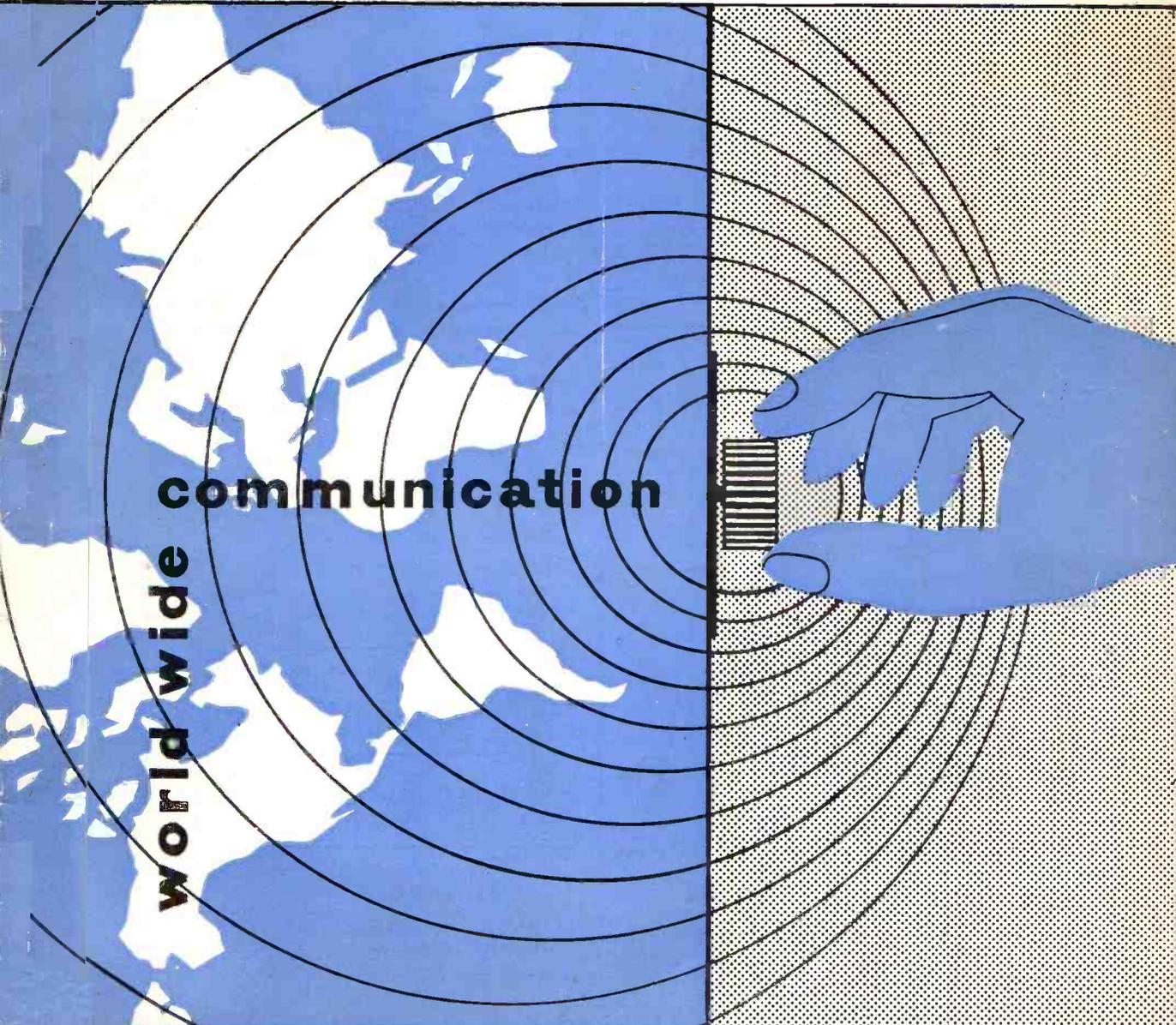


The SHORT WAVE Magazine

VOL. XVI

NOVEMBER, 1958

NUMBER 9



communication

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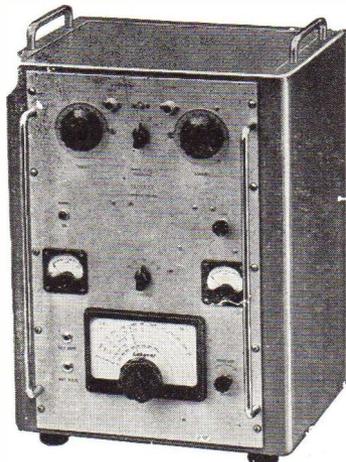
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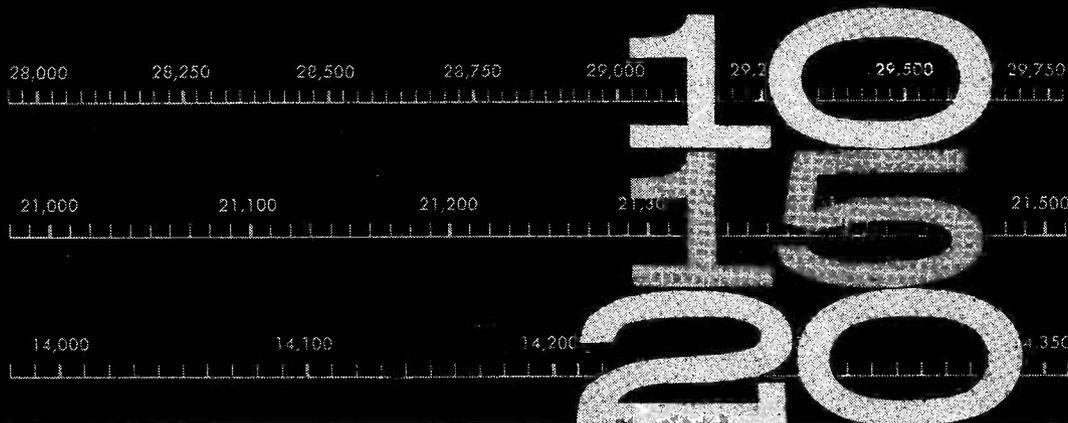


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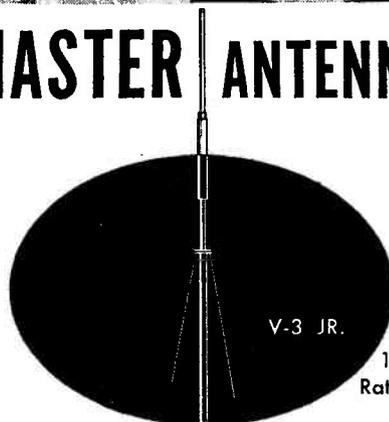


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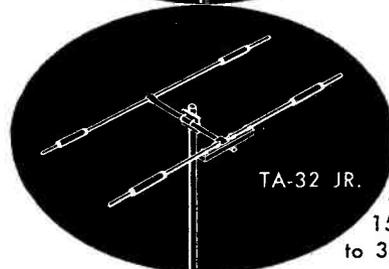


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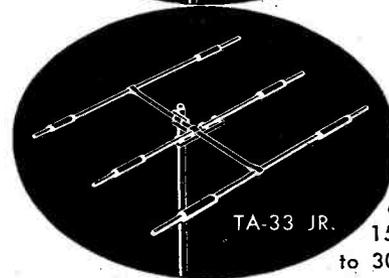
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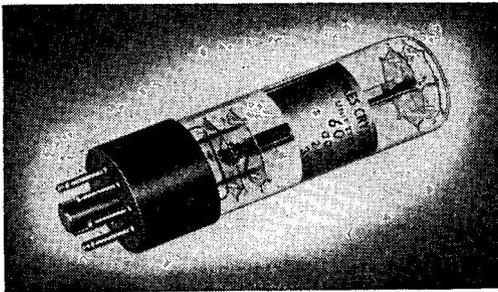
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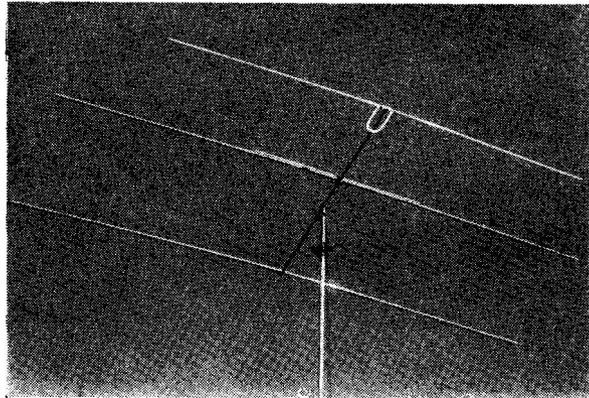
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The SHORT-WAVE Magazine

EDITORIAL

RTTY In amateur circles in the United States, a good deal of interest is taken in the practical application of frequency shift keying (FSK) as applied to the radio teletypewriter (RTT) or, as we know it in this country, the teleprinter. At any rate, there are now quite a number of W/VE stations operating FSK-RTT (RTTY), on the traffic-handling pattern familiar in American amateur operating.

Though the British amateur licence permits the use of FSK (designated F1 in the "types of emission" code) on all our communication bands, there are no U.K. amateur stations using this method of transmission—the main idea and the only real advantage of which is its capacity to operate a teleprinter direct. While this obviously has interesting possibilities—the distant station types a message which comes out at the receiving end as a typed facsimile—and in theory, at least, a "message can be left" at any time the receiver is alive—it is also clear that the system is not, from the purely amateur point of view, cheap to instal. Moreover, it is not easy to get going unless standard commercial apparatus is used. By what for us was an unfortunate chance, much of the "surplus" British ex-Service teleprinter apparatus (the finest of its kind in the world) was sold to the U.S.A. at the end of the war. It is this equipment that some of the W's are using.

There is also the disadvantage that, for other users of the band, FSK is a noisier and more troublesome source of interference than AM phone, as anyone will know who has heard the "jingle-bells" transmission from an American amateur RTTY station on one of our DX bands.

However, it is the modern method of transmission in the commercial communication field, and so should be of interest to those who aspire to the highest levels of communication technique in modern Amateur Radio practice.

Since RTTY operation demands that all stations using the system should conform to certain coding standards in order to make themselves intelligible to one another and because in this country the obvious application (in the amateur field) is for point-to-point working over comparatively short ranges, it would seem that it should be possible to allocate a frequency area in the 80-metre band for U.K. stations wishing to embark on RTTY. Alternatively, as F1 is permissible on 28 mc as well as on VHF, local working free of interference would be feasible at, say, the HF end of 10 metres (where we have a clear band) and in the 145.5-146.0 mc area of the two-metre band. In both these spaces, disturbance to other users of the band would be at a minimum. In either case, strong signals would be obtained for local working up to distances of 40-50 miles or so.

Austin Fobler
G6FO.

An LF Band Transceiver

SELF-CONTAINED UNIT FOR
160, 80, 40 METRES

D. NOBLE (G3MAW) & D. PRATT (G3KEP)

Essentially, this is a design for a transportable three-band station, suitable for either mains or battery power supply. As such, it is low-powered and is intended to give QSO's rather than to work DX. Various forms of construction are possible round the circuitry given, which embodies transceiver principles in that the audio section is used both for transmission and reception.—Editor.

THE need arose for a small self-contained transmitter-receiver which could be employed for mobile, portable or fixed station use. It was required to operate on the LF bands, either with CW or good quality telephony. A circuit was evolved to meet these conditions, and the diagram of the final unit is shown in Fig. 1. Originally, the transmitter was crystal controlled only; but, due to many unsuccessful attempts to break into local nets, it was decided to provide for VFO operation on 160 metres. It should, however, be mentioned here that operation on any other band still does necessitate the use of crystal control.

The main reason for constructing such a transceiver was that of working while on holiday, when the need is for taking a minimum of equipment. This transmitter-receiver has also proved to be of great value in quickening the interest of several short-wave listeners by using it to operate /A from their homes prior to them receiving their own licences.

The general arrangement consists of a 1-V-2 TRF receiver using a Brimar 6BX6 in the RF and detector stages, with a 6AM6 and 6BQ5 as audio valves. The transmitter runs a 6C4 Clapp VFO on 160 metres, into a 6BX6 buffer and 6BQ5 PA employing pi-section coupling to the aerial, with Heising (choke control) modulation of the PA by using the two receiver AF stages and a crystal microphone. The unit was built on a chassis 6 x 9 x 2½ inches with a front panel 6 x 9 inches. Two power supplies were constructed; one is for AC mains operation, the other being a vibrator unit for 6 volt DC operation. Each unit was built on a chassis 3 x 9 x 2½ inches, and the plug arrangement

adopted permits either power supply to be fitted directly on to the main chassis, making the total table space for the chassis nine inches square. The output from each power supply is 250 volts at 80 mA.

Transmitter

As explained earlier, the VFO was an after-thought, and this had, therefore, to be mounted on a small sub-chassis to the rear of the receiver section. The circuit values were determined by experiment, and are given in the table. Output is taken from the VFO by means of a short length of co-axial cable fitted with a wander-plug so that it can be coupled into the crystal socket when 160-metre VFO operation is required. The second valve in the transmitter operates as a conventional untuned buffer amplifier when VFO is used, and as a Pierce oscillator when a crystal is inserted. The coil of the pi-network circuit was fitted with a three-way rotary switch so that operation on the three LF bands could be obtained.

Receiver

As the equipment was to be used for local telephony and EU/CW working, it was decided that a TRF design should serve the purpose quite adequately. Denco B9A permeability-

Table of Values

Fig. 1. Transmitter, Receiver and Modulator sections of the Transceiver

C1, C21,	C35, C38 = 25 μ F 25v. wkg.
C27 = 3-30 μ F Philips	electrolytic
Trimmer	C36 = .05 μ F paper
C2 = 50 μ F variable	C37 = .005 μ F paper
C3 = 120 μ F silver	R1, R2 = 100,000 ohms
mica	R3, R6,
C4, C5 = .001 μ F silver mica	R9 = 180 ohms
C6, C7,	R4, R8 = 10,000 ohms
C10, C13,	R5 = 18,000 ohms
C28, C29 = 100 μ F silver	R7, R15,
mica	R19 = 22,000 ohms
C8, C39 = 0.1 μ F paper	R10, R13 = 33,000 ohms
C9, C11,	R11 = 470 ohms
C12, C15,	R12, R18 = 1 megohm
C16 = .001 μ F disc cera-	R14 = 47,000 ohms
mic	R16 = 4.7 megohms
C14, C23,	R17 = 4,700 ohms
C24, C25,	R20 = 2.2 megohms
C31, C32 = .01 μ F paper	R21 = 220,000 ohms
C17 = .002 μ F silver	R22 = 130 ohms
mica, 1000v. wkg.	VR1 = 100,000 ohms
C18 = .0005 μ F variable	potentiometer
C19 = .0005 μ F 2-gang	VR2 = 500,000 ohms
variable	potentiometer
C20, C26 = 150 μ F silver	Ch = 10 Henry 40 mA
mica (for 160	LF Choke
metres)	M = 0-50 mA meter
C22 = 50 μ F 2-gang	V1 = Brimar 6C4
variable	V2, V4,
C30, C34 = 8 μ F 350v. wkg.	V5 = Brimar 6BX6
electrolytic	V3, V7 = Brimar 6BQ5
C33 = 470 μ F ceramic	V6 = Brimar 6AM6
L1 = 90 turns, 30g. enamelled copper wire, close wound on ½ in. diam. paxolin former.	
L2 = 60 turns, 22g. enamelled copper wire, close wound on 1½ in. diam. paxolin former, tapped at 30 and 40 turns from aerial end.	
L3 = Denco B9A plug-in coil "Blue" Range 3 for 160 and 80 metres, Range 4 for 40 metres.	
L4 = Denco B9A plug-in coil "Green" Range 3 for 160 and 80 metres, Range 4 for 40 metres.	

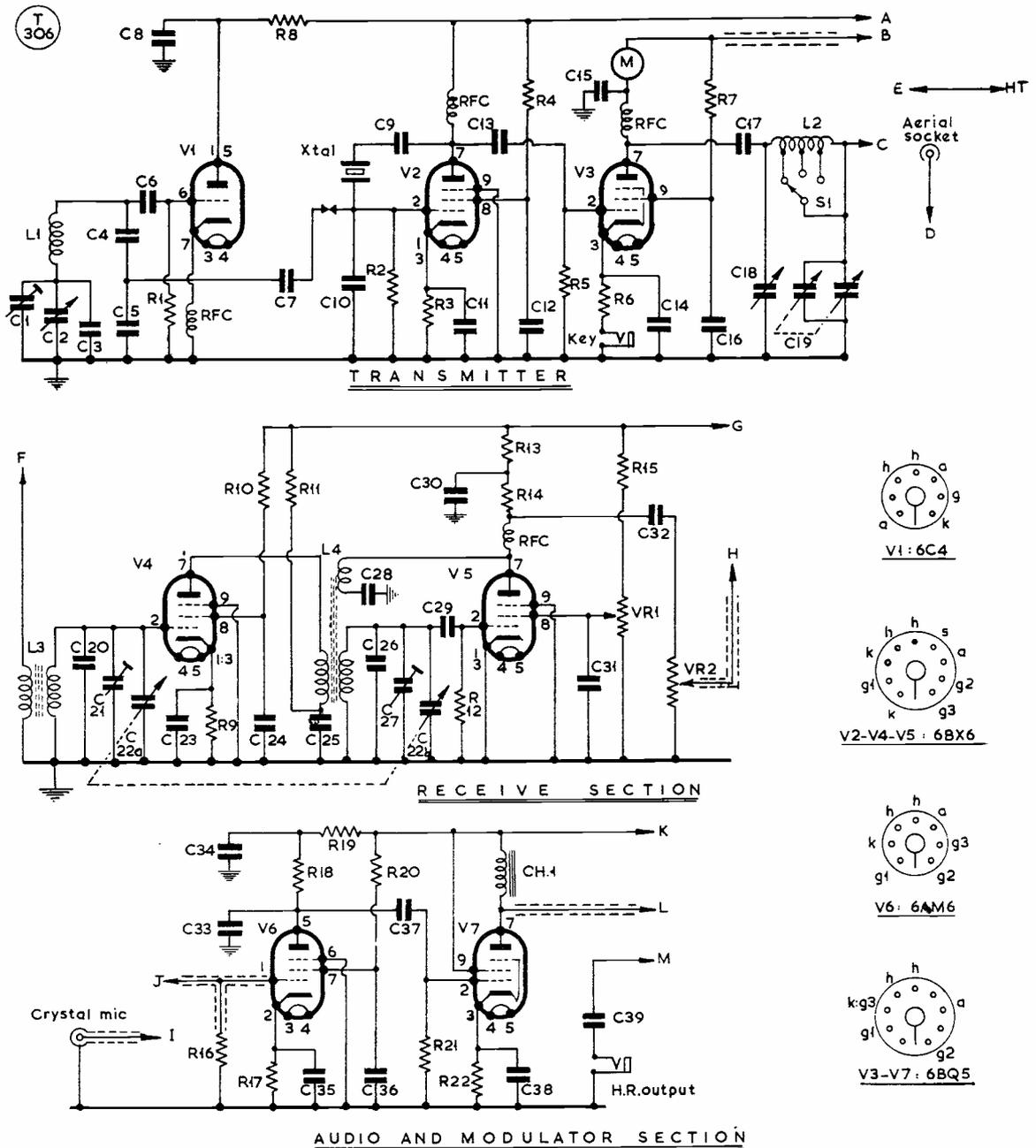


Fig. 1. Circuit arrangement for the transmitter, receiver and modulator for the transceiver described by G3KEP/G3MAW. On "transmit," the audio side of the receiver functions as the modulator. Either VFO or CO drive can be used.

tuned plug-in coils are employed, and, so as not to necessitate the need for a high-capacity variable condenser for band-setting (which would have required a larger chassis) fixed

padding condensers were soldered across the actual coil pins. There is the disadvantage, however, that separate coils are required for each band. The tuning condenser used is a

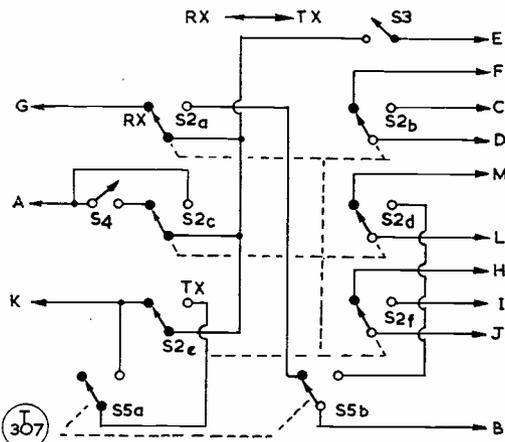
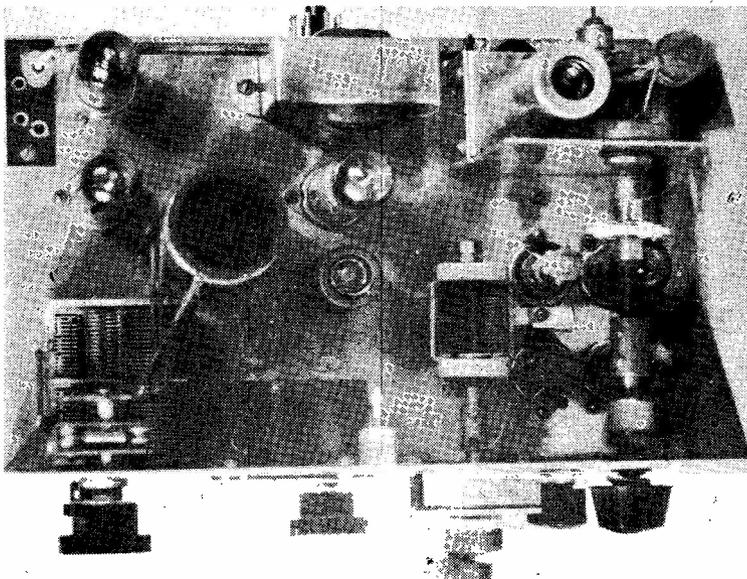


Fig. 2. Switching for the Transceiver. S2 is the send-receive switch, shown in the "receive" position, and S3 is the CW/phone switch, set for "CW." Toggle switches S4 and S5 are for main HT on-off and VFO netting respectively.

miniature 2-gang 50 μF type, and Philips concentric trimmers were placed across the tuning condenser for final adjustment. The detector is fed *via* the AF gain control and transmit-receive switch to the AF stages. Output is taken from the anode of the 6BQ5 through a 0.1 μF condenser to a jack socket mounted on the front panel. In the prototype, a 5-inch loudspeaker and output transformer were built into a Denco speaker cabinet. High-impedance



Plan view of the G3KEP/G3MAW Transceiver layout, with the receiver section on the right; the VFO is mounted on the sub-chassis, behind the receiver, the output being fed through coax to the grid-pin of the crystal socket, at top left. At centre are the modulator and receiver output stages. Brimar miniature valve types are used throughout, the PA being a 6BQ5.

Table of Values

Fig. 3. Vibrator Power Supply

C1, C2 = .05 μF paper	R1, R2 = 47 ohms
C3, C4 = 100 μF 25v. wkg. electrolytic	RFC = 2.5 mH RF choke
C5 = .01 μF 1000v. wkg. paper	CH1, CH2 = see text
C6 = 0.1 μF paper	CH3 = 10 Henry, 80 mA choke
C7, C8 = 16 μF 500v. wkg. electrolytic	T1 = Vibrator transformer (see text)

phones can be used but, due to the large amount of audio power available, these cannot be recommended! The AF gain control operates only on the receiver; on "transmit," the circuit values are worked out to given full modulation with a crystal microphone.

Switching

The change-over switch S2 employed was a 2-bank wafer assembly selected from the junk-box. Either one of this type or a P.O. key switch may be used for S2, but whichever is the case, it is essential to keep the AF switching contacts away from those which change over the aerial, or feedback will result. A double-pole change-over toggle is used to select phone or CW. A toggle-switch to enable the VFO, or CO, to be brought on during reception is included, as is also a switch in the HT feed to the whole unit.

The 6-volt vibrator power supply circuit diagram is shown in Fig. 3. The transformer used in the model was a mains type having a 250-0-250 volt winding and two 4-volt windings; the two LT windings were connected in series, with the mains input winding unused. Any suitable mains transformer would serve, although better results would be obtained from a vibrator transformer wound for the purpose. Nevertheless, the set-up shown met the purpose quite adequately, and an output of 250 volts at 80 mA was obtained for an input of 6 volts. The vibrator used is a Wearite 6-volt synchronous type QFA/6, obtainable on the "surplus" market. In the battery leads are two filter-chokes. Ch1 and Ch2. These can be wound with about two yards of 14g. enamelled copper wire on pieces of $\frac{1}{2}$ in. wooden dowel.

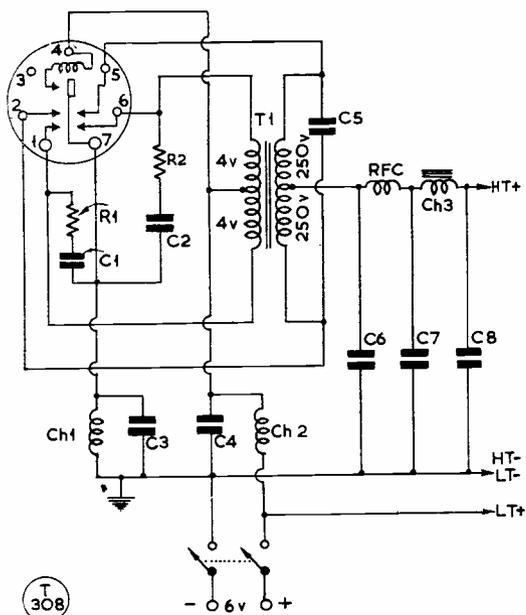


Fig. 3. Vibrator power supply unit for the Transceiver. If used for portable or mobile work (in a car) a separate battery should be provided, as most car electrical systems are positive-earthed.

The wiring on the LT side should be kept as short as possible, using thick, low-resistance wire, or a reduction in output will ensue.

For the mains power-supply, a transformer capable of delivering 250 volts at 80 mA is required. In the prototype, a transformer with one heater winding only was available, so that a rectifier valve with an isolated cathode had to be used.

Results

The unit described here is operated on 160 metres with a long-wire aerial; results compare quite favourably with the writers' own Top Band transmitters, and several European contacts have been made. On 80 and 40 metres, good phone and CW reports are consistently received from all over the British Isles, while several QSO's have been obtained

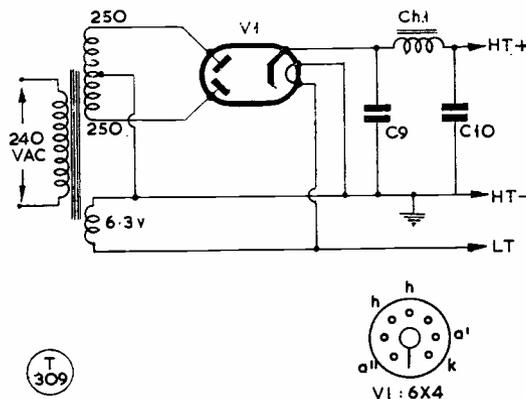


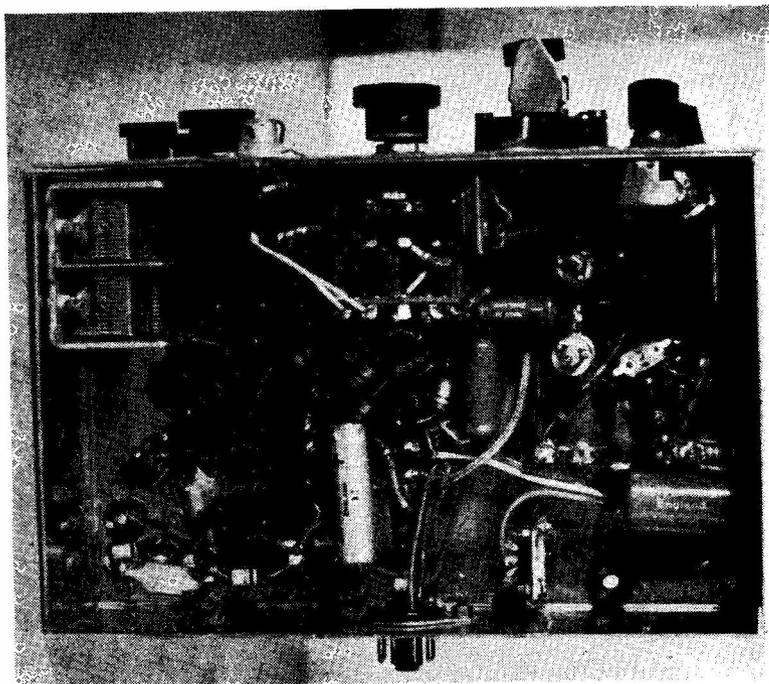
Fig. 4. A standard type of mains HT supply unit for operating the Transceiver.

