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VOL. XVII NOVEMBER, 1959 NUMBER 9

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Managing Editor: AUSTIN FORSYTH, O.B.E. (G6FO)

Advertisement Manager: P. H. FALKNER

Published on the first Friday of each month at 55 Victoria Street, London, S.W.1. *Telephone: Abbey 5341/2*

Annual Subscription: Home and Overseas 33s. ($5·00 U.S.) post paid

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The SHORT WAVE Magazine

EDITORIAL

Exhibition *Had there not been the war, the very first Amateur Radio exhibition in Britain would have been held in London in the November of 1939, under the aegis of* SHORT WAVE MAGAZINE. *We had the arrangements in hand when the outbreak of war — in which all the then members of the* MAGAZINE *staff were immediately involved — put an effective end to the project.*

From the first Amateur Radio exhibition post-war, in 1947 — sponsored by the Radio Society of Great Britain — the show had a somewhat chequered history up to 1955, when it faded out altogether, there being no Amateur Radio exhibition in London in 1956.

However, the need for such an annual event, held in the metropolis, had been clearly and forcefully demonstrated. So for 1957 the undertaking was put into professional hands, and a move made to more suitable accommodation. As a result, the 1957 Amateur Radio exhibition was a great improvement on its predecessors — from the point of view both of visitors and exhibitors — with a higher attendance figure than ever before. Last year's was even better, with another big increase in the attendance.

So we can look forward to November 24-28 next as marking a new milestone in Amateur Radio progress in this country. There is now a small but flourishing section of the great radionics industry which caters directly for the particular needs of radio amateurs, whose numbers are growing steadily not only in the U.K. but throughout the world. In their own way, the firms whose products will be on show at this year's Exhibition have made an important contribution to this progress. They are offering specialist equipment for a specialised market — and, as we know, that is a very exacting requirement to meet.

Having also over the years made our own contribution to the growth and progress of Amateur Radio — and appeared at every Amateur Radio exhibition since the beginning —we are confident that the Exhibition to be held this month, the 12th in the series, will outshine all its predecessors in importance, interest and attendance.

Hamilton Fosbil G6FO.

All-Band CW/Phone Transmitter

CONTROL CIRCUITRY AND POWER SUPPLY

Part II

C. L. WRIGHT, B.A., B.Sc. (G3CCA)

The first part of this article appeared in our October issue, which should be referred to for continuity.—Editor.

It has been stated several times, in the technical press, that audio frequencies above 4 kc only tend to increase the band-width of the RF channel and do not contribute to the intelligibility of the received signal. Also that the retention of the lower frequencies, apart from consuming considerable power, add nothing to the readability of the signal[4]. Several methods have, therefore, been evolved for the elimination of these unwanted frequencies, the most popular circuit being the diode limiter, or "clipper" device. This limits, or "flattens off," a portion of the audio waveform to some arbitrary level, irrespective of the amplitude of the input signal, and produces square waves. Making a Fourier analysis of the resultant waveform, it will be seen that harmonics extend into the high frequency spectrum of the audio range. To prevent these harmonics from appearing in the modulated signal, a filter is necessary to eliminate them. The main disadvantage of this method is that careful alignment of the clipper-filter circuit is essential, otherwise severe distortion will occur in the output signal.

To eliminate the unwanted frequencies, without the need for special circuit alignment, or distorting the output waveform, a Baxandall type filter[5] has been incorporated in the output stage of the pre-amplifier. This consists of high-pass and low-pass filters, in conjunction with a feedback network, resulting in the cut-off of all frequencies below 65 cycles and above 4 kc. The high-pass filter also assists in the reduction of any 50-cycle hum which may be present due to stray magnetic fields from the heater wiring. The frequency response curve of this filter, measured in conjunction with the complete pre-amplifier circuit, is shown in Fig. 3. (For Fig. 2 *see* p.294, October.)

Gain control VR1 (Fig. 2) is part of the feedback network and ensures that the output impedance is reasonably low, matching the input impedance of the modulator.

Although the combination of feedback and a high-pass filter assists in the reduction of unwanted hum, additional precautions must be taken to ensure that 50 c/s is not introduced into the valve circuits at a level which would render the filter inoperative. It is essential therefore, where high gain, low noise pentodes such as the 8D8 are used, that P.T.F.E. screened valveholders be fitted throughout. The centre spigots of the valveholders should be connected to a common earthing point in each valve circuit. If the bakelite type of valveholder is used, 50 c/s currents are liable to be induced from the heater pins into adjoining electrodes, due to pin capacitance. Hum can also be induced into the circuit by the influence of stray magnetic fields acting on inductive loops formed by the wiring. To prevent this occurring the earthing points in each valve circuit should be connected together with heavy gauge wire; this will ensure that any 50 c/s currents flowing in the chassis are kept to a minimum.

In the writer's case, the heater voltage for the pre-amplifier valves is obtained from the 4 amp. 6·3 volt winding of the heater transformer that goes with the VFO/driver power supply. The 285 volt HT, at 5 mA, is obtained from the low voltage section of the modulator HT supply circuit. This is taken to the pre-amplifier through pin 8 on the DC or "X" socket at the rear of the RF unit (to be described), the audio output socket being located in the same position.

A Grundig six-pin socket and bracket assembly (Part number 90/137), is flush mounted on the transmitter front panel and is used to connect the pre-amplifier input and the control circuits to the Grundig microphone.

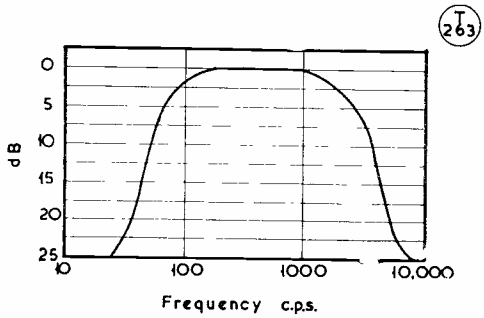


Fig. 3. The audio frequency response curve of the speech amplifier designed by G3CCA for his all-band transmitter.

A similar socket connects the key and the control circuits when the transmitter is used for CW operation; this is discussed further in the section relating to the control system.

The preamplifier circuit has been carefully designed for Brimar 8D8 low-noise pentode valves and should it be found necessary to use other valve types, the filter network and biasing arrangements must be adjusted accordingly, otherwise distortion may occur.

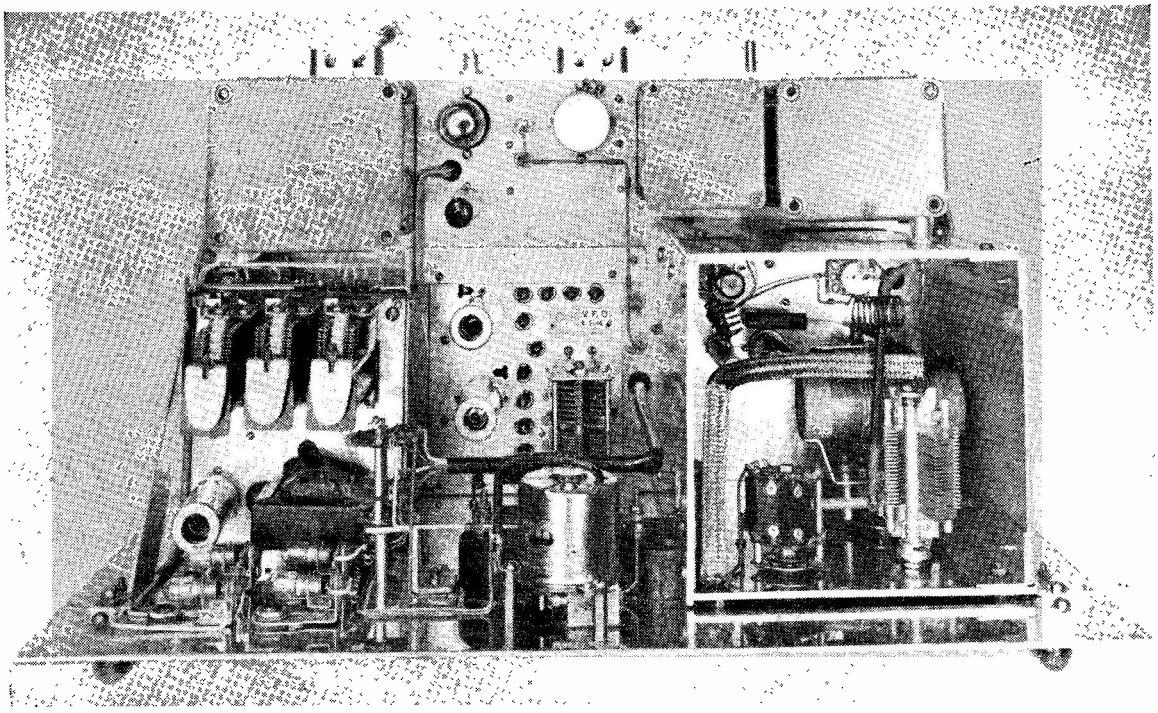
Control Circuit

The purpose of the control circuit is to enable all the operational sequences to be performed by the push of a switch, located in the microphone handle. (*See* Fig. 4, p.349.)

Voice control (VOX) has not been incorporated in this unit although it has been seriously considered. The reasons for its omission are numerous and it is not proposed to discuss them in this article. Extensive tests are, however, being carried out to find a circuit with suitable characteristics and if these meet with the author's requirements, then further thought will be given to the matter.

Preliminary tests were made with control circuits incorporating standard P.O. Type 3000 relays fitted with a series resistor and operated direct from the DC supply. This method was regarded as unsuitable due to the high potential present across the switch contacts in the "stand-by" or "off" position. A low voltage, direct connection system was also dismissed as the operating current had to be high. Apart from these objections, it was also found that both systems introduced hum into the grid of the first valve in the microphone pre-amplifier. Even with extensive screening and filtering, this hum could not be reduced to an acceptable value.

After carrying out several experiments with different types of relays, a specification was prepared for the "ideal control circuit," as it was now realised that this must be controlled and operated by a *very low* DC voltage. In this respect the author had previously designed and used a switching circuit which, subject to a slight modification, met the specification; in this device a radio valve was used as a static switching element with a control potential of one volt. Unfortunately after completion of the initial tests it was realised that this circuit was to be the subject of a patent specification and could not be published. To overcome this complication thoughts turned to a transistor switching device and it was hoped that this



Top-side view of the RF chassis, with the control circuit, incorporated in the relay unit of Fig. 4, on the left, the PA "transmission time meter" in the centre, and the 6146 PA stage, clamper valve and pi-network in the screened compartment on the right. The Geloso type 104/4 VFO unit is at the centre of the chassis. The VFO/exciter power unit, to the circuit of Fig. 5, is at the rear, and the speech amplifier is underneath the relay control unit.

would be as effective as the valve circuit.

Before commencing development on a transistor circuit, enquiries were made to obtain the cost and operating characteristics of commercial transistorised relays, but the outcome of these investigations was not encouraging. It was discovered that a set of relays, suitable for the requirements of the proposed control system, would cost in the region of ten pounds. Even at this price, the maximum number of contacts available was insufficient for controlling the transmitter and it would be necessary to incorporate three additional Type 3000 relays. In view of these limitations, and at the same time to reduce the cost, it was decided that a suitable transistorised switching circuit would have to be developed, using Type 3000 relays fitted with a minimum of four sets of change-over contacts.

Several circuits were tried before the final version, shown in Fig. 4, was found satisfactory; this employs three identical transistor relay circuits so the description of the switching action is confined to the first transistor section only.

The transistor Tr1 is a Mazda XC101 with a P.O. Type 3000 relay in its collector circuit; this relay has a coil resistance of 5000 ohms, which is very critical and must not be reduced. Experiments can be tried with relays other than the one quoted, but care must be taken not to overload the transistor.

The base electrode (b) of the transistor is connected to the potential divider, R4 and R5 which, in conjunction with the emitter (e) resistors R2 and R3, biases the base positive, with respect to the emitter. This gives a standing current of 2·3 mA which is insufficient to energise the relay RL1. By shorting the emitter bias resistor, R3 to earth (positive line), the emitter is made "more positive" than the base and the transistor conducts heavily, the current in the collector circuit increasing to 6·7 mA, energising the relay. To ensure a constant switching action, the collector is decoupled by R1 and C4, the time constant of these components being selected to give a reasonable pull-in time. The resistor R2, in the emitter circuit, prevents the transistor from exceeding the rated power dissapation when R3 is shorted out.

The diode D1, across the relay coil, is essential due to the transistor load being inductive, as a large peak voltage is generated across the coil at the instant of switching off[6]—that is, when R3 is re-inserted in the emitter circuit. This peak voltage is in series with the supply voltage and results in a negative voltage pulse at the collector which is liable to exceed the maximum collector-emitter voltage rating, permanently damaging the transistor. With the diode shunted across the coil, the relay current tends to flow through the diode, limiting the amplitude of the pulse voltage. The insertion of this diode pulse limiter in the relay circuit increases the relay drop-out time, but as it is only in the region of 60 milliseconds it does not affect the operation of the transmitter. However, should it be decided in the future to use voice control, modifications will have to be made to this diode limiter circuit as well as the transistor relay components.

Before describing the complete control sequence, examination of this transistor relay circuit will show that with the control switch in the stand-by or off position, only the emitter bias voltage appears across the contacts. In either operating positions the switch contacts are at "earth" potential.

Table of Values

Fig. 4. Transistor Control Circuit

C1	.01 μF, paper 350-volt wkg., TCC type 383
C2	.01 μF, paper 350-volt wkg., TCC type 383
C3	.01 μF, paper 350-volt wkg., TCC type 383
C4	2 x 50 μF, electrolytic 50-volt wkg., T C C type CE100DE
C5	12 μF, electrolytic 50-volt wkg., T C C type CE59DE
C6	.001 μF, Moulded mica 1,500-volt wkg., TCC type M3GO
C7	.001 μF, Moulded mica 1,500-volt wkg., TCC type M3GO
R1	1,200 ohms, ½-w. carbon
R2	470 ohms, ½-w. carbon
R3	5,600 ohms, ½-w. carbon
R4	10,000 + 2,200 o h m s, 1-w. carbon, in series
R5	1,200 ohms, 1-w. carbon
R6	1,200 ohms, ½-w. carbon
R7	470 ohms, ½-w. carbon
R8	5,600 ohms, ½-w. carbon
R9	10,000 + 2,200 o h m s, 1-w. carbon, in series
R10	1,200 ohms, 1-w. carbon
R11	1,200 ohms, ½-w. carbon
R12	470 ohms, ½-w. carbon
R13	5,600 ohms, ½-w. carbon
R14	10,000 + 2,200 o h m s, 1-w. carbon, in series
R15	1,200 ohms, 1-w. carbon
R16	100 ohms, 1-w. carbon
R17	10 ohms, ½-w. carbon
RL1, RL2, RL3	P.O. Type 3,000 Relay, 5,000-ohm coil, 4 sets of c/o contacts (Magnetic Devices Ltd., Type 305)
D1, D2, D3	Mullard OA73 germanium diode
Tr1, Tr2, Tr3	Ediswan-Mazda XC101 transistor
"P" Socket, "C" Socket	Grundig, 6-pin socket assembly, Part No. 90/137
SW1	D P D T panel mounting toggle switch, Radiospares
H.M.	Elapsed Timer Meter-Type 58/5A (250-volt A C motor) Counting Instruments Ltd.

Relay Operating Sequence

The complete operating sequence of the control system must be fully understood before attempting to wire the relays into the transmitter. In the description which follows,

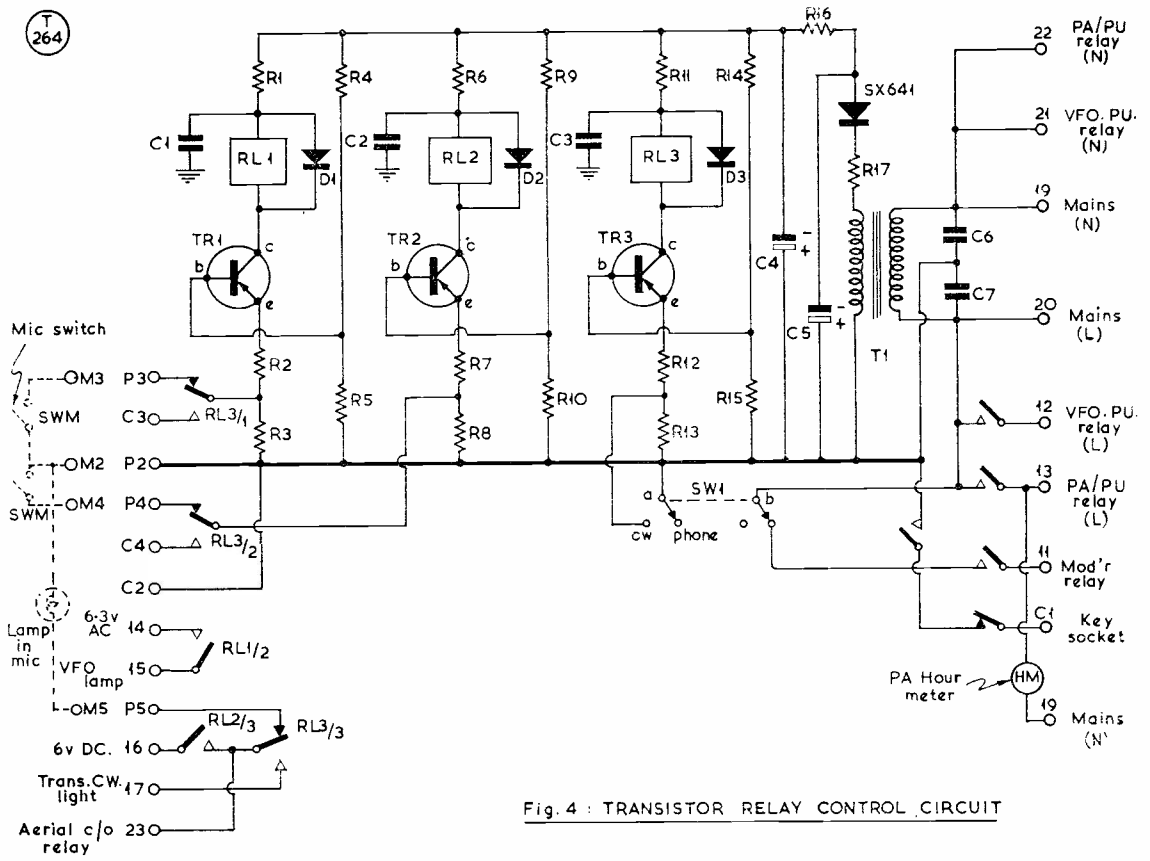


Fig. 4 : TRANSISTOR RELAY CONTROL CIRCUIT

Fig. 4. The relay control circuit, using transistors, devised by G3CCA for the all-band transmitter described in the article. One switch on the microphone controls the whole relay unit, which performs all transmitter functions, with appropriate panel indication.

(Note : In this drawing, the contacts connected to point " 12," VFO/PU, on the right should be marked RL1/1 ; to " 13," RL2/1 ; to " 11," RL2/2 ; and to " C1," RL3/4. The open contacts from the base line through RL3/4 should be marked RL1/3.)

reference is made to relays in the other circuits of the transmitter as well as those in the control system.

With switch Sw1 in the phone position, the six-pin socket (reference " P ") is connected into circuit as the transistor Tr3 is in the quiescent state and relay RL3 is de-energised. Placing the microphone control switch in the " net " position connects pin P3 to P2 and shorts the resistor R3 to earth, (positive line). Transistor Tr1 now conducts, energising relay RL1 which closes RL1/1, this in turn operates relay RLv in the VFO power supply. The mains voltage is now applied to the primary of the HT transformer *via* RLv/1 and RLv/2. In addition to this operation, RL1/2 energises the VFO lamp on the transmitter front panel and RL1/3 removes the blocking bias from the cathode of the 6062 (or 5763) driver valve by shorting out the 47K resistor (R4) in the VFO power unit. Under these conditions, the VFO is oscillating, making it possible to " net " on the received signal ; the PA and modulator stages, however, are still inoperative.

At the conclusion of the netting operation, the microphone control switch is placed in the centre or " off " position and transistor Tr1 returns to the quiescent state ; relay RL1 becoming de-energised so all contacts revert to the " stand-by " condition.

To radiate a signal on the selected frequency the microphone control switch is placed in the " Transmit " position. In this case, the VFO control circuit contacts again close and in addition, a second set of contacts operate, connecting P4 to P2. Transistor Tr2 now conducts as well as Tr1, so that both RL1 and RL2 relays are energised. The action of RL1 having already been described the operating functions of RL2 are now explained. Energising RL2 closes contacts RL2/1 and RL2/2, these in turn energise the relays RLp and RLm in the high voltage power unit and the modulator respectively. The contacts associated with these

relays apply the mains supply voltage to the primaries of the high voltage and modulator HT transformers. In addition, RL2/3 closes and supplies the 6 volt DC to both the transmit lamp, in the microphone handle, and the aerial change-over relay RLa. On completion of these operations a signal is radiated by the transmitter on the selected frequency.

At the end of the transmission period, the microphone control switch is returned to the centre position, opening both sets of contacts so that transistors Tr1 and Tr2 return to their quiescent state and all relays revert to the "stand-by" position.

A unique feature of this transmitter is the inclusion of a "transmission hour meter," which is operated when the relay contact RL2/1 is closed. This enables an accurate record to be made in the log book of the actual transmission time for each QSO; the author also uses it as a QSL card reference number!

For CW operation, the panel switch Sw1 is placed in the "CW" position; this shorts the bias resistor R13 in transistor Tr3 emitter circuit to earth (positive line), thus energising RL3. The change-over contacts, RL3/1 and RL3/2 operate and transfer the control circuits from the phone socket "P" to the CW socket "C," so that the transmitter can now be controlled by the switch mounted on the base of the key. Contacts RL3/3 and RL3/4 also operate; the former transfers the 6 volt DC supply (*via* RL2/3) to the CW lamp on the front panel, and the latter opens, removing the short across the 47K resistor in the VFO power unit. The transmitter cannot radiate under these conditions due to the blocking bias on the cathode of the driver valve. Operating the key returns the driver stage to normal and enables CW to be transmitted.

Table of Values

Fig. 5. Low Voltage Power Unit

C1	=	100 μF, electrolytic 12-volt wkg., T.C.C. type CE18B
C2	=	16 μF, electrolytic 500-volt wkg. T.C.C. type CE14P
C3, C4	=	50 + 50 μF, electrolytic 350-volt wkg., Radiospares
C5	=	0.01 μF, 1,000-volt wkg., T.C.C. type 2043
C6	=	0.01 μF, 1,000-volt wkg., T.C.C. type 2043
C7	=	1,000 μF, electrolytic 12-volt wkg., T.C.C. type CE10B
R1	=	400-ohm 10-watt w/w, Painton type P.302
R2	=	4,700-ohm 10-watt w/w, Painton type P.302
R3	=	100,000 ohm, 2-watt carbon
R4	=	47,000 ohm, 2-watt carbon
R5	=	2,700 ohm 10-watt w/w, Painton type P.302
R6	=	10-ohm 2-watt w/w, Painton type P.406
L1	=	5/25 Hy. 150/15 mA, swinging choke, Woden type PCS.11
VR1	=	50,000 ohms potentiometer, 5-watt w/w, Colvern
T1	=	300-0-300 volts 100 mA, Woden type PTM/MUL. 10/M
T2	=	5-volt 3-amp and 6.3-volt 4-amp, Woden type PTF.18
T3	=	6.3-volts 1-amp (*see text*) Radiospares
RLv	=	2-pole n/o, AC relay, Magnetic Devices, Series 100, with, 250-volt coil, 5-amp contacts
V1	=	Brimar 5Z4GT
V2	=	Brimar OA2
M1	=	25-volt, 450 mA, full-wave bridge rectifier, Grundig Part No. 18/213

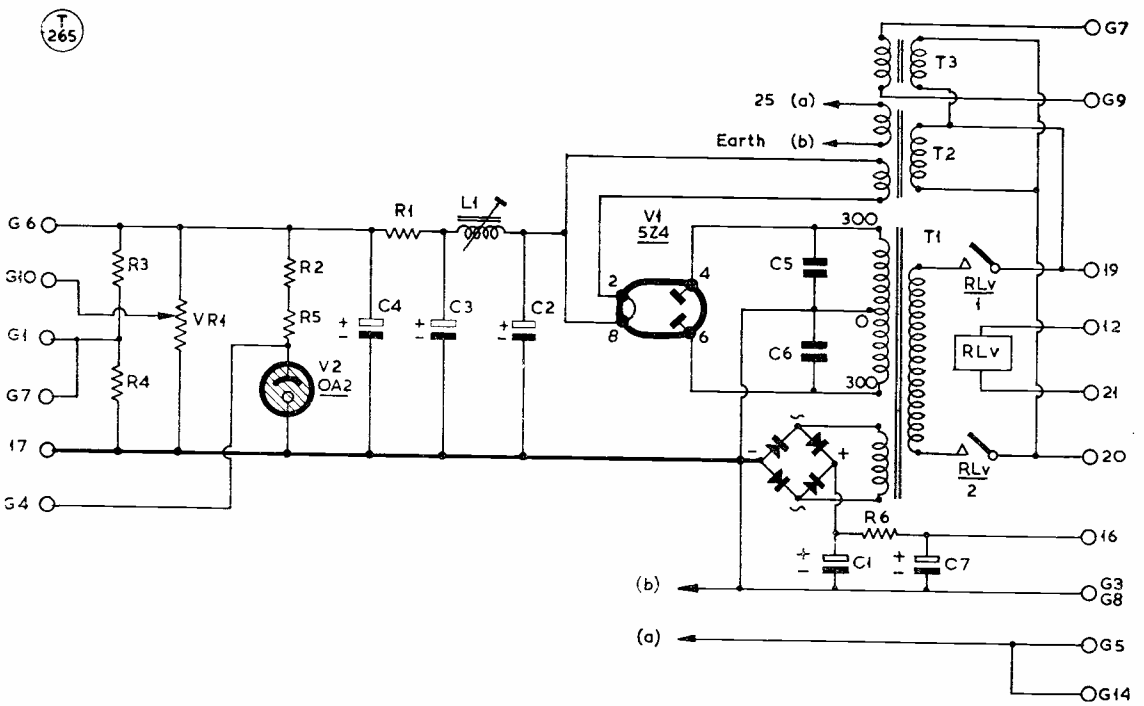
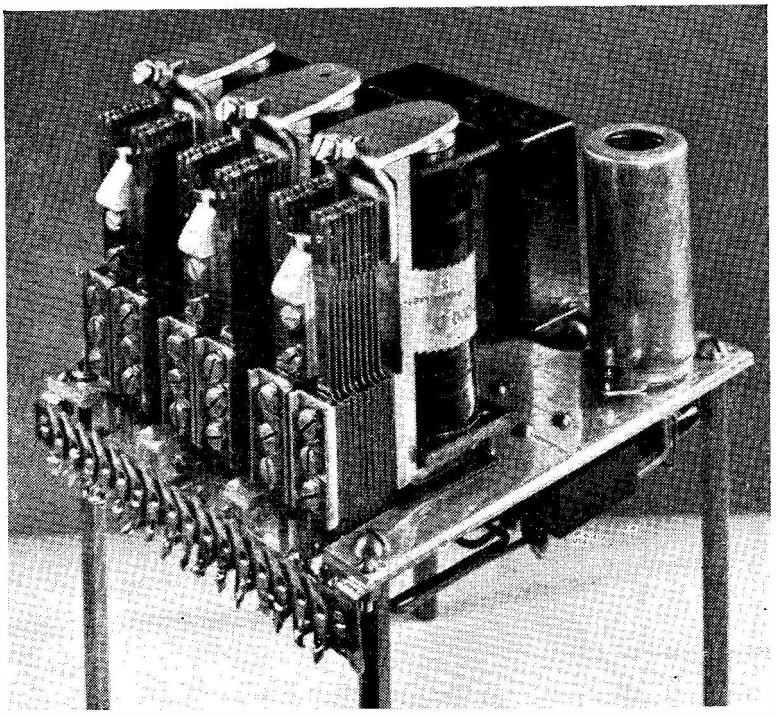


Fig. 5. Circuit of the low-voltage power supply unit for the all-band transmitter. Numbered connection points key with the other circuit diagrams.

The panel switch Sw1, however, consists of two poles and in the CW position this second pole open-circuits the mains supply to the modulator. This prevents the HT from being applied to both the modulator and the microphone pre-amplifier when the transmitter is operated under CW conditions. It has not been found necessary either to remove, or short out, the modulation transformer during CW transmission.

