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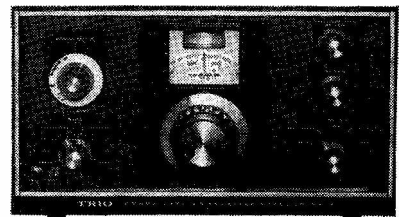
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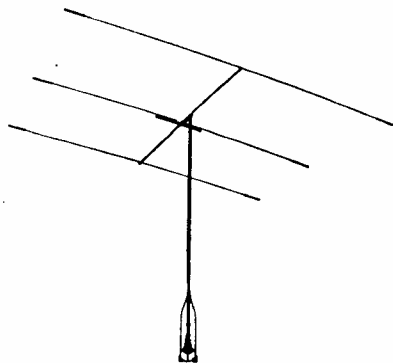
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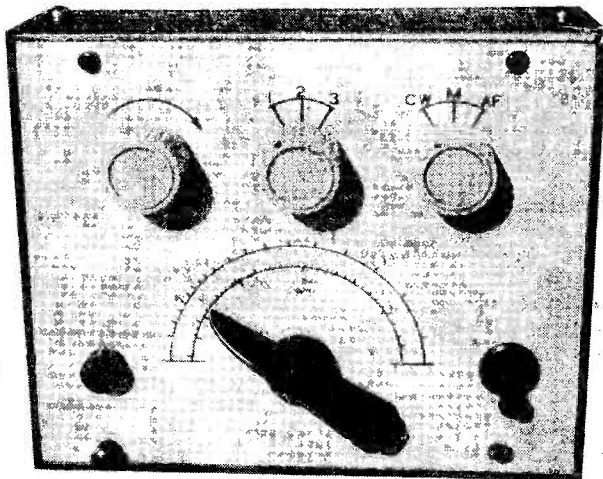
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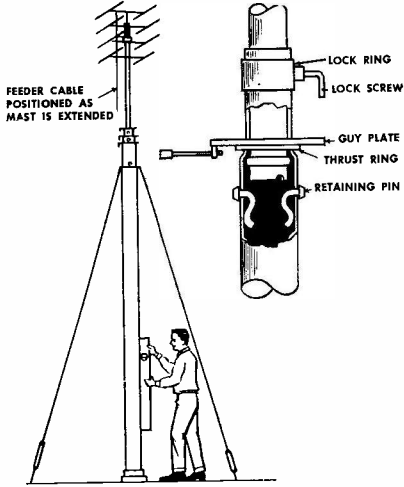
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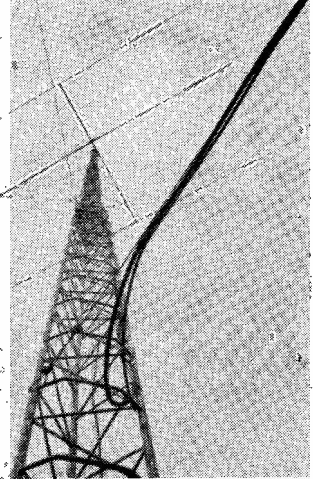
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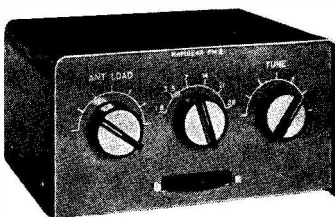
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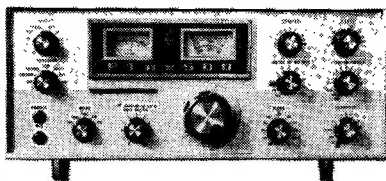
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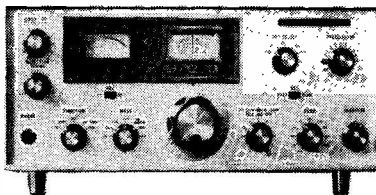
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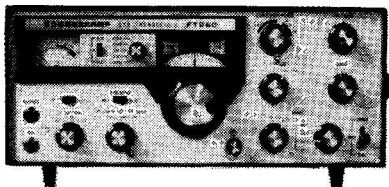
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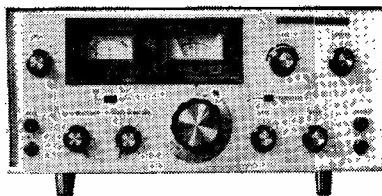
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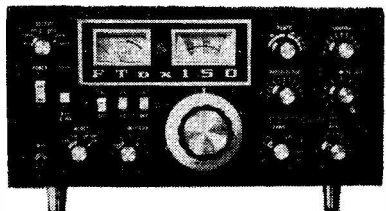
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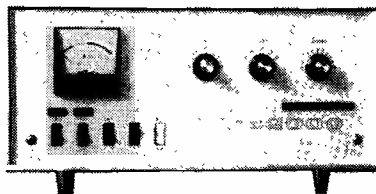
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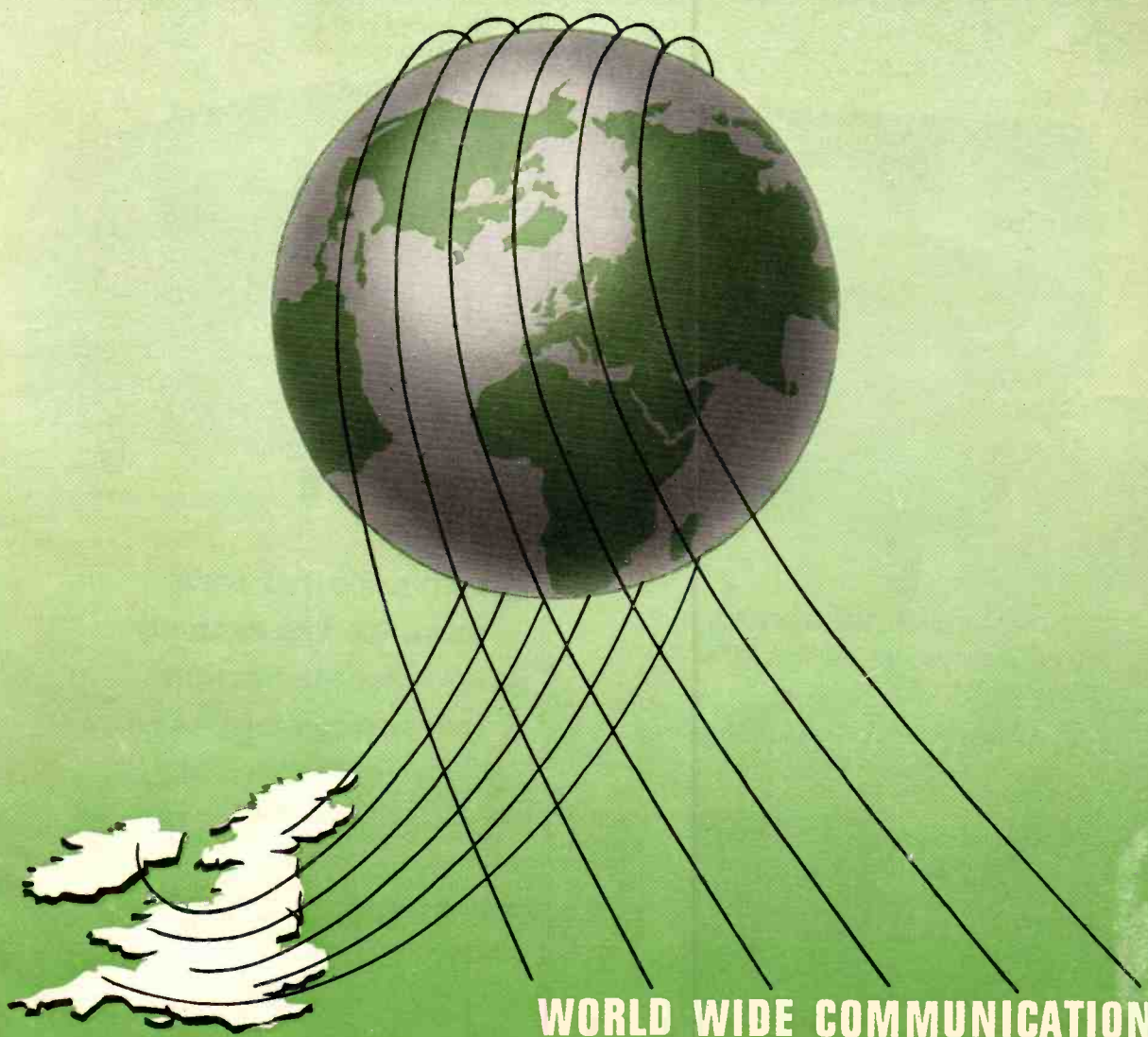
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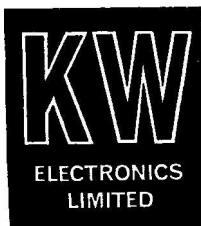


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SHORT WAVE MAGAZINE

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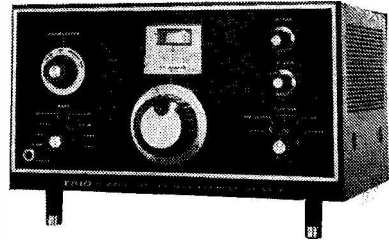
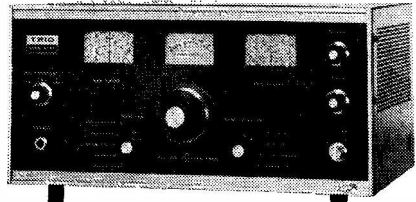
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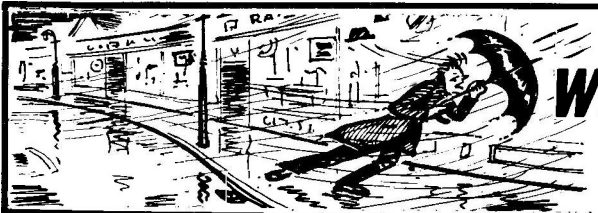
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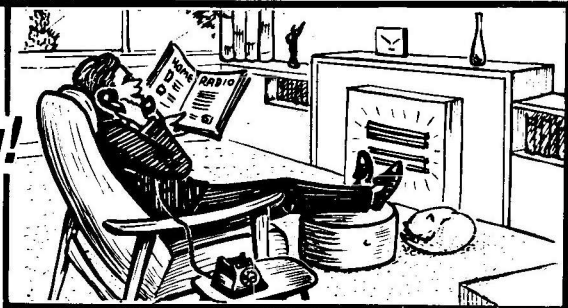
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The SHORT-WAVE *Magazine*

E D I T O R I A L

Pollution *The current national and international concern with the problems of pollution covers a wide field—there is even talk of a condition described as people-pollution, and we all know what that implies.*

Nevertheless, not yet touched upon are the phenomena which are of considerable importance to all interested in radio communication—and those are the many ways in which the ether has been polluted, and is becoming steadily more so.

All over the country, there are overhead power systems, working at voltages from 6 kV to 400 kV, spewing out sharsh and causing severe interference over wide frequency areas, from LF to VHF. Much of this trouble is due to faulty jointing or ineffective insulation, the medium-voltage lines apparently causing most of the trouble, because of having been built with insulators not suitable for all conditions of weather.

But there are plenty of other sources of ether-pollution—from the main-line electric trains with their shoe-collectors, or pantographs fizzing and spluttering against the 25 kV overhead conductors, to next-door's latest electric drill-set (complete with accessories) used with great enthusiasm on Sunday mornings. Between these two extremes are innumerable rotary machines of every sort, size and description, many with dirty commutators or faulty slip-rings; a vast display of flashing electric signs; and many millions of cunning thermo or relay-controlled devices—all totally unsuppressed.

The end-product of all this activity is that the country as a whole is subjected to a general level of electrical noise which tends to rise and fall as the weather changes, and affecting telecommunication circuits of all sorts—including, of course, the amateur bands.

This situation is certain to get worse and a great deal needs to be done to improve the present state of affairs even marginally. The national organisation responsible for Electricity Supply could well set an example by tackling some of the ether-pollution problems it is causing, and British Rail should look into the matter of how much general noise-interference their systems and installations can produce. And that would only be a beginning.

It is evident that pollution of the ether needs to be looked at just as closely and treated quite as seriously as any other sort of pollution of our environment.

*Austin Forth,
G6FO.*

TRANSMITTER HT SUPPLIES

CIRCUITRY AND DESIGN CONSIDERATIONS—RATINGS AND CHOICE OF VALUES

F. G. RAYER, A.I.E.R.E. (G3OGR)

This is a useful practical article on one of the basic requirements for the successful operation of any AT-station—the power supply unit, so often taken for granted. We are frequently told “provide a PSU giving so-many volts at whatever milliamps”, it being assumed that some such source of power can be made available without much bother. The details here show how to provide V/mA outputs over a wide range and for a variety of loads in the radio amateur context. There is nothing new in these circuits, but they do pin-point some basic facts that need re-stating from time to time.—Editor.

When building a transmitter, or buying one without a PSU, the problem of suitable HT supplies has to be met. Large transformers are expensive. We may want to use something we have, if possible, or may need to boost, or even reduce, the HT we are getting. Actually, a whole range of voltages can be obtained from a given transformer, and this can help provide a solution.

With the circuits here it is impossible to give exact output voltages, though general results to expect can be indicated. But where detailed figures are provided, these are only for the actual components mentioned. As an example, it was found in tests that one 250v. 100 mA transformer gave exactly 250v. at 60 mA, whereas another of the same rating but different manufacture provided 290v. at 60 mA.

VA Ratings

Receivers and amplifier type transformers have a continuous rating, and can thus supply a known amount of power ($V \times A$) under continuous duty. For an AM transmitter, we can assume that resting periods of equal length follow periods when current is drawn; for CW and SSB, the duty period is shorter. So “continuous” ratings can be safely exceeded. This varies with the generosity of rating by the maker, but an increase in rating of 25% seems a safe starting point. Should the transformer get too warm, the current should be reduced.

Rectifiers

Though solid-state rectifiers often fill requirements admirably, thermionic valves have their uses. Transformers often have rectifier heater windings, and sometimes an old 5U4G or pair of 5R4GY's from the junk box may be exactly what we need.

Capacitor Input and C.T.

The valve circuit of Fig. 1, with the centre tapped HT secondary, can be used for transmitter stages having a fairly steady current demand, or for all stages of a small transmitter (such as Top Band).

Voltage depends very much on the current drawn. With one particular rectifier and a 300v. secondary, results were as follows:

No load, 420v.; 10 mA, 400v.; 20 mA, 390v.; 40 mA, 360v.; 60 mA, 335v.; 80 mA, 320v.; 100 mA, 300v.

With all capacitor input systems of this type the no-load voltage is expected to soar to about 1.4 times the rated voltage on load.

Fig. 1 also shows the substitution of silicon rectifiers, with R1 and R2 to limit peak current. Such resistors may be wanted with a valve, if the HT secondary resistance is low. With a capacitor input circuit, the minimum series resistance and maximum value for C1 are listed for various rectifiers. The resistance is the “total effective limiting resistance” which includes the HT secondary, R1 and R2 (if fitted) and reflected primary resistance.

To find this figure, use a meter to measure the primary resistance, and that of one-half of the secondary. Multiply the primary resistance by turns ratio squared, and add

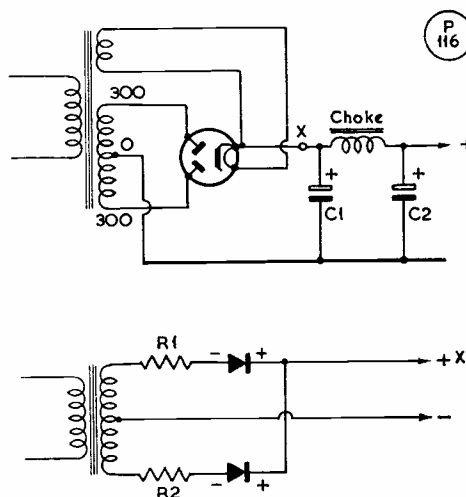


Fig. 1. Circuit for capacitor input, secondary centre tapped.

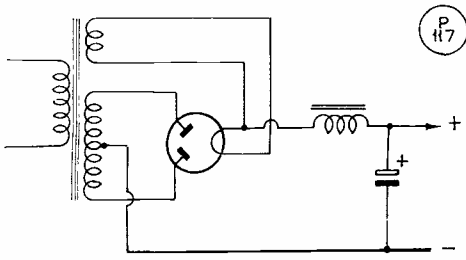


Fig. 2. Using a choke-input circuit.

the secondary resistance. That is, $N^2R_p + R_s$. The turns ratio can be taken from the voltage, e.g., with a 300v. secondary and 240v. primary, the ratio is 300:240, or 5:4. If the result is under that required, add R1 and R2 to make up the minimum value.

Choke as Dropper

Clearly, voltage lost in the smoothing choke depends on its resistance, and current flowing. $V = I \times R$. So a small 300-ohm choke would drop no less than 30v. at 100 mA, while only 10v. would be lost at 100 mA with a 100-ohm choke. A choke with low DC resistance is essential for large currents at maximum voltage.

With choke input circuits (Fig. 2) the inductance of the choke also becomes important.

A choke with a high DC resistance is suitable for a steady current, and when the voltage obtained is enough. For a low-current circuit (such as for bias) a resistor of 1K to 2.2K may be used instead.

Regulation

Fig. 1 has bad regulation, as already shown—420v. off load, and 300v. at 100 mA. If a supply has good regulation, output voltage only changes a little with changes in current taken. Voltage regulation as a percentage is:

$$\frac{(E1 - E2) 100}{E2}$$

E1 is the voltage at minimum load, and E2 that at

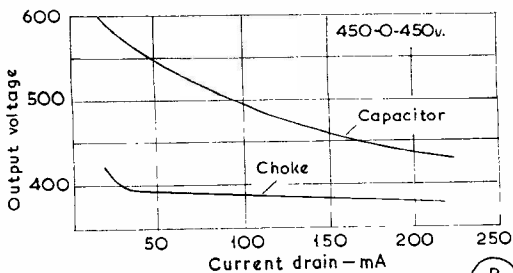


Fig. 3. Load/Output curves—see text.

maximum load. We see that the voltage regulation of Fig. 1 is only likely to be acceptable if the range of current demand is small.

Choke Input

This is shown in Fig. 2 (silicon rectifiers can again be used). With a given transformer, voltage is reduced, but regulation greatly improved. There is no need to make up any particular DC resistance, to protect the rectifier.

Fig. 3 is a comparison of capacitor and choke inputs, using a 450v. transformer, with a 5U4G. With choke input, output is around 380-390v., for currents of 25 mA to 250 mA. With capacitor input, 440v. is obtained at 225 mA, rising to 500v. at 100 mA, and over 550v. at 25 mA.

So a choke input circuit is best for those stages where the current demand varies considerably—such as Class-B modulators and SSB PA stages. With choke input it is also relatively easy to keep the no-load voltage from soaring.

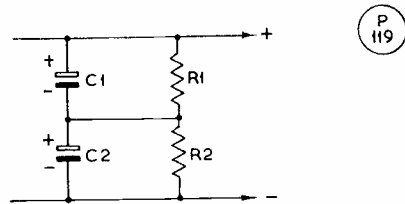


Fig. 4. Bleeder arrangement—see text.

Bleeders

A bleeder resistor across the HT supply will discharge the capacitors. Besides being an essential safety measure, it also improves regulation by providing a steady load.

With a capacitor-input circuit, a wasteful bleeder current is needed to give much regulation. To keep the output under 500v. in Fig. 3, the bleeder would have to consume about 100 mA. So a capacitor input circuit usually has a safety bleeder only—such as a 100K carbon resistor of adequate wattage.

With choke input, a relatively small bleeder current will keep the voltage down, if the choke has the minimum specified inductance. This is obtained by using a swinging choke, the inductance of which is high at low currents (typically 25-5 Henry). The bleeder need only draw about 20-25 mA, Fig. 3. For the circuit mentioned, a 15K 15w. or 20K 10w. resistor will do.

When the HT voltage is high, use two or more smoothing capacitors in series. The bleeder can then be two resistors in series, R1 and R2, Fig. 4, to equalise the voltage. The effective smoothing capacitance is half that of either C1 or C2—16 μF if C1 and C2 are each 32 μF. The voltage rating of the capacitors must take into account the voltage rise when current is not drawn.

A 400v. 250 mA supply using two 32 μF 450v. capacitors, with 20K bleeders, Fig. 4, was found fully satisfactory. The transformer was a Gardners R147, 500-0-500v. 250 mA, and the rectifier a 5U4G. [cont'd.]

Other Circuits

Fig. 1 gives around the transformer secondary voltage. With 8 μ F for C1, a Parmeko P.3141 choke, and two SE-05 selenium rectifiers, a Parmeko type 5084/3C 250v. transformer gave 300v. at 100 mA, falling to 280v. at 120 mA—suitable for all stages of a Top Band transmitter.

Fig. 2 produces somewhat less than the HT secondary voltage, which may be useful in some cases, and in addition shows better regulation.

Because of their low forward resistance, silicon rectifiers give some extra voltage, compared with thermionic rectifiers. So this may be a convenient means of boosting output voltage a little.

When the transformer is supplying HT only (no heaters) there is no apparent harm in juggling with primary tappings to change the HT voltage a little. With a 500v. HT secondary, changes of 10v. in primary taps will change output by about 20v., and this can be useful within limits.

When none of these means give what is wanted, an alternative circuit may be adopted.

Bridge Circuit

This is easy with silicons, and bridge rectification with choke input is shown in Fig. 5. With the Parmeko 250v. transformer mentioned, this gave 445v. at 75 mA, falling to 440v. at 90 mA (for a 6146 PA). Rectifier ratings are as for Figs. 1 and 2. Output voltage is, however, approximately doubled, compared with Fig. 2. The circuit is easy on transformer and rectifiers, and readily adapted to most transformers.

The circuit can be used with capacitor input, with limiting resistors (R1, R2) in series with the secondary. This gives maximum voltage with a particular winding, though poor regulation. It is used in some equipment.

Voltage Doublers

To get even more voltage, a voltage doubler is generally used. These do not have very good regulation, but the availability of high-value capacitors makes them practicable, and they are used for certain requirements.

Fig. 6 is a voltage-doubler circuit. The actual output will depend considerably on factors such as the transformer resistance, smoothing capacitances, and current drawn. With capacitor input and a 250v. secondary, around 600v. on moderate load should be expected.

With various SSB equipments, the choke and C3/C4 are omitted, saving components. This can be perfectly satisfactory. In a similar way, with an AM transmitter the PA could be supplied from C1, and the modulator from C2, Fig. 1, to reduce voltage loss in the choke. With these methods, the capacitors must be of large value. With no choke and C3/C4 omitted, Fig. 6, C1 and C2 can each be 150 μ F, 450v. working, for a supply furnishing up to 700v. output. As with Fig. 5, no centre tap is required on the HT secondary.

Silicon Rectifiers

These have adequate current rating, the 500 mA and larger types being inexpensive. The peak-inverse-voltage (p.i.v.) requirements are often less readily met.

The peak secondary voltage is about 1.41 times the

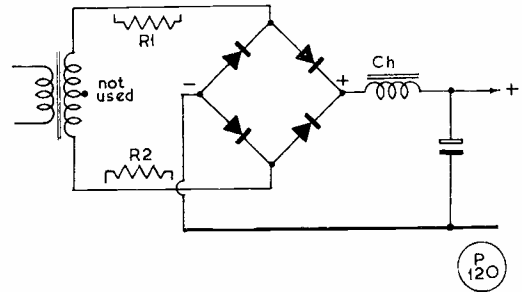


Fig. 5. The Bridge Rectifier.

voltage which would be shown by an ordinary AC meter or multi-range meter. If no current is drawn, C1 in Fig. 1 would charge to this figure. On the next half-cycle the rectifier must withstand 2x1.41 the ordinary AC (or r.m.s.) voltage. If some current is drawn, the peak inverse voltage will be a little less, because C1 is not so fully charged.

For a 250v. secondary, rectifiers with a p.i.v. of 800 are recommended. Rectifiers of 1,000 p.i.v. will do for 350v. secondaries.

For higher voltage supplies, it is convenient to use two or more rectifiers in series, for each position where a rectifier is shown. Thus pairs of 800 p.i.v. rectifiers in series would do for 500v., or pairs rated 1,000 p.i.v. for 700v. To equalise backward potential, a resistor of about 470K is connected in parallel with each rectifier.

Safety

For the user's safety, sensible construction and good insulation of leads will be required. Lightly insulated wire is *not* adequate for high voltages. Power can best be taken off with an insulated multi-pin plug and socket.

Where wire-wound or large-wattage resistors are involved, to improve regulation or otherwise, a safety bleeder of a few hundred K-ohms is also incorporated as well. This will discharge capacitors, which can give a nasty shock.

Fuses are also essential, to protect the equipment. A fuse can be at X, in Fig. 1, or equivalent positions in other circuits. With silicon rectifiers and capacitor

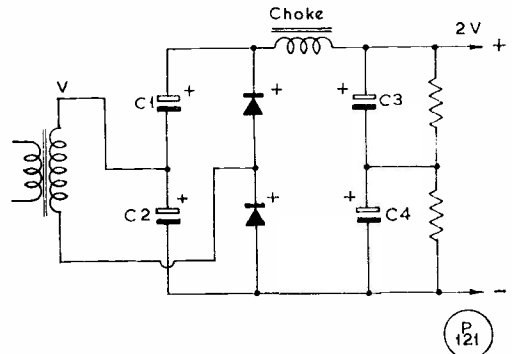


Fig. 6. Voltage Doubling—see text.

HT Supply Table

Circuit	Transformer	Rectifiers	Capacitors	Choke	Output
Fig. 2	250-0-250v. 60 mA	2 × 500 mA 800 p.i.v., etc.	24 μF 450v.	10H 60 mA	200v. 60 mA
Fig. 1	<i>ditto</i>	<i>ditto</i>	C1 8 μF 450v. C2 32 μF 450v.	<i>ditto</i>	250v. 60 mA
Fig. 1	350-0-350v. 125 mA	5U4G	C1 16 μF 550v. C2 32 μF 550v.	5H 150 mA	400v. 100 mA
Fig. 1	400-0-400v. 200 mA	<i>ditto</i>	C1 32 — 32 μF 450v. C2 <i>ditto</i>	3H 200 mA	420v. 200 mA
Fig. 5	300-0-300v. 120 mA R1/R2, 25 ohm 1w.	4 × 500 mA 800 p.i.v.	32 + 32 μF 450v.	10H 120 mA	500v. 80 mA
Fig. 2	700-0-700v. 150 mA	5R4GY	40 + 40 μF 500v.	8H 150 mA	600v. 150 mA
Fig. 2	750-0-750v. 250 mA	2 × 5R4GY	80 + 80 μF 500v.	3-5H 250 mA	620v. 250 mA
Fig. 6	250v. 500 mA	4 of 500 mA 1,000 p.i.v.	C1 125 μF 500v. C2 <i>ditto</i>	<i>None</i> No C3/4	650v. 200 mA
Fig. 2	800-0-800v. 500 mA	2 × 5R4GY	32 + 32 μF 550v.	6H 500 mA	650v. 500 mA
Fig. 2	850-0-850v. 300 mA	<i>ditto</i>	100 + 100 μF 550v.	2-15H 300 mA	700v. 300 mA

input circuits, the fuse will have to be fairly large (and preferably the anti-surge type) or it will fail when switching on.