Table of Values

Fig. 4. AC Power Supply Unit

C9, C10 = 16 μ F, 500v. wkg. electrolytic	T1 = 250-0-250 volts at 80 mA, mains xformer
CH1 = 10 Henry, 80 mA choke	V1 = Brimar 6X4

with Russian stations. On phone, the input is 6 watts, while on CW it may be increased to 8 watts.



General arrangement of the Transceiver below chassis, with the transmitter section on the left. Components and circuitry are economised by making the audio section common to both transmitter and receiver. The B7G valveholder mounted vertically near the power plug was used for a voltage stabiliser, which proved unnecessary in the final design.

Matching a Ground-plane

USE OF QUARTER-WAVE SECTIONS

K. E. FELTON, B.E.M. (G3IEF)

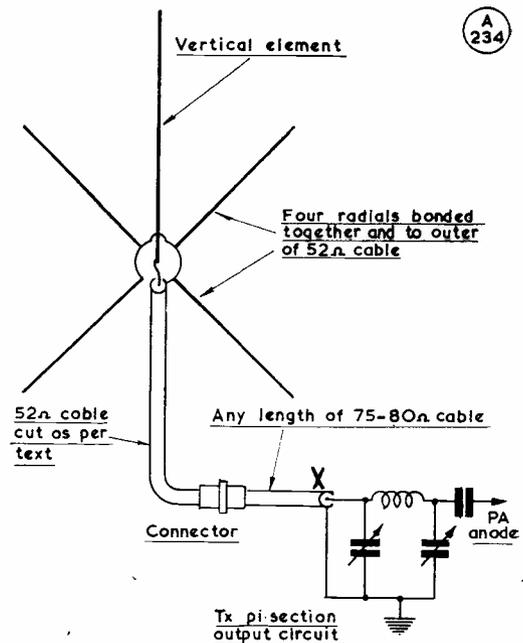
ONE of the disadvantages of the ground-plane aerial is the fact that at the point of connection of the feed line the impedance is low and of the order of 35 ohms. To overcome this and to offer a reasonable match to a 75/80 ohm coaxial feeder many designers of ground-plane aerials advocate that the four radials shall be sloped downwards at an angle, the most popular figure quoted being 45 degrees. This, in the writer's opinion, produces a hybrid which is neither a true ground-plane nor a vertical centre-fed dipole. Additionally, another useful characteristic of the ground-plane aerial is lost—the fact that the whole assembly can be erected out of the way of the XYL's washing by using a support of only 10 or 12 feet in height.

Having decided that a *pure* ground-plane is to be desired and that for reasons of domestic policy it is best to have the radials at 90° the problem then resolves itself into matching the aerial to the output of the transmitter. The great majority of modern transmitters are designed to have a pi-section output stage and at first it would appear possible (due to the wide range of impedance that a pi-section will match) to connect straight to the aerial and tune it up. The fallacy here is that you need some 35-ohm coaxial cable to do this properly; furthermore, unless you design a low-pass filter of 35-ohm input and output impedance your ordinary 75/80-ohm designed low-pass filter will not attenuate harmonics in the output anywhere as efficiently as it will (should) when it is working between proper impedances.

How to Match

The solution offered is to connect a *velocity-factor corrected* section of 52-ohm coaxial cable between the aerial and the 75-ohm cable from the pi-section output of the transmitter.

If the 75-ohm feeder from the transmitter has no standing wave on it and the aerial does absorb all the power offered to it, then looking either into the aerial or back into the 75-ohm feeder the impedance will appear resistive. Now, two resistive impedances R1 and R2 may be matched by inserting a quarter-wave section



Layout of the arrangement described by G3IEF, designed to allow a ground-plane to be correctly matched without distortion of the radial pattern. For a centre impedance of 35 ohms, the correct length of 52-ohm cable for each band is given for matching into the usual 75-80 ohm feeder, which can be of any length. If a low-pass filter for 75 ohms is in use, it should be inserted at the point X in this diagram.

of transmission line of characteristic impedance equal to $\sqrt{R1 \times R2}$. Taking a ground-plane aerial as being of 35 ohms impedance and a 75-ohm coaxial cable as feeder, as it happens this works out to 51.23 ohms, which is quite near enough to use a section of the 52-ohm cable available on the surplus market. The piece of 52-ohm cable (of the correct length) is then simply connected between the ground-plane and the feed end of any length of 75-ohm cable, using suitable coaxial plugs and sockets, or through connectors (see Fig. 1). The far end of the 75-ohm cable goes to the pi-section output circuit of the transmitter in the usual way.

There now remains the method of determining the correct length of 52-ohm cable to use; provided that this is of solid polythene insulant this can be arrived at by multiplying an exact physical quarter-wave length (a quarter-wave of the wavelength for which the ground-plane is being designed, of course!) by the factor 0.66.

To assist those who might be puzzled even by this, Table I is given in which these figures have been worked out for all bands 3.5 to 28 mc, it being assumed that not even the most

TABLE I
Quarter-Wave Matching Section, 52-ohm Cable
Cut for Mid Band

Mc BAND	LENGTH IN FEET
3.5	44.49 = 44 ft. 6 in.
7.0	22.96 = 22 ft. 11½ in.
14.0	11.46 = 11 ft. 5½ in.
21.0	7.65 = 7 ft. 8 in.
28.0	5.6 = 5 ft. 7¼ in.

enthusiastic will erect a ground-plane for Top Band!

For those who want to do it themselves, perhaps for other frequencies, the formula is:

$$\frac{300 \times 0.66 \times 39.37}{(f \text{ in mc}) \times 4 \times 12} \text{ feet}$$

This may be reduced to:

$$\frac{162.4}{(f \text{ in mc})} \text{ feet}$$

Derivation of the factor 0.66 is as follows:
The effective permittivity of the dielectric

relative to velocity in free space is designated ϵ and for solid polythene ϵ is equal to 2.3.

The velocity ratio equals $\frac{1}{\sqrt{\epsilon}}$ which works out to 0.66.

For those who have odd pieces of coaxial cable lying about of which the breeding is unknown, the following may be of some assistance.

At high frequencies the impedance of a coaxial cable

$$Z_0 = \left(\frac{138.1}{\sqrt{\epsilon}} \times \log_{10} \left(\frac{D}{d} \right) \text{ ohms} \right)$$

Where D equals the internal diameter of the outer conductor in inches and d equals the external diameter of the inner conductor in inches and ϵ equals 2.3, again assuming solid polythene dielectric. Admittedly, you need a micrometer and the maths. to get this out, but it's not as difficult as it looks and all you need do is put the two measurements for D and d in the formula and you have the impedance of the cable in ohms.

RADIO HOBBIES EXHIBITION

This is, of course, the Exhibition of the year for all radio amateurs—and anyone else interested in Amateur Radio, whether licensed or not—and it takes place at the Royal Horticultural Old Hall, Vincent Square, London, S.W.1, opening on Wednesday, November 26 and closing on Saturday evening, November 29. The R.H. Old Hall is within a short walk of Victoria Station, and any bus along Victoria Street will put you down at the Army & Navy Stores, which would be even nearer. After normal business hours there is plenty of parking space in the vicinity of the Old Hall, though it is pretty congested at any other time.

The latest information shows that there is going to be much of interest to see at the Radio Hobbies Exhibition. K.W. Electronics will have a new 150-watt RF amplifier to follow their "Vanguard," and will show a new amateur-band converter which makes any vintage receiver into a double-superhet. The R.E.E. Telecommunications two-metre 50-watt self-contained transmitter will be another new item. There will be a wide range of aerial assemblies, including the Mosley and the do-it-yourself kits offered by Richard Maurice, from which something like 100 different UHF/VHF systems can be built up from standard components. Relda Radio will have a demonstration of the Collins TCS equipment (as described in our October issue), while Jason, Cossor and Mullard will be showing items of test gear in kit form, as well as a wide range of equipment in the field of transistory; one of the Mullard exhibits will be a 15-watt transistor amplifier or modulator. Standard Telephones will have a big display of Brimar valves,

and Mullards will be showing those interesting transmitting types that all keen amateurs covet. Among the other exhibitors will be found a considerable selection of apparatus of direct interest to every radio amateur, the firms to be represented being Enthoven, Home Radio (factoring Eddystone and Panda equipment), Lewcos, Minimitter (something new is expected here), Philpott's, Taylor, Teletron and Whiteley. All three Services will have exhibits of practical interest, and there will be amateur TV (and colour TV by G3LI/T) as specialised demonstrations. The technical publishers are well represented, and we shall be on Stand 14, where we shall be offering a good selection of manuals and handbooks of importance to the radio amateur, also the new and revised version of the *DX Zone Map*—see p.476.

The ticket draw this year will be for a Racal receiver, valued at £400—but even if you can't win that, you will still miss a great deal if you are not at this year's Radio Hobbies Exhibition, which will be opened by Air-Marshal Sir Raymond Hart (Controller of Engineering & Equipment, Air Ministry) at noon on Wednesday, November 26. The Exhibition will be open every day, Wednesday-Saturday 29th from 11.0 a.m. till 9.0 p.m., and the usual catering facilities will be available.

U.K. CALLSIGN SEQUENCE

The latest callsigns for new U.K. amateur stations are in the G3N— series, and at the rate at which licences are being issued, we shall be well down into them by the end of the year. If yours is a new call, do not forget to let us have it for the "New QTH" page and the *Radio Amateur Call Book*.

OBTAINING THE ODD VOLTAGES

SOME SIMPLE AC/DC CIRCUITS

J. Brown (G3LPB)

VERY often one requires an unusual voltage—be it low, high, AC or DC, with any polarity. These can be obtained quite easily, as shown in this article, the circuits of which can be put together simply, cheaply and efficiently.

One may need a bias supply for a new PA, for instance; this can, of course, be taken from batteries, but in these days they are little used. The following are two simple circuits which are efficient, and give any polarity, with variable voltage. Fig. 1 is a simple unit, the power to feed this being borrowed from the heater supply. T1 is a speaker transformer, M1 is a Brimar RM1 metal rectifier (selenium type), the smoothing condensers need only be small ones, and for the choke a normal receiver type will do, or a small output transformer with the secondary winding removed would be suitable. Fig. 2 shows another such, this time using an LF transformer of the Ferranti AF type; the ratio controls the actual output, e.g., a 3-1 transformer with the mains AC supply connected to the high-resistance side will give about 80-90 volts to the rectifier, which results in a supply variable from 0-80 volts DC, which will suffice in many cases.

In these circuits, the connection of the rectifier determines the polarity of the output. This is better explained in Fig. 3, which shows how a selenium rectifier will work in either direction of polarity, though more efficiently the right way round. Fig. 3 shows how two different polarity outputs can be obtained; in No. 1 the output is positive, i.e., the potentiometer centre-tap is positive; however, should a negative supply be required, the unit can be wired with no earthy connections, or the connections to the metal rectifier can be reversed. Thus, for positive output the AC connection goes to the black, or unmarked, side of the rectifier, with the DC taken from the red side of rectifier. If a negative supply is wanted, the AC goes to the red side and the DC negative polarity appears at the black or unmarked side of the rectifier. No. 2 in Fig. 3 shows this polarity reversal.

Some surplus transformers on the market today

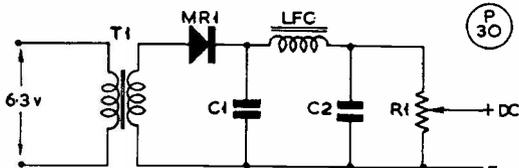


Fig. 1. T1 is a speaker transformer, with its primary fed from any available 6.3v. winding. With a Brimar RM1 rectifier, and C1, C2 or 8 μ F, a useful range of variable DC voltage can be obtained across the 50,000-ohm wire-wound resistor R1. The choke can be any suitable iron-cored component.

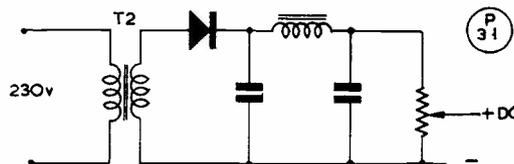


Fig. 2. In this circuit T2 can be an audio transformer (see text), all other values being as in Fig. 1.

have odd voltage windings; with these, or even by using the heater windings, many useful low voltages can be obtained with an EA50 as rectifier—these valves are only about a shilling each and they will give small voltages for special purposes. Fig. 4 shows the actual circuitry, this being in use in a valve voltmeter to “buck” the meter; it works excellently, and the EA50 will handle up to 100 volts at 5 mA comfortably. The anode side may be taken from any unused winding on the power transformer. The smoothing condensers will have to be chosen to suit the DC output, likewise the smoothing resistor;

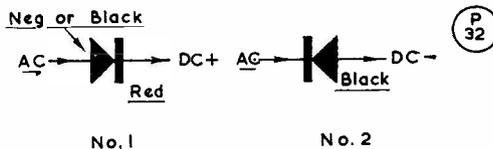


Fig. 3. Changing DC polarity from the rectifier. In No. 1, AC is fed to the black end, and the DC is positive at the red end. In No. 2, AC is fed to the red end to get a negative DC output.

for low voltages, as sketch, 25 μ F 12v. bias condensers are excellent, and for the higher voltages use the 8 μ F 150-volt type.

Unusual AC voltages required are again easily obtainable. By phasing spare heater windings, all values of voltages can be derived. If a heater transformer has, say, the following windings: 4, 4, 5, 5, 6, 6, and 20 volts, numerous voltages between 4 volts and 50 volts can be obtained—very useful for dial lamps, relays, or odd heater values, e.g., 10v. or 12v. The correct phasing connection must be made, as two AC windings in series can produce either the

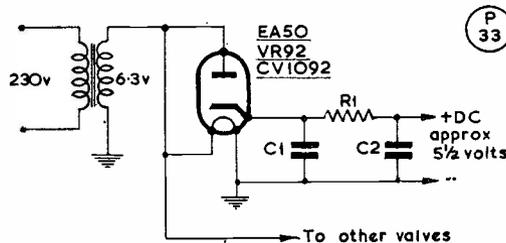
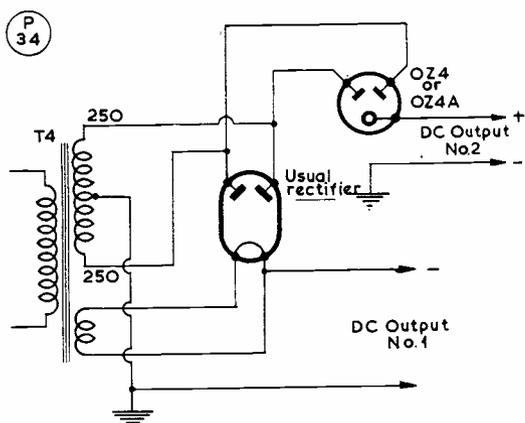


Fig. 4. Using this circuit, DC voltage outputs up to about 100v. can be obtained, depending on the transformer winding available. At around 120v. AC on the EA50, there may be flash-over between anode and cathode, and the most obvious application of the circuit is for low-voltage DC. R1 can be 1000 ohms 1-w. for smoothing, other values being as for Fig. 1. T3 is an existing heater winding, a spare 6.3v. section, or any source of AC up to 100-120 volts or so.



total of the windings or nothing, as, if out of phase, the windings will cancel each other out. e.g., if 6v. plus 5v. windings are in phase, they give 11 volts ;

Fig. 5. Method of obtaining a secondary DC output from an existing power pack ; such a supply could be stabilised by a VR150/30. Using a Brimar OZ4 gas-filled (non-heater type) rectifier, a starting voltage of 300v. is recommended, and a DC output of something like 200v. at 40 mA could be expected in this circuit, provided the secondary of the mains transformer T4 will give the additional current.

if "out of phase," only 1 volt is obtained. The output of each individual winding is measured, and the total available voltage when in phase can be determined. Some time may be needed juggling the connections around before the correct phase connection is found.

Mention should also be made of the gas rectifier—again, these can take the place of small metal rectifiers, as they require no heater current, and a 250-0-250v. winding in use to feed an exciter or similar apparatus can incorporate a gas rectifier to obtain another DC supply. Fig. 5 shows how this can be done. The current load is, of course, limited by the rating of the rectifier and the capacity of the transformer.

Fifteen and Ten on an Indoor Aerial

PRACTICAL TWO-BAND SYSTEM

R. Q. MARRIS (G2BZQ)

TO the man who has a long garden, and a good mast, this article will be of little interest. But the writer is in a first-floor flat, with no facilities for an outdoor aerial. He was determined to transmit, and if possible, to work DX as well, using an input of 15 watts on 21 and 28 mc. Several weeks of experiments with every conceivable type of indoor aerial (bent, twisted and corkscrew) resulted in the design about to be described, after eliminating practically every other possible combination.

The room housing the transmitter measures 12ft. x 10ft. and conventionally has windows along one wall, and a fireplace on another. A half-wave aerial for 21 mc is approximately 22 feet, and for 28 mc about 16 feet. It will be seen that in the space available neither length could be accommodated in any orthodox fashion.

Before proceeding further, it might be as well to point out that odd lengths of wire, quarter-wave wires and half-wave wires (end and centre fed) were all tested. Summarising the results: The odd lengths of wire were just as "odd" inside as outside. A quarter-wave

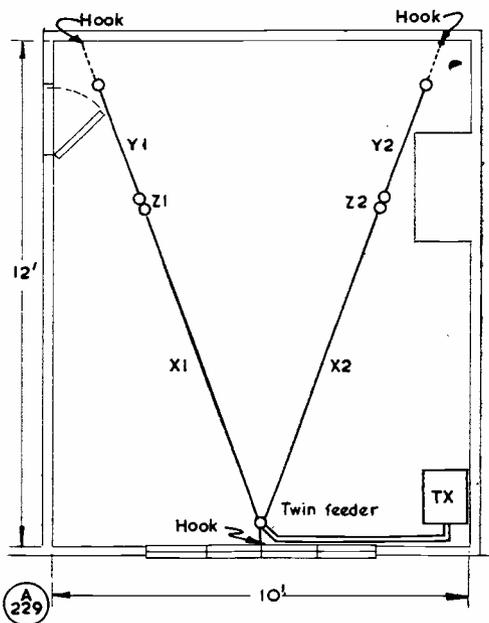


Fig. 1. Solution to the problem of working DX on two bands from a flat without outside aerial space. After much experiment, G2BZQ has evolved this ingenious arrangement; "invisible" wire is used, strung on insulated screw-hooks, band change from Ten to Fifteen being by jumpers at points Z1, Z2.

aerial requires a good earth, and a good earth just does not exist in an upstairs flat, though some success was achieved by laying chicken run netting under the carpet! The end-fed half-wave aerial worked, but due to its length resulting in much bending being necessary, the results were not too good.

[over

It was found that a centre-fed half-wave aerial, with the ends bent down, or folded back on themselves, produced quite good results.

Reference to Fig. 1 will show that the final aerial evolved, which works very well under the circumstances, is a half-wave centre-fed horizontal dipole, with the quarter-wave limbs bent to a "V." In theory, the angle of the "V" should exceed 60° , but in practice at G2BZQ it is about 45° without any apparent ill effect. The feeder should be taken away at 90° downwards, or away from the apex of the "V" in a horizontal direction, and then bent down at 90° where convenient. Do not bring the feeder between the limbs of the "V"; 75-ohm feed line should be used and twin feeder gives better results than coaxial, for the short lengths necessary.

Each limb of the half-wave "V" consists of a 28 mc quarter-wave section (X), plus a short length (Y), which makes the limb quarter-wave at 21 mc by putting a shorting link across the insulator (Z) between X and Y. Thus, on Ten X1 and X2 form the aerial, and on Fifteen X1 + Y1 and X2 + Y2 are used.

The dimensions are as follows: X1 = X2 = 8ft. 4in.; Y1 = Y2 = 2ft. $9\frac{1}{4}$ in.; Z1 = Z2 = $1\frac{1}{2}$ inches. The total length of each quarter-wave limb is 11ft. $2\frac{3}{4}$ in., which is just accommodated in the room.

The shorting link Z is made by soldering a short length of 14g. wire to the backs of two

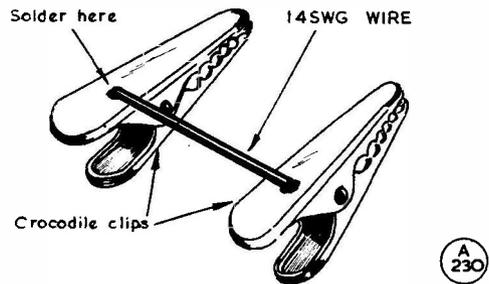


Fig. 2. The crocodile clip jumpers used to bring in the additional wire sections for the 15-metre band. Cartoons

crocodile clips, so that the ends of the jaws are $1\frac{1}{2}$ inches apart, as suggested by Fig. 2.

On 28 mc the shorting links are not on, but for 21 mc they are clipped across the insulators.

To make the aerial as unobtrusive as possible, 22g. tinned copper wire was used, slung on three insulated hooks screwed into the picture rail. The wire was terminated each end with thermoplastic $\frac{3}{8}$ -in. diameter curtain rings obtained (like the hooks) from Woolworths at a price of several for 6d. The 75-ohm twin feeder is about 10 feet long.

As for results—well, with 15 watts input on 21 mc, all Europe can be worked with ease, and DX is raised from time to time. Similar results are becoming apparent on Ten, as the band opens across the Atlantic.

"THE OTHER MAN'S STATION"

We are always glad to see station descriptions, with a *clear, sharp* photograph, for appearance as "The Other Man's Station," which has been a regular feature of SHORT WAVE MAGAZINE for many years. All we require is the information "in your own words," with whatever technical or personal details you care to give. The story is written from these notes, and payment at the usual rate is made for all such descriptions published.

RADIO FREQUENCY MEASUREMENT TECHNIQUES

A new Note on Applied Science dealing with signal generators, attenuators, voltmeters and ammeters at radio frequencies has recently been published. Twenty years or so ago, instruments designed to give a signal of known amplitude were known as "standard signal" generators. The word standard, which was meant to refer to the signal rather than to the generator, has now been dropped from most of the catalogues. The voltage values are usually engraved on the scales of the instruments, but it is obvious that these scales must be checked if the instruments are to serve as authentic standards, or generators of known voltages. The present pamphlet explains the procedures which have been adopted for

calibrating such instruments. It also gives some useful information on the calibration of attenuators and the behaviour of voltmeters and ammeters at radio frequencies.

Notes on Applied Science, No. 19: *Signal Generators, Attenuators, Voltmeters and Ammeters at Radio Frequencies*, published for D.S.I.R. by the Stationery Office, price 1s. 6d. (U.S.A., 27 cents), by post 1s. 8d.

THE COMMONWEALTH CABLE

One of the important decisions at the recent Commonwealth Conference in Canada arises directly from the great success of the G.P.O.'s existing Trans-Atlantic telephone cable. The decision was to link all the capitals of the British Commonwealth by a similar cable, giving immediate and private speech communication, 24 hours a day, between Commonwealth countries all round the world. This astonishing project—and it is wonderful, when one considers the technical complexities of the scheme and the immense distances involved—will take a long time and cost a great deal of money, but experience with existing long-distance telephone cables shows that it would be of immense value not only as a strategic factor, but also for business and commerce generally.

A Transportable Station

80 METRES IN A 20LB. GRIP
D. BUCKLAND (G3JKM)

This is another article to show what can be done in the way of getting a fully portable station down to the dimensions of a week-end case—not for working competitive DX, but just for giving QSO's. Even if your requirement is not the same as that of our contributor, here are the ideas for a /A or stand-by outfit, rather on the lines of the "spy box" of the war days.
—Editor.

THE need for a small transportable station arose owing to an impending period of compulsory National Service, and the prospect of two years without Amateur Radio facilities appeared intolerable! Some months before call-up, work on the project commenced. It must be admitted that a reasonably accurate forecast of National Service conditions was possible, and it was confidently expected that during the period of training an amateur station could be located at, and operated, from the establishment to which the writer would probably be posted. (It was hoped to maintain contact with the "old home," where G3DIR and G3JKM share the station.) It was not so easy to forecast the future after training had been completed, but amateur operating during the training period—which eventually proved to last for nine months—was regarded as a very welcome prospect.

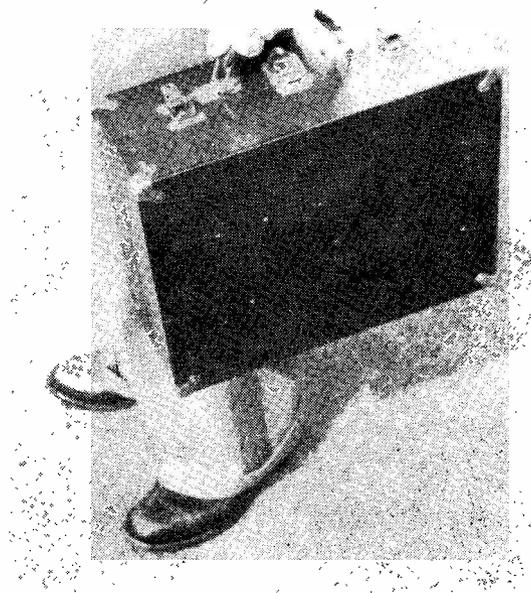
General Design and Layout

The station is contained in a specially constructed wooden carrying case, and measures 14½ ins. by 11½ ins. by 5½ ins. This case is finished in polished dark oak, with a handle, catches and lock, rubber feet and brass corners, and is of a most presentable appearance. When open the lid can be detached and made to serve as a firm surface for writing. Inside the lid are fitted small clips which hold spares, auxiliary equipment for operating the station, such as the Morse key, microphone, headphone, crystals, ballpoint pen, log, and so forth. A reel holds wire for aerial and earth, and the total weight is just twenty pounds.

