grid is swung to reduce effective bias on peaks to less than about −1·5 volts. R1 5,000 ohms wirewound ; R2 100,000 ohms ; R3 220 ohms ; C1 100 μμF ; C2, C3 ·01 μF.

pressor makes a negligible difference—and is most convenient.

The frequency stability versus HT variation is excellent ; raising the 92 v. to 250 v. produced less than 3 cycles change at 3·5 mc. Nevertheless, the author uses a neon stabilizer (CV188) to regulate the HT. The warming-up period should be about 15-20 minutes, after which the drift due to changing interelectrode capacities of the valve are negligible ; drift is also compensated for by a part of the tuning capacity being of the negative temperature coefficient variety. The inductance itself will not change much provided it is wound on tightly in the first instance and a ceramic form is used, since the temperature coefficient of ceramic materials is very low.

Output is taken directly from the tuned circuit, with a high input impedance at the succeeding buffer stage, to avoid undue loading. Both the type of buffer and the coupling condenser (effectively in series as far as stray capacity is concerned) are arranged to have the least possible effect upon the tune. This is done by using 1 μμF between the " hot" end of the coil L and a suitable cathode follower, the output from the cathode follower being 6 volts peak-to-peak across a 1,000 ohm load.

The frequency of oscillation of all the LC transitron circuits considered may be taken as $\frac{1}{2\pi\sqrt{LC}}$, although if the frequency is made very low by large inductances having appreciable DC resistance, the resultant frequency would be lower than that given by this simple expression.

It is strongly recommended that if harmonics are required they be generated by a separate valve, say, a saturated pentode fed by the oscillator. It can be done in the oscillator by shifting the point of inflection (by suppressor bias) and turning the output up full ; the relationship of the screen resistor to the HT rail may also be used to produce limiting and consequent distortion.

Transmitter Control

It is obvious from the above that here is an excellent VFO for the transmitter. Since the VFO frequency would always be checked, it would be permissible to reduce the high specification demanded in the previous section by allowing the input capacity of the pentode to be hung straight across the tune (Fig. 8). As long as the buffer was operated Class-A, well clear of grid current, it would be quite satisfactory. The *de luxe* version should, of course, include the cathode follower,

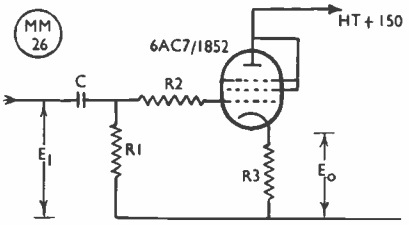


Fig. 9. Cathode follower buffer stage suitable for the LC transitron. C 1 μμF ; R1 120,000 ohms ; R2 3,900 ohms ; R3 1,000 ohms. The efficiency of this circuit is about 80 per cent.

feeding into a high slope, short grid-base pentode operated as required.

Cathode Follower Buffer Stage

A valve must be chosen that is free from grid current (most EF50 valves are unsuitable for this reason) and one in which the "leakage" due to the ultimate C_{gk} does not carry the RF straight through from the input circuit to the cathode load, making the valve a minor participant. A suitable circuit is shown in Fig. 9. The grid stopper is advisable as there are certain conditions (frequently obtained) under which a cathode follower becomes unstable.

If a greater input impedance is required the grid leak must be returned to the cathode *via* a suitably by-passed bias resistor inserted above the cathode load.

DX COMMENTARY

ON CALLS HEARD, WORKED & QSL'd

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

Another excellent month of DX. April and May have lived up to their old reputation by producing a whole crop of interesting contacts, new countries and new reporters to "This Column." Judging by the WAZ claims, the amendments arriving by the next post, and the frantic post-cards saying "Please add Zone 19" (or a new country), the hardened DX-chasers are being whipped into a frenzy by the sound of so many new things on the air !

Unquestionably 14 mc has been the happiest hunting-ground during the month, although 28 mc is still very lively most of the time. The latter band surprised most of us on a recent Sunday afternoon when it suddenly filled up with W6's in a way that we had not heard for some two months. At 1400 there were a few VU's, ZS's and a South American or two ; at 1500 the whole American 'phone area was full of Californians. What a band !

VR6 Pitcairn Again !

The 14 mc band, however, has produced some *really* hot ones for the careful searcher. We don't yet know how long the chief of these will be on the air ; but on May 16 he arrived, signing W6RWQ/VR6 and working ZL's. After a little burst of very rapid CW he went on 'phone, which, unfortunately, was almost unintelligible. (For that reason we are not quite sure if we worked him—but we think and certainly hope we *did* !) Next morning he was heard on much better 'phone calling "CQ Santa Monica, Calif," so naturally no one outside Santa Monica called him (or did they ?). At the time of writing we don't know much about him, but fear from the general symptoms that his stay in Pitcairn Island will be a very short one. It is thought, however, that VR6AY—or some call like it—may come up again as the result of W6RWQ's visit, and remain on regularly. G6ZO (London, N.20) worked him at 2210 DST on May 16, when W6RWQ/VR6 confirmed that he had already had "one G contact."

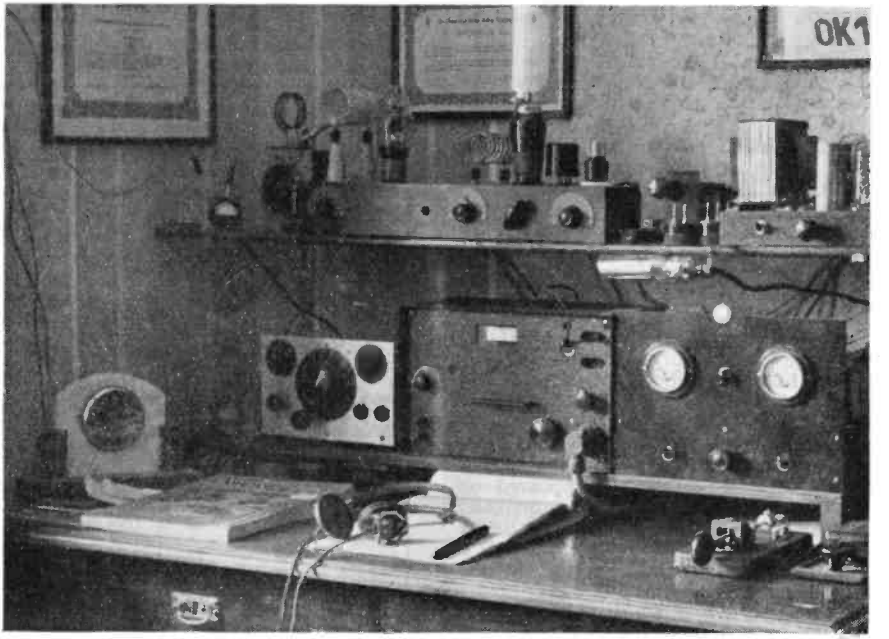
Other extremely nice ones down there in the Pacific include W3EKK/VK9 in the Admiralty Isles ; FK8VB (New Caledonia) coming in again on 28 mc 'phone ; YJ1AB (New Hebrides) and VR4AA (Solomons), both on 14 mc 'phone ; the spasmodic appearance of VR5PL (Tonga) on 14 CW ; and ZK1AB (Cook Is.) coming in again with a really fine signal. There's something about these Sunny South Seas . . . .

Other phenomena of interest are the arrival of UAØKQA at the mouth of the Lena, who obligingly tells everyone that he is in Zone 19 ; of UR2KAA (Estonia) ; and of W3KXO/Iwojima, who is giving a lot of folk a new country on 28 mc 'phone. That's enough jam for a little ; now for the powder.

VFO Dept.

We regret to say that some of the VFO fraternity are still in the deepest disgrace, and would like to recount two true incidents. We heard ZK1AB working a succession of stations somewhat off his own frequency, and he told one of them "Can't work anyone on my own freq—I can't even monitor myself for VFO's on it." And *still* they called him dead on his own frequency. Later he said "Definitely going off the air now—will be back in exactly twelve hours' time. Sri, boys, QRT." And as he sent "SK" his frequency came to life like "Daybreak on a Surrey Farm" with more VFO's than we have ever heard at one time or place before. It appears that the unintelligent use of a VFO goes with inability to read the code !

The second incident was even more astonishing. We were working W3EKK/VK9, who had signed with a clear QLM, and still, *throughout the QSO*, his own frequency was cluttered with VFO's calling him (even while he was sending, of course). So we told him he was QRM'd by these boys and he came off his bug for a minute and sent, very slowly, "I don't answer calls on my freq or within 5 kc of it so they are wasting their time." Unfortunately most of them were still too busy calling him to hear that ; but at least



General view of OK1AW, who with 40 watts to an ECO-driven 807 PA and a 66-ft. Windom has worked 38Z, 92C post-war. Receivers are an 0-V-1 and 7-valve superhet for 28 mc.

it is a sign of the times. It is becoming obvious that when a rare DX station appears, he simply will not be able to hear anything on his own frequency and will have to revert to QLM/QML procedure (or even QMH/QHM, because there is a sign that the HF end of 14 mc is going to be used at last).

Lastly, G2BVN (Romford) tells us that every VFO manufactured by an American firm goes out with a note reading "In using a VFO common courtesy should be applied to prevent unnecessary interference with other operators. Thoughtless use of a VFO will only rob others of pleasures to which they are rightfully entitled." 'BVN recently sent a copy of this to someone who squeezed him ; we hope it made them think.

No need for further comment here, except perhaps the obvious one that you have to buy or construct a VFO, whereas common courtesy is free, untaxed and unrationed, and, one would imagine, should be plentiful.

WAZ

A new and larger list of Zones Worked appears herewith, and the rate-of-climb of some of the keen types is remarkable. It is obvious that our lower limit will soon have to be placed much higher than 30. What is extraordinary is the fact that quite a few of those who have only claimed 30 or 32 Zones have worked the elusive Zone 23, so that nothing should stop them from eventually hitting the top. All the 39-ers are only waiting for Zone 23 ; who will be the first over the stile ? AC4YN is *not* the only possible station in that Zone, but we are keeping it quiet for the moment !

G6ZO (London, N.20), at the head of the list with 156 countries, sends in a terrific catalogue of recent DX, including such rarities as W2WMV/C9 and MXBCM, both in Manchuria, W7KLQ/J9 (Iwojima), VK4BI (Papua), KS4AC (Swan Island), ZS3F (South West Africa) and TA3SO (Turkey). He has a card from the latter. Jim's list of C's, J's, PK's, KG6's and VS6's reads just like the Call Book.

Close runner-up is G2PL (Wallington), who says he wishes ZM6AC, VR5PL, MX2AG, YJ1AB and VR2AB would listen for Europeans occasionally. 'PL has been temporarily out of action, but is

now fit again and doubtless will be showing a rare turn of speed.

G8KP (Wakefield), another thirty-niner, has unearthed UH8AF and UJ8AD for two more new countries, and has worked VP8AD, AC3SS, KS4AC, PK1MD, ET3Y, UAØKQA and TA1AP during the past month, among many others of interest. He has worked everything on an old doublet he slung up temporarily a year ago. It is 20 ft high one end and 25 the other, and sags badly in the middle. Where are these rotary experts?

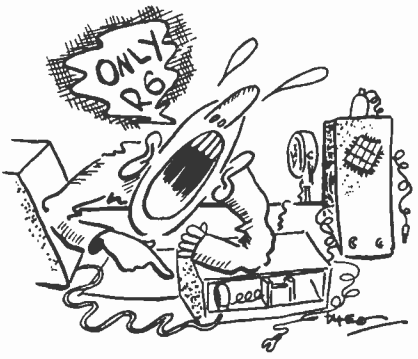
From Overseas

A newsy letter from ZD4AB (Gold Coast) gives the information that ZD1KR (Sierra Leone) is still very active and that ZD2G and ZD2K (Nigeria) are also on the air. ZD4AH and ZD4AI are both working from the Gold Coast, but ZD3AF (Gambia) seems to have packed up. (ZD3B, however, has appeared on 14 mc CW since this letter arrived.) ZD4AB points out an error in the listing of countries for WAZ. Ivory Coast is a French possession and should not be listed with the call ZD4; if it ever comes on the air it is another separate country.