Power should be drawn from a 3-pin mains plug, allowing earthing of HT negative, transformer core, and thus all following equipment. Fit the smallest L-conductor fuse which does not blow.

It is often better to use two transformers, for low and high HT supplies, rather than trying to squeeze everything from one transformer, and having to use numerous dropper resistors.

The "HT Supply Table" above shows suggested transformers, rectifiers, and other details, for supplies from 200v. to 700v.

HEATHKIT'S NEW EXPERIMENTAL KIT FOR JUNIORS

A new basic experimental-electronics course for junior enthusiasts is now available from Heathkit. Called the *Heathkit JK-18*, it enables 35 practical experiments to be carried out using the learn-by-doing-it-yourself technique. All parts are mounted on a "bread-board" (the sort of thing now being used throughout the electronics industry for research and development work) and the various circuits can be constructed from instructions with the Kit—for easy connection and disassembly, solderless spring-clip connectors are provided. The 35 different circuit assemblies possible include: Battery, diode and transistor testers; Code oscillators; a Light-sensing alarm and Light-dependent oscillator; Field strength indicator; Code transmitter; Wheatstone Bridge; and a Capacity Bridge. The manual with the Kit incorporates a fold-out diagram, describing the working of the circuit in easy language, and all parts for any

circuit that can be built up have both a pictorial illustration and the standard schematic representation, so that the student also learns how to read circuit diagrams. With the manual goes a dictionary of the more usual electronic terms and definitions, and the Morse Code. The cost of this new *Heathkit JK-18 Kit*—which we commend not only to students but also to those who teach radio-electronics—is £14 3s. post free. Further details from: Daystrom Ltd., Heathkit Division, Two-Mile Bend, Gloucester (29451).

AMERICAN NOVICE BANDS

The following frequency areas are allotted to American amateurs holding "novice" licences, which incorporate the letter N in the callsign prefix: *80m.*, 3,700-3,750; *40m.*, 7,150-7,200; and *15m.*, 21,100-21,250 kHz. All transmissions must be CW only, with a maximum power input of 75 watts. Naturally, U.S. novice licensees are very eager to make contacts with overseas stations.

TR.2002 CONVERSION FOR TWO METRES

DISCUSSING A USEFUL TRANSMITTER/RECEIVER COMBINATION

C. G. MOLLOY (G8BUS)

The TR.2002 is as yet not very well known as surplus equipment but, as this article shows, it is of considerable interest for easy conversion as a low-power Tx on two metres, with associated receiver. At most VHF stations, its prime use would be as a stand-by rig, or for local working. It would in any case be an instructive conversion exercise for anyone looking for a quick and not too difficult start on Two Metres.—Editor.

A FURTHER release recently to the surplus market of the TR.2002 Aircraft Transceiver presents the opportunity to get going quickly on the two-metre band. Designed to operate on 121.5 MHz from an emergency 24-volt DC supply, the TR.2002 comprises a crystal controlled transceiver complete with modulator, crystal controlled superhet receiver, 24-volt dynamotor with switching and changeover relay. Twin-chassis construction is used—the receiver is the upper, removable one—to make a compact unit measuring only $7\frac{1}{4} \times 4\frac{3}{4} \times 12$ in. A control input socket (Fig. 1) gives access for the microphone, low impedance headphones and changeover switch. The power consumption is 3 amps. at 24 volts and the input to the PA is approximately 5 watts.

Transmitter

The transmitter (Fig. 2) is easily adapted for 2 metres. A 10-125 MHz mc crystal oscillator/tripler (V5) produces 30-375 MHz to drive a doubler (V6) which in turn drives a second doubler (V7) to produce RF at 121.5 MHz into the PA (V8). Replace the crystal with one from the 8 MHz range. Wire a 10 pF silver mica capacitor in parallel with C10 to resonate the anode tuned circuit of V5 at 24 MHz. V6 now functions as a tripler. Remove L3 (it is fixed to the chassis by a single bolt), reduce the number of turns from $5\frac{1}{2}$ to $3\frac{1}{2}$ and refit, peaking the anode tuned circuit of V6 to 72 MHz. V7 then doubles to 144 MHz when the

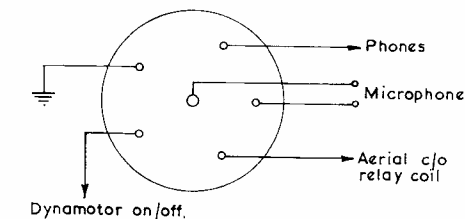


Fig. 1

VO
146

Fig. 1. Control socket as fitted on the TR.2002.

number of turns on the self-supporting coil L4 is reduced from $3\frac{1}{2}$ to two. Remove $2\frac{1}{2}$ turns from the end of the PA coil (L5) remote from the aerial tap, to resonate the PA anode circuit at 145 MHz. The Tx modifications are now complete. The valve and trimmer designations used in Fig. 2 are those engraved on the chassis beside the respective components, preceded in the case of the transmitter section by the symbol 1.

A number of test points are brought out to the rear of the transmitter chassis. Those marked TP1 to TP4 in Fig. 2 are connected to the grid circuits of V5 to V8 respectively; a 5 mA meter connected between one of these points and chassis gives sufficient indication of grid drive for peaking. The anode current of the PA valve is monitored by connecting a low range milliammeter between TP6 and TP7 which will measure the voltage drop across the 10-ohm resistor in series with the HT feed to the PA anode. A calibrated absorption wavemeter should be used to ensure that the correct harmonic has been selected at each stage.

The modifications described above are on the underside of the lower chassis and can be carried out without any dismantling. The upper chassis is very easy to take out. Pull the 12-pin Paignton plug and coax plug out of their sockets on the receiver. Loosen four instrument-type screws on the front panel, remove a single bolt from the rear supporting plate and lift out the receiver.

Table of Values

Fig. 2. Transmitter section of the TR.2002 (top right)

C1 = 15 μ F	R2, R3,
C2 = 175 μ F	R6, R7,
C3, C7,	R10, R14 = 1,000 ohms
C12 = 002 μ F	R5, R9 = 150,000 ohms
C4, C5,	R8, R12 = 27,000 ohms
C8, C9,	R11 = 470 ohms
C13, C14,	R13 = 39,000 ohms
C17, C18,	R15 = 12,000 ohms
C19, C21 = 330 μ F	X1 = 10-125 MHz, as fitted (see text)
C6, C11,	L1, L6 = RF chokes
C16 = 100 μ F	L2, L3,
C10, V15,	L4, L5 = as fitted (see text)
C20, C24 var., as fitted	V5, V6,
R1, R4 = 100,000 ohms	V7, V8 = 6F17

Table of Values

Fig. 3. Modulator as fitted TR.2002 (opposite)

C1, C2,	R7, R9 = 10 ohms
C3 = 330 μ F	R8 = 1,000 ohms
C4 = 002 μ F	R10 = 150,000 ohms
C5 = 01 μ F	T1 = Mic. xformer
R1, R2 = 4,700 ohms	T2 = Mod. xformer
R3, R4 = 220,000 ohms	V1, V2 = 6BR7
R5 = 2,700 ohms	V3, V4 = 6F17
R6 = 1.1 megohm	

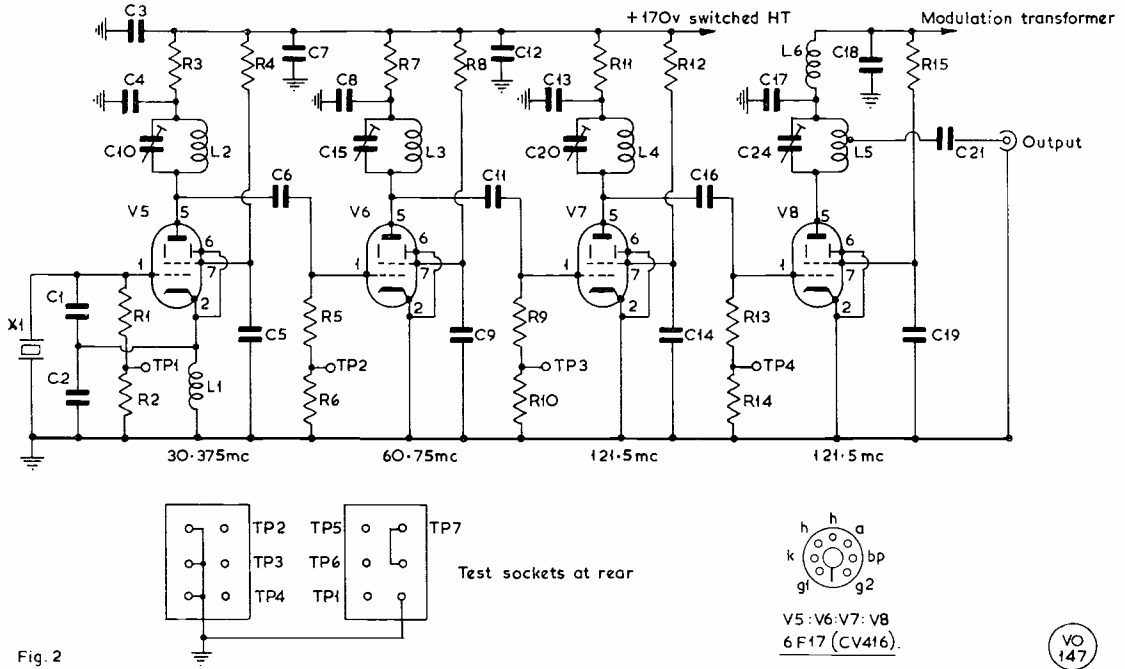


Fig. 2. Transmitter section of the TR.2002.

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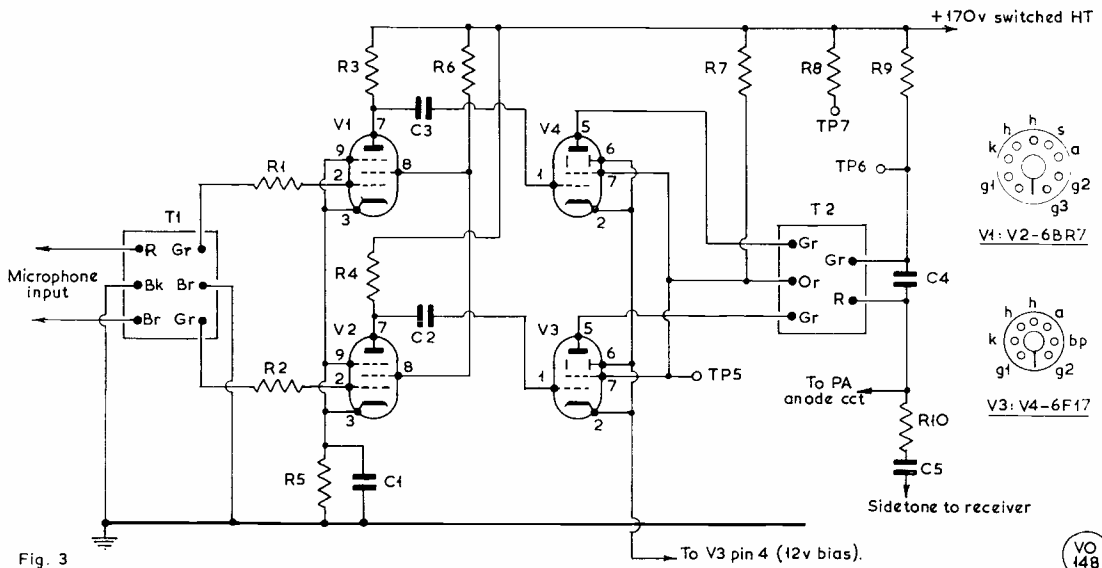


Fig. 3. Modulator as fitted in the TR.2002.

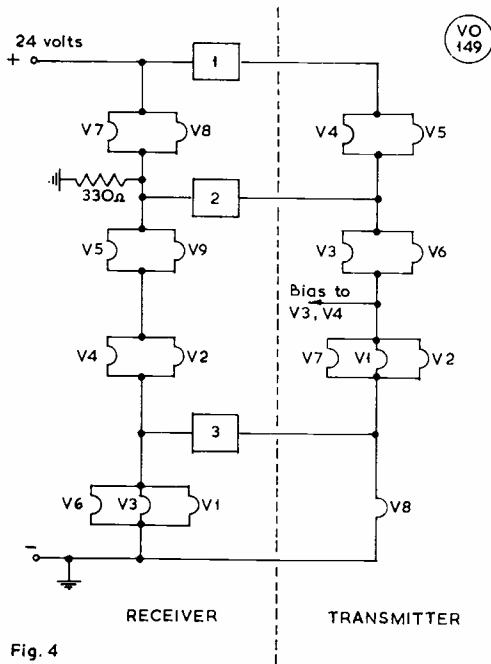


Fig. 4

Fig. 4. Heater wiring as in the original.

The crystal holder is a HC6U type which will have to be changed if popular 10XJ surplus crystals are used. Remove the spigot and adjacent "mod" label for easy access to the chassis beneath the crystal holder. Enlarge the holes left by the HC6U holder to take wander sockets at 1/4 in. spacing and solder on the wires removed from the old holder. Crystals in the 6 MHz range can be used

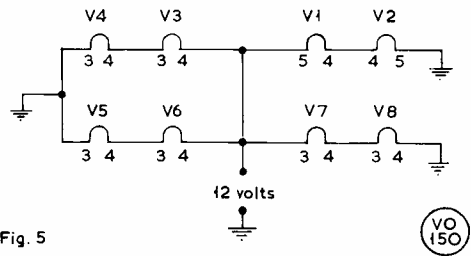


Fig. 5

Fig. 5. TR.2002 Tx heaters as modified for 12-volt input.

without further modification to the transmitter, though the drive to V6 will be lower since V5 is now quadrupling instead of tripling.

The modulator (Fig. 3) does not require modification, but it should be noted that the common lead from the cathodes of V3 and V4 is taken to a 12-volt tapping point on the heater chain to provide bias (Fig. 4). The writer removed the tapping and connected a 820-ohm 1-watt resistor from the commoned cathodes to chassis, so that the biasing would be independent of the heater chain and

Table of Values

Fig. 6A. Main receiver circuit, TR.2002

- C1 = Ae. trim
- C2, C3 = 330 μ F
- C4, C5 = trimmers
- C6, C7, C8, C11, C13 = 100 μ F
- C9, C17 = 100 μ F
- C10, C12, C14, C15, C16 = .01 μ F
- R1 = 150,000 ohms
- R2 = 220 ohms
- R3, R7, R8, R12 = 2,200 ohms
- R4 = 27,000 ohms
- R5 = 47,000 ohms
- R6, R9, R10 = 100,000 ohms
- R11 = 190 ohms
- T1, T2 = as fitted
- L1, L2, L3 = as fitted
- V1, V2 = 6AK5
- V3 = EF92

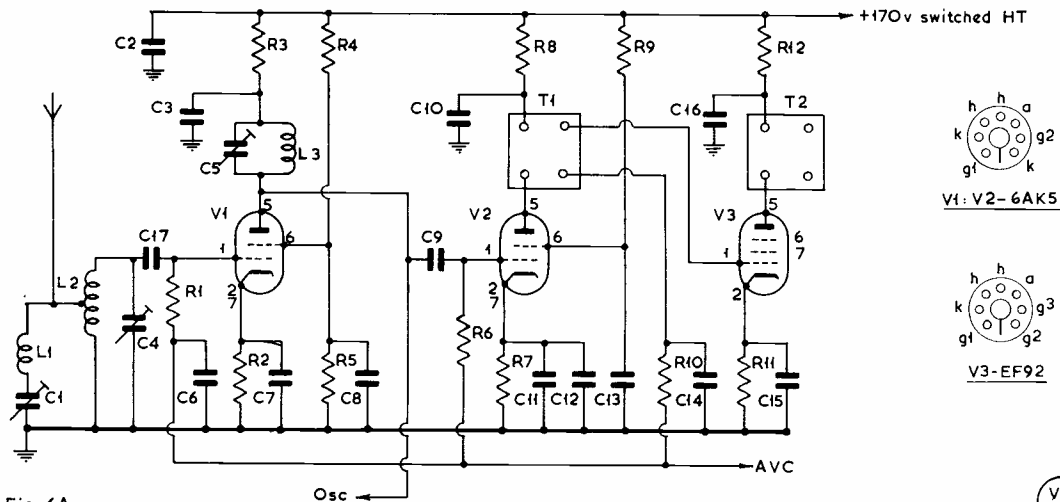


Fig. 6A

Fig. 6A. Main receiver section, TR.2002.

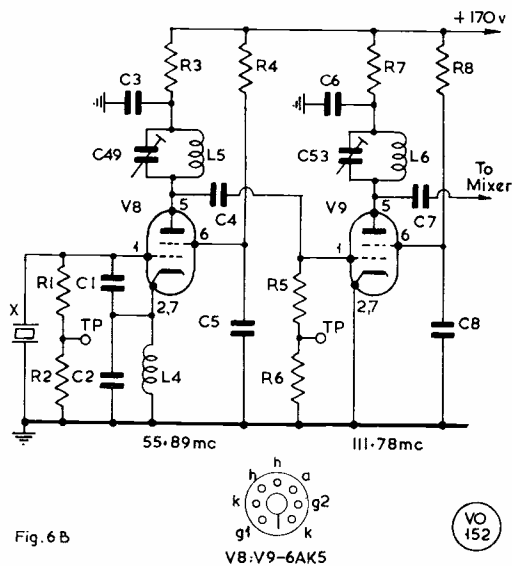


Fig. 6B

Fig. 6B. The receiver oscillator-amplifier — see text.

Table of Values

Fig. 6B. Oscillator-amplifier, Rx side, TR.2002

C1 = 15 $\mu\mu\text{F}$	R4 = 47,000 ohms
C2 = 170 $\mu\mu\text{F}$	R8 = 68,000 ohms
C3, C5, C6, C8 = 330 $\mu\mu\text{F}$	L7 = RF choke
C4 = 100 $\mu\mu\text{F}$	L5, L6 = see text
C7 = 1 $\mu\mu\text{F}$	X = 13.972 mHz
R1, R5 = 100,000 ohms	(see text)
R2, R3, R6, R7 = 2,200 ohms	V8, V9 = 6AK5

the latter could be run from AC. A magnetic type of microphone connected to one half of the primary winding of the input transformer gives satisfactory results.

Although the complete transceiver works from 24 volts DC it will probably be more convenient to operate the Tx side alone from external HT and heater supplies. The power requirements are 170 volts at 100 mA or so and either 12 volts at 1.05 amps. or 6 volts at 2.1 amps. Fig. 4 shows the series-parallel heater interconnections between the transmitter and receiver. Fig. 5 gives a conversion to 12-volt working for the heater circuit of the transmitter alone, which utilises some of the existing wiring. To convert from 12 volts to 6 volts:

- (a) Join together V2 pin 4, V4 pin 4, V6 pin 3, V7 pin 4,
- (b) Transfer supply from V1 pin 5 to V1 pin 4,
- (c) Connect V1 pin 5 to chassis.

HT is brought from the dynamotor via a red lead running beneath the chassis to a centrally positioned tag. Remove this lead and replace by one from the external HT supply. The relay fixed to the underside of the chassis controls the dynamotor. The writer took out the relay, dynamotor,

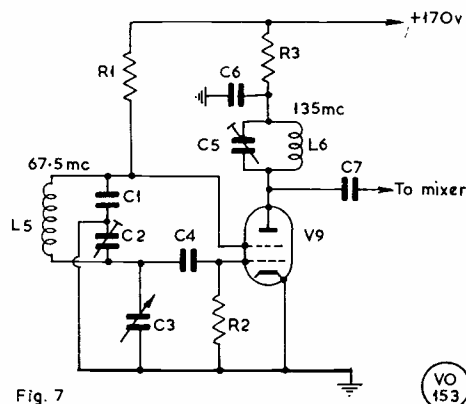


Fig. 7

Fig. 7. Modification for circuit Fig. 6B. Values are : C1, 50 pF ; C2, C5, as fitted ; C3, 5 pF, main tuning ; C4, 100 pF ; C6, 330 pF ; C7, 1 pF ; R1, 68K ; R2, 100K ; R3, 2.2K ; L5, L6, see text and refer Fig. 6B ; and V9, as V9 in Fig. 6B.

associated chokes and wiring, clearing a large area of surplus components. The send/receive relay, mounted on the front panel adjacent to the aerial socket, will operate from 12 volts DC. Alternatively, the relay may be replaced by a manually-operated switch.

Receiver

The circuit of the front-end of the receiver is shown in Figs. 6A and 6B. A 13.972 mHz crystal oscillator/quadrupler (V8) drives a doubler (V9)—see Fig. 6B—to supply 111.8 mHz to the mixer (V2), Fig. 6A. Incoming signals from the aerial are amplified by a single RF stage (V1) before they are applied to the mixer to produce an IF of 9.7 mHz. Three IF stages are followed by detection and a single stage of LF amplification (V7) to feed a transformer which gives an output suitable for low impedance phones. Delayed AVC is applied to the RF, mixer and IF valves. LF gain is controlled by a preset

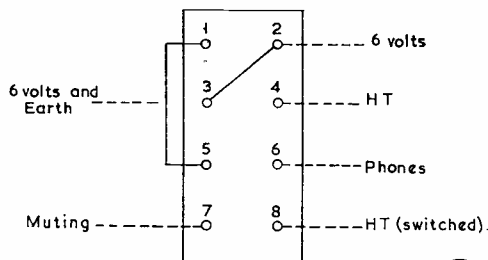


Fig. 8

Fig. 8. Modification connections for the Paignton socket on the TR2002—see below.

Connections to the Paignton plug are: Pins 1, 2, 3—Heaters (see Fig. 4); Pin 4—170 volts HT for output valve only; Pin 5—Chassis (Earth); Pin 6—Phones; Pin 7—Muting; Pin 8—170 volts switched HT.

pot, adjustable from the top. In spite of the high value of IF and consequent wide bandwidth, the receiver should be useful for portable or local working and it was decided to use it in its entirety rather than adapt the front end for use as a converter. The crystal and the oscillator valve (V8) in Fig. 6B are not required and are removed. The associated doubler (V9) is modified to work as a free-running oscillator/doubler at 67.5 mHz using components from the crystal oscillator. Remove 3 turns from L5 and wire up as indicated in Fig. 7. A front panel is fixed to the receiver with a 5 pF variable capacitor mounted on it and wired to the oscillator through a short length of coax

positioned above the chassis. Reduce the number of turns on L6 (Fig. 6B) from 6 to 5 so that the tuned circuit in the anode of V9 can be adjusted to 135 mHz. Remove two turns from the aerial coil L2 (Fig. 6A) and a single turn from L3 and adjust the associated tuned circuits to resonate at 145 mHz.

The receiver power requirements are 170 volts at 60 mA and either 12 volts at 0.9 amps. or 6 volts at 1.8 amps. A rewiring will be necessary to convert to 12-volt working. For six volts working: (a) Run an additional wire from V9 pin 4 to chassis; (b) Rewire the Paignton plug as shown in Fig. 8 on p.21.

CALCULATION SIMPLIFIED

FOR F, L AND C

A. T. CAMPBELL (G3PEQ)

For many people, formulae can be very off-putting. Those who revel in the purity of mathematics may raise an eyebrow as they read this article—but it is common-sense, and should make things a lot easier for many others while, as our contributor shows, giving answers near-enough for all practical purposes.—Editor.

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

THIS equation, fundamental in radio, is often considered a nuisance to solve. If a large number of accurate solutions is required this is true, even if logarithms are used, although if less accuracy is acceptable the nomogram (*abac*) offers a quick and easy way of obtaining the answers. But for *practical* purposes, where absolute accuracy is not necessary, the equation can easily be solved in the head by the method which follows.

The expression π occurs in the denominator. If you are working with a GDO, the scale of which is not likely to be less than 5% in error, and are using 20% tolerance capacitors, then it is ridiculous to say $\pi = 3.14159$: Call π 3 and the arithmetic is at once reduced, and any error resulting is likely to be less than the errors arising from coil-winding.

The equation then reduces to

$$f = \frac{1}{6 \sqrt{LC}}$$

If in addition we are working in μH , pF and mHz the equation becomes:

$$f = \frac{1,000}{6 \sqrt{LC}}$$

and we are able from this to evolve the following simple

rules for obtaining f :

- (a) multiply the values of the inductance and capacity together;
- (b) take the square root of the answer;
- (c) divide this into 1,000;
- (d) divide the result by 6 and the answer is the frequency in mHz, near enough.

Do all calculations mentally, approximating where convenient.

Example 1. What is the frequency of a circuit in which

$$\begin{cases} L = 10 \mu\text{H} \\ C = 100 \text{ pF} \end{cases}$$

Answer $LC = 10 \times 100 = 1,000$
 \sqrt{LC} is about 30
 $1,000/30$ is about 30
 $f = 30/6 = 5 \text{ mHz}$

Example 2. $\begin{cases} L = 3.5 \mu\text{H} \\ C = 27 \text{ pF} \end{cases}$

Answer $LC = 94$
 \sqrt{LC} is about 10
 $1,000/10 = 100$
 $f = 100/6$, about 17 mHz.

If you are having difficulty in extracting those square roots in your head, you can be shown in a minute how to do it. Meanwhile, the mathematical types, with table books at hand, might note that quite an accurate answer can be obtained as follows:

- (a) multiply the values of the inductance and capacitance together;
- (b) look up their square root;
- (c) look up the reciprocal of this;
- (d) multiply the reciprocal by 1,000;
- (e) divide by 6.

Because we assumed the value of π to be 3, this result will be about 5% too high: if you correct for this, you will be very near indeed to the correct value of f .

Now to the mental calculation of square roots. In the first place, do not be afraid of continually approximating; as a rule, the errors caused by approximating will eventually nearly cancel out. In Example 1 we said

$\sqrt{1000}$ is "about 30." Actually, it is 31.6; and we said 1000/30 is "about 30" whilst it is really 33.3. The result we obtained however, 5 mHz, is exactly right!

First, the square roots of numbers up to 100. We all know the square of the first ten numbers. Just take the nearest square and give its root as the required value. If you aim at greater accuracy than this—and it is sufficient—then you can obtain the squares of all numbers-and-a-half by multiplying the number by the succeeding one and adding $\frac{1}{4}$:

$$1\frac{1}{2}^2 = (1 \times 2) + \frac{1}{4} = 2\frac{1}{4}$$

$$2\frac{1}{2}^2 = (2 \times 3) + \frac{1}{4} = 6\frac{1}{4}$$

$$3\frac{1}{2}^2 = (3 \times 4) + \frac{1}{4} = 12\frac{1}{4}$$

$$8\frac{1}{2}^2 = (8 \times 9) + \frac{1}{4} = 72\frac{1}{4}, \text{ and so on.}$$

When a number contains more than two figures, proceed as follows, using 43259 and 6573 as examples:

- (a) divide the number into pairs of figures from the right: 4'32'59; 65'73;
- (b) Find the nearest square root of the last figure or figures on the left: 2; 8;
- (c) add a zero for each pair of succeeding figures: 200; 80.

By the use of Table I, even the small amount of calculation involved so far can be avoided—just multiply L and C together as previously and look up the required frequency in the table. The table can also be used in reverse. For example: What inductance is required to resonate with 100 pF at 3.6 mHz? From the table, LC for 3.6 mHz is 2000, therefore $L = 2000/100 = 20 \mu\text{H}$.

If you are interested only in the amateur HF bands, then Table II, for which the writer is indebted to G3SZW, will give you all you require.