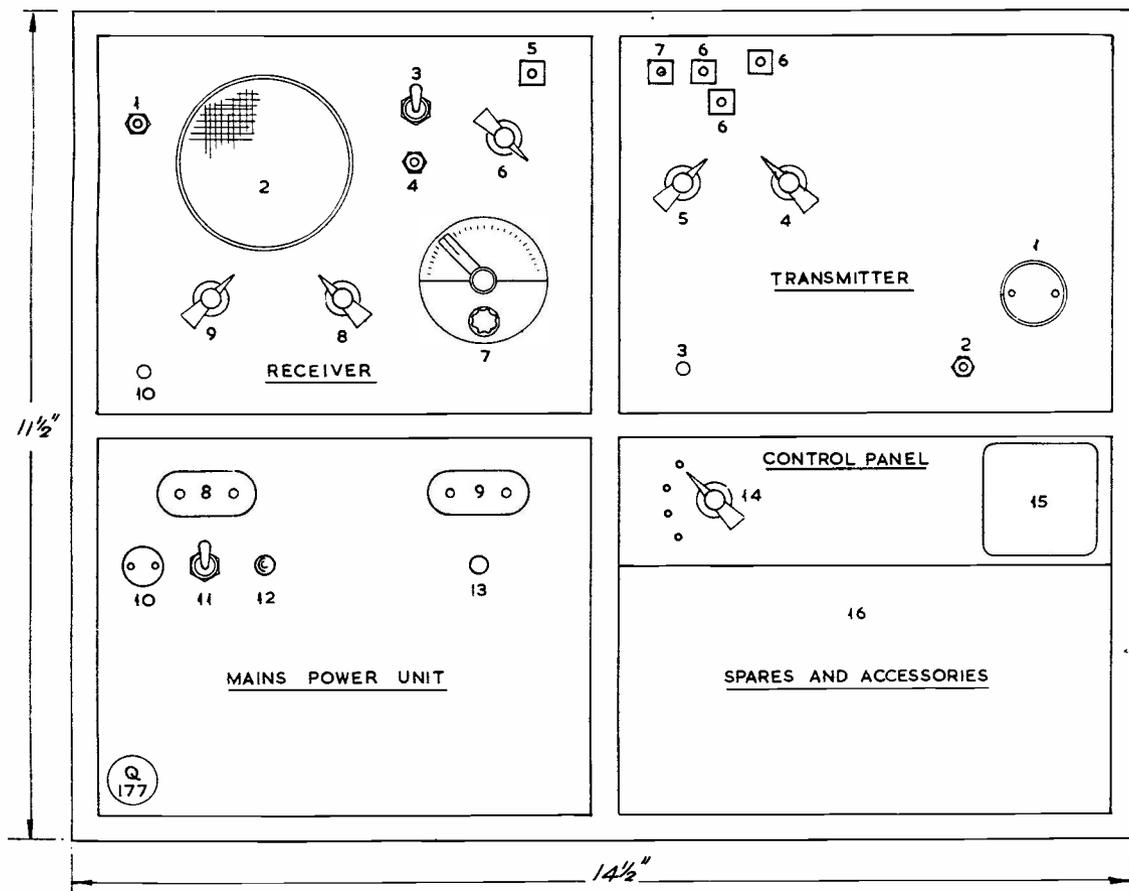
The bottom of the case contains the station proper, and this is securely fitted inside a protective thickness of sponge rubber sheeting. There are four units, each built into small tin

boxes sprayed grey cellulose—these boxes originally contained small cubes of a popular beverage! They are ideal for this (and many other radio purposes) and take paint well. Only one frequency band is catered for—3.5 mc—as this was considered to be the best choice for reliable communication with the home station, and, given reasonable conditions, would be suitable for contacts further afield.

Power input to the final RF amplifier is something less than eight watts, and both CW and phone can be worked. A receiver suitable for use with such a transmitter need not have high gain (the home station runs considerably more power), but good selectivity would be necessary, and an RF stage, followed by a detector and output stage, proved to be adequate. Main power would be available, and so no provision is made for battery operation. The power unit is built, like the other units, into a standardised tin box, but this meant that a transformer and choke of suitable size had to be obtained. This proved to be of very little trouble, for it happens that a firm which specialises in making non-standard as well as standard transformers has premises in the writer's vicinity. For those wishing to build something similar, power pack components of small size can be found by ferreting round the usual sources of supply! The switching of power from receiver to transmitter and vice



The 80-metre station described by G3JKM is truly portable. All accessories and spares are also contained in the case, the total weight of which is 20 lbs.



Outline sketch showing the general arrangement of the units in the G3JKM transportable station for 80 metres. This drawing should be compared with the photographs.

versa is carried out in the fourth tin box compartment, the control panel, part of which holds tools, small spares, test meter, and so on. All units are constructed on the *lids* of the tins, which have been reinforced by a backing plate of 16g. half-hard aluminium, and the four tin boxes have themselves been bolted together, with suitable spacers to enable the lids to be fitted, and together they make a firm and solid block.

Receiver Details

The receiver is a TRF arrangement, using an EF91 as RF amplifier, and a second EF91 as a leaky grid detector with reaction control, RC coupled to a 6BW6 in the output stage. This last valve may seem rather large for such a small receiver, but besides driving a small $2\frac{1}{2}$ in. loudspeaker, it also serves as the modulating valve when operating on phone, and so is the logical choice. The tuning range is restricted

to the 3.5 mc band, which simplifies matters, considerably, and a small series trimmer condenser is fitted to resonate the aerial; this makes a big difference to signal strength. The one aerial is used for both transmitting and receiving and is changed from one to the other of the two units by a small knife switch which can be plugged on to the appropriate sockets of the units when operating. Considerable ingenuity was needed to fit the components into the small space available, but the final result is most satisfactory.

Transmitter Design

The transmitter is crystal controlled. It was not considered feasible to build a VFO into the space available, and expect it to have the required stability. The crystal oscillator valve is an EF91, and the screen volts are stabilised, the stabilising valve being fitted adjacent to the oscillator stage. The oscillator drives a 6BW6

KEY TO LAYOUT DIAGRAM

Receiver

- | | |
|-------------------------|----------------------------|
| 1. Phone jack | 6. Aerial trimmer control |
| 2. Loudspeaker | 7. Main slow motion tuning |
| 3. Modulation ON switch | 8. Reaction control |
| 4. Microphone | 9. Gain control |
| 5. Aerial socket | 10. Supplies feed-through |

Transmitter

- | | |
|--------------------------|---------------------------------|
| 1. Crystal in socket | 4, 5. Pi-tuning controls |
| 2. Keying jack | 6. Tappings on main tuning coil |
| 3. Supplies feed-through | 7. Aerial socket |

Power Compartment

- | | |
|----------------------------|---------------------------------------|
| 8. Supplies to receiver | 13. Earth terminal |
| 9. Supplies to Transmitter | 14. Main control switch, send/receive |
| 10. Mains input socket | 15. Test meter in position |
| 11. Mains on/off switch | 16. Spares compartment |
| 12. Indicator lamp | |

as PA, which is pi-coupled to a random length of aerial. (Note the use of similar valves for receiver and transmitter, thus economising on spares to be carried.) Keying takes place in the cathode of the oscillator valve—hence the need for the stabiliser—and the PA can be plate-and-screen modulated. This is accomplished by switching the microphone into the cathode of the leaky grid detector valve (making suitable circuit changes by the switch) and using this stage as the microphone amplifier. The output stage 6BW6 loudspeaker transformer, instead of feeding the speaker, is switched to a small heater transformer connected in reverse, so that the ratio of approximately 40:1 presents a reasonable match to the plate and screen impedance of the final; the receiver gain control remains in circuit. It has been found that the final can be fully modulated by this means. The

modulating transformer is fitted in the fourth box, adjacent to the change-over switch for send-receive. Four crystals are available to ensure finding at least one spot in the band where QRM is not too bad.

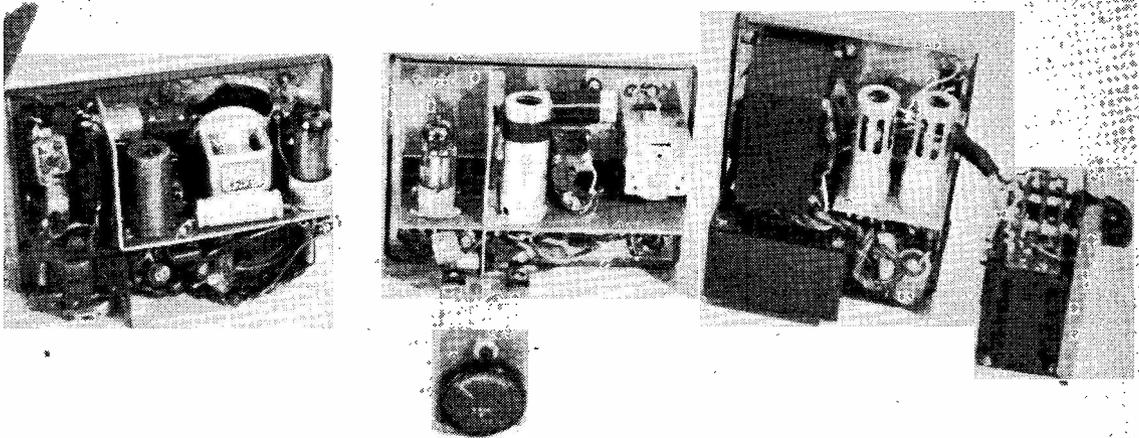
Power Supply Details

This is quite straightforward, using the specially made transformer and choke. Two miniature 6X4 rectifiers are used, in parallel, in order that sufficient HT current may be available without undue loading on the valves. The output voltages are brought out to multiple-pin connectors from whence they are distributed to the receiver and transmitter by mating plugs. A small indicator lamp glows through a red opal when mains power is switched on, and the HT is controlled by a rotary switch to give "LS," "Phones," "CW" or "Phone."

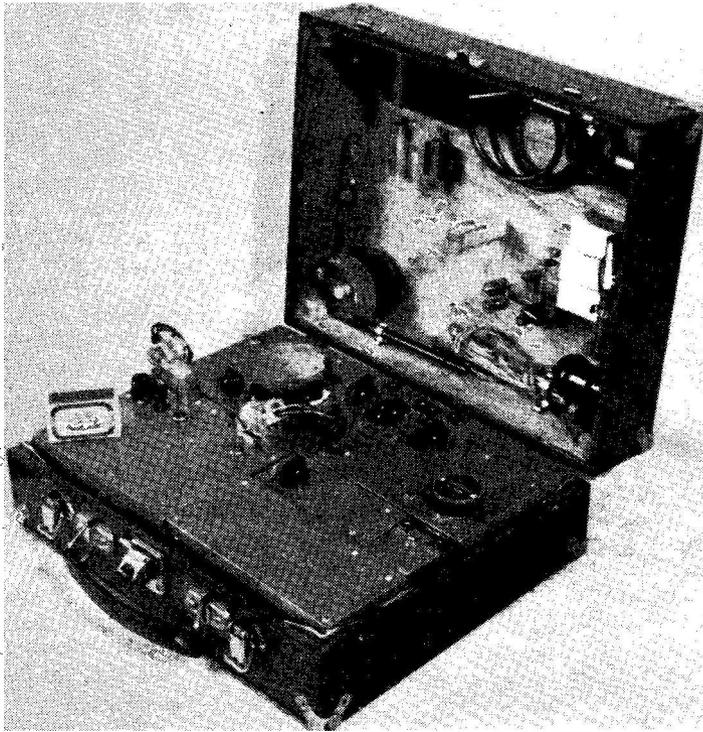
Auxiliary and Test Equipment

For testing and maintenance work, a small 500 microamp. meter, 1½ ins. diameter, was built into a specially-constructed container, which is very small. Using separate input sockets—thus avoiding the necessity for a four-position switch—the meter will read to 30,000 ohms, 100 mA DC, 300 volts DC, and—with a small nine-inch rod pickup plugged into the appropriate socket—it will also give an indication of RF output, and can thus be used as a tuning meter.

Cutting and wiring pliers, a small screwdriver with a mains neon indicator in the handle, some fuses and wire are carried in the spares compart-



The units of the 80-metre transportable station described by G3JKM. Using "Oxo" tins of various sizes (sprayed grey cellulose) as the individual chassis, the items are, left to right: Receiver, Transmitter, AC mains power unit, and Control panel, with the test meter in front of the transmitter. The units are actually built on to the lids of the boxes, these being stiffened with aluminium sheet, the lids then fitting into the boxes for screening and protection. The assembly complete is shown in the other photographs.



The G3JKM portable station is assembled in a carrying-case made for the purpose. The lid is deep enough to accommodate the accessories and four crystals are carried to give some choice of frequency in the 80-metre band. Reliable two-way contact was possible with the home station G3DIR at a range of 100 miles, reception normally being on the 2½-in. speaker seen in the compartment at upper left. The match box is for general size comparison.

ment, which is protected internally by sponge rubber sheeting to prevent any movement when the station is in transport.

During the period of operation from the

"TCS TRANSMITTER-RECEIVER ASSEMBLY"

There is a slight correction to this article which appeared in our October issue. The author, G3LOX, informs us that in the connector diagram on p.411, Fig. 4B, the transmitter plug, pin No. 2 should be marked 400v. HT, and pin No. 12 goes to No. 7 via the interlock.

FOR SALE OR WANTED

This month's spread of Small Advertising is one of the most extensive we have yet published, in both the "for sale" and "wanted" categories. Indeed, the volume of small advertising in *SHORT WAVE MAGAZINE* is consistently greater than in any similar periodical, proving what we have so often said: That if you have anything worth selling, or need any particular piece of equipment, you cannot do better than use our Small Advertisement columns, through which over the years thousands of pounds' worth of apparatus has changed hands, and the re-sale value

National Service QTH, the necessary permission from the GPO and the local Service authorities having been obtained, CW contact with the home station at a distance of 100 miles was successful on every occasion when it was attempted, which was an average of about three times a week. On two occasions phone was attempted, and although not 100% successful, speech was audible. The receiver proved to be quite adequate, phone from the home station being easily readable at good loud-speaker strength. Contacts on the key were made with locations as far apart as Lancashire and Cornwall, and several QSO's were obtained with DL's and HB's.

Those at the training establishment who knew nothing of Amateur Radio were duly impressed, and not a little envious of the one who could contact his home every evening if he wished, and even the officers showed considerable interest. But now that training is ended,

the unit is back at the home QTH, as the present Service location of G3JKM does not permit of Amateur Radio operation. However, this little transportable station will without doubt serve further useful purposes.

of a wide range of gear has been established. Rates for readers' private advertising are low, and a quick response is assured for attractive items. Draft your advertisement carefully and legibly, with full punctuation and using the accepted abbreviations, and count each word at 3d. (5s. minimum charge) allowing an extra 1s. 6d. for a box number if that is required. Send it, with remittance, to: Advertising Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1—and don't leave it too late if you want to be in the next issue.

BOOKS FOR CHRISTMAS

While not wishing to anticipate the present-giving season too far in advance, we have no hesitation in drawing attention to the suitability of books for Christmas—and for a radio amateur, what better present could there be than a book from the extensive range offered by our Publications Dept. on p.450 of this issue.

DX COMMENTARY

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

ALL through the summer, it seems, one has been saying "Just you wait until the DX season really opens and you'll be more than satisfied." Well, no one can say it hasn't opened now; the whole month under review has been terrific for DX of all kinds. In short, it has probably been the most prolific yield of all-round DX since your commentator started writing this feature a little more than twelve years ago.

Not only have the rarities been there, and plenty of the easier DX for the not-so-experienced 'chasers, but fantastic signal-strengths have been the exception rather than the rule. For example, the mass of W's to be heard on 14 mc almost any night after 2200 GMT has consisted of more S9 signals than weaker ones. Even with the receiver gains down at very reasonable settings, incoming DX has reached the truly painful level of audibility. Five or six USA stations, in particular, could not have been louder if they had hitched themselves to the far end of our long wire. Even VK's, ZL's, JA's and others have reached the same levels many times.

So now you all know what "peak conditions" are really like. Probably the majority of our regular readers were not active at the last sunspot maximum in 1947-48, so they are having a brand-new and very pleasant experience. Back in those years there was less than half the activity on the bands that there is to-day, so the whole thing was less of a scramble and, some might think, more enjoyable. But that is a matter of opinion and the last thing we want to do is to sound dissatisfied—so now to pro-



W9AC

CALLS HEARD, WORKED and QSL'd

ceed with the world-wide DX gossip that has come in from all the usual sources.

DX Gossip

There has been plenty of rare stuff to choose from this month, and all sorts of possibilities are announced for the future. The sad fact, however, is that many of them only mature at short notice, and by the time this Commentary appears they are all over and done with.

KH6MG/ZK1 has been very active from *Danger Island*, which is about 700 miles distant from ZK1 and may well count as ZM6 or ZM7—no pronouncement as yet . . . CN8IU will be in *Monaco* from December 14-20; no call-sign as yet . . . ZL1ABZ worked from the *Kermadecs* on 14 mc CW and phone during October, but he didn't seem to get this far; all his 80-metre contacts have been disallowed for DXCC credit by the ARRL.

VS1BB/ZC5 was very active in early October, but has now returned to base . . . VQ3PBD promised to operate from *Zanzibar*,

VQ1, on 28 mc phone, and did so with huge success.

The *Galapagos* gang (HC8AGO, 8LUX and 8WGF) had not been heard at the time of writing, but are probably active right now . . . KB6BJ has left *Canton Island* and we gather that there are no KB6's at present . . . VK9X calls will be allotted to *Christmas Island* (one in the Indian Ocean that was formerly ZC3), as it now comes under the administration of Australia, in the same way as Cocos-Keeling.

KS4AZ was on from *Swan Island*, and W4HBY/KS4 is said to be on 14250 kc phone fairly regularly . . . BV1US is now busy on 21227 kc . . . XW8AH is very active from *Laos* on 21020 CW . . . A "3W8FM," said to be in *Viet Nam*, is reported to be more likely in OK or SP-land!

VK2AIR, who ran the very successful VK2AYY/LH expedition from Lord Howe Island, is talking of a possible swoop on FK8, ZM6, VR5 and ZM7, all of which should be pretty popular . . . Legitimate stations in *Korea* are HL9KR, 9KS and 9KT.

Others, operated by Korean nationals but not allowed to work foreign stations, have the HL2 prefix.

Spitzbergen is now represented by SM5WN/LA/P, who will be there until next summer; usually around 14060 kc . . . LA2JE/P also continues his activities from *Hope Island* . . . JT1AA said he would be QRT from September 21, but has been heard since that date; when he leaves, it is doubtful whether there will be any further activity from *Central Mongolia*.

W0PBW/ZK1, with KH6MG/ZK1 on *Danger Island*, has also been heard on 14 mc . . . FK8AS still awaits his FW8 licence for *Wallis Island* activity . . . On the other *Christmas Island* (VR3) we gather that VR3O is a Marconi employee out there and is building an SSB rig; he says that the suspension of licences is only temporary, while tests are actually going on. (This via G3KUM, who is out there, and G3DPH.)

There should be a spate of PY0 activity from *Trinidad Island* about the time you read this, with PY0NA, 0NB, 0NC, 0NE and 0NF all firing up—all bands, AM, SSB and CW; behind the project are PY1CK, 2CK, 7AN, 1HQ and 1BIG . . . San Diego DX Club, who ran the recent Clipperton Island epic (FO8AT) are now thinking in terms of *Socorro* (XE4), to which the most recently-projected one petered out.

Pacific-fanciers should look around on 14 mc CW for K6IGP/KP6, W3ZJU/KP6 and W2EPS/KJ6, the last one also being on 29 mc phone.

Iwo-Jima has been a rare spot for the last few years, but activity is increased now with KA0IK and KA0IJ, who work on alternate nights—mostly 14 mc phone . . . AC4AX is genuine (we seem to say this every month) but there seems to be more than one of him. W's have worked an AC4AX with their beams due south!

XZ2TH is putting Burma back on the map . . . VS9MA continues activity from the Maldives . . . The projected VU5 expedition by VS1BB has fallen by the wayside with licensing difficulties . . . Danny Weil (VP2VB) has

been running very successfully from Antigua as VP2AY, and should by now be setting up in Dominica with another new call, having spent ten days in Montserrat on the way.

HR0AA has been reported on the low edge of 7 mc — status unknown . . . ZD8JP very active from Ascension . . . No news of Chatham Island activity, although ZL3DA is said to be there; he listens for calls in the 14000-14100 kc sector but remains on 14315 SSB himself. (Later: ZL3VB is now on 14 mc CW most days around 0700; he is resident.)

Another New One ?

In the same category as the ZK1 activity on *Danger Island* is the arrival of MP4DAA on *Das Island*, Persian Gulf. This is one of the Trucial states, quite separate from Bahrein, Qatar and the Omans. MP4DAA is a communications engineer on the island, which is 1½ miles long and half-a-mile wide, where they are drilling for oil (and they've struck it!) He will be there for more than a year.

but at present only gets on the air about once a week (14048 kc, rock-bound); more news of him later, we hope.

ZL3DX says he may be able to go to VR5 and the Kermadecs . . . VS9AS may be operating from *Oman* as VS9AS/A in November . . . VS9MI, the new arrival in the *Maldives*, has been heard on 14 mc CW (1900).

You don't have to wait to hear a PY0 call-sign now if you still want Fernando de Noronha; PY7AFN, 7SC and 7LR are all there, and active. PY7AFN is on 14 mc CW, PY7SC mostly on 28 mc phone and the third one barely on the air yet . . . VK0TC is on 21 mc phone, long path, early mornings . . .

Late Flashes

Red-hot gen, on the *Trinidad Island* affair is that they should be active now until November 24, on 28, 21 and 14 mc, CW and AM. Also a little SSB but on 14 mc only. PY1CK, 0NA, 0NF and 1BIG will all be present.

VR1C is active again, with a

**FIVE BAND DX TABLE
(POST-WAR)**

Station	Points						Countries	Station	Points						Countries
		3.5 mc	7 mc	14 mc	21 mc	28 mc				3.5 mc	7 mc	14 mc	21 mc	28 mc	
DL7AA	905	113	171	245	199	177	260	G3INR	332	46	59	128	62	37	138
G3FXB	766	73	131	215	197	150	245	G3IGW	330	44	68	102	66	50	130
G5BZ	745	64	118	255	187	121	263	G3HZL	314	31	62	106	68	47	128
G2DC	711	79	103	212	173	144	237	G3LET	311	14	54	153	68	22	164
G3DO	654	24	45	241	172	172	265	G6TC	302	17	67	127	59	32	143
GW3AHN	616	16	55	189	221	135	243	MP4BBW (Phone)	276	1	5	88	117	65	141
G3WL	541	41	91	176	127	106	205	G2BLA	272	32	50	66	69	55	110
G3BHW	530	15	32	181	173	129	225	G2YV (Phone)	270	12	27	83	95	53	138
G3ABG	519	45	84	170	117	103	194	G8DI	266	25	56	74	62	49	114
W6AM	517	30	58	287	86	57	287	G3HQX	266	15	37	78	68	68	121
G2YS	492	71	87	163	109	62	180	G3JJG	265	38	45	94	53	35	113
GM2DBX (Phone)	425	34	31	160	102	98	176	G3DNR	245	10	21	87	61	66	116
G6VC	398	34	52	150	94	68	172	W3HQO	156	3	5	28	76	24	94
W6AM (Phone)	367	13	32	262	39	21	262	G3KXT	150	8	6	41	13	82	109
G3JLB	367	43	50	95	89	90	163	G3IDG	114	11	15	29	27	32	50
G3FPK	338	31	72	118	74	43	143	G3DNF	112	6	29	38	28	11	50
G3JZK	336	17	56	77	117	69	161								

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

Quad and a better signal . . . VQ8AJ/C returned to Mauritius in mid-October . . . Strong possibility that French Guinea (represented by FF8AC/GN) will count as yet another country . . . IIAFS will be operating from San Marino, probably during the CQ DX Contest.

Ten Metres

One could sum up the 28 mc situation by saying that the band has been wide open for all kinds of DX, in the proportion of about ten phones to one CW. Phone men are very happy about this—brasspounders equally despondent. But the CW half of the CQ Contest (November 29-December 1) will change all that for 48 hours!

G3FPK (London, E.10) found Ten going great guns and often heard all continents in the mornings; on CW he raised EL1X, JA, VK's, ZL's and a UA9; VK9DB and 9XK were among those worked.

G3BHW (Margate) collected ET2US, LA2JE/P, VE3BQL/SU, FS7RT, DU1AP, SV0WB, VK9DB, VP2AY, VP2LS, VQ1PBD, UO5 and XE's on phone; G3HQX (Mitcham), with a new 2-element beam, worked CR4, EA9, PJ2 and UO5 for new ones; G3HZL (Isleworth) raised LU for a new country and Arizona for another state.

GW3AHN (Cardiff) had his big moment when he worked a UA0 in Zone 19. This gave him his WAZ on phone (he already has it for CW) — with "the usual 25 watts input." If this isn't something fit to print in red type, we're surprised. Congrats. to GW3AHN on a very fine piece of work. Others he rolled in included FP8AR, HC, HK, HP, OA, PJ2, TG, VK9, VP1EE, VQ1PBD, XE and 9G1 (all phone), plus KP4 and two VK9's on CW.

G2DC (Ringwood) finds 10 metres alive, with a vengeance. Four new ones for him were HK7LX, VP2AY, VQ6AQ and UN1AA, others booked in being JA, UA0, VU, VQ4, VK9's and ZD2.

G3ABG (Cannock) had a regular explosion of activity on phone, and lists about 65 DX stations worked, from all over! Too



In Southern Rhodesia there is a family of five who all hold amateur licences — father ZE3JW, daughter ZE5JB, sons ZE1JN and ZE7JO. Here we see a second daughter, recently licensed as ZE8JP, in QSO with her sister ZE5JB, with OM ZE3JW, the father of them all, keeping a watchful ear on her Morse procedure — and what a proud father he must be!

numerous to mention but there's not much missing—not even VQ1PBD! He tells us that VK9BS was in Papua but will be back in New Guinea in two weeks. Incidentally, G3ABG attributes all his success to changing the coax on his 28 mc Quad for open-wire feeder.

G3FKM (Birmingham) was one of those who raised VQ1PBD; G3LET (Westcliff) on CW worked EL1X, VK9DB and 9XK, and other VK's and ZL's; G3DNR (Broadstairs) bagged ET2US, CR4AD, ZD2JM, UO5 and ZL (all new), plus 9G1, EA8, UA0, PY and the like.

G5BZ (Croydon) collected CR6, CO, VP7, KP4, ZE, KZ5 and such-like, on CW. G3WL (Plymouth) put up a "T2FD" (remember those?) and with 40 watts collected fifteen new ones on the band. Among them were KA9PW, KC4USB, KH6, KL7, TI, UA0, VK9 and YV.

New for G31GW (Halifax) were SV0WR and U18AG, both CW; for G3DO (Sutton Coldfield) FP8AR, FU8AE and 9G1BA, all phone. G3MJL (London, W.7) reports for the first time, entirely on ten-metre phone doings. He worked one whole Sunday morn-

ing and afternoon, with never a report less than 5 and 9 plus (using a Bi-Square aerial). Most of the time he was sitting on 29.5 mc, but he did come lower to work CO2OZ and an LU. G3JZK (Cambridge) got VK6FL and ZL3RB, on phone.

Fifteen Metres

As regards phone, this band probably takes second place to Ten for once, but for the CW addict it has been a howling success. G5BZ's list includes VS9MA, KX6BT, KH6MG/ZK1, LA2JE/P, KM6BK and 6BL, VK9XK, HC8LUX (Galapagos) and VP0AB (presumed phoney). Plenty more "routine DX" was also worked.

GW3AHN comments on the good conditions to the Pacific in the mornings. Phone brought him KH6, KL7, KM6BK and 6BP, KR6, VK9, VR2DE and ZK2AB, as well as VP2AY, VP5AB (Turks) and VP9DC. CW was even better with FB8XX, HV1CN, KH6MG/ZK1, KM6BK and 6BL, KX6BT, VK0RO, VR2DA and 2DG, XW8AH and plenty more.

G3HQX raked in CE, CR6, EA9, HE, KR6, ST, VP2, ZD1, ZP, ZS3 and a few more; G3FPK acquired three new ones with

VP2AY, UQ2 and VK9RR, as well as KL7, VK's, ZL's and VQ2; G3ABG got in HV1CN, SM8CHA/MM, TI2LA, UQ2AB, VS9AT, ZD7SA, ZL and ZS—all on CW.

Nine new ones for G2DC were HV1CN, HS1E, VR2AG, ET2KY, KR6JF, KM6BK, UL7HB, UI8AG and UD6AB. Also worked—DU7SV, EL, JA, KL7, KP4, KM6BL, LU1ZS, VS1, VS6, VS9, VP8, VK9's and XW8AH. The only one that got away was HL9KT!