The power supply for the control circuit is obtained from a 30-volt 30 mA "C" core transformer in conjunction with a GEC silicon diode type SX641 operating as a low power half-wave rectifier.

It is interesting to note that the control circuit shown in the photographs, and incorporated in the original transmitter, uses a Brimar 6AL5 double diode valve as a full-wave rectifier in conjunction with a 30-0-30 volt transformer. The primary of the control circuit transformer is connected to the unswitched AC mains supply as it must be permanently energised.



The transistor control circuit assembly, discussed in the text. The valve on the right supplies 36v. for the transistors, but has since been replaced by a small silicon rectifier. All connections for the control circuitry are made to the tag strip at the front of the chassis.

Control Switch

Before the control circuit can function in accordance with the operating requirements, certain modifications are necessary to the switch incorporated in the Grundig GDM503 microphone. This necessitates removing the internals from the case; to do this it is necessary to take off the microphone grille by taking out the two brass screws located at the top of the microphone case. Removal of the grille reveals two countersunk screws above the microphone element. Unscrewing these, together with the fixing screw located in the microphone handle near the lead outlet, allows the bottom half of the casing to be removed, giving access to the switch contacts. All leads connected to the microphone control switch should be removed from their respective tags. It is very important that the actual microphone leads and those going to the transmission lamp should not be touched.

Using the same leads, the switch and six-pin plug should be re-wired to bring about the required switching sequence. After this operation, the microphone is re-assembled into the case, taking care not to trap any of the leads when fixing the screws back into their respective positions.

Should a Grundig microphone not be used, a three-position switch, capable of performing the same functions as the Grundig switch can be employed. A suitable switch can be constructed from an old relay if desired.

Low Voltage Power Supply

The low voltage power unit supplies all the voltages and current required by the VFO/driver section of the transmitter; it also supplies the heater voltage to all the valves in the RF unit. Examination of the circuit diagram given in Fig. 5 shows that there are three transformers; this is necessary as primary circuit switching is used for transmitter control.

The HT supply for the VFO/driver stage is obtained from a Woden type PTM/MUL.10/M transformer (originally designed for the Mullard 510 audio amplifier). It delivers 300-0-300 volts at 100 mA to the anode of the full wave rectifier V1 (5Z4G). Two condensers C5 and C6 are included in the secondary circuit to reduce switching transients. The normal

6·3v. heater winding of this transformer is connected to a Grundig type 18/213, 25 volt 0·5 amp. bridge metal rectifier. This section of the circuit gives the 6 volt DC required for the "transmit" lamp and the aerial change-over relay. (The 5-volt rectifier heater winding on the HT transformer is not required so this winding has been omitted from the circuit diagram.) The 5Z4 rectifier heater is energised from the Woden filament transformer (T2). A second winding on this transformer (Woden type PTF.18) supplies 6·3 volts at 4 amps for all the valves in the RF unit, with the exception of the heater voltage for the 6062 (or 5763). The latter is obtained from a small 6·3 volt 1 amp. open clamp type transformer (T3), mounted under the chassis. The primaries of the two heater transformers are connected direct to the incoming mains supply; the primary of the HT transformer has the relay control contacts RLv/1 and RLv/2 in the mains circuit. This relay is mounted on the side of the chassis, directly beneath transformer T1. The operation of the relay has been described in the section relating to the control circuit sequence.

If the transmitter is used for phone operation only, transformer T3 is not required; the 6062 (or 5763) heater can be connected to the normal heater supply and its cathode earthed in the Geloso unit.

A swinging choke is used in the smoothing circuit; this is a Woden PCS11 with an inductance of 5 Hy at 150 mA increasing to 25 Hy at 15 mA, which in conjunction with the R-C filter network, C3, R1 and C4, results in a low ripple voltage and gives good regulation, ensuring a clean note on CW. The R-C filter also reduces the HT voltage to the level required for the 6062 and 6CL6 anodes, the screen voltage for the 6CL6 being obtained from the anode of a Brimar OA2 stabilising valve.

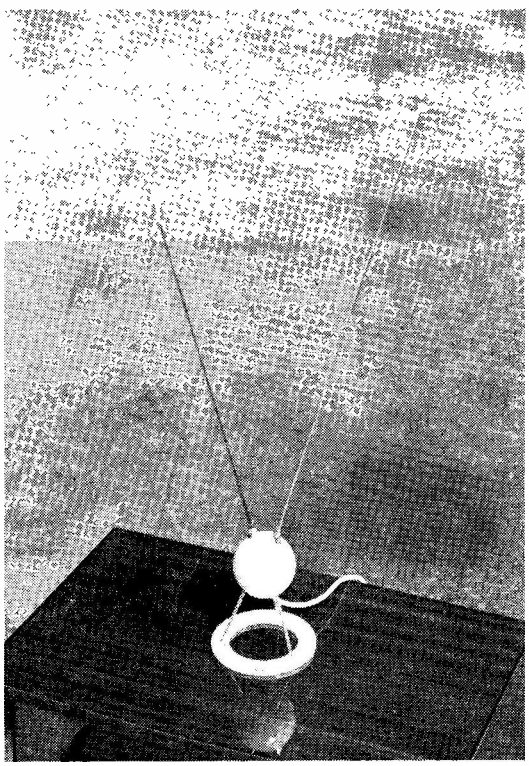
A 50,000-ohm potentiometer VR1 is connected across the 300-volt line to enable the screen voltage of the 6062 (or 5763) to be varied for adjusting the RF output of the driver stage. A fixed potentiometer network, R3 and R4, supplies the blocking voltage for the driver valve. This is removed by shorting R4 to earth, either by the key (for CW operation) or by contact RL1/3 in the control circuit for phone operation.

(To be continued)

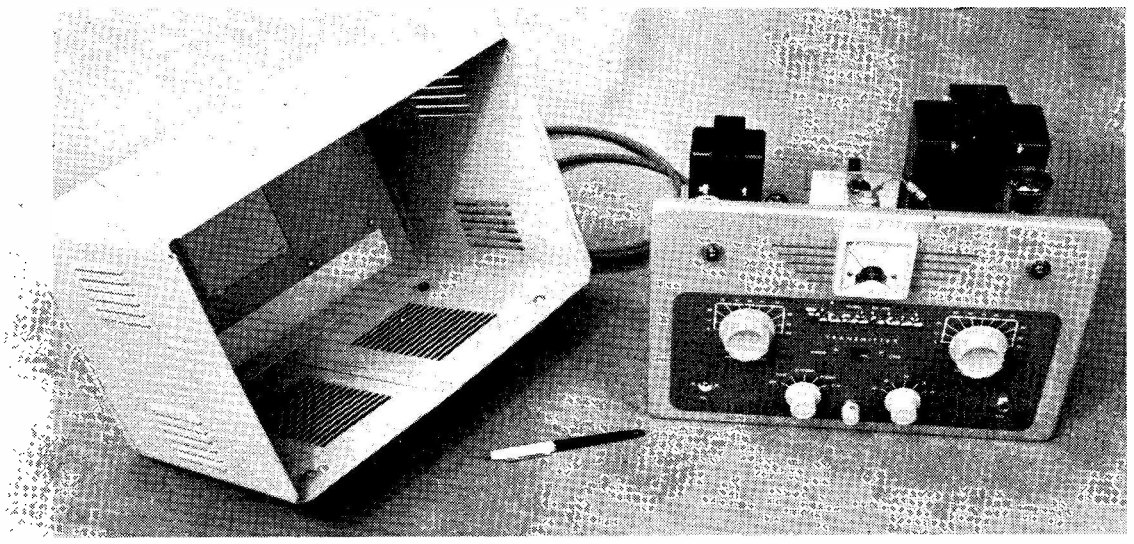
THE BACON "FUEL CELL"

Working from the established principle that electricity can be produced from almost anything provided you can find how to extract it, F. T. Bacon, of Cambridge, has developed and demonstrated a new type of "fuel cell" for generating electricity, which has attracted much attention. His system works by the reaction of hydrogen and oxygen with an electrolyte of potassium hydroxide—the action is somewhat the opposite of the electrolysis of water, and in fact the by-product of the Bacon fuel cell is water, as well as electricity.

The plates are of nickel-plated steel and each cell gives about 1 volt. Large currents can be taken without damage to the cell, though the efficiency falls off rapidly under excessive load conditions. The current capacity is governed by the area of the plates and the quantity of gas fed to them. To obtain some usable power for the demonstration, 40 cells with 10in. dia. plates were put in series, and in this form the battery gave about 80 amps. at 32 volts, or 2½ kW. which is sufficient to do quite a lot of useful work. There is much development yet to be done, and it is understood that the Bacon invention has been taken up by an American firm for manufacture under licence.



Neat Labgear model C.35 telescopic-adjustment indoor table-mounting TV aerial. It is finished cream with chromium plated metal parts, and is effective for full coverage of Bands I, II and III.



General appearance of the Heathkit DX-40U five-band transmitter before installation in its matching cabinet, with a size comparison. It runs 75 watts input on CW, and the controlled-carrier system of modulation drives the PA to 60 watts on phone. The kit of parts supplied is complete to produce the transmitter as illustrated.

HEATHKIT DX-40U

COMPACT, EASY-TO-BUILD CW/PHONE TRANSMITTER

THE Heathkit range of equipment — conceived and born in the U.S.A.—is becoming well known in this country. Here we illustrate the DX-40U, an attractive proposition for the medium-power operator, as a stand-by or second transmitter for the fully-equipped station, or for the beginner who wants something from the book which he is sure will work.

Rated at 75w. input for CW operation on the five bands 80-10 metres, and at 60w. for phone working, the DX-40U is self-powered, and the general design, circuitry, parts supplied and finished appearance are essentially modern and up-to-date. With the kit as provided—complete to the last detail—operation can be on crystal-control only, but there is an additional socket on the rear chassis drop for drive from a suitable external VFO tuning the 3·5 mc band, for which HT/LT can be taken from the accessory-socket, also on the back. Crystals in the range 3·5 or 7 mc may be used, depending on the output frequency required.

Though the PA stage can be matched into a wide range of impedances, for best results the RF output should be taken through a low-impedance (50-300 ohm) feed line, either direct to a current-fed aerial system or to an external ATU. For a beginner, an ideal arrangement would be a doublet cut for 7,050 kc, the feeder line being 75-ohm coax directly coupled from the transmitter into the aerial, no aerial tuning unit then being required—as this system would also give 3rd harmonic operation, the 21 mc band could be covered without any change in the aerial or its feeder layout being necessary. For more sophisticated (but not necessarily more efficient) aerial systems, an external aerial tuning unit should be used for

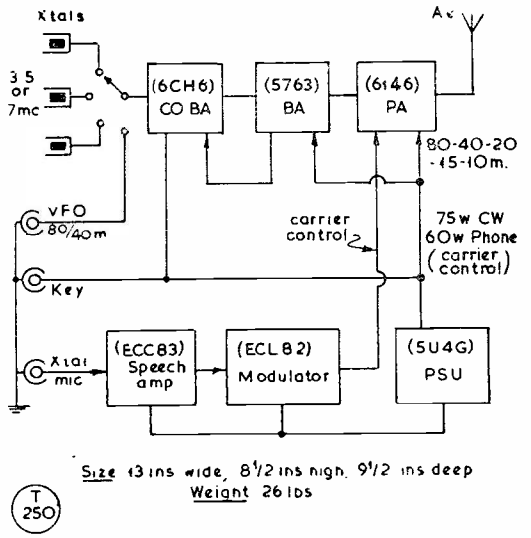


Fig. 1. Block schematic of the DX-40U CW/Phone Transmitter described and illustrated in the accompanying article.

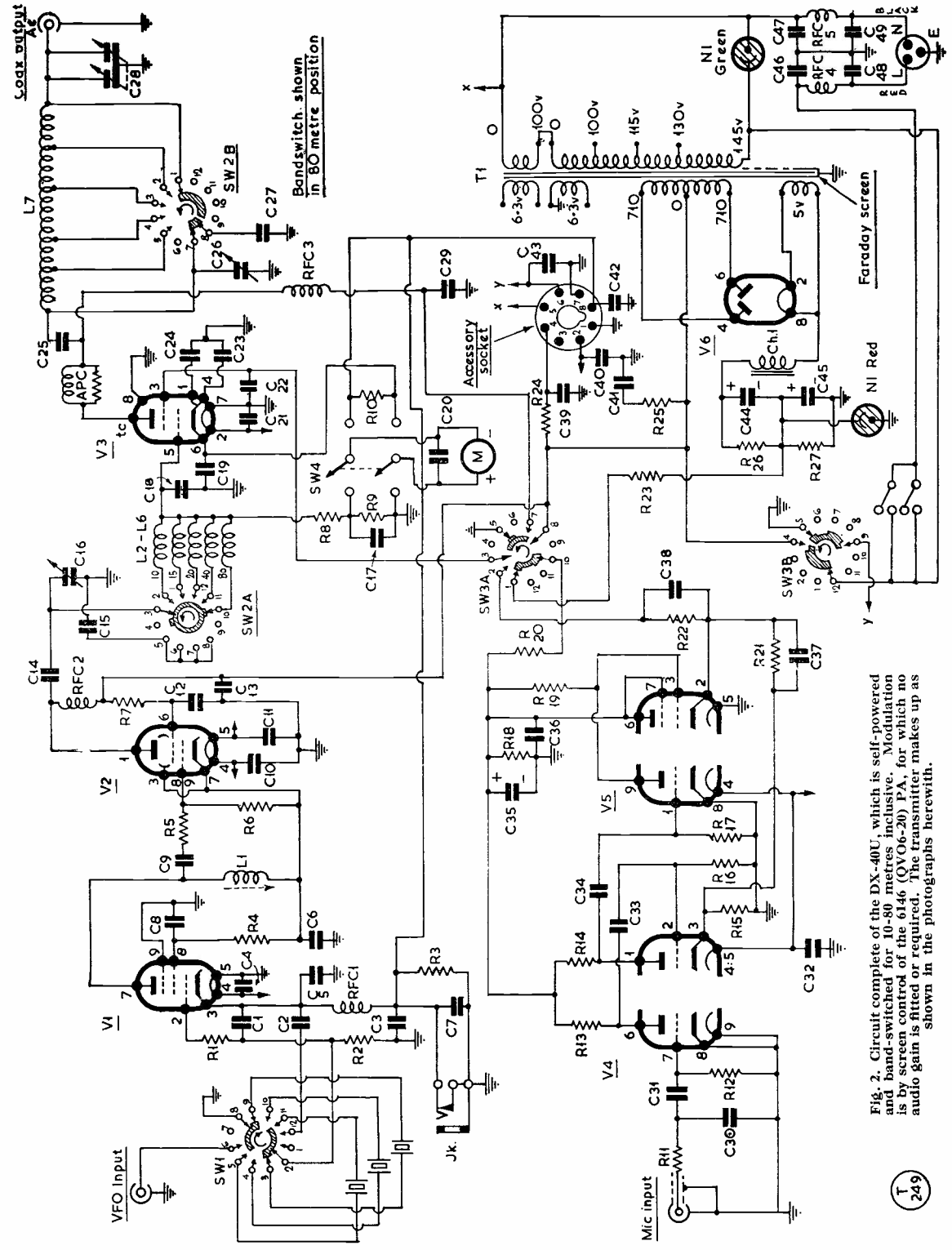


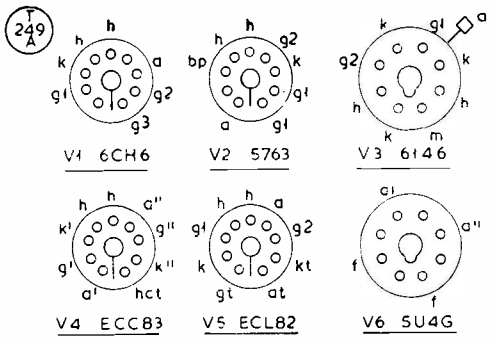
Fig. 2. Circuit complete of the DX-40U, which is self-powered and band-switched for 10-80 metres inclusive. Modulation is by screen control of the 6146 (QVO6-20) PA, for which no audio gain is fitted or required. The transmitter makes up as shown in the photographs herewith.

T 249

Table of Values

Fig. 2. Circuit of the Heathkit DX-40U

C1	= 22 $\mu\mu$F	C28	= 446–446 $\mu\mu$F, var.	R20, R24, R26, R27	= 20,000 ohms, 10-w.
C2, C4, C6, C7, C8, C10, C11, C17, C19, C20, C21, C23, C24, C40, C42, C43, C46, C47, C48, C49	= .002 μF	C30, C37	= 100 $\mu\mu$F	R22	= 12,000 ohms, 2-w.
		C33	= 500 $\mu\mu$F	R23	= 6,800 ohms, 2-w.
		C35	= 20 μF, 450v., elect.	R25	= 1,000 ohms
		C38	= 2 μF	L1	= 20-metre coil
		C41	= .005 μF	L2	= 10-metre coil
		C44, C45	= 40 μF, 450v., elect.	L3	= 15-metre coil
		R1, R5	= 47 ohms	L4	= 20-metre coil
		R2, R6	= 100,000 ohms	L5	= 40-metre coil
		R3	= 47,000 ohms	L6	= 80-metre coil
C3, C32	= .01 μF	R4, R7, R8	= 27,000 ohms, 1-w.	L7	= Tapped PA coil assembly
C5	= 220 $\mu\mu$F	R9	= 20 ohms	APC	= APC (anti-parasitic choke)
C9, C18	= 47 $\mu\mu$F	R10	= 0.67 ohm	RFC1,	
C12, C13, C29, C36, C39	= .002 μF, 1,000v.	R11	= 4,700 ohms	RFC2	= 1.1 mH
		R12	= 2.2 megohms	RFC3	= 2.5 mH
C14, C22, C31, C34	= .001 μF, 1,000v.	R13, R14, R21	= 470,000 ohms	V1	= 6CH6
C15	= 27 $\mu\mu$F	R15	= 2,700 ohms	V2	= 5763
C16	= 20 $\mu\mu$F	R16, R19	= 1 megohm	V3	= 6146
C25	= .001 μF, 1,500v.	R17	= 10 megohms	V4	= ECC83
C26	= 140 $\mu\mu$F, var.	R18	= 50,000 ohms, 10-w.	V5	= ECL82
C27	= 68 $\mu\mu$F, 3,500v.			V6	= 5U4G



Base connections for the valves used in the DX-40U.

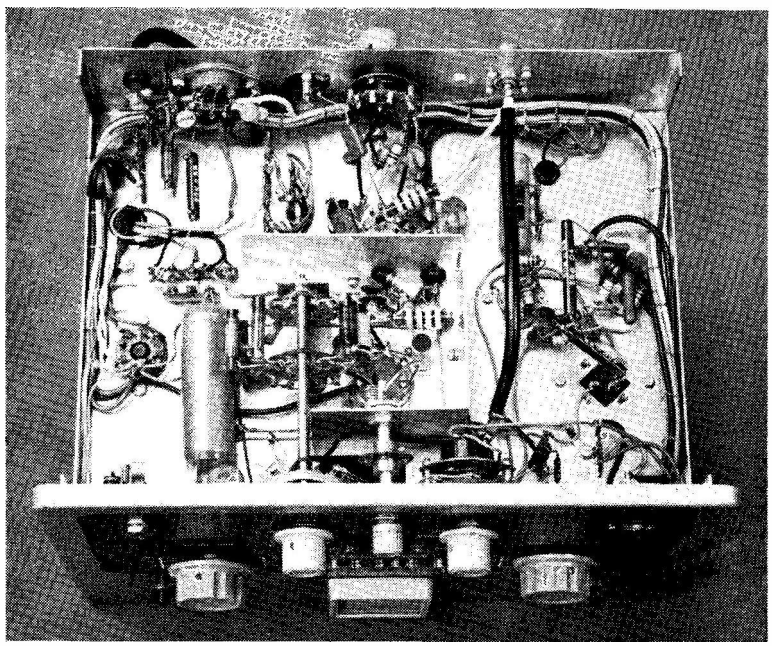
Heathkit unit, the VF-1, which will match this transmitter, but for our tests a "modified TU7B" type of external VFO, much attenuated, was used.

For phone working, the system of modulation is a form of PA screen grid control—called controlled carrier—which, from a low "resting" (or non-modulated) level of carrier output, produces modulated DC on the screen of the 6146, so that the carrier varies upwards to the maximum for full CW output. This system is self-adjusting, in that over-modulation is not possible, and since the speech amplifier circuit values ensure full gain from any standard type of crystal microphone, no audio proper matching and loading.

Performance and Results

A single meter is switched to read either PA grid or plate current, and there are miniature neon indicators for "power on" and "transmit." The controls are smooth and positive, and the operating switch gives off, tune, standby, phone and CW positions.

Results with the model as illustrated here have been very satisfactory both on CW and (within its limitations) on telephony. The keyed note is clean and sharp, and the CO will go off with certainty with any crystal capable of oscillation in either the 3·5 or 7 mc bands. The CW output using VFO is, of course, dependent on the stability and quality of note given by the VFO itself — there is a

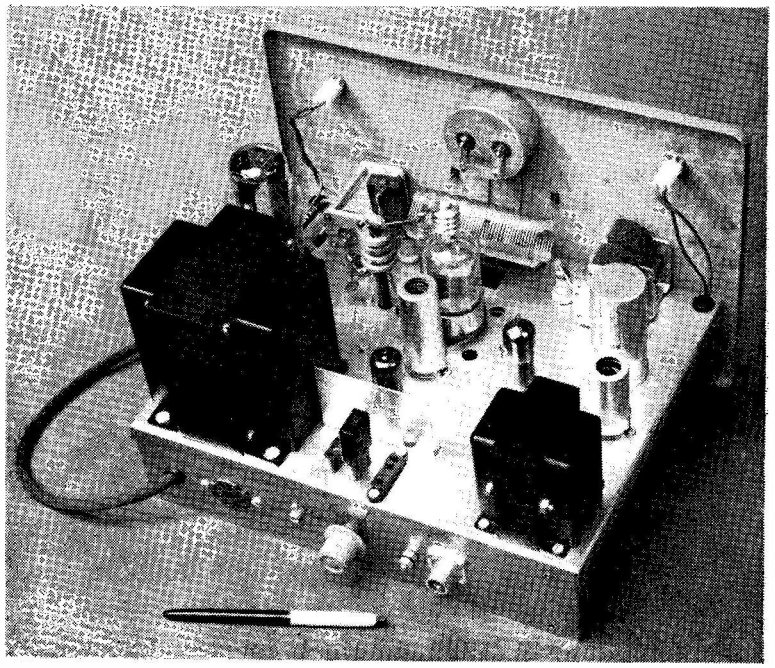


Layout and wiring below chassis for the DX-40U, as built to the instructions and with the parts supplied. The exciter/PA section is in the central screened compartment, with the CO stage immediately behind.

gain control is fitted — nor, indeed, is it necessary.

While the telephony output is very good, the transmission cannot "sound as loud" as a conventional amplitude-modulated signal of comparable power rating; within limits, the stronger the speech input to the microphone the deeper the modulation (though this is not an exact measure of modulation control!), while from the point of view of the receiving operator, the carrier seems to disappear during pauses in transmission, or when the speech is low-toned. However, the fact is that as a system of efficiency modulation, the DX-40U arrangement works very well and gives entirely satisfactory results within its limitations.

Full RF output can easily be obtained on all bands, and there is ample drive available for the PA on 10 metres using a 7 mc crystal or 3·5 mc VFO. Though the power transformer is generously rated, it tends to run rather warm during sustained operating sessions. However, after a two-hour "soak test" at an adjusted input of 75 watts on 10 metres, which was found to give 52 watts into a calibrated RF load, there were no signs of stress anywhere.



Inside the DX-40U Transmitter, showing general layout above chassis, which is punched ready for the acceptance of all parts. The power supply section is on the left, with the smoothing choke at lower right. The PA is a 6146 (Mullard QVO6-20) and its tank assembly can be seen immediately beneath the meter, between the tuning condensers. The switch on the rear chassis drop (foreground) is for VFO-crystal selection, with the aerial socket to the right and the accessory connector at left.

Some General Comments

The time taken to build the DX-40U Transmitter as shown here, from the kit of parts supplied by Daystrom, Ltd., was 14 working hours. Tools used were a soldering iron, BA box spanners, screwdriver, long-nose pliers, side cutters and a wire stripper.

With the DX-40U kit comes a manual which is one of the best of its kind we have yet seen. It is an outstanding example of clear, patient and meticulously accurate explanation on the "do-it-yourself" theme. Well printed and illustrated, covering every detail and containing much incidental information—such as hints on soldering and notes on suitable aerial systems—the DX-40U Manual also gives complete fault-finding and maintenance procedures. As a technical handbook, it is a model of what such manuals should be.

T. E. GOLDUP, C.B.E., M.I.E.E.

It is with great regret that we have to record the sudden death of Thomas Edward Goldup, aged 65, a member of the board of Mullard Ltd. Educated at the R.N.C., Greenwich, he served in the Royal Navy as a signals officer during the First War and then became senior experimental officer at the Signal School, Portsmouth, in the early days of valve development. This led him to the Mullard valve factory, and in 1928 he started the well-known Mullard technical service department, which made him widely known throughout the industry. By 1938, he had become a director of a Mullard subsidiary and by 1951 was on the board of the parent company.

Having been in on radio development in the pioneering days, and being of an experimental turn of mind himself, Thomas Goldup had a great respect for the amateur contribution to radio research and discovery. However, he also recognised the importance of sound basic training for those aspiring to make a career in radionics, and so was much interested in technical education. He made a very considerable impact on the College of Electronics at Malvern, of which he was chairman, and his interest in its affairs was always practical. Made C.B.E. in 1954, he became President of the Institution of Electrical Engineers for the 1957-58 session.

Test Oscillator Unit

WITH SEVERAL USEFUL VARIATIONS

J. N. WALKER (G5JU)

This is an interesting device, with various practical applications. The basic circuit is that of a two-terminal oscillator, which enables the unit to be used for a number of checks and tests.—Editor.

THE well-known grid dip oscillator is a versatile instrument and one practically indispensable to the radio amateur who engages in experimental work involving tuned circuits. The unit here described does not take the place of a GDO but is another useful piece of equipment to have by one, since with it certain tests can be made more easily than with a grid dipper. And, as will be seen, construction is quite simple and the components required are few in number—most readers will already have them to hand.

Circuit Features

Basically, the unit is a twin-triode valve with various small components connected to the electrodes in such a way that a single-ended oscillator circuit is formed. By " single-ended " is meant that only two connections have to be made to the circuit under test to produce oscillation, and one of these is at zero RF potential, *i.e.* earthed. This feature is of considerable value when making tests on unbalanced circuits where the elements are not

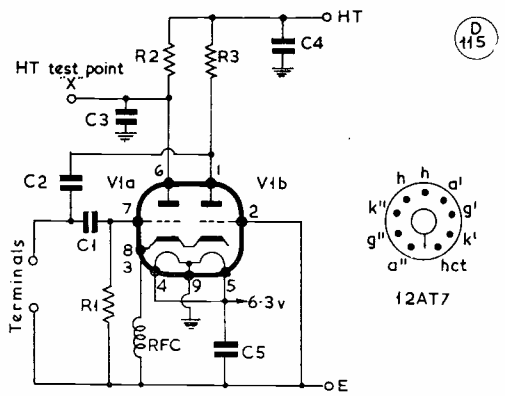


Fig. 1. Basic circuit of the test unit described by G5JU, which has several very useful applications.

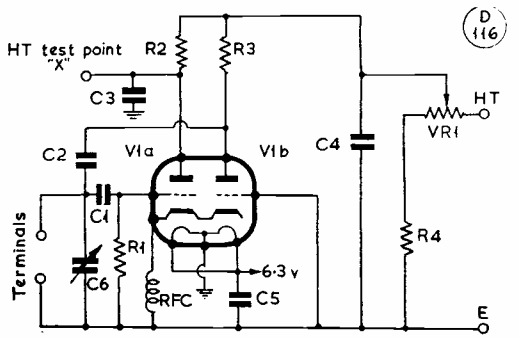


Fig. 2. A more refined version of Fig. 1, the advantages of which are explained in the text.

easy to get at—examples are a coil inside a screening can, or a coil *in situ* in a piece of equipment.

In its simplest form, the circuit is as shown in Fig. 1. The first half V1(a) of the double triode acts as an amplifier and is cathode coupled to the second half V1(b). The voltage appearing at the anode of V1(b) is applied to the input grid V1(a) and the phasing is then such as will introduce regeneration. With suitable component values, actual oscillation will occur provided the tuned circuit connected to the terminals is not already heavily loaded, *e.g.* by an aerial, or is not faulty (open circuit or shorted turns).