Table I

Inductance, capacitance and frequency.

LC	f	LC	f	LC	f
8000 ...	1.8 mHz	900 ...	5.3 mHz	95 ...	16.3 mHz
7000 ...	1.9 "	800 ...	5.6 "	90 ...	16.8 "
6000 ...	2.0 "	700 ...	6.2 "	85 ...	17.3 "
5000 ...	2.2 "	600 ...	6.5 "	80 ...	17.8 "
4000 ...	2.5 "	500 ...	7.1 "	75 ...	18.4 "
3000 ...	3.0 "	400 ...	8.3 "	70 ...	19.0 "
2000 ...	3.6 "	300 ...	9.2 "	65 ...	19.7 "
1000 ...	5.0 "	200 ...	11.3 "	60 ...	20.5 "
		100 ...	15.9 "	55 ...	21.5 "
				50 ...	22.5 "
				45 ...	23.7 "
				40 ...	25.1 "
				35 ...	26.9 "
				30 ...	29.1 "
				25 ...	31.8 "

Table II

Amateur bands f, L and C.

f	LC
1.8 ...	7818
3.5 ...	2067
7.0 ...	517
14 ...	129
21 ...	57
28 ...	32

MOBILE RALLY PROGRAMME

The Calendar is beginning to fill up, and we have now been notified of dates fixed as follows:

May 3: Spalding & District Amateur Radio Society "Tulip Time" Rally.

May 3: Thanet Radio Society Mobile Rally at King George VI Park, Ramsgate, Kent.

May 10: Ealing & District Amateur Radio Society to hold a Rally at Hanwell Community Centre, London, W.7.

May 17: The annual Northern Amateur Radio Mobile Society Rally.

June 14: First Elvaston Castle Mobile Rally, to be arranged by the Nunsfield House (Derby) Amateur Radio Group.

June 20-21: Anglian Mobile Rally, at the Show Ground, Ipswich, Suffolk.

June 21: Rally at Singleton Park, Swansea, organised by the Univ. Coll. of Swansea Amateur Radio Society.

June 28: Thirteenth South-West of England Mobile Rally, at Longleat Park, near Warminster, Wilts., organisation as in previous years.

July 5: Eleventh Mobile Rally to be put on by the South Shields & District Amateur Radio Society.

July 19: Rally to be organised by the Scarborough Amateur Radio Society, at Burmston Road Barracks.

Further details, if received from the organisers in time, will be given in issues to appear shortly before these Rally dates. For full publicity (which is in the interests of all concerned), we ask for: Outline programme, call sign/frequency of talk-in stations, facilities available on site (such as refreshments, car parking, entry charges, etc.) and the QTH of the contact-man responsible for correspondence and enquiries. All such information should be sent as soon as possible to: "Mobile Scene," SHORT WAVE MAGAZINE, BUCKINGHAM. Please note also that we are unable to publish any Mobile Rally details unless they are notified direct to us.

TAKE CARE!

It is reported that on January 7 Thomas Kloos, K8DHT (Hinckley, Ohio) was killed by electrocution while working on his rig. While we have no details of what actually happened, it is another warning to *Take Care*. When making adjustments with power on, always (1) Keep one hand in a pocket; (2) Use insulated tools wherever possible; (3) Stand on a rubber mat; (4) Have the main on-off switch within reach, and (5) Make sure the aerial/ATU are insulated for DC/HT with respect to the PA. These are all simple and, indeed, obvious precautions—they should be taken as a matter of course, so that they become second-nature.

To become a D/S costs only 45s.—or for first-class posting, 48s.

DC/DC POWER SUPPLIES FOR MOBILE

DISCUSSING THE TECHNICAL REQUIREMENTS—TWO INVERTER CIRCUITS

R. J. HULBERT (G3SRY)

With the Mobile Season upon us there are many more keen operators becoming interested in |M and thinking about fitting a rig into the car, caravan or boat. For whatever type of Tx/Rx that may be in mind, the PSU must be a prime consideration. Of course, there are available commercial equipments that give you all you want, from any 12 to 36-volt DC source, after you have done the installation. But if you prefer to design and build for yourself, this article will suggest ideas when it comes to getting down to the practicalities of providing power.—Editor.

IN SHORT WAVE MAGAZINE for July 1963 there appeared an article by G. M. King, G3MY, describing a DC to DC Inverter. This unit involved a pair of OC28 transistors operating as a resistance-coupled multivibrator. The voltage-converting transformer was a standard *Radiospares* component, which although being a stock item at that time, seven years ago, was discontinued shortly afterwards. Many amateurs wishing to build the unit were faced with the problem of finding a suitable transformer. When one got down to facts, it was soon discovered that few worked as well as the one selected by G3MY. Sad tales of woe were heard on Top Band. Some of these PSU's would not start on load, a few would not start off load, while operating frequency and efficiency varied enormously. Short-circuited transistors were not uncommon, usually due to lack of inductance in the transformer primary. (All this was, of course, no fault of G3MY, since with the transformer he specified the thing worked very well.)

A number of amateurs, wishing to operate mobile using the economical transistors, solved the problem with a toriodially-wound saturating output transformer by *Avel*. The big snag here was that their unit was expensive and in due course it too became unobtainable. The problem of constructing an inexpensive inverter became acute, there then being practically no supply of suitable transformers.

The writer came to the conclusion that the situation could be eased if an inverter's oscillatory circuit were separated from the output transformer—since a linear output transformer having less stringent specifications could then be employed without undue difficulty. This idea was toyed with for a while, but due to interest in transistorised 160m. transmitters operating direct from the vehicle supply, no progress was made. More recently, the interest at G3SRY has changed toward solid-state mobile SSB equipment. Since a transistor linear requires a higher voltage than that obtainable from the vehicle

battery, interest in inverters has been revived.

Inverter Design

It would be helpful at this point to consider standard commercial inverter design practice, and how this fits into the amateur sphere. Two types are in common use, both employing a pair of switching transistors. The more usual arrangement is to use a saturating output transformer with feedback windings, to enable an oscillatory circuit to be established. Given precise information with regard to the magnetic qualities of the laminations, and a few simple formulae, a suitable transformer can be designed without much difficulty. Winding such a transformer is more difficult, since few of us have suitable facilities. This type of inverter is therefore only suitable for commercial production on a fairly large scale.

The other type involves a normal linear output transformer, so that a vibrator, or even an ordinary mains transformer, can be pressed into service. The feedback circuit, however, needs a saturating driver transformer, which has to be designed in a manner not unlike the output

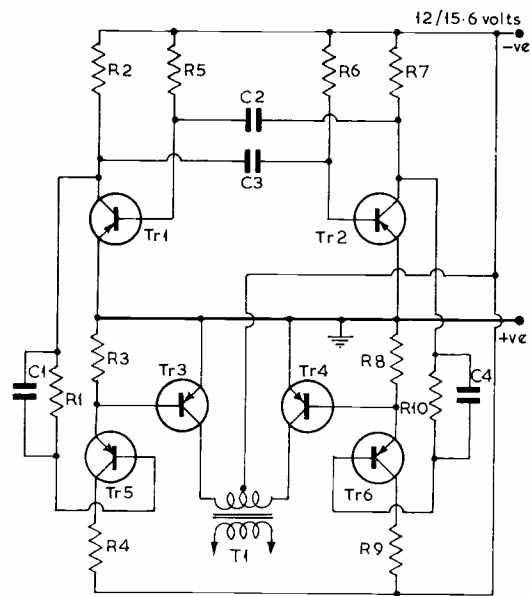


Fig. 1

P
113

Fig. 1. Circuit for a DC/DC Inverter.

Table of Values

Fig. 1. Suitable DC/DC Inverter for Mobile

C1, C4 = 0.47 μ F	R5, R6 = 15,000 ohms
C2, C3 = 0.22 μ F	T1 = see text
R1, R2,	Tr1, Tr2 = BCY31
R7, R10 = 1,000 ohms	Tr3, Tr4 = OC35
R3, R8 = 47 ohms	Tr5, Tr6 = GET-114
R4, R9 = 47 ohms, 3w.	

NOTE: All resistors $\frac{1}{4}$ -watt carbon unless otherwise stated.

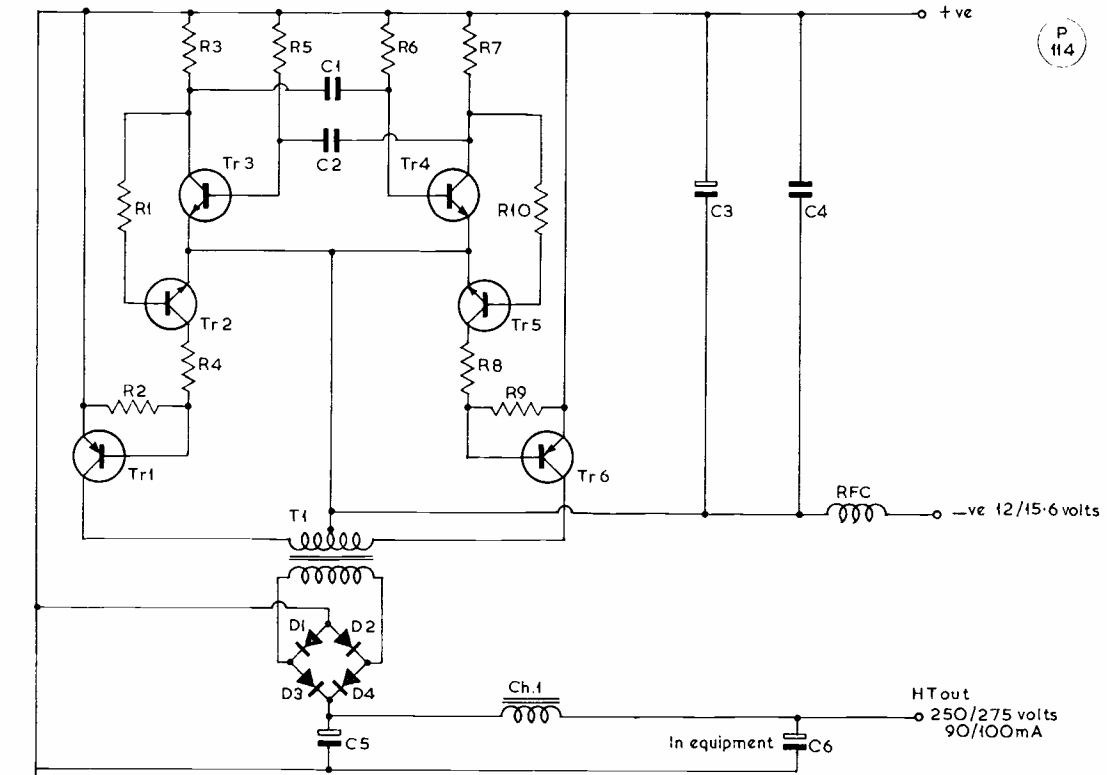


Fig. 2

Fig. 2. Another circuit for a DC/DC Power Supply for Mobile.

transformer of the previous type. Since this transformer handles less than one watt, it is small, and can be hand wound. It is not easy to obtain the special laminations in the small quantities required, making construction tedious and somewhat uncertain. The frequency of both types is load-dependent, and starting troubles are sometimes encountered in a new design. The output transformer in the second type is more critical than would be the case if a driving oscillator were to be used. As we have seen, neither type really lends itself to "one-off" amateur production.

Going back to the G3MY design, this was resistance coupled, though others have been capacity coupled. Both types have their pitfalls for the unwary. The main snag with them is that, when used to provide a fairly large power output, the lack of separation between the oscillator and the circuit delivering power can upset things. The degree of feedback, and often the frequency, change with loading—so it is obviously not possible to produce a reliable circuit specifying any old transformer out of the junk box. One interesting feature of G3MY's design is that the operating frequency was very low—between 30 and 100 Hz being typical. Obviously, at such a low frequency a rather large primary inductance is required for the transformer, which explains why so many

Table of Values

Fig. 2. Another DC/DC Inverter for Mobile

C1, C2 = 0.22 μ F	R5, R6 = 15,000 ohms
C3 = 1,000 μ F, 25v.	RFC = RF filter choke
C4 = 0.47 μ F	Ch. = 2.5 Hy
C5 = 50 μ F, 350v.	T1 = see text
C6 = (in equipment)	D1, D2,
R1, R10 = 2,200 ohms	D3, D4 = BY-100
R2, R9 = 47 ohms	Tr1, Tr6 = OC35
R3, R7 = 510 ohms, 1/2w.	Tr2, Tr5 = BFY-52
R4, R8 = 47 ohms, 3w.	Tr3, Tr4 = 2N697

NOTE: All resistors 1/4-watt carbon unless otherwise stated.

vibrator transformers were unsatisfactory. If use is to be made of transformers to hand, this point must be borne in mind when producing a driven inverter.

It was therefore decided to raise the operating frequency to approximately 600 Hz, since this would provide a good compromise between LF losses on the one hand and HF on the other. At this frequency one stands a good chance of persuading the majority of surplus vibrator, and many mains transformers, to work satisfactorily.

The next logical step was to look at a free-running

multivibrator, driving a pair of switching transistors. Since low-power transistors are no longer expensive, this method has great possibilities for the amateur requiring only one-off. In considering a design along these lines, the writer rejected the possibility of driving switching transistors direct from the multivibrator, since the load on the oscillator would be too great. Bearing in mind that driver transformers have been considered undesirable, the choice of circuit became limited. Two driver transistors would therefore be required. Two alternative circuits suggested themselves: (1) P.N.P. transistors, with common collector drivers; (2) N.P.N. silicon transistors, with common emitter drivers. In both cases the switching transistors would be p.n.p. Circuit (2) seemed more attractive, since silicon transistors can be run at much higher temperatures without ill effects, and suitable n.p.n. types are available at low cost. Circuit (1) has the disadvantage of requiring a few extra components, to obtain square-wave drive at the bases of the switching transistors. Both circuits have in fact been thoroughly tested, and are satisfactory up to an input current of not less than 4 amps. They are offered herewith, including the relevant information.

Circuit (1)—p.24

This circuit is shown as an incomplete design, in as much as the rectifier and filter side has been omitted; it would of course follow the same lines as Circuit (2). Two BCY-31 silicon transistors are connected as a free-running astable multivibrator, at a frequency of approximately 600 Hz. It is important to achieve a mark-space ratio close to 1:1. If this is not so, the duty cycle of one switching transistor may become too large, and its ratings exceeded. If an oscilloscope is available, the waveform can be inspected, and one of the BCY-31 base resistors lowered in value to achieve the desired result. Without a 'scope, the best approach would be to use a matched pair of BCY-31's, and close-tolerance components for the time constant circuits. The waveform at the collectors of this simple astable is not square. This is due to the fact that the charging current for the coupling capacitors is obtained *via* the collector loads. The leading edge is therefore rounded, and since an emitter-follower has no voltage gain, this rounded waveform would be presented to the switching pair, if steps were not taken to correct it. A 1K resistor, in parallel with a capacitor of 0.47 μ F, is connected between the collector of each BCY-31 and the base of the appropriate emitter follower. This sharpens the leading edge appreciably, the final result being square-wave drive at the bases of the switching transistors. Limiting resistors of 47 ohms are connected in series with the collectors of each emitter follower, which sets the maximum base drive for the final stages. At this level of drive, the switching pair will saturate with an inverter input current of at least 4 amps., using typical devices. This is the maximum input level for this inverter driver, due to the ratings of the emitter followers.

Circuit (2)—p.25

This circuit is offered as a complete design to power a 10-watt Mobile installation. It employs two 2N697's, or similar transistors, connected as a free-running astable multivibrator, at approximately the desired frequency of 600 Hz. Each transistor is drawing roughly double the

power of the oscillator of Circuit (1). This allows more resistance to be placed in series with the driver bases, and thus lighten the load on the multivibrator. The driver stages in this circuit are current, rather than voltage, fed—unlike the emitter followers of Circuit (1). As with the previous circuit, steps should be taken to ensure that the mark-space ratio is near-enough 1:1. The output waveform at the collectors of the astable is not square, for the reason given in the description of Circuit (1). By providing an excess of drive current to the driver bases, the transistors reach saturation long before the peak has been reached. This produces square wave current in the collectors. The collector load for the drivers is made up by the base emitter junctions of the switching pair and the 47-ohm series-limiting resistors. These 47-ohm resistors are connected between the base and emitter of each switching unit, to reduce the possibility of leakage current turning on a transistor during what should be its "off" period. With the values given, this circuit has the same power handling capacity as Circuit (1)—that is, capable of taking 4 amps. input (50-60 watts). Capability can be increased by pushing up the drive to both the drivers, and the switching pair, by reducing the limiting resistors. This cannot be taken too far, since the multivibrator would suffer from excessive loading, and the input power to the driving unit will become unduly large. A better way to obtain the additional drive required for QRO inverters is to make more efficient use of the driver output power, from a readily available driver transformer.

The two inverter driver circuits described are so simple to get going that little needs to be said concerning their construction. The oscillator can be built on *Veroboard*, or tag strip, and the switching transistors should be mounted on a suitable heat sink. Transformers can be selected by checking the no-load current at the primary centre tap. Transformers showing more than one amp. are suspect, but it should be kept in mind that this waste current will drop when the unit is loaded.

DC to DC Inverters for Mobile Use

Brief Specification for a Suitable Transformer for Circuits (1) and (2).

*Core 15/16 by 1 1/8 in. stack. Approximate square area, one square inch.
Window area: 1 7/8 by 1 5/32 in.
Primary winding, 56 + 56 turns 22g. En., bifilar wound. (Res. 0.3 + 0.3 ohms.)
Secondary winding, 1100 turns 32g. En. (Res. 45 ohms.)*

With this transformer, the inverter Circuit (2) gave an output of 250 volts at 90 mA, input voltage of 12v. With a normal vehicle supply, which can be as high as 15.6 volts, the output voltage will rise substantially.

The overall efficiency obtained with this transformer was 67% under the loading conditions stated. This includes power drawn by the driving unit, copper and iron losses, and losses in the rectifier and filter circuit. Other transformers tested gave similar results in both circuits.



SHORT WAVE LISTENER FEATURE

POINTS OF INTEREST FROM A LARGE MAIL

— TECHNICAL QUERIES DISCUSSED —

NEWS, VIEWS AND COMMENT ON

AMATEUR-BAND LISTENING

By *Justin Cooper*

EVERY once in a while one hears of an amateur or SWL being killed by his rig; sometimes a simple matter of electrocution, or sometimes by pulling the rig on to himself as a result of "catching a packet" unexpectedly. Most of us have been "bitten" on occasion by the gear and thought no more about it, becoming, indeed, far too careless for our own good. If the greater part of the station gear is transistorised a spot of servicing on some valved item can result in a shock, due to forgetting that valves work at *much* higher voltages—and usually have plenty of milliamps. behind them.

For all of us there are certain rules to observe: All wiring should be kept in good condition, and use the correct colour-codes. Existing wiring will conform to the *red* for Live, *black* for Line (or neutral) and *green* for Earth convention, and within the equipment a clear and consistent code should be adopted—for instance HT plus at red, HT minus at violet, black for chassis earth wiring, and perhaps brown for bias or low-voltage stuff, all other wiring being pink. New items coming into the shack may conform to the revised mains-wiring colour code, which will become compulsory later in the year although at the moment either code is permissible. Here one can start off right by going to one's local electrical shop or Electricity Board and obtaining the sticker showing the correct method and colour-code for mains plugs, thousands of which have already been sent out with Electricity bills.

A good hard look at the shack wiring comes next. For a starter, it should be possible to cut off all mains supplies by one simple action—and the switch in question should be clearly marked (and all the family know just where to find and operate it). Physically check that all wiring is correct, both as to its colour coding to keep live and neutral where they belong and also that it is up to "IEE Wiring Regulations" standard. Particular note should be taken that nowhere have any *plugs* as distinct from sockets any possibility of voltage appearing on them when they are not plugged in—the writer has witnessed at least one nasty Field Day accident which arose because someone pulled out a plug in order to disconnect some gear and found himself hanging on to two plug pins carrying mains voltage!

Earthing, of course, goes without saying, as does the use of three-pin plugs for connecting AC/DC equipment, such as TV sets, to avoid the dangers of live chassis, and as an incidental bonus to help keep clear of TVI. Capacitors connected to mains should have ratings of at least 1,000 volts to cope with the peak-to-peak figure.

When designing and building equipment, everything should be arranged to "fail-safe." When working on equipment, before taking tools to it all the smoothing capacitors should be earthed—and *not* to chassis if you want to preserve the surface finish! If you must have the rig out of its case with power on, as when taking voltage readings on a valve base, then start by connecting the earthy side of the meter to the chassis, and put one hand in your pocket before probing with the meter for the valve voltages.

All this will help to ensure safety; but the final precaution deals with the aftermath of an accident. Get one of the artificial respiration posters (local St. John Ambulance unit can help here) up on to the shack wall, or make quite sure you have people trained in the methods in your household.

The Mail

And quite a big one it is, this month, too! Perhaps it would be as well to kick off by looking at the prefix queries, many resulting from the rash of new ones that have appeared of late; and, sad to say, some that have been dealt with in this piece, and by G3KFE in "CDXN" several times before! In moments of depression, this is apt to make J.C. wonder if all his correspondents skip "SWL" when they read their copy of SHORT WAVE MAGAZINE!

K. Taylor (Sunderland) mentions the AX prefixes, being used by VK stations this year (for the Cook Bicentenary) and U4L/3, a Russian station celebrating the Lenin centenary. YT is a variation on the YU theme, celebrating 25 years of independence of that country, pointed out by the *Singletons*, John and Shelagh, in *Hull*. They also note IRØ, being used by stations in Rome, and the subject of an award. "UK" is not a prefix used in this country, but is a Russian one; Russian VHF-calls, beginning with the letter R, such as RA9 and RB5, are also being heard on Ten of late—these are beginners with novice licences, allowed on that band (more's the pity, for they can make an awful hash of it). They have been mentioned in various letters. CV was used in Uruguay during the *CQ WW Contest*, says *S. Foster (Lincoln)* who adds WX3MAS, operating from Christmas City, Bethlehem, Pennsylvania, and HT, being used by YN—Nicaraguan stations from the beginning of 1970, as a commemoration.

Some phoneys now, and a few "doubtfuls." *P. Fry (Eastleigh)* logged TM5ZDB which sounds a little fishy. *S. Whitehead (Brighton)* recorded an "AB5APZ" in the

contest on September 14; this was surely a misreading of a prefix.

The combination of a BC-453 and an Electroniques front-end with the efforts of *G. Foster (Preston)* resulted in a first entry of 318. Geoff would appreciate any information on the R.1224 receiver—offers to him at 3 Egerton Road, Leyland, Preston, PR5-2YB. On the score of phonies, he mentions "VA1FB," heard on Twenty. It is a fair bet that this was a misreading for VO1FB, St. Johns, Newfoundland, of Top Band fame.

"LF4" and "6A1" are prefixes shown up by *D. Garrad (London, S.E.23)*, the former being almost certainly dud and the latter a mislogging for 6O1.

R. Nicholls (Narborough) has a couple of doubtful specimens in "FU1FH" and "5U5SK." There is a suspicion that the first one might have been DU1FH, well known on the bands, in disguise; 5U5 could quite legitimately hail from Niger, albeit J.C. seems to recall most of those at present around using 5U7 as the prefix.

A variation on the theme of Prefix Queries crops up in the letter from *R. Carter (Rishton)* who wants to know how the pre-war G calls were issued. All the full calls had the prefix followed by two letters: From 1921 to 1935 the prefixes were G2, G5, and G6 indiscriminately, though actually up to 1926 there was no official prefix, these coming in from 1928. Then the order was G8, G3, and finally G4, which series was not completed when war broke out—hence the paucity of G4/2's on the air today. The present G2-plus-three letter calls were in pre-war times known as AA (Artificial Aerial) licences, which carried no prefix letter, e.g., 2AFB would become G2AFB after the resumption of activity in 1946.

Matters Technical

The question of reducing images in a receiver lacking an RF stage worries *D. S. Henry (Edinburgh)* who has tried various forms of ATU. The problem is simply that one either goes to a higher IF and uses a low-noise mixing stage, or alternatively, with the typical 455 kHz IF, uses at least two stages of preselection (to the detriment of the cross-modulation performance!) to get the image response above 14 MHz down to even a tolerable level. The latter solution is the one adopted in all the older receivers, and dates from the days when two high-gain stages were necessary anyhow in order to overcome the noise of the mixer, and at the same time IF selectivity could only be obtained by using low IF's or double conversion. The modern trend towards limited-coverage receivers confined to the amateur bands and the availability of SSB filters at higher IFs, such as 9 MHz, plus the development of low-noise mixers, has resulted in a veritable revolution in thinking over the past ten years. As for curing the trouble of images, there is little or nothing (beyond using an ATU and possibly a low-gain preselector) that can be done, albeit such a combination needs "driving" with extreme care to avoid unwanted noises.

A similar sort of problem is raised by *D. Smith (Nuneaton)* who is building a VHF converter and proposes to use an IF of 2-4 MHz. The choice of the IF for a VHF converter is a difficult one, and often ends up where the crystal from the junk-box dictates! Ideally, one should have the highest possible frequency out of the converter,

in order to reduce the images and "birdies." However, many people like to use the main receiver calibration which virtually forces the IF range on to some calibrated range of the main Rx. For those with the amateur bands-only-type of receiver, the IF is more or less settled at 28-30 MHz. Personally, J.C. would use the latter anyway, as he has always had considerable trouble with IF breakthrough and images whenever he has tried to use the lower IF's with a converter.

Talking of IF breakthrough, *R. Berkolds (Chatham)* was looking for the cause of it in his set-up and was rather surprised to find the KTW61's in his CR-100 sounded like rattles when shaken! Oddly enough, most of the glass octal-based valves do rattle like this, and it has to be a pretty hefty rattle that condemns them to the dustbin.

Obtaining bandspread coils for an HRO is the problem bugging *S. Bushell (Sunbury-on-Thames)*. One can either modify the existing ones to bandspread operation after doing a few sums and scanning the circuit diagram to get the hang of the scheme, always remembering that the HF end of the range is the bit that is spread. Alternatively, one can advertise for them, although they fetch good prices even if in only fair condition—see the small advertising in the *Magazine*, where they are frequently on offer. Incidentally, the pre-war and war-time HRO models were never fitted as standard with a 15-metre bandspread coil pack—this allocation did not come into being till the early fifties, after the standard type of HRO went out of production.

The "law" of a variable capacitor puzzles *R. Smith (Basingstoke)*. If one plots a graph of measured capacitance against degrees of rotation from minimum to maximum for various types one will soon get the hang of it. If the vanes are of the semi-circular type one gets a straight line on the graph. Then there is a shape which looks a bit odd but gives approximately a linear change of frequency against rotation when used with a given coil; this is known as the straight-line-frequency type. Wavelength is proportional to the square root of the capacity, and so one often finds square-law variable capacitors which give a linear scale of wavelength on the dial of a BC receiver. A "halfway house" between the straight-line frequency and straight-line wavelength types is the log-mid-line law which makes the problems of ganging capacitors with reasonable tolerances on the inductors a little easier.