G3BHW's phone fetched in DU6IV, HL9KT, KB6BH, KM6BP, SVØWT, VK9NT, VP3VN and VR2DE; CW was good for DU7SV, FB8XX, FP8AR, KH6MG/ZK1, VP2AY, KM6BK, XW8AH, XZ2TH and YA1AA.

G3FKM mentions FB8XX and 8ZZ, KM6BP, XZ2SY and ZK2AB on phone, with KM6BL, KX6BT and XW8AH responding to CW. G3LET on CW managed FP8AR, JAØAQ, KX6BT, KZ5CM, VP7BT, VS9AT and the less rare stuff. New ones for G3WL were UF6FB, VS6DX and TI2LA.

G3DNR worked FP8AR, EA9, VQ2 and UA9; G3IGW heard KM6BL but didn't make contact; G3DO's phone netted KM6BP, KX6BT and ZK2AB; G3HZL, on CW, found UO6UQ but lost XZ2TH.

G3JZK raised ET2VB and I1CR/M1 on CW, with ZS8I and ZD1EO on phone; FB8XX got away repeatedly, CW and phone, French and English!

You will have noticed the wonderful amount of rare Pacific DX among the foregoing (we thought we had done quite well with VR2, KM6, KW6 and KX6!) How long this will last, it is impossible to say; but it's nice to wipe it up while it's there . . . there may be another eleven years to wait!

Twenty Metres

Twenty has become the band one uses when the others are not so hot! It's been good *all* the time, of course, but the joys of working rare DX on Ten and Fifteen without short-skip interference are so great that one can neglect Twenty without any

qualms at all.

Selections from G5BZ's list include FP8AR, VQ8AQ, HV1CN, KC4USK, K61GP/KG6, VP7NA, ZK1AK, VS9MI, DU1DR, KS4AZ, FB8CH, VK9DB and a couple of KH6's over the long path—a thing G5BZ has been trying to do for years.

GW3AHN worked KS4AZ and KV4AA on CW, but obviously hasn't taken much time off from the other two bands. G6VC (Northfleet) got ON4BQ/LX for a new one—local but useful. G3FPK also added a new one with ZD2FNX, but spent little time on the band.

G3ABG raised HV1CN, KV4AA, VP2AY and FO8AT, all CW; ZA1MA was a gotaway. G2DC finds the wolf-pack as voracious as ever, and says it has to be a brave chap with a good signal who can survive their tactics from a rare DX location. New ones that he "salvaged" were KS4AZ and FK8AS, and others included KH6, KR6, VP2AY, VP7, VS1, VS9 and ZK1AK.

G3HQX winkled out CR6, FF8, KG6 and VQ3; G3IGW collected VP2AY, VP4WI, VP5BL and VP9Y, as well as OA, UF6 and VU; G3HZL weighs in with FB8ZZ, KM6BK, OY, VP4 and FQ8 (all CW), also HK on phone and UAØKQB in Zone 19. Best gotaway was HC8LUX (0530).

G3LET's list is a long one, from which we extract CE1AD, FB8CH, FP8AR, FO8AC, ON4CK/LX, HV1CN, VKØDA and ØTC, VP2AY, VQ8AQ, XW8AI and XZ2TH. He heard FU8AE, but he was working France only at the time.

G3FKM raised ZL3DA (Chatham Is.), who was on SSB; on CW he collected KS4AZ, KS6AG (her first G contact), KM6BJ, KX6ZC, VQ8AJC, KH6MG/ZK1 and XW8AI (a pretty high-quality list!) A gotaway was W2EPS/KJ6—only heard once. G3FKM also remarks on FF8AC, who is in French Guinea and now signs FF8AC/GN, doing a roaring trade in consequence. Watch him—he may be appointed as a new one . . .

G3BHW stuck to CW and the result included DU1OR, HV1CN,

HK3LS, KG6AHA, KM6BK, KS4AZ, KX6ZC, VP2AY, VQ8AQ, VS9MI, VS9O and XW8AI—all good stuff! G3BHW says he has worked more DU's in the last few weeks than he *heard* in the previous three years; XE's have also appeared suddenly.

The Other Bands

However good Forty and Eighty may have been, they have certainly been neglected in favour of this welter of rare DX on the HF bands, and who can wonder? We have a few reports, all the same. *Forty* gave G6VC a new one in the shape of UP2KCB; G3JHH (Hounslow) got on the band with 25 watts and worked his first Italian!

G3FPK raised VP3BO for a nice new one, following him up with VP3ER; others were PY1NW, UN1AH, VE and an I2. G3FPK finds the hash building up again, with the jammers and weird noises that spoil the band last winter; he also says ZA1KC makes frequent appearances but is very weak.

G3LPS (Blackburn) sends

TOP BAND COUNTIES WORKED

(Starting Jan. 1, 1952)

Station	Confirmed	Worked
G2NJ	98	98
G3JFQ	96	96
G6VC	96	96
G3JHH	92	93
G3FNV	91	92
G2AYG	88	88
G3KEP	85	85
G2CZU	79	79
G3DO	75	75
GM3COV	68	70
G3LBQ	61	67
G2CZU (Phone)	61	62
G3KEP (Phone)	59	62
G3LHJ	56	66
G3JSN	49	62
G3LEV (Phone)	39	47
G3LNR	38	48
GW3HFG (Phone)	30	40
G3LNO	23	41

another Forty-only report, and has found conditions better—even excellent at times. New Europeans were LX2GH and UN1AH; other QSO's included UA9OM, VP3BO, VE, PY, many W's and LA1EG (Tromso). W's can now be worked from midnight until 0830.

G3LNR (Nottingham) has gone "QRO" with 30 watts, and this brought him W4's and 9's; heard on the band were VP2AC, VE8SQ, FA8EC and LU1FBW. G3JZK raised HE9LAC for a new one.

G2DC wonders why the DX fights shy of *Forty*, which can be so good. He worked all W districts, VE 1-2-3, PY, CX and VP2AY, and says that VQ6AB is going to give the band a try-out, week-ends at 1900-2000 GMT.

G3IGW collected PJ2ME and VP7BT for a couple of new ones (Forty); G3HZL finds it good in the early mornings, having raised all W's except a 7; also HE and YV, not to mention a doubtful "PX3AC." G3LET worked W's, PY's, VE6SZ, UA9CM, ZL, UO5 and HI8BE (0200).

Concerning *Eighty*, there is less to say. G3FPK collected OE for a new one, and heard PY4AON, but he only has his 7-mc dipole plus its co-ax for this band. G2DC raised VP2AY and found VE, VO, W and PY signals roaring in during the early mornings.

G3HZL managed to snag W's and a ZL; G3JHH was getting around Europe with an SM1, a DLØ and his first TF. He scores 89/112 towards the DL diploma.

The Overseas Mail

Just when we were thinking there were no more to be had, in comes W6AM (Long Beach) with his score now up to 287, thanks to W3ZA/3W, VP2MR and ZL3DA. On phone he makes it 262 with the help of VP2MR, W3ZA/3W, VK2FR/LH and ZL3DA! To make the point, he remarks "Too bad Danny keeps going to all the places I've already worked!" It's tough at the top, all right, but a total of 300 is now possible.

UR2BU (Tartu) has been knocking off the DX in fine style, on three bands. Twenty has given him FL8AC, SP5LM/LA/P, PZ1AM, YN5CC, ZP5EC, JT1YL.

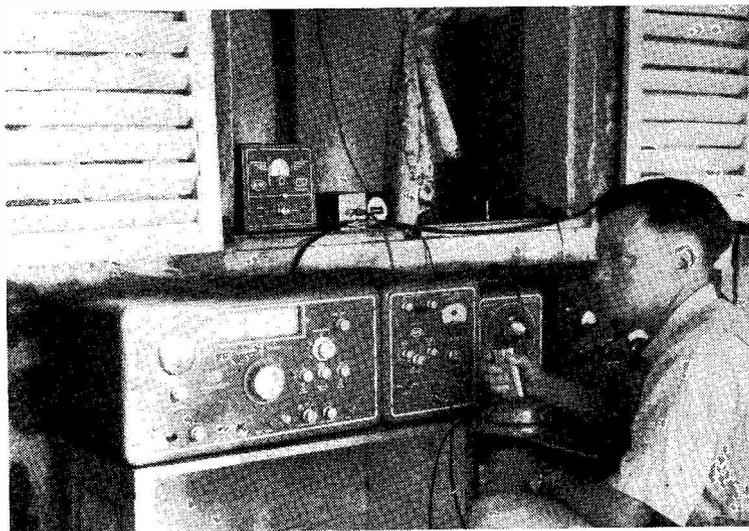
XW8AI, VQ8AQ and many others; best on Fifteen were OR4VN, VP8CR, VK9RR, OQØPD, FW7WU, EL's, ET's, and innumerable of the less rare ones; a short burst of Ten phone brought in OQ5, PY, ZD6RM and ZS. He collected his 40th Zone early in the year with FB8XX.

VS1HU (Kranji) now stands at 186 worked, the latest being ZS8I and FO8AT on 14, plus VP2VB on 21 mc. Others worked included VS9MA, VP6, VP2, ST2,

on CW and KR6AK on RTTY!

ZC5CB (Labuan) was formerly G3LZV, and at the time of writing had only been on for about two weeks, but had worked G2MA, 3CMY, 3HRO, 4CP and GM3EST, as well as VK9's (Cocos and Norfolk) and a KG6. ZC5CB will probably QRT between November 15 and December 15 and return to VS6, but he says several ZC5 licences will be issued in the near future.

CR9AH (Macau) sends along a nice photograph and tells us he



VQ9GU was at Mahe, Seychelles Is., during July and August, when some 450 contacts were made with 69 countries, on the 14 and 21 mc bands. VQ9GU is VQ4GU of Nairobi, and was operating for the Italian film-producer Renato Spinotti, who was himself IIBK in pre-war days. As power was from the hotel diesel plant, the VQ9GU activity was restricted to about one hour daily.

CR6 and the like on 21, as well as ZS2MI, W3ZA/3W and FU8AE on 14 mc. The only station raised on 28 mc (at his time of writing) has been VS9MA! Other news from Kranji is that the famous W6UOU SSB rig which went to VR2 and VR4 has passed through the hands of VS1FJ and is now at 4S7KD and *en route* for the Maldives. (Oh, yes—it went to Norfolk Island as well!)

Also we hear from VS1HU that VK2FR is now permanently on Lord Howe Island; that AC4AX is heard daily on 14100 kc CW (1100-1330 GMT); that ZC3AC's new call on Christmas Island will be VK9XN (VK9XM is also on the island); and that a series of QSO's has passed between VS1HU

now has a home-built SSB rig finishing up with 6146's in AB1. He has a 3-element shortened beam for 14 mc and an all-band trap vertical. Conditions out there are not good, he says, but he is on 14 mc CW around 2100 GMT.

DL7AA (Berlin) goes up a bit further in the Five-Band, and is now in a position to claim a phone WAS—K7BVX in Nevada on 10-metre phone gave him the missing one.

Top Band Trans-Atlantics

W1BB, still in full control of the situation, will be transmitting every Sunday morning, 0500-0730 GMT on 1810 kc, calling and listening during alternate five-minute periods. This will apply

from November till March. The "official" tests will take place on December 7 and 21, January 4 and 18, and February 8 and 15, between the same hours, but there is likely to be just as much activity on the "unofficial" mornings in between.

The main thing is: *Do not call in the 1800-1825 kc Sector.* Most of the W/VE stations will be there, and the presence of one strong signal on this side can wreck the whole thing. The perpetrator will not only be very unpopular over here, but he won't be heard there, anyway, because the W/VE's don't listen over 1800-1825 kc. So do keep it clean.

W/VE stations will call "CQ DX Test" for the first five minutes of the hour, then the third and fifth periods and so on; they will be listening during the second, fourth and sixth five-minute periods. Synchronise your watches by WWV on 5 mc before you start up—and anyone VFO'ing on to the DX signals can expect a rocket!

W1BB welcomes skeds with anybody on the band and on any authorised frequency nominated by the DX station. All you have to do is to drop him an airletter, and if you want to arrange HF-band skeds to discuss arrangements, Stew will be pleased to cooperate on that, too.

Reports on W1BB's Top-Band signals will be welcomed at any time, and Stew says that some of the SWL reports have been among the most accurate and valuable he has received.

With this year's slightly lower sunspot activity, things should be better than last season; but you never know what is going to crop up, and it's sticking to it that produces results.

Other Top Band News

G3LHJ (Newton Abbot) joins the Top-Band ladder with his score of 56/66—we feel another WABC creeping up! GM3JDR and GM3LXT gave him two new ones, and he finds things lively around 2200 GMT.

GM3JHH (92/93) still wants Orkney, Berwick, Dumfries, Scillies and Sark! Any offers?

He has had some fun with a QRP battery rig, which got around quite well.

On the afternoons of November 15, 16, 22 and 23 the Clubs will be running their "MCC" event. This is primarily an inter-Club affair, but they do get one point for each QSO with non-competing stations. But *please* don't confuse matters by calling "CQ MCC" unless you are actually operating a Club station.

Miscellany

Recent comments on Country-Counting, Sheepskinnery and detailed Band-Planning have brought forth quite a few opinions, most of which are in agreement with our published views. G3FPK, however, does not like the idea of a physical division of the globe into areas, since we already have the WAZ scheme, about which there is no ambiguity. He asks, "Is there any convincing argument against recognising as a country a territory possessing its own stamps, currency and/or government? Some very tiny bits of land would become countries (*viz.* Sark)—but that would be more logical than decreeing a lighthouse on a rock to be a country just because some enterprising character lands some radio gear on it."

G3FPK thinks we're being rather hard on Sheepskins, and says it's easy for amateurs with 20,000 QSO's in their logs to be a bit *blasé* about this aspect of the hobby. Let us hasten to say that (apart from our SHORT WAVE MAGAZINE series) we have the greatest respect for the universally accredited ones—DXCC, EDXC, WAZ, WAS and so on—and even for some of the smaller ones which do *mean* something. Those we deride are the innumerable which sprout from month to month—Worked All Scunthorpe YL's, Worked All Little Twerpington Radio Club Committee Members, and the like. (Incidentally, a club of quite a different calibre, Grafton, has just introduced a very worth-while award, which is referred to a few paragraphs further on.)

EI6X (Limerick) thinks the VQ4ERR scheme for band planning an excellent one—if everybody can be persuaded to learn it and

use it. But, as he says, there will always be a certain number of "Klots" who either won't know anything about it, or just couldn't care less. G3FPK also agrees with it in principle, with the reservation that if you try to extend this allocation idea too far, it becomes impossible to apply. He would like to see a division of the CW bands into "W chunks" and "non-W chunks," with possibly the same treatment for AM and SSB. DX-peditions would then simply use the "non-W" portions, making things better both for themselves *and* for the W's.

Returning to EI6X, he is now firing up again with a two-band Quad, a rebuilt PA and an R9'er on the receiver. He is at the moment working for WAVE, TPA and WNACA—all on phone.

G3JZK wrote from YU-land just too late for our last issue, and says there was lots of activity from G3JZK/YU2GH; but Radio Zagreb studios were near by, and his signals were breaking in on all their audio equipment! TVI is no problem, because they use Band III only, and there are hardly any sets in existence yet (they cost a year's income for most people). But this cuts the other way, too, since *nothing* is suppressed and the noise is unbelievable. Eighty and One-Sixty are quite unusable out there.

G3IGW asks, "Is Viet-Nam separate from Cambodia?" Yes, it certainly is. But there has been no activity from Cambodia, so far as we know; thus 3W8AA and W3ZA/3W, both in Viet-Nam, count only as one country.

G3DO reports he has been awarded the WPX Certificate on Phone. It is the first in Europe and only the second in the world for Phone—therefore, a very fine effort and a worthy piece of flag-waving for the G fraternity.

If you are without your QSL for a YI2AM contact, you can get it by sending a log extract to G3IGI (66 Quarry Lane, Birmingham, 31), whose brother is with the R.A.F. at Habbaniya and has access to the QSL cards and records of YI2AM.

We are asked to announce that the VS2 prefix for Malaya (now

an independent country within the Commonwealth) will change to 9M2 with effect from January 1 next year. There is no change in country status for any scoring purpose.

And during January 9-11, the WAE DX Contest, which is a CW-only affair, will be taking place, on all bands 3.5 to 28 mc. The necessary information will appear here in the December issue—in the meantime, you can get a copy of the full rules on request, with one IRC, to: D.A.R.C. DX-Bureau, Fuchsiweg 51, Berlin-Rudow, Germany. This popular and well-supported event is run by the D.A.R.C., the German amateur society.

New Sheepskin

We are glad to mention a new award which really will mean something and should be worth chasing after. Grafton Radio Club announce the "Worked All London Town" (WALT) Award, based on the 118 London Postal Districts. They are E.1-18, E.C.1-4, N.W.1-11, N.1-22, W.1-14, W.C.1-2, S.W.1-20 and S.E.1-27. The "possible" is 118.

The basic award is for working 65 of these Postal Districts, with endorsements for every additional 15 districts thereafter. All contacts must have been made after January 1, 1958, and can be CW, Phone, Mixed, or for individual bands. British Isles residents are restricted to 1.8, 3.5, 7 and 144 mc and any other VHF band; overseas operators may claim for contacts on any band.

Claims, with QSL's and check list, to Awards Manager, Grafton Radio Society, Montem School, Hornsey Road, London, N.7, with postage for return (Overseas, 10 IRC's, or British P.O. for 2s. 6d.).

SWL Corner

Peter Day (Sheffield) sends a report covering seven bands, being a 50-mc (6-metre) enthusiast. In those regions he has heard the ZE's, says the band is open for ZS, and should open up to W very soon. ZE6JL is on 50.25 mc every day at 1630; ZE1JN hears CT1CO nearly every night, same time; ZE2JE has worked 26 USA stations; ZE2JV and ZC4WR have a daily sked;

OH5NQ is at the HF end; and W5VY is looking for European contacts. HB9QQ and 9BZ have both been heard in South Africa.

Plums on the other bands were OK's on 1.8 mc, W phones on 3.5, OQ5 (CW) and KZ5 (Phone) on 7, VQ1ERR on 14, KH6MG/ZK1 (CW) on 21, and VQ1PBD, KW6CB, VK9DB and PJ2MC on 28 mc phone.

L. D. Strange has moved from Sutton Coldfield to Leeds, but before leaving he logged FP8AR on 21 and 28 mc; several VP8's on 21 mc; PY7SC (Fernando de Noronha) on both bands; and KH6MG/ZK1 on 21 mc CW. S. R. Smith (Crewe) mentions HC4IM, XZ2HT, FK8AS, VKØRO, 15AAW and FB8ZZ (all 14 mc CW); and FB8XX, ET2VB, ET2KY and KM6BL on 21 CW; finally KR6JF was heard on 28 mc CW.

C. N. Rafarel (Birmingham) heard both VQ1ERR and VQ1PBD; his phone log on 28 mc includes VP8DS, VP2VZ, HB1UE/HE and two VE mobiles; on 21 mc VP8CR, 8DI and 8DC, VS9MA, AP2AB, VK9DB, LX1HM and FB8YY; 14 mc gave him ZL5AF, TG9AZ, YN4CB and XE1UF. J. W. Bluff (Harrow) reports a number of stations which have been included under the "DX

Gossip" heading, or have been duplicated by various reporters. Other items are that another Clipperton expedition is expected; that VQ4GU hopes to return to VQ9 with a portable generator; that more Trinidad Island operation is planned by PY1CK; and that VK9BS is on phone from New Guinea, both 21 and 28 mc. And, for anyone wanting Wyoming, W7GBL has a six-element beam for 14 mc and operates early mornings!

D. Stanton (Rushden) reports for the first time, with a good list of DX on 21 and 28 mc; A. W. Collis and G. D. Eddows (Bournemouth) likewise are first-timers, and their joint report mentions VQ1PBD (28), ZD1FG (21 CW) and VR2DE (21 phone). V. Porter has moved from Loughton to Roker, Sunderland, where he finds the noise level terrible, but promises to report regularly in future.

As a final note, may we repeat that while DX conditions are so good, we simply have not the space for lists of calls heard from our SWL friends. But we are always grateful for items of DX Gossip which they pick up in the course of their listening sessions, and for details of stations which are so unusual that one



VS1FJ, Singapore, who is well known as G3IDC of the R.A.F. Amateur Radio Society, runs only 25 watts, but has worked 210 countries in 40 Zones, with 176C confirmed in 39Z. His aerial is an 86-ft. Zepp-fed top for the four HF bands, as well as a ground-plane for 20 metres. The key is a Marconi marine type, the modulator runs a pair of G.E.C. KT66's in push-pull to give about 12w. of audio, and the microphone is a Chinese copy of an American moving-coil type, made in Shanghai! The receiver at VS1FJ is an Eddystone 888.

might presume that few other listeners or transmitting amateurs have heard them. But routine DX, or even what we used to call "rare DX," is so plentiful these days that long lists of stations heard simply cease to mean anything at all—except that one has a receiver that works!

In short, SWL's: (a) Real rarities; (b) Curiosities; and (c) Gossip about new stations coming on the air, expeditions or unusual happenings.

And now acknowledgments, as ever, to all our sources of information, particularly W4KVX's *DX Bulletin*, the WGDXC *Bulletin*,

W1BB and all our correspondents (including the SWL's) who have supplied the odd items that make the news.

Next month's deadline is **first post on Friday, November 14**, which doesn't give a lot of time, so please get down to it and squeeze that log right away. For the following month the deadline will be *December 15* (overseas readers please note). Address everything, as ever, to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. And, from your Commentator, 73, Good Hunting, and BCNU.



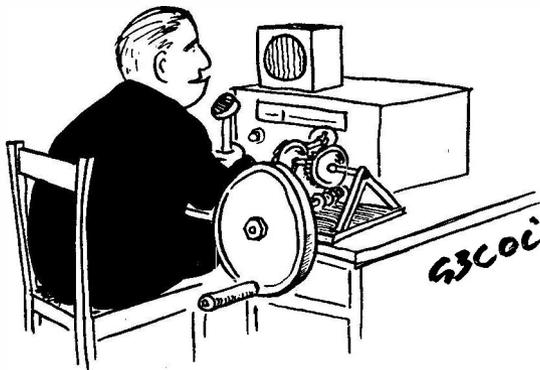
For the summer HB9CM has a mountain chalet, shared with HB9OM. The receiver is a BC-348 and the transmitter runs an 807 PA at low power.

THE CLUB CONTEST

For the thirteenth successive year, MCC will be played off on Top Band during the week-ends November 15-16 and 22-23. This is our annual inter-Club affray (MCC—"Magazine Club Contest") and the rules in full were given on p.441 of the October issue of *SHORT WAVE MAGAZINE*. As non-Club stations can help to swell the scoring, all 160-metre operators interested in fast CW working—it is a CW-only affair—are invited to participate, and to endeavour to work each Club once only during the whole period of the Contest, for one point. Club stations can be identified by the fact that they will be calling "CQ MCC." It is particularly requested that non-Club operators avoid using this call, which is intended only to recognise Clubs to one another. As usual, check logs and comments on the Contest will be welcomed from individual operators.

INTERESTING LECTURE

We see from the lecture programme of the Radar and Electronics Association that the meeting on January 26 will be to hear Dr. D. W. Fry, deputy director at Harwell, talk about "Zeta, Nuclear Power and Fusion." This should be an extremely interesting evening. Membership of the Association is open to



"... Since I have modified the bandspread ..."

anyone who has, or has had, any connection with radionics, and full details can be obtained from the Secretary, Radar and Electronics Association, 83 Portland Place, London, W.1. Meetings are held at the Royal Society of Arts, John Adam Street, London W.C.2.

THE NEW DX ZONE MAP

We are glad to be able to announce that the new and revised edition of our well-known DX Zone Map will be ready for distribution by November 24. The Map has been completely re-drawn and re-coloured, with many more place names, and it now includes the whole area of Antarctica. It is a Great Circle Map of the World centred on the U.K., from which the magnetic bearing (for beam alignment) and distance are given to any part of the world. All the exotic and little known islands, and such places (that we could think of) have been plotted, and there is a world-time scale reckoned from Greenwich (GMT). The 40 Zone areas into which the world is divided for Amateur Radio purposes are clearly marked, and the major prefixes in each Zone are listed separately, in the margins. In short, an indispensable adjunct for the DX operator and a handsome addition to any station, as the Map is 35ins. wide by 25ins. deep and intended for wall mounting. The price is 9s. 3d. post free, of our Publications Dept. and delivery is in a special packing to prevent damage in transit.

DX ON 600 METRES

Years ago, one of the side-line interests of those who could read Morse was "listening to the ships on 600 metres." Even now, this can be an illuminating experience, particularly under present conditions which, late in the evening, bring in coast stations from the Gulf and eastern United States. Mediterranean stations can also be heard, as well as some others down the west coast of Africa. For those who may not know, all such land stations have three-letter callsigns, and ships four-letter, the prefix structure being in general similar to that used by amateur stations. A little concentrated listening and logging will soon get them sorted out.

THE STOWE RADIO TELESCOPE

RESULTS OBTAINED AND SOME NOTES ON TECHNIQUE

J. M. Osborne, M.A. (G3HMO)

Our contributor is well known for his enterprising and original approach to the newer problems and interests in the Amateur Radio field—from transistory, some years ago, to the design of loaded aerial sections for mobile working, and the tracking of the first radio satellites. Latterly, his efforts have been devoted to radio astronomy, and the radio telescope discussed here is probably the only one of its kind in the world designed, built and operated purely in the amateur context—and an interesting fact about radio astronomy itself is that it was by original amateur effort some 20 years ago that the subject has recently become one for such earnest study by professionals. Since this article was written, G3HMO has left Stowe for a new appointment on the science side at Westminster School, where he will be continuing his various research activities.—Editor.

SINCE the war many of us have been fascinated by the progress of Radio Astronomy and the great discoveries made in this field. It all began with Jansky and later Reber, who were true amateurs. For an amateur to repeat many of the important experiments and observations is quite possible and infinitely more satisfying than just reading of them. The account which follows describes an elementary Radio Telescope set up at Stowe School and how it has been used to observe the main features of the "radio" sky. Some preliminary notes on the installation appeared in the July issue of SHORT WAVE MAGAZINE.

The waves reaching us from outer space have, for the most part, the characteristic of noise—entirely random radiations over a very wide and loosely defined band of frequencies. The telescope consists of a directional aerial and a receiver with an output meter (equivalent to an S-meter) for recording noise level. The frequency for these observations was chosen as 208 mc for a variety of reasons. The behaviour of the sun in this part of the spectrum is fairly easy to observe and shows enormous fluctuations from time to time. The radiations from the Milky Way and from the most powerful discrete sources (popularly called "radio stars") are strong enough to be readily identified. A high-gain directive aerial system for this frequency is not unduly cumbersome or expensive; Band III

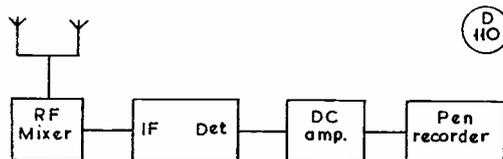


Fig. 1. Block schematic of the electronic assembly for the Stowe Radio Telescope designed by G3HMO.

aerials and circuits are available and save much tedious development effort. Working just outside the occupied part of the ITV band reduces interference from this source to tolerable limits.

The aerial system chosen, after consultation with G2HCG of J-Beam Aerials, Ltd., Northampton, was a pair of fringe-area skeleton-slot Yagis, making 32 elements in all. The two arrays were arranged side-by-side on an equatorial mounting; that is, a rotatable pole set at 52° to the horizon and pointing at the Pole Star, so that any source in the sky can be kept in the beam by rotating the mast alone. A detailed description of the aerial and receiver will be left until later. Briefly, the line up is (see Fig. 1) aerial, RF mixer, five stages of IF, diode detector coupled to a DC amplifier, and recording milliammeter. The trace on the chart is then a plot of noise level against time.