That oscillation is actually taking place can be checked by connecting a high resistance voltmeter (on a range measuring 200 to 300 volts full scale) from point " X " to chassis and noting that the voltage drops when the terminal " hot " to RF is touched.

The resonant frequency of a given circuit can be found by locating the signal on a calibrated receiver, it being assumed that the frequency under test is known within rough limits.

If oscillation does not occur, it is an indication of a fault existing somewhere—and this is another feature which is of value and is not possessed by a GDO.

The stray capacity across the terminals is low (less than 10 $\mu\mu$F) and although the

Table of Values

C1 = 20 $\mu\mu$F, silvered mica
C2 = 6 $\mu\mu$F, ceramic
C3, C4, C5 = .003 $\mu\mu$F, Cascap ceramic
R1 = 100,000 ohms, ½w.
R2, R3 = 47,000 ohms, ½w.
RFC = 2.5 millihenry Cat. No. 1010 Eddystone.

Additional components used in Fig. 2 above.

C6 = 100 $\mu\mu$F, variable Cat. No. 585 Eddystone
R4 = 5,000 ohms, ½w.
VR1 = 50,000 ohms wire-wound pot'meter
V1 = 12AT7 or equivalent.

resonant frequency will be shifted slightly when using the unit, the change will be small, especially when there already exists considerable capacity across the circuit under test. Naturally, the connecting leads should be kept as short as possible.

Crystal Testing

Another application of the basic circuit shown in Fig. 1 is the checking of crystals for activity and frequency. With the values indicated, reliable operation has been found to occur over a range of from 6 mc at the high frequency end to 1,000 kc on the low frequency side. It is only necessary to connect the terminals to the pins of the crystal, and check as before with a voltmeter and a receiver. Harmonics at a useful level are produced from a 1 mc crystal well into the HF range of a receiver.

Probably the circuit could be persuaded to oscillate at higher crystal frequencies by paying attention to the value of inductance inserted between the cathodes and chassis.

Improved Version

The circuit of a slightly more elaborate version is given in Fig. 2. A variable condenser has been added and also a potentiometer to control the voltage applied to the valve anodes. The instrument can still perform the original functions but now is useful also as a (rather crude) signal generator, both frequency and amplitude being under control. If one wished, a much more elaborate signal generator could be built up around this circuit by adding cathode follower output, an attenuator and a modulating device. The main advantage would be in the simplicity of the coils—one winding only is necessary and adjustment for correct coverage would be relatively easy.

Frequency Range

Tests made with an instrument having the component values in Fig. 1 have shown that consistent oscillation can be expected over what may be termed "normal high frequencies" and beyond. At the low frequency end, oscillation is maintained at 1,000 kc, although admittedly becoming a little weak at this frequency. For consistent use on moderately low frequencies—1 mc downwards— it would be better to increase the values of C1 and C2 *pro rata,* and use a 13 millihenry choke in the cathode circuit.

Oscillation is strong at 40 mc. As an experiment, a two turn coil of 20 SWG wire, ¾in. diameter, was connected directly to the terminals (no leads) and the circuit was found to be oscillating strongly at 137 mc ! And this was with a version where no particular care had been taken in making leads very short, and so on. By adopting a layout more suitable for VHF, reducing C1 and C2 somewhat, and possibly substituting a lower inductance choke, there is no doubt ready oscillation will occur at frequencies of 200 mc and above. As a guide, the following figures are those applicable to the original unit, as Fig. 1:

Applied HT 180 volts: *Figure at point "X,"* oscillating, 90 volts; non-oscillating, 55 volts.

Using a potentiometer as in Fig. 2 oscillation ceased when the potential at point "X" dropped below about 20 volts.

Audio Operation

The writer has not so far made any tests in this direction but it is obvious a version which would work at audio frequencies would be useful for testing iron-cored components and when making up filter units using parallel C and L.

There is no reason theoretically why the circuit shown should not be successful provided component values suitable for the low frequencies are chosen. It is suggested that C1 be made ·01 μF ; C2 ·001 μF ; C3 8 μF ; and the cathode inductance a small iron-cored choke — naturally, some experiment may be necessary to achieve satisfactory operation over the whole audio range.

GDO Application

Readers may already have realised that, in the tunable version of Fig. 2, the addition of a micro-ammeter in series with the grid leak R1 will convert the unit into a grid dip oscillator. A meter reading 500 microamps. full scale will generally be found suitable. If this refinement is added, it would be well to fit a coil socket in addition to the terminals, and make up a range of coils (and graphs) to cover the frequencies where interest lies.

Regeneration Control

In the circuit of Fig. 2, by reducing the applied voltage, using VR1 for the purpose, a point will be reached at which oscillation ceases, the action being quite smooth. Consequently, controlled regeneration, below the point of actual oscillation, is possible, enabling the "Q" of any circuit connected to the terminals to be increased considerably. Higher gain and greater selectivity follow.

This leads to the idea of applying the circuit for increasing the selectivity in a receiver. This

is possible in two ways—connecting across one of the windings in a IF transformer, or across a tuned RF circuit.

In either case, it is better to build in or at least add on the unit, as close as is physically possible to the appropriate circuit, in order to keep lead lengths low. It should not be forgotten that an unshielded wire may radiate and give rise to unwanted coupling and consequent instability. Initial tests, to judge how much improvement is possible (and it can be well worth while), can be made with an external unit, using a short length of screened lead and adjusting a trimmer or core to take up the added capacity of the lead. A valve screening can should be fitted also. When used in this way the circuit of Fig. 2 applies but C6 should be omitted.

Form of Construction

The exact form of construction can well be left to individual taste since, in any case, it will depend on how much elaboration is needed. The simple unit of Fig. 1 fits nicely into a small diecast box (Eddystone Cat. No. 650) with a pair of terminals (one insulated) at one end, and the leads to a small power unit (kept specially for use with test instruments) at the other.

If the variable condenser is fitted with direct drive, again the '650 box serves well but it would be better to use a slow motion drive and some re-arrangement may then be necessary. Layout is by no means critical but naturally undue stray wiring should be avoided, particularly when operation at VHF is required.

Word of Caution

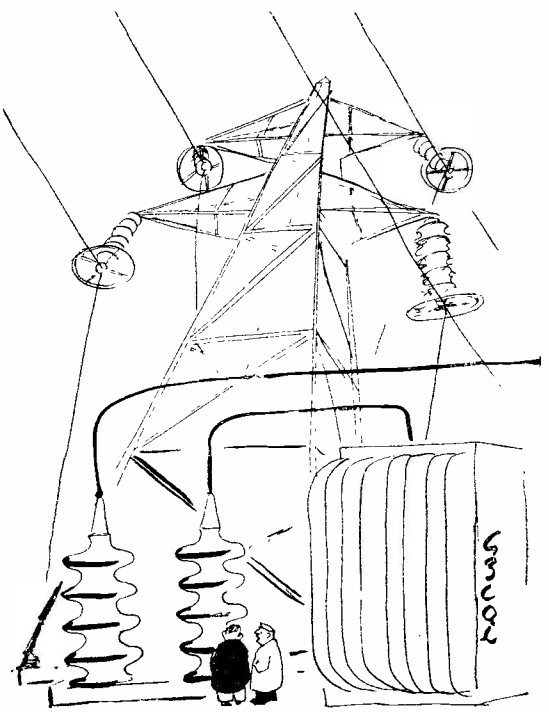
Obviously oscillation will occur at (or very near to) the resonant frequency of the circuit to which the leads are connected and at times it will be necessary to exercise some care. Naturally, no ambiguity will arise with a simple L/C circuit with no other elements attached, but a tuned circuit *in situ* may have an RF choke or other coils associated with it and then oscillation may occur at a totally unexpected frequency.

Again, in some cases IF transformer windings are tapped to reduce the loading and connections to the full tuned winding are not available externally. Connection of the unit to the tapping point will result in oscillation or regeneration at a frequency higher than the true resonant frequency. This factor should be borne in mind when applying the unit as a "Q" multiplier.

For the same reason, the unit cannot be attached directly to the aerial terminals of a receiver—the resonant frequency of the aerial coupling coil is likely to be much higher than that of the first tuned circuit and the performance is likely to deteriorate rather than improve. Connection must be made across the full tuned circuit.

AMATEUR RADIO EXHIBITION

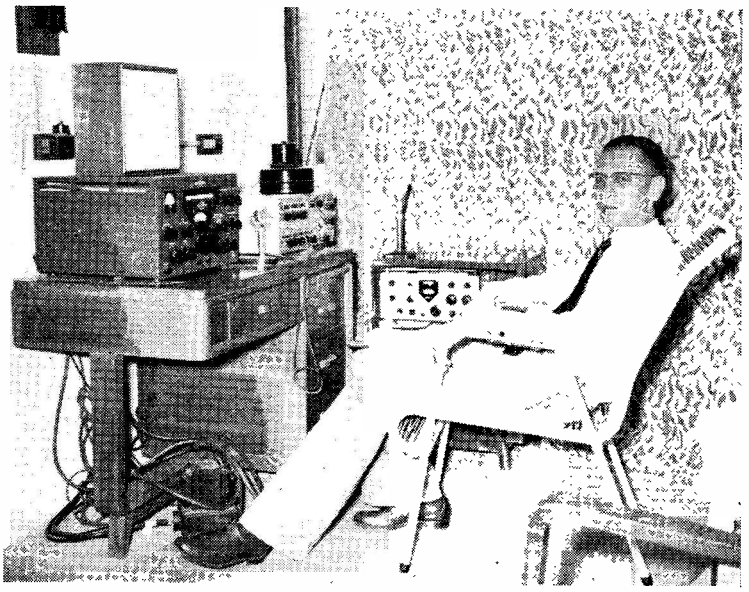
This opens at the Royal Horticultural (Old) Hall, Vincent Square, London, S.W.1, on Wednesday, November 25, and continues until Saturday, 28th. If you want to avoid the crush, come in the morning or early afternoon. For those strange to London, the pinpoint for Vincent Square is Victoria Station; from there go down Vauxhall Bridge Road for about 500 yds. and turn left into Rochester Row; any turn to the right will bring you into Vincent Square (which is a playing field for Westminster School). For those coming by Underground, get out at St. James's Park, take the Victoria Street exit and turn down Artillery Row, near the Army & Navy Stores; Artillery Row leads into Greycoat Place and Rochester Row, the second left-turn off which brings you into Vincent Square. Having paid your entrance and got your catalogue, you will find us at Stand 19. For the casual visitor, the keen customer and the trade buyer, this year's Amateur Radio Exhibition is going to be the biggest and most interesting yet.



" . . . . I'm like you, Syd, I don't go much on QRO . . . . "

DX COMMENTARY

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



XZ2AD

LAST month's preamble, to the effect that DX was of interest to everyone, and that it consisted of much more than mere country-chasing, brought forth a goodly crop of comments. It is interesting to note that every single one of them maintains the ideas put forward, strongly advocating that this Commentary should continue to cater for all levels.

One long and interesting letter contains so much sound sense that it is a pity the writer insists on remaining anonymous. We can't understand the reason, for the sentiments expressed do him nothing but credit.

Summarising the letter, we are impressed by his slogan—"DX is Fun." It certainly *should* be, but is it? At what point does it cease to be fun? The answer is to be found in the old expression: That radio is fine as a part-time hobby, but terrible as a full-time obsession.

If you want to enjoy your hobby, then *enjoy* it—and to do this, you must be able to do as you like. You are not forced to spend interminable hours on a QRM-laden band, just because a rare prefix is said to be about. If you'd sooner go on Top Band phone, or just take the dog for a walk, then do one of those things!

The full-time obsessionist reminds us of a character met on the beach this summer; he mixed with friends and acquaintances who were quite content to laze in the sun, and succeeded in convincing some of them that they were committing a sort of crime if they didn't go in the water. Something was there which ought to be enjoyed, and they were missing it . . . it didn't occur to him that they were probably enjoying their holiday-making in their own way (which didn't happen to be his).

So . . . work the DX your own way. Take it as it comes; be lazy or energetic according to your fancy. When you feel that terrible urge to work five new ones in a week, or perish in the attempt, then go ahead and satisfy it! But if you don't want to do anything like that, don't let the talk or the doings of others force you into it.

And so we go on to the exploits of correspondents, most of whom (thank goodness) seem to be part-time hobbyists rather than full-time obsessionists. Incidentally, so many of them have interesting comments to make on things in general that we are covering the "miscellaneous patter" before going on to the doings on the separate bands.

It has been a good month, and more and more people have reported on five or even six bands. The Five-Band Table positions are changing furiously, and some of the newcomers are piling up good scores. So on now with the story.

CALLS HEARD, WORKED and QSL'd

Miscellany

Contest Clashes are the subject of quite a few grumbles this month. G3LET (Westcliff) and G3CQE (Norwich) both comment on the way the WADM Contest made a mess of the VK/ZL affair (and the FOC DX Marathon was on at the same time!) G3ABG (Cannock) says that the 3·5 mc DX Contest, sponsored by the Tops CW Club, encountered a private OK Contest on its first week-end and the WADM affair on the second. G2BLA (Welwyn) also noted the latter clash with some regret. The plain fact is that there are altogether too many contests, just as there are too many sheepskins, sponsored by small organisations who

fix their dates without reference to anyone else. The iniquitous thing is that they should invariably occupy week-ends, the only time that quite a lot of operators ever have free for scouring the bands. Vote for the Progressive Party (prospective candidate, Arabackle Oblifork) and we will fix all contests for Tuesday afternoons!

G3FPQ (Elstead) remarks that 28 mc has been completely blocked at times by the Russian novice stations (all those "R" call-signs), only about 5 per cent. of whom have signals which can even be called readable. The popular circuitry for these types seems to be a modulated oscillator running off a cunningly-wobbulated power supply.

G3JZK (Cambridge) spent part of his holiday in Munich, where he lost no time in contacting the locals. He says they have a "Radio Beerhouse" once a fortnight—no formal meeting, but everyone just turns up and talks in groups. He, too, comments on the ten-metre Russians, and says it's a good way of picking up some of the rarer prefixes on the band, if you can stand rubber-stamp QSO's which take half an hour.

G3NKH (Huddersfield) dislikes the growing number of Americanisms creeping into our QSO's, and also the use of badly-mutilated CW jargon by phone operators. The former habit is responsible for handles, tubes and antennas, and the latter for "going QRT" or "signing offanclear" when it's simpler and clearer to "close down." He also notes quite a bit of Klottery, even on Top Band, in the form of calling stations who are still calling CQ, and calling others who are working someone else, even on a different frequency.

DX Gossip

Two licences from Muscat (MP4MAA and 4MAB) have been issued—no details of activity as yet . . . There's a rumour that Walvis Bay (at present in ZS3) will be issued with a new prefix, possibly ZSØ . . . VS9AZA is in the Independent Sheikdom of Quaiti—status unknown.

W9IOP still hopes to operate HV1CN on CW during the *CQ* Contest (November 28-30) . . . VR3AC is on Christmas Island (the Pacific one, of course). Incidentally, we dropped a real clanger by giving it a VR1 prefix last month, but not a soul made comment! It seems that future operators there may all have two-letter calls ending in C.

ZS6IF will be working from ZS8, 14 and 21 CW, between December 12 and 20 . . . AC4AX hopes to be on with a BC-610 and a rhombic, as soon as the gear is all lined up . . . There is now talk of counting East and West Pakistan as two countries—they are widely separated geographically.

3A2BB and 3A2BT put in some concentrated operating from Monaco at the end of September and beginning of October. G3FPK and G3IEW were there . . . KH6JEM/KJ6 is a nice-sounding call which was to have been flying around at the end of September. Anybody hear it?

Super-DXpedition

YA1IW, VU2NR and VU2AK are said to be planning an expedition to VU4, VU5 and AC5; in fact, the calls VU4DX, VU5DX and AC5DX have already been allocated; the rig will be Ted Henry's world-famous KWM-1, and the date aimed at is December 19. (Later news says that the call VU2ANI will be used at all locations.)

Rarer and Rarer

Carajos Island is about 250 miles north of Mauritius, and has already been occupied for a very short time by VQ8APB. Now it is said that VQ8BBB is in the same place—at present on 7 mc and later on 14 mc.

We are told (by friends on the *other* side of the Atlantic) that Rockall has every qualification for

FIVE BAND DX TABLE
(POST WAR)

Station	Points	3.5 mc	7 mc	14 mc	21 mc	28 mc	Countries
G3FXB	803	75	131	222	213	162	261
G5BZ	782	64	119	266	205	128	275
G2DC	780	84	114	234	194	154	262
G3FPQ	760	71	102	218	211	158	242
G3DO	686	24	47	248	188	179	275
GW3AHN	658	16	55	201	240	146	261
G3ABG	580	55	88	186	131	120	212
W6AM	566	40	68	296	96	67	296
G2YS	521	72	92	164	118	75	181
G3LET	458	32	89	178	118	41	199
G3IGW	447	44	73	112	119	99	163
G6VC	438	38	57	155	112	76	181
GM2DBX (Phone)	427	34	31	160	102	100	176
W6AM (Phone)	424	23	62	279	49	31	279
UR2BU	418	17	39	138	126	100	176
G3FPK	404	36	82	126	99	61	159
MP4BBW (Phone)	330	1	5	126	120	78	163
UR2BU (Phone)	313	4	13	99	108	89	148
G2BLA	304	33	57	71	74	69	120
G8DI	304	32	59	88	72	53	125
G3BHJ	272	8	27	37	128	71	156
G3MCN (Phone)	271	4	6	60	139	62	170
G3LHJ	262	11	30	96	99	26	136
VO2NA	261	19	35	107	64	36	117
G3WP	256	17	34	80	24	101	138
G2DHV	245	22	27	127	52	17	141
W3HQO	212	3	8	67	105	29	140
G3JFF	207	12	52	107	33	3	113
G3MJL	173	8	40	33	29	63	92
G3MMP	173	5	25	36	45	62	88
VQ4GQ	173	1	10	72	59	31	106
G3NAC	165	6	20	47	67	25	87
G3DNF	156	7	31	45	41	32	68
G3IDG	144	15	15	41	36	37	65
G3NOF (Phone)	140	1	9	21	78	31	107

(Failure to report for three months entails removal from this Table. New claims can be made at any time)

a "country"—it's certainly as good as Serrana Bank, or better—and that it's time an enterprising U.K. party got themselves set up with a GR prefix! Any volunteers?

Tannu Tuva—perhaps the most elusive of all. After years of rumours that UAØOM was going there, always denied later by UAØOM himself, we now hear that he operated thence for *one day*.

More DX Strays

VS5GS apparently runs a 200-*milli*watt rig (anybody worked him?) and is talking of a QRO set-up before long . . . UAØBD is said to be on Bolshevik Island, Arctic Circle . . . ZC7AS has been causing a lot of buzz, and is said to be in Jordan; but we've had a ZC7 scare before (may even have been the same call-sign, but it was years back . . .).

VE6QG/SU and VE3EGD/SU have probably left Egypt by now, but VE6AEE/SU will be there . . . VS9OC is known to VS9OM and is genuinely there in Oman . . . XE4B operated for 92 hours and made 2024 contacts; *none*, so far as we can ascertain, with Europe; they hope to repeat the deal some time.

A large-scale Galapagos Island DX-pedition is in the wind—possible date next January. Three OA's and a W8 are named as operators, and OA4GM has a 56-ft. schooner which he is very anxious to sail there . . . Phonies still abound: Two recent ones were FO8AC/FO8, claiming to be on Clipperton Island, and a character signing MP4TWA, not known in MP4T territory . . . VR4BW is said to be on 21 mc phone . . . JZØHA is back on 21 mc CW . . . VK9AD is closing down on Norfolk Island, but rumour has it that his SSB rig is going to VR1B.

DL9PF, who put LX and PX on the map in a big way this year, hopes to go to Turkey with a TA call next summer . . . YN4CB, well known from that spot, now owns the call TG5HC—rarer and better!

A mysterious KK6AF, worked by sundry W's in October, is said to be on Kure Island; an expedition of this kind apparently *was* planned by some KM6's a while back . . . FP8BT, heard in September and October, was apparently not good; the calls haven't yet got that far!

Lee Grant, already well known to most G's as ST2NG, ZD3G, VS9AG and MP4BCN, is now in Hargeisa with the call VQ6NG; his gear hasn't yet caught up with him . . . Vic Thorne of ZD6BX is now licensed as VQ3HD . . . CR6LA is an Exhibition station in Luanda and will be on the air until mid-November.

WPX Ladder

This is being started as another mild incentive for the DX-chasers, the first entries appearing in the little table herewith. This is based strictly on different prefixes only, worked and confirmed, and we acknowledge *CQ Magazine* as the source of our inspiration on the theme of WPX. So now count up all the different prefixes you have worked, find out how many you have confirmed, and let us know. Sort your list into CW and Phone, and Phone only for a separate classification if you want it.

VP7VB Active

Danny Weil has been on the air as VP7VB (from Bahamas, of course) and we hear that a suitable boat for *Yasme III* has been located already. The "Yasme Foundation" has been formed (directors KV4AA, W4QDZ, W4TO, K4KCV, W6GN, W8EWS and W9AC). He hopes to be under way for HC8 (Galapagos Is.) by Christmas, and will not in future be sailing alone. Possible members of the crew are W2HQL and ZL1AV.

(The paragraph on p.252 of the September issue, about the alleged cancellation of the VP2VB licence, was a last-minute addition, made editorially from a report accepted in good faith. We are glad to make it clear now that the report was unfounded, and to apologise accordingly to the "Yasme Foundation."—*Editor.*)

Ten Metres

A pretty lively band on the whole, but not for the exotics. Probably the best band of all for uninterrupted DX contacts, with the accent on phone, as always. At week-ends, the W's have been pouring in.

G2VV (Sunbury) spent only about one hour on it (with a bent 68-ft. aerial in the roof, 17 feet high) and worked VE4SX, a K9 and a KØ. G3LHJ (Newton Abbot) raised JA1AKH, JA6DH, VQ4HT and 7G1A, all on CW.

G3NOF (Yeovil) achieved phone with FB8CM, JA1BOW, KG4AA, MP4QAO, PJ3AD, UL7FA, VQ5FS, XE1JP, YN1WW, YV5ACM, 9G1CO, and sundry W's, Russian novices and ZS's. GW3AHN (Cardiff) worked RH8ABC on phone and ZS7M on CW. G5BZ (Croydon) snagged 7G1A, CX2BT, VQ3HD and W6.

G3FPQ, now fully active from his new QTH, uses a tri-band type of beam 42 feet high and finds results excellent; his phone raised K6MOG/KG6, UL7FA, VS9OM, XW8AL and sundry "R" stations.

G3ABG, also on phone, collected CR6, VQ2, ZE, 5A2, ZS's and a CX. G2BLA, on CW all the time, mentions EL4A and GI3AXI for new ones; also UA9OM, VK6RU, ZD2DCP, W's and the like.

G2DC (Ringwood) thinks 10-metre CW is on the increase at last. He worked IP1ZGY (new for WAE, at least), W's, VE's, ZD2, ZD7SA, VK and ZL. G3JZK exchanged phone with RA6's and an RB5. "all apparently using modulated oscillators with spring-steel coils . . . The initial switch-on caused a splendid *vibrato* FM about 50 kc wide, gradually dying away . . . About 300 per cent. mod. and barely readable." By contrast, RD6ADU was stronger than all

WPX LADDER

Station	Worked	Confirmed
G3ABG	305	237
G3LHJ	295	195
G2BLA	275	188
G3ABG (Phone)	237	169
G3JFF	106	15

(Each different prefix worked counts as one. Claims can be made at any time, but to keep in this Table claims must be confirmed every three months at least).

the others, with 10 watts of well-modulated T9x and a 4-ele beam.

Fifteen Metres

Still the pick of them all, with DX a-plenty for both the phone and CW addict—and nearly all at convenient hours, too. GW3AHN's fine list may serve as an indication . . . *CW:* BV1USB, CR6BX, JZØHA, LA3SG/P, ST2AR, VK9RO, 9XK, VP7VB, VP8EP, 8ET, VQ3CF, 3HD, VQ4ERR, ZC5AF, 7G1A, 4S7FJ. *Phone:* FU8AC, HK3GQ, HV1CN, MP4QAO, VK9DB, 9NT, 9RO, VP4MM and VS5GS.

G3DO (Sutton Coldfield) raised VS5GS on phone for a new one, also UAØLO and KG6JA. G2VV, on CW only, worked 7G1A, LU, VE7, VS6, VQ4, ST, ZL and a couple of /MM's.

The best for G3LHJ were KR6HT, VP5EM, VQ2 and 3, VS9AH and 9AZ, ZS3D and 9M2EK—all phone; CW fetched in CE9AF, FU8AA, JA3SJ and 6PA, VS5GS, VQ6AB, VK9RO, UN1AH and 7G1A. G3FPQ's phone accounted for FB8CD, FB8XX, FB8ZZ, FK8AU, FU8AC, KB6BH, KC6JA, K6QPG/KW6, MP4DAA, VP8's, VR2AZ, VS5GS, VS9OM and ZS8O; CW brought in 7G1A.

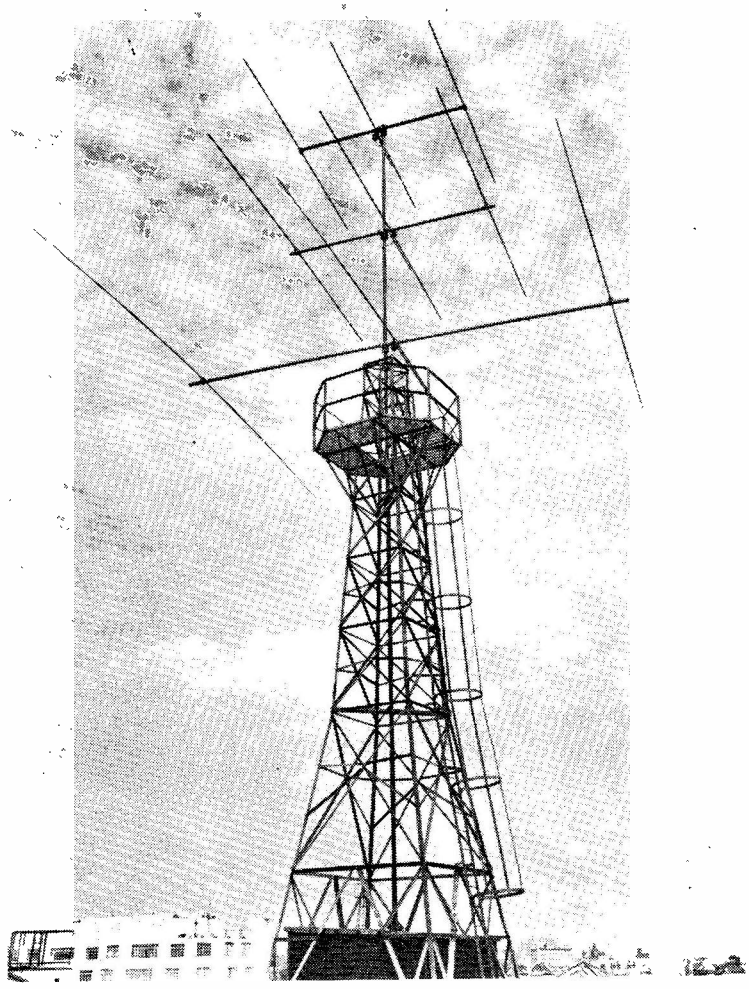
G3ABG worked FB8XX on phone, ST2AR and 5A2CV on CW. G2BLA, on CW, raised IP1ZGY, VK9NT and ZL1AH. G3LET, also CW, added JZØHA, FY7YF, KR6MD, VU2JA and VU2RM.

Best from G3NOF's long list of phone QSO's were FB8CD and 8ZZ, FE8AH, HH2CL, KA7MD, KG4AV, PJ3AD, PZ1AX, VP8, VQ3 and 4, VS9OM, XE1JP, XW8AL, YA11W, 9G, 9K and 9M.

G5BZ winkled out 9G1BM, CT2AI, VQ9AIW, CE9AF, LU, PY, ZE and the West Coast W's. G3NAC (Yatesbury) raised VK3RP for his first VK, and UQ2AN for a new one on this band. G3JZK managed to snag FB8XX and 8ZZ (both around 1540) and laments the disappearance of FB8YY! Others were VS9OM, HZ1AB, DU1SA and FA2VG (the latter is a good one for WPX).

G2DC finds the short skip on the wane at last and is glad to notice the VK/ZL signals improving *via* the long path at 0700-0800. Asians are also good, especially the 9M2's, JZØHA and VS9OM. The last two were all-time new ones; others worked were CE9AF, CR4AL, OR4RW, OA3D, VP7VB, VP8EP, XZ2BB and 2TH, ZD2, XE1AX and two 9M2's.