VU2AT is now G3CAT (Pinner)—see New QTH's—and if anyone who worked him between November 15 and January 10 will get in touch, he will receive his QSL by return.

SVØAA (see DX QTH's) tells us that the only XA call-signs for Greece are now XABU and XAFX, both in the Dodecanese. XABX, XAFO and XACW are now SVØAA, ØAO and ØAD respectively, as explained on p. 173 of the May issue.

J4AAK/G4LV is active in Miho, Japan (QTH in list) and wants all the QSO's with G that he can possibly get. He is using 150 watts with the P/P PT-15 job described in the December, 1946, issue.



We usually get S9.

WORKED ALL ZONES LISTING

Maximum Possible 40 Zones.
Total Prefixes Listed 213.

Station	Post-war Zones Worked	Post-war Countries Worked	All-time Zones	All-time Countries
G6ZO	39	156	?	?
G2PL	39	149	39	171
G8KP	39	131	39	154
G6QB	39	126	39	148
G2WW	38	131	38	131
G2AJ	38	126	?	?
G5YV	38	123	39	136
G3DO	38	119	38	136
G2CDI	38	116	—	—
G3ZI	38	107	38	115
G3AAK	38	107	—	—
G5RV	38	106	39	141
G6BS	38	104	?	?
G5VU	38	?	?	?
GW3AX	37	?	?	?
G8RL	36	101	?	?
G4AR	36	94	?	?
G6WX	36	92	?	?
G2CNN	34	92	—	—
GM2UU	33	79	36	105
G3HS	33	?	?	?
G5IV	33	?	?	?
G8FF	32	78	33	87
G8UR	32	?	?	?
G8QX	30	73	?	?
G6PJ	30	60	?	?
J4AAK	30	?	—	—
G4LX	30	?	?	?
GW4CX	30	?	?	?

MD5AJ (see list) is operating from the Canal Zone on 7 mc CW—QSL's for MD5AJ and SU3GM should be addressed to GM2HIK, the operator.

VS1BU (Singapore) expects to be returning home almost at once, but his second op. will be carrying on with a new call and the same QTH. 'BU has been using an ex-Japanese transmitter, on a rubber plantation, and has had many 'phone QSO's with Great Britain. Regular activity in VS1 now includes 1AK, 1BU, 1BX and 1BY, but many of the old ones are inoperative.

G2CUR is on the air with the call MD5AK and has already worked a few G's with 12 watts. He is on 14 mc from 1500 to 1600 and 1800 to 2130 daily, and we presume he means GMT.

VP2GE (Grenada, B.W.I.) sends us the QTH's of four active amateurs on the island; VP2GB has already been worked by several G's.

G3LK, under cover in Persia, is keen to listen for G stations on 28, 14 or even 3·5 mc. All communications must go to his home address, 13a Western Road, Hove, Sussex.

VE3QB (Lanark, Ontario) sends us an interesting account of a visit by Sir Arthur Harris to RCAF Headquarters, during

which the Amateur Airforce Radio Net was called into operation for a demonstration. 'QB says that the Canadians still cannot understand why we in England are not allowed to handle traffic and he wonders whether we shall ever see a British Empire net.

General DX

G4PF (Liverpool) has received a QSL card from South Africa with an Imperial Reply Coupon and a two-part recording of his signals on a disc. He contrasts this with an Austrian station who sent a report and said he needed wallpaper.

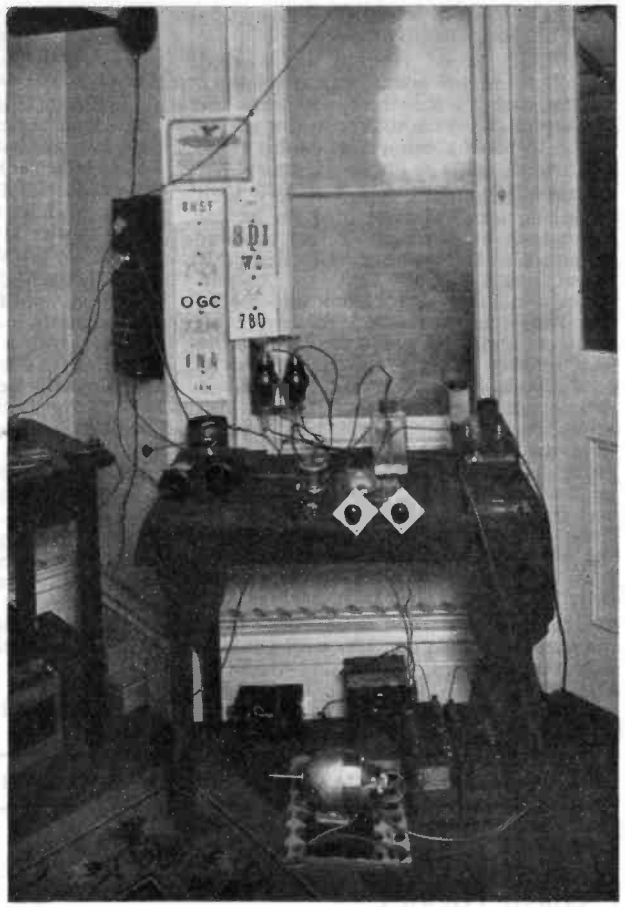
G4PF is having his call pirated by someone down South, and wishes the latter would tell the few locals that he works not to QSL.

G2DGJ (Leyton) was recently out in Gambia and remarks that ZD3B is genuine. He uses an ex-US aircraft transmitter rehashed to function on 14 mc. The note is T7 and the creep is terrible (we've worked him !)

G5WC (Upper Norwood) has worked C1AN, VS1AQ, VQ5JTW, ET3Y, NY4AE, NY4CM and ZD4AI, to mention only a few nice ones. He is disgusted with the "hogging" that still goes on on 14 mc, particularly local 'phone working and 'phone at the FL end. G6BB (Streatham) has bagged VP9E, I1AHC/16, VS9AN, VU7BR and PZ1FM. VP9E was on 7 mc. 'BB tells us that W2NGW is active on 7020 and 7055 kc and wants a schedule with someone in Southport, as he is Lancashire born.

GM2UU (Stranraer) sends a good list of countries and zones worked exclusively on low-power 'phone, but adds that he has four V-beams which probably help ! He wants to co-operate with anyone who knows all about rhombics, including the source of 800-ohm high-wattage carbon resistors.

Several Windom enthusiasts have come to light, including G5YV (Morley), who agrees with our statement that a variable tap would be a nice thing to have—if it could be controlled from the shack. He has used all sorts of aerials, including rotaries, and still likes the Windom best. His list includes J9ABB, PK6HA, VK7DS, KS4AC, W6VDG/KW6, PK2DL,



Going back a bit. G5LS (now GM6LS) as the station looked in 1924 when located in Blackheath, London. The Tx was a self-excited job on 95 metres, using a pair of Mullard 0/50's in parallel, with power from a DC generator run off accumulators. Ex-G6XG, now VK2NO, was 2nd operator about this time, and the DX worked included Trans-Atlantics. Note the water grid-leak !

ZK1AH, VQ8AK, VU7BR, CR7AD. . . . Kind of speaks for itself, doesn't it ?

G3AAK (Broad Hinton) has worked himself up to 107 countries and seems to be the first "3-plus-three" to pass the century mark. Five metres is now taking up an increasing proportion of his time, but his DX list is as impressive as ever.

G6BW (Churchill, Som.) is very keen on seeing activity maintained on 28 mc throughout the summer. Before the war he and G6VK organised tests with this object, and found that at certain periods, notably just before full moon, the W's were workable. He wants all amateurs and SWL's who are keen on the idea to keep going on the band and to send reports to him for compiling. He is certain (and we agree) that the old idea of writing off 28 mc during the summer gave the false idea that the band went dead. When a number of stations were persuaded to come up on schedule, this was disproved. Ben has been active on 7 mc and 3·5 mc, using his fixed 8JK 14 mc beam ! We regret, in view of the previous remarks, to state that he finds it better than his 67-foot Windom !

G2WW (Penzance) has collected some interesting Russian contacts with UA6LI, UB5HO, UD6BM, UR2KAA, UAØSF, UJ8AD, UL7BS and finally UAØKQA, who gave him Zone 19 and moved him up the ladder. Others of interest were ZC6DD, C3YW, KH6BM, KZ5GD, XE1A and VE7ZM. This was mostly on 14 mc CW—and very nice, too.

G2SA (Burnham-on-Crouch) has been heard off the coast of Tunis on 1·7 mc. He has worked UAØSH and also added Nevada and Oregon to his list of States worked. G2CBW (Southall) gives us two more Mobiles for the collection—I1PFC, on a trawler in the Med., and LA3BA, off Alexandria and bound for Palestine.

G8QX (Malvern) reminds us that a Windom used for reception picks up both horizontally and vertically polarised signals, with a possible gain over normal aerials of 3 dB. He has an idea of using a dipole with both members going off at 45° to the horizontal, which may give a similar effect and, in his case, will enable the dipole to clear some chimney-pots instead of swiping them off !

G3DO (Sutton Coldfield) sends a beautiful list of zones and countries ; recent DX includes K6ETF/KC6 and VR2AB on 'phone, and ZK1AB on CW. G2CDI (Stokenchurch) has jumped to 38 zones with the friendly UAØKQA. The latter has been a big help this month ! 'CDI tells us that SH2D is operating on 28350 kc with the Swedish Solar Expedition in Brazil ; a second station, SH2C is working as a link from the Gold Coast.

DX FORECAST FOR JUNE 1947 (ALL TIMES GMT)

	7 mc	14 mc	28 mc
NORTH AMERICA :			
East and Central	0001-0500	1400-0800	Erratic
West Coast	?	0400-0800	?
CENTRAL AND SOUTH AMERICA	2300-0300	2100-0800	0900-2300
AFRICA :			
North of Cancer	All day	All day	0900-1600
South of Cancer	?	1500-2200	1100-2000
ASIA :			
West of 75° E.	1400-2100	0900-2100	0900-1600
East of 75° E.	1800-2300	1000-2100	1200-1800
OCEANIA :			
VK, ZL, VR, ZK etc. . . .	?	0600-1500	1000-1400
PK, KA, KG6 etc. . . .	?	1300-2000	1000-1400

NOTE.—*The times given above are the most likely periods during which signals may be expected from the parts of the world indicated. Under unusual conditions, signals may be heard outside these times.*

QSL's to SM7UZ. 28 mc DX at G2CDI includes 'phone with HI6OF, HI8MV, CP1AX, VS6AM and VQ5DES. He says that the VFO should eventually reduce the QRM quite a lot, when the inspection parties get busy and check such matters as "Measuring frequency before QSY," "Listening on new frequency before QSY," "Possessing frequency meter" and so on. He thinks there may well be 300 less stations on the air one day, as 300 VFO units of a certain type have recently been sold by one firm !

This is hardly DX, but should be of interest to readers of this feature. The Geography Section of the Wandsworth Training College, London, S.W.18, wants daily schedules with amateur stations in the U.K. with a view to exchanging daily reports on wind direction and weather, using the Beaufort scale. The college station will use the calls G3AMF/A and G3AQM/A on 7133 and 3614 kc. Interested operators please write and arrange schedules.

G2DX (Camberley), a real old-timer from 1919, recently worked ZS1AX. In the course of the QSO he asked for the whereabouts of Major Swart of old South African A6N (in the days before prefixes). To his amazement ZS1AX turned out to be A6N himself. They looked up their logs and found that their last QSO was in February 1926 ! G2DX says an interval of 21 years and 3 months must be a record for two consecutive QSO's.