Results

Solar Radiation. The most powerful extra-terrestrial radio source is the sun. A convincing and informative experiment is to turn the aerial ahead of the sun and let the sun "drift" through the beam. Fig. 2 is reproduced from an original trace showing several features of the experiment. In the first place, the polar diagram of the beam can be seen from the general shape. (Of course, the diagram would have to be replotted in polar co-ordinates to get the usual picture.) That this shape can be recognised follows from the fact that the sun is, for most of the time, a fairly steady noise source. However, as is well known in DX circles, the sun occasionally exhibits great activity. At sunspot periods and at many other times great outbursts of radio noise exceed the

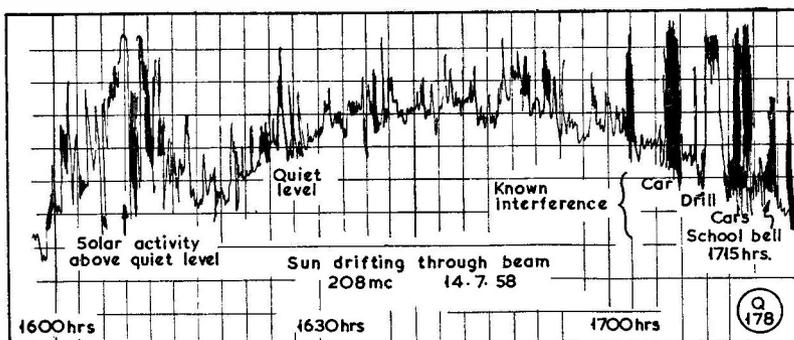


Fig. 2. Trace obtained as the sun drifted through the beam of the Telescope. A sudden burst of solar activity is shown on the left, as the sun enters the beam. The steady, or quiet-noise, level of the sun is clearly suggested by the shape of the trace as the sun moves across the beam. The severe effects of local man-made interference after 1700 GMT can be seen to the right of the trace.

"quiet" level by factors of up to a thousand times. These bursts last from a few seconds to hours or days. Indication of such "enhanced activity" is clearly seen in Fig. 2 just as the sun started to enter the beam. The amplitude of the disturbance can be judged by comparing it with what the quiet level would have been at this time. That such activity affects long-distance propagation is well established, but much scope exists for research. The extra-terrestrial noise levels are down in the receiver noise, and almost any interference produces catastrophic effects on the trace. Most of the interference on the right of Fig. 2 was caused by known sources. Limiting in the DC amplifier is indicated by the trace not reaching to full-scale deflection. Experience is needed to differentiate between enhanced activity and local man-made noises. Since no fundamental difference exists between the traces given in the two cases, this can never be done with certainty.

The Milky Way

Our own galaxy, the Milky Way, shows a steady background of radiation which is strongest towards the centre of the galaxy. This radiation is the extra-terrestrial "hissing" discovered by Jansky. Reber, on home-built apparatus of his own design, later mapped this noise level as a function of position. This map and others at various frequencies clearly identify the source with the galaxy. The centre of the galaxy is obscured visually by dust clouds (interstellar matter). That we can see further into our own galaxy in the radio spectrum is illustrated by sweeps across the sky. Two sweeps are shown in Fig. 3, the first with the aerial set at 10° above the equator and the second 10° below. The aerial was swept from horizon to horizon at 20° per minute and then back. (Being lower in the sky, the second sweep is through a smaller arc.) Each sweep shows a maximum on crossing the plane of the Milky Way, the value being greater as one approaches the galactic centre, which lies 28° below the equator. The trace has been made smoother than in Fig. 2 by increasing the time constant of the detector, the condenser being changed from $0.1 \mu\text{F}$ to $1.0 \mu\text{F}$. The sweeps were made at full sensitivity (greater than was used on the sun) and recorded after midnight, when normal interference is low. The object of the return sweep was to check the reproducibility and lends validity to the results. For instance, a large asymmetric kick appeared on one trace (not shown here) which coincided with an aircraft flying through the beam.

Interferometry. If two aerials separated by many wavelengths are connected to the same receiver, the output depends on their relative phase. Consider the receiver in Fig. 4 situated centrally (in terms of feeder length) between two aerials. Suppose there is

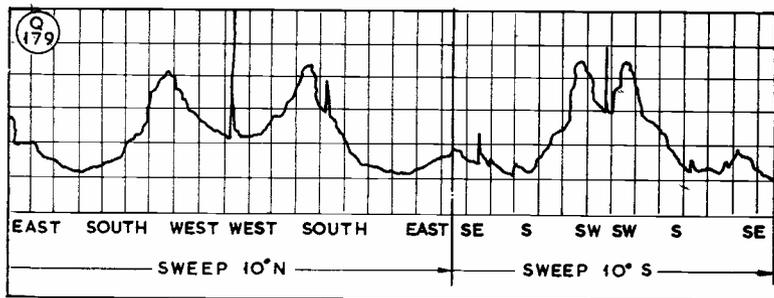


Fig. 3. Sweeps through the Milky Way at 10° above and 10° below the equator, showing clearly the noise maximum in the plane of the Galaxy. After a sweep from the eastern horizon through south to the west, the Telescope was returned from west to east as a check. These sweeps should then be mirror images — which they very nearly are, except that the second trace shows a greater maximum because it passes nearer the centre of the Milky Way. This simple experiment is an indirect proof of the validity of all the observations discussed in the article.

a source of radiation, e.g. the sun, in the direction shown. The path of the waves reaching the right-hand aerial is longer, and if this distance is a whole number of wavelengths greater, then the two signals are *added*. Should the distance be a half wavelength greater, or less than this, then the signals from the two aerials, being 180° out of phase, will exactly cancel each other. As a source passes through the beam, successive *maxima* and *minima* will occur.

The Yagis were removed from the equatorial mounting and set up 36.5 wavelengths apart on an east-west base, both looking south, and a recording was taken of the sun drifting through the beam (Fig. 5). Comparison with Fig. 2 will make the interference pattern clear. It will be seen that this technique gives good identification of solar disturbances, as these show up only on the peaks, while terrestrial or local interference can occur all the time. However, the method reduces the effective observing time, and reduction of interference by improved aerial siting would be better. Nevertheless, it is this technique which has enabled two discrete sources to be positively identified with the Stowe radio telescope, which is in all essentials an amateur installation.

Radio Stars. Some two thousand discrete sources

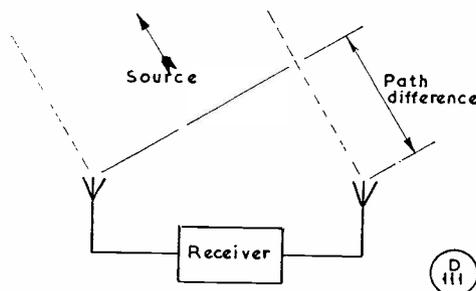


Fig. 4. A diagram to explain the principle of the interferometer. The signal arriving at the "far aerial" travels further, thus causing a phase lag. According to the path length the signal from this aerial may either reinforce or cancel out that from the "near aerial." Thus, successive maxima and minima will occur as the signal (or, in this case, noise) source passes through the beam. A most convincing trace from the Telescope used as an interferometer is shown in Fig. 5.

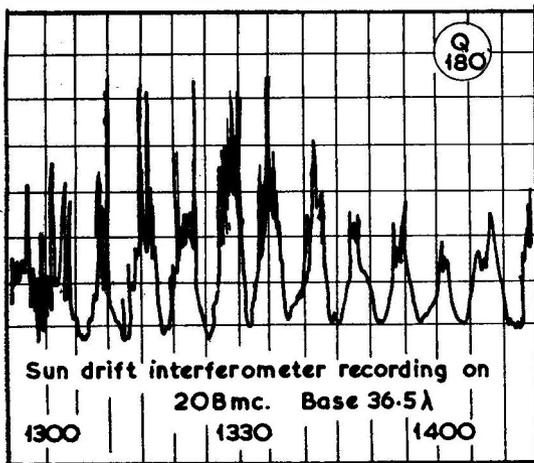


Fig. 5. An interferometer recording of the sun, with the two aerial sections of the Telescope (see photograph) spaced at $36\frac{1}{2}$ wavelengths at 208 mc. The scan is obtained by the rotation of the earth. Compare with Fig. 2.

have been observed in the heavens, although relatively few have been independently confirmed. The two most powerful occur in the constellations of Cassiopeia and Cygnus. They are known as Cassiopeia-A and Cygnus-A, and are several times more powerful than any other discrete source. Even so, they are only one-fiftieth or so of the strength of the quiet sun and weak in comparison with the background radiation from the Milky Way. (Detection of such a source with the beam-width and gain available at Stowe is analogous to trying to find a candle with an exposure meter when it is in front of a white floodlit wall!) But as these sources are point radiators in a uniform background, an interferometer drift recording shows them up as a weak interference pattern superimposed on the radiation from the galaxy. Figs. 6 and 7 show this pattern if one studies the trace carefully. In each case the period of fluctuation has been measured and this, together with frequency and base-line, enables the declination of the source to be calculated. In both cases, the result is within one degree of the accepted declination of these sources—which can be taken as a satisfactory result using amateur equipment.

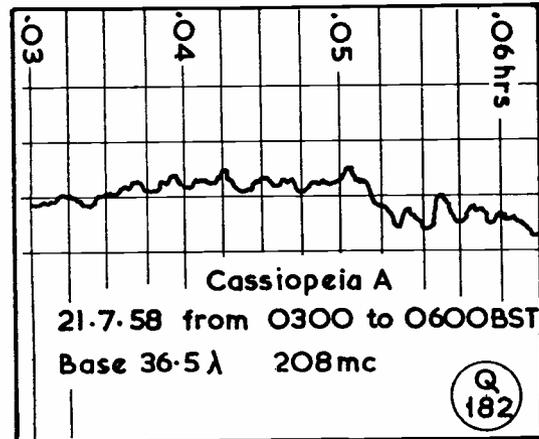
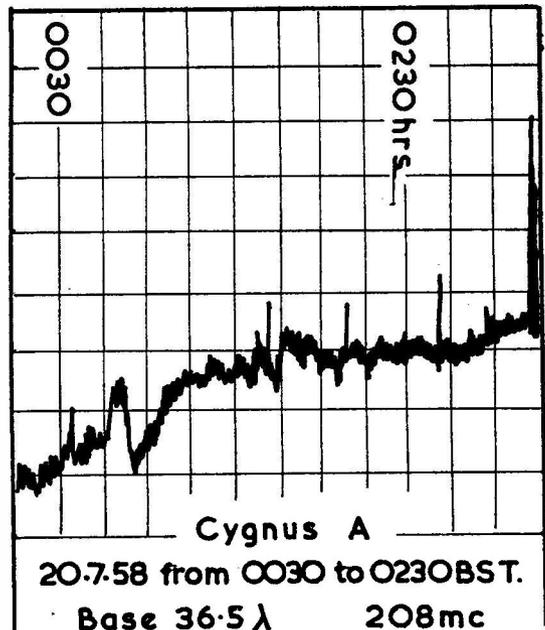
Cygnus-A is now known to be two galaxies in collision 200,000,000 light years away and, of course, we are observing waves which started on their journey through space 200,000,000 years ago.

Equipment

Aerial System. This consisted of two "Double Four" J-Beam aerials with two "Plus Eight" units to give two arrays of sixteen elements which could be used together or independently. The combined array gives a gain of about 18 dB over a dipole. The feeders were connected to the slot through baluns and delta sections. A phasing and matching box combined the feeds to a single feed to the receiver. Short feeders were used with the aerials fitted up on the equatorial mounting, and 30-yard lengths when they were separated to operate as an

interferometer. Using low-loss feeder, this represents about the maximum useful length with tolerable attenuation, and made the physical separation of 36.5 wavelengths between aerials possible. As this aerial gear had been measured and matched up before leaving the J-Beam factory, it was a considerable help to know that no further adjustment was needed to the aerial system. Incidentally, to have specified a frequency too far outside Band III would have increased the cost several times.

The Converter. The performance of the converter determines the capabilities of the Radio



Figs. 6 and 7. These traces are remarkable in that they disclose the presence of radio stars. The small wave-like motion in the trace indicates a source moving through the beam. At such enormous sensitivity, minute variations in receiver gain, mains voltage or general noise-level produce relatively large disturbances on the trace. Thus, it becomes a matter of interpreting the recordings correctly.

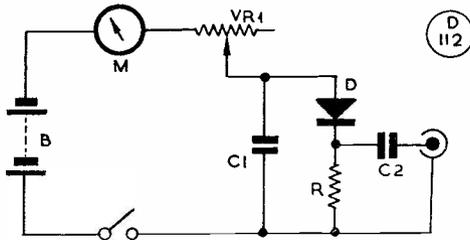


Fig. 8. The simple noise-generator used in lining up the receiver section. At low outputs the generator simulates the noise signals from outer space.

Table of Values

Fig. 8. A Simple Noise Generator

C1, C2 = .001 μ F disc	D = Silicon Diode
R = 72 ohms	M = 0-1 mA meter
VR = 25,000 ohms	B = 9v. GB battery

Telescope. The vital requirement is that the signal-to-noise ratio of the RF stage should be not just good, but should approach the theoretical maximum. The Band III converter supplied by the Rainbow Manufacturing Company was basically their type TCD, incorporating an ECC84 cascode RF stage and an ECF80 oscillator-mixer. The Band I filter, the Band I/111 common aerial connection and the two-channel switching had been removed. Painton high-stability carbon resistors were fitted in place of the usual composition types, the latter being a potential source of excess noise.

This converter, as received from the factory, gave adequate results on solar noise. However, the use of a simple noise-generator, as shown in Fig. 8, enabled a considerable improvement in the signal-to-noise ratio (SNR) to be obtained, partly at the expense of gain. The noise-current generated in a silicon diode is passed through a resistor matching the feeder impedance. By varying the DC current through the diode, a variable noise output can be obtained. This was fed to the converter, which was in turn connected to the IF strip. Readings were taken of the *change* in volts across the diode detector load on switching the noise generator on and off. Any adjustment or modification which

increased this change was made permanent.

The following, little by little, gave a large overall improvement—so much so that the noise-generator output had to be reduced to the minimum setting towards the end. The ECF80 triode-pentode was strapped as a triode-triode. Injection was reduced by removing the inductive coupling and relying on stray injection. The relative position of the oscillator coil to the mixer grid coil was adjusted for optimum SNR. The aerial coupling coil was dispensed with and the input taken to the bottom of the first tuning coil. The coil and trimmer were adjusted for resonance and matching. All signal frequency coils were rewound with silver-plated copper in place of the PVC covered wire. The two valves were accidentally interchanged in their sockets (which ruined them!) and they had to be replaced. Although now useless for the purpose of this converter, they showed no deterioration in a commercial FM receiver—from which the importance of having good specimens should be obvious.

The second harmonic of an Advance signal generator, which went up to 104 mc, was used for adjusting the coils, although the precise value of frequency is of no consequence. It is advantageous to have a wide bandwidth in a radio telescope, as one is then collecting more noise energy, so that the usual bandwidth/SNR relationship no longer applies. There is no point in de-grading the performance of the receiver, however, merely to extend the bandwidth.

Table of Values

Fig. 9. Rainbow Type TCD Converter

C = .001 μ F feed-through	R1 = 47 ohms
C1 = 30 μ F Philips Trimmer	R2 = 18,000 ohms
C2 = 100 μ F	R3 = 100 ohms
C3 = 3 μ F	R4 = 820 ohms
C4 = 10 μ F	R5 = 8,200 ohms
C5 = 5.6 μ F	R6 = 10,000 ohms
L1, L3, L4 Coils resonated at 208 mc	V1 = ECC84
L2 Cascode interstage coil	V2 = ECF80
L5 Oscillator coil at 163 mc	
L6, L7 45 mc IF and link	

(N.B. Neutralising of first triode effected by anode-to-input strays).

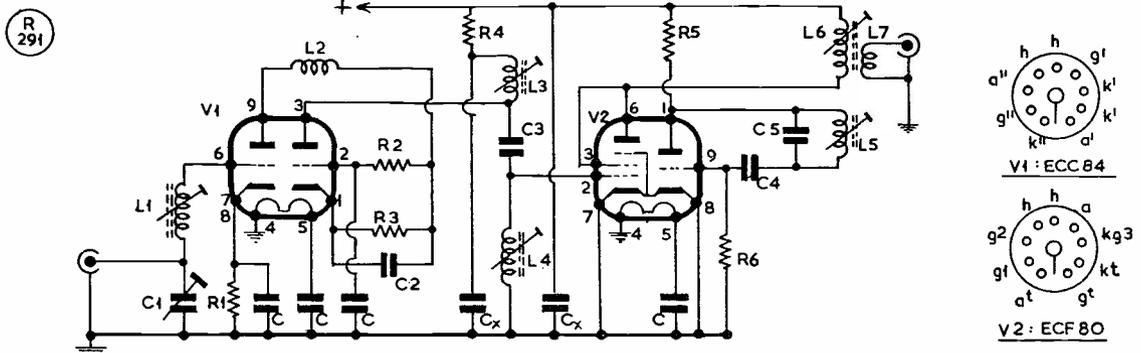


Fig. 9. The circuit of the Rainbow Radio Band III ITV converter type TCD, as modified for the Radio Telescope. The 208 mc noise signal at the aerial is converted to an IF of 45 mc. All condensers marked C are feed-through, and Cx are .001 μ F by-pass.

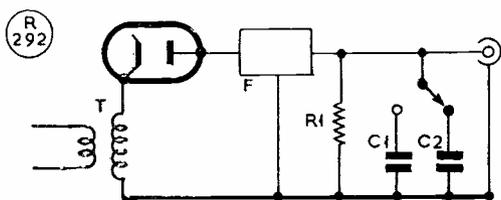


Fig. 10. The modification to the Pye 45 mc IF strip, to omit the final cathode-follower stage; the detector is connected direct to the DC amplifier of Fig. 11, this driving the pen recording mechanism which produces the traces shown in this article. It should be noted that (for printing purposes) all these traces are reproductions of the originals.

Table of Values

Fig. 10. Pye 45 mc IF Strip modification

- C1 = 0.1 μ F
- C2 = 1.0 μ F
- R1 = 5 megohms
- F = Existing IF filter
- T = Last IF xformer

The IF Section. The IF was chosen as 45 mc, so that use could be made of a Pye 45 mc IF strip. This useful piece of "surplus" provides a large part of the electronics, ready-made for a few shillings. The only modification was to scrap the last stage, a cathode follower, and to fit a new diode load of a 5-megohm leak and 0.1 μ F or a 1.0 μ F condenser. The latter value gives a suitable time-constant for discrete source observation, while the former is more appropriate for watching rapid solar fluctuations. The power supplies were two 120-volt 30 mA packs in series, each stabilised with a neon. With 240 volts on the plates of the EF50's and 120 volts on the screens, the bias was adjusted to about -0.75v., so that the total plate current to the strip was in the region of 30 to 35 mA. These figures were arrived at by trial and error in the absence of any known published data on the strip itself.

The DC Amplifier. The output from the diode detector when the aerial and converter are connected is of the order of -10 volts, this being a measure of the total noise. It is necessary to be able to detect the very small increases in this value which occur

when the aerial is directed at extra-terrestrial sources. The additional voltage output of the receiver, due to the quiet sun, was one-twentieth of the existing receiver noise, and that due to the most powerful discrete sources only about one-fiftieth of that of the sun! As such signals were to drive the 3000-ohm 1 mA pen recorder, a DC amplifier was needed. The major part of the negative output from the diode was balanced out, as is shown in the circuit diagram of Fig. 11. By using a separate power supply, the chassis potential may be slid up the potentiometer VR2 across the supply, thus backing-off the diode output volts to give a reasonable bias to one half of the 12AU7; the other half is approximately balanced by VR1. A fixed resistance R4 in series with the meter reduces sensitivity to a suitable value for solar work; it may be shorted out by switch for full sensitivity. Any increase in aerial noise will drive the first grid more negative, thus upsetting the anode-to-anode balance and causing a reading on the pen recorder.

The Pen Recorder. For the Stowe Radio Telescope the writer was fortunate in having a pen recorder for the output. This cost several times more than the whole of the rest of the gear put together. The money was provided by a generous grant from the Royal Society, through a committee which sponsors research in schools. The instrument chosen was an Evershed and Vignoles recording milliammeter. The chart, 4 in. wide, could be driven by a synchronous motor at a variety of speeds between 12 inches a minute and one inch an hour. For serious radio astronomy, even of the amateur variety, it is doubtful if any substitute exists for a pen recorder. However, with patience, the movement of a meter needle can be plotted against time. It is

Table of Values

Fig. 11. DC Amplifier for Pen Recorder drive

- C1 = 100 μ F 25v. elect.
- R1 = 20 megohms
- R2 = 500 ohms
- R3, R5 = 5,000 ohms
- R4 = 20,000 ohms
- R6 = 43,000 ohms
- VR1 = 25,000 ohms
- VR2 = 5,000 ohms
- M = 0.1 mA pen recorder, Evershed and Vignoles

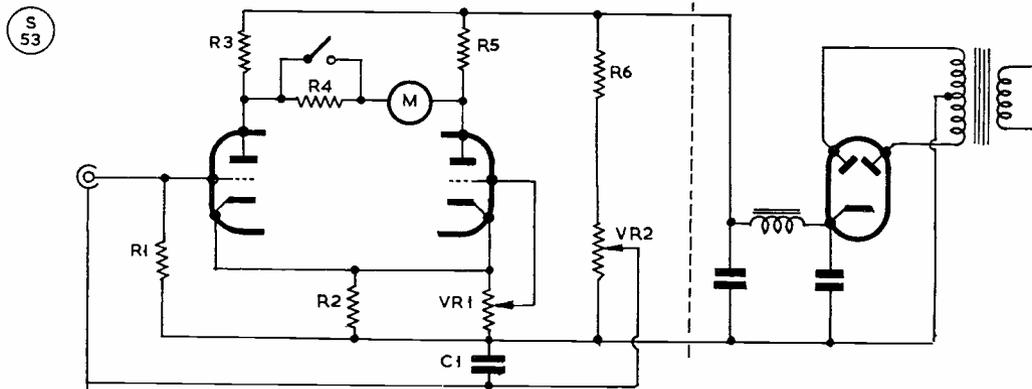
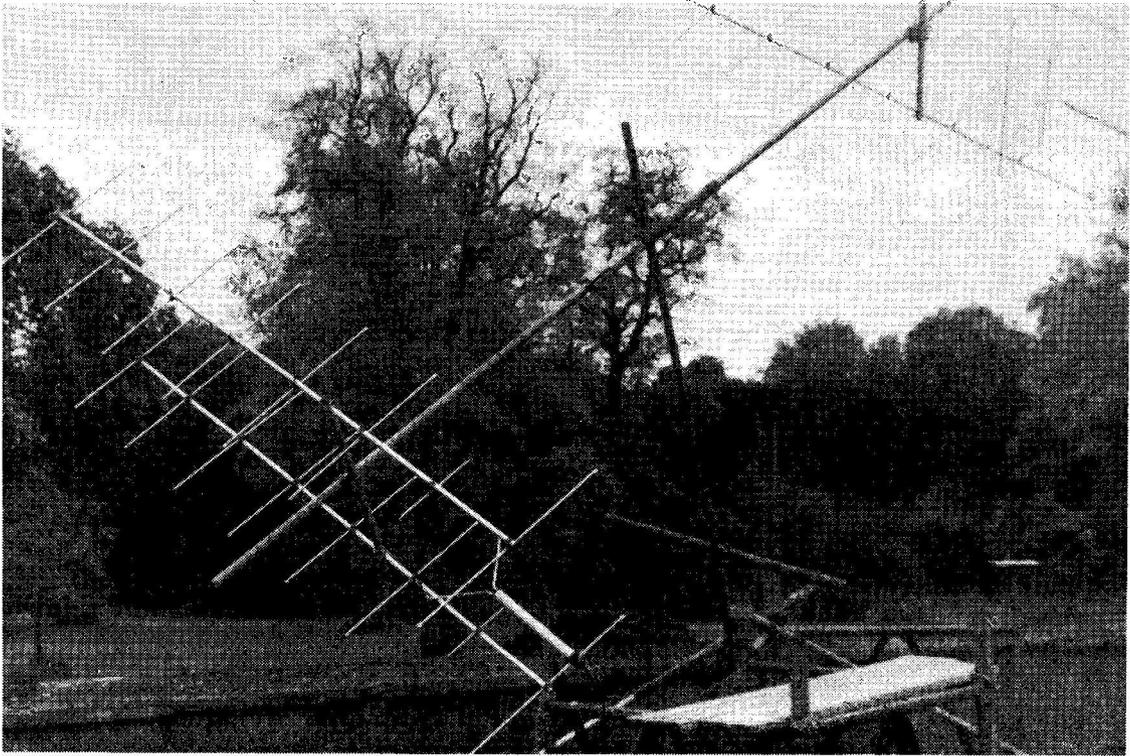


Fig. 11. To drive the pen recorder with the noise signal from the detector, this DC amplifier was evolved. The negative bias developed by the diode is countered by the setting of VR2. Zero setting of the pen recorder M is achieved by VR1, and R4 is used to limit the sensitivity when making solar observations. The valve is a 12AU7.



The 32-element J-Beam 200 mc aerial assembly used as the Radio Telescope at Stowe School, Bucks., for the experiments described by G3HMO. As explained in a previous article (p. 265, July, 1958 "Short Wave Magazine") the beam is mounted in such a way that rotation of the pole alone will keep it aimed on any desired target area in the heavens. Some results obtained with the Telescope are shown in the trace recordings of noise from the sun, and known radio stars. By separation of the two sections, the system can be used as an interferometer — see text.

also known that a self-balancing potentiometric pencil recorder—made with surplus motors, a volume control, a cord dial drive mechanism and a few valves—has been built at a cost of little more than time, labour and ingenuity. It should be well within the scope of a competent amateur model maker.

Conclusion

Radio Astronomy is a vast subject, and the writer has made no attempt to do more than outline those sections relevant to observations made with the Stowe Radio Telescope, for the design, installation and operation of which he was responsible. Nor has the theory of specialised receiver design been more than touched upon. It is hoped, however, that enough information has been given here to provide a general picture of the practical techniques used and in particular to illustrate how much can be done with relatively simple apparatus. The author is grateful to several boys of Stowe School, especially P. D. C. H. Goodhart and H. N. Hawley, whose enthusiastic assistance enabled the results discussed in this article to be achieved in the brief period, of four weeks only, allowed by circumstances*. Acknowledgment and thanks are also due to G2HCG of J-Beam

Aerials for advice and help on aerials; to Mr. Clark, of the Rainbow Radio Manufacturing Company, for the loan of the modified converter; and to the Royal Society (Committee on Research in Schools), who found the money for the Pen Recorder.

(Editorial Note: In the reproduction of the pen recordings for printing, some of the fine detail has unavoidably been lost. In the Cygnus-A trace on p.479, the steady rise from left to right is due to the Milky Way moving into and across the beam. Superimposed on this there is also a weak rise and fall about every 8-9 minutes, and careful inspection of the trace will show seven minima between 0115 and 0215—this is the evidence referred to in the caption. The trace for Cassiopeia-A, made at full sensitivity, is smoother than for Cygnus-A because of the larger time-constant used in the detector (C2 of Fig.10 in circuit). The period in this case is about 12 minutes, because Cassiopeia-A is nearer the Pole and therefore moves more slowly through the beam.)

* Ultimately it is hoped that the Telescope will be erected again, this time at Westminster School, London.

OLD TIMERS MEET AGAIN

LONDON, OCTOBER 10, 1958

AT the third Old Timer Dinner, held in the Bedford Room of the "Horse Shoe," Tottenham Court Road, London, on Friday, October 10, there was a reunion which for many of those present was a unique occasion—a meeting of those who had held a transmitting licence for not less than 25 years, the reckonable date being January 1, 1933.