G3MCN (Liverpool) managed phone with FU8AC, HI8GA, KC6JA, UL7FA, VK9RO, VS5GS, DU6MJ, KR6DZ, MP4DAA, OD5LA, VP8DM and VS9OM.



Three-band transmitting array for GB2SM, Science Museum, South Kensington, London, S.W.7. The tower, supplied by British Insulated Callender's Cables, Ltd., is 48 ft. over roof level, putting the 10-metre section of the array about 160 feet above the pavement. The other two sections are for 15 and 20 metres respectively. Having a separate, properly matched and fed, beam for each band has given GB2SM a much-improved DX potential.

Twenty Metres

The general verdict on this band, as compared with Fifteen, seems to be "more QRM—less DX." G2DC says the short-skip QRM is still "a real stinker," but he did work two new ones—LA3SG/P and VS9OM. Others raised were OH2YV/Ø, KH6JG, KG6AAY, KG1DT, PX1PF, JA4CF, UAØKQB, UJ8AC, ZK1AK and 3A2BT.

GW3AHN collected VE6QG/SU and some VK's on phone; ZL3VB (Chatham Is.), FR7ZD and VK's

on CW. G3DO also managed to find ZL3VB, as well as LA3SG/P —both all-time new ones for him.

G2VV got all over the place with his indoor 68-footer, best being OR4RW, ZP5AY, YS1O, UA9, ZS and the like. G3FPQ put CW into CR9AH and LA1NG/P; phone to HB9QP/CR8, MP4DAA, VS9OC and 7G1A.

G3LET stuck to CW and made interesting QSO's with FR7ZD, VKØCC (Macquarie, 0800), VKØTF, VS9OC, FK8AW, ZS3T, KG6CY, FF8's, VP3ER, LA3SG/P and 1NG/P, HC's, PJ2CP and FP8JC. G3NOF, on phone, lists ET2US (SSB), TI2RMA, VE8, VK, VP3IG and 3A2BT. G3NAC just mentions MP4DAA, on phone.

TOP BAND COUNTIES LADDER

(Starting Jan. 1, 1952)

Station	Confirmed	Worked
G2NJ	98	98
G3JEQ	96	97
G6VC	96	96
G3JHH	94	94
G3FNV	93	95
G2AYG	88	88
G3KEP	86	86
G3KOR	84	90
G2CZU	81	82
GM3AVA (Phone)	72	74
GM3COV	71	73
G2CZU (Phone)	67	68
G3APA	65	75
G3MCY	65	67
GM2UU	64	67
G3LBQ	63	69
G3LHJ	62	69
G3KEP (Phone)	62	64
G3FS (Phone)	61	61
G6QN	60	74
G3LWQ	60	67
G3NFV	55	63
G3MXJ	41	51
G2AAM	35	35
G3JFF	33	37
G3LNO	23	41
G3NKH (Phone)	20	32

(Failure to report for three months entails removal from this Table. New claims can be made at any time.)

G3JZK, in a very short spell, raised CR4AX, HH2LD, VP3ER and VS9OM—all CW. G5BZ stuck mostly to Twenty, as usual, with the following results: ZP5HK, VP8CW and 8DL, VQ8AD, KR6MG, OH1RX/Ø, YA1AO, VQ9AIW, OR4RW, YV, FY, MP4, CX, CP3CN and VPØCC — with others too numerous to mention.

G3GMK (Southampton) reports for the first time. He gave VKØRH (Wilkes Land) his first G contact at 1650 on October 8—using 35 watts, crystal, and dipole. Other stations worked were KL7, VE8, 5A2CV and W's, also PX1CH, who said "QSL *via* ON4CH" — anyone else know about this one?

G3JUX (Stone), another successful rock-bound type, worked VE7, ZB2, ZC4, TF, and sundry W's and Europeans, and also tells us that ZC4CS is packing up and going to 5A-land.

Forty Metres

Doings on 7 mc are getting a little more interesting, but for the DX'ers this band is only 50 kc wide, and even this strip has more than its quota of Klottish inmates. However, the odd scoop can be pulled off by the crafty ones. G2DC finds the W's good between 0600 and 0800, with the VK's also showing up; he worked KH6CTM, VK3YD and 4YP, UA9KSA, W's, VE and VO.

G3MXJ (Gravesend) with 35 watts and a 66-ft. Zepp, worked 4X4JU, TI2CMF and OH2XK/Ø, all new ones; he raised quite a few W's, too, including VE2AZI/W1 (Vermont), who is ex-G3GGN; the latter's station is 1300 ft. a.s.l., and he says his only companions are bears, deer and chipmunks! He runs 75 watts to a 180-ft. aerial, and signals compare well with the competing kW/beam combinations.

G3FPQ, on CW, worked VK3YD, VS1FZ and VS9OM (the latter for his first G on Forty). G2BLA got a QSO with CT1KD (CT's are pretty scarce these days), W and OH2XK/Ø, as well as many Europeans.

"Good if you can stand the racket," says G3LET, and adds: "Certain East Europeans have been knocking off inaudible JA's in strings, although they don't get the VQ's as well as we do." VK3YD is workable every morning up to 0830, with no other DX on the band. G3LET's best were KG4AG, KZ5TD, VK, VQ3 and 4, VO, SVØ, CN2BK, 3A2BA and 2BB and EA6AM.

G3NAC had a report on his CW from BERS-195 (Victoria, Australia) for two days running—but he couldn't hear any VK's when he was on. G3JZK worked W6SYY at 0500, together with plenty of East Coast W and VE.

Eighty Metres

This is a band that really is improving rapidly, DX-wise, as they say; and G2DC remarks that by this time next year the boys with the long wires will be having fun. He found W's coming in pretty well around 0700—and later in the winter we shall probably find the ZL's back there

G3ABG spent a lot of time on Eighty during the Tops DX Contest, although the DM Contest running at the same time made the band a shambles. However, he achieved a multiplier of 33 for the band, and in the course of it worked OHØ, UN, UP and UR, all new ones. Some of the more distant Europeans could be worked as early as noon, and several by 1600. (At the week-end of writing this, the FOC Marathon was livening up the band, and for a while it was like the ARRL Contest; it was possible to work one station per minute for quite a while in the early evening.)

G3LET winkled out a nice one with AP4M, and also raised OHØNC and OH2YV/Ø. Many others mention good European contacts, but the real DX is still scarce and difficult to work. Seven or eight years back one could work VQ4 and ZS most evenings, and doubtless these conditions will return.

And as an earnest of the DX to come, in a late flash G8DI (Liverpool) reports working ZL4IE at 0645 on October 17—real DX on 80 metres. He also raised W4KAC, Alabama, for his 14th State on the 3·5 mc band. Nice going.

Top Band DX

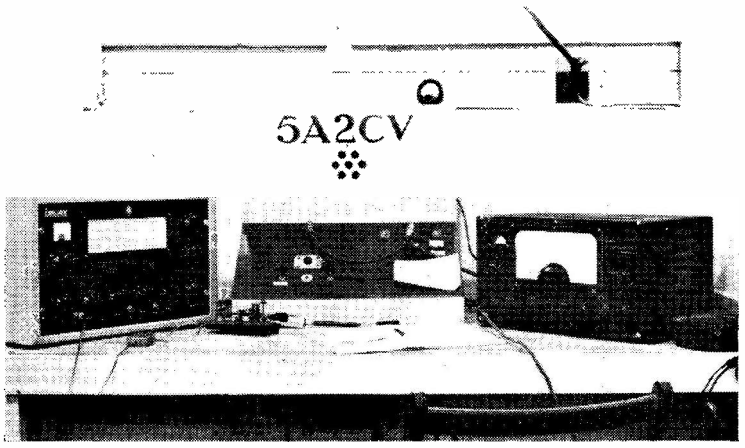
W1BB has fixed the dates of the official Trans-Atlantic Tests as follows: December 6 and 20, January 3 and 17, February 7 and 21. There will probably be just as much activity on the other Sunday mornings in between, but for these "official occasions" everyone is asked to stand by the usual procedure.

For U.K. stations this is, briefly: *Listen* for the first five minutes of each hour, and alternate five-minute periods thereafter; *Call* during the second five minutes, and alternate five-minute periods from then. **Do Not Call** W/VE stations in the sector 1800-1825 kc—they won't even be listening there. Probably the best spot for calling W's will be between 1825 and 1830 kc, but you can't *all* squeeze in there! If everyone is to have a chance for a reasonably QRM-free contact, this schedule must be strictly observed. Anyone heard calling W/VE stations *on* their frequencies will incur the wrath of all!

Apart from the scheduled tests, W1BB will be on *every* Sunday morning from November to March from 0500 to 0730 GMT. He will call and listen for alternate five-minute periods, and will work mostly on 1802·5 or 1807·5 kc, but sometimes (according to QRM conditions) on 1817·5 or 1822·5 kc.

On these occasions he will be listening in the sectors 1800-1805 and 1825-1830 kc. mostly. W1BB welcomes and invites schedules with any station; send him an airmail with full details, and also arrange any desired schedules on the DX bands with him to discuss matters beforehand.

Stew also welcomes *reports* on his signals, whether from SWL's or from transmitters who have called him but been unlucky. He will be working mostly from the home QTH with 200 watts, a 265-ft. doublet and a 75A4; but there will be some operation from W1BB/1, at the Winthrop Yacht Club with a quiet location and the entire aerial suspended over salt water, and also from Harrington, Maine, 300 miles NE of Boston, with a Vee-beam, in a quiet country location. Special QSL's and a handsome "Award" Certificate for Firsts are available from W1BB.



5A2CV, Tobruk, is an RAF-ARS club station, where they run a Panda Explorer as transmitter, with a Radiovision Commander receiver. Bands worked are 40-10 metres, CW and phone, and the 5A2CV boys are always glad of a call from U.K. stations. This winter, they hope to be on 1,825 kc with a half-wave aerial positioned for Top Band working in this direction. For those fortunate enough to QSO, it will be a new country and another continent.

Activity is also promised from W1IGU (after having been off Top Band for 25 years); VE2AZI (ex-G3GGN); VP3AD; and most of the regular W/VE stations. PJ2CK will be listening and reporting, as will KH6IJ, who is studying in Massachusetts. ZL3RB will be resuming his skeds with W6KIP, and numerous W6's and 7's will also be active. Given the right conditions, who knows?

Top Band in "CQ" Contest

During the CW section of the *CQ* Contest, November 28-30, we are told that VE2WW will be on the 160-metre band with two operators. They will be on 1805 kc each night for a short period starting at 0600 GMT. Not much hope of working them, because all the W/VE stations will be after them for an extra multiplier, but SWL's may like to check their Top-Band efficiency, and any specially keen DX'ers on this band who are not entering for the contest will probably be on parade.

GDX and WABC

GM3AVA (Larbert) returned to Top Band last May, after a long absence, and has worked 74 countries on phone since then. He has 72 of them confirmed, and finds most stations very helpful over QSL's when one explains that a certificate is at stake.

G3MWG (Mill Hill) has claimed his WABC and wants only about five counties for a repeat on phone. He set out to do this within a year of being licensed, and managed to make the CW section within the deadline. And G3FS (Sidcup) writes that he managed his phone WABC in exactly six months, the aerial being a 200-ft. length of 26 SWG, coupled through an ATU.

G6QN (London, S.W.19) now scores 60/74 and will be claiming WABC any moment. His work with the "33-ft. piece of string" has aroused a lot of interest, and he says that it is definitely better than some of the contraptions like "150 feet folded back on itself." It is fed from a conventional pi-circuit, with 20 turns of series loading.

G3NKH joins the Ladder, and was pleased to snag Rutland (G3IDX/A); he has found conditions good during the late afternoons, using a half-wave wire about 35 feet high. G3MCY (Tangmere) says that the Rutland expedition run by G3IDX, 3JLO and himself was a great success, and convinced the three operators that *good* manners were the order

of the day, on this band, at any rate. Working was such a pleasure that they hope to plan a sortie into Huntingdon soon. The Rutland cards have been sent, *via* the Bureau, but if anyone wants a direct QSL, G3MCY will oblige.

Another successful Top Band expedition — of which advance notice was given here last month — was pulled off in Armagh by GI6TK, 3AV, 3JEX and 3LFH; they made over 100 contacts in 40 counties (six prefixes!) The site was 800 feet a.s.l. and the aerial farm comprised two half-waves at right-angles and a vertical quarter-wave. Both CW and phone were used. Readers are asked to note that GI3NKO is in Fermanagh and also /A in Tyrone, so only Armagh is left with no permanent activity.

G3KOR (Liverpool) wants to thank the stalwarts who run /P stations, especially G3IQO and G3KLZ, who have provided lots of new ones. G3IQO is a little behind with QSL's, but they will all be attended to.

G3FPQ learnt from UA9CM that Russian amateurs are no longer licensed for the band—a bit disappointing for those who were hoping to get them this winter. G2VV, having had a bind last month about CW at the HF end, is now horrified to find phone almost covering the LF end! Well, if a complete change-over can be painlessly arranged, it will be a pleasant novelty . . .

In the GDX category, G2NJ mentions G4RJ/P, Scilly, working G's during *daylight* on October 10, when conditions were particularly good on Top Band. G2NJ also worked GI3JEX/P, GM3IQO/P for Kirkcudbright, and G3FAU/P and G3JLO/A, both for Rutland.

News from Overseas

VP6WD (St. Michael) has nearly finished a new linear amplifier and is hoping for plenty of DX, although conditions have been bad out there for the summer months. Their time factor is such that Asia is hard to work unless you sit up until about 3 a.m. local time. Mac sends one of his airletter-cum-QSL's, previously referred to. —*See* p.246, September.

UR2BU (Tartu) tells us that he understands some G's to be short of a QSL from UR2. Karl says he has already QSL'd 100 per cent., but will be glad to send duplicates on application.

MP4QAO (Umm-Said) is active on 28, 21, 14 and 7 mc with 120 watts of CW and Phone; he also works 14090 CW and 14300 kc phone from his other QTH's, MP4TAE and MP4MAB, mainly between 0900 and 1400 GMT. On 7 mc he has worked 58 countries on CW and twenty on phone, and hears G's from 1800 onwards most nights, but they all seem to be working Europeans and not listening for DX calling them. He has also heard G's on 3·5 mc and *Top Band*, and will put up a dipole for each band if the activity warrants it. Meanwhile, he is still trying for YI and 4W permits.

RTTY Activity

G3CQE (Norwich) has broken new ground by working VE7KX and some W's on RTTY! As he says, he has only just broken the barrier, and more news will be coming soon. The W's were worked on 21 and 7 mc—the first one on 7 mc thought he was being hoaxed . . . G3CQE also had "half an RTTY QSO" with VK3KF, and has worked G2UK on 3600 kc—all these contacts are almost certainly "firsts." All amateur RTTY stations commence and sign off with straight CW; there are 6000 active ones in the U.S.A., normally using 21090, 14340 and 7140 kc.

G3CQE writes: "With the facilities I now have for checking commercial teletype stations, I am disgusted at the power and frequency-space wasted by them. 'Quick brown foxes jump over lazy dogs' for hours on end with no traffic at all. If we also think of the broadcasting and the jamming that goes with it, we, as amateurs, could morally claim about ten times the ether space we have now." Meanwhile, all credit to him for yet another piece of pioneering.

The SSB Side

We have quite a number of regular contributors using SSB for all their phone contacts, and many more rigs a-building. It is interesting, too, to note that G3NOF says that although he only operates AM, he works many SSB stations. A notable sideline is that if you work one SSB station, many others are likely to chip in, and you find a widely-flung DX net going in no time at all.

Monaco Story

G3FPK and G3IEW arrived in

Station of I1IT, Florence. This photograph was taken by SWL Paterson, G-L018, on a recent visit. He reports that I1IT runs 150 watts in the transmitter and has a 12-valve communications receiver, all home-constructed. Aerials are a 20-metre Zepp, a dipole for 15 metres, and two-element rotary beams for 10 and 20 metres.

3A2-land on September 27, and started up the same evening, using 3A2BT and 3A2BB respectively (Monaco calls are now being cancelled and some of the earlier ones re-issued). Conditions were not as good as last year, but G3FPK has now worked 75 countries from 3A2, and this time he made 602 contacts, 3A2BB making nearly 500.

European operating, in particular, was bad, many stations having to be told that they wouldn't get a QSO until they behaved themselves. Some of the G stations, says G3FPK, were not much better! The Monaco power station has been re-equipped and the mains volts now stay around 125, Variacs no longer being necessary.

3A2AH has just about finished a new SSB rig . . . 3A2BF and his wife, 2BY, are active . . . 3A2AJ works in the Power House . . . many others have built transmitters, although they haven't yet got call-signs.

WAGM Certificate

The WAGM is sponsored by Aberdeen amateurs, who are finding that chasers experience difficulty in unearthing the necessary GM2, 4, 5, 6 and 8 call-signs. They pass on the word that there should be plenty of GM activity from December 31 to January 3 inclusive (New Year's Day falls on a Friday this year). The Aberdeen group also asks any of the "rarer" Scottish stations to co-operate, especially during that period.

Late Flashes

Some DX Shorts from SWL P. Day (Sheffield): FK8AU, daily on 21180 kc at 0900 GMT; KC6JA on 21200 kc phone, around 1500-1700 . . . Joe Anson, Koror Island, Palau Group, West Carolines; HB9QP/CR8, 14305 kc SSB at 1530 GMT; YA1AO, 28 mc, noon; FU8AC (21250 and 21180 kc), 0900, often works FK8AU.

RAEM says there are *no* amateurs on Wrangel Island, but UAØBD is at Severnja Zemlya Sound, and UAØKYA is in Kizil City, *Zone 23*—both on 14 mc . . . VS4JT hopes to operate from VS5 and ZC5—the first by the time you read this, the second around February 20 . . . JA1ACB is planning operation from Marcus Island (about half-way between JA and KW6). It might well be a new one. Probable date, January 15 for three or four days only.

FK8AU might be on from Wallis Is., FW8, during January . . . CE9AF is at General O'Higgins Base, Graham Land . . . UAØKIA is at Magadan, about as far to the east of Northern Russia as one can get . . . OX3RH is 300 miles north of the Arctic Circle on the East Greenland Coast . . . VE8DM gives his position as 66°N., 108°W.—also pretty remote . . . K9TNM/MM is on the s.s. *American Mariner*.

Another Big DX-pedition

W4BPD has at last released plans of what might be *the* big DX event of 1960. The itinerary looks like this: South Carolina—New York — Lisbon — Madrid — Guinea — Liberia — Ghana — Sao Thomé—Belgian Congo—Uganda —Kenya—Tanganyika — Zanzibar —Aldabras—Cosmoledo Islands—St. Pierre—Providence—Farquhar Island—Isles Glorieuses—Tromelins. And on the return trip: Ethiopa — British Somaliland — Socotra — French Somaliland — Saudi Arabia—Yemen—two neutral territories each side of Kuwait — Egypt — Lebanon — Syria and home. The whole trip will take about three months, starting date being around March 1. Watch this space for further details!

"CQ" DX Contest

Don't forget the dates for the CW section of this world-wide affair—November 28, 0200 GMT to November 30, same time. Full rules on p.307 of our October issue. A large U.K. entry is expected, in several of the categories, including multi-operator.

Heading Photograph

XZ2AD, of Rangoon, pictured in his neat and up-to-date station, now runs Collins SSB equipment. But his experience goes back to the days of bright-emitter valves, ebonite handles and cardboard coil formers. For those who may remember, his call-signs have been, successively, AI2AC, VU2AC and now XZ2AD. We are always glad to welcome to this feature old timers with a story like that!

And so to the close of another Commentary. This has been a rather "meaty" one and we must apologise to writers of long letters whose comments appear only as short notes—also to others whose news has been incorporated in the general chat. Acknowledgments, as always, to W1BB, to the W4KVX *DX Bulletin*, the *WGDXC*, and to the many correspondents, including SWL's, whose odd scraps of information all go into the main accumulation of news and gossip.

Next month's deadline is **first post on Friday, November 13,** so please sit down *now* and write. Address it all to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Until next month, 73, Good Hunting and — BCNU.

COMMAND RECEIVERS AS DOUBLE SUPERHETS

POSSIBLE MODIFICATION PROCEDURE DESCRIBED

C. Cox (G3LDB)

WHILST engaged in the design of a suitable receiver the author was faced by several problems, each peculiar to the individual design requirements. It was intended to build a triple-superhet to cover the 80-10 metre amateur bands, and to get at least another two S-points on DX signals.

Several circuits were designed, contemplated and modified. The final version was to be a crystal-controlled front end, with its 4 mc IF output tuned over 4-6 mc for the 10-metre band. It was decided to build the back-end first, and get this going before proceeding with anything else. Many ingenious and equally unworkable arrangements were thought about, and then the usual lazy-and-easy-way-out thought came. Why not use the BC-454? *But it's not a double-superhet.* Make it one. *How?* The point was discussed among friends, and the idea was almost abandoned after hearing expressions such as "conversion conductance" and "equivalent noise resistance." Then it was remembered that G9BF had done it using all 6H6's—and what G9BF could do, the author could do better !

Why not use the BFO can from the BC-454 as a fixed local oscillator, tuned either above or below the 1415 kc IF produced by the BC-454, and thus get 85 kc for the BC-453 IF transformers which could be used just by substitution ?

So destruction and construction were started. The BC-454 had been converted as described for the Q5'er in the November 1956 issue of SHORT WAVE MAGAZINE (noting that the junction C7a and C10b should be earthed, and the lead deleted from the bottom end of C28 to earth).

Making the Modifications

Then the first and second IF cans from a Q5'er were plugged into the place of the second and third IF's of the BC-454. The BFO can was removed from its place, and the can from the Q5'er substituted, together with its lead from the anode of V7 and the resistors connected to the other two tags, and soldered in. The 15 μF condenser above V5 base is removed and a 25 μF tubular type, earthed at one end, is substituted. The 3 × ·05 μF capacitor pack above the first IF can is removed, and ·05 μF single condensers soldered in place. This is done to provide space for the BFO can from the BC-454 which is now fitted, together with its two associated resistors and condenser.

The following connections are then made to the first IF valve V5, which will now become the second frequency changer, using another 12K8: remove lead from pin 5 and connect to pin 8. Earth the other end of the resistor connected to this lead, and cut away the wire joined to it, as this goes to the gain control line. The lead to pin 4 is removed entirely, and a hole cut into the first IF can for a lead with a top cap attached, which is taken through the hole to the grid end of the IF transformer. The lead to pin 8 is connected to pin 3, and the lead on pin 6 taken to pin 4. The strap between pins 3 and 5 is removed. The BC-454 BFO can is now placed just above the first IF can, with its three tags vertical and nearest the valve base of V5. The resistor on the bottom tag is now taken across to the red lead on the 3 × ·05 μF condenser pack on the other side of the chassis to pick up HT. The centre lead of the BFO can with its resistor and condenser is taken to pin 5 of V5, and the top lead taken to pin 6. A 3 $\mu\mu$F capacity is connected from pin 6 to earth, and a 30 $\mu\mu$F condenser soldered across the two end tags of the BFO can. It may be found necessary to remove the bank of four resistors near V5 in order to make room for the BFO can, but this is easily accomplished by connecting them to their respective points on the valve and IF can bases.

The result should be a double superhet, covering 3-6 mc, with a first IF of 1,415 kc and a second IF of 85 kc, giving excellent performance after it has been lined up, in accordance with normal superhet practice.

The writer has also converted the Top Band version of the BC receiver to this system, with very satisfactory results.

The BC-454 at G3LDB is used as the tunable IF with a crystal controlled RF-24 unit, making it a triple conversion job, which is superior to the RF-24/BC-342 combination previously used, giving greater selectivity. It is intended later to add the other IF can from the Q5'er mounted on the back of the '454 where the dynamotor used to be.

Anyway, all that's needed for the arrangement described here is a BC-454, two IF cans and a BFO can from the Q5'er, a 12K8 and one or two condensers—and some patience. Why not try it and see the difference ? It's certainly inexpensive !

THE MOBILE SCENE

With that wonderful summer now no more than a memory, mobile activity in the sense of rallies and long journeys for the sake of making /M contacts are over until the spring. However, this is the time when keen mobile operators will be improving on their equipment and thinking about new gear for next year's Rally season. And, in that connection, it is to be expected that there will be much more mobile activity on the HF bands, particularly 10 and 15 metres, with Eighty popular for working round the U.K. There is really no reason, in the present state of the art and with so much excellent commercial gear available, why (nearly) everybody should operate mobile on Top Band. It is in some respects easier to get going on the HF bands, and the ranges to be expected are certainly much greater.

However, as regards GDX, arising from the note on p.266 of the September issue of SHORT WAVE MAGAZINE, mentioning G3EKX's /M contact on 160 metres with GD3HQR, we have a report from

G6NW/M (Hayes, Middx.). On August 31, he and G2CDN/M at St. Ives, Cornwall, had a Top Band QSO at RS-57 both ways, while *in motion*, the path distance being 235 miles! It seems that both G2CDN and G6NW, while operating mobile, have many times worked to distances well over 100 miles on 160 metres.

Following are some additions to the Mobile Register: G2ADR, Acomb, York *(Ford Zephyr PPY-680, 10-80m, inclusive, 60w.)*; G2HKU, Sheerness, Kent *(160m., Austin A30 HRV-401)*; G3BGW, Newmarket, Suffolk *(160m., Hillman Husky NER-657)*; G3KQF, Derby *(160m., Austin Ten RC-4508)*; and G3NMR, Ilford, Essex *(10-160m. inclusive, Ford Thames 12-str. Estate WYU-862)*.

THE RADIO AMATEURS' EXAMINATION

A report on the May 1959 R.A.E. appeared on p.301 of the October issue of SHORT WAVE MAGAZINE, from which it will be seen that too many candidates did not appreciate the importance of being able to answer properly the compulsory questions on licence conditions. There is no real excuse for this, as full details on what is known as the Amateur (Sound) Licence can be obtained on application to: Radio Services Dept., Radio Branch, Headquarters General Post Office, London, E.C.1. Ask at the same time for their pamphlet, *How to Become a Radio Amateur*.

For the Examination itself, the City & Guilds of London Institute, 76, Portland Place, London, W.1, will supply a list of recommended books for reading for the R.A.E., most of which should be obtainable through the local library service. A very good book which contains all the essential reading for the technical part of the Examination is the *Radio Amateur's Handbook*. Though it is American, it has been the standard guide to the subject for well over a quarter of a century — and, of course, the fundamental principles and the techniques of Amateur Radio are the same in any language. The *Radio Amateur's Handbook*, in its latest edition, is available from us at 34s. post free, and is an invaluable source of reference on all aspects of radio in the amateur context.

As regards the syllabus for the R.A.E. and copies of past question papers, these can be obtained from the City & Guilds (address as given) at 1s. for the syllabus and 6d. each for the question papers for the last three years; be sure to quote "Subject No. 55 — Radio Amateur's Examination" when applying.

COURSES FOR THE R.A.E.

Further to the courses already notified, we have been asked to publish the following:

Chingford (London): At the Senior Evening Institute, County High School, Nevin Drive, Chingford, E.4, on Mondays, 7.30-9.30 p.m. Classes have started but additional enrolments can be accepted on application to the principal.

Liverpool: At the Riverside Technical College, Riversdale Road, Aigburth, on Mondays and Thursdays, 7.00 to 9.30 p.m., with GW8PG as instructor. Enrol at the college on those nights.

London (Holloway): The courses organised by the Grafton Radio Society—*see* p.267 September issue —have enrolled a total of no less than 72 students for the three evenings; the Monday session is now full, but a few more can be taken for the Tuesday and Wednesday evenings. Apply to G2CJN as soon as possible.

Weston-S-Mare: At the Technical College & School of Art, Lower Church Road; R.A.E. technology (Mondays, 7-9 p.m.) and Morse (Wednesdays, 7-9 p.m.). Enrolment by application at the College.

Wigan: At the Technical College: Morse (Wednesdays, 7-9 p.m.) and R.A.E. theory (Thursdays, 7-9 p.m.). Modern amateur-band equipment available for demonstration, under call-signs G3MOS. Apply to the Physics Dept.

The Redifon Type GR.286 VHF/FM radio-telephone equipment has become an outstanding success in the marine communication field, and is now a standard fit in ships of the Castle and Clan Lines, and in tankers of the major oil companies. The transmitter frequency-coverage is 156.05-157.40 mc, on 18 channels, crystal controlled. The corresponding receiver section is a crystal-controlled double superhet with a first IF of 10.6 mc and second of 450 kc.

RAMBLINGS ON CODE

PHONE MEN MAY READ THIS, TOO!