Sitting as he is only eight miles from the BBC's Daventry station—with its several high-power BC services—*W. Butcher (Towcester)* finds he has the Overseas Service breaking at 14.2 MHz. Without knowing which outlet of that service it is that is being received, and hence its fundamental frequency, it is somewhat difficult to be sure of the mechanism by which this comes about; but since Butch says it usually occurs when the band is going out, one can reasonably guess that it is a function of gain-control setting, and hence is generated by the big signal driving either the RF or, more likely, the mixer, into non-linearity. As to a solution, perhaps the most likely would be to search around and find which is the true frequency of the signal causing the trouble and then to use a good old-fashioned wave-trap to reduce its amplitude at the input to the receiver.

Correction!

Our attribution, last time out, to the Army Cadets of noises on 6.62 mHz is hotly disputed in three letters: *D. C. Sargent (Birmingham)*, *M. Kinnersley-Taylor, G3WTA (Morpeh)* and *M. Bass (Nottingham)*; the first two are both operators on ACF/CCF nets, while SWL Bass has heard the signals on 6.62 mHz and drawn his own conclusions. It seems we owe the ACF/CCF chaps an apology—this lot on 45 metres are in fact nothing more than yet another Crop of Stinkers. There is another nest of them on 4.85 mHz and, in the North Midlands, just above 2 mHz. All J.C. can say is that if this is the case, he is glad there is no general-coverage receiver in his shack!

Special Interests

G. Braund (Taplow) has quite a lot to talk about in his letter, on various subjects, but of particular interest is the fact that he is one of the few SWL's who take a serious interest in inter-continental DX working on Top Band, he having logged KV4FZ and K1PBW on CW and SSB, as well as VP9GJ, PA0PN, HB9CM, W1, W2, W4, W8, W9, and 9X5SP. Nice going on 160m.

Another reader with a special interest is *A. Hackett (Manchester 18)*, who has been an SWL for 12 years, starting with a BC receiver and gradually progressing to his present Racal RA-17. His main interest is now RTTY, for which mode the receiver is hooked to a Creed 7B page printer, 7TR punch, and 6S/5 reader. The terminal unit, which converts the RTTY signals into DC voltages to drive the 'printer, is at present an ex-Army unit, although plans are afoot to brew up a transistorised TU. In addition, there is a transistorised "regenerative repeater" the function of which is to take in the distorted signals and deliver them clean out to the machine. Lest anyone should think this last statement is facetious, it is well to recall that this is just how the better varieties of el-bug work on CW—taking shaky Morse from the operator and delivering perfectly-spaced characters to the transmitter keying leads! Of course, these schemes can only work up to a point, and when the distortion is too much for it to cope it just goes off into sending gibberish.

Here and There

R. Treacher (Eltham) has a long letter, most of the major points in which have already been covered, but it is of interest to note how quickly Bob has climbed up the HPX Ladder, and how, in order to do so, he has applied himself to "doing his homework"—something which makes all the difference to one's standing in any competitive context.



James Husband, 28 Askett Walk, Seacroft, Leeds, has an interesting DX record, including a card for a QSO heard from Cape Kennedy when the first "Men on the Moon" were going off. He runs an HA-350, PCR3 and HE-80 as receivers, with a converter for two metres. On the wall is a copy of our "DX Zone Map." James is also very interested in small-lathe work and model engineering.

K. Kyezor (Perivale) has been somewhat inactive because of job commitments which have kept him from home; and when he has been able to get on, all that he has been able to hear are the same old prefixes, and very few in the way of new ones. Just to make matters worse, J.C.'s bleary old eye spotted "7K2" and "AT3" in the list and deleted 'em—hard luck!

The 80m. DX hounds come under the eagle eye of *C. Jones (Mold)* who is appalled at some of the goings-on and liddery that occurs. Fair comment, Chris, but it is also fair to say that the vast majority of it arises because most of the people on the band, at the Phone end anyway, seem to be bent on stopping any station from working out of his own backyard. Although he seldom works 3.5 mHz, J.C. has at times joined in the DX Net on Forty, and always received from the "regulars" an eminently *civilised* welcome, in the best sense of the word—which is more than can be said for some of the clots who try to horn in without first finding out what it was all about.

L. Cunningham (Wath-on-Dearne) comes up with a brief note to explain his absence from parade by saying he has been listening carefully to G3MWN and Mr. Nelson, R.A.E. instructors at Mexborough Schofield Technical College, with a view to passing his R.A.E. and Morse. Good! *J. Haig (Hitchin)* is also tackling Subject No. 55, and has joined the Shefford group.

Reverting to the question of mentions of Amateur Radio in fiction, *D. Greenhalgh (Manchester)* and one or two others mention Hammond Innes, a novelist of great distinction, although he does take some liberties with license conditions when he gets on to Amateur Radio.

to the window-frame. However, from the log, comparisons have been made of his results in the *CQ WW* Phone Contest for 1965, 1967, 1968, and 1969. Despite the progressive deterioration in aeri-als and equipment, and the reduced time spent listening during this very long Contest, it is interesting to find that his logged score has risen each year, indicating that the operator is himself improving his technique much faster than the gear is deteriorating. It is also of interest, perhaps, to note that the argument about the possibility of hearing the qualifying number of 200 prefixes for HPX in a single weekend has been settled once and for all—on the ten-foot indoor bit of wire, it took SWL Nielson just 16½ hours, admittedly in the environment of a major Contest.

Another chap at the top of the table who uses very simple gear is *D. J. Reynolds (Dudley)* who has three dipoles (Ten, Fifteen, and Twenty) on a common feeder in the loft, and for the LF bands about 50ft. of end-fed wire, also indoor, all fed straight to the receiver without benefit of any matching devices. On the bench is an SR-200. With this tackle, David has taken his score up to 820 on the HPX Ladder in a relatively short time.

A. Watson (Dartford) has been less active than of late, thanks to a combination of boarding-school *sans* a receiver, and a holiday job involving getting up at 0645 every morning. However, a Q-multiplier of Heathkit origin has been added to the station, and a few small mods made to the SR-200 to accommodate it—results are quite startling to the ear, particularly on the LF bands.

From *R. Allisett (St. Peter Port, Guernsey)* we have the glad tidings that Dick has become the proud possessor of his own call, GC8DCO, and is busily getting ready for the first QSO. Dick is working on a MOSFET converter, and the Printset transmitter, and at the time of his letter was counting up the where-withal for a J-Beam 8-over-8 aerial.

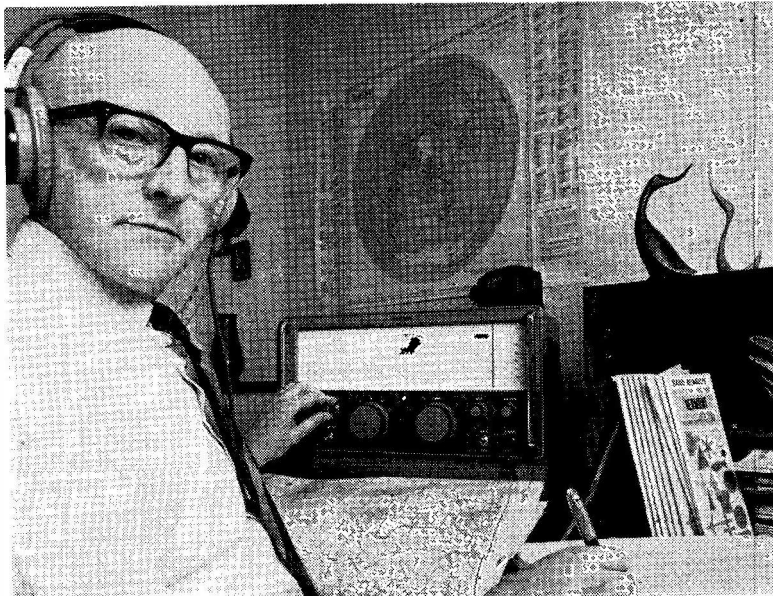
The picture of his station enclosed with his letter by *J. Brackenridge (Maybole)* is unfortunately not clear enough for reproduction; it shows a CR-70A and an Eddystone 659, both of which are used in conjunction with a PR-30X preselector and 60ft. of wire, end-fed, running East and West.

Several people have written in as a result of the note from *M. Newsome*, some time ago, asking for details of his conversion of an HRO coil pack for 144 mHz. *C. Hill (Castle Bromwich)* is one of these, and it is suggested that he gets in touch with SWL Newsome direct at High Inhams, Sutton-on-the-Forest, Nr. York, for details. However, perhaps it would be well to say here that it will *not* be an easy conversion to apply, for various reasons. In the first place, the HRO valves are of *much* too high an internal capacity for effective working in the modern context, and so it is to be expected

that the sensitivity and signal-to-noise ratio will be poor. In addition there is the fact that the use of a tunable oscillator (which is the way the HRO works) is *very* unsatisfactory for VHF use as regards stability—unless all sorts of precautions are taken. One may be able to hold a strong local, but it is a very different matter when it comes to GDX. Moreover, the wiring existing in the HRO is hardly laid out for VHF working, and so one could expect that a two-metre coil which does work on one receiver could well be quite crazily unstable on another specimen from the same batch. It would undoubtedly be more satisfactory to go direct to an outboard converter and work this into the receiver in the conventional way—unless the exercise of converting the HRO itself to give some sort of result is regarded as one in which the mere obtaining of a two-metre signal is a technical *tour de force*!

* * *

Your J.C. is picked up by G2FWA on the suggestion that earth resistance should be measured by DC methods, since, as Edgar rightly says, electrolytic action in the soil will result almost inevitably in a situation where the meter will give a reading which depends on which terminal of its terminals is connected to which earth; and furthermore, that possibly due to some obscure "contact-wetting" effect (such as is met at low level on relay-contacts) different *meters* will give different answers! All very true, and the only real answer is to use an AC bridge, preferably at the operating frequency. However, the point J.C. was driving at still remains—which can be summed up as "you *can't* pay too much attention to your earthing system if you want to have a big signal." As an interesting sidelight, G2FWA finds that earthing his TV set



SWL H. M. Graham, 28 Park Lane, Harefield, Middlesex, has for years now been a regular correspondent to "SWL," with a very creditable HPX score. His present Rx is an Eddystone 840C, with a Joystick/Joymatch antenna system. He too has our "DX Zone Map," showing on the wall above the Rx. Careful records are maintained, and SWL Graham can give chapter-and-verse as to what was happening on the bands years ago.

chassis—by way of suitable capacitors, of course—to a system *separate* from the transmitter, fitting a high-pass filter in the TV aerial, and adding a mains filter to the TV right at the point where the lead goes into the set, has not only got rid of the TVI but gives a very marked improvement in the noise level in the station receiver, as well as killing that heterodyne whistle from the TV on the 200 kHz BBC channel, and the line-timebase harmonics cluttering up Top Band.

VHF has attracted *R. Bagwell (Frimley)*; Bob has been brewing up aerials for two metres, naturally, and is very enthusiastic about the Cubical Quad as a good type for home construction. He has adopted sides of about 20in. and a spacing between elements of around 16in., with the tuning stub on the reflector about 4in. long to the shorting bar. Other details, mechanically, are substantially what one would expect from a reading of the articles in the literature on the HF-band Quad. J.C. has always been puzzled as to why the Quad aerial has never been popular on VHF, in view of its undoubted effectiveness and simplicity of construction; but it is probably mainly a matter of "fashion," which should have no bearing on selection of design details, but almost invariably does! (It is also a matter of back-to-front ratio and side-lobe pick-up!—*Editor.*)

N. P. Taylor (Wembley) is trying to persuade his school authorities to let their radio club put up some aerials, but seems to be running into difficulties—perhaps a talk with the committee of the nearby Club group might result in some assistance. On a slightly different tack, Neill asks, in effect, for all the details on loading up a 3ft. car aerial for /M working on 160 metres—a tall order, indeed! Broadly, the best answer is to "suck it and see" by winding up a coil on the former, setting it into position, and then coupling a one-turn link at the feed-point. A GDO should then indicate, approximately, the resonant frequency of the set-up, the coil turns then being adjusted accordingly. (This could take *hours!*) And it *must* be realised that the slightest shift of frequency in the receiver has to be followed by a retuning of the whip if real success is to be achieved—this is most easily done by bringing some of the coil down into a little box at the bottom of the aerial, to which a link coupling can be added to go to the receiver. A capacitor in series with the aerial coil to ground can then be used to trim up for a specified frequency.

* * *

The idea of revalving his B-40 receiver attracted *M. Fatherley (Wokingham)*—until he looked inside! Mick is right; it would be a mighty task indeed.

H. M. Graham (Harefield) is, like SWL Nielson, a long-time correspondent, and, also like Arthur, is of a statistical turn of mind. Since he came back to amateur-band listening in 1963, his best year has been 1969, with 189 countries booked in from 36 Zones, in spite of having taken time out to listen to and be amazed at the activities on the U.S. Citizens' Band.

Education does not end when you leave school, as *D. Whalley (Corsham)* has found out; now that he has a job, he has joined the local Club, only to find that his evening classes, his home, and the radio club are in three different towns, so on one evening each week

he goes from work to College, on to the club meeting, and from there back home, all by public transport—J.C. would be deterred by even the thought of such frantic dashing around!

G. Dover (Nottingham) has been somewhat inactive on the operating side, thanks to a bout of constructional work, starting with an oscilloscope and working his way through to rebuilds of the station power supplies and on to an ATU.

J.C. often gets letters asking how much information is needed for entry into HPX. Basically, *only the prefixes*—but as much else as possible if there is any element of doubt, or where it is a "new one" of some sort. In simple terms, enough to enable us to assess the situation. This should answer the question of *V. Wright (Paignton)*, who has about 150 of the 200 required to make a start at the bottom of the Ladder.

It is surprising how many people are around when the morning band opening is due, just waiting for it; *N. Crampton (Romford)* heard VK3AKP calling CQ just as the 20-metre band opened up. In seconds, the VK was drowned in the deluge of stations calling him.

N. Henbrey (Northiam) had a spot of bother with the receiver resulting in replacement of the output transformer and a scratchy RF gain control; but he and son David are now back on and climbing up the Ladder steadily.

From *S. Culnane (Harrow)* comes news of a minor disaster. Seems that Steve bought an R.109 for the sum of 7s. 6d., and then went and put twelve volts on the heaters—snag being of course that the correct voltage is *two!* Steve wants to know if anyone knows of modifications for either 2 or 4 metres which can be done to the 71 Set. Anyone with any information, please write direct to S. Culnane, 38 Torver Road, Harrow, Middx.

Other Letters

With so much correspondence this time round and so much in the way of this-and-that in it to be dealt with, the pile has had to be looked at rather selectively, with the result that we can only acknowledge and thank readers as listed below for their letters and HPX claims, as it has not been possible to mention them in the piece:

J. Pullen, *Barton-on-Humber*; G. Ayton, *Sunderland*; D. Maunders, *Settle*; D. J. Lee, *Hemel Hempstead*; K. Plumridge, *Southampton*; H. Plumridge, *Southampton*; D. Randles, *Sale*; F. Cullery, *London, S.E.12*; R. Mortimer, *Abingdon*; C. Price, *Bolton*; A. T. Cheesley, *Kuala Lumpur*; R. Miller, *Putney*; A. Glass, *Plymouth*; W. Moncrieff, *Hampton*; P. Goff, *Towcester*; M. Stokes, *Walsfield*; R. Thorneycroft, *Shifnal*; R. Woods, *Slough*; C. J. A. Morgan, *Wallsend*; C. Pearson, *Northfleet*; A. Cobb, *Hull*; J. Fitzgerald, *Gt. Missenden*; P. Gould, *Tipree*; R. Bence, *Cardiff*; R. Hyde, *R.A.F. Locking*; J. H. Wrench, *Kidderminster*; M. Williams, *Sleaford*; P. Sharman, *Bromley*; A. Vest, *Durham*; C. Garcia, *Worthing*; B. J. Gilbert, *Tonbridge*; N. Hoult, *Loughborough*; M. Fisher, *Bradford*; R. Shilvock, *Lye*; and W. Bowen, *Dinas Powis*. Thanks to all these for their co-operation—their HPX claims have been taken in, where applicable.

Deadline

So there it is once again; the deadline for next time is **March 7**, addressed as always to "SWL," SHORT WAVE MAGAZINE, BUCKINGHAM. Till then, good hunting.

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

A PART from the occasional eccentricities of the inmates, the bands have been pretty reasonable for much of the time, considering the season of the year. Contests, of course, stirred up lots of activity both on the HF allocations and Top Band—albeit G3KFE would like to see some rationalisation of the situation to concentrate activity on a few major events, weeding out the small affairs, so as to give the rag-chewers and the rubber-stamp QSO merchants who cannot operate during the week a chance for the odd contest-free weekend. . . .

Eighty and Forty

It's quite a while since last we commenced the monthly survey on these two bands, which is rather a shame when there is so much DX to be worked by those who have the will and the ability to scratch round a couple of layers below the surface.

As was to be expected, W6AM (Long Beach, California) has taken more than a passing interest in the Five-Band DXCC, and at the time of writing is "home and dry" on all bands above Eighty—where the tally is 87 countries since the starting-date for 5BDXCC. However, it is, possibly, of more interest to sample a short period of Don's activities, namely from January 6-16. Most of these were CW: 9V1OY, KS6DH, KA2RH, VS6DO, XW8CS, VR5UG, G8KS, DM2DOG, CR4BC, YT1BCD, VP8JT, F8VJ, 9M2LN, HP1HXG, LA6U, and SMØCC—all raised in this short period is more than adequate proof the DX is in fact there to be worked.

G3YDX has popped up from Newquay, Cornwall, with a KW-2000A instead of the old QRP set-up, and has a dipole at 20ft. and a ground-plane at floor-level on *Forty*, which between them resulted in interesting CW QSO's with W7, WØ, JA3BKC, VP2MT, 8P6BU, PY7AWD/O, AP5HQ, UL7GW, among others. Incidentally, W7JLU in Oregon was

raised for a 559 report as late as 1030 *clock*.

A few Far Eastern signals were heard between 1900-2030z by G2DC (Ringwood) although Jack found it was a waste of time trying for them, thanks to the wall of EU's calling when he went to "receive." All things considered, G2DC is tending to the opinion that there should be a small portion of the band which is, by general agreement, reserved for DX stations to call on, as is done so successfully on Top Band. However, this would then raise the problem of defining DX—and the writer would *definitely* not be prepared to attempt an acceptable interpretation! Turning to 7 mHz, it seems the morning period has been most successful, from, say, 0630 to 0730z when conditions have been very good but at the same time changeable, dropping out suddenly with no "tapering off." ZM1AAK/K and ZM1BN/A have both been heard at this sort of time, although both were usually being gobbled up by PY's. All W call areas with the exception of California were worked, plus VE1-3, VO, EA9EJ and EI2CB.

Still another CW operator is G3XAP (Stowmarket) who has at last raised his first W7 on 40m., in the shape of W7JLU/7; this was after quite a performance, hearing G's calling the W7, but not being able to find him, moving to one side and calling CQ which raised W1DB saying the W7 was calling G3XAP—still no joy! After the chap had worked a few more G's, to Phil's delight he suddenly came up out of the noise and was duly worked. Oddly enough, after all this time waiting for a W7 since being first licensed, the very next session on *Forty* produced another brace of them. In sum, the month on this band yielded 63 W's over all call areas, 8 VE's, OD5FA, CN8DW, PY2EXD, JA1EMV and ZL1AJR.

By and large, G3XTJ (Palmers Green) seems to have had a frustrating month on all bands. *Forty* gave CN8MN, 4Z4DZ and UAØTP—but Ed was quite unable to raise either

ZD9BM or PY7AWD/O.

The season is still against G2HKU's ZL sked, although they have been in contact on at least one occasion when a 4X4 heard both of them, and came on frequency to act as a relay. 4X4KM was the kind soul in question; and it is nice to hear that there are still stations about who are ready to do something more helpful than lose their tempers on the air. However, to return to the matter of 3.5 mHz, G2HKU found 9H1BE on 3780 one evening at 2150z, and duly got him into the log.

Now to the SSB stuff. Here we are with G3NOF (Yeovil), who has concentrated mainly on the period after 2200 and again in the early mornings, around 0630z. The late stint resulted mainly in VE1 and VO1, but the mornings were more productive: C31AP, CO2FA, CR4BC, HC2GG, HK3WO, KZ5AE, VE3ACD, VO1DE, VP2SY, VP2VI, XE1J, ZB2BX, ZM3LE and an assortment of W's were all raised, but HS5ABD and XW8BP were gotaways. All this on *Eighty*; Don tried a session on *Forty* during the ARRL Contest, and made his first W QSO's on that band between 0840 and 0940, ending up with 21 of them booked in with S9 signals, scattered over the W1-4 and W8 areas.

Very little time was spent on either band by G3VPS (Wartling), for various reasons, but on 3.5 mHz a couple of interesting ones were 9H1K—just a few blocks from 9H1BL—and SM5ANS/MM, aboard one of those monster tankers. As for *Forty*, there was one new one, in the shape of CT2AO, plus a goodly sprinkling of W's.

At G3VLX (Sidcup) the motto in exploring the HF bands seems to have been "softly, softly, catchee monkey," with only two sessions on *Eighty* noted. The first, in the evening, produced LX1BW (SSB) and LZ2IM (CW) while the other was an early-morning spell, 0730-0800 GMT, when split-frequency operation resulted in QSO's with W3GM, W2AC and W4IHK.

[over

Magazine Daylight Test

It is some years now since we laid on one of these, and many people have written asking for another one. So—try **Sunday, April 12**, from 1000 to 1700 clock. Come on Top Band, either Phone or CW, and see what you can work at distances greater than, say, 100 miles, and report the results. Call "CQ Daylight Test" on Phone, or "CQ MDT" if you are paddling a key, just so that everyone knows what you are up to and locals don't stop for a long natter on top of that choice DX. But *don't* make a contest out of it; just log it all and report the results. The main thing here is to let us have your report, if possible, posted that evening; and should this not be possible, certainly before the following month's deadline, and separated from the main report if you are a "regular." What story we can tell about this will be in the June issue, depending on reports received.

Top Band

As far as your conductor is concerned, it has been a case of a quick spin round the dial, a shudder, and a flip of the bandswitch to somewhere else; this though G3KFE has been an addict of 160m. for more years than he cares to remember, back to the earliest period of his SWL life—which is not to say Top Band has not been giving; it has, but, with its usual perversity, at times when G3KFE was otherwise engaged. About the only QSO's of any note in your scribe's log were with G3HVX, to fill in Hereford and GM3OGJ/A, who popped up *exactly* where he had said he would be on the band, at exactly the right time, and did a roaring trade from Kinross.

It is quite a while since G3SVK last had a ride round the country looking for good spots in rare counties and then using them. In the meantime, nothing has been heard of him, apart from the trip to GD already reported on and another to the same place to work through the *CW CQ WW 160 Contest*. Using the same site as before, and with much help from GD5APJ (*alias* F5QQ) in preparation of the site, GD3SVK came on and worked OK, OH, OE, HB9, PAØ, DL, GW, GI, G, GM, GC, EI, ZB2BO, W1BB/1, K1PBW, W3GM, W1HGT, K2GNC, W2FJ, W1TX,

W8AH, WIWY, W2TA, W2GGL, W2IU, W1KVI/1, KV4FZ, VO1FB, VO1HN and VE1ZZ—all on Top Band! OHØNI was heard but *not* raised, neither was the TA2. When not engaged in amassing this collection, sleeping, preparing the site or clearing it (or eating) GD3SVK was dishing 'em out on Sideband. As far as your scribe is concerned, it was a case of no joy, insofar as he did not "get in" during the hours of darkness, but completely overlooked that GD might be audible in daylight on SSB. However, on the Sunday morning, when G3KFE had retired to a hot bath and a book, the phone rang to advise that he had the choice between going out dripping wet to a cold shack to work Fred, or staying put and missing GD this time. We still want GD on Top Band SSB!

As commented a moment ago, it is quite a while since G3SVK has done one of his Cook's Tours of rare counties; but he is off on another soon—and this one comes in the Large Economy Size. Book these dates: April 18, *E. Lothian*; April 19, *W. Lothian*; April 20, *Kincardine*; April 21, *Moray*; no operation on April 22;

April 23, *Perth*; April 24, *Argyll*; April 25/26, *Bute*; April 27, *Ayr*; April 28, *Wigtown*; April 29, *Dumfries*; April 30, *Peebles*; May 1, *Selkirk*; and May 2, *Berwick*. Some tour! Now, to the details. It will be CW during the early evenings, then SSB to around midnight, followed by another spell on CW to pick up the stragglers. Callsigns, *GM3YNC/P* and *GM3SVK/P*. As there will be only one night at each stop, except for Bute, please follow the rules—tune up off the frequency, keep QSO's as short as possible, *don't* call on CW while the SSB operation is taking place, and *please* try to net as accurately as possible. To which your scribe would add the suggestion that even if you don't chase counties, come on and listen to an artist at work, whether it is CW or Phone.

Another expedition will probably be operative during April, by G3LQI, mainly CW, who has planned a week out with a tent and a KW-2000A; Stan asked for suggestions as to suitable counties, and at the time of writing was believed to be tee'ing up the details.

On a more light-hearted line, many

SIX-BAND DX TABLE

(All-Time Post War)

Station	Countries	28 mHz	21 mHz	14 mHz	7 mHz	3.5 mHz	1.8 mHz
G3DO	337	202	242	330	90	83	9
G3KMA	249	191	178	187	123	54	11
G3NOF	318	187	220	303	36	58	2
G2DC	338	172	310	329	167	116	20
G3LZQ	259	140	156	208	72	38	8
G3IGW	207	127	156	168	125	101	46
G3XBY	164	108	115	102	70	56	6
G3PQF	161	105	47	98	84	56	13
9H1BL	163	95	95	123	56	48	—
G3RJB	168	75	54	153	60	37	8
G3VPS	135	48	42	116	59	38	14
G3XAP	95	44	46	43	47	29	13
G3WPO	103	35	24	66	49	30	21
G3VLX	34	6	2	4	1	25	17

Note: Placings this month are based on the "28 mHz" Column. Claims must be made at least every three months to retain a place.

Oak Okleshen, W9EXE, 22637 Ridgeway, Richton Park, Illinois, 60471, is also ex-VR5AR and says he knows about pile-ups from the sharp end. Here, he is evidently ready for any competitive eventuality.



of us have enjoyed working G3RAD /M from the "Broadstairs for Holidays" publicity van each spring. Dick is at it again: During March 2-7, going through Bedford, Dunstable, Northampton, Burton-on-Trent and back through High Wycombe.

But back to reporting the events of the past month. G3IGW (Halifax), along with G4MH, decided to have a real try in the *CQ WW 160 Contest* after the break-up of the remarkable G/VK Top Band path at the end of December. They came on from Lochnaw Castle, Wigtownshire, with three aeriels each of 300ft., one East-West, one North-South, and one vertical. Down South they were a booming great signal all through the day, and piled up 284 QSO's, 38 of them Trans-Atlantic, a countries multiplier of 30 and a final claimed score of over 45,000 points. Among the DX worked were W3NKK, Delaware; W3JXS/5, Texas; W4BRB /VP7; KV4FZ, OH0NI and ZB2BO. Dozens of other W's were heard but not raised, the band remaining open to the U.S. on the Sunday till as late as 0915z. During the daylight period 160m. was wide open to all G and OK for the whole time.

Another one on for this contest was G3RFS (East Barnet) who raised 17 W/VE stations and 16 different countries, including among them TA2E and KV4FZ. During the Trans-Atlantic Test on February 2, Neville worked W1-4, W8 and W9, plus a new country in 5Z4LE/HZ at 0430 clock, the latter being, of course G3RBP. This makes G3RFS now 34 Countries Worked, and WAC on Top Band—fine going.