Of course, this brought together a great number of very interesting people in the world of Amateur Radio and, by a happy coincidence, the total actually sitting down was 73.

The gathering included such personalities as G5KH, Horace Cullen, whose experience goes back to 1901 and who, about that time, actually had a QSO with Sir William Preece, the then Engineer-in-Chief, G.P.O., who had himself been instrumental in encouraging the early experimental work of the young Marconi . . . G2NM, Gerald Marcuse, who can fairly claim, among his many great distinctions, to be the father of Empire broadcasting, he having been granted a special licence to explore the possibilities . . . G3HT, William Pope, who as a school-boy was licensed as PZX before the 1914-18 war . . . G2WJ, Ralph Royle, one of the very first writers on amateur transmission, a distinction shared also by G6QB, Tommy Thomas, in the days of *Popular Wireless* . . . G2MR, Bill Thomson; G2NH, Ernie Dedman; and G5MA, Bob Munday, who started grinding crystals over 30 years ago and are now principals in one of the best-known crystal-manufacturing firms in the world . . . G2DX, Kenneth Alford, with a tremendous DX record and an experience going back to the earliest days . . . G5ML, Freddy Miles, and G6LL, Jimmy Mathews, who had

both made an international DX reputation before 1930 . . . G6CW, John Curnow, and G6MN, Eric Martin, who, having started in the 1920's, are still as active as ever and well up to the minute with their equipment . . . G2UV, Bill Corsham, whose callsign will surely be immortalised in the annals of Amateur Radio—for it was he who invented the QSL card.

This is but the briefest reference, because it can only be brief, to some of those with a great story to tell; indeed, everyone present on this occasion

Present at the OLD TIMERS' DINNER

G2AK, G2BZ, G2CX, G2DC, G2DX, G2FM, G2FV, G2HP, G2HQ, G2MI, G2MR, G2NH, G2NM, G2NY, G2PX, G2QB, G2TP, G2UV, G2WJ, G2YL, G2IG, G3HT, G4FX, G4RD, G5BV, G5BZ, G5CD, G5CS, G5GR, G5KH, G5LC, G5LI, G5JU, G5MA, G5ML, G5QA, G5RS, G5UM, G5VM, G5VS, G5WP, G5XB, G5YY, G6CL, G6CW, G6FI, G6FO, G6FU, G6GR, G6HR, G6IO, G6KK, G6LI, G6LJ, G6LL, G6MN, G6NZ, G6OT, G6OX, G6PA, G6QB, G6RB, G6SC, G6UB, G6US, G6UT, G6WN, G6XL, G6HX, G8KC.

could contribute something of importance or interest to the history of Amateur Radio.

One of the toasts of the evening was "The Spirit of Amateur Radio" when thoughts were with those who, licensed in recent years, have the responsibility of carrying on the tradition. The torch is being rekindled with every new callsign issued.

The guest of the evening was Dr. R. L. Smith-Rose, C.B.E., D.Sc., Ph.D., Director of Radio Research, Dept. of Scientific and Industrial Research, and himself an experimental radio engineer of great distinction. The whole of the organisation for the Dinner was in the hands of G6CL, Jack Clarricoats, who also held the gavel, and the chair was taken by Leonard Newnham, G6NZ.

A.J.F.

BBC's TV TRANSLATOR AT FOLKESTONE

The BBC began transmitting on July 14 last from a new type of low-power television transmitter, known as a "translator," which is undergoing extended service trials at Folkestone. (This town is typical of small populated areas which are within or adjacent to the service areas of the main BBC stations, but are prevented by surrounding hills from obtaining satisfactory reception.)

A translator converts the sound and vision signals from one channel to another without demodulation to audio and video frequencies (which is what occurs when a normal relay installation is employed). This simplification increases the reliability of the equipment, which can be arranged for automatic unattended operation. Because the equipment is small it can be conveniently housed in weather-proof and insect-proof cabinets, thus dispensing with the need for a station building. The BBC utilises cabinets of existing design and special precautions have been taken to provide sufficient cooling. The power supply is included in the steel cabinets, so that the translator can work direct from

the local mains.

In this equipment, separate channels have been provided for the amplification of the sound and vision signals using common frequency-changing oscillators. The double frequency-changing process facilitates the rejection of spurious signals and provides additional protection against "in band" feedback. The first frequency-changing process resembles that in a normal television receiver, producing vision and sound intermediate frequencies of 34.65 mc and 38.15 mc respectively, and the second frequency-changing stage produces vision and sound signal frequencies in the required channel.

The Folkestone translator peak white vision power output is 1.5 watts and in conjunction with the type of transmitting aerial used gives an effective radiated power of 7 watts in the direction of maximum radiation. It is hoped that the installation of similar low-power translators, which have been developed by the BBC's Designs Department, will enable at least some of the small populated areas in which satisfactory reception is difficult to be given an improved television service.

FRED AND HIS PIRATE

INTERESTING LOCAL QSO

By G3COI

ONE nice Saturday afternoon, when many other households were humming with part-time and do-it-yourself activity, Fred stealthily began to ascend the ladder to his roof-top shack. He trod softly in order to escape detection by his XYL, who always had "a few jobs that wanted doing." Mind you, it was not that Fred hadn't done his fair share of odd jobs in the past, but today he felt like a good ragchew on 80.

He gained the trap-door and pushed it open with infinite care. He paused, but the expected call from below did not come, so he eased himself into his QSO Cave and minced his way across the junk-littered floor with the precision of a ballet dancer. At last, he lowered himself gingerly into his wicker chair, which creaked abominably. (It is well known that not even a cat can sit down silently in a wicker chair.)

He squeezed a backless three-pin plug into its mate dangling under the table. Rummaging through a tangle of flex, he twisted two bare ends together; then without pause depressed two switches on a narrow box marked "Bomb Selector." Straightening up, he withdrew a phone jack from a panel marked "Oxo" and simultaneously inserted his microphone jack into a socket at the rear of the 1154 case. Deftly, he knocked over a large ebonite knife switch with his elbow as the room gradually became filled with 50-cycle vibration.

He spun the dial of the 1155 down to 80 metres and searched for a point where the magic-eye was inactive. This was Fred's Method of Finding a Clear Spot in the Band. He alighted at last on one such, which was between a powerful but silent carrier and G5—, who had an equally powerful but not silent ditto. On this apparently quiet channel, Fred could still hear at least three stations at S8, but regardless he switched to transmit.

"Switched to transmit"!—what a wealth of feverish activity is conjured up by those three words! He pummelled and twitched at the rig like a cinema organist who had smoked a packet of reefers, until thirty seconds later he was able to pick up the half-coconut shell that held his crystal insert and say "CQ."

As always, when calling CQ, Fred was transformed. He was the lone radio officer of a sinking tanker from whence all but he and the master had taken to the boats. The master himself was hovering in the background—impotent and entirely dependent on Fred's efforts to obtain succour. The ship's mains and emergency supplies had packed up, but with cool rapidity Fred had fired up a transistorized transmitter-receiver-power pack—just something he had knocked up during the long night watches.

Fred's voice assumed a clipped tone—efficient, smart, vibrant, virile, etc. He spoke without falter-

ing, using the new phonetic alphabet, of course, but occasionally slipping in a home-made one, like "Gravy" or "Shirtfront," just to amuse himself.

After a quarter of an hour or so, he decided that every ship-er-station on the band would have heard him, so he went over. (*See above—in reverse.*) Now, normally Fred never raised anyone with his first CQ, for several reasons—among them being forgetting just that one switch, or because he made his call so long that those who did hear him became so exasperated that they determined not to answer if he was the last man on 80. But today, by pure chance (and so that I can finish this story within a reasonable time), some misguided creature did answer—G9XY, to be exact, a local who wanted a check on his modulation, or something. Fred recovered from his surprise and the QSO went ahead in the normal way.

However, it slowly dawned on our man that this G9XY sounded different—his voice was hoarse and nasal—not like the chap that Fred knew at all. So suddenly a wave of horrified excitement struck—he must be working a pirate!

Cunningly, he enquired about G9XY's QTH, his likes and dislikes and his last contact with Fred. Yes, he was a clever gink all right—he seemed to know all the correct answers, but he slipped up over the last one by saying he had mislaid his old log. Feverishly, Fred fished out an ancient frame aerial he had made one day to "cut out some QRM" and wired it to his 1155. He was just getting a lovely bearing when he noticed that the null point had suddenly extended to 360 degrees—his XYL had cut the mains supply.

Her head appeared above the welter of TU5 coils on the floor. "What about that washer on the bathroom tap?" she said. It was an order, not a question. Poor old Fred; G9XY wasn't a pirate after all, as he pointed out a week later, but had had a heavy cold—hence the hoarse and nasal voice.

THE "NEW QTH" SPACE

We would once again remind readers that the issue of a new call sign, or a change of address, should be notified to us immediately, for appearance not only in "New QTH's," but also in the *Radio Amateur Call Book*, the world-wide directory for which we are the U.K. agents. This is the only Call Book with a guaranteed world-wide circulation, for the simple reason that it is (and has been, for more than 30 years) the sole such publication which lists every known radio amateur station in the world.

MORE STEREOPHONIC TESTS

The BBC is now carrying out further stereophonic sound tests at fortnightly intervals during 10.15 to 11.15 a.m. on Saturdays, the next test being on November 15.

The Network Three transmitters, both medium-wave and VHF, are being used for one channel and the BBC Television Sound transmitters for the other. Later in the series, a single transmitter will be used instead of two for each reception area. To follow these stereophonic tests, listeners need a television set and either an MW or a VHF receiver.

ANYONE with a barometer to tap, or an eye for the weather maps, will have started, about Tuesday, October 21, to get interested in the possibility of an opening developing on VHF. In fact, the barometer climbed steadily all the week, and by about mid-day on Thursday, 23rd, had reached the highest pressure ever recorded on your A.J.D.'s instrument. The condition then persisted for several days, it not being until Monday, October 27, that the glass began to fall back appreciably. During all this period, and until the 29th, there was high and unbroken cloud cover all over the central area of the country, with steady, moderate temperatures and absolutely no wind. With this great anti-cyclone well established, it seemed as if everything in nature was just standing still.

As regards the effect on VHF, the period October 23-29 will go down in the record as the longest, steadiest and most widespread tropospheric opening yet experienced on the two-metre and 70-centimetre bands. There was rare EDX of all sorts for everyone to work and to hear, and the propagation characteristic was so stable that DX signals were coming in at the same strength over long periods for several evenings running. Two new countries appeared on two metres—OK and SP, worked by several G's, for new records, new "firsts," and new totals in the DX tables.

What Happened

As to actual results, the account that follows is based almost entirely on your A.J.D.'s own gleanings—it was after deadline when the two-metre band broke open, and though several operators were good enough to rush in "stop press" items, there could not be any great volume of individual reports. This whole feature is itself by way of being "stop press," as it was written with one hand on the typewriter and the other on the VHF receivers (so to speak). It does not, therefore, purport to be a full account of all the happenings, of which we hope to hear much more for the next issue.

Going back to Thursday,

VHF BANDS

A. J. DEVON

**Prolonged Tropospheric Opening
over Wide Areas—
Exceptional DX Conditions
during October 23-29—
OK1VRP and SP6CTP Appear
on Two Metres—
New Records Made and Much
DX Worked—**

October 23, then: The persistent cloud cover was preventing the fullest development of a good reflecting layer, nevertheless DL, ON and PA were being worked from the London area and the Midlands, a noteworthy contact being DL3VJ/G3BA on two metres, and G3HBW/G3MED on 70 centimetres. G6YP was knocking off the PA's in fine style, and PAØMZ was a strong phone signal in the South Midlands. G3KEQ had a good QSO with DJ1XX, and it was clear that in general things were well on the move, with the EDX coming in, and workable.

By the evening of Friday 24th, conditions were even better, but U.K. activity was low, which was most unfortunate, as there were numerous EU's on, including LX1SI, worked by G3LTF, for one. The G's who were on worked mainly F, ON and PA, with some DL's coming through. With U.K. stations generally, 70-cm activity was good, and many contacts were being made, direct and cross-band.

Then we come to the first big occasion—Saturday October 25, when propagation conditions were extremely good to the south and

south-west; indeed, by about 2230, it would have been easily possible to work EA, had there been anyone on in Northern Spain. As it was, F8XT, away down in the Charente district, near the Atlantic coast of France, was a strong, steady signal all the evening, working G's one after the other, some from well up-country in the U.K., those noted being G3EKX, G3GKF, G3JWQ and G3LHA. For F8XT, the nearest point on the English coast is about 380 miles, so that some of his contacts were over 500 miles; he himself was particularly interested in EI and GI, but at the moment it is not known if he succeeded. Another good DX French station, a little to the north of F8XT, was F9LL, La Rochelle, also working G's, one of his best contacts being with G2HOP. F9JY, Cherbourg, was on later in the evening, working CW, and coming in well after midnight.

On the 25th, one of the outstandingly successful stations was G5DW who, from near Bridgewater, worked LX1SI at 1930 and DL3NQ at 2105; and, be it noted, G5DW stuck to his regular frequency throughout—he is HF of GB3IGY. During all this two-metre activity, there was quite a party going on in the 70-cm band, it being said that conditions were even better on that band than they were on two metres. From where your A.J.D. sits, it was hard to judge this, as it was not possible to do more than check 430 mc occasionally. On changing back to 144 mc at about 2300 on the 25th, G5CP/M was heard working F3LP in Le Havre (rated as a loud local for most of the time) the interesting thing being that G5CP was mobile in the Cotswolds.

Conditions were good again all through Sunday 26th, and the steadiness of the opening was shown by the DX contacts being made under full daylight conditions. We have no great detail yet for the happenings during this particular period, as your A.J.D. was deeply involved in other *Magazine* work all that day and far into the night.

A check on the glass on the morning of Monday, October 27, showed it to be still high and

TWO METRES

ALL-TIME COUNTIES WORKED LIST

Starting Figure, 14
From Fixed QTH Only

Worked	Station
78	G5YV (787)
73	G3CCH, G6NB
70	EI2W (316), G5MA, G6XM
68	G3BW, G3GHO
66	G3IUD (302), G5BD
64	G3BLP, G3HBW, G3KEQ
63	G2FJR (542)
60	G2OI (402), G3DMU
59	G3EHY, G4SA
58	G3FAN (637), G3IOO, G8OU
57	G8SB
56	G3WW (770), G5DS (654)
55	G2HDZ (495), G2HIF, G5BM, GW5MQ
54	G8VZ
53	G2AJ (519), G4CI, GM3EGW (196)
52	G2NH, G3JWQ (416), G3LHA (350), G6RH, G6XX, GW2ADZ
50	G3ABA, G3GSE (518)
49	G3HAZ (358)
48	G3FIH, G5ML, G6TA (487)
47	G2CIW (264)* G3DKF, G5WP
46	G4HT (476), G5BY, G6YU (205)
45	G2AHP (647), G2DVD (362), G2XC, G3BJQ, G5JU
44	G3BK, G8DA
43	G2DDD, G2FCL (322), G3BA, G3COJ, G3DLU,* G3HWJ, G3KHA (262), G3KUH, G3WS, G4RO, G5DF
42	G2HOP, G3BNC, G3GFD, G3IER, G6CI (220)
41	G2CZS (282), G2FQP, G3DO
40	G3CGQ, G3DVK (265), G5MR (366), G8KL
39	G2IQ, G3GBO (434), G3LTF, G3VM, G8IL (325)
38	G3APY, G3CKQ, G3HTY, G3KQF, G8VN (190)
37	G3FNW, G2FZU (180), G3DLU, GC3EBK (260)
36	G2DCI (155), G3CXD, G3DLU*, G3IIT, G6CB (312), G8IP
35	G3FZL, G3FYY (235), G3HCU (224)
34	G3AEP, G3CKQ (162), G8IC, GM3DIQ

steady; during the day, PE1PL was very strong on his regular schedules. It was in the early evening of the 27th that OK1VRP appeared, on a frequency all his own—143.996 mc—and giving his QTH as Snezka, 120 km. north-east of Prague. Harold of G5YV was first to get him, at 1830, and a very fine "First," too, others known also to have worked him being G3CCH, G3JWQ, G6LI and

Worked	Station
33	G3FUR, G3GSO, G3HHY (125)
32	G3HIL, G3KPT* G8QY, G8VR, GC2FZC
31	G3HXO, G3KPT (180), G5RP
30	G2AHY, G3FRY, G3GOP (208), G3GVF (129), G3IRA, G3KEF (110), G5NF, GW8UH
29	G3AGS, G3AKU, G3FIJ (194), G3MAX
28	G3ITF, G8DL, GM3BDA
27	G3CVO (231), G3DAH, G3ISA (160), G3LTF/A, G6GR, G8DR (178), G3GQB, GW3GWA
26	G2BRR, G3CFR (125), G3MED, G3SM (211), G3YH, G4LX, G4MR (189)
25	G3JMA, G3JXN (220), G5SK, G6PJ
24	G3FD, G3FXG, G3FXR, G3JHM
23	G3CWW (260), G3HSD, G4JJ/A, G5PY
22	G2DRA, G3AGR (135), G3ASG (150), G3BPM, G3IOE, G5AM, G8NM
21	G2AOL (110), G3DVQ, G3IWI, G6XY
20	G3EYV
19	G3FEX (118), G3GCX, G5LQ (176), GW3MFY
18	G2HDR, G3DBP, G3JGY, GC2CNC
17	G3EGG
16	G3FRE, G3MLS
15	G3IWA
14	G2DHV, G3CYY

Note: Figures in brackets after call are number of different stations worked on Two Metres. Starting figure for this classification, 100 stations worked. QSL cards are not required to verify for entry into this Table. On working 14C or more, a list showing stations and counties should be sent, and thereafter added to as more counties accrue.

* New QTH

G13GXP; the latter contact is almost certainly a new European ground record, but at the moment of writing this (we have to close for press *some time*!), there had not been an opportunity to get it checked off. G5YV had a second contact with OK1VRP, at 2340, by which time he said he had worked nine G stations—so there are a few others who are happy about having raised a new and difficult country from the U.K. Some of the other outstanding occurrences on the evening of the 27th were that OZ3NH was being worked comfortably from the London and Midland areas; G3FZL/GM3EGW had a good QSO on their regular schedule, with which they have been succeeding very frequently just recently; DL3VJ and DL3YBA were coming into the Midlands and making plenty of contacts; and PAØMZ, saying he was "in the eastern part of Holland," *i.e.*, nearly DX (!) was a good phone signal well after midnight. A check over the air with DL3YBA disclosed that SP5AU had heard him "several times," but apparently Fritz had not yet had a signal from SP5AU, except *via* Aurora on other occasions. And if we may say so here, an unexpected arrival on the two-metre band on the 27th was old timer G5JO of Cambridge, knocking off the PA's.

The facts with regard to SP6CTP, near Wroclaw (or Breslau), who is on 144.15 mc, are not quite clear yet, but apparently he worked G5YV and G6LI during the evening of Tuesday 28th; this is quoted with due reserve, however, as it has not been possible to check with those directly concerned. We shall know by next time, anyway. (Once again, it had to be an off-night for A.J.D., so there was no watch on the band during what was another evening of wide-open conditions.)

We are now down to the evening of Wednesday, October 29, when, with various angry people screaming through telephones at your A.J.D., this lot had finally to be closed for press. By the 29th, the centre of gravity, so to speak, had shifted to Scandinavia, and beams were north-east for stations like LA4VC, LA9T, OZ6CK, OZ7BR, SM6ANR,

SM6BTT, SM6PR, SM7ANB, SM7BAE and SM7BCX—to mention only those heard on A.J.D.'s apparatus. The G's noted in QSO were G2FNW, G3HBW (who did particularly well with these Scandinavians), G3WS, G5KG, G5MA, G5YV, G6LI and G6NB. There were, of course, many others for, as we have said, the EDX was there for all to work.

It has not been possible to give much factual detail on the Seventycent activity and results, but all the G's who can work the 430 mc band were right on the ball, and never failed to ask the DX for a straight or a cross-band test if it could be done at the other end. We very much hope that all who got results on 70 cm will let us know about it for the next issue.

By the morning of October 30, the barometer was beginning to fall back, though the general weather condition remained stable;

SEVENTY CENTIMETRES

ALL-TIME COUNTIES WORKED

Starting Figure, 4

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

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

there may well have been one or two more good evenings after the 30th.

The Tabular Matter

This is presented in full but, having regard to the recent happenings, cannot be anything like up-to-date—all claims made for last month and up to deadline are, however, included. We shall be glad to have details from all concerned for the various tables—there must be quite a lot of movements to go into both Countries Worked and the 70-Centimetre All-Time.

Rest of the News

Though the activities of the month are over-shadowed by the big news outlined already, there are yet several matters of interest to report.

G3HBW (Bushey) finds that he and G3MED (nr. Northwich, Ches.) can work regularly on 70 centimetres over their path-distance of 145 miles, while G3HBW has also been able to put a consistent 430 mc signal in at G2OI and G3HYH, both in Eccles, Lancs., at 155 miles. G3HBW had an interesting experience on the evening of September 25 when, during a brief Auroral opening, he worked GM3EGW and got a partial contact with GM3DIQ—then the Aurora faded. Arnold now has his 5/5 at 40 ft. and well in the clear, which, he says, has resulted in a "spectacular improvement in consistency."

G3LHA (Coventry) always well in on anything that is going, made claims for the Tables before the October opening, so we can expect to see some further movements here. G8DA, who used to be in Exeter, is now at Keynsham, near Bristol, and is in action with a "temporary 4-ele Yagi at ten feet"; even with this, he finds results an improvement on the Exeter location; G5MA is now "ever present" with him, and he receives more distant stations like G3FAN (Ryde, I.o.W.) well. G6NF (Croydon) is able to claim no less than six more counties on 70 cm, including G3JWQ for Derbyshire and G3MED for Cheshire, and G3GSO (Derby) puts in a claim for the Annual. G5MA (Great Bookham, Sy.), one

TWO METRES

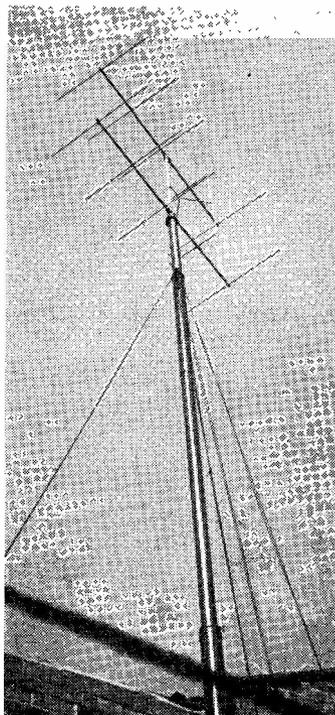
COUNTRIES WORKED

Starting Figure, 8

- 16 ON4BZ (DL, EI, F, G, GC, GI, GM, GW, HB, LA, LX, ON, OZ, PA, SM, 9S4)
- 16 G3GHO, G5YV, G6NB (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, ON, OZ, PA, SM)
- 15 G4MW
- 14 G2FJR, G2HDZ, G2XV, G3IOO, G5BD, G5MA, G8OU
- 13 G3BLP, G3CCH, G3DMU, G3GPT, G3JWQ, G5DS, G6LI, G6XM, G6XX, PA0FB
- 12 F8MX, G2HIF, G3FAN, G3GHI, G3KEQ, G3WW, G6RH,
- 11 EI2W, G2AJ, G3ABA, G3DVK, G3GFD, G3HAZ, G3KUH, G3LHA, G3WS, G4RO, G4SA, G5UD, GM3EGW
- 10 G2AHP, G2FQP, G2HOP, G3BK, G3BNC, G3DLU, G3EHY, G3GSE, G3JZN, G3KQF, G5MR, G8IC, GW5MQ
- 9 G2CZS, G2DVD, G2FCL, G3DKF, G3FLJ, G3FUR, G3GSO, G3IUD, G5ML, GC3EBK, GM3DIQ
- 8 G2CIW, G2DDD, G2XC, G3AEP, G3AGS, G3BOC, G3GBO, G3HCU, G3HWJ, G3KHA, G3VM, G5BM, G5BY, G8SB, G8VZ, GC2FZC

of the most consistent stations on the two-metre band and now being well heard all round, is still on his regular schedule with GD3UB at 2215; it is quite consistent on CW. G5MA did a holiday trip recently, in the course of which he was able to visit G2FJR and G6UJ in Driffield, Yorks. Bob is now up to 40C in Annual Counties—not bad, with the year not two months gone. (We hope he is going to get some competition in this year's Table, too!)

GW3MFY (Bridgend) found a few good evenings before the big opening, and mentions G2NY and G3HYH heard again (Sept. 26/27) but no QSO; G3FZL was worked on September 27 for a first-timer, and G2DDD was heard on October 12. GW3MFY reports GW3LJS (Mumbles, Glam.) as now on two metres, usually late in the evening, and also says that when G3FZL and G3HBW are on their QRO he can hear them off the sides of their beams while they are calling GM3EGW. Other stations heard and called, but without joy, include G2BHN,



The slot-fed 5-over-5 two-metre beam built by G3GSO, Derby. It is 38 feet up and his QTH is 150 ft. a.s.l.

G3LOK, G3LTF, G4DC, and G8VZ. GW3MFY wonders if people tune high enough in the band—he also remarks that he listens with *both ears*!

PE1PL (The Hague) reports that of the regulars worked during the period before dead-line, G2NY had become more consistent following alterations to his aerial, and G3IRS was often a good signal when other U.K. stations were below average.

Going back to the results of G13FWF/GM6WL on Seventycems, reported last month, they have since been on a regular schedule; for the 18 days actually tried, GM6WL has always been heard in Lisburn; in the reverse direction, G13FWF was received on five days out of 12, it having been decided to make it cross-band when GM6WL found that he had too much local QRM for satisfactory reception on 430 mc. Inputs up to 100 watts are used, with an indoor aerial at the Glasgow end; signal level has varied from S2/3 to S9. This is a very

interesting VHF schedule, and we look forward to hearing how it goes under winter conditions.

High Power on Two

It should be noted that the U.K. stations using what is described as high power—which means anything up to a kilowatt—are in fact licensed for it, though under strict conditions; one is that operation should be on frequencies above 145.5 mc. Some of the West Country operators who run normal inputs are now encountering severe QRM in what was normally a very quiet area of the two-metre band.

While excessive power under good conditions—as during the October opening—is unnecessary and can be intolerable, it cannot fairly be argued that under normal conditions a few stations using 500w. or so in the HF sector are much trouble. It is all a matter of relative values. Most people run moderate powers of less than 100 watts—some, of course, very much less. Then, if someone with a good beam and a bigger valve than a QQVO6-40A starts up with 150w., fully modulated, he can become a nuisance to his neighbours. But the fact is that anyone is permitted to use this sort of power if he wishes; the only difficulty is getting efficient inputs of this order. It follows, then, that the real QRO boys in the HF sector of two metres have gone to a great deal of trouble (and, in some cases, expense) to get themselves organised for power in excess of the usual 150w.—and, incidentally, in using it, they are proving that consistent GDX, such as over the Cheviots and into GM, is quite possible.

Obituary—G3DA

With the deepest regret, which we know will be shared not only by those who knew him personally but also by many readers of "VHF Bands," we have to report the untimely death of Anthony Boswell, G3DA, of Manchester. He was killed in a road accident at Woburn Sands, Beds., on the evening of October 16. G3DA was a very keen and active VHF operator, and was outstandingly successful in /P working from the Isle of Man, as GD3DA/P. It was

TWO METRES COUNTIES WORKED SINCE SEPTEMBER 1, 1958 Starting Figure, 14 From Home QTH Only

Worked	Station
40	G5MA
37	G3JWQ
34	G3HBW
27	G3LTF
26	G3KQF
22	G3GSO
21	G3LTF/A
20	G3KPT
19	G3DVK
14	G3MAX

This Annual Counties Worked Table opened on September 1st, 1958, and will run till August 31st, 1959. 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.

only a few months ago that we reported, in this space, his appointment to the important post of Telecommunications Officer at Ringway Airport, Manchester. To his widow and family, we offer sincere condolences.