S. G. Mercer (G2DPY)

THE spur that urged the writer to learn code, at eleven years of age, was an early effort at a short wave receiver. This was a "miniaturised" 0-V-0 nestling in a full-sized biscuit tin which—in spite of an added refinement in having its lid taken off, connected with stout wire to the "chassis" and placed on the operator's seat—suffered grievously from hand-capacity.

In youthful innocence it was assumed that the object of the metal chassis and cabinet was to clear this curse. There followed experiments in pruning, a few inches at a time, 30 feet or so of earth wire; extension controls on the tuning and reaction condensers; and the use of rubber gloves! In spite of it all, the hand-capacity persisted and the log was maintained in circumstances of excruciating difficulty.

The reward for telling the QSL recipient that the "weather was cloudy, temperature 56° Fahrenheit, wind strong, SW," etc., *plus* the fact that he was calling "Test," usually resulted in about 10% QSL return. Upon looking back, this poor reward is not surprising!

One day, the idea struck that as earsplitting whistles could be produced with the greatest of ease, and, that to get the reaction condenser "just below the point of oscillation" was extremely difficult, a much more enjoyable time and fuller reward could be obtained by copying CW signals.

The *Boy Scouts' Diary* was consulted and with great enthusiasm the Morse Code was attacked from its beginnings. Conventional methods were dispensed with; a book was read paragraph by paragraph in *dits* and *dahs* with, at first, frequent references to the diary. A week or two of this brought gratifying progress and amateur CW calls were logged. Commercials, too, after listening to lengthy callsign sequences.

As proficiency was acquired, the game of short-wave listening became much more interesting—unbelievably so, and the QSL return improved tremendously, as every SWL who has learnt Morse will have found. Before leaving the subject, it might be mentioned that it was *ten years* before any attempt was made to send a single dot on a real key!

Code Characteristics

One can invariably recognise an operator by his style, even though he uses a keyer. There is something about a chap's initial idea of Morse that will persist no matter what he uses, almost. Other curious things strike one about code operating. On occasions, a fast but rhythmic operator has been answered in his own style. He has really lapped it up and obviously thought it the real stuff! Hearing someone with a similar style, that operator is credited with being in the top flight!

It is believed that two good CW operators, using abbreviations, can get through more conversation in less time than *most* phone operators. (Rule out those interesting SSB types on duplex at the top ends of the bands—they are mostly converted CW operators, anyway.)

Are there any rules for abbreviations? One sometimes sees a set at the end of books on operating. Where an abbreviation is unmistakable, use it, especially with the longer words. Groups like *bn, hvg, tmw, am* (for morning) are just a few examples that used in context are obvious. The conversion to abbreviations in one's head and the transference into code takes place automatically with experience.

Pleasure on the Key

Full duplex operating—when it was possible on the amateur bands—is a real delight to the CW man. Sending traffic with true break-in—just a *dit* and back he comes. So many aspects of key work give one pleasure.

What is most pleasing, although strictly "not done" nowadays, is to send fast with a real T8-minus rasper! Sounds fine. The writer remembers once operating, out East, a large push-pull brute force oscillator Tx, run from a dynamotor, with no smoothing worth the name; this job pushed out a rippling blast that cleared megacycles on either side—reaching Jubbalpore with undiminished intensity at all times. This keyed beautifully and would thrill one with the beauty of its mighty pulsation!

No article on CW operation could be complete without reference to "types." The writer has always found the I's on semi-automatics very interesting! The Scandinavians and many W's are the most fluent. Some well-known amateurs are always baffling when on the key—one cannot claim to be able to "read anything" because it is impossible to read *them*!

The writer is not of a demanding nature and has always been happy to read whatever version of the code the other chap sends. If it is readable, then it is nice to work him. Is there any need for perfection? No, of course not. It takes all sorts to make a world and who is one amateur or another to say that this style or that *must* be best. If it is too bad, the operator just will not make contacts. If it is reasonable, he will. Either way, so long as he is content, good luck to him.

One works many amateurs nowadays who say quite frankly that they learnt enough code to pass the test and promptly forgot it afterwards. No doubt in years to come there will be a noticeable lessening of fluent CW operators. It is perhaps in evidence now.

Part of the writer's job is to take down a string of figures by landline phone. It has been noticed that writing down three or four groups behind, it is very, very rarely necessary to ask for a repeat. The account of Ted McElroy, some 20 odd years ago, winning a Morse reception contest at 79 w.p.m. is always remembered. It started something like this: "The Morse flowed out at 40 w.p.m. There was deep silence for a few seconds and then the typewriters began to click." One could imagine those contestants kicking off about four words or more behind and no doubt McElroy was the last to start.

SWL • • • • • •

NEWS AND OPINIONS — PLACE OF THE SWL IN AMATEUR RADIO — USEFUL ADDITIONS TO THE SWL STATION — QUESTIONNAIRE FOR READERS

IT is very pleasing to the compilers of this feature to find more and more variety in readers' letters, and to note how many SWL's there are whose ambitions are not confined to the number of countries they can hear, or the QSL's they can collect.

G. Curtis (South Harrow) is quite an old hand at the game, and he laments the rather unfriendly relations that exist between the transmitting and receiving men in certain quarters. As he says, when the transmitting fraternity ask "What use are SWL's?" the latter could easily reply "And what use are those transmitters who clutter up the band with meaningless AAA's, clottish procedure and self-conscious, childish talk?" But no — the thing to do is to reduce the tension rather than increase it. G.C. continues: "I, for one, can never thank the transmitting fraternity enough for the pure joy they provide with their DX-peditions, rare call-signs, useful information and all their usual activities. Many *serious* listeners obtain so much fun from merely listening, hunting the rare ones, winkling out the gen. on future activities and so on, that they have very little time for anything else." And he adds that many of them are potentially better operators than some of the men behind the key or the microphone — which is perfectly true.

Incidentally, most of the tip-top operators of today *did* serve their apprenticeship as SWL's. No doubt they were pretty good at that, too. It has long been axiomatic that the competent SWL makes the best transmitting amateur — that has been true since the earliest days.

The fact of the matter is that the really keen and knowledgeable SWL's of today can be of great assistance to the transmitting fraternity; furthermore, their efforts *are* usually appreciated. We happen to know, by the way, that *G. P. Watts (Norwich)* can claim 271 countries heard *and confirmed*. Take it from us, you can't get all those QSL's back without sending a report that is of definite interest; some of the rare phone stations have literally tens of thousands of QSL's to cope with, and they certainly wouldn't waste time over the "Heard you 5 & 7, Pse QSL" type of SWL report.

Then we have a very interesting story from *Edgar Paterson, G-L018 (Hatch End, Middx.)* writing of his summer-holiday trip to Italy where, in Florence, he had the good fortune to meet I1IT, who made G-L018 and his XYL as welcome as if they had been old friends. The original plan was to visit Palermo, IT1TAI, and Malta, ZB1G, from whom G-L018 already had invitations, but their arrangements had to be altered because of a local shipping strike! However, the reception they got from I1IT made up for this — in addition to much kindness and hospitality, they were able to go on the air from his very fine station, which is all-home-built, including the 12-valve double-conversion superhet.

Test Schedule Bureau

Co-operation between transmitter and receiver is also the theme of a long letter from J. J. Sowerby (Stafford), who has been a listener for 39 years! He suggests an interesting scheme: He would like us to set up a bureau which would arrange schedules with transmitters all over the world. Stations agreeing to transmit on a certain time and frequency would have their schedules published in SHORT WAVE MAGAZINE, and SWL's would then send off very full reports in a previously-agreed form, giving all possible details of their own equipment and of the results of their reception of the special transmission.

This "synchronised mass listening" (for it is intended that there should only be a few special schedules each week-end) could produce some very interesting gen. for the transmitters taking part, and could also be the basis of some sharp competition between the SWL's at the listening end.

It seems to us an interesting and practical scheme, but it certainly wants thinking over and working out in detail. Meanwhile, we would like readers' views on the subject. This is not the sort of project which is worth entering into unless the right sort of co-operation is assured.

SWL Mobiles

P. Day (Sheffield) asked in our September instalment whether any other SWL's "went mobile." This has brought a reply from *J. O. Challis (Leigh-on-Sea)*, who goes one better and operates "/MM" (Maritime Mobile) from a 23-ft. auxiliary cutter. He has a receiver for Top Band and 80 metres on board, using the rigging as an aerial, and does most of his listening in the Thames Estuary.

D. Barnett (Nottingham) writes to say that he has been working mobile with an 18 Set, rebuilt in a new casing; the aerial is a twelve-foot whip fixed to the luggage-rack of the car. Most of his work with this was done on 40 metres.

Don't overlook the fact that transmitters with mobile equipment also have to be pretty efficient listeners as well! One often hears contacts across half the world, both ends being mobile *and* on the move; an equivalent performance for a Mobile SWL would, of course, be for him to log a DX *mobile* transmission while on the move himself. That is the goal to aim at, as far as efficiency is concerned.

SWL Overseas

Geoff Greville writes from no less exotic a spot than *Port Moresby, Papua*, where he finds short-wave listening pretty interesting. His radio memories go back to the days of Capt. P. P. Eckersley (pre-B.B.C.!) and as a small boy he was taken to see the famous Signor Marconi, although, as he says, it had very little effect upon him at the time!

He was the first person in Port Moresby to pick

up the SOS from the *Yasme*, when Danny Weil lost his boat between Australia and New Guinea. From then onwards he has been going all out to improve his knowledge and experience, and hopes to possess a VK9 call-sign one day. Meanwhile, his R.208 covers 10-40 mc, a '522 does duty on 144 mc, and a transistorised portable is used on the 1·8, 3·5 and 7 mc bands.

Difference of Opinion

Many of our regular readers stress the point that they, as SWL's, do not in any way envy the transmitting fraternity, and that they think that being a good SWL is an end in itself. On the other hand, there is a strong body of opinion on the opposite side, and speaking for them now is *J. M. Nisbet (South Croydon)*, who writes: "*Of course*, the SWL is a potential transmitter, and the sooner he is taught theory and the operating codes, the better for him and the bands he might one day use."

He finds the task of covering the R.A.E. syllabus from books only is rather difficult, and says that most areas have an evening institute, where, if there is sufficient demand, an R.A.E. course will be laid on. And where does the demand come from? Why, the SWL's—naturally. Usually through the medium of the local radio club or clubs. We have often stressed the value of belonging to a club, and need not repeat it here.

Aerial Problems

Many readers underline the fact that the average SWL is not too well placed for the erection of aerials which will work according to the book. Most of them are compromises and some have to be downright fakes. An article on this subject is requested, and we will do our best to describe, in the next instalment, some useful but compact aerials, suitable for dwellers in flats and "digs." Meanwhile, we should welcome details of successful ones from any of our readers who are using them.

Shorts

P. Waters (Hornchurch) uses an 0-V-1 and an R.107; for the latter he is going to build a converter to cover 15, 10 and 2 metres. His aerials are a 100-ft. wire for the LF bands, a 20-metre dipole and a V-beam (no details). *P. M. Crawford (Darlington)* tells us he uses an S.750 with a 33-ft. Windom aerial, along with the usual ancillaries, and has been finding some good DX on 28 and 21 mc.

P. A. Roberts (Poole) runs an R.107 with a 120-ft. wire, and hopes to add an RF-24 unit in due course. *C. N. Rafarel (also in Poole)* is settling down in his new QTH, but only has a 14-mc dipole strung from a garage roof to the eaves of a bungalow. He hopes to erect some decent-sized poles before long and resume business in full swing. Meanwhile, he has logged some excellent DX on 14, 21 and 28 mc, including the Seychelles expedition, VQ9ERR.

R. Marshall (Sale) persuaded the men re-roofing the house to attach one end of his aerial to the chimney; the GPO played ball with the other end on a telephone pole. The result—A1, he says, and the DX is rolling in as never before. His list of 21 mc calls more or less proves it, and he no longer marvels at some of the DX heard by other readers—he gets it for himself!

R.1155 Tip

E. Willox (Aberdeen) noticed a recent reference to the adjustment of the R.1155 BFO by means of a screwdriver. He decided to go one better and managed to fit a knob on the thing. This was achieved by using the spindle of an old solid-dielectric variable condenser, which was of two diameters. The narrow end fitted into the "BFO Adjust" hole, and the end was cut and filed to fit the slot on the BFO condenser; the spindle was held in position by the locking ring (also from the junk condenser); and a knob was fitted on the outside.

E.W. goes on to tell of his history as an SWL, which started with a crystal set, 0-V-0, 0-V-1, small battery set and then the R.1155. Next step was an R.208, but this has now been dismantled. A CR-100 has since been added to the family. All the gear is nicely mounted in a home-made wooden rack, with hardboard front panel giving sloping fronts to the two receivers. Aerials are a 10-metre dipole and a 70-ft. wire. Both amateur and broadcast bands are covered, but E.W. only sends reports to *broadcast* stations. Unusual!

Converters — a Flashback

We have to thank three or four readers, and particularly G3JZK (Cambridge) for comments on the article on Converters in the September issue. G3JZK makes the following points, and corrects a few ambiguities and inaccuracies which appeared. First, when a crystal oscillator is used on an overtone, nothing emerges at the fundamental frequency. In Fig. 2, p.257, this is *not* the case, and all harmonics are audible.

The circuit in Fig. 3, p.258, *is* of the overtone type, giving odd multiples of the crystal frequency with no qualifications. However, the variable condenser C7 should be shown *directly* across the coil L4, leaving the crystal between the common point and the grid of the V2 triode. You may also have noticed the comment about this circuit on p.301 of the October issue—if your crystal is "sticky," return R6 to the junction of R5, C6.

In the next article on Converters we will really go into this business of fundamental and overtone oscillators in more detail, as there is a good deal of misapprehension on the subject.

G3JZK also comments that the 6J6 is not the best of valves to use in a cathode-coupled RF stage, since that valve was originally intended as a VHF oscillator, and becomes one at the slightest opportunity. A 12AT7, as he says, is a wiser, but more expensive choice.

"THE EXTRAS"

We well remember, in our early days of owning a transmitting licence, how a friend from distant parts said he was very anxious to come and see "the station." He asked what it consisted of, and we

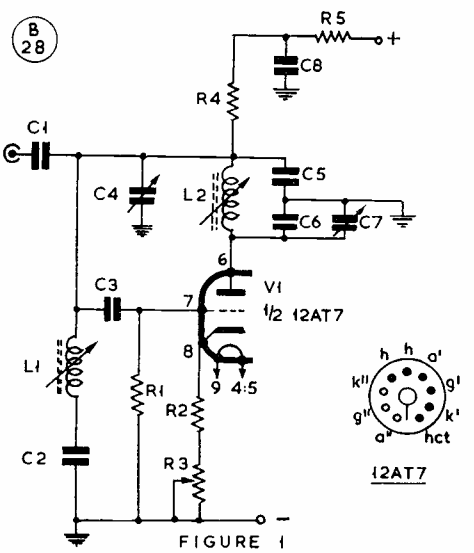


Fig. 1. The basic circuit of a Q-Multiplier. With full switching, this device can appear very complex on paper, but this simplified diagram shows a Q-Multiplier suitable for peaking signals only, without also giving the "match" facility, which requires another valve.

Table of Values

Fig. 1. Basic Q-Multiplier Circuit

C1, C2,		R2	8,000 ohms
C8	.005 μF	R3	10,000 ohms, variable
C3	500 μμF		
C4	10 μμF, variable	R4	47,000 ohms
C5	.003 μF	R5	10,000 ohms
C6	.001 μF	L1	1.5/3.0 mH
C7	100 μμF, variable	L2	120-150 μH
R1	2.2 megohms	V1	½ 12AX7

replied: "Just a transmitter and a receiver." Without using the actual words, it was obvious that his opinion was "How dull!"

Even more dull it must be, then, for a "Short-Wave Receiving Station" (impressive title) to consist of just a *receiver!* True, that is all that is necessary, together with the know-how, to hear amateur transmissions from every active country in the world. But there are so many "extras" that one can build, buy, or just think up on one's own, that we decided to devote a few columns to this subject. If you are the serious-minded type, you can call them "ancillary equipment"; if you take your hobby light-heartedly, they will become "gadgets." Either way, there are many of them available, and they all make for better listening or more enjoyable operation.

We can't possibly list them in order of importance, since that is so much a matter of opinion; but it is left to readers to choose from the goods offered and to decide for themselves which they ought to ask for in the Christmas stocking.

Frequency Meters

Unless your receiver has been very accurately calibrated in the first place, it is an advantage to know the exact frequency of any particularly interesting station that you hear. A heterodyne frequency-meter is the piece of equipment needed for doing this job, and, basically, it consists simply of a valve oscillator with a wide tuning range.

It must be an extremely stable oscillator, obviously, and this dictates the circuitry, the stability of the power supply, and the mechanical construction of the whole thing. If you build one yourself, you will still have to borrow a good one in order to calibrate your own with sufficient accuracy.

Eventually we hope to develop this theme and devote a whole article to a home-built frequency meter. Meanwhile, we can only refer you to the Readers' Small Advertisements, where you will find frequent offerings of the LM7, LM14, Class-D Wavemeter and the BC-221. The latter is the "classic" frequency meter, built like a battleship and supplied with the most detailed calibration charts, but it cannot be acquired these days for much under £20. (In 1947 people were turning them down at less than half that price, but their value has now been realised.)

The method of operation of all heterodyne frequency-meters is the same: Tune the meter until its oscillator beats with the signal you are listening to, adjust carefully to zero-beat, and read the exact frequency off the calibration chart.

S W L • • • • • • •

continued

The "Q-Multiplier"

It is clear from readers' letters that almost everyone has heard of the "Q-Multiplier," but that very few know what it really is. It is a means of producing real "crystal-gate" selectivity from a receiver that has no crystal gate. Basically, it consists of an extremely sharply-tuning circuit (in other words, one with a very high Q), which can be connected in parallel with the first IF transformer in your receiver. It employs a coil with a Q of 200 or more, and by means of positive feedback from a regenerative circuit across the coil, this is increased to an "apparent Q" of 4000 or even more than that. The coil is tunable, and its extremely sharp resonant frequency can be moved from side to side across the response curve of your relatively flat IF transformer to give vastly improved selectivity and additional gain.

Fig. 1 shows the circuit in simplified form. L2 is the high-Q coil, connected in a Colpitt's oscillator circuit across the anode and grid of V1. The valve is brought up just short of the oscillation point by the cathode control R3, and the grid circuit of the valve is connected across your IF transformer by a length of co-ax, the inner connected to C1, the input condenser, and the outer to earth. The coil and condenser L1, C2 are used to tune out the capacity of the co-ax, to avoid detuning the receiver IF. C4 is the fine tuning condenser on the front panel.

In the simplified circuit, as shown, V1 is half of a 12AX7 or similar valve; the other half is usually

used in an additional circuit which gives a " notch " instead of a peak, and can also be tuned across your IF response curve. Thus the peak condition can be used to peak any desired signal ; but by switching the Q-Multiplier to " null," the notch can be used to *remove* any interfering signal within the response curve (as, for instance, a CW or phone station beating at some particular frequency with the phone you are trying to listen to).

The full circuit, with switching, becomes somewhat complex, but the basic one, as shown, is easily understandable. Q-Multipliers are available in kit form, and will always prove useful unless your present receiver is very, very good.

The Q-Fiver

The piece of gear that was originally known as the Q-Fiver (or " Q5'er ") was one of the first post-war efforts to simplify the problem of building a double superhet. The recipe was simple: Take a not-too-selective superhet with the conventional IF of 465 kc ; inject the IF output (before the second detector) into a new mixer-oscillator giving a beat at a much lower frequency, such as 85 kc ; amplify at this second IF of 85 kc ; and finish up with a conventional tail-end.

Almost immediately someone spotted the fact that the excellent little BC-453 receiver did the whole job, for its tuning range actually covered 465 kc. Thus one can fit a BC-453, outboard fashion, to any receiver with a 465 kc IF ; feed the IF into the BC-453 exactly as if it were an external signal ; tune the BC-453 RF stages to 465 kc ; and make use of its excellent and extremely sharp 85 kc IF.

(For the novices, the reason for using a lower IF where extra selectivity is desired is simple . . . if you want a resonance curve—let us say, 5 kc wide—it is easier to produce this at 85 kc than at 465 because 5 kc is a much greater fraction of 85 kc than it is of 465 kc—one-seventeenth compared with one-ninety-third.)

Fig. 2 shows the block diagram of a Q-Fiver, the existing receiver being cut off short after the last IF

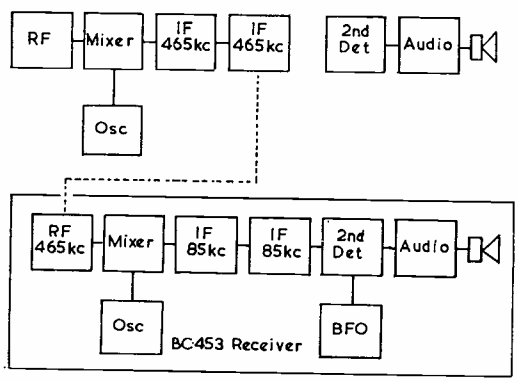


FIGURE 2

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Fig. 2. Block diagram of a " Q5'er," using a BC-453 receiver, the tuning of which is set to 465 kc. In the arrangement shown here, the rear section of the original receiver is not used.

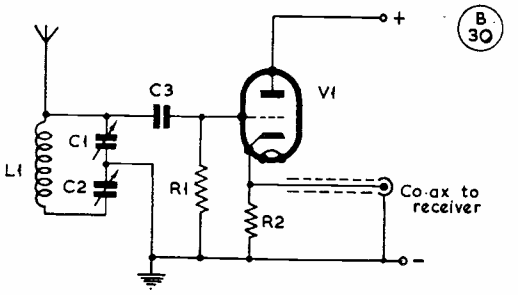


FIGURE 3

Fig. 3. A device known years ago as the " R9'er," which provides efficient aerial matching into the receiver — this alone will often lift signals two or three S-points. This version operates as a cathode follower.

Table of Values

Fig. 3. The R9'er Circuit

C1, C2 = 150 $\mu\mu$F, variable	R2 = 1,500 ohms
C3 = 300 $\mu\mu$F	V1 = (*see text*)
R1 = 1 megohm	

stage. Coupling into the BC-453 must be very loose, not much input being required. A lead from the aerial terminal of the BC-453 pushed loosely into the vicinity of the grid of the normal receiver second-detector is often all that is needed. This will not de-tune the receiver IF and will avoid any difficult modifications.

A good Q-Fiver will often work almost as a Q-Multiplier (as far as audible results are concerned), since by tuning the RF stages of the BC-453, various combinations of staggered IF can be produced. All kinds of queer shapes can be induced in the resonance curve, and we have often found it possible to tune out an unwanted signal simply by adjusting the tuning control of the BC-453 (very sharply, of course).

The R-Niner

A device for which spectacular results were claimed, soon after the war, was known as the R-Niner (or " R9'er "). This consisted merely of a device for matching the aerial input to that of the receiver, and was, basically, the kind of thing we described in this feature on p.32 of the March, 1959, issue, under " Matching the Aerial to the Receiver," but here in conjunction with a single valve.

In those early post-war days many receivers were operating with an odd length of wire hitched on to one or other of the input terminals. The mismatch was probably terrible, and any attempt to correct it resulted in a spectacular gain in signals. Many users of the device, especially on ten metres, found that it brought S5 signals up to S9 ; and so many people were still using the old " Q5 R9 " notation in those days that it became known as the R9'er. Nowadays it should be called the S9'er—and, strictly speaking, the Q5'er should become the R5'er! But the name doesn't really matter.

Fig. 3 shows a very simple form of R-Niner, with the aerial matched into a triode by means of the

SWL • • •

continued

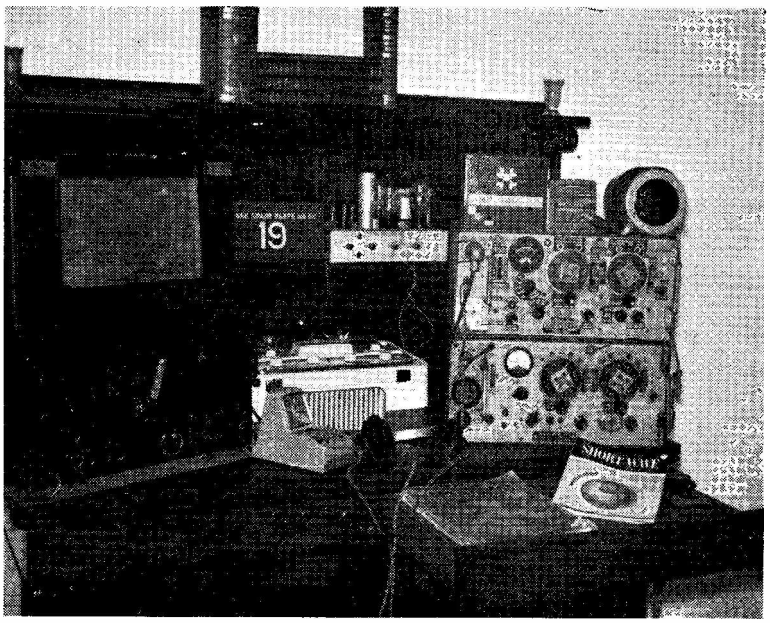
familiar circuit used in most aerial couplers, and the output taken, at low impedance, from the cathode circuit. Almost any triode with a reasonably low grid / cathode capacity will operate well. The stage will not give any voltage gain, being a cathode follower, but by improving the input matching will, of course, make a vast difference to signal noise ratio and will have the effect of giving better signals all round.

Which to Use ?

No doubt some readers are asking themselves what their shack would look like if they were to become fully equipped with all these aids to listening. With a frequency-meter, a receiver with an R-Niner ahead of it and a Q-Fiver after it, to say nothing of a Q-Multiplier wound round its middle, they will have quite a lot to look after. Separate power supplies are needed for some of these accessories, too, although the Q-Multiplier's requirements are so small that they can be derived from the receiver.

The answer to this is—how good is your present receiver? If the aerial matching is poor, you would like an R-Niner ; if its selectivity is not up to standard, either a Q-Multiplier or a Q-Fiver would help, but probably they would not both be necessary. Whatever the size and shape of the receiver, a frequency-meter is a "must" if you happen to *want* frequency-measurement of a fairly accurate standard.

Take your pick: Assess the performance of your present receiver, and work onwards from there. And we shall be mentioning, from time to time, plenty of other extra pieces which may induce you to add something more to the station. As against all this, though, remember the virtues of simplicity and don't add anything that is not going to pay for its keep and afford you solid satisfaction. In other words, it should really do a job.



Station of SWL N. Gaynor, 59 Elizabeth Street, Liverpool, 3, who has been active for 12 years and has a useful array of gear. The BC-348 is the main receiver and is fitted with an S-meter ; he also has 19 Set receivers modified for 10-160 metres, as well as a two-metre receiver. An aerial tuning unit is used on all bands. SWL Gaynor is not a QSL card collector in the ordinary sense — but he writes direct to distant stations suggesting that they acknowledge his report, which he makes as detailed as possible, at a given time over the air. He says he finds this much more interesting than card collecting. Incidentally, SWL Gaynor is 79 years of age ! He wonders if he qualifies as the "oldest active SWL."

SWL QUESTIONNAIRE

For the interest of all regular readers, we should like to present in the next instalment a little table showing certain particulars. It is *not* proposed to make this a competitive table or "ladder," but rather a summary of information to show what the successful SWL's are using these days.

If you wish to appear in the table, please fill in the following details on a post-card or a single sheet of paper, separate from any other report or correspondence, and address them to "SWL," SHORT WAVE MAGAZINE, 55 Victoria Street, London, S.W.1, posting not later than November 25.

Details required: (1) *Name and town ;* (2) Type of *receiver* used ; (3) Type of *aerial* used ; (4) Total number of countries logged on (a) *Phone Only*, (b) *Phone and CW* ; (5) Total number of countries *verified* on (a) Phone Only, (b) Phone and CW. If you don't go in for QSL'ing, leave the fifth column blank and you will still be included in the table.

The description of the receiver should also include details of any converter or extra apparatus such as Q-Fivers and so on.

Even if the publication of such a table means very little from a competitive point of view, all readers of this feature will be able to see for themselves what gear the more successful of our SWL's use, and that, in itself, is of sufficient interest to justify the publication of these simple particulars.

Correspondence from short wave listeners is welcomed for this feature, the next appearance of which is in the January issue. The closing date is Nov. 25 and all mail should be addressed: "SWL," c/o The Editor, Short Wave Magazine, 55 Victoria Street, London, S.W.1.