It is a rare event to hear G2DC on

Top Band, but he does have an annual crack for the *CQ Contest*, in which he rolled up 15 countries, albeit only three out of Europe, with VO1FB, WIHGT and KIPBW.

For some time now, GM3IAA (Inverness) and your scribe have been corresponding on the vexed subject of working DX from that part of GM, and obtaining W QSO's on Top Band within the legal limits of power. However, GM3IAA has "done things" to raise the aerial and improve the earthing, all of which have helped considerably, so that Jim now has VO1HN and KIPBW booked in, as well as being able to do comparative tests with both these stations on the relative merit of the two "VS1AA" aeriels which adorn Jim's garden. However, it is interesting to note that even with all the effort, Jim *still* heard G3SED and G3RFS giving VO1HN S7 at a time when not a peep could be found from the Newfoundlander in Inverness. Thinking back on this, G3KFE recalls that about the only time that he has ever had difficulty hearing a *weak* signal from GM3SVK was when that station was up in Inverness. . . .

G8HX opines that too many stations assume Top Band is only good for very local QSO's during daylight, although he himself finds that with all the difficulties of poor aeriels at his place, contacts of 100-150 miles are frequently possible—so let's see what can be done during MDT on April 12. As another issue, Frank has a side-swipe and a little chuckle over the stations so often heard using the "NAG code"—RST579, NAG George, and QTH somewhere-or-other!

Talking of daylight DX, on Top Band, G3XDY (Cleethorpes) has mentioned the cracking signal put in by PA0MIR, PA0PN and HB9T to his part of the world, all three being raised around *lunch-time* with reports as high as 599. Your scribe can add to that! An SWL friend was recently in the Clacton area, listening with a loaded whip only to the PA stations around midday, 59 on Phone.

Kirkcaldy is the place to live if you want to learn the "How" of Top Band operation, as the local Club have demonstrated so often in MCC. Now, along comes GM3YOR (Kirkcaldy) with a report on his first few months of operation with an indifferent aerial, home-brew transmitter and Eddystone 740 receiver. To date he has 62 counties and ten countries raised, the latest being GM3YCB in Dunbarton and G3WGG for Sussex. Andrew is mainly operational from home on 160m., but has /A facilities on occasion from the Hq. of 1192 Sqn., ATC; they have an open night on March 6, when GM3YOR/A will be on CW, and looking for QSO's to demonstrate that sort of operation. Times, 1900-2200 clock, and a special invitation to anyone connected with ATC to give them a shout.

From Nash Point, in the lighthouse, we hear from GW3UUZ, who reminds us that at Christmas time he raised TA2E—at 0430, clock—after hearing OK's working him. Three hours later VE3QU was booked in for another new country on 160m. and GW3UUZ is now setting his sights on beating G3IGW's score. Since then, Andy has been off the air, refurbishing the transmitter and installing grid-block keying. In another

TOP BAND COUNTIES LADDER

<u>Station</u>	<u>Confirmed</u>	<u>Worked</u>
<i>Phone and CW</i>		
G2NJ	98	98
G3HDO	98	98
G2HKU	96	96
G3WPO	94	96
G13WSS	92	92
G3VLX	81	97
G3XDY	79	91
G3XTJ	79	90
G8HX	76	83
G3XTL	62	78
G3KFE	51	67
G3LXD	37	65
<i>Phone only</i>		
G2NJ	98	98
G3TSL	94	97
G3WPO	90	91
G3VGB	90	95
G3PQF	81	92
G3XTJ	60	79
G13WSS	47	63
G3XDY	44	75
G3NPB	17	62

(Claims may be made at any time. A claim must be made at least every three months to retain a place.)

connection, GW3UUZ mentions the operations of the Maesteg Contest Group, formed to bring on the next generation of contest operators, albeit there is a leavening of experience from the Port Talbot crowd. Andy says his part of the business is to provide the shack, the aerials and act as tea boy!

A little more activity is reported by G13WSS (Holywood), mainly in the Contest; Cyril has not been able to "get over the pond" on his hundred-foot Best Bent Wire draped across the garden, but worked HB9QA for a new country, EI6AK (Cork), EI9BG (Clare), EI9J (Cavan), DL9KRA and loads of OK/OL. GM3IGW/A was the outstanding signal, as indeed he was throughout the U.K., with GD3SVK/A also prominent. The only new one on Phone was GM3OGJ/A from Kinross.

Tony, G3WPO, is cross with your

scribe, and understandably so—it seems we have been crediting him with more counties confirmed than worked! During the *CQ Contest*, he raised a couple of VO's and a brace of W1's but, sadly, nothing new; in counties, GM3OGJ/A brought him up to 96-down two-to-go.

After a year on 3.5 and 7.0 mHz, G2NJ has returned to his old Top Band haunts, to give joy to many in the way of contacts with the county of Peterborough-and-Huntingdon, as it is now known. Nick has words of praise for GD3SVK/A, as ever an excellent signal and well operated.

The news of G3SVK's Monster DX-pedition will no doubt interest G2HKU (Sheppey) who has been choking over Kincardine and Ayr for a long time now. GD3SVK/A and PA0PN on SSB, plus CW with GW3HGL and a couple of OK's, were the best in a rather lean month.

Top Band for G3VLX was almost entirely a dip in the Contest, a dip which pulled out OK's, G13JXS, DL9KRA, GW3UCB and GD3SVK, with W1HGT and OH2VO as gotaways.

Sorry to say, G3XAP was again out of luck with his vertical as far as the Contest went, as winds were too high. A pity, after all the effort expended in getting rid of the electrical noise on the site. However, there is the possibility of an inverted-Vee, with the apex at 105ft., so Phil may get semi-permanent /P aerials up there.

If you want a CW QSO with 9H1BL, look out for him between 1700 and midnight GMT, around 1820 to 1850 kHz, about the end of March. As it is primarily a holiday, Peter has no hard-and-fast routine worked out, but would be pleased to assist anyone who has a special time in mind.

If you live in the London area, particularly on the North side, you will almost certainly suffer cross-modulation if either G3RFS or G3RPB are around. But it is *not* their fault, as G3XTJ proved when he borrowed G3UGK's receiver, a B.40 which has been "operated on" to reduce its susceptibility to this annoying defect.

It is fair to say that at least half the complaints of broad signals from the Big Boys are due to the inadequate performance of receivers in this area. For ship-borne use, the Navy has always a serious problem with cross-modulation, and their receivers are a whole order better than anything on the amateur market. A spin round Top Band with one of those receivers from Portsmouth — when, say, G3SED, is at full bore—will soon show the truth of this—particularly if an amateur receiver is to hand for quick change-over comparisons. (Possibly the best suggestion that G3KFE can offer to the problem of front-end non-linearity is the use of an 813 in Class-A as the receiver RF stage.)

If you want Norfolk, which is not too easy to raise, look out for the Norfolk Net, on most evenings with AM, the calls being G3YLC, G3YLA, G3YRZ, G3WRJ and G3THS; it is understood that G3WZM has SSB facilities. They normally live on 1915 kHz, with 1880 kHz as the alternate, dependent on the QRM situation. This is an informal net, and callers are welcome; but to advertise where they are, they usually sign as "The Norfolk Net."

QSL's — and Such

Regular readers may by now have noticed the absence of G2AYQ this month. Sad to say, Ted collected an overdose of the 'flu bug, and then got pneumonia to make sure of it. The doctors won't let him home just yet, let alone into the shack, but G2AYQ will still be processing Cornish Award applications sent to his home address, as his wife will be bringing them to the hospital. If you want to drop a line—*QTHR*.

Just after this hits the bookstalls, 5H3KJ and 5H3LV will be hitting Latham Is., Zanzibar—February 28 till March 2, with two rigs and aerials to cover 7-28 mHz. Confine your exchange with them to a report, and listen on the frequency, since they will be broadcasting the other information once every fifteen minutes on whichever band they are using at the time.

Now to the point—we've held out

Reporting the HF Bands

Station of ZLIARY, Ray Chandler, P.O. Res. 3, Auckland Radio, Bucklands Beach, where the gear is Collins 75S-1 as receiver, 32S-1 transmitter and a Mosley TA-33Jr. Ray is one of New Zealand's leading DX'ers.



on you for long enough! 5H3KJ/A to W7VRO; 5H3LV/A to VE3ODX; XW8CS to R. G. Price, American Embassy, APO 96352, U.S.A.; CR4BC to Box 36 St. Vincent, Cape Verde Is.; PY7AWD/O via PY2PO, Box 842 Recife; ZM1AAK/K to ZL2AFZ; 9H1CB, Ken Randall, to his home call, G3RFH; VKØHM to WA6EAM; VP2VI to VE3ACD; 5R5AR to K4DEN; FB8XX to F2MO; G3RTU/4X4 to 4X4 Bureau; TAINC to DJØUJ; 9X5AA to W1YRC or ISWL; TR8DG to P.O. Box 356, Libreville; VP2SY to P.O. Box 80, St. Vincent; ZB2BX to GW3PSM; HS5ABD to W6DQX; JT1AH and UA9VH/JT1 to P.O. Box 639, Ulan Bator.

Finally, the QSL information for the GM3SVK forthcoming tour: QSL's direct with s.a.e.'s sent up to four weeks after will be replied to direct, but after then *all* will go through the Bureau.

Thanks for the foregoing information to W6AM; Geoff Watts's *DX News Sheet*, G3NOF, G2DC, G3XTJ and G3SVK.

The HF Bands

Work DX the Easy Way! None of this Top Band nonsense of scratching around for it, just serve it on a plate. But even then there are problems enough. One that disconcerts more than the others is the time question when run-of-the-mill stuff is being chased. For example, K1LEM was on Twenty a few days ago with an enormous signal from Vermont. With such a potent offering from a fairly rare State, he was

doing good business—until G3KFE arrived at a point near the head of the queue, when he promptly went QRT. A look at the clock and a bit of surprise, when it was realised that he was almost certainly going off the band in order to eat at a time when your scribe was more concerned with questions of sleep! The ironic part of it all is that both parties are almost certainly writing down the *same* time in their logs—GMT.

Twenty Metres

Last time out, your conductor mentioned his thrice-frustrated VP2VI contact. By the time that reached the readership the score had reached five attempts all of which had been foiled before any RF had actually been radiated towards the Caribbean. By then it may be well imagined that it was a case of "VP2VI or bust," but eventually the opportunity came, the RF radiated and, praise be, back he came to the second call.

G3NOF was not overly-pleased with the early-morning state of Twenty. It seemed to be hanging fire till as late as 0730, and then only dishing up UA's and IL's. VK's were as late as 0900 in making an appearance, and nothing was heard from the mid-Pacific. Around 1600 a few VK's were getting through, together with some Indian Ocean stuff. Later, a few Africans appeared and from 2000 onwards Central and South America on several evenings. JX3MN, KC4USH, JT1AG, VKØHM—several times, around 1600z and 14220 kHz—and 9LIRP all escaped, but the baited hook was

swallowed by CR6AK, FB8XX, FG7XL, TAINC, TR8DG, UA9VH/JT1, VK's, VP2AA, VQ8CR, WAØVJO (Colorado), ZE2JA, 5R8AR, 5H3LV, 5V2DB and 9Y4VT—all, as ever, on SSB.

G3YDX (Newquay) had a ground-plane at *two* feet (!) and says that he can't understand what the boys are beefing about, as he managed Sideband with EA8EN, TF5TP, CX2CO, LU5OH, VP2AA, 6W8BD and 5N2AAF. On CW he turned in ZS5UR, 6W8AI, 9J2RQ, XE2BBO, PY's, YV's, PZ1AV, CR6AI, PY7AWD/Ø, M1I and all the W call areas except California.

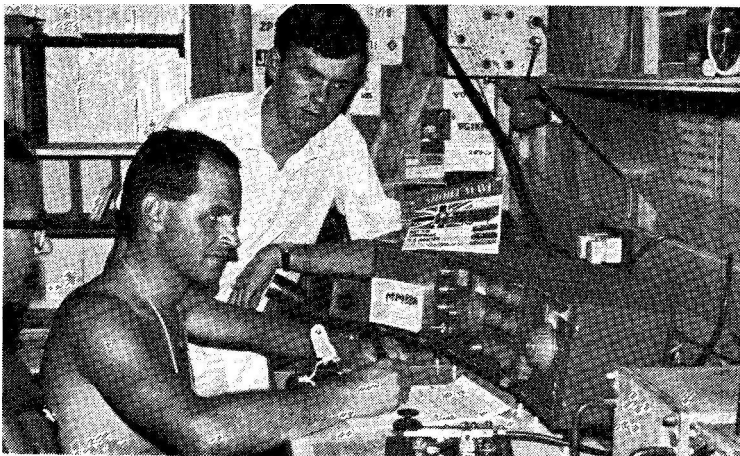
XW8CS seems to be quite partial to U.K. QSO's, as he appears in logs regularly, notably that of G3VPS, who raised him on the key for a new country. SSB gave EP2DX, EA8GK, TA2SC, PY, UA9 and 9H1. The G3VLX log on *Twenty* is even briefer, containing as it does just one contact, with VP2MT, found at 1902z on 14191 kHz.

G2DC observes that the signals from VK/ZL and the Pacific are beginning to show up a little earlier in the mornings; only a few, though, and these almost invariably the same ones. Otherwise, the story has been one of plenty of all-round DX if one could brush aside the QRM and ill-temperdness.

Here and There

At the time of writing this, the TI9 expedition is believed to be "open for trade," insofar as quite a horde of stations has been heard calling—but, at the moment, the TI9

The boys at MP4BBA, R.A.F. Muharraq, Bahrain, built their own shack out of a couple of out-size packing cases, and air-conditioned it—very necessary in that climate. They have a Trio TS-500 with remote VFO and the aerial is a TA-33Jr., with DX-100U/AR88 as stand-by. Activity is mainly CW/SSB on 10-15-20m., though 40/80m. are occasionally worked using dipoles. The station is on the air daily, and contacts and skeds with the U.K. are always most welcome.



signal has not appeared out of the rumpus. However, their five-day stint will be done by this reaching print, and all that remains is the QSL.

The W4AMG trip to Spratley Is. was first rumoured to have been postponed, but the latest information suggests it is quite definitely cancelled.

Another one, which all one's instincts suggest to be "not on," is the ZA prefix; but when suggestions of a DX-pedition there are being made by someone of the calibre of DL7FT then one is prepared to keep an open mind. The prime dates proposed are May 15-22, transmitting 14195 kHz, and listening in the area 14250-14350 kHz. If this date misses, then the alternative is September 19 to October 4.

Now to a couple of interesting letters from old-timers. G2NK (Bromley) takes up that comment last time round about KDKA and Schenectady, by W6AM. G2NK is certain that KDKA—back in 1926-'27—was the short-wave outlet of the Westinghouse transmitter at Pittsburgh, Pennsylvania, quite a distance away. So, on reflection, was your E.P.E., but a look through the various old references which litter his shack has made him doubt. G. G. Blake, in 1928, refers to KDKA broadcasting, for the first time, the sound of a human heart, from New York, and Hutchinson, in 1934, ascribes the station to Westinghouse, Pittsburgh, but in terms which suggest it was relaying some other station. Historians, please elucidate!

On a totally different theme, Ken Lay, G5LY, has some acid remarks

to offer on the "Hertz *versus* megacycles per second" controversy. While Ken has nice things to say about the position taken up by *SHORT WAVE MAGAZINE* about this, he also comments that back forty years, *QST* of November 1929 notes that the then U.R.I. (the I.T.U. of those days) was proposing to adopt the Hertz as a replacement for the cycle. G5LY suggests that in 1929 science was able to contain this highly contagious disease, which we in 1969 have signally failed to do." It is one thing to erect a stone monument—but it is quite another "to hang it round the necks of hundreds of thousands of innocents!"

Turning to matters Maritime Mobile, keen-eyed followers of this piece will have read the news of the quarantining of the liner *Oronsay* in Vancouver, and, possibly, wondered what had become of G3RJS/MM, who wrote in to us on occasion from the ship. Paul in fact left her before the outbreak of typhoid, after a 2½-year stint which included three trips round the world; at the time of writing he was due for another appointment as a sea-going radio officer. (Thanks for this item to G2NJ, Peterborough.)

Arthur Edwards, G6XJ, is now back in the U.K.—at least for 1970!—after his long holiday in Oceania, where he signed VK3AMM for part of the time. At the moment, he is on CW on the HF bands (from Torquay), with a beam or some sort of high-gain array in prospect, and also runs CW/Phone on Top Band.

And during the FOC Marathon Contest over February 7-8, G6FO

was pleased to encounter old friend G5LC in the guise of ZS6BDO, busy knocking off the W's on ten metres.

G3WUD (Bramhall, Cheshire) reports that he is being pirated by "a somebody" purporting to be him on Top Band. G3WUD has not operated 160m. for well over a year, and now has no equipment for the band.

Having let his licence lapse 12 years ago, George Webster of Cambridge—having gone through the necessary procedures—is now back on the air under his old callsign, G5GK. He says it may take him a little time to get "acclimatised to the new way of things."

The 21 and 28 mHz Bands

One advantage of Fifteen, in the view of G2DC, is that at least you yourself do not hear the QRM that descends upon any choice bit of DX you may be calling! A new one for him was EA9EJ, worked at 1630z on 21026 with S9 signals; Justo is quite active, mainly CW on all the HF bands. Others worked included CE2DI, CR6GO, CX1JM, JA2LA, JA6CYU, OA4MS, PY2OU, PY2PH, PY7ABV, UL7GW, UL7JI, U18's, UF6's, UM8's, VS6BC and an array of VK's and ZL's. Ten also was acceptable to Jack, provided that one could manage the right hours, which G2DC gives as 0900-1100z for the Middle East, 1100-1300z for the Far East, and 1400z onwards for W/VE. In terms of log entries, it meant MP4BHH, MP4BBA, TA2E, UF6FE, AX2BPN, VK4FH, VK6AE, VU2JN, 4R5AU, all W call areas and

VE1-7.

All that G3NOF has been able to do on 21 mHz was to take a few odd trips round the dial at weekends. JA, KR6, and VK signals were all heard from 0900, long-path. Although Don was not on the band himself, locals assure him that in the afternoons the S.E. Asians have been very good over the short path. The only QSO's were with JA3KZQ, JA3MNP, KR6JV and W's. On *Ten*, the band has been holding up till about 1900 on occasion, and G3NOF has been a wee bit more fortunate here, with SSB contacts down for VS6DO, PY, ZS's, K7ZIA (in Utah), W7PEY (Arizona) and W0WPD in North Dakota.

Odd how some people like a band, and yet others dislike it quite strongly. This is the case with G3YDX who finds *Fifteen* quite a bore; however he may think about this band, on which he makes do with the 7 mHz aerial, he certainly has different views about *Ten*—for which he has a W0HTH-type two-element array at 20ft. boom height. CW first, with AX2VN, XE1AX, 9J2RQ, W7VJI and K71VJ (both in Wyoming), W7GKF (Montana), W7ITN in Idaho, and AX8HA. The other mode gave 9J2's DT, ED, PV, RV and RQ; SV0WA, ZP5FH, MP4BFO, CR4BC, CE3RR, VP7CG and 5N2ABG. Cards from the ZP5 and the VP7 were already in when Ron wrote his letter.

CW on *Ten* produced contacts for G3VPS with W's, AX8HA, UM8ABB and a marathon three-hour affair with 9HIAZ, which convinced Peter that his keying arm needed a bit more practice!

Contests

Here, as always, the news comes in from Frank Anzalone, W1WY, who not only writes about it but operates as well—as anyone who worked him during the *CQ WW 160 Contest* will agree. Frank says that over there, conditions were quite good, albeit the QRM on the Friday night was heavy. Several of the chaps beat 200 QSO's handsomely, and a few made 300—that's a lot of QSO's for a Top Band Contest!

April 11-12 are the dates for the 1970 *CQ WW WPX SSB Contest*. Start 0001 GMT Saturday, and go through to 2359 on the Sunday. Of the 48 hours, 18 are to be taken as rest times, clearly indicated in the log, in not more than five periods, by the single-operator stations. The multi-operator entries can take the full 48 hours. Single-operators can be either one-band or multi-band entries, the bands being 3.5 mHz to 28 mHz. Exchange RS plus a serial number starting with 001 and going on to four digits (1000) if you make a thousand or more QSO's.

Scoring this time is different, with

double points for LF-Band QSO's. Score three points for stations in continents different from your own on 14, 21 and 28 mHz; six points if the QSO is on 3.5 or 7 mHz. Contacts in the same continent but not your own country count one point on the HF bands, and two on the LF allocations. A station in your own country can be worked for a multiplier but *not* for QSO points. A station can be worked once on each band, but prefix credit can be taken only once regardless of band.

The final score is, for an all-band entry, total QSO points on all bands, multiplied by the number of different prefixes worked. For the single-band entry (for which a minimum of twelve hours' operation is required) multiply QSO points on that band by the prefixes worked. Use a separate log sheet for each band, with the 18 hours of non-operation clearly shown; indicate prefix multipliers where they first appear, and check the log for duplicate contacts and multipliers. Recopied logs are to be in their original form, with corrections clearly marked. A prefix checklist is desirable for operation in this Contest, and a separate list of the claimed prefixes would be appreciated with the log. These, together with a summary sheet, showing all scoring information, the category into which the entry is to go, and the contestant's name and address for mailing (in *block letters*) plus a declaration that the station was operated within the rules and regulations of the country in which it operates, to *CQ WPX Contest Committee*, 14 Vanderventer Avenue, Port Washington, L.I., N.Y. 11050, U.S.A., post marked no later than May 15.

The second half of the *ARRL DX Contest* comes up in March, on dates which were given last time round—see p.752 for details.

Deadline

And so we take our leave for another month; and if it sounds a little as though we had rushed through, blame the weather—digging cars out of snow-drifts when we *ought* to have been preparing the copy! Deadline for next time is **March 9**, addressed, as always, CDXN, *SHORT WAVE MAGAZINE*, BUCKINGHAM, 73, BCNU, de G3KFE.



“... Last request is for a final-final-final on Top Band ...”

ONCE again propagation during the period has been nothing to write home about. The rise in pressure to 1,020 mB around January 19/20, and again on January 28/29, brought some relief to the tedium, but it was short-lived and pretty restricted, and few contacts over the 100-mile mark could be concluded satisfactorily.

From comments heard on the bands, it would appear that some *standard* of what constitutes an "opening" would be a good thing. To hear stations talking about "a good lift" because 70-mile QSO's on two metres were possible, must indicate that either the relief from hearing nothing but locals had gone to their heads, or they had never been on for a good opening! Unless one is running high power, a good antenna system and an efficient receiver, it is perhaps better not to comment publicly on conditions as observed at one's own location, but to listen around and see just what the "big boys" are working. From a good site with 100 watts, contacts over 100 miles should be possible for most of the time, irrespective of propagation conditions. Appearances can be so deceptive, and what happens frequently is that low activity is mistaken for poor conditions. As an example of this, the Cornish beacon was heard strongly at Herne Bay—a distance of about 290 miles—around January 18/19, and yet the activity from the West Country was very low. It has been said before, and merits repetition, that if one wants a QSO, it pays to call, even on what appears to be a dead band. It is surprising how many operators are just tuning around on the receiver apparently waiting for someone else to make the first move. Once the move has been made, how frequently one hears activity build up.

By this time last year, the first Aurora affecting two and four metres had made its appearance, but none has been reported so far for 1970, although WWV has been heard transmitting disturbance warnings on several occasions. However, as past records show, we are moving into a period when such manifestations are likely, and a quick check to the North from time to time is worth while.

The going was hard during the 144 mHz CW Contest on January 25, judging from the reports being passed, and from the scores heard

VHF BANDS

A. H. DORMER, G3DAH

towards the end of the event. For example, G3NNG, who can usually be relied upon to put up a good showing, was passing reports in the low forties at the end, compared with his total of 53 in the corresponding event last year. The early-morning timing of the contest seemed to be generally popular, and if extended into the summer months, should produce some really good DX. There is little doubt that early morning is the best time for extended tropo. contacts.

Comments heard during the four-metre fixed station contest on February 8 indicated similar conditions, and Willy McClintock, G3VPK, will be hard put to approach his winning score of last year. Even G3TDH at Luton, whose score was the highest heard at this QTH, was lagging badly on his 67 contacts of 1969. As far as can be learned, no GP's were heard in the South, and the best signal from the North appeared to be that from G3RLE, and even that was pretty dodgy at times.

The 70 cm. Cumulatives, which offered so much promise for increased activity on that sadly neglected band, have got off to a very bad start with activity and propagation low for the first three of the five sessions. Twelve contacts on each occasion would be considered a good score.

Australis Oscar V

This satellite was successfully launched from California on Friday, January 23, 1970, at 1131 GMT plus two seconds. Such is the accuracy of the preparations for this event, that the AMSAT authorities actually apologised for the two-second delay on the scheduled time! Having successfully completed 273 orbits, the VHF transmitter on board ceased to function on Saturday, February 14, and the HF transmitter was left permanently on 29.450 mHz. Early trouble with the Command receiver on board had caused a malfunction which prevented the HF transmitter from working as programmed and, for some time, operation was continuous instead of at weekends only as planned. This was subsequently rectified, but a recent attempt to re-set the HF transmitter put such a load on the batteries that the two-metre gear failed to operate, and the HF transmitter is, as already mentioned, transmitting continuously. In this mode, the life is not expected to extend beyond March 7.

However, now that *Oscar V* has been aloft for some 300 orbits, the parameters have been firmly established, and vary very little from those predicted. The orbit time is 115.08 minutes (decimals, not minutes and seconds); the inclination is 106.8°, and therefore retrograde; and the track separation is 28.77°, which is to say that, on North/South passes, the Equator crossing point shifts West by that amount with each successive orbit. At more than 40° East or West of Greenwich, reception in this country on VHF will have been difficult or impossible. Initially, the satellite appeared to be tumbling and spinning about two axes, as was obvious from the changing audio tones on Channels 2, 4 and 6, but seemed to stabilise later. Reception of the HF (29.450 mHz) signal in this country has proved to be very difficult due to heavy QRM, and few reception reports have been confirmed. In any case, it could have been anticipated that the received signal would be weaker than the two-metre one, due to the frequency propagation characteristics, and in spite of the higher power, 250 mW against 50 mW. The radiated frequency on two metres seemed to have been a little low on the 144.050 mHz specified.

Reception of the VHF signal in Herne Bay seemed to vary from S2 to S6 depending upon the closeness of the pass, fading due to ionospheric irregularities and the vertical reception pattern of the ten-element Yagi. The time during which the signal was audible was, of course, a function of the range, and appeared to vary between about ten minutes and twenty-five for a near overhead orbit.

To many amateurs, whose main interest is operating, this satellite did not offer anything like the possibilities for DX as previous ones which carried transponders, but the various authorities concerned with manufacture and launch were so encouraged by the results obtained with *Oscar V*, that plans are already in hand to launch another before the end of the year, and this will be a true transponder, receiving on two metres and re-transmitting on 70 cm, and will possibly be made in Australia as a follow-on project.

It is still not too late to participate officially in the monitoring of the satellite if appropriate VHF records have been kept, or if HF monitoring only is envisaged, and report forms (which *must* be used since they are subsequently required to provide computer information) can be obtained, together with the relevant data sheets, from Bill Browning, G2AOX, *QTHR*. Please do not forget to enclose a large s.a.e. with any request.