VHF Century Club

Latest to gain the distinction of VHFCC is W. E. Butt, GC2FZC, Guernsey, who has worked eight countries and showed 103 cards; his Certificate is No. 230.

Dead-Line

This must be **Wednesday, November 19**, for the December issue—in particular, please let us have all claims right up-to-date. And as those who have not been mentioned this month will understand (and to them we also apologise) the press of events has been such that the feature had to be re-cast just as it was ready to go to the printers. In fact, your A.J.D. was caught well on the wrong foot when the glass started to climb on October 21. So now 73, with you again on December 5, all being well—and don't forget the address: A. J. Devon, "VHF Bands," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1.

Voice-Operated Control Switch

SPEECH BREAK-IN FOR MOBILE OR FIXED-STATION WORKING

R. F. G. THURLOW (G3WW)

This is a useful and interesting article describing a practical change-over system which makes mobile operating much easier and safer. As a voice-operated switch, it is equally applicable to the home station, for snappy operation in the same manner as in CW break-in working. The circuits discussed in "SSB Topics" in the October issue perform the same sort of function, but in a different way, and would not be suitable for mobile operation. The voice-controlled circuit described in this article is essentially a direct switching arrangement, actuated by speech input to the microphone and designed to give rapid change-over, in the sense of transmitter-on, receiver-off.—Editor.

WHY should anyone want to go to all the trouble of installing a voice operated send-receive switch in a car?—for that is just what the Vox Box is. There are two good reasons—the first is that it allows one to use a lapel (or breast) microphone and keep hands on the wheel (and not have one's attention distracted by hand or foot switching); secondly, operation while in motion is a good deal less obvious to those who may disapprove of it!

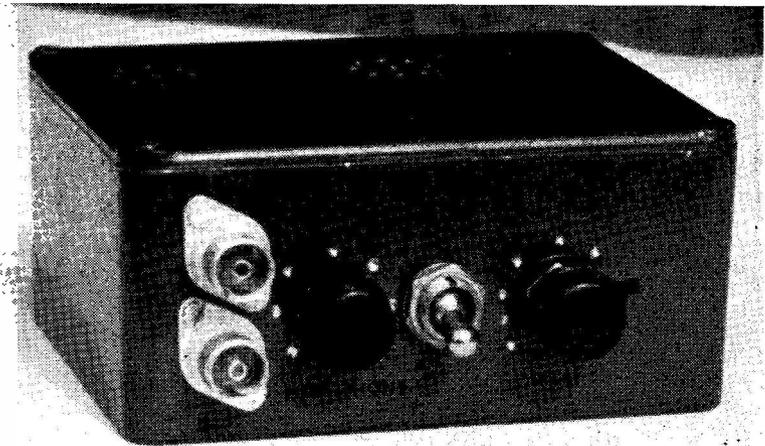
Even with influential assistance the writer could not obtain delivery of this interesting piece of equipment — known as the "Vox Box," and produced in the States—before leaving America at the end of his recent two weeks' visit. However, the details given in a *CQ* article of August, 1958, and the firm's advertisement, stirred a memory of an article in August, 1956, *QST* by W2NDG and K2DKD, on "Simple Voice Control for the AM station."

Their unit was built up from parts available over here at the present time and the circuit adapted for mobile use by putting it across the send / receive

switch contacts; it was first tried out on a rough chassis to see how, and if, it would really work—and it did first time—and then potted into an Eddystone $4\frac{3}{4}$ in. x $3\frac{5}{8}$ in. x 2 in. metal box, in time for display as a working unit at the September Woburn Abbey Mobile Rally.

Constructional Points

As can be seen from the photographs and circuit the unit consists mainly of two twin triodes, a high resistance relay, two potentiometers, and a switch. The front of the box supports the two coaxial sockets—the microphone is plugged into one, and the other socket connected by coaxial cable to the existing microphone input socket of the transmitter speech amplifier—with the audio gain potentiometer, a double pole on/off switch breaking both filament and control circuit lines, and the relay-delay control potentiometer. In the circuit used the relay is energised when HT is applied to the second half of the 12AU7 relay valve, and is released when the microphone is energised. Therefore, the control circuit contact must "make" on transmit when the relay is de-energised (as also must the other contact switching-in the delay capacity C6, of .25 μ F) and unless the control circuit is also broken by the on/off switch this circuit will remain "made" when the relay is de-energised for any reason. The position of the relay at the right-hand side of the box is clear from the photograph and it should be mounted in the box, with wiring attached, before any other component, as its size will determine to some extent the layout of the other parts. The relay must be of a high resistance type of between 5,000 and 10,000 ohms with double-pole single-throw contacts



Exterior appearance of the Voice Operated Control Switch, which will change over from "receive" to "transmit" merely by speaking into the microphone. The knobs are for the control potentiometers, which can be set for gain and delay.

(both to "make" when the relay is de-energised) and necessarily of small size. The relay shown is one found by the writer on the "surplus" market in London (made by Magnetic Devices, Ltd., Series 2400) with a 10,000 ohms coil and only $3\frac{1}{8}$ in. long by 1 in. wide. Since the unit was constructed a more suitable small one of 11,000 ohms (available at Porter's of Cathedral Road, Worcester) has been tried out and works well. except the essential ones, are first removed; this relay measures $1\frac{1}{4}$ in. x $1\frac{1}{16}$ in. x $1\frac{1}{8}$ in. high.

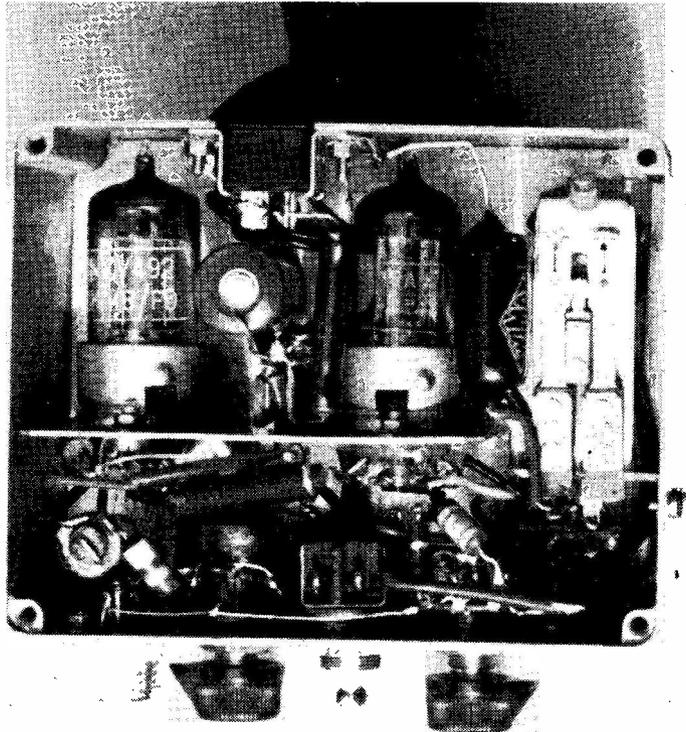
The HT and LT supplies are brought to a miniature 4-pin Jones socket mounted on the side of the rear wall of the box, between the two valve tops, and the two control circuit wires leave the box by a grommited hole beneath this socket. Next mount the components on the front wall of the box with long leads to the On/Off switch.

The valves are fitted in horizontally with the 12AX7 to the left, on a metal bracket $3\frac{1}{4}$ in. x $1\frac{3}{8}$ in. with a $\frac{3}{8}$ in. lip facing towards the front of the box, fixed $2\frac{1}{8}$ in. from the rear, with a slot cut in the bottom of the bracket to allow the On/Off switch wires to lie along the bottom of the box.

The valveholders are placed halfway up the bracket and are spaced $1\frac{7}{8}$ in. between centres with pins 4 and 5 uppermost.

The valveholders and components must be wired up as completely as possible *before* the bracket is bolted into position with one bolt through the centre line of the lip, and the valves already in their sockets—otherwise, it will be difficult to finish the wiring with everything in.

A three-point tag board is mounted on the bracket between the valves and the HT and LT leads from the valveholders taken to it through holes drilled in the bracket. R12, a 10,000-ohm wire-wound resistor, is connected to this tag board and the Jones socket, and since the photograph was taken R13, of 33,000 ohms wire-wound, has been added from the tag board lying across the bottom of the 12AX7



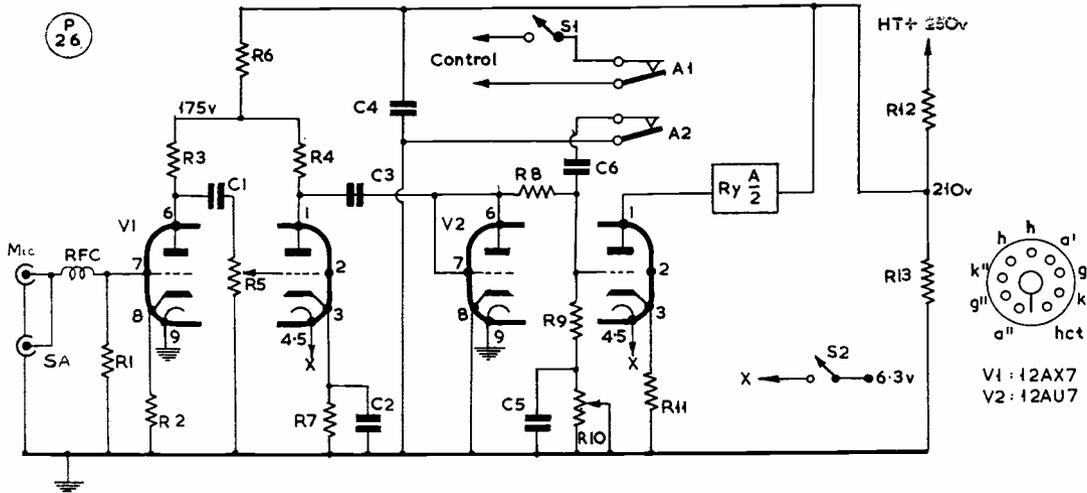
Interior construction of the Voice-Controlled Switch described by G3WW. A fast-acting relay is required, and assembly is simplified by building on small chassis subsequently fitted into the box. Some further constructional points are explained in the article

to a soldering tag slipped under the head of the bolt holding the valveholder to the bracket. The .25 μ F condenser C6 can be seen suspended between the 12AU7 and the relay.

The whole circuit only draws some 10 mA which drops to about 4 mA when the relay is de-energised by the voice; R13 was added to stabilise in some degree the sudden rise in the HT voltage supply on speech. The unit is fed direct from the 6v. AR88-type vibrator supply which runs the home-built mobile transmitter and "amended" Command 1.5-3 mc receiver, and it was found necessary after extended tests to insert R6, of 150,000 ohms, for the proper and stable operation of the 12AX7 under mobile conditions, to obtain the voltages shown on the circuit diagram.

Result

This small box sits on the parcel shelf of the writer's Volkswagen next to the transmitter, and the control wires are clipped across the send/receive switch mounted on the steering column. The left-hand side potentiometer sets the required level of voice to operate the relay



Circuit of the Voice-Operated Switch described by G3WW. The effect is that audio input actuates the relay, which switches the main control circuit. It should be noted that the microphone connects both to the normal speech amplifier (SA above) and to the grid of the first valve in the Switch. Gain and relay action are controlled by R5 and R10 respectively and in practice complete voice-control of the whole mobile installation can be obtained. The relay should, of course, be a fast-acting type. The photographs show the general construction of the Switch, as a small separate unit.

and the right-hand potentiometer adjusts the degree of delay called for under varying conditions to hold in the relay after one has finished speaking—if the delay is set for too short a time, it may sound like an intermittent break in the microphone lead. With the delay adjusted properly, almost four hours of continuous mobile QSO's were enjoyed during one recent journey with the normal send/receive switch used only three times when checking the transmitter loading on changing frequency, all other switching being carried out merely by speaking into the microphone *à la* SSB. Build this voice control unit and enjoy it—even if it is only to be used on the home-station transmitter.

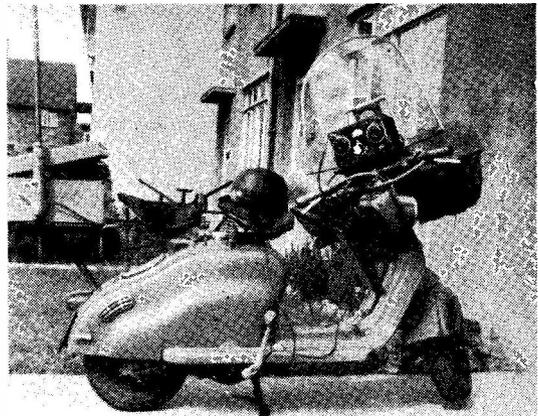
Table of Values

Voice-Operated Control Switch			
C1, C3 = .005 μ F	R8 = 100,000 ohms	R11 = 2,200 ohms	RFC = 1.5 mH, miniature
C2 = 20 μ F, 25v.	R9 = 560,000 ohms	R12 = 10,000 - ohm	S1, S2 = DPST toggle
C4 = 8 μ F, 350v.	R10 = 2 megohm	w/wound, 5w.	V1 = 12AX7
C5 = 0.5 μ F		R13 = 33,000 - ohm	V2 = 12AU7
C6 = 0.25 μ F		w/wound, 5w.	
R1 = 1 megohm			
R2 = 1,000 ohms			
R3 = 470,000 ohms			
R4 = 220,000 ohms			
R5 = 100,000-ohm potentiometer			
R6 = 150,000 ohms			
R7 = 1,500 ohms			

(Note: All resistors half-watt rating except as stated).

THE AUTUMN "RADIO AMATEUR CALL BOOK"

The latest edition of the *Call Book* is now available from us, for immediate delivery. This Autumn (or "Fall") issue is a stupendous publication of 670 pages—it weighs 2½ lbs. and costs us 1s. 9d. to post—and of the 250,000 or so station addresses given, nearly 15,000 amateurs are listed for the first time. The total number of corrections since the last issue, which was the summer edition, is some 30,000, which includes amendments, deletions, additions and, of course, the changes of address. Not only should you be in the *Radio Amateur Call Book*, for the U.K. section of which we are responsible as sole agents for the United Kingdom and Europe, but if you are at all interested in DX, you need a copy. The price is 41s. 6d. post free, of our Publications Dept. The G listings are complete up to and including the callsign/addresses in the July issue of *SHORT WAVE MAGAZINE*.



When G3CBE operates /M on his Lambretta, the box on the carrier contains a car battery and motor-generator for power supply. The battery is not charged from the machine, but on the bench, as it is found that at 57 amp. hr. capacity it gives ample air-time. The whip aerial mounting is also on the carrier bracket. (See next page.)

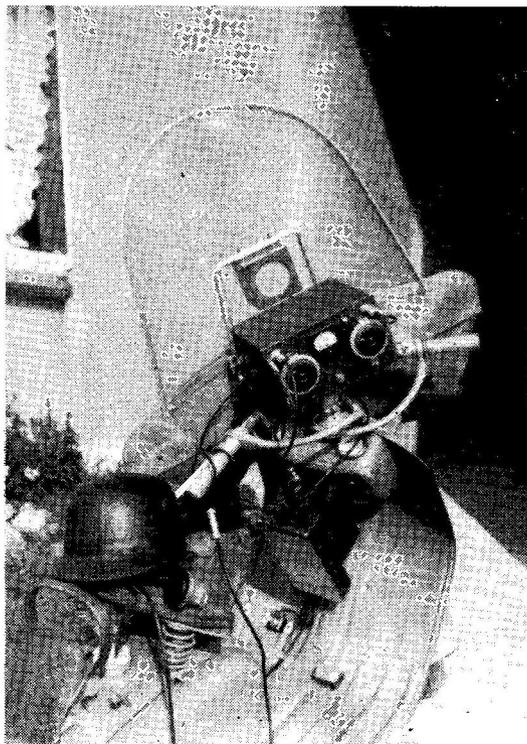
MOBILE ON A MOTOR-CYCLE

From Notes by G3CBE

THE 160-metre mobile equipment operated by G3CBE/M of South Ockendon, Essex, is carried on a Lambretta 150 Scooter, the general arrangement being as shown in the photographs.—See p.491.

In this enterprising and unusual approach to mobile working, the transmitter side consists of an EF91 VFO into an EC91 buffer, with a QV04-7 in the PA, running 8-9 watts input; this is modulated by 12AX7-EL84, with a carbon microphone fitted in the crash helmet. For his receiver, G3CBE has a modified Command set, with a 3½-in. speaker; it has been found that this speaker, mounted as shown in one of the photographs, gives more readable speech and safer running conditions than with a headset. The aerial is a 12 ft. 6 in. base-loaded whip fitted on the carrier bracket, and send/receive change-over is by a kick switch mounted on the near-side running board of the Lambretta.

Power supply is from a 250v. 125 mA motor-generator fed from a standard 12v. 57 amp. car battery, which also gives the LT, these two items being mounted together in a box on the carrier. This battery is not charged on



The G3CBE/M set-up on a Lambretta 150 scooter. The microphone is on the helmet and for reception a small speaker is used, this being safer than a headset, as explained in the article. Good mobile contacts up to ranges of 30 miles and more are regularly obtained.

the scooter, but from a charger at the home QTH; it will give several hours' continuous running, and has been used for up to three hours in one session without noticeable loss of output.

The best distance so far covered by G3BCE/M, with his installation as shown in the photographs, is 35 miles, from Pitsea in Essex across to G3MLO of Canterbury, Kent, while all mobile reports received have been consistently good as regards quality and signal strength.

* * * *

THE MOBILE REGISTER—Fourth List

Following are the details so far received for the Fourth List for the Mobile Register. Previous Lists appeared in the July, August and September issues of SHORT WAVE MAGAZINE. All active mobiles are invited to let us have the necessary information for publication in the Register—a QSL card will do, endorsed "Mobile," with a note of the band(s) worked, and the make and registration number of the vehicle.

<i>Callsign & Home QTH</i>	<i>Band(s) Worked</i>	<i>Vehicle & Regn. No.</i>
G2DUG, Cheltenham, Glos.	160, 80m.	Ford Consul RJH-329
G2YS, Filey, Yorks.	160, 80m.	Morris Oxford SBT-811
G3EJA, Reading, Berks.	160m.	Morris Series-E EVO-259
G3ESP, Ackworth, Yorks.	80m.	Bedford Brake HHL-649
G3GMN, Gloucester	All, 160- 2m. incl.	Austin A40 Van MHY-368
G3HCK, Hurst Green, Sussex	160, 80m.	Ford Zephyr SKJ-890
G3IRE, Hove, Sussex	160, 80, 40 15, 10m.	Sunbeam Talbot PVX-328
G3JFH, Cheltenham, Glos.	160m.	Ford Thames PDG-720
G3JSJ, Enfield, Middlesex	160m.	Ford Prefect HMY-651
G3KFT, Cheltenham, Glos.	160m.	? ?
G3MFV, Harrogate, Yorks.	160, 80, 40m.	Ford Zodiac 3519-U
G4OF, Gainsborough, Lincs.	160, 80, 40m.	Humber Snipe DBC-938
G6VX, Cheltenham, Glos.	160, 80, 40m.	Ford Prefect KBO-822
G8ML, Cheltenham, Glos.	160, 80m.	Vauxhall Velox SDD-720

Safety First — Safety Last — Safety Always

NEW QTH's

This space is available for the publication of the addresses of all holders of new U.K. call signs, 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.

DL2AD, W. W. Cock (*G3HN, ex-VP1HN/VP5HN*), 1 Corps Signal Regt., B.F.P.O. 15.
G3ALI, R. S. Small, 69 Forty Lane, Wembley Park, Middlesex.
G3MNN, T. G. Kelly, 4 Vincent Square, Biggin Hill, nr. Westerham, Kent.
G3MKP, L. S. Phillips, 84 Cedar Road, Romford, Essex.
G3MNR, R. L. Stanford, 20 Strathleven Road, Brixton, London, S.W.2.
G3MNS, I. Swan, 44 Main Road, Gedling, Notts.
G3MPM, D. C. Jewell, 65 Meadow Road, Earley, Reading, Berks. (Tel.: Reading 63798.)
GW3MVE, A. A. Bullimore, 94 Maple Road South, Sebastopol, nr. Pontypool, Mon.
G3MVX, J. Burke, 72 Quebec Road, St. Leonards-on-Sea, Hastings, Sussex.
G3MWI, V. A. Lane, 18 Hucclecote Avenue, Woodhouse Park, Manchester 22, Lancs.
G3MWS, J. T. C. Sladden, 5 Knave Wood Road, Kemsing, Sevenoaks, Kent.
G3MXG, G. P. Grapper, 55 Chesnut Avenue, Handsworth, Sheffield 9.
G3MXM, F. G. Wilkins, 69 Oldfield Road, Westbury, Wilts.
G3MXS, B. Shields, 118 Homefarm Road, Woodchurch Estate, Birkenhead, Cheshire.
G3MYW, W. Waugh, 29 Linden Road, Dunstable, Beds.
G3MZN, R. W. Lightfoot, 5 Periwinkle Lane, Hitchin, Herts.
G3MZP, D. F. Alldrick, 261 Boldmere Road, Wylde Green, Sutton Coldfield, Warks. (Tel.: ERDington 1322.)
G3MZY, J. D. Last, 22 Balmain Road, Davyhulme, nr. Manchester, Lancs. (Tel.: Urmston 5125.)

GM3MZZ, A. H. Kightley, 28 Castlandhill Road, Rosyth, Fife.
G3NAI, R. E. Norman, 143 Hurst Road, Smethwick 41, Staffs.
G3NAK, G. Mallinson, 57 Birch Road, Berry Brow, Huddersfield, Yorkshire.
G3NAQ, G. H. Grayer, 103 Vicarage Road, West Bromwich, Staffs.
G3NAU, Rev. P. R. Heath, St. Peter and Paul's, Brailes, Banbury, Oxon.
G3NAX, C. F. Walters, 42 Primrose Street, Astley Bridge, Bolton, Lancs.
G3NBC, K. A. V. Hurrell, 84 Cedar Road, Romford, Essex.
G3NBO, P. G. Watson, 10 Farndale Road, Loughborough, Leics.
G3NBP, D. C. Free, 49 Queen Ediths Way, Cambridge. (Tel.: Cambridge 88779.)

CHANGE OF ADDRESS

G2ABK, N. T. Hodgson, The Bungalow, Raithby Road, Hundleby, Spilsby, Lincs.
GW2BJL, W. S. Robinson, The Lawn, Magor, Mon.
GM2CHN, D. Niven, 190 Nithsdale Road, Pollokshields, Glasgow, S.1.
G3BBT, J. F. Hagon, 59 Jameson Road, Owton Manor, West Hartlepool, Co. Durham.
G3DXB, R. Gladwell, 14 Perne Road, Cambridge, Cambs.
G3EIZ, C. S. S. Lyon, Chantry Way, Abbot Road, Guildford, Surrey.
G3GKQ, A. Roberts, 15 Conway Avenue, Clitheroe, Lancs.
GM3HLK, D. Ferguson, 75 Ingleby Drive, Glasgow.
G3HN, W. W. Cock (*ex-VP1HN/VP5HN*), 79 Longmead Avenue, Bishopston, Bristol 7.

G3IJU, E. Briggs, 111 Cheshire Crescent, R.A.F. Station, Tangmere, Sussex.
G3IRE, R. Ireland, 11 Farnway Close, Greenleas, Hove, Sussex.
G3IRQ, P. M. Rackham (*ex-DL2DY*), Bounds Farm, Ardleigh, nr. Colchester, Essex.
G3IWE, A. M. H. Wyse, Appleton Hall Gardens, Appleton, nr. Warrington, Lancs.
G3KCJ, A. H. Webb, Sandy Balls Estate, Godshill, Fordingbridge, Hants.
G3KOC, J. D. Pearson, 12 Manchester Square, New Holland, Barrow-on-Humber, Lincs.
G3KPO, D. Byrne (*ex-GC3KPO*), Jersey House, Eye, Peterborough, Northants.
G3KYF, K. G. Sullivan, 33 Keswick Road, Blaby, Leics.
G3LWS, E. H. Ross (*ex-VP8CZ*), 1 Meynell Road, Quorn, nr. Loughborough, Leics.
G3LXQ, D. L. Gallop, 46 St. Helens Down, Hastings, Sussex.
G3MAR, Midland Amateur Radio Society, c/o Birmingham and Midland Institute, Paradise Street, Birmingham 1.
G3MCW, R. A. E. Fronius, 169 Coxtie Green Road, Brentwood, Essex. (Tel.: Coxtie Green 412.)
G3MEF, T. C. Wylie, Landfall, Instow, N. Devon.
G3MIJ, D. Campbell, Ridgmont, Church Street, Faringdon, Berks.
GW3MSY, A. C. Davies, M.C., A.M.I.E.E., Clytha, Danygraig Drive, Llantrisant, Glam.
G5PW, H. Wright, 4 Valley Top, Hough Top, Bramley, Leeds 13.
G8DA, P. Malvern, 18 Lockingwell Road, Keynsham, nr. Bristol.

CORRECTION

G3JGR, Dr. G. S. Rockwood (*ex-4S7GS*), Southlands Hospital, Shoreham-by-Sea, Sussex.

NO DIFFICULTY

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THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for December Issue : NOV. 14th)

ONCE more the merry month of MCC is with us, and organising genius will be strained to its uttermost limits to cope with the situation arising! We have a feeling that this year will see more entries than ever before, and, since advance application is not necessary, it is still not too late for any Club with a Top-Band transmitter and some operators to plunge into the fray.

Rules, in full, appeared on p.441 of the *October* issue; all you have to do is to comply with them and to be ready by Saturday, November 15, to take the air on Top Band at the time stated.

We do not presume to give advice to participating Clubs except to warn them that if there are more than 40 entrants (and there may well be many more this year) they will all have to put external contacts very firmly in second place and concentrate on working *all* the other Clubs during *each* of the four sessions. Inter-Club contacts bring the big scores . . . but then a few non-Club (single point) QSO's may just turn things in favour of the station that makes most of them.

Club reports are much more numerous than usual this month, so we pass straight on to the summary of activities.

Aldershot have arranged an autumn programme which will include demonstrations of members' gear, followed by Morse practice. Interested visitors will always be welcome at The Cannon, Aldershot, Wednesdays at 7.30 p.m. **Bradford** will have a talk on Communications Receivers, by G3FDC, on November 18, and a social evening on December 2—7.30 p.m. at 66 Little Horton Lane, Bradford. Morse classes are held by arrangement before the regular meetings.

Clifton held their AGM in September and elected G3FVG chairman and G3DIC secretary. Their Championship Cup and D-F Shield were both won by G3HZI, and the Transmitting Field Day Trophy by G3DIC. A new transmitter has been built for MCC, and a committee formed to organise the entry. Nine members are taking the classes for R.A.E. Meetings every Friday at 225 New Cross Road, S.E.14.

Cornish had an excellent attendance on October 1 for a Marconi lecture on Echo Sounding. On view and working were Echo Sounders, Lifeboat Transmitters, Automatic Keying Mechanism and the latest Marconi Atlanta receiver. The December meeting will be held at Falmouth and will most probably be a Hi-Fi Night. **Coventry** will have a talk on Radio Theory by Mr. V. A. Dalkin, B.Sc., on November 10;

on the 17th G6WH will be lecturing, and the 24th is a social evening. All meetings at 9 Queen's Road, Coventry, 7.30 p.m., where the clubroom is also open every Tuesday for an hour's Morse instruction by G2FTK, the new secretary. The Annual Dinner will be held at the Fletchamstead Hotel on November 14.