VHF BANDS

A. J. DEVON

Conditions Revert to Winter Levels—

Meteor Shower Results—

Station Reports, News and The Tables—

WHILE the "summer VHF season" can now be said to be over, it has left a pleasant taste, with memories of some splendid EDX openings, and the proof that the keen VHF/DX operators of many European countries can be relied upon to be there when the real opportunities occur. Indeed, not the least remarkable of the phenomena associated with EDX working is how the grape-vine is shaken, or the buzz gets round, when the openings do come! One can picture the smiling faces of the keen types as they crank-up the machinery when they get the hunch, or the wire, or whatever-it-is, that DX is on the way. The point is that they are there when the time does come.

One such occasion during the present period was on October 5, when LA/SM stations were coming through well, mainly into the northern part of the country. Among the calls noted were LA4VC, LA9T, SM6ANR, SM6BTT and SM6PU, who between them made a number of U.K. contacts.

Otherwise, the pattern of events during the last month has not been exciting. The glass kept very steady until October 9, after which the trace began to fluctuate, reaching a sudden low on the 17th, when there was a violent gale. From this date until the moment of writing, conditions have been mediocre, to say the least.

Meteor Test Results

Having made all his arrangements and fixed his schedules for October 9, Arnold of G3HBW was informed that the Giacobinids Shower was more likely to appear on the 10th—so some new skeds were hurriedly organised, making it a two-day marathon for Arnold. Then he was given a further prediction that the meteor rate, or intensity, would not be up to the level originally expected.

As G3HBW says, the latter forecast was only too right however, in spite of this disappointing outcome so far as the Giacobinids advent was concerned, some interesting and worth-while results were obtained. On the 9th, G3HBW identified I1ACT, OK2VCG and OH1NL, and was heard by OE1WJ and OE6AP/P; on the 10th, Arnold again heard OK2VCG with several good bursts, and most of his own call was identified by the OK; OH1NL also reported hearing G3HBW. SM6PU was successful in identifying G3HBW on both the 9th and 10th, and Arnold was heard on one occasion by OZ3NH. Another report is from OZ7BR, who received OH1NL.

Though no two-way contact of any sort resulted from these efforts, the results that were obtained suggest that if the meteor rate had been up to the level expected, QSO's would have been possible. After all, G3HBW did better during the Perseids appearance in August—*see* p.263 September "VHF Bands" when the density as forecast was less than for the October occurrence.

Anyhow, Arnold is to be congratulated on what he did achieve this time under unfavourable conditions; his tests not only took a good deal of organising, but also called for a considerable operating effort. And all the time he knew, from the last-minute prediction, that the chances of success were not very good.

Incidentally, as an interesting hark-back on this subject of VHF reflection by meteor scatter, one of the very first articles about it appeared in the January 1947 issue of SHORT WAVE MAGAZINE, by G5BY—who at that time was very active on VHF and had already thought about the possibilities of working real DX by this method.

Some Station Reports

On his new 4/4/4/4 J-Beam, at 60 ft., G5ML (Leamington Spa) has worked GD3UB for a new one; Freddy is building a QRO final using a pair of 4-65A's in the long-line tank configuration—he is determined to work LA, OZ and SM on two metres!

At G3BDQ (St. Leonards-on-Sea) things have been improved with a slot-fed 6/6 and a hotter front-end, consisting of a 417A and EC80 in cascode, which as a pre-amp. is proving superior to the 6AM4 arrangement. G3BDQ can now work G6OX, in the screened direction, at any time, and is also getting about 50% reliability on a schedule with

TWO METRES

COUNTIES WORKED SINCE SEPTEMBER 1, 1959

Starting Figure, 14

From Home QTH Only

Worked	Station
40	G5MA
39	G3HBW
34	G3JWQ
30	G5ML
28	G2C1W
26	GW3ATM
24	G3KPT
22	G3AYC, G3GSO
19	G3HWR, GW3MFY
18	G3ICO
14	G3DLU, G3IOE

This Annual Counties Worked Table opened on September 1st, 1959, and will run till August 31st, 1960. All operators who work 14 or more Counties on Two Metres are eligible for entry in the Table. The first claim should be a list of counties with the stations worked for them. The list can be added to as additional counties accrue.

GW3MFY. During the period, six F's and GC2FZC were also worked.

For Bob at G5MA (Gt. Bookham, Sy.) the best contacts have been with EI2W, G6JY (Newcastle), GC2FZC, GD3UB, GM2FHH, GM3EGW and GW2HIY (Anglesey), the latter being a much-sought-after station because he is in a rare county. Another to work him is GW3ATM (Portskewett, Mon.), who also raised GI3GXP, these contacts being in GW3ATM's worst direction, across the mountains of Central Wales; he reports GW3LJP, likewise worked, as now active from Llandrindod Wells, on 145·6 mc, for the rare county of Radnorshire. For G3HBW (Bushey, Herts.) the October 5 opening brought good QSO's with several SM's and LA4VC, but LA9T failed to respond to many calls.

G2CIW (Birmingham) got in with the Scandinavians on the 5th, and noted an "abrupt deterioration" in general two-metre conditions after October 16, when the weather changed. G2CIW doubts whether much can be done about stirring up 70-cm activity at this time in the season, but is keen on the idea of a contest in the spring —anyway, to show that there *is* life in the 430 mc band. Jack sends a heard/worked list containing 16 call-signs, including such DX items as G2ADZ, GW2FVZ and PA0WAR.

GW3MFY (Bridgend, Glam.) now runs 100w, with a QQVO6-40A in the PA —but CW only. In addition to the G3BDQ schedule, GW3MFY keeps one with G3LTF (Danbury, Essex) and always finds it possible to exchange reports on CW. At G3AYC (BBC Radio Club), the new 2m. PA is running 80w, to a QQVO6-40A, modulated by a pair of miniature 807's; in his report, G3COJ mentions that there are several BBC Club stations—G3GDT at Bush House, and G3NTV at Lime Grove, as well as others in the Regions—but they are not thought to be on VHF yet.

GW3KYT is ex-G3KYT and is at Rhos-on-Sea, Denbighs., about two feet *below* sea-level! He will be on both VHF bands shortly, running full input to a pair of 4X150A's. G5CP (Chesterfield) worked SM6ANR and SM6BTT on October 5, and has got to 12C in the Countries table. G3GSO (Derby) has been overhauling and modifying the aerial system, which is now 6/6 and safe for the winter, while the PA is a QQVO6-40A at 45w.; a new converter on the bench, still with the bugs in it, is 6AM4 g.g., 6BQ7A cascode, EF54 mixer, and EC52 osc.

TWO METRES

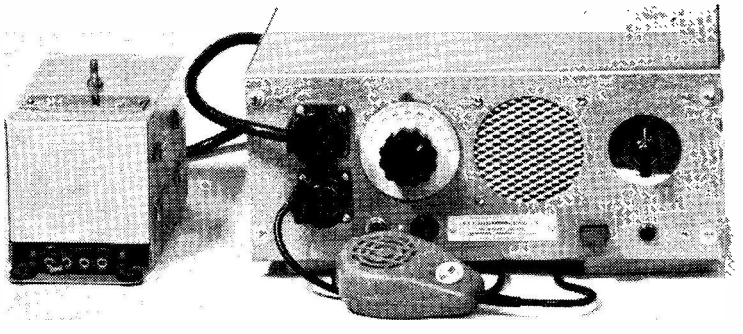
COUNTRIES WORKED

Starting Figure, 8

18	G5YV (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, OK, ON, OZ, PA, SM, SP)
17	ON4BZ, (DL, EI, F, G, GC, GI, GM, GW, HB, LA, LX, ON, OZ, PA, SM, SP, 9S4)
17	G6NB (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, ON, OZ, PA, SM, SP)
16	G3CCH, G3GHO, G3HBW, G5MA
15	G2XV, G3FZL G4MW, G6XM
14	G2FJR, G2HDZ, G3AYC, G3FAN, G3HAZ, G3IOO, G3JWQ, G3KEQ, G3WS, *G5BD*, G6LI, G8OU
13	G3BLP, G3DMU, G3DVK, *G3GPT*, G5DS, G6XX, GM3EGW, PA0FB
12	EI2W, F8MX, G2HIF, G3GFD, G3GHI, G3WW, G5CP, G5ML, G6RH, G8VZ
11	G2AJ, G2CIW, G2CZS, G3ABA, G3JZN, *G3KUH*, G3LHA, G4RO, G4SA, G5UD
10	G2AHP, G2FQP, G2HOP, G3BDQ, G3BK, G3BNC, G3DLU, G3EHY, G3GSE, G3GSO, G3KQF, G3MED, G5MR, G8IC, GW5MQ
9	G2DVD, G2FCL, G3DKF, G3FIJ, G3FUR, G3IUD, G3KPT, G8DR, G8GP, GC3EBK, GM3DIQ
8	G2DDD, G2XC, G3AEP, G3AGS, G3BOC, G3EKX, G3GBO, G3HCU, G3HWJ, G3JAM, G3KHA, G3MPS, G3VM, G5BM, G5BY, G8SB, GC2FZC, GW3ATM

After many moons, we hear again from G2ADZ, from his hide-out at Woolacombe in N. Devon. He is depressed about the paucity of his contacts on VHF, having had none of the EDX at all this summer—he often calls CQ through an evening and only works his neighbour across the water. GW3MFY. The reason, says G2ADZ, is that G's just don't beam his way; when they do, he gets the contacts all right, as we know. On 70 cm, G2ADZ has worked G3HYH and G3KPT, with G2CIW and G3HAW heard; for this band, his frequency is 433·00 mc, with 15w. into a 32-ele stack. G2ADZ will always come on at what he calls "a decent hour," and would, no doubt, welcome some GDX schedules. *QTHR*.

G3JAM (Woodford Green,



The new R.E.E. Communicator Mk.II is a VHF transceiver specially designed for mobile operation on two metres. The receiver section is a double-superhet, tuning 143-147 mc, with noise limiting. The RF power amplifier in the transmitter is a QQVO3-10A, screen modulated by a 6BW6. Size overall is 5½ ins. high x 13 ins. wide x 8 ins., deep.

Essex) sends full details of a very fine Tx/Rx layout which, though relatively QRP (he runs about 40w.) does him well with a 6/6 J-Beam. From a difficult and noisy site he has been able to work over 200 stations in 25 counties and 8 countries.

VHFCC Elections

There are four more to notify this month: F. J. Crisp, G3GZJ, of Lewisham, London, gains VHFCC Certificate No. 251; he is also /M on two metres, and his cards show four countries worked mobile, using a halo; the Tx runs only 12w. to a QQVO3-10, with a converter built round an E88CC.

Certificate No. 252 goes to S. F. Kasper, K2YIB, of Riverside, N.J., all of whose contacts have been made in the W1-W4 call areas, mainly in the last nine months. His PA is a 5894 (which is a tetrode capable of about 80w. RF output) and the receiver the National NC-300/VHF converter combination, with an 8-ele Telerex beam at 40 feet.

B. Howlett, G3JAM, gets Certificate No. 253, and shows a number of EU's worked among his cards.

Certificate No. 254 is awarded to M. Gessner, DL1EI, Munich, whose claim is particularly interesting in that it is one of those listing *no* U.K. stations worked—while the majority are, of course, DJ/DL, five other countries are covered; he has worked F3EM, three HB's, four I's, OE2JG, OE2KL, and OK1AA, OK1AZ. All the DL1EI activity shown is for the two-metre band.

Honour for G5NF

Each year, in October, the Italians celebrate the feats of Christopher Columbus (Cristofero Colombo), who was an intrepid explorer and navigator, even if the claim made for him of having "discovered America" is nowadays in some doubt. In connection with the celebrations, the city of Genoa has established, among other things, two Amateur Radio awards, taking the form of gold medals and suitably-inscribed parchments.

Which brings us to Leonard Ward, G5NF, of Farnham, Surrey. As reported in this space in our September issue, 11KDB/G5NF achieved the European two-metre record when, by sporadic-E, they were in QSO on June 14 last. So the "Columbian Institute of the City of Genoa" has made this year's award of the gold medal and diploma to G5NF, whom we congratulate on this distinction.

The Tabular Matter

The tables shown this month include all claims to date—and we hope on the next occasion to include not only the All-Time, but also the "Firsts" list, to which there are a number of additions since it last appeared. When making claims, please do enter them on a separate sheet, so that they can be picked up immediately when the Tables are being prepared; this has to be done before the body of the article is written; claims just mentioned in the text of a letter can be overlooked.

And when making claims for VHFCC, please note the rules again. We must have the cards, with a *check list*, and sufficient return postage, and packets sent to us should be registered. The 100 cards must be from different stations worked on the VHF bands, though /A, /M and /P under the same call-sign count as "different." We have lately had to return several claims which did not conform to the rules.

Dead-Line ——

This is **November 18** for the next issue. Please address it all to: A. J. Devon, "VHF Bands," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. With you again on December 4, all being well.

SEVENTY CENTIMETRES

ALL-TIME COUNTIES WORKED

Starting Figure, 4

Worked	Station
32	G2XV
27	G3HBW, G3JWQ, G3KEQ, G5YV
26	G6NF, GW2ADZ
23	G3BKQ, G6NB
20	G3HAZ
19	G2CIW
18	G3IOO
16	G2CIW*, G3LHA, G3MED
15	G4RO
14	G2DDD, G2HDZ, G3FAN
13	G3MPS
12	*G5BD*
10	G2OI, G3AYC, G3IRW
9	G3KPT, G5DS
7	G2HDY, G3JHM, G3LTF
6	G3JMA, G3KHA, G3WW
5	G3FUL, G3IRA, G3IUD, G5ML
4	G3JGY

On working four Counties or more on the 70-Centimetre band, a list showing stations and counties should be sent in for this Table, and thereafter new counties worked notified as they accrue

* New QTH

BRITISH ISLES TWO-METRE ZONE PLAN

Revision, March 1959.

Zone A: **144.0 to 144.1 mc.**	Cornwall, Devon, Somerset.
Zone B: **144.1 to 144.25 mc.**	Berks., Dorset, Hants., Wiltshire, Channel Islands.
Zone C: **144.25 to 144.5 mc.**	Brecknock, Cardigan, Carmarthen, Glam., Gloucester, Hereford, Monmouth, Pembroke, Radnor, Worcester.
Zone D: **144.5 to 144.7 mc.**	Kent, Surrey, Sussex.
Zone E: **144.7 to 145.1 mc.**	Bedford, Buckingham, Essex, Herts., London, Middlesex.
Zone F: **145.1 to 145.3 mc.**	Cambridge, Hunts., Leicester, Norfolk, Northampton, Oxford, Rutland, Suffolk, Warwick.
Zone G: **145.3 to 145.5 mc.**	Anglesey, Caernarvon, Cheshire, Denbigh, Flint, Merioneth, Montgomery, Shropshire, Stafford.
Zone H: **145.5 to 145.8 mc.**	Derby, Lancs., Lincoln, Nottingham, Yorkshire.
Zone J: **145.8 to 146.0 mc.**	All Scotland, Northern Ireland, Isle of Man, Cumberland, Durham, Northumberland, Westmorland.

Special Note: **Within certain Zones, there are vulnerable frequencies which should be avoided, as follows:**

144.00, 144.09 144.18, 144.27, 144.36, 144.45, 144.63, 144.72, 144.81, 144.90 mc.

These are spot frequencies reserved for aircraft safety purposes, and are for emergency working only.

Full Break-in with the 888A

SIMPLE EXTERNAL MODIFICATION AND ITS ADVANTAGES

N. P. SPOONER (G2NS)

MOST of us will readily agree that the highly specialised, craftsman-built Eddystone 888A receiver is "not for butchering." In spite, however, of its very adequate muting, its quite remarkable audio filter and its super band-spread, the inherent radio amateur flair for adaptation and modification will in many instances inspire yearnings for even greater operational facilities! Its excellent performance may rightly deter many users from tampering with the tidy circuitry, but nobody could regard the addition of two eight-inch lengths of insulated wiring as coming under the heading of either "butchery" or "tampering."

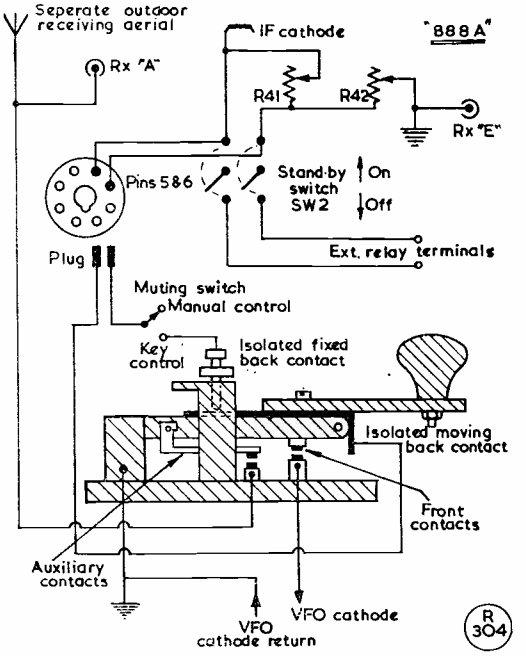
These two additional wires give complete receiver protection and muting control, when used for full CW break-in working — though at this stage many readers may feel that information of this nature can only interest a small handful of operators. The length of the suggested wires is approximately what is required for the five-minute job of connecting the "receive" side of the standby switch, Sw2, to the very convenient exit already waiting for them *via* vacant pins 5 and 6 on the S-meter socket A. And, moreover, both switch and socket are nicely in the clear and perfectly get-at-able with a soldering iron. A plug for the socket and two short, shielded external leads will reach the back contacts of the key, an on/off toggle muting switch in either lead selecting optional key or manual control of the muting. While theory and practice may differ, it is perhaps as well to keep all connections between key and receiver as short as possible and, like the VFO leads, run them in shielding.

A suitably modified Morse key has already been described by the writer in the December, 1958, issue of SHORT WAVE MAGAZINE and can be cannibalised from any "surplus" Telephone Set D, Mark V. This time there is one simple but very important difference — the moving back-contact must be completely isolated from the auxiliary and front moving contacts and their common earth path. Without dismantling the key (which should, of course, have already been cut from the paxolin deck of the telephone set), the brass moving back-contact is filed through with a tension file slipped through the archway holding the fixed back-contact and linked to a hacksaw frame in the usual manner. (The cut is made where the moving back-contact bends at right-angles to join the earthing strip along the side of the key.) The sketch clarifies the actual circuit connections with the key used.

After removing the unwanted contact, a new one is cut from a piece of tin or other metal, of a width that will lie in isolation down the centre of the divided lever without touching either earthing strip at the sides.

Action

Closing the muting switch circuit selects key control of the muting and an initial depression of the key opens the back contacts. This at once removes the short previously imposed by them across the standby sensitivity 50,000-ohm potentiometer R41, and the receiver is muted. With further depression of the key, the auxiliary contacts close and provide receiver protection by putting the separate receiving aerial and receiver input down to earth. Lastly, and only after muting and protection have been established, the downward limit of the key's travel closes the front contacts and



The circuitry and key connections involved in the modification suggested by G2NS. The effect is to give true BK operation with complete receiver protection.

the VFO cathode circuit (the PA stage, of course, being clamped or biassed). At this moment the outgoing signal from the transmitter is heard in the headphones for monitoring purposes, at a strength determined by the setting of sensitivity control R41.

Upon releasing the key, the VFO cathode circuit is broken, the aerial short is removed and the back contacts meet to re-impose the R41 short. The receiver is immediately restored to full sensitivity and accepts incoming signals at a strength determined by the setting of the 10,000-ohm IF gain potentiometer R42. If a click is heard during keying, this is usually due to the application and removal of the short across R41 and a fixed condenser of about ·005 μF between the fixed and moving back contacts should absorb it.

The drill is quite simple for the various modes . . . *Normal receiving, without transmission:* Muting switch off, standby switch on. *To test effectiveness of muting, without transmitting:* Muting switch on, standby switch off, key up accepts incoming signals, key down completely silences (mutes) the receiver. *To net, during transmitting sessions:* Muting switch off, VFO on alone without other stages of transmitter, standby switch on, press key while beating incoming signal with VFO. *For full, silent CW break-in working:* Receiver mains on, muting and standby switches both off, allow receiver to warm up, muting switch alone on, transmitter on, key down to transmit, protect and mute receiver and key up to receive breaking signals.

The pleasures of this type of operating, together with the astounding way in which the audio filter isolates wanted signals are delights easily appreciated by any keen CW operator. Confirmed telephony addicts say that the ease with which the other controls resolve SSB speech must be experienced to be believed. The muting and protection arrangements described here may also appeal to them.

UHF SCATTER LINK LAYOUT

INTERESTING MARCONI INSTALLATION

ON p.316 of the October issue of SHORT WAVE MAGAZINE, some brief details were given of the Marconi tropospheric scatter stations to provide communication on UHF between the West Indies islands of Barbados and Trinidad. The notes following explain the general layout, and show how quadruple diversity working is obtained with two sets of transmit-receive aerial dishes.

The tropospheric scatter station consists of two separate installations of Marconi 1kW transmitters Type HS315 feeding into two 30ft. dish aerials. Each aerial system gives a gain of 36 dB and thus provides an effective radiated power in the direction of maximum intensity which is of the order of 4 megawatts from each. The carrier at the VHF terminals is demodulated and the output transferred to modulate both UHF transmitters. The latter operate in the frequency band 680-970 mc, with a frequency spacing between transmitters of 4 mc; in addition to this frequency spacing their respective dish aerials are also spaced physically some 100ft. apart.

Simultaneously with the outgoing transmission, incoming signals from the other tropospheric scatter station are picked up by the dish aerials and fed to four associated receivers. The signals are in quadruple diversity; they are fed *via* a ratio square diversity combiner to the HM181 VHF equipment for re-transmission. The Barbados tropospheric scatter terminal is fundamentally the same in construction as that in Trinidad.

Quadruple Diversity System

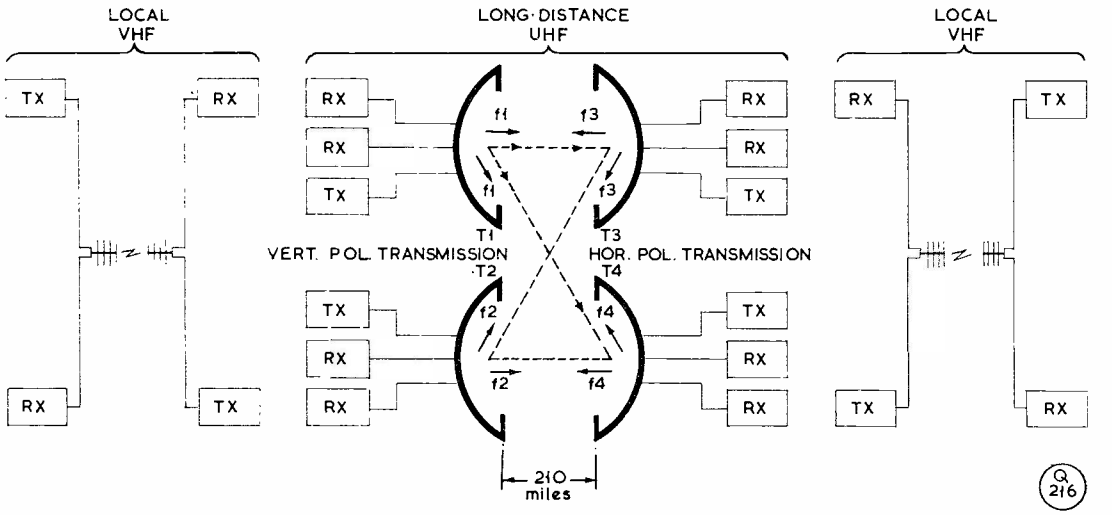
The accompanying diagram shows the layout and general mode of operation over the whole system, with details of the quadruple diversity system obtaining between the two UHF tropospheric scatter terminals. Considering the transmitting aspect first: T1 and T2 represent the first terminal, with its two 30ft. dishes mounted approximately 100ft. apart and the transmissions frequency-spaced by 4 mc. The transmissions, which are both vertically polarised, will be referred to as F1 and F2. They are modulated from a common source, namely, the demodulated output of the associated VHF link.

The second terminal, T3 and T4, is similar to the first, except that the two transmitted frequencies (although also spaced from each other by 4 mc) are horizontally, not vertically, polarised. (These frequencies will be termed F3 and F4.)

The dish aerials at both terminals are used *simultaneously* for transmission and reception. This is accomplished by the incorporation of cross-polarising probes in each feed horn which enable each individual dish to receive signals which are polarised at right angles to those which it is transmitting, *i.e.*, if the dish is transmitting vertically polarised signals it can simultaneously receive horizontally polarised ones. In addition to the transmitter, two complementary receiving chains are associated with each dish.

The practical operation of the system is as follows: The dish aerial of T1 is transmitting on a frequency F1, vertically polarised. That of T2 is transmitting on a frequency F2 also vertically polarised. Both transmitters have common modulation. The dish aerials at T3 and T4 are transmitting horizontally polarised signals on frequencies F3 and F4 respectively.

Considering the dish at T1: Coincident with its



System layout for the Marconi tropospheric-scatter link between Trinidad and Barbados, operating in the 680-970 mc band. The path distance is 210 miles, and by working in quadruple diversity — with signals horizontally and vertically polarised — a solid resultant is obtained by the combination of separate receiving chains. For scale purposes here, the apparent angle between the frequency paths is necessarily exaggerated ; in practice, having regard to the path distance, they would be as near parallel as makes no matter.

own vertically polarised transmission, it is receiving the two horizontally polarised signals from T3 and T4. These signals are in frequency diversity. Each is fed to a separate receiver chain.

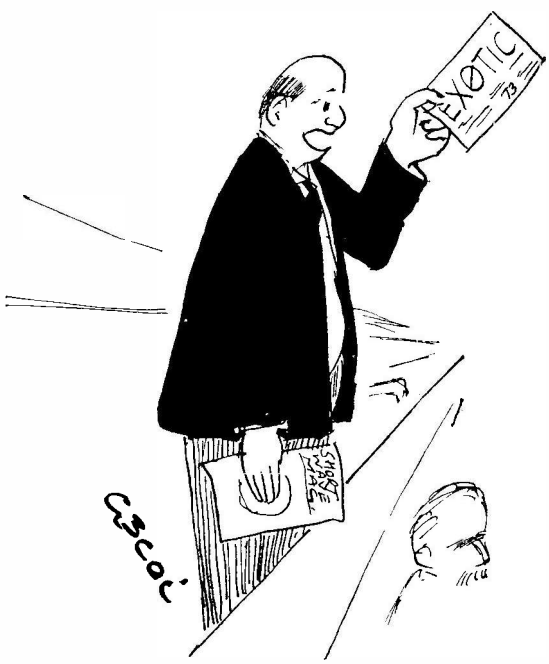
Similarly, the dish aerial at T2 also receives the signals originating from T3 and T4. These are fed to a pair of receiver chains in the same manner as for T1, and, of course, are also in frequency diversity.

Because of the physical spacing of the dish aerials, the signals arriving at one dish are in space diversity with respect to those arriving at the other. The four sets of signals (one pair picked up by T1 and one pair by T2) are therefore in quadruple diversity. The outputs of the four receiver chains are fed into a ratio square diversity combiner. The resultant is a composite, embodying the best signals received from two transmissions over four separate receiving chains.

The dish aerials at T3 and T4 operate in the same way, except that in this case the *vertically* polarised signals transmitted from T1 and T2 are received.

ARMY WIRELESS RESERVE SQUADRON

This was formed some years ago and is recruited from those interested in radio communication, who are trained as operators and technicians on Army equipment. Naturally, the Squadron has found much of its support from keen radio amateurs, who appreciate the fortnight's camp each year (all found, with full Army rates of pay) and the regular nets and correspondence courses covering Squadron work and responsibilities. Amateur activities are encouraged by a flourishing radio society, operating GB3AWR on the amateur bands when the Unit is in camp. Recently, the A.W.R.S. has had its name changed to: 404 Signal Squadron AER (Press Communications), since it is charged with the very important responsibility of running the special communications required by the Army's Press Correspondents. In this role, the Unit continues to provide interesting and profitable part-time training and facilities for radio and motor-cycling enthusiasts. Full details can be obtained from: Capt. J. A. Bladon, R.Sigs. (G3FDU), 28 Jack Lane, Davenham, Northwich, Cheshire.



" . . . . And, Mr. Postmaster-General, with the opening of the DX season I am advised that the postage on these alone will buy you enough vans to find those 19 Sets . . . . "

NEW QTH's

This space is available for the publication of the addresses of all holders of new U.K. callsigns, as issued, or changes of address of transmitters already licensed. All addresses published here are reprinted in the quarterly issue of the "RADIO AMATEUR CALL BOOK" in preparation. QTH's are inserted as they are received, up to the limit of the space allowance each month. Please write clearly and address on a separate slip to QTH Section.