From observed data, and information supplied by G2AOX, the U.K. co-ordinator for the project, members of the University of Kent Amateur Radio Club, notably G8BRD, Chris Dawson, and G3VJF, Paul Nicholson, wrote a computer programme for predicting the satellite positions in space and time, and extracts from the results, up to March 14, are shown in the Table on p.43. Other orbits can be calculated by adding or subtracting 115.08 minutes as appropriate, and by reducing the times given by approximately three minutes for each twenty-five orbits. The 50° North crossing point varies by ¼° at similar intervals.

VHFCC Awards

Certificate No. 48 goes to G3YLR for operation on two metres from Wembley, Middlesex. The call conceals the identity of G8BFQ, who

has been active on the band since December 1967, and who obtained the full Licence in May 1969. He has now worked some 750 *plus* stations on two metres and 70 cm, with the (almost inevitable) QSL return rate of around 30%. The gear for two metres comprises a Park Air 50X and a converter tuning 28-30 mHz into an HA-500. The transmitter runs 18 watts from a QQV03-10 PA into an 8-ele Yagi at 27ft. On 70 cm, the two-metre transmitter is used to drive a QQV03-25 tripler to 20 watts input, which feeds a 14-element Skybeam at 30ft. The complete station is built into a bookcase-cum-bureau in the dining room, the antennae being rotated by an Automatic Channel Master. Professionally, G3YLR designs power transformers, although on a rather grander scale than the average amateur would require—up to 250 kVA!

Malcolm Stanbridge, G3RHU, of Leiston in Suffolk, gains the Award for operations on two metres since October 1962. He has now clocked up 230 different U.K. contacts and 160 Continentals, working at week-ends and occasional holidays only. The QTH is but 50ft. a.s.l., and the 10-ele Yagi is mounted 42ft. above ground. A valve converter using a 6CW4 RF stage feeds a CR-100 tuning 2-4 mHz and the transmitter runs about 20 watts input to a QQV03-20A, although for some QSO's, a Pye Reporter was used with about three watts in. GC, GW and GM have all been worked with this equipment, and GI and EI have been heard. The QSL return rate is 60% for Continental and 45% for U.K.

stations.

Congratulations to them both.

Letters are still being received asking about the rules for this Award, which were first published in the May 1968 issue of *SHORT WAVE MAGAZINE*. For convenience, they are repeated below.

There are three separate Certificates which replace the single one originally awarded to operators working 100 stations on frequencies above 50 mHz. These Awards will be available to operators who provide satisfactory evidence of QSO's with 100 different stations on one of the three major VHF bands—Four Metres, Two Metres and 70 Cm. Application can be made, of course, for more than one band if the required number of contacts can be proved. You are *not* required to send *any* QSL cards with your claim, just a list of stations worked giving call-signs, date and time. This list will be checked on receipt and you will be asked to send *six* QSL cards, selected at random from your list, for verification purposes. If all is in order, these will be returned to you with the Certificate. Claims should be addressed to: "VHF Bands," *SHORT WAVE MAGAZINE, BUCKINGHAM*.

DX-peditions

G3BA and G3BHT have another expedition to EI planned for the period Saturdays May 23 to May 30. This covers the Spring Holiday break, and instead of shooting haggis as they did on the recent trip to GM, they propose to seek out the "little folk" in the shillelagh country. An appropriate award will be made to the operator who shows

THREE BAND ANNUAL VHF TABLE
January to December, 1970

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL pts.
	Counties	Countries	Counties	Countries	Counties	Countries	
G2JF	—	—	30	7	11	2	50
G3DAH	7	1	30	4	2	1	45
G3OHH	7	1	16	2	2	1	29
G8APZ	—	—	13	1	8	1	23
GI5ALP	4	1	8	4	—	—	17
G8BKR	—	—	6	2	3	2	13

The Three-Band Annual Tables show total claims to date for the year commencing January 1, 1970. Readers are reminded that claims should be sent in regularly to: *SHORT WAVE MAGAZINE, BUCKINGHAM*. Summaries by bands will be published at regular intervals.

most initiative in contacting the expedition. The general arrangements have been settled and include the establishment of an admin. net on 3,615 kHz operating from 1830 to 1900 clock daily, which will handle traffic such as late sked requests. Two-metre working starts at 1900 and finishes at 2300 BST. Three operating modes will be used—hour-to-hour plus 15 minutes on 145.41 MHz SSB; hour plus 15 to hour plus 30 minutes CW on the same frequency, and hour plus 30 to hour plus 59 minutes AM on 145.5 MHz. These times and modes have been chosen to suit the optimum activity ratio as determined during the last trip to Scotland. This should be a very good opportunity for the G8/3 types who had not got two metres at the time of the previous visit to Ireland, and indeed for most operators, since a different County will be visited each day. The actual itinerary is not finalised as yet, but details will be published here as soon as it is.

The gear to be taken is being brought up to 1970 standards and will produce 100 watts p.e.p. output on SSB, 60 watts of AM carrier and 70 watts of CW. The aerial will be a ten-element Skybeam at 24ft., and the receivers are all FET types with noise figures of better than 1 dB. Power comes from a 240-volt Minigen.

Requests for skeds can be made right away to G3BA, QTHR, and please enclose an s.a.e. for a copy of the sked list.

All this should stimulate activity in GI and EI, so even if the expedition cannot be contacted, and even if it has been, it will be worth while keeping the beam westwards and looking out for other DX.

Alan Papworth, G3WUW, will be operating /P from Merioneth from March 27 to 30th inclusive on two-metre CW/AM/SSB. The site is ten miles south-east of Llangollen at 2,572ft. a.s.l., and operating frequencies will be 145.41 MHz SSB, 144.26 AM and 144.08 CW. Times are from 1600 to 2300 BST daily, and skeds can be arranged on receipt of an s.a.e. It is possible that four-metre and 70-cm. gear will also be taken.

Those who heard the callsign OJ0MR on 144.236 MHz recently need not worry that it was a pirate.

It was in fact a DX-expedition to Market Reef near Aland Island, undertaken by some Dutch amateurs. They were operating on all bands 80m. to two metres.

The expedition to Rutland, February 8, by G3IBU, G3UOA, G3WYT and G8BRC appears to have been bedevilled by poor conditions. Their signals were very weak in the South, and from all reports were not much better in other directions.

Six Metres

Although we have not the six-metre band in this country, it is still a rewarding exercise to look out for DX on that band, which can be a good pointer for propagation on 70 MHz and possible sporadic E. Old Timers will recall that many contacts were made between the U.K. and the U.S., particularly cross-band contacts on 28 MHz, and there is little reason why similar cross-band work should not be possible with South Africa using 70 MHz at this end. It is not suggested that operations should be *ad hoc* but, with a little organisation, and given the fact that the North/South path is easier than the East/West at these frequencies, and the possibility of Sporadic-E into the bargain, contacts *could* result. For those who would like to have a go, there is a beacon on 50.1 MHz with the call ZS6VHF and groups are active around this frequency daily in the early mornings and also on Sunday afternoons. Useful callsigns to look for, and with whom to arrange skeds, are, *inter alia*, ZS4SA, ZS4CN, ZS4UH, ZS6AA, ZS6ADZ, ZS6AHW, ZS6APQ, ZS6AMC, ZS6ANZ, ZS6AQW, ZS6ASY, ZS6AEW, ZS6BKV, ZS6BJX, ZS6BKX, ZS6GX, ZS6HW, ZS6IN, ZS6MM, ZS6NM, ZS6RG, ZS6YQ, ZS6EU, ZS6UR and ZS6V, all of whom are regularly on the 6-metre band. Most groups operate a back-up net on 7 MHz or 14 MHz, and it should be possible to arrange skeds through this channel. Six-metre frequencies lie mostly between 50.0 and 50.136 MHz, and powers are of the order of 40 watts or so. It's worth having a try. Don't forget that the Rhodesians have now lost the band to TV and that even the ZE beacons have closed down.

Three Cm. Record

On February 8, G3EEZ and G3BNL set up a new 3-cm. record

for Britain. The path-distance between Clee Hill and Cleeve Common was 45 miles and signals were RS 5/9 both ways.

The gear at the G3EEZ end ran 723A/B klystrons for receiving and transmitting and a 2ft. diameter parabola with Cutler feed. The transmitting klystron was pulsed at 1,100 volts and the same pulse modulator was used as in their 13-cm. and 9-cm. experiments. The receiver had a balanced mixer with 1N23 diodes and a ferrite isolator between transmitter and receiver. The dish was of necessity only a matter of 2ft. above the ground. The winds were so high that there would have been a good chance that it might have been destroyed had it been in its usual place on the top of the car.

First class, and congratulations to them both, not forgetting G3OAD and G8ACB who assisted.

Beacons

The Sheffield four-metre beacon continues to be heard well in the South of England. Frequency is 70.695 MHz.

The GB3SC 70-cm. beacon has been running on dummy load since early January and is performing well. It produces an easy 30 watts of RF after the Hi-Q filter, and should provide a potent and reliable signal on 433.5 MHz when the P. & T. grant the full licence on completion of the legal formalities. The carrier is FSK keyed, the "space" being set to nominal frequency with a VXO, and the "mark" to plus 600 Hz so that it can be copied easily, even with the usual 2.1 kHz filters in an SSB receiver.

Meetings and Conventions

The South Bucks VHF Club meet as usual at Bassetbury Manor, High Wycombe. The next talk promises to be very interesting as the speaker will be Vic Hartopp, G8COB, of J-Beams. Date is March 3, and the time 8 p.m.

By March 19, Vic will have travelled further North, as he is due to address the Leicestershire VHF/UHF Group on that day when his subject will be the new Multibeam and circularly polarised antennae for satellite reception. The Group meets at the Leicester Polytechnic in The Newark, Room 45, and all who can afford a shilling are welcome.

Tickets may be obtained from G5UM, *QTHR*.

The next meeting of the South-East VHF/UHF Group will be on March 6 at 7.30 p.m. at Keynes College, University of Kent, Canterbury. It had been hoped that the P. & T. Radio Investigation Branch would be able to stage a presentation on TVI on this occasion, but pressure of outside work has caused this to be postponed, and instead, G3DAH will be substituting with a talk on VHF Operations.

If any VHF/UHF clubs or groups would care to send details of their meetings, this Column will be pleased to print them.

The meeting called for February 14 at the Imperial College of Science and Technology, to discuss the TRIDENT project, was cancelled suddenly, and no date has been given for another. Those interested in the scheme should keep in touch with G3JHM or G3FZL, *QTHR*, for further details.

The date and place of the Scottish 1970 VHF Convention have now been announced as October 4 in Dundee. Details nearer the time.

The International UHF/VHF Convention will be held again this year at the Winning Post Hotel, near Twickenham. Date is April 25 and the cost of the comprehensive ticket is 35s., and 6s. for the afternoon session only. As last year, there will be two lecture streams, under the chairmanship of G2UJ and G3BPT respectively, a trade show and raffle. Tickets may be obtained now from Frank Green, G3GMY, 48 Borough Way, Potters Bar, Herts.

News Items

G3OHH, Mow Cop, Staffs., the leader in the Four-Metre section of the 1969 Annual Three-Band Tables, is now QRV on 70 cm. G15ALP of Londonderry will also be up on that band from March 1 with 20 watts of CW output to a J-Beam 46-element job. Phew!

G8AEL (Wellingborough, Northants) became interested in RTTY some eighteen months ago and acquired a 7B printer and a Terminal Unit. Unfortunately, he had no gen. on the latter and so it stood gathering dust in the shack until the arrival of our October issue. There, on p.508, was a photograph of G8BNW with an identical TU. A quick SOS brought back three hand-made draw-

ings and all the dope required. The first T/P QSO was with—yes, G8BNW. G8AEL is now looking for RTTY contacts on both two and 70 cm., and as he works shifts, can make daytime as well as evening skeds.

As a follow-on to the comments about operating practices in the November 1969 "VHF Bands," several operators have passed on their "pet hates" to your scribe. Although not, strictly speaking, pointers to good operating, they may be quoted as examples of *bad* operating. The most unpopular one seems to be the chap who calls CQ in between chatting to a friend in the shack, or, even worse, calling a station and then carrying on a local conversation before announcing his own callsign. The use of "what say" at the end of a transmission also comes in for a fair amount of criticism.

* * *

From EA4AO (Madrid) comes a claim for a two-metre first between that country and EI2A. This was during the *Cetids* meteor shower in May, 1966. During this shower, and the *Perseids* in June of that year, EA4AO made five contacts by M/S and QSO's by this mode may now be included in the lists of "Firsts."

The Ashford Radio Club have now found a new site which looks ideal for VHF. Indeed their signal in Herne Bay is very strong indeed. The QTH is on top of Charing Hill, near Ashford, Kent, where the ground rises to 680ft. a.s.l., and surmounting this will be an 8-ele beam for two metres and a three-element for four metres. The 144 MHz gear comprises an AR88 with a Nuvistor converter and a 20-watt transmitter with a QQV03-20A PA. For four metres, a Pye Base Station and valve converter are in use. The site will be used for fixed-station contest working and also for /P from a neighbouring field. Local amateurs who are not already members of the Club may apply to G3YBE or G8BJR, *QTHR*, for further details.

Joost Berden, G3RND, writing from the I.o.W., whither he moved from Pontefract in Yorkshire some time ago, suggests that many reports of poor conditions are due not to propagation, but to inferior receivers. He criticises particularly FET converters compared with Nuvistors, which he finds very much better

AUSTRALIS OSCAR V Orbit predictions — March 1970

Orbit No.	Date	Time GMT	Angle at 50°N	Pass N or S
464	1	12.46	341.22	S/N
478	2	15.36	24.00	S/N
489	3	12.42	340.47	S/N
503	4	15.33	23.25	S/N
514	5	12.39	339.72	S/N
528	6	15.29	22.50	S/N
539	7	12.35	338.97	S/N
552	8	13.31	352.98	S/N
564	9	12.32	338.22	S/N
578	10	15.22	21.00	S/N
589	11	12.28	337.47	S/N
603	12	15.19	20.25	S/N
614	13	12.25	336.72	S/N
628	14	15.15	19.50	S/N

NOTE: The above data are selected from orbital information and indicate those passes which are most likely to give good reception in the U.K. on the days shown.

Dates subsequent to March 14 are not given, as it is likely that the satellite will have ceased transmission by then. Note that 29.450 MHz is now the only live frequency.

from the noise as well as the cross-modulation point of view. Not all readers will share this opinion, but 'RND says that he works many stations with RS 5/2 signals, and has used nothing but Nuvistors for years past. The writer's own view is that the best FET is probably better than all but the very best valve, and it would be interesting to see some figures on this point. Joost confirms the observation made last month, that many stations are still not observing the new Band Plan, but as is well known, this Plan is not mandatory, although life might be easier for many if it were made so. Incidentally, he now runs 50 watts p.e.p. of SSB on Two with a Heath SB-500 and a HW-100 driver, and although his site at Godshill is low, and the antenna at 10ft. only, he gets out well to the North.

G3OX now has a frequency synthesiser going with an accuracy of plus 5 Hz. Just the job for checking the beacons! G8APU has video on 70 cm. from Yateley in Hampshire, and G8BTN in Daventry will be coming on shortly with a 4CX250 tripler and 4CX250 PA. He has managed to acquire some really first-class studio equipment, and should be a good signal from there.

G3FET of Crowborough, Sussex, has been experimenting with double Quads for two metres with good results. Although they tend to become rather frequency sensitive, tuning the front end helps. G2XV of Cambridge uses a similar set-up.

G8CXM has been knocking off

the DJ/DL lot, which less fortunate mortals are not even hearing, from a /A site near Bedford, where he has access to a mast 175ft. high. He is shortly going QRO with a pair of 4CX250's.

G3COJ, High Wycombe, Bucks., has now got a converter going on 13 cm. based on the design by G3EEZ in the September, 1969, *Magazine*. He confirms that the design is certainly repeatable, but says that if crystals other than that specified are used to produce a different IF, there may be a spot of difficulty with the oscillator circuit, although the RF side went off straight away.

G8BCN (Clacton-on-Sea, Essex) is now QRV on 23 cm. using a 2C39A tripler to a 4½ft. dish. Plans are in hand to raise the antenna another 12ft., and to increase the PA input to

30 watts. First contact was with G3PQR in Frinton, Essex, at RS 5-8/9. G3PQR runs NBFM on this band from a transistor 70 cm. driver into a BAY66 PA and a 5ft. dish.

Anent the note on p.757 of our last, implying the withdrawal of permission to operate VHF on the Rock, ZB2BO informs us that this was a misunderstanding—it is the previous very favourable beacon *site* that has been lost, while its Tx had anyway to be shut down for maintenance. Full amateur operation on VHF is still permitted from Gibraltar, and there are various other beacon sites available.

The projected Train/Mobile transmissions by GM8APX, mentioned last month, ran into difficulties with the P. & T., although British Rail have expressed interest. Permission

was refused at very short notice, and although Bill Jarvis managed to get out word of the cancellation *via* GM3WFJ on the HF bands, he passes his regrets to those who may not have got the message, and says that he will be trying again later if possible.

Forthcoming contests are: March 3 for the next 70 cm. Cumulative; March 7/8 for the 144 mHz Open, which coincides with the IARU Region I event; and March 23 for the final round of the 70 cm. Cumulatives.

Deadline

Deadline for the next issue is **March 7, 1970**. The address for claims, news and comments is: "VHF BANDS," SHORT WAVE MAGAZINE, BUCKINGHAM. Cheers for now and 73 *de* G3DAH.

RADIO AMATEUR CALL BOOK

We have to notify a small increase in the price of the international *Radio Amateur Call Book*—to 45s. 6d. for the *DX Listings* Edn. (the world outside the U.S.A.) and 69s. 6d. for the *U.S. Edn.*, which lists some 300,000+ U.S. amateurs, with callsign, name, address and licence classification.

The U.K. section of the current (Winter Edition) of the *DX Listings* part runs to no less than 48 pages and includes all QTH's and changes-of-address as published in the "New QTH" feature in SHORT WAVE MAGAZINE up to and including our October '69 issue, together with some earlier notifications received by us for November "New QTH's," also all postal-code amendments up to that time. Thus, the U.K. section in the *DX Listings* edition of the *Call Book* is the most up-to-date in print for the G's.

We can supply the current issues of the *Radio Amateur Call Book* (which appears quarterly) from stock, the price of the two editions together, DX and U.S., being £5-10s. Orders, with remittance, to Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1. All prices quoted here are post free.

NOTE ON RTTY ACTIVITY

The current issue of the BARTG (British Amateur Radio Teleprinter Group) *Newsletter* lists no less than 114 stations, in 26 countries, as having taken part and sent in scores for the 9th World-Wide RTTY DX Contest. But out of this lot only four British Isles stations are included. Five bands were worked using radio-teleprinter communication exclusively, the great majority of the contestants being on 20 metres. The annual subscription to the BARTG is 15s. per annum, which includes the well-produced quarterly *Newsletter*. The hon. treasurer is Miss G. M. Southby, 51 Norman Road, Swindon, Wilts., England.

ABOUT THE RAIBC

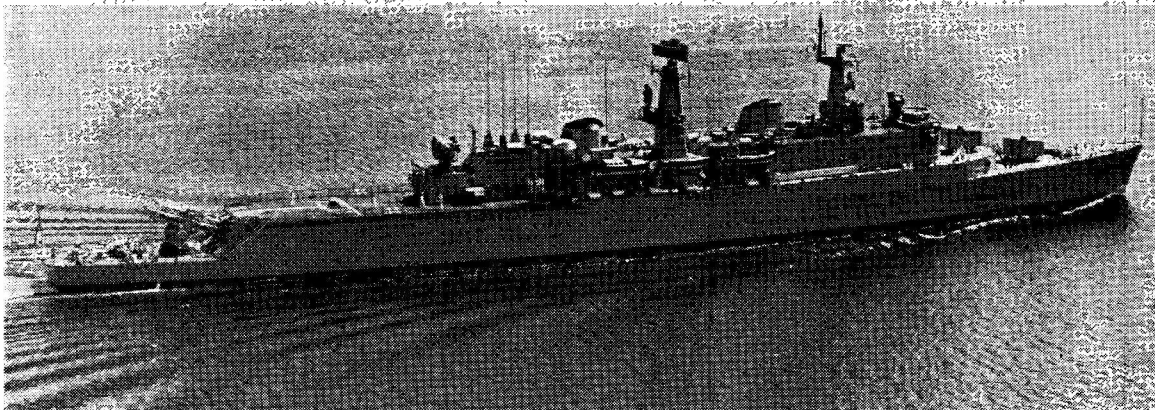
This society now has some 365 members in 12 countries—of these, nearly 130 hold amateur transmitting licences, the great majority of them being in the U.K. The hon. secretary of RAIBC ("Radio Amateur Invalid & Bedfast Club") is Mrs. Frances Woolley, G3LWY, 331 Wigan Lane, Wigan, Lancs. The RAIBC, all members of which are incapacitated in one way or another, is organised to be largely self-supporting—but, of course, outside help in practical ways (such as with transport, installation of gear and visiting), and financial assistance, is always appreciated. We can say that RAIBC funds are most carefully and economically disbursed—in fact, the RAIBC can be regarded as very worthy charity in the Amateur Radio context.

ELECTRICAL ENGINEERS EXHIBITION

This is another of the more important annual Exhibitions taking place in London. Called "Electrex 70," the XVth International Electrical Engineers Expo is to be held at Earl's Court, London, during April 8-15. A total of about 400 firms and organisations will be represented—including 25 exhibitors from West Germany alone—covering all interests and activities in the field of electrical engineering, from micro-switches to heavy machinery and electric vehicles.

BINDING YOUR VOLUME

With this issue starting a new Volume, readers who may want to preserve their copies of the last set, Vol. XXVII, are reminded that a cheap, easy and convenient way of doing it is by using our "Easibinder," as regularly advertised. It makes a neat job in hard covers, and the cost is only 14s. 6d. post free, immediate delivery from stock, of our Publications Dept. (Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1).



This fine-looking ship is H.M.S. "London," 6,000 tons, Flagship of our Far East Fleet. Chief Radio Supervisor Mike Matthews, R.N., G3JFF/MM, was on board her as a member of the staff of the Flag Officer, Second-in-Command, F.E.F. Both the Captain of "London" and the Admiral proved very co-operative when G3JFF was posted to the ship and requested permission to operate /MM on the amateur bands during the cruise to New Zealand and Australia—see article.

VK/ZL CRUISE—H.M.S. LONDON

EXPERIENCES UNDER /MM CONDITIONS

C/RS M. J. MATTHEWS, R.N., (G3JFF/MM)

Our contributor is well known for his Amateur Radio activities and on the DX bands. He is also a communications specialist serving in the Royal Navy, and has now achieved the degree of seniority that gets him picked for important jobs, ashore and afloat. All who read this will envy Mike Matthews the opportunity he had—and of which he made the fullest use—to operate as G3JFF/MM under such pleasant and interesting conditions.—Editor.

IN mid-September I found myself once more bound for the Far East to join the staff of the Flag Officer Second-in-Command, Far East Fleet. The flight to Singapore was made in one of the modern VC10's that R.A.F. Support Command use for fast, and comfortable, transportation of men and materials to distant parts of the globe. Sixteen hours after leaving Brize Norton in Oxfordshire I was back in hot humid Singapore.

The Flagship of the Far East fleet was the guided missile destroyer H.M.S. *London*, 6,000 tons, containing some of the most up-to-date and sophisticated weapons systems in the Western World. Two weeks after joining her we were on the way to Auckland and the beginning of a six-week trip around New Zealand and Australia.

Needless to say, I had made the necessary arrangements to get a U.K. Maritime Mobile licence and also requested to operate from the ship during the cruise.

Both the Admiral and the Commanding Officer (a communications specialist) had heard of my interest in Amateur Radio and I got the "go ahead" very quickly.

The 20-metre band appeared to be a safe bet for the first venture this time on the amateur bands, so the rig was fired up and a few minutes later 5Z4MG (Nairobi) was raised. The first U.K. contact was also made with G3US in Pontefract. The following evening recorded the first two-way G/MM contact when G3RSP/MM (s.s. *Esso Mercia*) was snared off Comoro Island in the Indian Ocean. During the trip down the Java Sea regular contacts were made with U.K., but as the time differential increased so the contacts disappeared.

The Royal Australian Naval Signal School (their version of G3BZU) were putting on an open day, complete with an active Amateur Radio station operated by Jim Lloyd, VK3CDR; he is a member of the R.N.A.R.S. and had specially written asking for a sked while we were on passage to New Zealand. Several contacts were made prior to the sked and when just 100 miles south of Norfolk Island we made a solid 5 & 9 QSO for over two hours. The many visitors to the shack ashore appeared most impressed by the fact that they were talking to a British warship—and a Flag Ship at that!

Cook Bi-Centenary Celebrations

Our visit to Auckland was only for 24 hours, and the following morning we sailed from Auckland in company with the Royal New Zealand Navy flagship, H.M.N.Z.S. *Blackpool*, and units of the RN, RAN, RCN and USN, for the city of Gisborne in Poverty Bay. It was exactly 200 years to the day that Captain Cook discovered New Zealand, and it was near the spot where Gisborne now stands that he landed. Our visit to this place was in connection with the anniversary celebrations.

Gisborne is also the home town of a very well-known New Zealand amateur—Jock White, ZL2GX, contest manager and N.Z.A.R.T. councillor, who made me most

welcome, and the two days' visit, with its parades and celebrations, went off admirably.

Our next port of call was just one day distant and after a rather rough trip south we were soon secured inside the beautiful harbour of the capital city—Wellington. Our previous host had been busy soliciting on my behalf and shortly after getting in I received a number of phone calls from local amateurs.

My first contact was with a well-known Antipodean OM/YL team—Noel and Thelma (ZL2UW/ZL2JO). Their lovely Wellington home commands a view across the harbour much envied by all who had ever visited them. Below us we could see the remains of the inter-island ferry *Wahine* which had come to grief a few months earlier at the harbour entrance.

An ex-G who emigrated to New Zealand over 10 years ago was another of my Wellington contacts. ZL2APT used to be G3ECW, somewhere near Romford. He and his XYL Phyllis took me round to see the sights of Wellington and its suburbs. There was snow on the high hills in the distance but the weather was just like a lovely U.K. spring day!

All too soon our visit to the capital was over and we sailed south across the Cook Strait and into Queen Charlotte Sound to see some of the sights that Captain Cook saw two centuries before in his *Endeavour*. We steamed up to Picton and then back out into the open sea.

During this trip from Wellington to Lyttleton we had embarked a TV camera team from the N.Z.B.C. They filmed all the activities that take place in a warship at sea. That night I was introducing a programme on the ship's closed circuit TV station "Radio London" and during my programme I found myself being filmed by the professionals. Not only was I seen on the messdeck TV sets, but a few days later I appeared on the New Zealand National Network.

My contact in Christchurch was ZL3MD, an ex-Navy man who had lost his sight in the last war. Phil was a shipwright by trade and I arranged to collect him and give him a tour around the ship. It was a pleasure to see his face light up as he stepped on board and savoured the familiar sights and smells! (I soon found out that he hadn't lost his liking for a tot of Nelson's blood, either!)