G2VV (Hampton) has been playing with some new aerials ; he now has six up, but plans a new 40-foot mast and a second long wire. There used to be a school of thought that said "The less sky visible from the garden, the better the DX." Seems to be coming back into favour.

Anyone waiting for a QSL from ZC6CK should get into touch with G3ASJ (Selby, Yorks), who is now operating on 1·7 mc only with an input of 3 watts from batteries. He says that in ZC6 the stations that we call DX were rolling in regularly at 599. G2AJ reports that VS6PQ will be on 14 and 28 mc about July and wants G contacts.

And so we sign off until next month, when the deadline will be first post on June 13 ; thanks and acknowledgments to all contributors, Good Hunting to everyone, and don't forget to measure that frequency before you QSY !

DX QTH'S

D2FO	LAC F. W. Boulton, Sect. 5, RAF, AHQ, BAFO, c/o BAOR.
EL5A	Col. John B. West, Monrovia, Liberia.
EP3H	QSL *via* G3LK, 13a Western Road, Hove, Sussex.
HH2CW	P.A.A., Port-au-Prince, Haiti.
J4AAK	Cpl. B. M. Selby, SHQ Signals, BC Air Station, Miho, BCOF Japan.
KZ5AZ	Box 1017, Curunzu, Panama Canal Zone.
MD5AFA	W.T.F.P., RAF, Deversoir, M.E.F.
MD5AJ	Cpl. J. A. Clark, No. 3 Forces Broadcasting Unit, RAF, Kabrit, M.E.L.F.
MD5AK	Lt. V. H. Thomas, 2051 (Maur) Coy., R.A.P.C., M.E.L.F.
NY4AE	D. Roberts, NAS Box 35Q, Navy 115, FPO, N.Y.C.
ST2AM	RAF, Khartoum, Sudan.
SVØAA, SVØAD, SVØAO	R. Signals, BMM(G), Athens, Greece.
VP2GB	Glyn Evans, Box 16, St. Georges, Grenada, B.W.I.
VP2GC	G. Benson, British West Indian Airways, St. Georges, Grenada.
VP2GE	A. Hughes, Box 65, St. Georges, Grenada.
VP2GF	C. McIntyre, Ford Service Station, St. Georges, Grenada.
VP2LA	APO 867, c/o P'master, Miami, Fla. (*Stn. on St. Lucia.*)
VQ4JBC	Box 4013, Nairobi, Kenya.
VU2AM	Capt. Edwards, GHQ Sigs., New Delhi.
VU2QV	QSL to GM3AR, 15 Ruthven Road, Giffnock, Renfrewshire.
W3KXO/Iwojima	624 ACWS, APO 86, c/o P'master, San Francisco, Calif.
ZD2G	Stevens, Post and Telegraphs Dept., Lagos, Nigeria.
ZD2K	c/o RAF, Lagos, Nigeria.
ZD3B	Signals, c/o BOAC, Bathurst, Gambia.
ZD4AH	G. C. Cawood, Box 287, Sekondi, Gold Coast.
ZD4AI	D. J. Robinson, Wireless Engineer, GPO, Accra, Gold Coast.

How Many Countries?

Any amateur who is interested in DX tends to assess the performance of his own and other stations by the number of countries worked. Our WAZ system is in itself an excellent measure of DX ability, but even so, those who have worked the same number of Zones must necessarily be placed in order of *countries* worked.

It is fortunate that international agreement has been reached on what is, or is not, a country—at any rate for the present. The Agreed List of Countries has been published in the various British and American journals, and instead of several different lists we have at last had the pleasant experience of seeing the *same* list appearing in several places.

We are publishing herewith something that has *not* been done before—a compact list of prefixes, alphabetically. This is not an attempt to be clever nor does it conflict in any way with the full lists published. But it should serve as a useful guide for quick reference, which is what is intended. There are still a few countries which have not been officially allotted a prefix, and these appear under their names. There are also various groups, such as Leeward Islands (VP2A, VP2K, VP2M) and Windward Islands (VP2D, VP2G, VP2L), which are quite easily separated out as groups. Anything appearing between two semi-colons, in fact, counts as a country; and there are no less than 213 in the list. For the moment, therefore, this can be taken as the total number of countries workable.

There are other cases in which two different countries use the same prefix (*e.g.* PK6 Moluccas, and PK6, Dutch Guinea). These have also been set out in such a fashion that there can be no mistake.

So when you make your WAZ claims, please base your number of countries strictly on this list, and if any additions or subtractions become necessary, we will give them from time to time, working on this same basic list.

It is inevitable that completely new countries (particularly small islands) will come on the air from time to time. These will have to be judged on their own merits, and if they appear to be a permanent addition to the collection, they will of course be added to the list. So now go ahead and count them up!

ALPHABETICAL LIST OF COUNTRY PREFIXES

AC3; AC4; AR; C (XU); CE; CM9CO; CN; CP; CR4; CR5; CR6; CR7; CR8; CR9; CR10; CT1; CT2; CT3; CX; D; EA; EA6; EA8; EA9; EI; EK; EL; EP (EQ); ET; F; F (Corsica); FA8; FB8; FD8; FE8; FF8; FG8; FI8; FK8; FL8; FM8; FN; FO8; FP8; FQ8; FR8; FT4; FU8 (YJ); FY8; G; GC; GI; GM; GW; HA; HB; HC; HE1; HH; HI; HK; HP; HR; HS; HZ; I; I6; Iwojima; J; J8; J9; KA; KB6; KC4; KC6; KG6; KH6; KJ6; KL7; KM6; KP4; KP6; KS4; KS6; KV4; KW6; KZ5; LA; LI; LU; LX; LZ; MD; NY4; OA; OE; OH (OI); OK; ON; OQ; OX; OY; OZ; PA; PJ; PK1, 2, 3; PK4; PK5; PK6 (Moluccas); PK6 (Dutch New Guinea); PX; PY; PZ; Sardinia; SM; SP; ST; SU; SV; SV (Crete); SV5 (Dodecanese); TA; TF; TG; TI; UA1, 3, 4, 6; UA9, Ø; UB5; UC2; UD6; UF6; UG6; UH8; UI8; UJ8; UL7; UM8; UN1; UO5; UP; UQ; UR; VE; VO; VK; VK4 (Papua); VK9; VP1; VP2A, 2K, 2M; VP2D, 2G, 2L; VP3; VP4; VP5; VP6; VP7; VP8; VP9; VQ1; VQ2; VQ3; VQ4; VQ5; VQ6; VQ8; VQ9; VR1; VR2; VR3; VR4; VR5; VR6; VS1, 2; VS4; VS5; VS6; VS7; VS9; VU2; VU2 (Andamans); VU4; VU7; W(K); XE; XZ; YA; YI; YN; YR; YS; YT (YU); YV; ZA; ZB1; ZB2; ZC1; ZC2; ZC3; ZC4; ZC6; ZD1; ZD2; ZD3; ZD4; ZE; ZK1; ZK2; ZL; ZM; ZP; ZS; ZS3 (S.W. Africa); ZS4 (Basutoland).

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 callsign and address on each sheet.

OVERSEAS

1·7 mc

OK1AW, Alois Weirauch, Mestec Kralove 9, Czechoslovakia.

G3ACK (339), 3BBF (559), 3BRA (449), 3BTB (449), 8OK (549), RQ (559). *April* 21-25.)

14 mc

Harold Owen, B.Sc., West African Cacao Research Institute, Tafo, Gold Coast Colony.

CW : D2DT (558), EI6G (55), 8F (448), G2AHP (458), 2AJ (55), 2AJB (55), 2BPW (448), 2BTX (329) 2CCD (458), 2CIX (56), 2CLL (56), 2CNN (55), 2DLJ (45), 2DVD/A (56), 2FDF (567), 2FMC (44), 2FMM (56), 2FSG (45), 2FWV (45), 2HNC (44), 2HNO (55), 2MI (55), 2NK (45), 2NP (33), 2QO (56), 2VK (55), 2VV (558), 3AAK (54), 3AB (568), 3ABC (55), 3AFZ (34), 3AOC (56), 3AOQ (54), 3AQF (56), 3BLG (55), 3CC (548), 3IQ (56), 3OF (55), 3QV (56), 3RQ (55), 3SN (44), 3SR (44), 3UQ (43), 3VP (558), 3WF (55), 3XD (55), 4JB (368), 4KI (568), 5BJ (568), 5CI (448), 5DQ (567), 5FK (458), 5GT (568), 5HH (558), 5LI (44), 5LY (55), 50F (447), 5QG (56), 5WI (44), 5YV (558), 5ZG (568), 5ZZ (55), 6CL (44), 6GN (56), 6HU (44), 6IC (55), 6LM (43), 6UT (45), 6WI (44), 6WP (448), 6XT (56), 6ZA (56), 6ZO (568), 8GP (56), 8HT (44), 8IM (458), 8IP (55), 8JR (44), 8KP (568), 8PB (56), 8QO (34), 8QY (56), 8QZ (55), 8TK (558), 8UD (55), 8WF (568), GI5UR (55), 8GK (55), GM3AHQ (55), 5SC (558), 6MD (55), 6RI (54), 6UC (558). *April, various dates. (RS values in brackets, T9 unless otherwise stated. Receiver : O-V-1.)*

VK3CX, A. G. Brown, 8 Mangarra Road, Canterbury, E7, Victoria, Australia.

G2BQR, 2CNN, 2IM, 2JT, 2LU, 2OC, 2PL, 2QO, 2VV, 3AAK, 3AVK, 3AZ, 3CC, 3JO, 3LR, 3OF, 3TN, 3VA, 3VO, 3XD, 4GZ, 4HJ, 4JZ, 5AY, 5BJ, 5CI, 5CW, 5FF, 5LI, 5MY, 5QA, 5RV, 5SK, 5SR, 5UB/P, 5YU, 5YV, 6CL, 6GN, 6JF, 6PR, 6QB, 6RB, 6RC, 6RH, 6UG, 6UR, 6XT, 6XX, 8GP, 8KS, 8QZ, 8TK, 8UG, 8UT, GI6TK, GM3RL.

28 mc

G3LK, in Persia.

'Phone : G3FJ (59), 8SK (58/9). *April* 18.

CW : G2CRD (459), 3FP (359), 3SU (449), 5CR (459). *April* 19.

'Phone : G2AMG (58), 2FFO (35), 3YZ (47), 5LN (59), 5TP (59), 8KD (59), 8ZD (58). *April* 19.

'Phone : G2FOC, 2ZF, 3LV, 4PF, 5RL, 6AY, 6WA, 8PB (all 59). *April* 20.

CW : G2SB (569), 5DS (349), 6MN/A (589), 6XS (479), 8VR (349). *April* 20.

CW : G3CO (369), 6GN (459), GM4NK (469). *April* 21.

'Phone : G2CDI (59), 2NM (57/8), 2TP (58/9), 3YM (55/9), 4CY (58/9), GI3ZX (58). *April* 22. *(Requests for reports to G3LK, 13a Western Road, Hove, Sussex.)*

FIVE METRES

G5BM, Berriville, Arle Drive, Cheltenham, Glos.

Worked : G3AAK, 5JU, 5MQ, 6YU.

Heard : G2IQ, 4OS, 8RS.

G6YU, 14 Bourne Road, Copsewood, Coventry, Warks.

Worked : G2AK, 2ATK, 2MV, 2NH, 3ABA, 3FD, 3IS, 3WD, 5AS, 5BM, 5JU, 5LJ, 5MA, 5PY, 6CW, 6MN/A, 6VX, 6XR, 8QX, 8SM, 8WL, 8WV.

Heard : G2XC, 4DN, 5BY. *(All month ending May* 18.)

SWL, 6 Guildhill Road, Southbourne, Bournemouth, Hants.