G3GMR, C. Scothern, 3 Albert Street, Radcliffe, Lancs.

G3NFP, L. R. Beckwith, 154 Philip Lane, South Tottenham, London, N.15.

G3NFZ, A. M. Parks, 63 Macdonald Avenue, Westcliff-on-Sea, Essex.

G3NJH, S. A. Scott, 6 Fieldside, Abingdon, Berks.

G3NLL, Amateur Radio Club, 2243 (Laindon Basildon) Squadron A.T.C., c/o J. W. Hayter, W.L.A. Hostel, Church Road, Laindon, Essex.

G3NMC, C. J. Randle, 69 Cherry Tree Avenue, Yew Tree Estate, Walsall, Staffs.

G3NMH, H. E. Perkins, D.L.C., Ty-Newydd, Wood Lane, Louth, Lincs.

G3NMQ, P. J. Crosbie *(ex-ZC4BC),* 73 Clyde Road, East Croydon, Surrey.

G3NMX, D. Wills, 35 Kingsfield Avenue, North Harrow, Middlesex.

G3NNC, B. L. Cayless, A.C.A., 124 Carlyon Avenue, South Harrow, Middlesex. *(Tel.: Byron 6155.)*

G3NNK, A. J. Reynolds, 107 Brian Road, Chadwell Heath, Romford, Essex.

G3NNR, J. G. McLoughlin, 23 Wayville Close, Mossley Hill, Liverpool, 18, Lancs.

G3NNT, S. J. Pilkington, 23 Southport Road, Ormskirk, Lancs.

G3NOD, R. J. Burton, 36 Dorothy Street, North Ormesby, Middlesbrough, Yorkshire.

G3NOH, G. D. Eddowes, 13 Rothesay Road, Gosport, Hants.

G3NOK, R. A. Knight, 12 Windsor Crescent, Northampton, Northants.

G3NOL, C. J. Brown-Greaves, 46 Shirley Gardens, Barking, Essex.

G3NOZ, W. Bailin, 301 Edgware Road, London, W.2. *(Tel.: PAD 2500.)*

GI3NPP, R. Gibson, Bush House, Dungannon, Co. Tyrone.

G3NPS, A. Bovington, 27 Kent Road, Gravesend, Kent. *(Tel.: Gravesend 7426.)*

G3NQA, S. W. Hall, 186 Tyburn Road, Erdington, Birmingham, 24.

GM3NQB, W. Hardie *(ex-VE3CLR),* 10 Moat Crescent, Hawick, Roxburghshire.

G3NQO, V. T. Brown, 40 Lansdowne Drive, Dalston, London, E.8.

G3NQS, E. Russell, 163 Fillebrook Road, Leytonstone, London, E.11. *(Tel.: LEY 7960.)*

G3NQW, G. F. Welsh, 110 Alderney Road, Slade Green, Kent.

G3NQX, W. H. Brown, 46 Moorhey Drive, Penwortham, Preston, Lancs.

G3NRA, D. Appleton *(ex-VS2ET),* 22 Maldon Road, Goldhanger, nr. Maldon, Essex.

G3NRK, M. L. T. Harvey, The Rectory, Sanderstead, South Croydon, Surrey. *(Tel.: Sanderstead 1366.)*

G3NRM, M. R. Moore, 30 Abbey Crescent, Beauchief, Sheffield, 7. *(Tel.: Sheffield 73155.)*

GM3NRP, P. Daniels, 6 Wishawhill Street, Wishaw, Lanarkshire.

G3NRS, R. S. Scales, 17 Westfield Avenue, Cross Lane, Scarborough, Yorkshire.

G3NSN, J. G. Waring, 25 Massie Street, Cheadle, Cheshire.

CHANGE OF ADDRESS

G3EVE, The Brighton and District Radio Club, Home Guard Club, British Legion, 76 Marine Parade, Brighton, Sussex.

G3GKH, M. D. Johnson, 9 Dene Close, Beech Lane, Earley, Reading, Berks.

G3GTH, E. R. Cooper, Mill Cottages, Heath Road, Hickling, Norfolk.

GI3HSG, F. Peirson *(ex-G3HSG/GM3HSG),* R.A.F. Station, Ballykelly, Limavady, Co. Derry.

GM3IAZ, A. H. Wickham *(ex-GW3IAZ),* South Lodge, Uplawmoor Road, Neilston, nr. Glasgow.

G3JLY, S. J. Sparks, Cefn Bryn, Gainsborough Road, Scotter, nr. Gainsborough, Lincs.

G3JU, S. G. Abbott, 2 Bramble Gardens, Aspley Park Drive, Nottingham, Notts.

G3KLI, F. C. Beadle, 5 Court Villas, Hartley Road, Longfield, Kent.

G3KLL, B. Mercer, 73 Tomlinson Street, Hulme, Manchester, 15.

G3LGW, D. G. Spencer, 69 Deakin Road, Erdington, Birmingham, 24.

G3LKH, A. R. Allwright, G.I.Mech.E., 30 Shelldale Avenue, Portslade, Sussex.

G3LQJ, R. V. Cox, Wayside, Kelling Road, Holt, Norfolk.

G3LYV, C. R. Rogers, 27 St. Martins Road, Finham, Coventry, Warks.

G3MBS, S. H. Gibbs. *(Please QSL to GM3MBS.)*

GM3MBS, S. H. Gibbs, 11 Rowand Avenue, Giffnock, Renfrewshire.

G3MUW, P. J. C. Ratcliffe, Wayside, Burrow Hill, Chobham, Surrey.

G3NDK, R. K. Webb, c/o Officers' Mess, R.A.F. Station, Waddington, Lincoln.

G3NJK, Dr. V. J. de Bono, c/o The Hull Royal Infirmary, Sutton, nr. Hull, Yorkshire.

G3RB, K. N. Smith, 41 South Parade, Whitley Bay, Northumberland.

G6BS, B. M. Scudamore, 122 Hinton Way, Great Shelford, Cambs. *(Tel.: Shelford 2193.)*

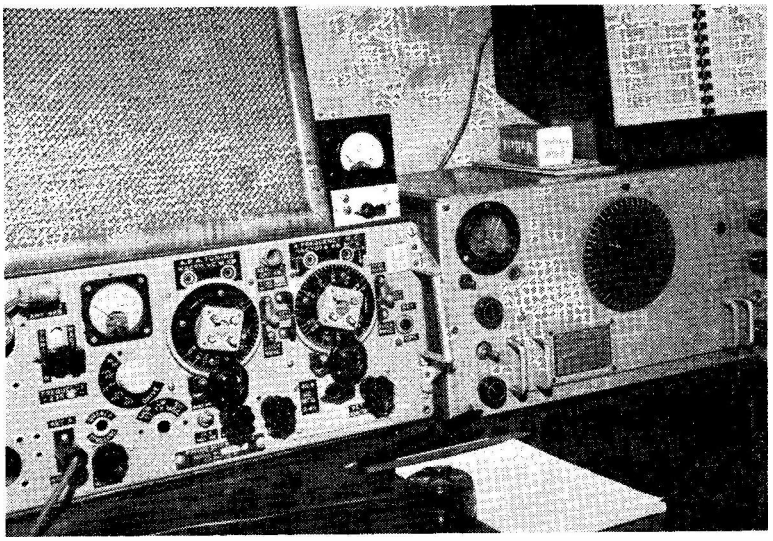
G6MI, R. F. Maynard, 131 Bloomfield Road, Blackpool, Lancs. *(Tel.: Blackpool 21335.)*

CORRECTION

G3CQE, W. M. Brennan, 11 Hammond Way, Salhouse Road, Norwich, Nolfolk.

THE OTHER MAN'S STATION

G3FEW



OWNED and operated by E. A. Rule, of 282 Hoe Street, Walthamstow, London, E.17, G3FEW was licensed in February, 1949, when at Chingford, London, E.4. The first year of activity was confined to CW on 40 metres, using a home-built receiver and transmitter, the latter running 14 watts to an 807 PA. With a folded dipole aerial, contacts were made with most of Europe, the U.S.A., and North Africa, but by the end of the year a modulator was added and the station remained active until December, 1955 when for domestic reasons activity had to cease.

Operation re-started in December, 1956 at the present QTH with the equipment as shown in the photograph. Space is strictly limited, the shack being only 4ft. × 5ft. × 8ft. and screened from the rest of the room by two hardboard partitions which, in addition, provide some acoustic insulation against extraneous noise.

Main equipment is an extensively modified transmitter-receiver Type 19, which may be seen to the left of the picture. The original frequency range of 2-8 mc has been extended to cover the 1·8 to 2 mc band and the grid modulation system replaced by a plate-and-screen modulator with high level speech clipping. Modulation is by a pair of Mullard EL34's operated in the ultra-linear mode and driven by a four-stage speech amplifier comprising two EF86 pentodes and an ECC83 double triode. The advantage of ultra-linear operation is reduced harmonic distortion resulting in considerably less side-band splatter. The microphone in use is an Acos crystal type Mic.32/2. A pi-network has greatly improved the efficiency of the Type 19 PA tank circuit, whilst a double conversion super-het arrangement, with a second IF of 85 kc, has increased the selectivity of the receiver considerably.

The main station receiver is a National HRO type MX, which is used in conjunction with a BC-221 for frequency checking ; next to the speaker may be seen the transistorised monitor and field strength meter.

A problem at the present QTH is an extremely high noise-level from trolley buses, and numerous attempts have been made to overcome this by careful design and placement of aerials. In use at present is a 75ft. long wire fed at the highest end (40ft.), after which it drops at an angle to a height of 8ft. This aerial is badly screened on all sides by tall buildings, the highest end being only a short distance away from the trolley bus wires, the resulting noise from these often being high enough to obliterate completely even the strongest of signals. Despite these drawbacks, telephony contacts have been made with stations up to distances of over 250 miles, all operation being at present confined to 160 metres.

As a standby to the main station, a low power battery-operated transmitter-receiver has been constructed and found useful for portable operation when opportunity offers.

LATEST RUSSIAN MOON-SHOT

The space vehicle launched on October 4 and christened *Lunik III* is using 39·986 and 183·6 mc. When at favourable positions in the orbit, with the transmitters switched on (by ground control, incidentally) the signal on 39·9 mc has been just identifiable below noise using a folded dipole cut for 40 mc and a three-stage crystal-controlled converter with tunable RF and mixer.

NEW APPOINTMENT FOR G5OG

In the new Government following the General Election, Mr. Charles Ian Orr-Ewing (G5OG), Member for Hendon North, becomes Civil Lord of the Admiralty, having previously been Parliamentary and Financial Secretary, and before that Under-Secretary of State, Air Ministry. In his new appointment, G5OG will have added responsibility for naval affairs.

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for December Issue : November 13)

ALL set for MCC? It looks as though there should be a record entry this year, several more applications for Contest Numbers having been received. All those allotted up to closing date are listed herewith.

The new rules do not seem to have brought forth any comment except from one single Club, who ask "What shall we do if a station comes back to a CQ or a QRZ call, and we don't know whether it is a Club or not?" The obvious answer is to send the six-figure group, assuming that he is . . . if he is not, and comes back with his QTH and so on, send the Club's QTH and treat it as a single-point QSO.

The fact is that there will be so many Clubs milling around that non-Club contacts will be pretty scarce this year. The obvious procedure is to work as many of the other Club stations as possible, right from the start of each session, and to look for single-pointers if and when things get slack. Clocks should be accurately checked for GMT at the start of each session. And so—

We wish all participating Clubs the best of luck from November 14 onwards. The identification numbers additional to the list on p.329 last month are in the panel on p.385.

Aldershot are now meeting regularly (every fortnight) at the Cannon Hotel; they also have a Morse practice class at the secretary's QTH every Saturday afternoon. Next regular meetings, November 11 and 25. **Barnet** held their AGM recently, and now meet on the last Tuesday at the Red Lion Hotel, Barnet High Street, 8 p.m. Next occasion is on November 24, when G3HRH will talk on Aerials for Amateur Radio, including the Bi-Square. December 29 is booked for a Junk Sale.

Blackburn have taken over a room adjoining the Corporation Park Hotel, and are busy working out aerial systems so that the club can enter for the *CQ* "Worldwide DX Contest." The club's licensed members are to give lectures on suitable subjects; Morse classes are running; and an R.A.E. class for beginners is on the agenda. Meetings, every Friday night at the Clubroom (8 p.m.).

Crystal Palace recently made a visit to Tatsfield (BBC Receiving Station), which was most successful and interesting. Meanwhile, the VHF section of the Club is very flourishing. In addition, a fair number of new members have been enrolled, partly, so they tell us, on account of these regular notes. Next meeting is on November 14, when the subject is Civil Defence Radio Communications.

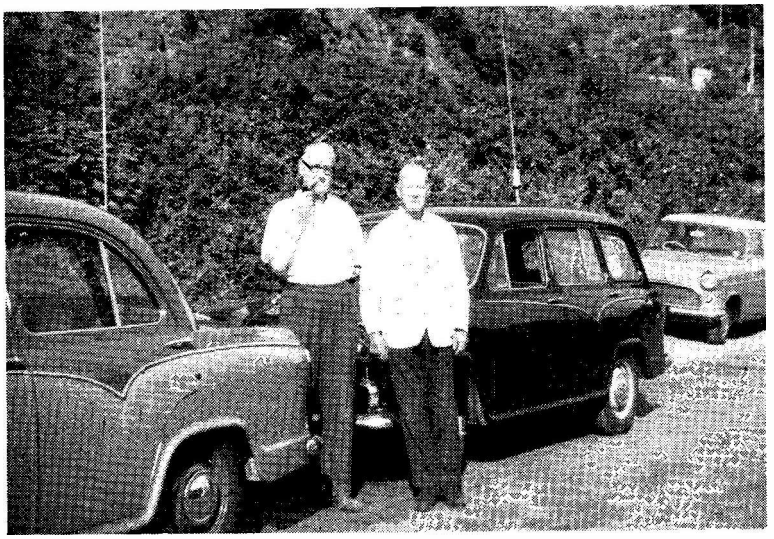
Derby announce the following meetings: November 11, Open Evening; 18th, Film Show; 25th, Open Evening; 28th, Annual Trip to London for the Radio Hobbies Exhibition. On December 2 there will be a Junk Sale. Headquarters are at Room No. 4, 119 Green Lane, Derby.

Dorking will be visiting the Mullard Radio Valve

For the Lincoln Hamfest and Mobile Rally on September 20, there were 160 visitors. The proceedings included a lecture on VHF by G3EOH, a raffle and an equipment display, for which Mullard Ltd. and K. W. Electronics lent gear. The winner of the prize for the greatest number of QSO's made on the way to the Rally was G3GWR/M, with G2CAJ/M second. SWL Colin, Liss, Hants., got the prize for the longest distance travelled to the Rally. During the morning, G3ESR/G3LWY entertained, at their home at Saxilby, Lincs., a number of visitors going to the Rally.

Co., Mitcham, at 6.30 p.m. on November 9; on the 10th they have their own informal evening at the "Star and Garter," Dorking, and on the 24th a Film Show (same place).

Leeds are visiting the Spen Valley Club (George Hotel, Cleckheaton) on November 11; on the 18th they have a demonstration of a simple short-wave receiver; and on the 25th they visit the Dept. of Biomolecular Structure, Leeds University, to see the Electron Microscope. Finally, December 2 is "Snag Night." **Mitcham** meet on November 6 for a lecture with photographic interest; on the 20th G3JJG will take on An Advanced Transmitter Design; and on December 4 there will be a talk on Television Radio Link Equipment and Techniques (BBC). All meetings are on Fridays, 8 p.m., at The Cannons, Madeira Road, Mitcham.



G5VS/M (left) and G2NM/M, on a holiday in Cornwall, were able to take in the Cornish Radio and TV Club field day near Redruth on September 6.

Newbury hold their November meeting on the 27th, and the accent will be on Films. This will be at Messrs. Elliott's of Newbury's Canteen, West Street, 7.30 p.m. **North Kent** send their *Newsletter*, as excellent as ever, from which we gather that their recent meetings covered "Aerials and the Amateur" and "Amateur Radio and the IGY." Two more members have passed the R.A.E., and Morse is also going ahead, so more calls are expected soon. Future meetings: December 10, KW Electronics; January 14, Film Show.

Nottingham is very active on Tuesdays and Thursday, and the transmitter is also operated on Sundays. During October they entered the *CQ* Contest and also the VK/ZL affair. R.A.E. classes are being held on Thursdays, Morse lessons and constructional facilities also being available. On November 17 there is a lecture by a member of the Rolls-Royce Vibration Dept., on Electronics and Physical Measurements.

R.A.I.B.C. continue their good work and propagate their news in their official journal, *Radial*. The presentation of the Mullard Award and Plaque to Peter Odell, G3MUM, was a big event which has already received publicity. Many disabled members will always be glad of help of various kinds, and more fortunate amateurs may find out all about this from the hon. sec. of R.A.I.B.C. *(see* panel).

REDIFON GR.400 SSB EQUIPMENT

We are asked to announce that for their meeting on Tuesday, November 17, the Sutton & Cheam Radio Society have been able to arrange for a demonstration by Redifon Limited of their GR.400 SSB equipment. Peter Pennell, G2PL, deputy chief engineer of Redifon's London division, will be present, with the chief of the Communications Laboratory. The meeting commences at 8.00 p.m. at The Harrow, Cheam Village, Surrey, and any further information can be obtained from: L. Seaton, G3HSK, 27 Shirley Hills Road, Addington, Surrey.

Ravensbourne meets every Wednesday, 8 p.m., at the Malory Secondary School, Launcelot Road, Downham, Bromley. **Reigate** forward their news letter, *Feedback*—they are a newly-formed Club and we hope to be able to publish details of their meetings in due course.

Shefford, after eleven years of Friday meetings, have had to change to Thursdays. The headquarters remain the same—Digswell House, Hitchin Road, and the time 8 p.m. There will be no meeting on November 5 (rival attractions?), but thereafter new members and visitors will always be welcome.

Slade meet on November 6 for a lecture and gramophone recital covering the history of recording from 1900 up to the present day (given by the Long-Playing Record Library of Blackpool). November 20 is booked for their AGM, and on December 4 there will be a talk on Colour Organs.

Southgate produce a very newsy *News Letter* with emphasis on the personal and technical sides of their activities. A fair amount of space is also devoted to the doings of neighbouring clubs, and to such events as Mobile Rallies; they meet at Arnos School, Wilmer Way, N.14, and at the last meeting, on October 15, the subject was VHF gear; next is on November 12.

Spen Valley have a meeting on November 11, but

THE FOURTEENTH MCC

First session Saturday, 14th. Rules in full p.328 October issue. Allocation of Club Identification Numbers on p.329 October. Additional entrants p.385 this issue. Call "CQ MCC." Get time-check before start of each session. Accurate log-keeping and snappy, contest-style operating will be essential. All logs must be received by December 2 certain.

the subject is not announced in their syllabus. November 25 is set aside for Printed Circuits. Both meetings are at the George Hotel, Cleckheaton, 7.30 p.m.

Stoke-on-Trent meet every Monday and Thursday in their own clubroom at the rear of the Cottage Inn, Oakhill. During the Jamboree-on-the-Air they were operating from the local Boy Scout Hq., and for MCC they will be working from their own "country site." An R.A.E. course is being conducted by G3EHM at the N.S. Technical College, every Friday evening. A small "unorganised" rally was recently held in conjunction with the Cannock Club.

Tees-side held their AGM and elected G3JYH chairman, G3JMO secretary and G3KBM treasurer. They recently paid a very successful visit to the BBC at Pontop Pike, where they filled the small building there to capacity. Future meetings, at Settlement House, Newport Road, Middlesbrough; November 13, G3JMO on the Panadaptor; November 27, a tape-recorded lecture; and December 11 (subject not announced). **Ravensbourne** have had to cancel their meetings at Downham School, and are now meeting once a month on a temporary basis in Bromley. Full details from the hon. sec. (*see* panel).

Wellingborough will be hearing about a visit to Calder Hall on November 5; the 12th is Members' Slide Night; the 19th is given over to a talk on Tape Recorders; and the 26th is as yet unbooked. The subject for December 3 is A Brief History of Electric Lighting (Mr. J. Farr).

Burton-upon-Trent report for the first time, to say that new members and visitors will be welcome any Wednesday, 7.30 p.m., at the clubroom, Stapenhill Institute. Lectures and so on are arranged for the second Wednesday, but every week there is a general get-together and the Club Tx is put on the air. The annual dinner is fixed for November 18.

Clifton held their AGM and re-elected most of the officers. They also formed an Audio Section under the guidance of Mr. D. Reed, who will be glad to hear from prospective members interested in this field. The club station is to be extended to include a VHF operating position and an SWL position. November 13 is booked for a Grand Junk Sale.

Cornish held their October meeting in Redruth on the 7th; on the 18th they paid a visit to the Bodmin beam radio station. G2AYQ has offered to represent the Club in MCC. Proceeds of a recent Junk Sale went to the Cheshire Homes Radio Group at Penzance.

Grafton held their AGM in September; recent events have included talks by G3JEA (Listening on the Ham Bands); G3KQZ (Past and Present Receivers); a Junk Sale and a Practical Evening. On November 6 they visit the London Fire Brigade Hq. for a lecture and demonstration on the radio system in use.

Great Yarmouth are newcomers to these columns, though not a new club. They meet fortnightly at the Electricity Sports Social Club, North Quay (near Southtown Bridge), and all are invited, particularly beginners and SWL's. Club activities, particularly lectures, will be increased during the winter months; next meeting after publication should be November 13.

Lincoln held their Hamfest and Mobile Rally in brilliant weather on September 20, attracting a crowd of 160. G3EOH gave a talk on VHF from the Amateur Viewpoint, and many prizes were presented. The ladies present were looked after by a lecture on Beauty Treatment (!). **Purley** meet on November 16

NAMES AND ADDRESSES OF CLUB SECRETARIES REPORTING IN THIS ISSUE

ABERDEEN: W. K. Heggie, GM3NHW, 80 Leslie Terrace, Aberdeen.
ALDERSHOT: J. E. Fuller, G3IQE, 9 Laws Terrace, Aldershot.
BARNET: E. W. Brett, G3LUY, 28 Edward House, Edward Grove, New Barnet.
BLACKBURN: F. W. Bird, G3GZE, 14 Old Bank Lane, Whinney Heights, Blackburn.
BRITISH TIMKEN: D. G. Chatfield, G3JXU, 55 Bush Hill, Weston Favell, Northampton.
BRADFORD: D. M. Pratt, G3KEP, Glenluce, Lyndale Road, Eldwick, Bingley.
BRITISH TWO-CALL CLUB: G. V. Haylock, G2DHV, 167 Engleheart Road, London, S.E.6.
BURTON-UPON-TRENT: J. A. Morris, 9 Rosliston Road South, Drakelow, Burton.
CLIFTON: C. H. Bullivant, G3DIC, 25 St. Fillans Road, London, S.E.6.
CORNISH: G. W. Hubber, 9 Cardrew Terrace, Redruth.
CRYSTAL PALACE: G. M. C. Stone, G3FZL, 10 Liphook Crescent, London, S.E.23.
DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby.
DORKING: J. Greenwell, G3AEZ, Wigmore Lodge, Beare Green, Dorking.
GRAFTON: A. W. H. Wennell, G2CJN, 145 Uxendon Hill, Wembley Park, Middx.
GRAVESEND: D. Andrews, G3MXJ, 42 The Fairway, Gravesend.
GREAT YARMOUTH: F./Sgt. Lang, G3KAY, Sgts. Mess, RAF Coltishall, Norwich.
GREENFORD: E. Gray, G3CPS, 111 Ravenor Park Road, Greenford.
LEEDS: D. Dinsdale, 8 Quarry Mount Street, Leeds 6.
LINCOLN: F. B. Travis, G3BCA, 202 Monks Road, Lincoln.
MITCHAM: D. Johnston, G3NFA, 23 Woodland Way, Mitcham.
NEWBURY: J. A. Gale, G3LLK, Wild Hedges, Crookham Common, Newbury.
NORTH KENT: D. W. Wooderson, G3HKX, 39 Woolwich Road, Bexleyheath.
NOTTINGHAM: E. C. Weatherall, 16 Avebury Close, Clifton, Nottingham.
PURLEY: E. R. Honeywood, G3GKF, 105 Whytecliffe Road, Purley.
R.A.I.B.C.: W. Harris, 25 Playford Lane, Rushmere, Ipswich.
RAVENSBOURNE: J. H. F. Wilshaw, G3MPX, 4 Station Road, Bromley, Kent.
READING: R. G. Nash, G3EJA, 9 Holybrook Road, Reading.
REIGATE: F. D. Thom, G3NKT, 12 Willow Road, Redhill, Surrey.
SHEFFORD: G. R. Cobb, G3IXG, 7 Hitchin Road, Shefford, Beds.
SLADE: C. N. Smart, 110 Woolmore Road, Birmingham 23.
SOUTHGATE: A. G. Edwards, G3MBL, 244 Ballards Lane, North Finchley, London, N.12.
SPEN VALLEY: N. Pride, 100 Raikes Lane, Birstall, Leeds.
STOKE-ON-TRENT: V. J. Reynolds, G3COY, 90 Princes Road, Hartshill, Stoke on Trent.
TEES SIDE: A. L. Taylor, G3JMO, 12 Endsleigh Drive, Middlesbrough.
WANSTEAD & WOODFORD: P. J. Seaman, 39 Kensington Drive, Woodford Green.
WELLINGBOROUGH: D. J. Trusler, 87 Irchester Road, Rushden, Northants.
WOLVERTON: R. E. Berkshire, 58 Western Road, Wolverton.

BOURNEMOUTH HAMFEST

This year the annual Hamfest organised by the Bournemouth Amateur Radio Society will take place on Saturday, December 5, 6.00 p.m. for 7.15. There will be a film show, raffle and dinner, for which the all-in charge is 15s. Those wishing to attend what should be an enjoyable meeting are asked to apply for tickets and other details to: F. G. Hamshere, hon. secretary, Bournemouth Amateur Radio Society, 55 Maclean Road, West Howe, Bournemouth (37550).

for a talk and colour slides from VK3ACS/G3NFG— at the Railway Men's Hall, Whytecliffe Road. An R.A.E. course is being run at the Roke County Secondary School, Kenley, and there is still time to enrol.

Reading announce that their Morse classes, run by G3GKH, will in future start at 7 p.m., the main meeting following at 7.30. The October talk was on SSB, by G3DXJ; and on the 10th a party of members went to the Newbury Hamfest.

Wanstead & Woodford held their AGM on October 7. G3JIX took the chair and was elected president for the coming year. Four new members were elected, the membership now being about twenty. Two new licences have been issued (G3NQS and G3NRN) and two other members are awaiting results. Meetings are at 8 p.m. on Wednesdays at Wanstead House, The Green, E.11. Note new secretary's QTH, in panel.

At the High Wycombe Agricultural and Hobbies Show in September, GB3HWS was in action, organised by the Chiltern Amateur Radio Club. Equipment used included a K.W. Vanguard transmitter, with Eddystone and Racal receivers, and numerous items of home-built apparatus were displayed on the stand. In a total of 12 hours' operating, over 100 contacts were made. In this photograph are, left to right: G3BII, SWL Perkins, G6VV of K.W. Electronics, G3NR, and SWL Barton, who is hon. secretary of the Chiltern A.R.C.

Bradford have an interesting feature on November 10, entitled "How We Began," by three junior members— an excellent idea which will doubtless be copied. On the 18th they pay a visit to Mains Radio Gramophones, Lidget Green, and on December 1 G3KLZ will be talking on Tape and Disc Recording. Meetings are at 7.30 p.m., 66 Little Horton Lane, Bradford 5.

British Timken have moved to a new QTH, a wooden hut of their own. G3NIB was recently operational during their Annual Show, working on 20, 80 and 160 metres. Visits are paid to local places of interest, and on November 28 they will be visiting the Hobbies Exhibition.

Gravesend recently held a "Phone v. CW" discussion, an Auction Sale, and a combined discussion on this year's and next year's field day. They will, as usual, be signing G3GRS in MCC.

Greenford now has a Club of its own, thanks largely to G3IZW and G3CPS, the latter being hon. sec. Membership is fourteen, with about seven licensed amateurs. Meetings are on alternate Tuesdays, 8 p.m., in Room 1, Greenford Community Centre, Oldfield Lane, the next being on November 10 and 24. On the intervening Tuesdays there is a phone net on Top Band.