Derby (A.R.S.) have an Open Meeting on November 12, and on the 19th the title is "For the Beginner." On November 29 they make their annual expedition (to the Hobbies Exhibition and the London Junk Shops!) A Junk Sale is fixed for December 3. **Derby** (S.W.E.S.) have a Round Table Discussion Group on November 13—each member talks for ten minutes on his previous week's work or activity. November 20 is an Open Evening, and on the 27th G3GSO, G3JFT and G3KQF will be showing colour slides.

Exeter are trying hard to find suitable Club premises, and hope to have a club station on the air early in the New Year. On November 13 at 7.30 p.m. they will be holding a Junk Sale, and on December 11 there will be a talk on Hi-Fi—probably at the new clubroom. **Flintshire** had a Junk Sale on October 6 and a Film Show on November 3. Next meeting is on December 1, when GW3JGA/T will talk on "Getting the Best From Your Receiver." The **International Ham Hop Club** have sent us their circular, *Ham Hop News*, in which are given full details of the facilities available to members, as well as accounts of activities and holidays which have already been sponsored. Full details from the hon. sec. (see panel).

Lothians will be meeting on November 20 at 25 Charlotte Square, Edinburgh, for a talk by GM3UM on "Getting Started." On December 4 there will be a talk on Radio Communications in the A.A. **Mitcham** have a Junk Sale on November 7 and a lecture by Messrs. A. C. Cossor on November 21. The "G5UX Key" (that of their late chairman) is being competed for in an all-band DX Contest extending over twelve months.

North Kent had an "Any Questions?" session on

CLUB NEWS

Reports for this space are welcomed from all Amateur Radio clubs, societies and local groups. They must reach us by the date given each month at the head of this article. The honorary secretary's name, call sign (if any) and full address must always be included in the report, which should be sent to: "Club Secretary," Short Wave Magazine, 55 Victoria Street, London, S.W.1. There is no charge for insertion. We are always glad to see clear, sharp photographs of club interest, payment being made for those that we can use in this feature.



Group photograph taken at the Lincoln Short Wave Club's hamfest and mobile rally held on September 21, at the Lincoln Technical College. About 120 visitors were present and some 18 mobiles were talked-in by G3TXH, the club's own station, operating on Top Band. The winners of the competition for the best home-built mobile installation were G2CAJ, London (first), G3KDO, Doncaster (second) and G3HRP, Scunthorpe (third); the prize for the most distant visitor went to GW2FOF. In addition to raffles and a sale of surplus equipment, tours of Lincoln City and its Cathedral were arranged for those visitors not interested in the radio side of the proceedings.

October 9 and a talk by G3GKZ on Amateur Direction-Finding on the 23rd. Some of their past lectures are very ably summarised in their monthly *News-Letter*, which also carries all kinds of notes and news for members.

Romford announce a Junk Sale on November 11, their Annual Dinner and Ladies' Night on November 18, and a Tape Quiz on November 25. All meetings are at 8.15 p.m. at R.A.F.A. House, 18 Carlton Road, Romford. **Slade** have a talk on November 7 on Electronics in the Hospital, by Mr. R. Lightwood; November 21 is fixed for their AGM, and December 5 for a Hi-Fi demonstration. They still run their twice-weekly Morse classes, and the "Club School" has been filled to overflowing on several occasions.

Spenn Valley have a Film Show (Mullard) at St. George's Hall, Bradford, on November 11. On the 26th Mr. G. N. Newman will be talking on Crystal Microphones. For the rest of the year the meetings will be at the George Hotel, Cleckheaton. **Tees-side** ran three stations at the Middlesbrough Horticultural and Handicrafts Show and made contacts with many countries. On November 7 they will be discussing recent station activities and also planning their future programme. A dinner is being arranged for a Saturday night in December. November 21 is fixed for a tape-recorded lecture. Both meetings are at Settlement House, Newport Road, Middlesbrough, 8 p.m. **Worthing** recently saw two interesting films, on the C.R.O. and The History of Radio. They will be holding their 40-metre receiving contest on November 23.

Surrey (Croydon) met for an illustrated talk on Long-Distance Commercial Communication by G8PP (P.O. Cables and Wireless Service) in mid-October. As recent "Sales of Surplus Gear" (not Junk Sales!) have been so popular that not all the gear offered has been cleared in the time, a special sale is being held at the November meeting, on the 11th.

The **London Short-Wave Club** is being re-formed, and will meet at the Battersea Men's Institute, forming part of that Institute's activities. Meetings

will be held every Friday, but Institute activities on other evenings will be open to members, including Elementary Radio, Advanced Radio and an R.A.E. course. A full programme of lectures and demonstrations is planned, and anyone interested should contact the secretary—see panel for QTH.

Torbay now have their own club headquarters, in Belgrave Road, Torquay, and it is hoped that they will be operational very shortly. A Club Tx is also aimed at, naturally. On October 11 G5SY (a well-known old-timer) gave a talk on UHF Transmission and Reception, and on November 8 he will continue with "Miniature Antennae for UHF." Note that this meeting will be at the YMCA, Torquay, at 7.20 p.m.

East Kent resumed their meetings after the summer recess with a talk on "Know How" by G2JF, who will be giving a lecture each month in future. R.A.E. Classes are being run by G3MDO, 7-9 p.m. every Tuesday. The meeting-place is Canterbury Technical College, Longport Street. **Halifax** heard about Receiver Construction from G3FDC at their October meeting. Their secretary, G3MDW, received a "Thanks Badge" from the Halifax Boy Scout Association for organising the amateur station in last May's "Jamboree on the Air."

West Lancs have acquired accommodation at Colonsay, Crosby Road South, with room in the garden for aerials. They therefore hope to put themselves on the air before long. Membership is increasing, with accent on youth, and a programme of Morse practice, lectures and possibly film shows is being prepared. They recently took part in a "Crosby at Leisure" Exhibition, and put G3IZT/A on the air from the exhibition hall. **Cambridge** have had a talk from G3WW ("I Visited America"), and, more recently, a Junk Sale. Meetings are at the Jolly Waterman, Chesterton Road, at 7.45 p.m., where on November 28 there will be a talk on Transistor Circuits.

Cambridge University operated G6UW in the Societies' Fair on October 7-8. Great interest was

shown and twenty members were present at a demonstration, on October 14, of G6UW in the Cavendish Laboratory. On November 11 there will be a talk on Electronic Training Devices (Redifon Ltd.); November 18 is booked for a talk on Problems of High Quality Tape Recording (Multimusic Ltd.); and on November 25 there is an informal meeting at U.3, Caius, with an Inventors' Quorum. The other meetings are in the Cavendish Laboratory, 3.15 p.m.

NAMES AND ADDRESSES OF CLUB SECRETARIES REPORTING IN THIS ISSUE:

ABERDEEN: W. K. Heggie, 80 Leslie Terrace, Aberdeen.
ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, London, W.3.
ALDERSHOT: S. E. Hume, 25 Kingsway, Aldershot.
BARNET: E. W. Brett, G3LUY, 28 Edward House, Edward Grove, New Barnet.
BRADFORD: D. M. Pratt, G3KEP, 27 Woodlands Grove, Cottingley, Bingley.
BURY: L. Robinson, 56 Avondale Avenue, Bury.
CAMBRIDGE: H. Watson, G3GGJ, New Road, Barton, Cambridge.
CAMBRIDGE UNIVERSITY: R. Kerley, G3MIK, St. John's College, Cambridge.
CLIFTON: C. H. Bullivant, G3DIC, 25 St. Fillans Road, London, S.E.6.
CORNISH: J. Brown, G3LPB, Marlborough Farm, Falmouth.
COVENTRY: A. Noakes, G2FTK, 4 Baron's Field Road, Coventry.
DERBY (A.R.S.): F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby.
DERBY (S.W.E.S.): J. Anthony, G3KQF, 56 Sherwood Street, Derby.
EAST KENT: D. Williams, G3MDO, Llandogo, Bridge, near Canterbury.
EXETER: H. M. Hayfield, G3MCJ, 113 Hamlin Lane, Exeter.
FLINTSHIRE: J. Thornton Lawrence, GW3JGA/T, Perranporth, East Avenue, Bryn Newydd, Prestatyn.
GRAFTON: A. W. H. Wennell, G2CJN, 145 Uxendon Hill, Wembley Park, Middx.
HALIFAX: A. Robinson, G3MDW, 7 Upper Brockholes, Ogden, Halifax.
INTERNATIONAL HAM HOP CLUB: G. A. Partridge, G3CED, 17 Ethel Road, Broadstairs, Kent.
LINCOLN: F. B. Travis, G3BCA, 202 Monks Road, Lincoln.
LIVERPOOL: W. D. Wardle, G3EWZ, 16 Mendip Road, Liverpool 15.
LONDON SHORT WAVE CLUB: K. R. Piper, G3LOO, 2 Catherina Terrace, London, S.W.8.
LOTHIANS: L. Lumsden, 33 Hillview Drive, Edinburgh 12.
MITCHAM: D. Johnson, 23 Woodland Way, Mitcham.
NEWBURY: J. A. Gale, G3LLK, Wild Hedges, Crookham Common, Nr. Newbury.
NORTH KENT: D. W. Wooderson, G3HKX, 39 Woolwich Road, Bexleyheath.
NOTTINGHAM: E. C. Weatherall, 276 Perry Road, Sherwood, Nottingham.
PLYMOUTH: A. W. Phillips, G3NBX, 8 Merrifield Terrace, Torpoint.
PRESTON: G. Lancefield, G3DWQ, 35 Brixton Road, Frenchwood, Preston.
R.A.I.B.C.: W. Harris, 25 Playford Lane, Rushmere, Ipswich.
ROMFORD: L. S. Owen, G3MDP, 53 Applegarth Drive, Newbury Park, Ilford.
SLADE: C. N. Smart, 110 Woolmore Road, Birmingham 23.
SOUTHGATE: A. G. Edwards, G3MBL, 244 Ballards Lane, London, N.12.
SOUTH MANCHESTER: C. M. Denny, G6DN, 18 Willoughby Avenue, Didsbury, Manchester 20.
SOUTH SHIELDS: K. Sketheway, 51 Baret Road, Walkergate, Newcastle-on-Tyne 6.
SPEN VALLEY: N. Pride, 100 Raikes Lane, Birstall, near Leeds.
SURREY (Croydon): S. A. Morley, G3FWR, 22 Old Farleigh Road, Selsdon, South Croydon.
TEES-SIDE: A. L. Taylor, G3JMO, 12 Endsleigh Drive, Middlesbrough.
TORBAY: G. Western, G3LFL, 118 Salisbury Avenue, Barton, Torquay.
WELLINGBOROUGH: P. E. B. Butler, 88 Wellingborough Road, Rushden, Northants.
WEST LANCs: A. Crighton, 77 Myres Road West, Liverpool 23.
WIRRAL: H. V. Young, G3LCI, 9 Eastcroft Road, Wallasey.
WORTHING: J. R. Tootill, 113 Kings Road, Lancing.

Acton, Brentford and Chiswick have recently had a Junk Sale and a talk by G5LQ on Low Power Contest working. On November 18 G4LS will be giving Hints and Tips on the constructional side. Morse practice at 7.30 p.m. every Tuesday at the Clubroom, 66 High Road, Chiswick, W.4.

South Shields held their AGM and elected G8AO president, G5WZ chairman and Mr. K. Skethway secretary. Mr. Glenwright, their vice-president, has presented a shield to the club, which was handed over to G2BCY, winner of the Constructional Competition. R.A.E. Classes have been started by G3LII. Meetings are on the last Wednesday at Trinity House, Laygate, but the clubshack is open every Friday evening.

Wirral, at their AGM, elected G3EGX chairman, G3KXR treasurer, and G3LCI joint editor and secretary. Eight members spent a week-end (October 11-12) putting Westmorland on the air, and this episode will be pictured in a film show on November 7. On the 21st the subject is Modernising the HRO, by SWL Evans.

Grafton held their AGM and got started on the new season's work with lectures on Antenna Design (G3JEA), Getting Started (G3AFC), R.A.E.N. (G8TL) and a Junk Sale. Over 70 members attend the Club's R.A.E. and Morse classes on Mondays and Wednesdays. They are operating from the Islington Town Hall Handicrafts Exhibition (November 17-22) and also preparing for MCC. Slow Morse classes every Friday at 7 p.m. Grafton have now introduced an award of their own, available to all, called "Worked All London Town" (WALT). It is based on the 118 London Postal Districts, and details will be found in "DX Commentary" in this issue.

Aberdeen, meeting every Friday at 7.30 p.m., will have a discussion on future club activities on November 7; the presidential address on the 14th; a Mullard Film Show on the 21st; and GM3ICS talking on his new transmitter on the 28th. **Bury** will meet at the George Hotel, Kay Gardens, at 8 p.m. on November 11, when G2IG will talk on SSB. December 9 will be their AGM and "Natter Night." All local amateurs and SWL's are always welcome. **Lincoln** are settling down to their routine meetings at 7.30 p.m. on alternate Wednesdays at the Technical College, and hope to provide an interesting programme for the winter months. Next meeting is on November 12—all visitors welcome.

From the *Liverpool News Sheet* we learn that a Top Band Contest will be run during the whole month of November, open to members of any North Western Radio Society. A Listeners' Section is also organised. Liverpool's own programme includes a Construction Contest on November 11 and a Junk Sale on the 18th. **Nottingham** (Amateur Radio Club) meet on Tuesdays and Thursdays at 7.30 p.m., with their Top Band transmitter G3EKW on the air most nights. They are also building a Tx for the HF bands. November 11 is booked for a talk on Hi-Fi and Stereophonic Sound, augmented by a demonstration; on October 28 G2OC gave a talk on QRP Operation.

Plymouth ask us to call attention to their change of secretary—see panel for new QTH. **Southgate, Finchley and District** ran GB3SRA recently at the

Wood Green Show, and worked many stations both on Top and HF bands. Next meeting is at Arnos School, Wilmer Way, N.14, on November 13, at 7.30 p.m., when judging will take place on the best home-constructed equipment for the G6QM trophy. A Junk Sale and Raffle may also be held.

Preston met with great success at their recent Hobbies Exhibition, although operation of GB3PRS was hard going through the QRM. New members were enrolled at a satisfactory rate, and all contacts will be QSL'd. On November 12 they have a lecture for beginners (Mr. W. Dewhurst); on the 26th they visit Barton Hall, the MCA aircraft control centre for the North. Provisionally fixed for December 10 is a film lecture.

Barnet report rising membership and a good lecture programme. A recent highlight was a talk by Bob Ford (ex-AC3SS and AC4RF) covering his experiences in Tibet and in the hands of the Chinese Communists—this meeting attracted an audience of more than one hundred. Future meetings will be at the Red Lion Hotel, High Street, Barnet, the next being on November 25 for a talk by G3BZG.

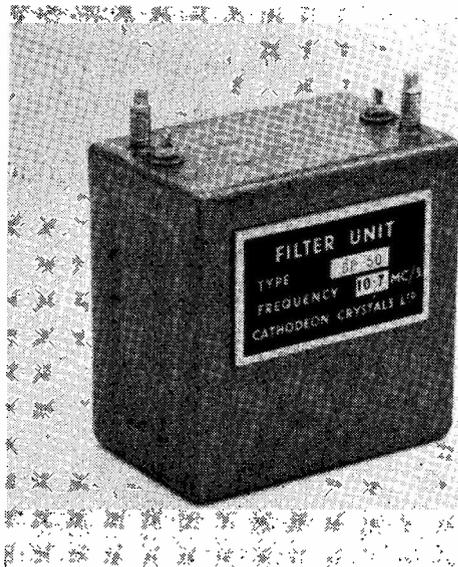
The Radio Amateur Invalid and Bedford Club send their news sheet, *Radial*, full of personal news about members and their activities. From the October issue we learn that the R.A.I.B.C. Forty-Metre Net has been resumed, and is now in action at 1000 GMT every Tuesday.

Newbury had an attendance of 75, including a large number of visitors, for their annual hamfest on October 19; G3IPR/A was in operation to talk-in the mobiles, and one of the attractions was a conjuring performance! Meetings are held on the last Friday of every month, 7.30 p.m., at Elliotts, West Street. South Manchester held their AGM on October 10, at which G3LQQ was elected chairman, G6DN vice-chairman and secretary, and G3DQU treasurer. The club now has its own 150-watt transmitter in operation on club nights, the next meetings being on November 7 and December 5, at Ladybarn House, 17 Mauldeth Road, Fallowfield. It is planned to provide Morse instruction and workshop facilities at the club. Wellingborough send us their forward programme in the form of a "fixture list," from which we notice G3CGQ is to lecture on Solar Radiation on November 27, that there is to be a club visit to the Amateur Radio Exhibition on the 29th, and that the annual Christmas Party is to take place on December 18. Meetings are held every Thursday at 7.30 p.m. at the Silver Street Club Room, and Wellingborough operate their own G3KSX.

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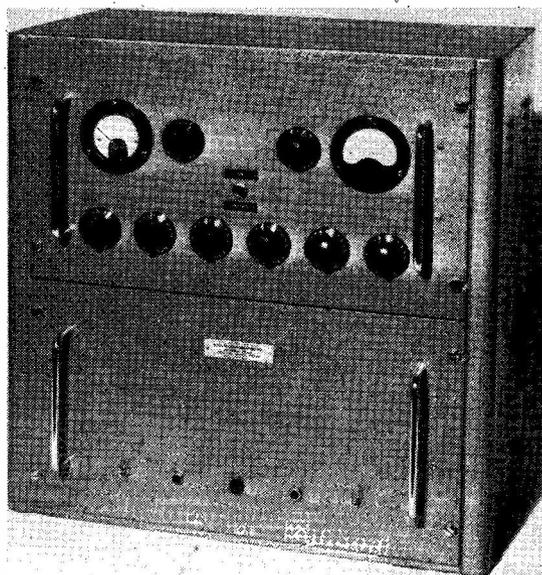
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HOME RADIO OF MITCHAM

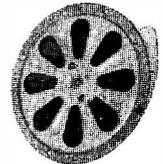
HEADPHONES



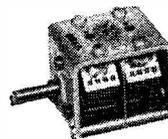
Brand new and boxed B.T.H. lightweight high resistance headphones. Resistance 4,000 ohms, impedance at 1 kc. approx. 17,000 ohms. Weight 7 ozs. Manufactured to highest specification. These are not Ex. Government. Originally made to sell at 45/- a pair, we are able to offer these while stocks last at the give-away price of **only 15/-** a pair. Without doubt the best offer of high-grade phones ever made.

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MINISTRY OF SUPPLY requires **RADIO OPERATORS** in Air Traffic Control at the Aeroplane and Armament Experimental Establishment, Boscombe Down, Wilts. Age over 20. At least two years' experience on these duties in H.M. Forces or civil aviation required. Knowledge of Radio/Radar aids and G.C.E. (OL) advantageous. Salary range £353-£734, women slightly less.—Applications to: Air Commodore Commanding, A. & A.E.E., Boscombe Down, Wilts.

SITUATIONS WANTED

FLIGHT RADIO OFFICER, age 39, 12 years with national airline, world travelled, active amateur, seeks position within the radio industry; keen, adaptable, anything with good prospects considered.—Box No. 2055, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

TRADE

NATIONAL HRO SPARES, gang and gearbox, £3; tuning knob dial, 25/-; control knobs, 2/-; ceramic valveholders, 1/6; AE/E terminal panels, 2/-; Spkr socket panels, 1/6; front panels, 10/-; rack mounting cabinet and panel, 30/-; crystal filter IFT's, 30/-; other IFT's, 12/6; BFO transformer, 12/6; CW/Osc variable capacitors, 3/-; bias electrolytics, 1/6; 6D, 8/6; 6C6, 7/6; 6B7, 11/6; 42, 9/6; 80, 10/-; bulbs, 9d.; Marion 0-1mA meter, 30/-; smoothing choke, 8/6; mains transformer, 17/6; Sprague 0.1mF 600v., 1/-; .01mF, 1/-; 0.25mF 350v., 1/9; circuit, 1/-; some coilsets, 17/6. Also AR77, AR88, CR100 spares. Include postage for goods or enquiries.—E. F. C. Owen, 33 Burreleigh Road, Sutton, Surrey.

CRYSTAL MICROPHONE INSERTS with exceptionally high output (Cosmocord Mic.6). Guaranteed newly made and boxed, 15/6 post free.—Radio-Aids, Ltd., Dept. S, 29 Market Street, Watford, Herts.

£1 each paid for Manuals BC640.—Altham Radio Co., Ltd., Jersey House, Jersey Street, Manchester 4.

WANTED: BC610 Hallicrafters, ET-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.

WANTED URGENTLY: Communications Receivers, type CR100 and CR150, also HRO's. Please state condition and price.—Relda Radio Ltd., 32a Coptic Street, W.C.1. (MUSEum 9607.)

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

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State suffix number, condition and if modified

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FOR SALE: One-kilowatt Transmitter, by Standard Telephones, £20.—Brook & Hill, 17/19 Great Eastern Street, E.C.2 (Tel. B1Shopsgate 1848).

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SHORT WAVE RECEIVER WANTED by keen listener; something with really wide coverage that gets the world.—John Pendred, 60, Alexandra Road, Parkstone, Dorset.

WANTED: Beginner's Morse Course.—Watson, 3 Bartlow Road, Castle Camps, Cambridgeshire.

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R1155A, T1154 and box of spares; ex. condition, working; unmodified, as purchased. No power packs. Buyer collects. £8 10s. 0d.; bargain!—E. C. Martin, 12 Furfield Close, Park Wood Estate, Maidstone, Kent.

SALE: Reconditioned R109 Receiver; AC mains, SP/Pack, bandspread, new cabinet, spare valves, manual; £4 15s. 0d., carriage extra.—D. E. Jones, 6 Talybont Road, Llanrwst, North Wales.

5 IN. OSCILLOSCOPE, converted 182A unit; *Radio Constructor* circuit, time-base to 100 kc; works well; cost £12 to build. Any offers?—Holley, 152 Leigh Road, Eastleigh, Hants.

WANTED: CR100 or AR88, in exchange for R107 in mint condition and cash.—Albans, 17 Fern Road, Cropwell-Bishop, Notts.

CR 100, as new and perfect, no mods.; complete set spares and manual; £16. R.1155, built-in power pack and output stage; new panel; perfect condn.; £6.—G3ISQ, 43 Hinton Parva, Nr. Wimborne, Dorset.

FOR SALE: R1132A, brand-new, £3; also R1392, less two valves and damaged meter, £3 10s., postage on each.—Spence, 11 Brookfield Street, Cornholme, Todmorden, Lancs.

EDDYSTONE 358x, complete with p/pack, 10 E coils and manual, £12 10s. 0d., or will pay cash adjustment in exchange for good S.750 or 840A.—Gullis, 5, Bradstock House, Hackney, London, E.9.

G M3BQA Dual Quad 10/15, as new, £10. Modulator unit BC-640A, pair of 1613's into pair 811's, manual, £5.—Exchs. Lancs. Box No. 2052, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

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SMALL ADVERTISEMENTS, READERS—continued

BC 342's for sale; two available, complete with 115v. transformers and loudspeakers if required; £15 each. — Bullett, 38a Sidney Road, Walton, Surrey.

AUSTRALIAN BUG, £3; Radiomobile, 1957, 12v. Car Radio, £10 (cost £28); 1500v. Electrostatic voltmeter, 10/-; Parmeko 100w. mod. tran., £1; fil. trans., 12v. 3a. and 5v. 3a., 9/-.

Valves (4/- each): 1625 (4); 12A6 (6); 5R4 (2); 5U4 (2); min. Japanese 807 (2); 12K8; 12SA7; 12SR7; 12SQ7; 12SF7; 12SK7 (5). — Box No. 2047, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: TVI-proof K.W. "Vanguard" Transmitter, as new, £43; carriage paid. — A. S. Thomas, Belle Vue House, West Cross Lane, Swansea, Glam.

SALE: Woden 120-watt Modulator, Labgear 5-band coupler with 5763 valves, high-voltage power packs, transformers, chokes, etc. Also quantity of valves, m/c meters, short wave components. All at low prices.—Ellis, G3SN, 47 Victoria Road, Saltash, Cornwall.

FOR SALE: Gonset Commander Mobile Tx, with matching tubeless VFO and push-to-talk mike; Morrow 5BR Converter for 12v. operation; homemade 300v. supply to suit Tx; stainless steel Master Mobile body mount; 96in. whip with Johnson Whipload six coil; Millen R9er with coils for 10, 15 and 20 metres.—Write E. S. Wilson, Dunlochan, Whitehead, Co. Antrim, N. Ireland. (Phone 3260.)

NO. 19 Wireless Set Manuals, not photostats, 12/- post free. Hallicrafters, S.38, £11 10s. 0d. DST-100, £12. Write—G. Eaton, 54 Yoxhall Road, Shirley, Warwickshire.

HAMMARLUND HQ-120 Rx, good working order, 0.54-30 mc, offers over £20? Geloso converter, 10-80m. built-in p/pack, as new, offers over £15? Radiocraft preselector, 1.7-30 mc, built-in p/pack, mint, £5. Or £40 The Lot.—(Scotland) Box No. 2050, Short Wave Magazine Ltd., 55 Victoria Street, London, S.W.1.

SALE: 6-Waveband Denco CT4 turret; long, med. S and 1.6 to 36 mc, separate 340 in. bandspread dial calibrated 3.5, 7, 14, 21, 28 mc bands, fitted in Eddystone black crackle case with chrome handles, panel drilled for S-meter and controls, with circuit for communications Rx, £11.—Box No. 2051, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: R-54/APR-4, together with R-54/TN-16, in mint condition, unmodified. Offers?—Box No. 2046, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

MINIMITTER FOR SALE, 5 months old, condition as new, nearest offer to £85. Also Acos Mike and low-pass filter. Extended payment accepted.—Meyers, 19 Norrice Lea, Finchley, London, N.2. (Speedwell 9186.)

OVERSEAS AMATEUR visiting U.K. November wishes to purchase small reliable easily portable type transmitter and also receiver, both to operate from 12v. DC and 220v. AC. All-band if possible, but transmitter must be capable phone operation and cover 40-metre band. Very small or midget-type preferred.—Box No. 2053, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SMALL ADVERTISEMENTS, READERS—continued

HRO Eight G.C. coils, 21 mc bandspread, £20. HSX28, modified, FB manual, matching speaker, £38.—Pilkington, 23 Southport Road, Ormskirk, Lancs.

BC 221 for Sale, good condition, with built-in power supply and handbook. Offers?—Box No. 2056. Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

CR100 with L/s. £20. 58 Set, never used, £2 10s. B2 m/Batt. p/pack, spares, £10. Two BCC Trans-Rec. complete (around 80 mc), what offers? 21 crystals. 2072 to 8250 kc. £2 10s. CAY Unit 1.5 mc to 3 mc. £2. R.C.A. Amp. 25w., £10. AVO wide-range generator, £20. O.N.O. the lot.—Box No. 2054. Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

TABLE TOP 150-watt TVI-proof transmitter, built by Louis Varney, 813, TZ40's, 3.5 to 28 mc switched. ATU and power supply. 4 hours' use only. £75 o.n.o.—(Tel. Charing (Kent) 205.)

WANTED: Radar or similar parabolic dish, 12 ft. in diameter or thereabouts. Suggestions or ideas welcomed.—Box No. 2039. Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Transmitters Types RCA ET-4332, £18; T1131, £12; Marconi AD67B, £18; Walkie-Talkie WS58, £11; Tx/Rx SCR-828, £28; TS12/AP, £7 10s. 0d. Bendix Receivers RA-10, £4 10s. 0d. Test Set IE19A, £15. UHF signal generator, RCA type 710A, £26. Buyer collects, Midlands.—Box No. 2037. Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

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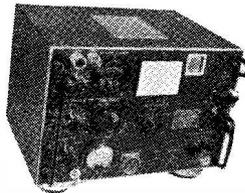
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