'Phone : G2AK, 2NH, 2XC, 5 MA 6VX, 8QX. *(April* 25-*May* 11). G2BMZ, 2VH, 2XC, 3AAK, 5BY, GW4FW. *(May* 13, 2130-0100 *DST).* G2AAW, 3PW, 5MA, 6LK, GW4FW. *(May* 14-17).

CW : G2MR, 2MV, 2NH, 2VH, 2XC, 3AAK, 5BY, 5MA, 5MQ, 6VX, 6YU, 8DV, 8SM, 8TS. *(April* 25-*May* 11). G2NH, 2VH, 3AAK, 3PW, 5BY, 5MQ, 5PY, 6LK, 8LY. *(May* 13, 2130-0100 *DST).* G2NM, 5MA, 5MQ, 6VX. *(May* 14-17).

G3BJQ, 3 Pytchley Road, Rugby, Warks.

G2ATK, 2BJY, 2IQ, 2IX, 2MR, 2NH, 3AAK, 3ABA, 3APY, 3AZT, 3IS, 3WD, 4LU, 5BY, 5MA, 5MQ, 5JU, 5LJ, 6CW, 6FO, 6VX, 6XJ, 6XR, 6YU, 8JV, 8QX, 8VN, 8WL, 8WV. *(All heard April* 12-*May* 15, *converter into R.*1155.)

G2XC, 34 London Road, Widley, Portsmouth.

Worked : G2AK, 2BMZ, 2IQ, 2MC, 2MV, 2NH, 2NM, 2UJ, 2VH, 2WS, 2YL, 3AAK, 3CJ/A, 3GM, 3IS, 3OO, 3PW, 4AP, 4DN, 4IG, 5AS, 5BD, 5BY, 5CM, 5IG, 5JU, 5LQ, 5MA, 5MR, 5MQ, 5PY, 5UM, 5US, 6AG, 6CW, 6DH, 6FO, 6KB, 6LK, 6NA, 6OH, 6UH, 6VX, 6YU, 8DV, 8GX, 8JB, 8LY, 8QX, 8SM, 8TS, 8WL.

Heard : G2AAW, 2CUA, 4OS, 6VF, 8SK, GW4FW. *(All since April* 1. *Receiver : Acorn converter with Eddystone Communication Receiver.)*

G5MR, South Lawn, Admiralty Road, Felpham, Bognor Regis, Sussex.

Worked : G2NM, 2XC, 5MA, 6KB, 8DV, 8TS.

Heard : G2AK, 2MV, 2NH, 2VH, 2YL, 3AAK, 3PW, 4IG, 6VX. *(All April* 18-*May* 15.)

The Editor Wants

- ★ Photographs of amateur stations, with brief descriptive notes.
- ★ Short articles on practical problems connected with Amateur Radio.
- ★ Photographs of amateur built equipment and club meetings.

Material accepted in the categories mentioned above will be paid for at good rates. Cards and photographs can be returned if required, as the block-making process involves no damage.

The Eddystone "640" Receiver

Magazine Test Report

WE are glad to be able to discuss what is the first British-made communications receiver *designed* in the true sense to be offered to the British amateur. There have certainly been attempts in the past to make the indigenous product available, but they have failed either because of a lack of manufacturing facilities and other background resources, or because the design was the eternal compromise between an ordinary short wave receiver of no particular merit and the full communications specification.

Indeed, it was at one time thought by some British manufacturers that the addition of a BFO with pitch control and a mechanically clever slow motion drive qualified an ordinary receiver for the communications title. This has done the British product a good deal of harm.

The Eddystone 640 is a radical departure from these notions. It has been designed by engineers for good amateur band working as the prime consideration. It is therefore fitted with properly arranged electrical band spread, a crystal gate, noise limiter and stand-by switch. The valve line is right up to the best ideas in the field of circuit design.

General Specification

Inclusive all valves, the "640" is a 9-valve job with one tuned RF stage, FC, two IF stages, detector-AVC-1st audio, 2nd audio output, noise limiter, BFO and rectifier. The valves used, in that or der are EF39, 6K8, EF39, EF39, 6Q7, 6V6, EB34, EF39 and 6X5. These are all international octal based on the Mullard or Brimar versions and are therefore easily replaceable.

The EF39 in the RF stage gives high gain with low noise, and the 6K8 with its high conversion factor is a very suitable choice as FC for the HF ranges. The IF frequency is 1·6 mc, with the crystal filter in the first stage. The crystal itself is vacuum-mounted for high Q and the associated circuit has been specially designed for this receiver; with proper operation, an adjacent channel attenuation of about 45 dB can be obtained, with little loss of strength of the signal on tune.

The RF gain control functions on the RF and both IF stages, and non-delayed AVC is applied to the first IF. The series noise limiter can be switched from the front panel and has been arranged to give the minimum of signal loss when in action.

The BFO, audio and rectifier circuits follow normal practice.

On the output side, the receiver will give 3 watts of audio and is arranged for a speaker with a 2·5 ohm speech coil or HR headphones. The headphone jack mutes the speaker and attenuates the input to the telephones. The stand-by switch cuts HT to the receiver on "transmit" and can be used to operate the transmitter change-over relay, for which connections are provided on the rear panel.

Band Spreading

An ingenious arrangement of the drive motions produces band set and band spread on the same dial. Two sets of paralleled three-gang condensers—band set and band spread—are used, driving concentrically mounted scale pointers. The larger is for band setting and the inner pointer for band spreading.

The band set scales are calibrated in megacycles, with the limits of the various amateur bands marked, and the band spreader moves over a semi-circular scale divided 0-100. Some approximate band spreading figures against this scale are: 28 mc, 45/100; 14 mc, 65/100; 7 mc, 50/100; 3·5 mc, 80/100. On 1·7 mc, the band setter is used for tuning, with the 'spreader as a vernier if required.

The tuning range of the receiver is 1,700 kc to 31 mc continuous, obtained in three slightly over-lapping bands. The 28 and 14 mc amateur bands are on Range 1, the 7 mc band on Range 2, and 3·5 and 1·7 mc on Range 3.

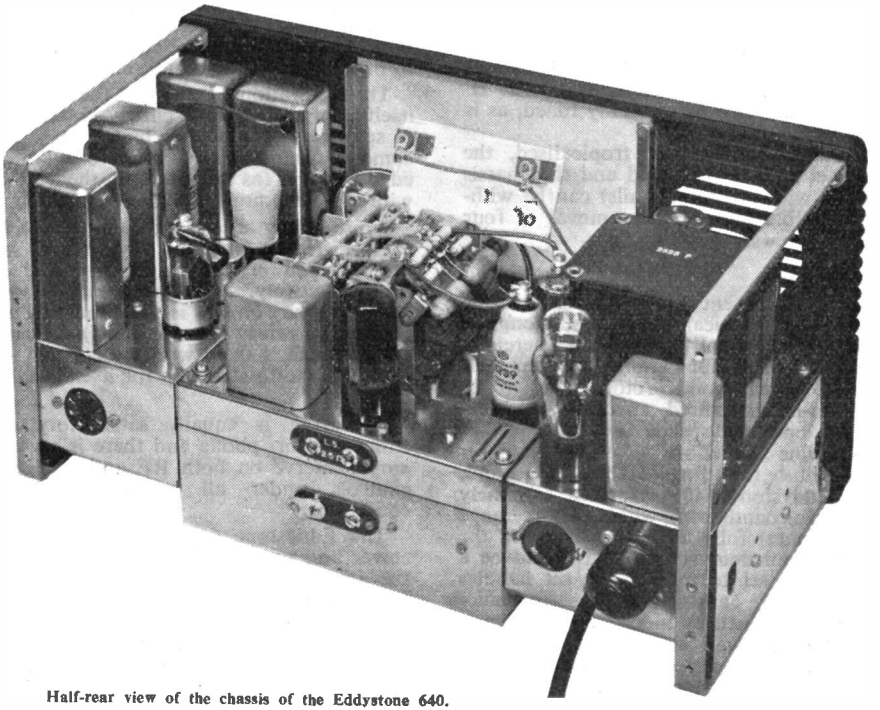
Figures

The overall sensitivity of the receiver is within 2 microvolts in for 50 milliwatts out. The crystal-out selectivity curve gives a drop of about 25 dB at 10 kc off resonance. With the crystal in, a very high degree of selectivity can be obtained with correct manipulation of the crystal phase control and everything tuned "dead on the nose" for CW reception. Image ratios vary from 45 dB down at 30 mc to about 100 dB down at 1·8 mc.

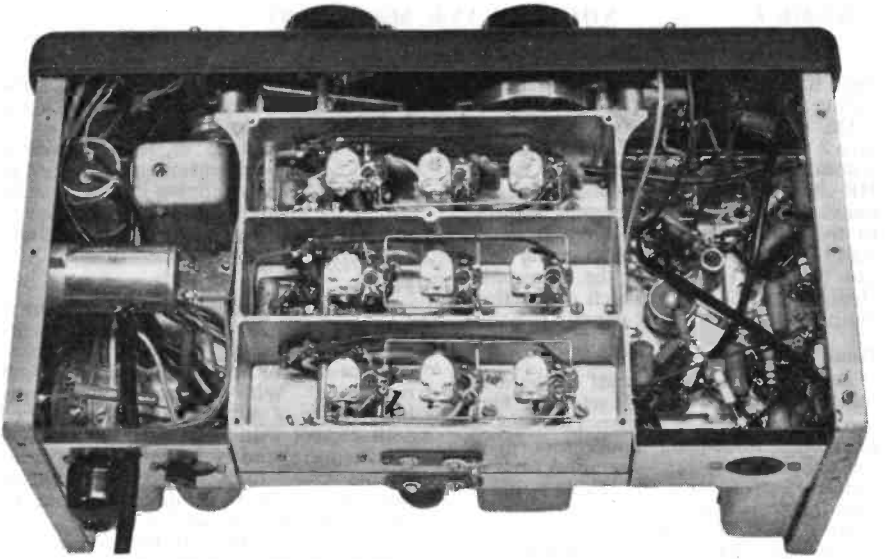
No S-meter is fitted to the receiver, but a socket is provided into which can be connected a meter scaled in the usual way and having a full-scale deflection of 200 microamps.

General Construction

The tuning unit is on a heavy aluminium



Half-rear view of the chassis of the Eddystone 640.



Under-chassis view. Note the heavy aluminium shell in which the tuned circuits are mounted.

casting, the power unit, IF and output chassis being of plated brass. The cabinet is of heavily rust-proofed steel, finished a fine ripple black.

The signal circuit inductances use dust-iron cores and are air-trimmed, while the general design and choice of parts ensures that the factory-adjusted tuned circuits maintain their trim indefinitely. The IF transformers are permeability tuned, as is the BFO coil.

All components are tropicalised, the cabinet is well ventilated and the chassis (fitted with protecting rails) can be withdrawn complete by the removal of four fixing screws.

Performance

The model sent us for test had a long run under practical conditions, alongside four other well-known commercially produced communications receivers and one extremely good prototype design for a non-manufactured amateur band receiver built for special use regardless of cost, time and effort.

Against this formidable background, the Eddystone 640 performed extremely well. In round terms, within its waverange it will meet fully all requirements in the modern amateur station and would be a decided asset to most. The set handles very nicely and all the performance figures obtained by independent measurement check well with the specification; those already quoted above can therefore be accepted as representative.

The layout of the thirteen panel controls is good and the movement of the main tuning motion excellent. The band spreader is on a flywheel which permits of rapid swinging across the band, with smooth, easy and accurate adjustment. Band spread, though not equal from band to band, is adequate on all ranges.

The calibration accuracy of the receiver itself is high, but the accuracy obtainable in setting up on the HF bands could be somewhat improved by the use of a knife-edge pointer (as opposed to the round wire indicator fitted) for the band setter.