Wolverton is going ahead, with many new and young members; they meet on Fridays at 7.30 p.m. in the Science and Arts Institute. Several talks are planned, including one on mobile working by G3IYX.

If you find GM3BSQ during MCC, it will be the station of the **Aberdeen** Amateur Radio Society— they will almost certainly be the most northerly entrant and though distance does put them at a disadvantage, Aberdeen are looking on the event primarily as an opportunity to make radio contact with other clubs. That's the spirit!

ADDITIONAL CLUB IDENTIFICATIONS FOR MCC

C.61 Harwell (A.E.R.E.)	*C.69* Danbury
C.62 Aldershot	*C.70* Cornish
C.63 Henlow	*C.71* Crawley
C.64 Hartlepools	*C.72* Ainsdale (Lancs.)
C.65 Norwich	*C.74* Wolverhampton
C.66 Deal	*C.75* Yatesbury
C.67 Wolverton	*C.76* Exeter
C.68 Wanstead & Woodford	*C.77* Aberdeen
	C.78 Greenford (Middx.)

Note: First list, numbers C.01-C.60 on p.329, October issue. No number "C.73," to prevent confusion.

"LIST OF COAST AND SHIP STATIONS"

What used to be known as the "Berne List"— giving callsigns, frequencies used, operating schedules and so forth for all ship and coast stations throughout the world—is now issued as the *List of Coast and Ship Stations* by the International Telecommunications Union, from Geneva. The text is in English, French and Spanish, and the List is in two parts: Vol. I "Coast Stations," and Vol. II "Ship Stations." The cost is about 7s. and 21s. per volume respectively, but as payment can only be accepted in Swiss francs (Fr.4.10 for Vol. I and Fr.12.80 for Vol. II) *or* UNESCO book vouchers (!), this new "Geneva List" is somewhat difficult to obtain privately in this country. The address to write to is: I.T.U. General Secretariat, Palais Wilson, Geneva, Switzerland.

SMALL ADVERTISEMENTS

(" SITUATIONS " AND " TRADE ")

9d. per word, minimum charge 12/-. No series discount; all charges payable with order. Insertions of radio interest only accepted. Add 25% for Bold Face (Heavy Type). No responsibility accepted for errors. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, S.W.1.

SITUATIONS VACANT

AIR MINISTRY have vacancies for civilian Radio Technicians at Royal Air Force Sealand, Cheshire, and at certain other R.A.F. Stations throughout the United Kingdom for the servicing, repair, modification and testing of air and ground radio and radar equipment. Commencing salary (national) (according to age) is £525-£670 p.a. Max. salary £795 p.a. Rates are subject to small deduction at certain provincial stations and to a small increase in London. Annual leave 3 weeks 3 days, increasing to 4 weeks after 3 years' service. A limited number of houses may be available for renting at Sealand. These houses are at West Kirby, some 15 miles distant.—Apply, giving details of quals. and exp. and mentioning this advertisement, direct to the Commanding Officer, No. 30 Maintenance Unit, Royal Air Force Sealand, or to Air Ministry C.E.4b, Cornwall House, Waterloo Road, London, S.E.1, for vacancies in other areas.

TRADE

" TELECOMM " 2-metre Transmitters, Converters and Receivers ; also the " Communicator " Mark II Mobile Transmitter/Receiver. Send s.a.e. for details, prices, H.P. terms.—R.E.E. Telecommunications. Ltd., Telecomm Works, Crewkerne, Somerset.

SMALL ADVERTISEMENTS, TRADE—*continued*

L.P. MORSE RECORDS: BEGINNERS AND ADVANCED COURSES. (G.P.O. PASS GUARANTEED OR REFUND.) — DETAILS: G3HSC, 45 GREEN LANE, PURLEY, SURREY.

VALVES FOR SALE (all tested on Mullard Valve Tester): 6F12, 6D2, EF80, 10FI, 6FI, PY82, 20LI, 6V6, 6P25, 6F13, 6F14, 6F15, 20DI, ECC-82, ECC-81, 5/- each, plus 1/- p. & p. on orders of less than six.—J. R. Calverley & Co., Ltd., 130 Water Street, Radcliffe, Lancs.

G3CGD QSL's: Fixed and mobile samples on request. Printing enquiries welcome.—30 St. Luke's Road, Cheltenham.

WANTED: Wireless Sets 31, Manpack or AFV.—Box No. 2185, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

QSL CARDS AND LOG BOOKS, G.P.O. APPROVED. CHEAPEST, BEST. PROMPT DELIVERY. SAMPLES. — ATKINSON BROS., PRINTERS, LOOE, CORNWALL.

WANTED: BC610 Hallicrafters, E.T.-4336 Transmitters, BC-312 Receivers, BC-221 Frequency Meters and spare parts for all above. Best cash prices.—P.C.A. Radio, Beavor Lane, Hammersmith, W.6.

QSL'S and Logs by Minerva. The best there are.—Samples from Minerva Press, 2 New Road, Brentwood, Essex.

WANTED FOR CASH: Good clean communication receivers and S.S.B. equipment. Please state price. — Short Wave (Hull) Radio, 30/32 Princes Ave., Hull. *(Tel. 18953.)*

FOLLOWING Bargains Post Free. Teleprinters Creed Type 3A/X, good condition, £13 10s. CR300 Receivers, reconditioned, modified 15 kc—30 mc, continuous coverage, built-in power pack, £30. British Q5'er, 200-500 kc, 7 miniature valves, £3 10s. R1155B, £5 10s. Command Receivers, 28-41 mc, £2 10s. R1355, £1 10s., Control Unit, Type 9, 10s. R1466, 32-40 mc, £1 10s. BC-357D, 2-valve Receivers, 40-80 mc, 10s. One only Type 12 Sender, complete mains pack, handbook, 1·2-17 mc, VFO/Xtal, 50w., £12 15s. Ideal field day, 48ft. portable mast/aerial, complete with all fittings, in holdall, £6. 14ft. one-piece stainless aerial whips, heavy duty transmitting base, £2 10s. New recent manufacture ½-megohm pots, SP switch, long spindle, boxed, 2s. 6d. Large stocks transmitting/receiving equipment held, meters, valves, etc. s.a.e. all enquiries.—Shroffren, 19 York Road Market, Southend-on-Sea, Essex.

READERS' ADVERTISEMENTS

3d. per word, min. charge 5/-, payable with order. Please write clearly, using full punctuation and recognised abbreviations. No responsibility accepted for transcription errors. Box Numbers 1/6 extra. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, S.W.1.

MINIMITTER CONVERTER, 1·5 mc output, £12. BC221-AK, £25. Three Denco 85 kc IFT's, 11/6d. each. Sundry valves, meters, components. — List from G5RP, Old Gaol House, Abingdon, Berks.

DX-40U with 3 xtals, VF1U (VFO), sold together or separate, can be tested; reasonable offers?—G3JDN, 14 Rushetts Road, Reigate, Surrey.

SMALL ADVERTISEMENTS, READERS—*continued*

MOBILE RIG for sale : Tx 40w. Geloso/6146, pi-out, 80-10m., size 10ins. x 7ins. x 6ins., £15. T/R relay, 12v., in small Eddystone box with coax sockets, £1. Modulator 25w. audio, c/w carbon mike, 2/5763 AB2, size 7ins. x 4½ins. x 6ins., £6. Minimitter Converter, 80-10m., 1·5 mc out, £6. BC-453, 0·5-1·5 mc, £5. Two 12v. roty. convrs., 400v. 100 mA, 30/- each. Above used 2 months, wkd. ZS, VK, 9G1, W, etc., *mobile.* Write for details, but s.a.e., please. Also: New 6v. vibrator p/p, ex-AR88. 25/-.—G3LVC, Church Cottage, Fleet, Nr. Weymouth, Dorset.

FOR SALE: Eddystone 640, FB condition, £16. Cowl-gill beam rotator with fixing plate, shaft, gearing and desynn direction indicator, £3 10s. TU5B VFO output 40 + 80, £1. Complete aquarium, £3 10s., or part-exchange for Geloso 4/102.—G3BNW, 13 Heywood Road, Alderley Edge, Cheshire.

R1155 FOR SALE, much modified, including output stage. RF24, modified, used as converter for 21 and 28 mc ; also RF25. Offers around £10 for the lot.—M. Marment, 116 Boyne Road, Sheldon, Birmingham, 26.

WANTED: CR100 and AR88, reasonable prices. FOR SALE: R.107, perfect, £11, or part-exchange with cash for above. — Albans, 17 Fern Road, Cropwell-Bishop, Notts.

HAMMARLUND HQ129X, professionally checked over and re-aligned ; fitted with makers' latest bandspread dial giving 21 mc calibration ; built-in auto-transformer for 230/250v. AC mains ; mint condition ; £60.—Webb, 233, Warwick Road, Kenilworth. *(Tel. 679.)*

AR88LF with manual for sale, £35 (or offer?)—G3NDC, 3 Orchard Road, Farnborough, Kent.

SELL: 600v. 200 mA PSU, £5 ; R1155, super SM drive, built-in PSU, wkg. but needs attention, 90/-. 350-0-350v. 200 mA xfmr., 15/-. Morse training set, with two keys, in wooden case, 20/-. VCR97, mu-metal screens, 62 Unit chassis and cabinet, 20/- (carriage extra); Birmingham area.—Box No. 2175, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

EDDYSTONE 888, with S-meter, just re-aligned by makers, £70. Also AR88D with S-meter and manual, £50 (o.n.o.?)—G3FKM, 10 Knightlow Road, Birmingham, 17.

RCA ET-4336 Tx with RCA Speech Amplifier, xtal osc. and VFO, £50. SCR-522 Tx, complete, £2. TCS-12 Tx/Rx with 12-24v. DC p/pack, £14. TCS p/pack for 12-24v. DC, £3. SX-28, with speaker, £28. CR-100, with speaker, £12. TCS-12 Rx, with speaker and p/pack, £8. Class-D Wavemeter, AC mains, £3. Eddystone Absorption Wavemeter, £3. Admty. 50-watt Amplifiers, with mains p/pack in cabinet, £6. Transformer, 230/115v. at 30 amp., £12. P.58 Rx 250-700mc, £5. Parmeko 15w. amplifier, £4. Collect or carriage extra.—GM3HJC, 21 Oxgangs Farm Avenue, Edinburgh, 13.

EDDYSTONE 750 Receiver and Speaker for sale, £40 (buyer collects). — Matthews, 40 Braedale Avenue, Motherwell, Lanarkshire. *(Telephone Motherwell 124.)*

R107 (1·2 to 17 mc) Communications Rx, calibrated amateur scales, hairline cursor, perfect, £10 (carriage £1). WANTED: HRO coil packs and handbook. — Davison, Officers' Mess, R.A.F. Bridgnorth. Salop.

SMALL ADVERTISEMENTS, READERS—*continued*

CR-100, excellent condition, noise limiter, S-meter, muting relay; also manual; £25 (o.n.o.?); d/d 20 miles London.—G3LVH *(MOU. 0743.)*

SALE: Eddystone 750, mint condition; speaker and handbook; buyer collects; £40.—Box No. 2176, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: 150/500-watt CW/Phone Tx, 80-10 metres, 813 final, rack or table-top, mainly American components (R175A choke, Johnson condensers, B. & W. coils, blower. etc.), built as per Jan. 1954 *QST;* LP (8KW.) filter, fully screened; VFO for Tx in separate table-top cabinet with switch for NBFM; £35. Complete high-power modulator on 4-foot rack, comprising pre-amp-driver (Class A, PX4's), modulator with push-pull 810's in AB2/B, UM3 mod. trans. and 1200v. power supply for 810's, £15. 500-watt Z-match (see *Short Wave Magazine,* Oct. 1958), £4. BC-221, unmodified, £15. 150/250-watt 2-metre final with almost new QY3-65 (see *Short Wave Magazine,* July 1957), £8. 100-watt complete 2-metre Tx, with 829 final (see *Short Wave Magazine,* July 1950), £5. 6AJ4 (3) cascode 2-metre converter and G2IQ 2-metre converter; both use 40 mc xtal and must be sold together, £7. 2-metre 4/over/4 J-Beam with aluminium pole (14 feet) and about 20 yards coax, £4. HRO with S-meter, coils, speaker, modified (see *Short Wave Magazine,* Sept. 1956), £7. Valves, power supplies, etc. Send s.a.e. Buyer collects or pays packing/carriage. Callers welcome. —Bloxam, 3 Brynfield Road, Langland, Swansea, Glam. *(Tel. 66363.)*

R107 in FB condition, S-meter, stabilised osc., N/L, pentode o/p, new RF/IF units, re-valved, mains only, £11 (carriage paid).—Ball, 56 Wistaston Green Road, Wistaston, Nr. Crewe.

26 ISSUES *Short Wave Listener,* 30/-; 8in. cabinet speaker, 22/-; 7 new ECC35, 25/-.—Box No. 2177, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Type 1132A receiver, 124 mc, and power unit. Type 3. WANTED: Transmitter; good make, new.—Box No. 2178, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

G6ZH TRANSMITTER, custom-built, screened 5ft. rack, 5 meters, 5 bands switched, no TVI in Devizes; remote control; 250 watts maximum Phone or CW; 4 PU's, each switched and fused; VFO, exciter, PA-4E27, coax output *via* LPF and selector panel; Modulator P/P TZ40. Equal to any commercial product up to £250.—Full specification and appointment to view from: T. Winchcombe, 16 Pans Lane, Devizes.

EDDYSTONE 840A, as new, £30.—Depledge, 14 Savill Road, Lindfield, Sussex.

OFFERS invited for Eddystone 750 Receiver, hardly used, in perfect condition.—King, Lee Ground Stores *(Titchfield 2238).*

SALE: 25w. table-top all-band Tx with power and mod., £9 10s.; matching VFO 80m. + £3 10s. (or offers?); s.a.e. for list of surplus gear.—G3MCA, 13 Greenfield Gardens, Orpington, Kent.

TAPE RECORDER for sale; Walter's 303 model, about 3 years old; working but needs attention, although brand-new mike. Any offers?—Please reply to Box No. 2179, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SMALL ADVERTISEMENTS, READERS—*continued*

WANTED: Eddystone S.640 or RCA-77E.—Ellsmore, 9 Barston Road, Quinton, Birmingham, 32.

COMPLETE STATION for sale: Geloso 212 Tx. 75 watts, £50. Eddystone 640 with S-meter and loudspeaker, £20. Marconi RL85 VHF Rx, £10. LM14 Frequency Meter, £25. All in new condition and delivered 50 miles radius of Nottingham.—Box No. 2180, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

LEAK AMPLIFIER with Collaro Transcription Unit; both in WB cabinet with record storage space; £30. Delivered reasonable distance.—G3FGY, 44 Laurel Avenue, Ripley, Derbyshire.

WANTED: PR120V or LG.300 in good order.—Details of condition and price to : G4RS, 17 Tudor Avenue, Bebington, Cheshire.

SALE: Eddystone S.640 with matching speaker and S-meter, £18 (o.n.o.?) Will transport approx. 10 miles.—Walsh, Lynton, Asquith Avenue, Thundersley, Essex.

NEW SURPLUS VALVES, limited quantity, 829B, 50/-; 703A, 8/-; EL38, 10/-; 12AX7, 12AU7, 5R4, 6AQ5, 6/-; 12AT7, 6AH6, 6V6, 5U4, 5Y3, 5/-; 6AK5, EF91, 3s. 6d. Many more types, also components, meters, etc.; s.a.e. for full list.—A. W. Sykes, 8 New Street, Morley, Leeds.

G5RV Elizabethan 150w. Tx, £12 (or exchange Binoculars). Also xtal Heterodyne frequency meter, needs attention, £4.—Ex-G3KTV, 322 Willenhall Lane, Coventry.

FOR SALE: R.1155N with p/pack, Type 46. Offers around £10; buyer collects.—Apply Tony Carr, 44 Churchill Road, Cheadle, Staffordshire.

FOR SALE: BC-348, p/pack, S-meter, £9. Rx 52, S-meter, £8. R1392, 100-150 mc, 15 valves, £2. T.1143 Tx, modified 2 metres, 15/-. T.1143 modulator, unmodified, 10/-. New QQVO7-40, £2. 829B, £1. SCP1, mu-metal screen base, etc., £1. PT15, 5/-. DET 19, 2/- (new). VS110, 2/- (o.n.o.?)—Ken, 216 St. Helier Avenue, Morden, Surrey. *(Mitcham 2592.)*

SELLING UP: 840 Rx, as new, with mounting blocks, no mods., £30. DX-40U with VFO, purchased June this year, fully operational to makers' manuals, £40. LM14 freq. meter with calibration book and p/pack, £11. VHF Converter, Type AM913/TRC, less valves (2), brand-new, £3 10s. AVO meter model A47 or all ranges, £6 10s. HRO IFs (2) and BFO coil (1), 12/-. Transformers: Gardner 500-350-0-350-500v. 180 mA, 0-4-6·3v. at 2A three times, 0-4-5v. at 3A twice, 200-250v. prim., new, 40/-. 200-240v. prim., 32-36-38v. at 2A, 10/-. Radiospares, 400-0-400v. 120 mA, 0-4-6·3v. at 4·5A, 0-4-5v. at 3A, 15/-. Bliley 100 kc xtal, 3-pin, 10/-. BC-221 1 mc xtal. 17/6. Collins mod. xformer, 1:1, 5/-. ARRL *Antenna Manual*, 10/-. Postage extra. — Crook, 39 Tonge Park Avenue, Bolton, Lancs.

EDDYSTONE 740, mint condition, £20. Radiocraft 2-valve pre-selector, 1·5-30 mc, £5. Can be delivered. — Hayes, 31, Beverley Crescent, Northampton.

G3MZY Table-Topper Tx, 50w. phone, 100w. CW, 80-10m., £25 (o.n.o.?)—Last, Wills Hall, Stoke Bishop, Bristol, 9.

SMALL ADVERTISEMENTS, READERS—*continued*

MINIMITTER MR37 Receiver, excellent condition and performance, £40.—Box No. 2181, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

EDDYSTONE 888A, latest model, perfect condition, £85. One pair Army 88 Tx-Rx walkie-talkies, each containing 14 miniature valves and 4 xtals, less batteries and headsets, £9. 1132 power pack, £5. Valves: 807's, etc., 2/6 each. Meters: 0-1 mA, 10/-; all others, 5/- each. All carriage paid.—GM3BQA, 19 Edinburgh Road, Cockenzie, East Lothian.

SALE: Labgear LG.300 Tx with 1000v. P/S and modulator (2 x 807). £75 (o.n.o.?) Spare 813. £1. AR88D with S-meter, £50. Vibroplex bug key, as new, in original carton, £6 10s. Top Band Mobile Tx/Rx, Hallicrafter HT-11B, complete with power supply, £20. Tape Recorder "Sound Mirror," £15 (o.n.o.?)—Spencer, 69 Deakin Road, Birmingham, 24.

FOR SALE: LG.300 Transmitter in immaculate condition, with home-built power supplies and modulator; just plug into mains and antenna. A bargain, £100 (o.n.o.?) Buyer collects. — G3MFO. P. Elliot. 17 Weighton Road, Harrow Weald, Harrow. Middlesex.

TX 6L6-807-P/P 35T's, 10/20 metres. Tx 6V6-807-242A. 40/80 metres. Tx 1625-1626. 160 metres. VFO Unit, 6 valves, 160 to 20 metres, with 500 kc xtal multivibrator check, with power supplies. Meissner Signal Shifter. Power supply 1000 volts 150 mA, 866 rectifiers; power supply 600 volts 100 mA; also 350 volts 100 mA. (2) Tx P/P 807's, 150-watt, with power supply, relay controlled 10 to 80 metres. Rx R.1155. Also many valves, meters, etc. £35 the lot, to clear; collected Hampshire.—Box No. 2183, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

B2 TRANSMITTER, all coils, £4. Eddystone 10-metre converter, black crackle cabinet, £3 10s. UM1 Transformer, £1 10s.—Ingram, 49 Lime Tree Avenue, Broadway, Worcestershire.

EDDYSTONE 888A in absolute new condition, £75; S-meter to match, £4 10s.; Eddystone speaker, £1 5s.; Brown's adjustable reed phones, £1 10s.; Minimitter 34-ft. rotary mast, complete with all fittings and base, £8.—*(Ruislip 2032.)*

SALE: Top Band Tx, Phone and CW, internal power pack, 10 watts; xtal controlled 1·980 and 1·820 mc; neat, compact, in grey metal cabinet; £10.—Box No. 2174, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

MODIFIED Bendix TA-12B transmitter, BC-224A receiver, modulator, power packs, crystal mike, etc., cheap.—EI4W, Glenina, Galway, Eire

AR88D v.g.c.; best offer over £35, plus carriage; consider exchange (plus cash) for best RF, three IF Rx, with S-meter and separate bandspread.—Box No. 2182, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

POWER PACK 700v. or 800v. 200 mA, 300v. 100 mA, 200v. 50 mA, 6v. 8A, £5. Vibroplex Bug Key, almost new, £5. HRO Dial and gearbox, £2. 500 μA meters, 10/-. Dummy loads, 6/6. Postage extra. — G3IDW, 14 Cricklade Road, Swindon.

SALE: Transmitter, Type 36 TCS-13 transmitter, with power supply; 4 ft. x 19 in. rack. £1 for a box of radio components. — D. Place, 11 Bowring Mead, Moretonhampstead, Nr. Newton Abbot, Devon.

SMALL ADVERTISEMENTS, READERS—*continued*

MOVING, must clear, real snips !! Further details, offers, etc., please, s.a.e. R.C.A. ribbon mike on stand, £2. LM13 frequency meter, similar to BC-221, but modulated, with book, £16 10s. 0d. Class-D wavemeter, £5. Radiocraft de luxe Pre-selector, gives 24 dB gain all bands, £6. Vitavox M/C recording microphone in box, £2 10s. 0d. EMI 2350 Studio recording microphone in transit case, brand new, cost £18 13s. 6d., accept £9 9s. 0d. Disc recorder, M.S.S. 33/45/78 with amplifier, snip, £30. Advance B3C laboratory signal generator, 100 kc-30 mc, £12. Hallicrafter "Sky Challenger," band-spread, 1200-30,000 kc, £9 0s. 0d. Transformers: Primary 200/250v., secs. 350-0-350 80 mA, 6·3, 4A, 5v. 2A; also ditto, but 250-0-250v., brand new, 18s. 6d. Amplifiers: Vortexion 15 watt CP20A 12v. DC or mains, £8 10s. 0d.; 12v. DC Mobile 10w. output, needs electrolytics, high gain, snip, £5 0s. 0d. Mullard "5/10" 10-watt amplifier, £7 10s. 0d. Garage charger, 6/24v. 6 amp. output, £8. All goods carriage forward. Inspection by appointment. — G3HSC, 109a, Church Street, Croydon.

AR88D, exceptional, £60. Panda Cub, new condition, £40. Offers considered.—G3CPS, 111 Ravenor Park Road, Greenford. Middx.

SALE: Eddystone S.640 with S-meter, excellent condition. New 813, 30/-.—G2HAC, 54 Lodge Street, Accrington, Lancs.

WANTED: Correspondence course for R.A.E. exam. Also AR88.—Box No. 2186, Short Wave Magazine, 55 Victoria Street, London, S.W.1.

WANTED to purchase or borrow, circuit for type RA10DB Receiver.—Gauden, 5 Park Road, West Wollaston, Stourbridge, Worcs.

CR100/2, excellent condition, spare valves, manual, £15.—Tinsley, Chingford, E.4. *Tel. SIL. 4431* after 4.30 p.m.

FOR SALE: BC-221AK (latest modulated version), brand new, all spares, charts, manual, etc., £35. —Cutler, Barn Cottage, Walberton, Arundel, Sx.

EDDYSTONE 840A, new condition, with matching speaker and mounting blocks, £35, f.o.b. London area. New 813, ceramic base, £2. Woden 20H 120 mA swinging choke, £1.—Box No. 2187, Short Wave Magazine, 55 Victoria Street, London, S.W.1.

ARMY SENDER 36, with modulator, £9. CR-100, with manual, £17. P.O. Rack, 15/-. 813 with heater xformer, 40/-. Woden 2½v. 10A xformer, 15/-. All as new.—G3MML, *Hornchurch 50059*.

MR37 Rx, perfect condition, with handbook, £30. Professionally built 200-watt Tx, CW/Phone, 10-80 metres, fully metered, 813 final, all power supplies and modulator, with BC-221 as VFO, with calibration chart, £25 quick sale. Operating desk and microphone given to purchaser complete station.—Lusty, 21 Gentleman's Row, Enfield, Middlesex (*Tel. 1394.*)

LG300 in immaculate condition. Indistinguishable from new, RF end only, no mods. High-level Modulator, AB2 miniature 807's, professional job, no power packs, £60. Would deliver within 100 miles.—G4OV, Windcroft, Mount Joy, Bridport *(2614)*, Dorset.

R1155B, PSU, output stage, modifications; RF stage EF91, IF stages EF93, S-meter, good condition, £9 (o.n.o.?). RF unit 20-35 mc, 35/-. RF24, 10/-. Browns F phones, unused, 25/-. Buyer pays carriage. — Jones, 33 High Street, Treorchy, Rhondda, Glam.

TR200, perfect condition, no TVI, GPO tested, complete with Z-match aerial tuner with built-in LPF and aerial current meter, Moni-Match S.W.R.B., relay control unit, genuine bargain, nearest £110. Am ordering new SSB Tiger when good home found for present Tx. So drop in and test this fine TR200 personally.—G3LDV, 7 Diana Gardens, Deal, Kent.

FOR SALE: AR88 condenser pack 3 x 4 μF, No. P.72026-515, 17/6. Genuine S-meter, 62/6. AVC/NL switch, 6/-. RF pot, 6/-. Brand new, boxed, inclusive of postage.—A. J. Reynolds, 149 Waller Road, New Cross, London, S.E.14 (*Tel. New Cross 1443* after 7 p.m.)

VHF RECEIVER wanted, mobile or mains.—Details please to A. McNamara, 70 Lyme Street, Manchester 13.

FOR SALE: Panda 120v. Tx, excellent condition, complete LP filter, etc., £65. AR77E Rx, perfect condition, £30. CR-100, latest type (not ex-Service), perfect, £25. Triplex Sig. Gen (new), 55 kc-120 mc, £15. All above complete manufacturers' manuals. Would prefer purchaser to air test and collect (South Coast).— Box. No. 2188, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

GONSET (U.S.A.) Mobile Converter 10/15/20/80 metres, £10. Labgear wide-band multiplier unit, £3. D.104 hand mike, £2. 3-element 10-metre beam, fits 2in. pole, with 40ft. co-ax and gamma-match, £4. All as new.—G2HAP, 80 Lostock Road, Davyhulme, Urmston, Manchester *(URM. 3383)*.

SALE: 3·5 to 28 mc Tx, CW-Phone, circuit, photo, details on request, £40 (o.n.o.?). Smoothing condensers, chokes, transformers, etc. Woden DT1, £2 s.a.e. list.—Cooke, 128 Drayton Road, Norwich.

R107 RECEIVER, in transit case, delivered 20 miles. WANTED: UM3 mod. transformer. —Reilly, 2 Chapelhill Road, Paisley, Renfrewshire, Scotland.

750, no mods., original components, best offer over £35 within 7 days. — Box No. 2189, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

AMERICAN 12-VOLT TRANSISTORIZED AMATEUR BAND CONVERTER, 3½ x 4½ INCHES; 10- TO 80-METRE BANDS; AS NEW; ONCE USED; CUSTOMS CLEARED. BARGAIN, £30.—BOX No. 2191, SHORT WAVE MAGAZINE, LTD., 55 VICTORIA STREET, LONDON, S.W.1.

AR88D RECEIVER, complete in cabinet, PVC wiring and new valves throughout, 500 kc marker xtal, and instruction book; delivered 60 miles; £45. SX-28 in working order. £30. BC-342, complete with 230v. AC power supply, £12 10s.—Wright, 72 Hartington Road, London, S.W.8 *(WIM 3158 biz. hrs.)*

K.W. VANGUARD, 160-10 metres, in good condition, including Panda LP Filter, £50 (o.n.o.?); deliver London area.—Box No. 2192, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

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Printed by The Courier Printing Co. Ltd., Tunbridge Wells, for the Proprietors and Publishers, The Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1. The *Short Wave Magazine* is obtainable abroad through the following: Continental Publishers & Distributors, Ltd., William Dawson & Son, Ltd.; AUSTRALIA AND NEW ZEALAND—Gordon & Gotch, Ltd.; AMERICA—International News Company, 131 Varick Street, NEW YORK. Registered for transmission to Canada by Magazine Post. *November* 1959