Our visit to New Zealand had now come to an end and we turned South for the trip into the South Tasman Sea around the Bluff. True to form, the roaring forties blew and one wondered how the lone round-the-world yachtsmen had managed to survive in such weather. During the trip around the Bluff I made a QSO with G8PO on 80-metre SSB. Conditions were good, less QRM than on 20, and signals were 5 and 6 both ways. However the path only remained open for about 20 minutes and then signals disappeared quickly.

Visiting Tasmania

Our next port of call was the Tasmanian capital, Hobart. After our four days' slog across the South Tasman Sea it was a pleasure to steam up the Derwent and secure under the shadow of their modern road bridge. Once again I was taken under the wing of the local amateurs and shown around from the top of Mount Wellington right out to the old convict penal settlement at Port Arthur. The highlight of the trip was a visit paid to me by VK7DK, who lives about 160 miles north of

Hobart. In 1955 he had been my first Australian contact (25w. to a dipole) and over the years we had had many QSO's on my various DX-peditions—but this was the first time we had met in person.

Highlights in VK

The major city of Melbourne was next on *London's* calling list. During the trip around New Zealand I had made contact with many amateurs in the area. Our visit to Melbourne coincided with the Cup Week—a combination of the Derby and the Grand National. Race day was a holiday and we were all allowed into the races free! Imagine my surprise when I found I had backed the winner at 25-1. That evening I visited another OM/YL team, VK3KS and VK3XB. Both are members of CHC and FOC. Several other prominent Victorian amateurs were also present that evening: VK3ABR, VK3AXK, VK3AHQ, VK3RJ, VK3NR and SWL Eric Trebilcock, who is very well known in the DX context. Eric had sent me an SWL report 'way back in my early days of Amateur Radio when, up to then, I had not managed to work into Australia. I had received reports from him also for all my DX calls and /MM operations. Imagine my surprise to be faced with a string of QSL cards that I had sent back to Eric ranging from 1954 to the present day.

Whilst in Port Melbourne the P. and O. liner *Oronsay* tied up astern of us. On board was another G/MM—G3RJS, who was the ship's senior radio officer. Very soon Paul and I were swapping yarns over a glass of brandy. Unfortunately he had to sail that evening and we were unable to get to the Wireless Institute meeting together. However I went along and met a large crowd of VK3's, many of whom I had contacted over the years.

After twelve days in Melbourne we sailed to join up with combined units of the Australian, New Zealand and Canadian Navies for exercises off the S.E. Coast of Australia. During this period all amateur activity was suspended. A fortnight later we all steamed into Sydney harbour.

Here I was to meet a regular to the Radio Show in London and a stalwart of the Guildford radio group—Harry Mead, VK2BJL, ex-G3OXI. Harry and his family had emigrated from the United Kingdom at the beginning of the year and were getting settled in to their new life. He had offered to take some leave to enable him to show me around Sydney and the surrounding country. He and his XYL and family very kindly put me up and enabled me to see more of New South Wales than I would ever have done on my own. We paid a visit to the local Wireless Institute meeting and here I met several well-known amateurs: VK2BPN (ex-G3EIX), VK2QL, VK2NF and VK2EO.

Too soon our 14 days were up and we turned our bows North for Singapore. Once again I kept up a fairly high level of amateur activity—although most of the stuff worked appeared to be Asian and Oceania. Again the time differential was against me. However, by the time we had arrived back in Singapore I had clocked up, from the ship, over 1,000 contacts in 58 countries.

What of future activity from G3JFF/MM? With a change of flagship early in the New Year and another trip to Australia—for the Australian Cook Bi-Centenary celebrations—it looks a sure thing. CU on 14025/14260 kHz.



THE OTHER MAN'S STATION

VR2CC

FRED CARTER, now VR2CC and the subject of our story this time, first became interested in radio around 1930—but that was not in Fiji. He was an SWL, at home in the U.K., and after Hitler's War went to East Africa, where he qualified in 1952 as VQ3DN. On returning to England in 1954, he became G3JND—and soon after was on the move again, this time to Tasmania, whence he emerged as VK7DN.

Came 1955, and he decided to settle in Fiji, where he has been ever since, under the exotic call VR2CC, much in demand by the DX boys—there have never been more than about twenty VR2's, with VR2CC one of the most active.

During the 20 years since he first became a reader of *SHORT WAVE MAGAZINE* (he says he has them all since 1950), Fred has built and used a wide variety of Tx/Rx equipment, always in tune with the times. Now, of course, he is on SSB, running Hallicrafters gear, the Tx being an HT-32B and the receiver an SX-115, with an SX-28 for general coverage. Other items of amateur-band equipment include a Heathkit monitor oscilloscope and reflected-power meter.

The main antenna is a home-built tri-band Cubical Quad for 10-15-20m., hoisted on a 50ft. mast and con-

trolled by a CDR rotator. Nowadays, VR2CC can most often be heard on 20 metres, but he also works 10-15m. on occasion.

A more recent interest has become DX/TV reception—they don't have television in Fiji (how lucky they are!)—and included in his report for these notes VR2CC sent some very good photographs, off his TV/Rx screen, of pictures received from Australian and New Zealand TV stations, 1,200-1,500 miles distant; he also gets a good and regular TV signal from the station on American Samoa, at 800 miles. All this is probably not by anomalous propagation as we know it in these latitudes, but by ducting—anyway, whatever the mechanism, the pictures appear on an all-transistor small-screen TV/Rx. (And he has no TVI to worry him!) For this television reception, the aerial system is a pair of 5-ele Yagis, stacked, at a height of 65ft. and, like the amateur-band Quad, rotatable. VR2CC extends his electronic interest to hi-fi and tape recording, for which he has some very nice equipment.

The VR2CC QSL card shows a palm-fringed lagoon, with a native in the foreground contemplating infinity—and by now you may be wondering what, after all his wanderings, VR2CC does out there. He is manager of the exotic Cathay Hotel, at Lautoka, Fiji, and when on the air is always on the look-out for U.K. contacts.

THE MONTH WITH THE CLUBS

By "*Club Secretary*"

(Deadline for April issue: March 6)

(Please address all reports for this feature to "*Club Secretary*," SHORT WAVE MAGAZINE, Buckingham.)

AN aspect of Club life which seems to be somewhat neglected, is that of mutual help in dealing with TVI and BCI. Your scribe has direct experience of dealing with TVI complaints—who hasn't?—but has found it a great help to have some assistance. Indeed, he would rather put up a mast single-handed than try to deal with a case of interference alone.

This suggests that possibly a few items of anti-interference equipment might well be held as Club property, such as high and low pass filters, a braid filter, a ferrite ring filter, and possibly an old TRF TV in going order—preferably one of those with a mains transformer power supply. To deal with a complaint, one needs someone to operate the rig while the licensee looks at the picture symptoms; and if the filters are available, they can be tried, a cure found, and a return visit promised when a similar filter to the one that cured the fault has been made up. It is the writer's experience that if you have the whole battery of filters available to try at one session, a complaint can be cleared up at one go, but if you try to play a "loner," you end up by going off the air in sheer self-defence!

If a kit of the usual, and less common, anti-TVI items is kept as Club property, they could well be in the hands of one technical type, who can keep them up to the mark, with an inventory, and make himself available to the others to help with TVI and BCI complaints, and explain to the irate viewer just why the amateur, if he wants to achieve certain results, must be on the offending band during TV hours, and how the TV set itself is so often at fault, and so on. In fact, do a good job of educating the uninstructed viewer as to the ins-and-outs of the whole problem, to the benefit of both sides. A distasteful task, admittedly, but well worth while, when one considers the proportion of amateurs who are unable to operate the DX bands, or even, in some cases, VHF, during civilised hours.

Looking at the Mail

Our first area this time is Wales-and-the-West; and it is interesting to observe how the numbers appearing in this pile have increased over the past few months.

At **Torbay** the March affair is a Junk Sale, at Hq., Bath Lane, rear of 94 Belgrave Road, Torquay—there must be some real "goodies" up for disposal, because the hon. PRO has not given us a date in his write-up. However, this is easily rectified by a call to the Panel

address—see p.51.

Having started operations informally, the chaps at **Barnstaple** are going to have a general meeting in the near future to set things on to a more definite basis. For March, the dates are 11th and 25th, at Crinnis, High Wall, Sticklepath, Barnstaple, the home of G4CG. The intention as far as the future is concerned is to carry on with the present two meetings each month, making one an informal and the other a lecture evening.

Bournemouth is the home of the Wessex crowd, who have a place at the Cricketers Arms, Windham Road, on the first Friday in the month and the Monday 17 days later. It is understood that a film-show is in the offing.

It looks like the first Thursday in the month for the **Cornish** main meeting, March 5, at the SWEB Club-room, Pool, Camborne; there will be two topics, namely a "potted talk" by G3OFN on that handy tool, the Antenna-scope, followed by the main lecture, by G3POB. The latter will be talking about the use of ex-Service receivers such as the AR88 and the HRO, in amateur working.

"Laymen's Language about Computers" is the title given by **Chippenham** hon. sec. G3UTO to G3UHO's talk on March 31. However, the lads get together every Friday, and the hon. secretary would always be only too pleased to give details of the current operations.

At **Plymouth** the form is a meeting on the first and third Tuesday, the latter being an informal. March 3 is down for G8CMG, Roger Williams, to demonstrate his home-brew stereo equipment.

Quite a packet of mail from **Bristol**, one way and another; and from it we note they have got a time-table of coming events nicely teed up right through to the autumn. For instance, March 10 is down for a conducted tour of the Courage Brewery, and on March 25 they take on the **Swindon** crew at Skittles in the "Pheasant," Bath Road, Chippenham. All this is in addition to the normal Tuesdays-and-Thursdays routine at 41 Ducie Road, Bristol. As for the new **Shirehampton** Club, also in Bristol, which we mentioned in this piece recently as a new formation, it is understood they are in session each Friday evening, albeit with a break over the Easter holiday period.

Taunton are still progressing with the fitting-out of their caravan as a mobile all-band station. They are also entertaining, on March 13, when they have a Quiz, playing against some other West-Country groups.

In the Applied Science building of the University College of **Swansea** on March 4, they will be listening to

A change of venue for the **North Staffs.** chaps is noted, the new place being at the Harold Clowes Community Centre, Bentilee, Stock-on-Trent, where the booking is for every Monday evening. Incidentally, this is the gang that used to be known as Burslem and as such got a very high marking in MCC for several years.

Weekly on Friday is the way of life at **Coventry**, with March 6 and 20 as "Nights-on-the-Air" for those not doing R.A.E. or Morse; March 13 a lecture on Colour TV, and March 27 for the Junk Sale.

The March meeting of the **Cannock Chase** group is on the 5th, at Bridgtown Sports and Social Club, for a talk, with slides, by G5PP on his trip to U.S.A.

Spalding next, with a Surplus Sale and Social at the "Ship Albion" in Albion Street, Spalding, on March 5. Visitors are advised that ample car-parking space is available.

At **Nuneaton** the Hq. is at The Grange, Caldecote, where the gang foregather on alternate Thursdays. This means March 5 and 19; the former is down for Top Band Operating while the second date is set aside for a talk on Home Construction.

Visitors are always welcome at No. 2 Guardroom, Sobraon Barracks, Breedon Drive, off Burton Road, **Lincoln**, avers the hon. secretary, going on to offer for March 3 a tape lecture; on the 10th a Construction Evening; Films on the 17th; and an "All-out Operating" Night on March 24. To round off there is March 31, which is down as an Open Evening.

Northerly Parts

Here we lead off with a couple of new groups, both based in Northumberland. First, there is **Newcastle-upon-Tyne**, who had an inaugural meeting at the Drill Hall, Vine Street, Wallsend, on February 9; all details for subsequent events were to be sorted out then, so we must refer you to Charles Morgan, at the address in the Panel on p.51 for the latest news, too late for it possibly to appear in the piece this time out.

Not very far away is **Bedlington**, where they made a start on January 29 with the title of **Northumbrian Radio Club**, and Hq. at Ashington and District Social Club, albeit the position here also is somewhat fluid and a contact with G3XAI, at the address in the Panel, would be a sound move before making a visit to Hq. At the moment the intention is to get together fortnightly.

To both these Clubs go our hopes for a good start and success in the long-term.

The Amateur Radio Club of **Nottingham** is another name of the Sherwood Community Association group, but the latter gives the clue as to where they foregather. Hq. is at the Community Association's place at Woodthorpe House, Mansfield Road, Nottingham, where they are "at home" every Thursday evening from 7.30. March 5 is a committee meeting, the 12th is slated for a Film on Computer Techniques and the 19th for a talk on an unspecified topic. The month is rounded off by an Open Evening on March 26.

Another Community Association group has its being at **Nunsfield House**, Boulton Lane, Derby, on Friday evenings. Here G3ALA has March 6 for some Films, with the following week devoted to the Club station. March 20 sees G2CVV lecturing, with illustrations, on BCI and TVI, while on March 27 there is an

Open Evening. For the future, there is a Mobile Rally, the date for which is provisionally June 14. Visitors are welcomed to Club meetings and should look for Room 7 when they have found the building.

Now to **Mansfield**, where the secretary advises that on March 6, at the New Inn, Westgate, Mansfield, the lads will have their AGM—no holds barred and bring your own weapons!

Liverpool missed the deadline last time by a couple of days, and so we have only the first part of the month given—a business meeting on March 3, followed by a Project Night on the 10th. For details on the meeting-place, contact G3MCN at the address in the Panel.

Another group which "went adrift" last time was **South Shields**, who assemble every Friday *except* the fourth in each month at Trinity House Social Centre, Laygate, South Shields; one of the March sessions is to be given over to judging their Construction Competition, with G8ANQ from Bishop Auckland in the judge's seat.

Lothians have March dates booked as the 12th, for which evening nothing—as yet—has been finalised, and the 26th, when GM3OWV will be officiating at a Quiz. Both meetings will be in the Board Room, YMCA, St. Andrew Street, Edinburgh.

The recent AGM at **Hull** resulted in a committee meeting almost on our deadline, and the hon. secretary is to be commended for getting the news out to us so quickly. Three meetings are on the card, the first being March 6, when SWL J. Singleton talks about the SWL Hobby—and he is one of those who know about SWL'ing. A week later, on March 13, G3MVO holds forth on his "Junk Box Linear Amplifier" and then on March 20, G3PQY takes charge of a (local) direction-finding event. In a normal month there would be four meetings, but this time one falls on Good Friday and thus is scrubbed. Hq. is at 592 Hessle Road, Hull.

The piece this month is beginning to read like a tabulation of rare Top Band Counties—and to heighten the illusion, the next letter we pick up is from **Westmorland!** Here, March is AGM-time, and they have the 20th booked at the "Coach and Horses," Coach Lane, Milnthorpe, Westmorland. Start time for the meeting is 7.30, and refreshments will be available.

York have their home in the British Legion place at 61 Micklegate, York, where they meet every Thursday evening. "Business" is segregated to the first meeting in the month; for other details contact the hon. sec.—see Panel—or, better, go and look the lads up.

Getting together in each others' homes must raise problems, and so intending visitors to **Wirral DX Association's** meetings are asked to get in touch with secretary G3OKA—see Panel—before attending a meeting, although they will no doubt be very welcome. On the last Wednesday in March, G3VVA will be host, and will tell them about his visit to VE7 into the bargain.

Hartlepoons are in the happy position that their success is such that larger accommodation is being considered; so before attending one of the weekly Monday evening affairs, a call to G3NWU would make *sure* the lads have not shifted Hq.!

Thursdays at the Grammar School in Heckmondwike is the place for **Spen Valley**, and for any intending visitors or friends. Unfortunately, we have only the February story, but that was pretty good.

It rather sounds from the wording of the North Leeds letter as though they have just moved home—but anyway, we can say that they are now getting together at Shadwell Social Club, Main Street, Shadwell. On the regular Tuesday evenings, they have the Club's VHF station on the air, and various other activities of interest in the planning stage.

At Northern Heights our old friend G3MDW says that with the AGM due on April 8 he is "hoping for a rest"—but your scribe will take a small bet they put him back for another year! However, the lads are still at the Peat Pitts Inn at Ogden, Halifax, and look like being there for some months yet while the old place is being sorted out. March 11 is RTTY by G3KEP, and on the 25th, G3KKS is going to show how an Anodic Finish can be obtained on aluminium.

Still thinking about accommodation, Derby have been trying to make their Hq. "permanent," where they can lay out all the tackle, and expand the facilities they

can provide. This has now come about, still at 119 Green Lane, but, of course, at the cost of an increased rental. This in turn means a rise in the subscription—but Derby members thinking of protesting should recall that the proposed rise to ten shillings is still less than most other Clubs; the old five bob rate was the same as that levied on members of Derby Wireless Club in 1911!

London and Southern England

Chiltern have had to move out of their normal Hq. at the British Legion for a few months while alterations are done to the buildings; so for March and April they are booked in at the Desborough Arms, Desborough Road, High Wycombe, on the last Thursday of the month. This makes it March 26, and on that date Eric Mollart will be talking to them about Direction-Finding.

Southampton get together regularly on Wednesday evenings at 14 Nightingale Grove, Shirley, and in addition have a once-monthly lecture at the Lanchester

Names and Addresses of Club Secretaries reporting in this issue :

- ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London, W.3.
 A.R.M.S.: N. A. S. Fitch, G3FPK, 40 Eskdale Gardens, Purley, Surrey, CR2-1EZ.
 BARNSTAPLE: H. Hughes, G4CG, Crinnis, High Wall, Sticklepath, Barnstaple, Devon.
 BRIGHTON (Technical College): R. A. Bravery, G3SKI, 7 Copse Hill, Brighton (506418), BN1-5GA.
 BRISTOL: E. J. Davies, G3SXY, 72 North View, Westbury Park, Bristol (33284), BS6-7PZ.
 BRISTOL (Shirehampton): R. Jones, G3YIQ, 84 Springfield Avenue, Shirehampton, Bristol.
 B.A.R.T.G.: D. J. Goacher, G3LLZ, 51 Norman Road, Gorse Hill, Swindon (21740).
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 CHIPPENHAM: P. Strand, G3UTO, 8 Brookwell Close, Chippenham (3723), Wilts.
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 COVENTRY: C. G. Jaynes, 20 Belgrave Road, Wyken, Coventry.
 CRAY VALLEY: D. Buckley, G3VLX, 234 Halfway Street, Sidcup, Kent (01-850 6945).
 CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London, S.E.23 (01-699 6940).
 DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby (21931), DE3-7GE.
 EAST WORCS.: R. J. Mutton, G3EVT, Summerhayes, Mill Lane, Alcester (2041).
 ECHELFORD: M. Clift, G3UNV, 45 Fordbridge Road, Ashford (59628), Middx.
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 FAREHAM: G. G. Bullement, G3XIV, 42 The Fairway, Portchester, Fareham, Hants.
 FINCHLEY: P. R. Cragg, G3UGK, Claregate School, Hatfield Road, Little Heath, Potters Bar, Herts.
 HARTLEPOOL: J. W. Thompson, G3NWU, 42 Furness Street, West Hartlepool, Co. Durham.
 HEREFORD: S. Jesson, 181 Kings Acre Road, Hereford (3237).
 HULL: Mrs. M. Longson, 4 Chester Road, Wold Road, Hull.
 KINGSTON: N. Dudman, Dunham Lodge, 88 Sandy Lane, Teddington, Middx.
 LINCOLN: G. O'Connor, 61 Steep Hill, Lincoln (24113).
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 LOTHIANS: W. Marshall, GM8BPL, 15 Craigleith Hill, Edinburgh, EH4-2EF.
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 SPEN VALLEY: N. Pride, G8BSC, 100 Raikes Lane, Birstall, Leeds (Batley 3925).
 SURREY: R. Morrison, G3KGA, 33 Sefton Road, Croydon, CR4-7HS, Surrey (10-654 5982).
 SUTTON COLDFIELD: R. P. Smith, 29 Coldstream Road, Sutton Coldfield, Warks. (021-351 2370).
 TAUNTON: P. Jones, G3WPJ, 20 Chiltern Street, Bridgwater, Somerset.
 THANET: J. P. Barns, G3BKT, 93 Crescent Road, Ramsgate, Kent.
 TORBAY: Mrs. G. L. Western, G3NQD, 110 Truro Avenue, Hele, Torquay.
 UNIVERSITY COLLEGE OF WALES: R. Wilcox, GW3TSH, Room 520, Neuadd Lewis Jones, University College, Singleton Park, Swansea, SA2-8PS.
 VERULAM: W. C. Dennis, G3NCK, 129 Colney Heath Lane, St. Albans, Herts.
 WESSEX: A. G. Emery, G8AVE, 7 Brunel Drive, Preston (3177), Weymouth, Dorset.
 WESTMORLAND: J. Forrester, 44 New Street, Carnforth, Lancs.
 WIMBLEDON: W. Hardcastle, G3XQX, 13 Carlwell Street, Tooting, London, S.W.17.
 WIRRAL (DX Association): J. A. Share, G3OKA, Trelawney, 21 Curlender Close, Bidston, Birkenhead, L41-7BN.
 YORK: J. A. Rainbow, G8BOK, 14 Temple Road, Bishopthorpe, York, YO2-1QN.

Lecture Theatre in the University. For the current details, contact G3HKT at the address in the Panel.

To hold a membership around the 100 mark, as **Purley** have done for some time now, is a pretty fair achievement. They have a keen secretary in G3FTQ, who has had years of experience in keeping the Club running and the members interested.

The Railwaymen's Hall, 58 Whytecliffe Road, Purley, has a booking on March 6 in the small hall for the Purley Natter Nite. This room will not be big enough on March 20, because on that evening there is to be a Junk Sale, and so they have the large room in which to stack both themselves and the Junk.

Now to **Echelford**, who have March 26—regulars do please note the change from the normal date—for the AGM at The Hall, St. Martins Court, Kingston Crescent, Ashford. Ten days earlier, at the same place, is the talk by K. O. Ambly, ex-LA4QE, of Collins International, who is to discuss the best ways of harnessing aeriels and propagation to amateur needs.

Now **Cray Valley**, at the Congregational Church Hall, Court Road, Eltham, S.E.9, who have Mr. J. D. Ralphs coming to speak on March 5 about the Diplomatic Wireless Service, which is something of a "first" and should be of great interest—DWS, it will be recalled, has all those clever gadgets that were displayed at the Show a couple of years ago. March 19 is the date for the Natter Nite.

The **Surrey** crowd get together at the Swan and Sugarloaf in South Croydon, apparently on the third Tuesday, although the *Newsletter* which is on file is a little early to make this date certain. There is also a hint that possibly the present venue may be changed—so if you are thinking of joining or visiting, a call to the hon. sec. would be a good idea—see Panel, p.51.

At **Crystal Palace** on March 21 G2MI is bringing along his slides of the Bermuda trip. Venue—Emmanuel Church Hall, Barry Road, London, S.E.22, prompt at 8 p.m.

Last-minute news from **Verulam** suggests someone did some smart work—it seems the programme "came unstitched" for various good reasons, and so generated a whole lot of alterations in the dates booked with speakers and general rearrangements. So, on March 18, G2YS will be at the Council Chamber, The Town Hall, St. Peter's Street, St. Albans, to talk about a trip to U.S.A.

Thanet are keen VHF types, clearly, as they meet every Friday *except* when the South-East VHF group are in session. Thanet's Hq. is at Hilderstone House, Broadstairs, where on March 13 they will be listening to colleague G3DAH of "VHF Bands" and on the 20th judging their Constructional Contest.

If you are ever around the Southgate area of North London, on a Friday evening, and have a thirst, you can go to the "Cherry Tree," sink a pint, and leave, without knowing that you have interrupted a session of what they claim is one of the most exclusive Radio Clubs in the world—**Finchley**. Just about every member holds a well-known DX call and the few who don't were selected for their skill in telling funny stories when things are going wrong. If you want to know any more, get in touch with G3UGK, as Panel.

The **North Kent Newsletter** and this column tend to get a bit out of phase, due to the dates on which the

North Kent meetings fall. However, the last one that came to hand gives the programme in full right through to June, from which it seems the Spring Junk Sale is down for March, as is also a visit from Mr. C. H. Jones of Mullard, who will talk about transistors and other semiconductor gadgets. March 12 for the Junk Sale, and so, presumably, 26th for the lecture; both, of course, at the usual Hq. For more details, contact the hon. secretary, G3WZJ.

If you are going to **Brighton Technical College Club** meeting on March 5 to hear F. R. Canning, G6YJ, on Semi-Conductors, be sure to look in the entrance hall for the room number allocated, which may vary. The problem is not so acute at Richmond Terrace on March 19, since it is an informal in the Club shack.

If you have a yearning for a KW-2000B in your shack, then you should certainly go on March 17 to **Acton, Brentford and Chiswick**, where G5ZA will be demonstrating his specimen—but you can be sure it will be well guarded! The venue, incidentally, is 66 High Road, Chiswick.

One of the better *Newsletters* to come our way each month emanates from **Mid-Sussex**; and it tells us, as part of a very striking front cover, that the Club meet at Marle Place, Leylands Road, Burgess Hill. The dates for March are 5th and 19th, although we have no news as yet of what they are going to do.

Mr. Leo Simpson is coming to **Kingston** on March 11, to talk about quick methods of fault diagnosis in Radio and Television. This one is at the Penguin Lounge, 37 Brighton Road, Surbiton.

Wimbledon have been missing from these pages for quite some time, although we have known how they were progressing by reference to the *Newsletters* of nearby clubs; but it is nice to hear directly from them again, and confirm that they still get together at the St. John Ambulance Hall, 124 Kingston Road, Wimbledon. Here they start smartly at 8 p.m. and the dates are always the second and last Friday of each month.

It is Sunday evenings at **Fareham**—rather an unusual day for meetings, but certainly successful, as it is understood the lads have overflowed their present room at Portchester Community Association into a larger. Every Sunday is the normal thing although this time Easter Sunday falls in the month and so is deleted. Perhaps the most important event in the month comes on the 1st, with G2QK saying "Fings ain't wot they used to be!" (He should know—we remember G2QI on 180 metres about 40 years ago!—*Editor*.)

Conclusion—Deadlines

Closing date for this feature in our next issue (April) must be **Friday, March 6**—and for the May offering it will be **April 3**. (Even after the exhortations of the last couple of months, we are holding five reports which came in too late for this time!) Also please remember that with *all* Club reports we want the QTH of the hon. secretary, every time, for inclusion in the Secretary's Address Panel. Our address is simply: "Club Secretary," SHORT WAVE MAGAZINE, BUCKINGHAM. Keep the fire in and the wheels turning. 73.

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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 U.K. section 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.