Noise limiter action compares well with such devices as fitted on any commercial receiver and certainly suppresses peaks most effectively. The maximum obtainable selectivity on CW is excellent (well up to 20 dB down at 400 cycles off) and any signal which is there with the crystal out can be made to stand up for itself with it in.

Reception is equally satisfactory on either CW or 'phone and there is always ample reserve on both RF and AF gain controls under all normal receiving conditions.

The Eddystone 640 is a beautiful receiver and no operator who understands the amateur band requirement could fail to be impressed by it from every point of view. Because it is so good and the first British design worthy of the British amateur, we are glad to devote so much space to it.

Here and There

The Synchrodyne

Dr. D. G. Tucker's article in the May issue on his new reception technique has naturally aroused considerable interest among those with a taste for breaking new ground on our communication bands. We are glad to be able to say that, by the courtesy of the Editor of *Electronic Engineering*, we shall be publishing something practical on Synchrodyne design in the near future.

Reproducing Back-Issue Material

As the result of a great many enquiries for back numbers of the *Short Wave Magazine* and requests for extracts from particular articles in issues now out of print, we have decided to institute a new service.

Articles or circuits can be reproduced to individual order from any back issue since No. 1, March, 1937, at a minimum inclusive cost of 3s. 6d. per *Magazine* page. Though at first glance this may be considered excessive, in fact it is the lowest figure economically possible for the work involved. The requirement should be stated as precisely as possible so that the correct copy can be traced for reproduction. Write in the first instance to The Circulation Manager, The Short Wave Magazine Ltd., 49 Victoria Street, London, S.W.1, for a quotation of the actual cost. The material will be prepared and forwarded within three or four working days of the receipt of the order.

Here are some example costings for reproducing articles in post-war issues: Transmitter for Five, May/June, 1946, 28s.; The All EF50 TRF Receiver, August, 1946, 17s. 6d.; R.A.F. T.1154 Transmitter, October, 1946, 10s. 6d.; First Steps on Five, November, 1946, 17s. 6d.; Readers' Half-Guinea Ideas, any post-war issue, 7s. The basis of calculation for pre-war numbers is the same.

The Zone Map

First orders should be distributed by the time this appears and we have little doubt that those who have purchased our Zone Map will agree that in every way it meets the requirements of the DX operator. All necessary information in regard to Zone working—Zone areas with a full list of countries and prefixes, beam alignments and distances from London, with time based on GMT—is given and the size, 21 in. by 35 in., is convenient for wall mounting. The map is in two colours and on heavy paper. Price is 3s. 9d., from your usual Amateur Radio supply house, or direct from us at 49 Victoria Street, London, S.W.1.

America's *CQ*

We are informed by Dale International Publications, Ltd., 105 Bolsover St., London, W.1, that they can accept subscriptions for *CQ* (17s. 6d.) and *Audio Engineering* (20s.). The former is the post-war successor to the well-known West Coast amateur monthly *Radio*, which flourished in pre-war years. The post-war version of *Radio* is now called *Audio Engineering*, and is a specialised publication covering the AF field in all its aspects. These papers are published by Radio Magazines, Inc., of New York.

Useful Tools

Some extremely useful midget tools for the amateur workshop are offered by Runbaken Electrical Products, Manchester. Their $\frac{1}{20}$ HP grinder and polisher, only 7 in. by $5\frac{1}{4}$ in., is adaptable by means of a flexible drive for light cutting, grinding, drilling and polishing of wood, bakelites and soft metals. Then there is a bench-mounting electric drill for small work, taking drills up to $\frac{1}{8}$ in. and capable of handling $\frac{1}{4}$-in. brass or $\frac{3}{32}$-in. steel, with a maximum gap of $3\frac{1}{4}$ in. The overall dimensions are $10\frac{1}{2}$ by 4 by 6 in. and the weight 9 lb. Both these tools are powered by 200/250-volt universal AC/DC motors.

B.I.R.E. Convention

The British Institution of Radio Engineers—of which Admiral Lord Mountbatten is President—held its 1947 Convention at Bournemouth during the period May 19-23. In the absence of the Viceroy of India, the chair was taken by Air Vice-Marshal R. S. Aitken. Some abstracts from the papers read and comments on the meetings held during the Convention will appear in forthcoming issues of the *Short Wave Magazine*.

FIVE METRES

First Sporadic-E Results
Individual Reports
The Relay Contest
Future of VHF

By **A. J. DEVON**

IN spite of the encouraging weather, conditions this month have only been fairly good, though with a few inspiring patches.

One was the brief appearance of sporadic-E on the evening of May 14, when, during the period 2055-2145 DST I1DA came up calling GM2DI and GM3OL. The Italian was received by GM2TW (Polmont, Stirlingshire) at Q5 S9 on 'phone and RST599 on CW. GM3OL (Dumfries) also heard I1DA at S8 on 'phone, but evidently missed I1DA's call to him, which was logged by GM2TW. I1DA was coming in well at GM2TW over the period 2055-2215 (at gradually decreasing strength after 2145) and was heard working other unidentified Italians. GM2TW also received a station signing F8B(?), heard calling GM2DI on CW at 2125 DST. He reports that during the period when these Europeans were logged, there was a violent thunderstorm over Stirlingshire, and that signals were peaking just before each flash of lightning.

This is the first recorded appearance of European DX this year; signals GM/I and GM/F were evidently getting through both ways and it is most unfortunate that no contact was apparently achieved. A point of great interest is that on this particular evening the path must have been strictly GM-I. There is always a good deal of activity round the times mentioned and it is inconceivable that no other station would have heard and reported I1DA and the F had they been there to receive in the south of England.

So the GM's have it this time, and our congratulations go to those concerned. Good progress has been made towards the first GM/I two-way, and it must come along any time now, as the season of sporadic-E is right upon us.

There was another flutter of excitement on the evening of May 24, when during the period 1800-2100 DST the band opened wide in an amazing fashion. Harmonics of real DX commercials like WAU, WEAN and WJC were coming in at strengths up to S8, the same obtained of ten-metre G's from all over the country, and the hiss phenomenon was strongly in evidence, coming in great waves right up to 60 mc.

These manifestations, for which the peak period was 2000-2100, were reported by several stations—G6FO (Penn, Bucks.) and G6UH (Hayes, Middx.) in particular—and at 2040 DST G6FO received a strong foreign 'phone calling "CQ north five"; these words were distinct and oft-repeated but the identity of the station will for ever remain a mystery, because the callsign was given twice only in quite incomprehensible English! Frequency was 59.5 mc.

The really important point about all this is that there was evidently a good path open across the Atlantic; WJC was a strong, steady signal for at least an hour. This means that a 50/58 mc G/W Trans-Atlantic could have been affected. No American amateurs were heard on 50 mc at G6FO, but stations in and around that band were very loud, and at times drowned out by the hiss noise.

The remainder of that evening of May 24 was quite good, though not startling, for GDX. The outstanding result was the reception of GM3OL by G8JV (Nottingham), the distance being about 180 miles. G6VX (Hayes) worked G5GX (Hull, 165 miles).

While on the subject of European DX and first contacts, "Five-Metre Firsts" are reprinted in the panel here for the information of those interested. These are all established claims, fully supported by documentary proofs and were last given in our December issue.

Enterprise

It may well be that G3BTC has started his career on the air by establishing a world's record! He must surely be the first amateur to commence operations at the VHF end of the spectrum, rather than on one of the more usual communication bands. Even if he is not, readers will join us in wishing G3BTC (Welling, Kent) success and happy days on five; such initiative deserves its reward. G3BTC is using equipment based upon recent articles in the *Magazine*.

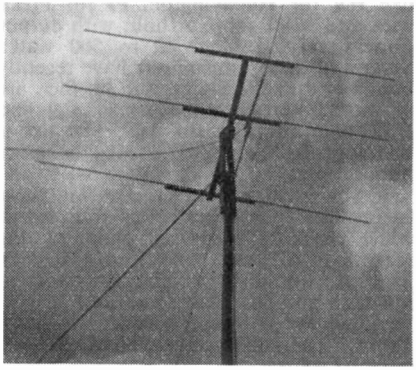
Report Summary

From the north, GM3OL with a new beam reports reception of G3TN (Oldham) G6LC (Warrington) and G3DA (Handsworth, Ches.). He is on regular schedule again with the Liverpool stations at 2230 DST most evenings. GM's worked by 3OL are GM2DI, GM5VG and GM3BDA, all first-time contacts to the south for the other operators concerned. It is very much to be hoped that in due time all these GM stations will leak through to what for 5-metre purposes is the "Far South." The GM's may be assured that they are being gunned for assiduously, with many beams turned hopefully north evening after evening.

A very useful line from GM2FZT indicates that there are now some 23 GM's active, mainly in the Edinburgh-Glasgow area and the districts round. Four stations in Glasgow have between them worked four others in Edinburgh. GM2DI has an 8-element Sterba array running NE/SW, and the GM's generally are using more CW than 'phone—which is all to the good.

In quite another direction, G2DWI (Bristol) lists G3YH, G6TO, G6VF and himself as active on 58 mc down there, with GW4FW (Cardiff), G2ZG (Weston) and G2AAW (Burnham-on-Sea) all worked. So Somerset is now well under way.

A welcome first report from G5BM (Cheltenham) who is on with old-timer G5BK and G3LP, both of the same town. G5BM is on 58720 kc, has a 3-element beam, a converter with 954 RF, and



G3BTC, Welling, Kent, built his 5-metre beam from G5LJ's design in the March issue. G3BTC can claim the distinction of having made his initial sally on the air on 58 mc ; on the day he received his licence, he worked G2MV on 5 metres for his very first QSO on any band.

G5TH WORKS SM5FS

Just as we put this issue down, news came that at 2255 DST on May 24, G5TH (St. Anne's, Lancs.) worked SM5FS on two-way 'phone, S8 both ways.

Unless prior claim is laid, this will be entered next month as the first G/SM two-way contact.

G. Elliott (Gosport) reports hearing FA8IH (Algiers) on 56·2 mc during the period 1800-1840 DST on May 26. FA8IH was RST579 at best, QSBS4; he worked G5BY, G6DH and G8RS.

On May 23, G6DH worked ON4KN, 56·3 mc, 0015-0125 DST, for a first contact.

25 watts to a PD. He has done well to have worked, among others, G5MQ, right across the heaviest country in Wales. A list appears in Calls Heard.

G2XC (Portsmouth) up to 22C, worked (or reworked) 21 counties between April 1 and May 18—it would have been the full 22 if G4OS (Chester) had not faded out after answering G2XC's CQ on May 10. He has also heard GW4FW, G2AAW and G6VF for stations in Glamorgan and Somerset yet to be hooked. G2XC has improved matters on the receiving side with a new converter using an EF54 RF stage which, after the initial taming process, is now performing much better than anything tried previously—so much so that signals that can be received on the new job are quite inaudible on the old converter. His recent results appear in Calls Heard.

G3OO (New Southgate, London) is back on 59,000 kc and working up for his century on five. He was recently with ON4IF in Antwerp, and found a well-equipped station with an enthusiastic operator. The frequency is 58·2 mc, be it noted, and a new 3-element rotary is in process of erection at ON4IF.

Incidentally, on the century theme, we should like to do a listing of operators who have worked 100 or more different stations on five, as part of the Counties Worked listings. Several stations we know are over 100-worked mark—let us have your claim, with the total, if you qualify.

G5JU (Birmingham) reports anything up to 10 stations active any night in that area. He also describes an extraordinary case of 5-metre reception by an elderly

gentleman (non-amateur and non-wireless) wearing a Multitone deaf-aid equipment. It's just wonderful where these wireless waves get to and how easily they can be detected !

G6YU (Coventry) has one more county with G5BM (Cheltenham) and he achieved 53 contacts with 22 stations over the month to May 18 ; five of these were new ones. G6XR (Keresley, Warks) took G6YU's 5-metre portable QRP rig on test with a 20-metre rhombic for aerial, getting an S7 'phone report from G6CW (Nottingham) and an SWL card from Norwich. Not bad !

Counties Worked List

Some amendments and additions have been received and appear in the panel. Please note that such amendments or claims for counties worked can only be accepted if addressed to A.J.D. in writing. Notifications received any other way are apt to be scribbled down on little bits of paper and then lost, with discomfiture and mortification all round. And we do like to keep the file tidy on this particular matter.

The Relay Contest

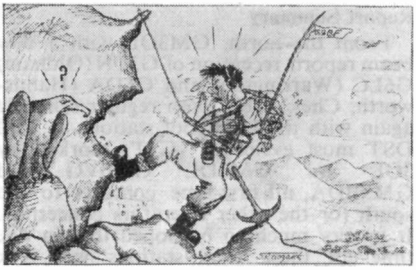
Well, here they are ! Much time and thought have been given to these rules and we very much hope that all active 5-metre operators will enter for what should be a useful, interesting and stimulating event. Though at first reading the conduct of the affair may seem a little complicated, in fact, it is simple enough once the basic procedure is grasped.

It is, however, not too much to say that this Contest will be a searching test not only of the equipment and its DX capabilities, but also of the operator behind the gear—not in the sense of time put in on an exhausting marathon, but in sheer operating ability and knowledge of the band, with all that those factors imply.

If conditions are favourable, some exceedingly worth-while GDX working should result ; the period chosen is, by previous experience, one of the best for GDX results. If conditions do not materialise, the Contest will still be good fun. The rules are being given well in advance to allow plenty of time for preparation—ruled record sheets and a map with 50-mile circles drawn round the station are obvious requirements and cannot be left till the last moment.

FIVE-METRE
COUNTIES WORKED LIST
Starting Figure, 14

Worked	Station
26	G6VX
24	G5MA
23	G2NH, G2XC
22	G2MR
20	G6YU
19	G2YL, G5BY, G6LK
18	G4IG
17	G6CW
16	G5IG, G5MQ, G6OH
15	G5BD, G6FO
14	G5PY, G8UZ



During Whitsun he had to go mobile on five.

Marker Signals

We have a full list of the RAF and MCA (Ministry of Civil Aviation) airfield beam approach (SBA) transmitters in the 33-40 mc band, which have CW call signs like HV for Hullavington, PI for Prestwick and MVT for Northolt, with output powers varying from 20 to 500 watts. Several of these transmitters have recently been heard in the States, and, in fact, are of more interest to readers of *CQ* and *QST* than they are to us. The list is therefore being passed on to them for publication.

If you have a receiver covering these frequencies it is nevertheless well worth while checking over this band, as the reception of, say, Manston MQ on 38·4 mc would be a fair indication to northern stations that conditions should be good for working north-to-south on 58 mc. The power output in this case is only 20 watts.

Prognosis

We are now frequently being asked " What do you think of the future of five

THE SHORT WAVE MAGAZINE

FIVE-METRE RELAY CONTEST

INFORMATION: In this Contest, the object will be to pass plain language messages through as many stations as possible. The form of the Contest will enable a particular message to be traced through all its links. In order to encourage message-routeing over GDX links, a heavy premium is placed upon distance. To prevent congestion and overloading of the regularly active stations the number of messages that can be passed in and out by any one station is limited. This will also emphasise the necessity for making the best use of conditions in order to clear traffic over the greatest possible distances.

The conditions of this Contest are within the terms of the current licence.

RULES

(1) The period of the Contest will be from 1800 DST on Saturday July 19 to 2359 DST on Sunday July 27.

(2) Points will be claimed for inter-British Isles working only, from the home location.

(3) Each entrant will prepare twelve messages, of not less than five words each, to be used as originated messages for transmission outward during the Contest. These messages must be strictly radio in character and each is to be given a number 1-12. A message, once cleared to a particular station, may not be used again as an originated message.

(4) The form of transmission of each message originated outwards by a particular station, X, will be *e.g.* "X 4 reducing power to ten watts." X is the originator's callsign and 4 the serial number of the message.

(5) The receiving station, Y, will log this message as "X 4 reducing power to ten watts Y."

(6) The receiving station Y, having thus added his own callsign, is then to alter one word *e.g.* "X 4 reducing input to ten watts Y." He may now re-transmit the message in this altered form to any other station.

(7) The next station to receive the message will, similarly, add his or her own callsign, alter one word, and pass the message on complete to the next contact. It is of no consequence if the sense of the original message is lost by the change of word.

(8) No one station may re-transmit more than twelve such messages, which will be additional to the 12 originated for himself or herself.

(9) No message may be passed back to a station which has already handled it until it has been through at least two other stations, as indicated by the callsigns suffixed to the message.

(10) After a particular station has originated and re-transmitted the full allowance of 24 messages, any further traffic obtained will count for points inwards only.

(11) Each message sent or received will score as follows :

(i) (*a*) Distances up to 50 miles, 1 point.
(*b*) For distances between 50-100 miles, 3 points.
(*c*) Between 100-150 miles, 6 points.
(*d*) Between 150-200 miles, 12 points.
(*e*) Between 200-250 miles, 18 points.
(*f*) Between 250-300 miles, 24 points.
(*g*) For distances over 300 miles, 24 points *plus* 5 points for every 10 miles of distance in excess of 300.

(ii) These scores will be multiplied by 2 for CW contacts and by 3 for telephony working.

(iii) If the station transmitting the message is on CW, both stations take points for a CW contact.

(iv) One station on 'phone transmitting the message entitles both ends of the contact to telephony points.

(v) CW check repeats by the sending station on messages being passed by 'phone are not permitted ; if used, the contact counts for CW points only.

(vi) 'Phone checks by the sending station on messages being passed by CW may be given, but do not count as points scored for 'phone working.

(12) As a convenience to other operators, stations participating should make use of the procedure signals "CQ MP" (I have a message to pass) and "CQ MR" (I am in a position to receive messages only) when calling.

(13) The record of work in the Contest will resolve itself into three forms : A, messages originated and cleared ; B, messages received and cleared ; C, messages received but not re-transmitted. Three separate sheets should therefore be maintained, set out as follows :

(A) Messages originated and cleared, with serial number, whether on 'phone or CW, and station to which sent, with points claimed for each such contact.

(B) Messages in full as received and cleared, with callsigns of link stations, whether on CW or 'phone inwards and outwards as applicable, and points claimed inwards and outwards for each such message.

(C) Messages in full with callsigns in the link, with points claimed for inwards contact, and whether on CW or 'phone.

(14) The passing of all messages must be timed and dated. RST is not required. Totals should be shown under these separate heads A, B, and C, the final score being the sum of the three totals.

(15) Logs, with callsign and address on each sheet, should reach A. J. Devon, c/o *The Short Wave Magazine*, 49 Victoria Street, London, S.W.1. by August 11. A preliminary report on the Contest will appear in the September issue and a full account in October.

metres ? " It seems a good time to try and answer this one.

Broadly speaking, 58 mc has no future. Since the essentials of the situation have been clear for some time and nothing can be done now to change them, no harm can result from a discussion of the whole matter here.

That our 5-metre band was in jeopardy became evident as long ago as November of last year. At that time, it was mistakenly assumed that amateur allocations above 30 mc were not in question. Then along came the demands for television and the radio navigation systems. By the beginning of the year it was fairly clear that a British amateur band in the 30-100 mc region was going to be difficult. By the time of the Paris meeting at the end of February, any hope of a British amateur 5-metre allocation was virtually extinguished.

Note that we say " British." Briefly, the difficulty is due to (*a*) the pressure of the radio navigation systems, (*b*) the requirements for television, demanding wide bands of frequencies, and (*c*) the fact that our Services have no particular interest in amateur frequencies in this region. These are all factors which are peculiarly British.

Such considerations do not necessarily apply to other countries. Therefore, an international allocation for amateurs in the 50 or 60 mc region is not unlikely. But even if this does materialise, the probability is that there would be a purely domestic *British* reservation which would, in any case, eliminate G activity in this region. We might, in fact, see ourselves as the only amateurs in the world not licensed for five metres !

Our own guess is, then, that arising from Atlantic City, British amateur operation between 30 and 100 mc will have to cease about June of next year, or perhaps a bit later ; but that most other countries that matter (the British alone abstaining) will accept an amateur allocation in this band ; and that for long after we have been closed down on 58 mc there will be no noticeable occupancy of vast areas in the 30-100 mc range due to the delays and difficulties which will inevitably arise with television development (in spite of the confident predictions to the contrary).

The foregoing is only an opinion ; it may not happen that way. We might get 250 kc or so in a useful part of the range. But the facts are as stated and all the signs are there that we shall lose the band.

However, this rather gloomy picture is relieved by the prospect of the proposed new allocation of 168-170 mc. In this country, and over the distances we are now getting accustomed to on 58 mc, it may be assumed that 168 mc will give very similar results. In particular, the effect of ducting—brought about by temperature inversion and intensively investigated during the war years—is much more marked on this frequency than at 60 mc. This means that the right conditions for what we call GDX on 5 metres should produce very similar, or perhaps even better, results on 1·8 metres. Moreover, aerial systems will be much more compact and far easier to install. The difficulty, as on 58 mc, will be the receiver. But even here the established techniques will work all right with valves like the EF54 for reception and the QVO4-20 for transmission. And the whole business will be much more fun !

In the meantime, we should make the best use we can of our old 58 mc band. Records established now and the results

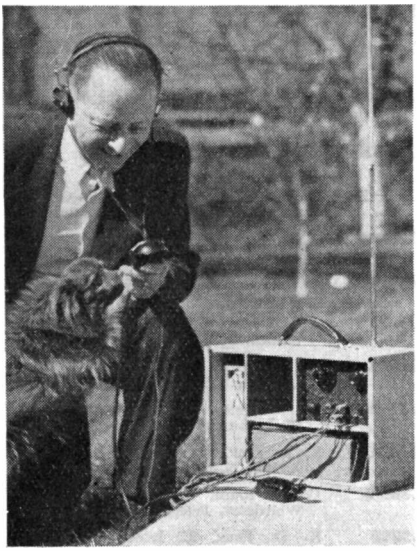
FIVE-METRE FIRSTS

France :	G2FA/F8NW, March 29, 1936.
Italy :	G5MQ/I1IRA, July 2, 1938.
Holland :	G2AO/PAØPN, August 17, 1939.
North Africa :	G5BY/FA8B, June 24, 1946.
Switzerland :	G5BY/HB9CD, August 22, 1946.

obtained in the next few months, enshrined in these pages, will remain to the credit of Amateur Radio and the operators who make them. Let us therefore get as much as we can out of " five " while the going is good, looking forward the while to new interests on 168 mc.

Ends

G3BJQ (Rugby) is like us all in wanting more activity before 2200 DST ; in the Home Counties area television is one deterrent. . . . P. J. Towgood (Southbourne, Bournemouth) using a 1-V-1 from a recent 58 mc receiver design in our *Short Wave Listener*, is getting good results with a rotary dipole, having heard DX like G5MQ, on CW several times, and G5BY and G2BMZ at S9 'phone. Other good signals in Bournemouth have been G2AK, G3PW, G6LK, G6VX and GW4FW. . . . G8QX (Malvern) now has 29 stations worked in 12 counties . . . .



OK1AWX testing his 5-metre portable rig. Unidentifiable G'phones were heard in Czechoslovakia on April 20.