- G3YNQ**, H. H. W. Billington, 39 Ruskin Drive, St. Helens, Lancs. (Tel. St. Helens 25531.)
- G3YQG**, N. S. A. Waylett, 71-B Wickham Way, Beckenham, Kent.
- GW3YQO**, D. M. Kirkwood, c/o Sgts.' Mess, R.A.F. Valley, Holyhead, Anglesey.
- GW3YSA**, A. Bartlett (ex-GW8CNY), 35 Pen-y-Waun, Efail Isaf, Pontypridd, Glam.
- G3YUH**, R. Ayling, Flat No. 4, 107 Dane Road, Margate, Kent. (Tel. Thanet 21607.)
- G3YUS**, D. C. Moule, 5 Bemerton Gardens, Kirby Cross, Frinton-on-Sea, Essex.
- G3YUX**, R. W. Moore (ex-G8ANG), 35 Gorsy Bank Road, Wilnecote, Tamworth, Staffs.
- G3YWG**, A. G. Emery (ex-G8AVE), 7 Brunel Drive, Preston, Weymouth, Dorset. (Tel. Preston (Dorset) 3177.)
- G3YWS**, J. M. Smith, 12 Ash Grove, Keyworth, Nottingham, NG12 5DH.
- G3YXH**, S. B. Marshall, 1 The Orchards, Church Lane, Gomersal, Cleckheaton, Yorkshire.
- G3YXN**, P. Whalley, 6 Oak Drive, Halton, Lancaster, Lancs.
- G3YYB**, A. Eagle, 12 Crossfield Drive, Worsley, Manchester, M28 4GP. (Tel. 061-790 3023.)
- G3YYC**, G. P. Sharples, 90 Sharples Avenue, Bolton, Lancs.
- G3YYD**, D. P. Wicks, 35 Oakwood Road, Bricket Wood, St. Albans, Herts.
- G3YZR**, J. P. Porter, 73 Stockton Lane, York.
- G3ZAF**, C. W. Attwell, 72 Arnal Crescent, Beaumont Road, Wimbledon, London, S.W.19.
- G3ZAG**, B. G. Taylor, 83 Bush Grove, Kingsbury, London, N.W.9.
- G3ZAJ**, D. Sutton, 19 The Pasture, Kennington, Ashford, Kent.
- G3ZAR**, P. Rubinstein, 18 Westland Road, Kirk Ella, Hull, HU10 7PJ.
- G3ZAW**, K. W. Bird, 2 Arnall Crescent, Daventry, Northants, NN11 5AY.
- G3ZAZ**, F. W. Mills, 2 Newark Place, Fulwood, Preston, Lancs. (Tel. Broughton 3385.)
- G3ZBA**, Dr. S. Sefton, 8 Sandmoor Avenue, Leeds, LS17 7DW. (Tel. Leeds 686794.)
- G6AEW/T**, Mexborough Technical College Amateur Radio Society, Park Road, Mexborough, Yorkshire.
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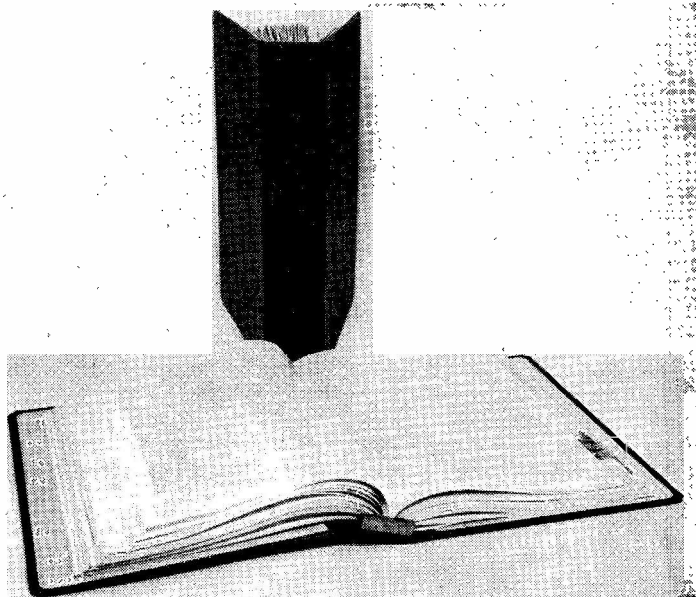
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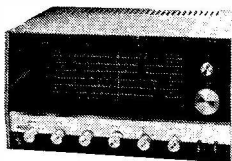
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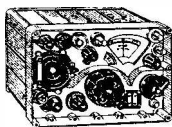
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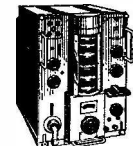


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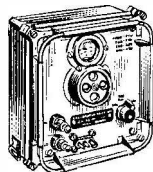
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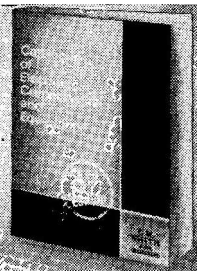


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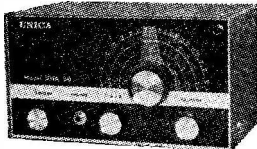
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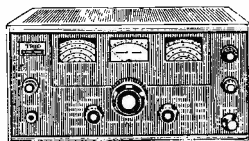


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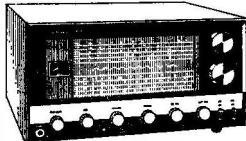
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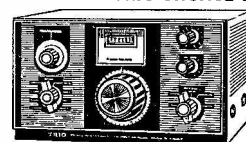
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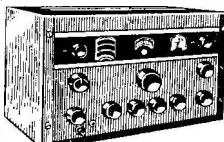
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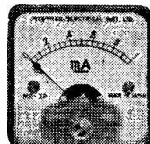
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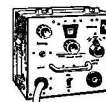


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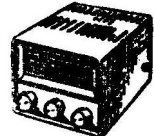
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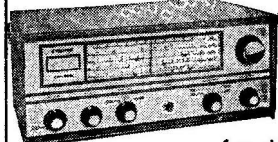
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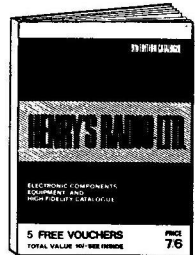
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SELLING: Minimitter MR-44 Receiver, double crystal conversion, crystal gate, Q-multiplier circuit, requires some attention, asking £14 plus carriage. — Wood, 6 Bournemouthe Gardens, Folkestone, Kent.

WANTED: To buy, diagrams and instructions to convert any TV receiver into an Oscilloscope.—Adkines, 164 Sutcliffe Avenue, Nunsthorpe, Grimsby, Lincs.

SELLING Cheap: The following Valves—U19, 866, 866Jr., TZ40, 805, 807, 813, KT8, 12E1, PX4, FW4-500, 954, 6AS6 and others — also 'scope tube VCR-138.—Box No. 4879, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SMALL ADVERTISEMENTS, READERS—continued

AAVAILABLE at Godshill, Isle of Wight, bed and breakfast accommodation with evening meal; h. and c. in all rooms, comfortable TV lounge, and baby-sitting facilities. Also a 4-berth caravan with all amenities.—Barden, G3RND, Bridgecourt Farmhouse, Goodshill (606), Ventnor, Isle of Wight.

FOR SALE: Meters, flush, 2-in. square 200 mA, 10s.; dual range 40/120 mA, 12s. 6d.; flush 4in. dia., 50 microamps, 25s. Paper smoothing condensers, Mica-mold 8 mF 1000v., 7s. 6d.; Aerovox 2 mF 1000v., 5s. WANTED: Woden UM1 or UM2 mod. xformer.—Ingram, 5 Springhill Cottages, Snowhill, Broadway, Worcs.

SALE: Commercial television studio video monitors, cost about £385 new, bargain at £10 and £5 depending on condition, but all working.—Jones, G6ABC/T, 3 Bircham View, Austin Crescent, Egg-buckland, Plymouth. (Tel. 76552.)

TOP quality polypropylene non-rot rope. Diameters, 3/4in., 1300 lbs. breaking strain; 5/16in. +1890 lbs. B/S; and 3/8in. dia., 3100 lbs. B/S. Send s.a.e. for sample.—Powell, GW3HUM, 21 Tanybryn Estate, Valley, Anglesey.

WANTED: Pye power unit AC-10PU, also Pye FM Bantam, or similar. FOR SALE: Pye six-channel transistor Ranger, complete and unmodified. Trio TS-500 and PS-500, new and guaranteed, £165, G.E.C. BRT-156 FM radiotelephone, low band, as new, £25.—Austen, 28A Valebridge Road, Burgess Hill (3409), Sussex.

APRIL Issue Short Wave Magazine, due out March 26. Single-copy orders 4s. (or 4s. 3d. "first-class") post paid to reach us by Tuesday, March 24, for despatch on Wednesday, March 25th. These copies are sent flat in an envelope.—Orders, with remittance, to: Circulation Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SELLING: For £25, an R.C.A. AR88D. — Trull, G3RAD, Thanet Radio Society, 1 Approach Road, Broadstairs, Kent. (Callers after March 8th, 1970.)

SALE: K.W. Viceroy Tx, Mk. IIIA, with extra filter; also a KW-77 receiver, both unmarked and with manuals, price £155, will not separate.—Michaelson, G3RDG, QTHR, or ring 01-455 8831.

OFFERING: Vintage Marconiphone "V2 Long-Range two-valve receiver", dated 1922, in original condition. Photograph available. Best offer secures.—Maxwell, 5 Picton Place, Haverfordwest, Pembrokeshire, West Wales.

SELLING: An Eddystone 840C receiver, little used and in first-class condition. Price £35, buyer to collect.—Stampton, 67 Medhurst Crescent, Gravesend (G3284), Kent. (Ring evenings.)

FOR SALE: National HRO Rx, with coils and PSU, £18. Also available operating instructions for Oscilloscope Type 13A, 10s.—Jones, 230 Roman Road, London, E.6. (Tel.: 01-476 4050.)

SALE: A Top Band AM/CW Tx, price £8. Transistorised PSU for Mobile, £4. Mains power unit, £4. All these items home-constructed. Also a BC-453B "Command" Rx, 60s. Or you can have The Lot for £15, plus carriage.—Broadley, GM3WBP, 67 Ranachan Gardens, By Campbeltown, Argyllshire, Scotland.

FOR SALE: Three-section 36-foot mast, with guys, etc.; also aerial wire, Morse key and a xtal microphone; price all-in £5, you collect.—Dewar, 16 Avon Road, R.A.F. Station Abingdon, Berks.

WANTED: A paddle for an electronic keyer. SELLING: A BC-453 at 60s., and an R.216 hand-book, 15s.—Copeland, G3NZZ, 1 Dunnaman Park, Kilkeel, Co. Down, Northern Ireland.

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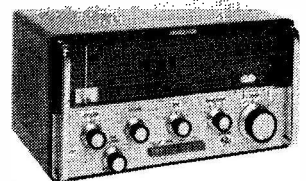
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EDDYSTONE EA12 'Ham Band' receiver. Built to professional standards but specifically for the amateur enthusiast. High sensitivity for all reception modes CW, MCW, AM and SSB. FSK adaptor available as ancillary £195.0.0d.

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Tank Aerials. Three 4" sections making 12', 8/6. P. & P. 3/- any number Bases, 4/6. P. & P. 2/-.
Breasts Sets. Safe for Mobile Operation, 10/-, post paid.
Xtal insets to fit above Breast Sets, 7/6. P. & P. 9d.
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VALVEHOLDERS, B9A and B7G, 8d. each. Octal Ceramics, 1/3.
BY100 Rectifiers, 3/9 each, SM78P Silicons 800PIV 750M/A, 3/9.
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March is traditionally the month for high winds and therefore the time to go out and check your guys are secure and tight. I hope your rotator will survive the tempest, but if it fails remember we can repair or replace from our CDR stock.

News this month is that the K.W. Atlanta went into confinement recently and now emerges with its newborn—a Remote V.F.O. Unit.

Looking just like her mum, this little dolly retails at £34 and really makes the powerful Atlanta a versatile job.

While she has been away the Atlanta has had a few other internal ops. too and is very much improved as a result. I took her home for a few days to try her out. My goodness! what a smashing rig she is. I've always thought I'd never chop my faithful old 2000A in for an Atlanta although she's getting a bit long in the tooth. But I was so impressed with the improved performance plus the split-band facility of the new V.F.O. that I'm haggling with myself for a good trade-in deal!!

I've never had such good sig. reports and praise for such excellent audio quality. Not only did I make a lot of noise in ZL, VP8 and KR6, etc., but the natives could understand what I was saying too! No increase in price, by the way. She's still £250 complete. 73 till April, de Mike.

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Telephone: Dartford 25574

SMALL ADVERTISEMENTS, READERS—continued

SELLING: An Eddystone 750 receiver, £42. Also a home-built transmitter, coverage 10 to 80 metres, with modulator and PSU, £34. (Midlands).—Box No. 4881, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Yaesu-Musen Line in as-new condition —FR-DX400 de luxe receiver, coverage 160 to two metres, all extras fitted; FL-DX400 Tx, 10 to 80m.; also FL-200 linear amplifier; spare valves, etc., all in at £250 or offers, buyer to collect.—Ring Young, Harbury Wells 273 (Warwickshire).

SELLING: Wavemeter Class-D, 6-volt, 70s. Teleprinter 7B, 24v. motor, no cover, chassis broken near keyboard, 80s. Crystals Type 10X: 100, 500, 1000, 1547.5, 1981, 2496, 3520, 3600 kHz; Type 10X-AJ in 600, 6990, 7010, 8400, 8500 and 465 kHz; Type HC-6U in 2500, 2516.6, 6033.3, 6066.6, 6100, 6133.3, 6166.6, 6266.6, 6300, 6333.3, 12166.6, 12500, 12833.3, 13166.6, 13500, 14166.6, 14500, 14833.3, 15166.6 kHz; and Type B7G, 50, 51 and 415 kHz. Offers for any or all. (Somerset).—Box No. 4880, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: Heathkit HW-12A Transceiver, with AC and DC (positive earth) PSU's; both solid state. Price £75.—Michaelson, G3RDG, QTHR. (Tel.: 01-455 8831.)

OFFERING: Codar A.T.5 Tx and mains PSU, brand new, at £16. Labgear converter for 160m. mobile, as new, 60s.—Ring Morgan, G3MEM, Kidmore End 3701 (Reading, Berks).

MANUALS: For B.40, Collins TCS, CR-150/3, Cossor 339, at 35s. CR-100, CR-300, SX-28, S.27C, AR88LF, 25s. R.206, R.216, AR88D, 15s. RA-17, RA-137A, 45s. R.408, 55s. BC-221, HR0, BC-455, 7s. 6d. R.209, S.20, S.23, S.24, R.1132A, 10s. Postage extra. About 80 others available.—Brooks, 5 Farrant House, Winstanley Road, London, S.W.11.

WANTED: Sommerkamp FR-500 receiver, 2-metre converter and FM detector not essential. **SELLING:** Mullard 5-10 Hi-Fi amplifier, with control unit, 80s.—Stringer, 76 Cuckfield Road, Hurstpierpoint (3127), Sussex.

WANTED: Trio 9R-59DE or equivalent general coverage receiver for 1.0 to 20 MHz.—Davies, 95 Preston Street, Shrewsbury (4780), Shropshire.

SALE: Heathkit SB-610 monitor 'scope, quite new (only been tested) for 465 kHz but all IF coils supplied, £38. FR-100B Rx, coverage 1.8 to 30 MHz and 15 MHz band, £85; matching speaker, 60s. KY102 bug key, new and unused, 60s.—Barry, 47 Gerald Road, Wollaston, Stourbridge, Worcs.

EXCHANGE or SELL: BC-221 frequency meter with original charts, internal stabilised PSU and headphones FOR R.209 receiver, 12v. DC, or sell the BC-221 cheap. **WANTED:** Eddystone S.750 Rx in any condition.—Handy, 105 Humber Avenue, Coventry, Warks.

MOBILEERS: Lucas 11AC Alternator, positive or negative earth, complete with all control boxes, universal bracket and technical data, price £20.—Michaelson, G3RDG, QTHR, or ring 01-455 8831.

WANTED: Hammarlund SP-600 VLF Receiver, must be in new condition and unmodified; state price and condition.—Passfield, 30 Greenleaf Close, Tulse Hill, London, S.W.2. (Tel.: 01-674 5825.)

WANTED: CR-100 or similar receiver, in good condition; preferably from the London area.—Oughton, 48 Morley Hill, Enfield, Middlesex.

FOR SALE: KW-201 SSB receiver, 16 months old and in excellent condition, with crystal calibrator, handbook and circuit, £85 or near offer. (London area).—Box No. 4883, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SMALL ADVERTISEMENTS, READERS—continued

WANTED: By SWL, an Eddystone S.640 or similar receiver. Offers, pse.—Lloyd, 10 Melbourne Road, Earlsdon, Coventry, CV5-6JP.

SELLING: Marconi ATU, 25s. R.C.A. Crystal Multiplier, 50s. BC-1033, 50s. HRO PSU, 50s.; dial, 30s.; coil, 20s. Meters 20 microamp., 54 mV, 25s. each; RF, 20s. Multitester, 35s. Receiver R.450/SP-600J11, 540 kHz to 54 MHz, technical U.S.N. R.50M, £16 10s. BC-788 VHF, 27 to 145 MHz, 50s. Bendix MN-26Y, 30s. R.C.A. Aircraft Transmitter, 160m., 70s. BC-221, £10. Carriage extra, s.a.e. for details and list.—Wright, 249 Sandy Lane, Hindley, Wigan (55948), Lancs.

SALE: Sommerkamp FL-DX500 transmitter with companion FR-DX500 receiver and FL-1000 linear, £275 or near offer, or PART EXCHANGE KW-2000, etc., W-H-Y?—Jones, G5ZT, 3 Bircham View, Egguckland, Plymouth (76552), Devon.

OFFERING: Hallicrafters SX-146 receiver, eight months old (cost £140 new), still in as-new condition, at £90 or near offer. Part exchanges welcomed.—Snowden, Swainsea Lane, Pickering, Yorkshire.

SALE: Partly-built G3HTA-type receiver, complete with all new components, including Electroniques GC coil pack, Eddystone 898 dial, etc., etc.; also HE-30 Rx, needs attention, and Hamgear preselector—offers? **WANTED:** Speaker and headphones for Trio 9R-59DE.—Garlick, 135 Rookhill Road, Pontefract, Yorkshire.

FOR SALE: Yaesu FT-DX400 Transceiver, complete with microphone and handbook, bargain at £160, or near offer. (Cornwall).—Box No. 4882, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE Hallicrafters S.27 Rx. 28 to 144 MHz, for AM/FM, price £10. Also B.29 Rx, 15 to 560 kHz, £6. **WANTED:** Any information on the R.209 receiver.—Watson, 74 Bowrons Avenue, Wembley, Middlesex, HA0-4QP. (Tel.: 01-903 4363.)

SELLING: Star SR-200 Sideband Receiver, as new, price £30.—Scales, G3NRS, 17 Westfield Avenue, Scarborough, Yorkshire. (Tel.: 61238 day, 60623 evenings.)

RTTY Sale: Creed 7B teleprinter, F/F carriage, two governors, manual and cover, with latest DL6EQ T.U. bandpass filter, magic-eye indicator and PSU, in steel cabinet; also DL6EQ AFSK/1050 with Carpenter relay, in diecast box. All in excellent order, price £27. Delivery to 150 miles, petrol by arrangement.—Michaelson, G3RDG, QTHR. (Tel.: 01-455 8831.)

SALE: Cossor double-beam oscilloscope, working, £10 or near offer. Also 19in. commercial TV studio monitors, working, bargain at £10, plus carriage.—Jones, G5ZT, 3 Bircham View, Egguckland, Plymouth (76552), Devon.

FOR SALE: Cossor 1035 Mk. II Oscilloscope, £25. Creed 7B teleprinter, with tape attachment, less keyboard and type, £8 10s. CRM-1 indicator, £7 10s. Marconi HU11 FSK audio adaptor, with manual, £18. Stroboscope fork, GPO No. 5, 125 Hz, 30s. Command receiver, 1.5 to 3.0 MHz, brand new and boxed, £8. Codar PR-30X preselector, £5 10s. Green & Davies two-metre crystal converter, 14.16 MHz IF, 90s. Triplett signal generator Type 1632, as new, £12. AR88 speaker, brand new, 55s. Replacement film-strip dial for R.216, 21s.—Reynolds, 5 Headland Way, Lingfield, Surrey.

WANTED: Buy or loan, handbook or circuit diagram for BC-733 aircraft receiver.—Whittingham, 17 Erlesmere Avenue, Denton, Manchester.

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EDDYSTONE EC10 Mk. 2 £69 10s., ... Mk. 1 £59 10s.
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TRIO TS510 Transceiver with PS510 £212
TRIO JR310 latest S.S.B. A.M. Rx £77 10s.
TRIO JR500SE, stable, S.S.B. A.M. £65
TRIO 9R59DE, 550 Kc/s to 30 mcs, gen. cov. £39
TRIO HS4 phones £5 19s. 6d., ... speaker ... 85/-

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R.C.A. AR88D, very nice Rx in good condx. £55
PYRAMID LINEAR, demonstration model, all parts £50
PILOT BLUE PETER with trawler band B.C. set £10
LABGEAR LG50 Tx, 80-10m., A.M., C.W. £25
LABGEAR 2m. CONVERTER, 4-6 mc I.F. powered £10
MARCONI, Super TF144C, attenuator first class £25
 Carriage extra all Receivers, etc.

6HF5 VALVES NEW R.C.A. ... four matched £10 + 4/6
6HF5 VALVES, 2 gns. ea. + 10/7 tax ea., ... pair £5 + 2/6
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SPHINX and **PYRAMID** cabinets and PNLS, bargain £4 ea., 12/6
XTALS 10/- ea., ... **ROTARY RELAYS** 11/6 ea. + 2/6
BIRKETT'S BETTER BEAMS, 2m., new 49/6 + 12/6
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KLYSTRON power supply units. Modern, slight external damage, £4/10/-, carriage paid.
METERS. 2 1/2" round 500 ma, 3 1/2" square 5 ma calibrated 0-400 amps, 3 1/2" square Moving Iron 100 volts, 15/- each, post paid. Oblong 6" x 4 1/2" 250-0-250 Microamps calibrated 2.5 volts, 750 mV, 50 mV, 4 1/2" x 4 1/2" 204 microamps, calibrated 3v., 10v., 100 ohms, 25/- each, post paid.
ONE ONLY. C.T. 478 Precision Signal Generator 1.3 to 4.2k. Mc/s., calibrated attenuator, etc. for 200/250 A.C., £27/10/-, carriage paid. Excellent condition.
RECEIVERS. R1475. 2-20 Mc/s. Large slow motion dial, etc., with original power unit for 12 volts D.C. or 230 volts A.C. Less connecting cables, all connections marked, £11, carriage £1.
RECEIVERS. B40, 640 kc/s. to 30 Mc/s. Speaker A.C. power unit built-in. Bandwidth switched 1, 3 and 8 kc/s. Crystal calibrator, circuit diagram, £22/10/-, carriage 30/-.
AVO 7, fully reconditioned with test leads and leather case, £13, registered post paid.
WEATHER FORECASTING EQUIPMENT. Rainfall gauges, consisting of copper funnel, collecting bottle and measure with chart for year, 30/-, Wet and Dry bulb Hygrometers with relative humidity charts, Centigrade, 24/-, 8-day Thermographs readily available charts, £7/10/-, All post paid.
WAVEMETER Class D as new with accessories, 6v. D.C., £7, carriage paid.
AERIAL VARIOMETER TUNERS for 91 set, 16/6, post paid.
HEADSETS for 19 or 22 set with microphones, used, 10/-, post paid.
RACAL RA17. Aerial trimmer capacitors 220pf, 5/-, post paid.
CENTRE ZERO AMMETERS. 30 amp. for cars, 7 amp. for motor cycles, 8/6 either, post 1/6.
CRYSTAL CALIBRATORS No. 10. Excellent condition, £3/10/-, post paid.
WALTON pocket watches, unissued, £3/10/-, registered post paid.
VALVES, new 807 and 5U4, 6/- each, post paid, or 6 for 23/-, post paid.
RELAYS PO 3000 type, new, 1000 ohms, 2 make 2 break 5 amp. contacts, 7/6, post paid.
SINGLE GANG 500 pf VARIABLES, new and boxed, 6/-, post paid.
PAPER CAPACITORS, 6 µf at 2000 test volts. 4" x 5 1/2" x 1 1/2", four 18/-, post paid. Cad.-plated **EQUIPMENT HANDLES**, 5" centres x 2 1/2", two for 7/-, post paid. **COSSOR 1035** Scopes, £17/10/-, carriage paid.

FOR CALLERS ONLY
AR88 RECEIVERS, from £35, **7B TELEPRINTERS**, £10.
 All Receivers and Test Equipment are in working order at time of despatch. Carriage charges quoted are for England and Wales only.
 Telephone 34897
 Terms: Cash with order. Early closing Wednesday.

40-42 PORTLAND ROAD, WORTHING, SUSSEX

SMALL ADVERTISEMENTS, READERS—*continued*

WANTED: Heathkit RA-1 receiver; good condition essential; price and full details please.—Boston, 14 Gainsborough Close, Rainham, Kent.

FOR SALE: Minimitter Mercury transmitter, covers 10 to 80m., AM/CW/FM, runs 150 watts, in excellent condition, £30. R.C.A. AR88D receiver, £40. Hallicrafters S.20R Rx, £15. Output Power Meter Type TF-340, £10. Advance Signal Generator E1, 100 kHz to 60 MHz, £10. Advance Audio Generator Type J1, £20. Cossor Type 343 Ganging Oscillator, £10. (South-East).—Box No. 4884, Short Wave Magazine Ltd., 55 Victoria Street, London, S.W.1.

SELLING: CR-100 and S.36A receivers with manual and spares, both require some attention. Price together £20.—Ring Neale, Dorking 6133.

WANTED: For a U.S. amateur, Heathkit SB-10U SSB Adaptor; first class condition essential.—Full details, pse.—Bluer, GW3UUZ, QTHR.

OFFERING: Receivers Racal RA-17L, with RA-98 SSB Adaptor; Hammarlund HQ-180AC, with speaker; Marconi CR-150 and PSU; also two Pye Ranger dash-mounting low-band Tx/Rx and one Base station. K.W. Valiant mobile Tx, covering 10 to 80m. Triumph Oscilloscope/Wobbulator (ex-U.S. Navy), for 115/230v. BC-221AH frequency meter, with RA-133 regulated PSU. American Heathkit Q-Multiplier, 450 to 460 kHz. WANTED: A.T.M. CRM-1 Tuning Indicator, FSY and FSW Terminal Units; friction carriage for Creed 7B printer; Eddy-stone 830/7 receiver; Audio Oscillator. (Home Counties).—Box No. 4885, Short Wave Magazine Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Nova-Pal D/F receiver, complete with all charts, mint condition, in leather case with mounting brackets, etc., £18. Sanyo Tape Recorder, Model MR-212, with spare tapes, microphone and also in mint condition, £14; mains PSU for recorder, 30s., or free with foregoing. WANTED: K.W. E-Zee Match and 50-ohm 3-way coax switch. State price, condition, etc.—Jones, GW3TMP, QTHR.

SALE: Minimitter Mercury Tx, Model 200, in mint condition electrically and mechanically, coverage 10 to 80m., AM/CW/NBFM, with Minimitter LP filter and spare (new) TT21 PA valves; also unused 10-metre dipole with 60ft. coax. All-in price £35, delivery at cost. (South-East).—Box No. 4887, Short Wave Magazine Ltd., 55 Victoria Street, London, S.W.1.

SALE: TG-10 Auto Morse paper-type keyer, U.S. Army model, 115v. mains, seven valves and p-cell, variable speed tape drive, with circuitry, price £5, buyer to collect. Coax relay for aeriels, new, 15s. Xtals 1 MHz, miniature and 3in., 15s. Manuals: T.1131, T.1154, BC-728 U.S. Army Rx, 15s. WANTED: R.A.F. Type 4 push-button control box; Hallicrafters S.5-10 Rx; BC-187 Tx.—Cockle, 14 Leewood Way, Effingham, Leatherhead, Surrey. (Tel.: Bookham 5439.)

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