G5MR endorses our suggestion that when conditions are good all 'phones should sign over on CW. . . . A. H. Bower (Hull) has a converter with 2 RF stages and a g.g.t. out in front, working into a home-built superhet, with a rotary dipole ; this Rx is not functioning too well yet, and so far only locals and semi-locals have been heard . . . . OK1AW says that April 20 was a good day in Czechoslovakia ; G's, HB's and I's were heard on 'phone but not indentified ! The OK's are busy on 112, 224 and 448 mc and are getting two-ways up to 30 miles on 224 mc. . . . From WØZJB's column for June *CQ* we get it that the W's had several aurora and some sporadic-E openings during April, good ranges being obtained. WØDDX/WØYUQ are making contact over 125 miles of hilly country on 144 mc several times a week (what did we say earlier ?), and W3QKI found that 50-mile stations were local, 100 miles average and 150-mile distances rather exceptional on this band *during the winter months ;* the expectation is that summer bending will improve these distances considerably.

Closing Date—July

This must be June 17 *latest* as we have to go to press a little earlier for the July issue. Please write A. J. Devon, c/o *The Short Wave Magazine*, 49 Victoria Street, London, S.W.1.

SUBSCRIPTIONS AND RENEWALS

Direct subscriptions, at 20s. for 12 issues of the *Short Wave Magazine* starting with July, can still be accepted if addressed to the Circulation Manager, The Short Wave Magazine, Ltd., 79 Victoria Street, London, S.W.1.

If your subscription is due for renewal, the notice was in the envelope bringing you your last copy. It is only necessary to return the completed form with your remittance.

AERIAL DESIGN

The "8-Element Square-Loop Antenna" built by the Federal Corporation of America for VHF transmission is claimed to give a power gain of 8 times with a circular field pattern. The elements are mounted on an 80-ft. self-supporting tower, which is in turn perched on the top of the highest skyscraper in Minneapolis.

QSL BUREAU

Cards are held for the G's listed below, whose full addresses are unknown to us. If you are in the list, please send a stamped addressed envelope of a suitable size, with your name and callsign, to BCM/QSL, London, W.C.1. The cards will be forwarded on the next clearance.

G2AFM, 2AJS, 2ALH, 2AOW, 2ATY, 2AXA, 2ATN, 2AXQ, 2AYZ, 2BIU, 2BRH, 2BUV, 2BTU, 2CNK, 2CNM, 2DHM, 2DTD, 2DUV, 2DWN, 2GBZ, 2HCO, 2HIL, 2HKW, 2HN, 2RJ, 2RN, 2TZ, 3AAR, 3ABN, 3ABS, 3ACY, 3ACZ, 3ADE, 3ADP, 3AEF, 3AGF, 2AHH, 3AIL, 3AIX, 3AKW, 3ALK, 3ALY, 3AMH, 3AMO, 3AMW, 3APP, 3APZ, 3AQF, 3ARD, 3ASX, 3ATZ, 3AUP, 3AUR, 3AUU, 3AWA, 3AWC, 3AYK, 3AZP, 3AZY, 3BMC, 3BDJ, 3BGN, 3BHS, 3BHW, 3BIE, 3BIN, 3BIP, 3BLG, 3BNH, 3BNP, 3BOP, 3BPN, 3BRT, 3CJ, 3CLD, 3GG, 3JV, 3LM, 3OY, 3QW, 3TP, 3XD, 3YV, 4DP, 4FC, 4FG, 4BS, 5BT, 5HS, 5JL, 5MN, 5NB, 5QK, 5WL, 6DV, 6FJ, 6GA, 6TC, 6TR, 8DG, 8FC, 8LX, 8OQ, 8SS, G12FHN, GM3AJZ, 3BCI, 3BHO, 4AA, GW3ALV, 3BHA, 3ZV.

NEW QTH's

Only those which have changed since the appearance of the September, 1939, issue of the Call Book or were not included in it for fully licensed operation, or are now licensed for the first time, can be published here. All that do appear in this column will automatically be included in the next Call Book, now in preparation. The number of QTH's we can print each month depends upon space available. QTH's are inserted as they are received, up to the limit of the space allowance. Please **write clearly** *and address to QTH Section.*

G3AIX A. F. Parsons, 413 Chester Road, Sutton Coldfield, Warks.

G3AIZ C. C. Olley, 56 Hampton Road, Forest Gate, London, E.7.

G3AOO D. J. Birch, 93 Prince Edward Avenue, Denton, Nr. Manchester.

G3APZ F. Worker, 63 Manor Road, Friar Park, Wednesbury, Staffs.

G3ARE F. W. Chubb, 54 Molesworth Road, Plympton, Plymouth, Devon.

G3AUB N. R. Paul, 4 Southcliffe Road, Reddish, Stockport, Cheshire.

G3AVM R. F. Pashley, 209 Hemsworth Road, Norton, Sheffield.

G3AWN D. A. Lafbery, 44 Lyncroft Avenue, Pinner, Middx.

GI3AXD J. Burnley, 37 Cherryvalley Gardens, Knock, Belfast, N.I.

G3BBT J. F. Hagon, 21 Marmion Road, West Hartlepool, Durham.

G3BCS R. G. Cousens, 38 Collins Road, Wednesbury, Staffs.

G3BDX H. L. Booth, 7 Hampstead Square, Grindon, Sunderland, Co. Durham.

GM3BFD W. L. P. Shepherd, Inverfiddich, Castle Street, Thurso, Caithness.

G3BFF / **G3BHJ** O. J. Russell, B.Sc., A.Inst.P., 15 Reepham Road, Norwich, Norfolk.

G3BGD F. Ward, 228 Lynn Croft, Eastwood, Notts.

G3BGG C. O. Titley, 111 Rugby Road, Binley, Coventry, Warks.

G3BHZ A. Hickling, 179 Barnsley Road, Wombwell, Nr. Barnsley, Yorks.

GM3BHO J. R. Orr, 2 William Street, Helensburgh, Dumbartonshire.

G3BIW J. B. Bedford, Alford, Lincs.

G3BJK A. E. Poynter, 145 Uxendon Hill, Wembley, Middx.

G3BJQ W. H. Tanser, 3 Pytchley Road, Southfields, Rugby.

G3BJV K. M. Dunscombe, 9 Springhill Road, Saffron Walden, Essex.

G3BKE R. G. Jack, 40 Angers Hill Road, Blackpool, Lancs.

G3BKT J. P. Barnes, 18 Grange Road, Ramsgate, Kent.

G3BLV F. Rose, 16 North Bridge Street, Sunderland, Co. Durham.

G3BLZ T. Turvey, 40 Union Street, Wednesbury, Staffs.

G3BMM J. W. Lymer, 25 Wyggeston Street, Burton-on-Trent, Staffs.

G3BNO H. Hipple, 4 Portelet Road, Stoneycroft, Liverpool 13.

G3BNO/A H. Hipple, c/o 20 Craigside Avenue, West Derby, Liverpool 12.

GW3BOA D. G. Sullivan, 7 Curre Street, Cwm, Ebbw Vale, Mon.

G3BOI A. W. Post, 1 Raleigh Avenue, Hayes, Middx.

G3BOT A. B. Reeder, c/o Solar Physics Observatory, Madingley Road, Cambridge.

G3BOV E. P. Mansfield, 80 Lossingham Avenue, London, S.W.17.

G3BPB E. Pestell, 115 Heathfield Road, Grantham, Lincs.

G3BPV T. N. Carter, 43 Oxford Street, Burnham-on-Sea, Som.

G3BPX 28 Henslowe Road, East Dulwich, London, S.E.22.

G3BQR C. A. Lennox, Concord, Cedar Avenue, Christchurch, Hants.

G3BRQ K. B. Tackley (*SVØAC*), 15 Hillcourt Avenue, North Finchley, London, N.12.

G3BRY G. W. Blunt, 16 Coronation Avenue, Whittlesey, Peterborough, Northants.

G3BSF K. D. Faux, 22 Rosemont Avenue, Finchley, London, N.12. (*Tel. : Hillside* 5162.)

G3BTC W. E. Green, 20 Roseacre Road, Welling, Kent. (*Tel. : Bexleyheath* 3918.)

G3BVG N. Caws, 53 Corfton Road, Ealing, London, W.5. (*Tel. : Perivale* 6301.)

G3CAT A. F. Ward (*ex-VU2AT*), 6 Moss Close, Pinner, Middx.

G3CCW C. C. Wilson, 18 Heathbank Avenue, Irby, Wirral, Cheshire.

G3CFN H. A. Edwards (*ex-XAFN*), 20 Atkins Road, Clapham Park, London, S.W.12.

G3CRO G. J. Fermor, 13 Hamilton Crescent, Palmers Green, London, N.13.

G3HR H. Ridge, Balmoral, Chapel Lane, New Longton, Preston, Lancs.

G4DU A. E. Hyde, 64 Park Road, Ilkeston, Notts. (*Tel. : Ilkeston* 662.)

G4IX G. M. Barber, 8 Salterns Way, Lilliput, Parkstone, Dorset. (*Tel. : Canford Cliffs* 878.)

G5GX H. M. Rix, 39 Corby Park, North Ferriby, Hull, Yorks.

G5HQ E. A. Pollard, 143 Ramsgreave Drive, Blackburn, Lancs.

G5XT 4 Cranford Gardens, Acklam, Middlesbrough, Yorks.

G5ZZ N. T. Warren, M.B.E., Silkstead Cottage, Shawford, Winchester, Hants. (*Tel. : Twyford* 3173).

G6FV C. Kirby, 5 Station Road, Teynham, Sittingbourne, Kent.

G6YJ F. R. Canning, A.M.I.E.E., Maristow, Windmill Drive, Burgess Hill, Sussex.

G8AI D. G. Ross, 41 Mildred Avenue, Hayes, Middx.

G8GO S. Stanley, 15 Pelham Street, Sutton-in-Ashfield, Notts.

G8QR R. Brake, 67 Trafford Road, Norwich, Norfolk.

The other man's station

G4OY

Some of the photographs recently appearing under this heading have been of large stations with an abundance of apparatus. G4OY, G. Beaumont, 43 Upper Albert Road, Sheffield, cannot claim to be one of these—but he is very proud of his new shack, which is a converted Anderson shelter ! Receiving his AA call (2CXV) in 1937, and full call in 1939, the outbreak of war did not damp his enthusiasm for radio ; for 6½ years he used his knowledge to good effect in the R.A.F.

The post-war transmitter, which feeds a dipole aerial on 20 metres, consists of a 6L6 tritet driving two 807's in push-pull, with 750 volts on the anodes ; modulation is by two 6L6's, also in push-pull. The whole transmitter is self-contained, with the modulator and power pack on the lower rack. For reception an R.1155 is used. G4OY has also a separate single-valve transmitter and O-V-2 receiver (not shown here) for work on the 1·7 mc band. The transmitter pictured is mainly operated on 14 mc, with occasional excursions to 7 and 28 mc.

The station is certainly compact, and very comfortable in this fine summer weather, but G4OY does not quite know what will happen if next winter is as cold as the last one !

THE MONTH WITH THE CLUBS.

FROM REPORTS

A falling off in the number of Club reports seems to have coincided with the first signs of summer weather ! There may be no connection, but if there is it is quite understandable. A certain number of clubs are arranging field day events, but it is enevitable that activity will lessen during the next few months.

It is encouraging to note that new clubs are still forming ; our complete register has nearly reached the 90 mark now, although that includes a few that have not been heard of for some months.

Reports for next issue are wanted by first post on June 12, please, addressed to the Club Secretary, *The Short Wave Magazine*, 49 Victoria Street, London, S.W.1.

Torbay Amateur Radio Society.—This club is a newcomer to our columns, and very welcome. Its President and Vice-President are G5SY and G5QA, and the list of officers includes seven transmitting members. The Acting Hon. Sec.'s address is given in the panel. Meetings are held on the third Saturday of the month, 7 p.m., at the YMCA, Torquay. Morse classes are arranged for beginners.

Midland Amateur Radio Society.—MARS members were recently given an interesting lecture on FM by G5BJ. The practical aspects of a transmitter and receiver were fully dealt with, and 65 members and friends were then able to hear for themselves exactly what FM could do. Meetings are held at the Imperial Hotel, Birmingham.

Wanstead & Woodford Radio Society.—Various novelties, including a "Club Sked," have been arranged. The latter is held on Mondays at 8.30 p.m. on the top band, and from six to eight transmitting members take part, with the SWL's standing by. This is also a help to the latter with their Morse practice. A headquarters library has now been started, Morse classes are held on Tuesdays, and the Chairman runs technical classes in alternate weeks.

Clacton Radio Club.—Welcome to another newcomer, recently formed and holding fortnightly meetings. The club transmitter, G3CRC has already been on the air ; slow Morse classes are held, and G6DH is giving a series of lectures on the Fundamentals of Radio. The headquarters address is 26 Victoria Road, Clacton-on-Sea ; Secretary's QTH in panel.

Kynoch Radio & Television Society.—This club has been formed for the employees of I.C.I. (Metals), Ltd., Kynoch Works, Witton, Birmingham. Its activities will cover interests in quality reproduction, recording, short wave reception and transmission and various applications of electronics. It is hoped that a club station and laboratory will be in action in the near future. A good programme of lectures, visits and demonstrations has already been arranged.

Brighton & Hove Group.—Fortnightly meetings are held at the Golden Cross Hotel, Western Road, Brighton, at 7.30 p.m., the next being on June 16 and 30, when the subjects will be "Test Equipment" and "The Radio Amateurs' Examination." On June 7-8, a field day event is being organised on Ditchling Beacon with two stations.

North West Kent Amateur Radio Society.—"Methods of sending the Morse Code" were discussed at the May meeting ; on June 27 there will be a junk sale, and in July G2WI will tell "Some Stories of a Signals Officer in Canada." Meetings are held at Aylesbury Road School, Bromley, at 8 p.m.

Thanet Amateur Radio Society.—A dozen enthusiasts have got together and formed this new club. Activities so far have been confined to finding their feet, raising funds and accommodation and so on, but there are already five licensed amateurs among the members, and the rest are potential holders of call signs. We wish the "Thanet Gang" every success and hope to hear that the club is fully established very soon.

Reading & District Amateur Radio Society.—They have been running a very successful exhibit at the Town Hall, consisting of a complete amateur station working under the call G5XB/A and using G5XB's own equipment. This exhibition has brought Amateur Radio before the public eye and has already resulted in an increased membership. A photograph of the opening of the exhibition is reproduced in these pages. Meetings take place at the Palmer Hall, West Street, on the second Wednesday and last Saturday of each month.

Yeovil Amateur Radio Club.—A permanent headquarters has now been secured in the Technical School, Kingston, Yeovil, and it is proposed to build a club station and apply for a club licence. Morse classes are held at each meeting (Wednesdays at 7.30 p.m.) and new members will be made welcome.

West Middlesex Amateur Radio Club.—They are very active, and meet on alternate Wednesdays (2nd and 4th) at the Labour Hall Rooms, Uxbridge Road, Southall. The future programme includes demonstrations, D/F, 5-metre field days and so on. Attendance varies between 20 and 30, and it is hoped to apply for a licence shortly.

The Mayoress, with Mr. I. Mikardo, M.P. for Reading, and Mr. H. D. Hughes, M.P., PPS to the Minister of Education, look over G5XB/A, the Reading Society's enterprising effort at the recent Exhibition.

RAE & Farnborough District Radio Society.—Membership now stands at 40, and meetings are held on alternate Mondays at the RAE Assembly Hall. June meetings are on the 9th and 23rd at 7 p.m. Several interesting talks have been given, on subjects ranging from Marine Operating to Television, and a successful junk sale has also been held.

Ellesmere Port & District Amateur Radio Club.—This club, a newcomer to our pages, meets every Wednesday in the local Labour Hall. Morse classes and lectures are arranged, and new members will be welcomed—secretary's QTH in panel.

Thames Valley Amateur Radio Transmitters' Society.—At the very successful May meeting, G8SM gave an interesting talk and demonstration on "Five Metres." SP1HH will be lecturing at the June meeting, which, unfortunately, is on June 4, the day of publication, so that advance notice is not possible.

Grafton Radio Society.—GW3ALE, whose efforts have played a great part in the successful growth of Grafton, is demobbed and returning to his home in Wales. He takes with him the good wishes of every member. The Edgware Club were recently welcomed on a visit to Grafton, and it is hoped to arrange a future meeting of several Clubs on the same evening. Meetings continue to be held on three days each week, and several successful junk sales have been put on recently. New members welcomed at North London's "Mecca of Amateur Radio."

Birmingham & District Short Wave Society.—Meetings are now held on the first Monday of the month at the Hope and Anchor Hotel, Edmund Street, at 7.45 p.m. The annual subscription has been abolished and members now pay 9d. per meeting. Following a recent lecture on valve oscillator circuits, talks on FD's and PA's have been planned. Note the change of secretary—see panel of addresses.

Stourbridge & District Radio Society.—The General Meeting was held in May, and a large gathering heard a lecture on Radio Aids to Navigation, by F/L G. W. Adam. Future meetings will include talks on VFO's and Transformer Design. Two portables will be operated for the field day event. Meetings take place at King Edward's Grammar School, Stourbridge, on the first Tuesday of the month.

Kingston & District Amateur Radio Society.—Past gatherings have been very well attended, and the club still flourishes, but no further meetings will be held at the Three Fishes Hotel. No new venue has yet been found, but members will be notified individually about the next meeting.

Dublin Radio Club.—This club has been reorganised, and now meets in the Foresters Hall (Room 6), 41 Parnell Square, Dublin, on Wednesdays and Fridays at 8 p.m. Morse classes are in full swing, and

many members have constructed their own receivers. A technical library has been opened, and more books will be welcomed by the librarian, Mr. C. O'Mara. The secretary's QTH is in the panel.

Liverpool & District Short Wave Club.—Talks, auction sales, and meetings over the air have been held, and the club's own transmitter, G3AHD, is operating in 1·7 and 3·5 mc. A film was recently shown of the construction of radio parts for the RAF during the war. Meetings are on the first and fourth Tuesdays; the club is also anxious to co-operate with other clubs operating on 3·5 mc and to hold joint meetings over the air.

Wirral Amateur Radio Society.—This club now boasts over 60 members and meets twice monthly at the YMCA, Whetstone Lane, Birkenhead. The June meetings are on the 11th and 25th at 7.30 p.m. G2AMV and G6VS lead a local "net" at 8 p.m. every Friday on 1·7 mc; some members join in and many others listen. This is an aspect of Club work that might be adopted more widely—good work, Wirral!

Harrogate & District Short Wave Radio Society.—We are glad to hear of yet another newcomer, with a membership of 20 and a full summer programme planned. They meet on June 11 and June 25 in the YMCA, Victoria Avenue, at 7.30 p.m.; and the subjects will be "LF Amplification" by G5LB, and "Interference—Causes, Effects and Cures" by G8UY. Future plans include discussions, demonstrations, visits, field days, Morse classes and lectures on the syllabus of the Radio Amateur's Examination.

Bradford Amateur Radio Society.—The proposed exhibition of amateur gear has had to be postponed owing to the Civil Centenary Celebrations, but will take place later in the year. A lecture was recently given by Mr. E. M. Price, M.Sc., one of the society's Vice-Presidents, on Modern Precision Methods of Frequency Measurement.

Slade Radio.—On May 18, they held a not-so-usual event as part of the evening's proceedings. G2AK and G5LJ, both well-known 5-metre operators, provided a link between the Club headquarters and G5LJ in Sutton Coldfield. Later, G2ATK/P travelled over to G5LJ by road, maintaining contact with G2AK and G5LJ the while, with solid three-way working all round. The whole affair lasted from 8.10 to 9.50 p.m. and proved an unqualified success.

North East Amateur Transmitting Society.—This club is now one year old, and a recent Hamfest celebrated the fact; membership is over 50 and still increasing. Members lately visited the Cosmos factory in Sunderland and were taken on a conducted tour.

Hi-Q Club, Giffnock.—GM3ANV is on 7 mc, and GM3AR concentrating on 3·5 mc, will welcome all reports in an attempt to check his radiation pattern. GM2KP and GM2AKK are breaking new ground on the highest frequency band now allotted, and have succeeded in generating RF on it—but no reception yet. The Club is discussing the suppression of harmonics as the current theme of interest, and would like to hear from anyone with views on the matter; the accepted methods have not proved satisfactory in practice.

Following are the names and addresses of the secretaries of the clubs mentioned this month. They will be pleased to give every assistance to prospective members.

BIRMINGHAM (Short Wave Society): N. Shirley, 14 Manor Road, Birmingham 9.
BIRMINGHAM (Kynoch): J. G. Harrison, Kynoch Works, Witton, Birmingham 6.
BRADFORD (Amateur Radio Society): J. H. Macdonald, G4GJ, Mayfield, Wagon Lane, Bingley, Yorks. (*Tel.: Bingley* 965.)
CLACTON (G3CRC): A. P. Kerford-Byrnes, G6AB, Haywire, 44 Preston Road, Holland-on-Sea, Essex.
DUBLIN. W. C. Rothwell, 8 New Ireland Road, Rialto, Dublin.
ELLESMERE PORT. J. Macdonough, 24 Brooklyn Drive, Whitby, Wirral, Ches.
FARNBOROUGH. P. R. Burkett, G4PS, Park View, Priory Street, Farnborough, Hants.
GIFFNOCK. (Hi-Q Club): J. D. Gillies, GM2FZT, 3 Berridale Avenue, Glasgow, S.4. (*Tel.: Merrylee* 4060.)
GRAFTON (G3AFT). W. H. C. Jennings, G2AHB, Grafton LCC School, Eburne Road, London, N.7.
HARROGATE. K. B. Moore, Spinney Cottage, 2a Wayside Crescent, Harrogate.
KINGSTON. A. W. Knight, G2LP, 132 Elgar Avenue, Tolworth, Surrey.
LIVERPOOL. T. W. Carney, G4QC, 9 Gladeville Road, Aigburth, Liverpool 17.
MIDLAND. W. J. Vincent, G4OI, 342 Warwick Road, Solihull, Birmingham. (*Tel.: Solihull* 0413.)
NORTH-EAST. J. W. Hogarth, G3ACK, 4 Fenwick Drive, Blyth, Northumberland.
NORTH-WEST KENT. L. Gregory, G2AVI, 18 Upper Park Road, Bromley, Kent. (*Tel.: Ravensbourne* 2071.)
READING. L. A. Hensford, B.E.M., G2BHS, 30 Boston Avenue, Reading, Berks. (*Tel.: Reading* 60744.)
SLADE. L. A. Griffiths, 34 Florence Road, Sutton Coldfield, Wars.
STOURBRIDGE. D. Rock, Flat 1, Block 1, Worcester Road, Summerfield, Nr. Kidderminster.
THAMES VALLEY. D. R. Spearing, G3JG, Thurston, Orchard Way, Esher, Surrey. (*Tel.: Esher* 3369.)
TORBAY. F. J. Wadman, G2GK, 106 Warbro Road, Torquay, Devon.
WANSTEAD (G3BRX). R. J. C. Broadbent, G3AAJ, 24 St. Margarets Road, Wanstead Park, London, E.12.
WEST MIDDLESEX. H. C. Bostock, G3BNC, 1 Grange Road, Hayes, Middx.
WIRRAL. B. O'Brien, G2AMV, 26 Coombe Road, Irby, Heswall, Ches.
YEOVIL. D. Hover, 16 Richmond Road, Yeovil, Som.

CLASSIFIED SMALL ADVERTISEMENTS

READERS' ADVERTISEMENTS

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FORSALE,latest Marconi communications receiver. Eleven valves, covers 60 kc to 32 mc. Two RF stages BFO, variable selectivity with crystal filter, speaker and phones. £65 or near offer.—110 Foresters Drive, Wallington, Surrey.

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