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VOL. XVIII OCTOBER, 1960 NUMBER 8

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SHORT WAVE MAGAZINE

Vol. XVIII OCTOBER, 1960 No. 204

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

Advertisement Manager: M. GREENWOOD

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

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

AUTHORS' MSS

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FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT-WAVE Magazine

EDITORIAL

Defence *The trend of world events — sometimes called "the international situation" — periodically gives rise to some anxiety, when it looks as if it might not take much to spark off a war in which we could become involved.*

We are in such a period at present. While obviously it is not our intention to start sounding off on the war-horn, it is worth remembering that there is at the moment a great need for more recruits for Civil Defence — to say nothing of the Service reserves — and in particular for those who can be fitted in for communications duties.

It is here that the AT station operator has so much to offer. With his specialised knowledge and experience, he can play a large and important part — not, be it noted, by offering his station and equipment for some private network operated on the amateur bands, but by offering himself for training either with the local Civil Defence organisation, or in a Service reserve.

The responsibilities undertaken by experienced radio amateurs in war, and in particular the last war, are now a matter of history. By joining up in good time and getting trained, they were ready when the call came and made a contribution out of all proportion to their numbers. This is not to mean that the same thing is about to happen again, or that it ever will, but in all human affairs it is as well to be prepared for eventualities.

As things are, the authorities responsible for the nation's preparedness are dependent mainly upon volunteers. And apart from any other consideration, membership of a Service reserve organisation can be very satisfying and worth-while for its own sake.

Austin Forbes G6FO.

WORLD-WIDE COMMUNICATION

Improved Grid Dip Oscillator

WITH DC AMPLIFIER

A calibrated grid dip oscillator is almost essential if any experimental work at all is being done—certainly, it is one of the first things with which the beginner in transmission should provide himself. It is easy to make, simple to use and has many practical applications. This article describes a version of the GDO which is a little better than the usual arrangement; it is more sensitive, and so the calibration can be made more accurate and reliable.—Editor.

ONE of the most versatile pieces of equipment an amateur can possess is a Grid Dip Oscillator. Where much experimental work is carried out, it becomes almost indispensable.

Resonance of a grid dip oscillator with the circuit under test is often indicated by noting the change of grid current as read on a meter inserted in series with the grid leak. As the current is low, a very sensitive meter is necessary, and even then the movement of the needle is only small unless tight coupling is used between the two circuits—and tight coupling should be avoided because it is liable to cause an appreciable change in the GDO frequency.

It is not the actual grid current flowing which is of interest so much as the *change* of grid current, and it is obviously desirable to amplify this effect if it can be done without undue complication. In this case, DC amplification is called for and can easily be arranged with a bridge circuit in which a valve acts as one arm of the bridge. The negative grid potential developed across the oscillator grid leak is applied to the grid of the amplifying valve. When an external circuit interacts with the GDO, the grid current falls, the grid potential becomes less negative, and the resistance of the anode/cathode path of the amplifier valve drops. The balance of the bridge (in the anode circuit) is upset and a good positive upward reading is given on a suitably connected meter. This is altogether more satisfactory than trying to observe a slight dip of the needle. A further benefit is that a more robust type of meter can be used as an indicator.

The circuit of an instrument using this principle is shown opposite. For convenience, oscillator and amplifier triodes are contained in a single envelope and, to permit compact construction, a miniature valve on a B7G base is employed—the Mullard ECC91 and the 6J6 are equally suitable.

The first half of the valve is arranged as a normal oscillator. The second half is the DC amplifier, the bridge being formed by R5, R6, R7 and R8 in series, and the valve itself. The meter is connected with the polarity indicated and the needle adjusted to zero with R7. The actuating voltage is taken from the junction of the two grid resistors R1 and R2, *via* a decoupling network which filters out RF voltage.

The magnitude of the reading obtained will vary according to the sensitivity of the meter, and this in turn depends on the full scale deflection. Ideally, a miniature meter reading to one milliampere would be excellent. These are now offered by several manufacturers. Alternatively, an external meter of any diameter can be used, a jack being fitted to the instrument and the meter plugged in when required. This, however, is not so convenient as having the dial and meter observable simultaneously, and it also means an additional loose lead to get in the way.

Another point is that the value of the resistors in the bridge arms depends on the meter full scale deflection. Obviously, if high value resistors are used with a high reading meter, sufficient current to give a large deflection could not flow even with a bridge completely out of balance. The values given are correct for an 0-5 mA meter, but R4, R5 and R6 should be increased to 47,000 or 51,000 ohms if an 0-1 mA meter is used (½ watt ratings are then permissible). R7 should be 25,000 ohms in the first case, 50,000 ohms in the second. A wire-wound component is desirable but not essential. The potentiometer can be a miniature type, but could as well be a full-size component.

Reverting to the oscillator, it will be appreciated that any standard circuit can be used, provided the design is such as permits operation at high frequencies. The present version is for what might be called "normal," high and medium frequencies, the range covered being from 30 mc (actually somewhat higher) to 820 kc. Standard Eddystone plug-in coil formers are used so that an intending constructor can rely on securing a close approximation to the calibration frequencies listed in the panel.

Grid Dip Oscillator

LIST OF COMPONENTS

1	Diecast Metal Box	*Cat. No.* 650 *Eddystone*
1	Microdenser 140 $\mu\mu$F (C1)	*Cat. No.* 586 *Eddystone*
1	Coil Base (4-pin)	*Cat. No.* 707 *Eddystone*
	Miniature Coil Formers (*as required*)	*Cat. No.* 763 *Eddystone*
1	Direct Drive Dial	*Cat. No.* 595 *Eddystone*
1	Knob	*Cat. No.* 785 *Eddystone*
1	Valve type ECC91	*Mullard*
1	Valveholder B7G type	
1	M/C Meter — *see text.*	
1	Switch SP on/off	
1	Potentiometer 25,000 or 50,000 ohms (R7) — *see text.*	
2	3-way Tag Strips.	

Fixed Condensers

C2 = 100 $\mu\mu$F Silvered Mica.
C3 = 200 $\mu\mu$F Silvered Mica.
C4 = .001 μF Moulded Mica.

Resistors

R1, R2, R8 = 10,000 ohms ½ watt.
R3 = 100,000 ohms ½ watt.
R4 = 47,000 ohms ½ watt.
R5, R6 = 27,000 or 47,000 ohms (*see text*) 1 watt.

Coils

Eddystone plug-in formers, or "Globe-King" type—*see text*

Construction

The construction is straightforward, except perhaps for fitting the valveholder in a position to give room for the small components attached to it, and which also allows for easy valve insertion. The valveholder should be spaced away with half-inch pillars and all connections to it should be made before bolting in position.

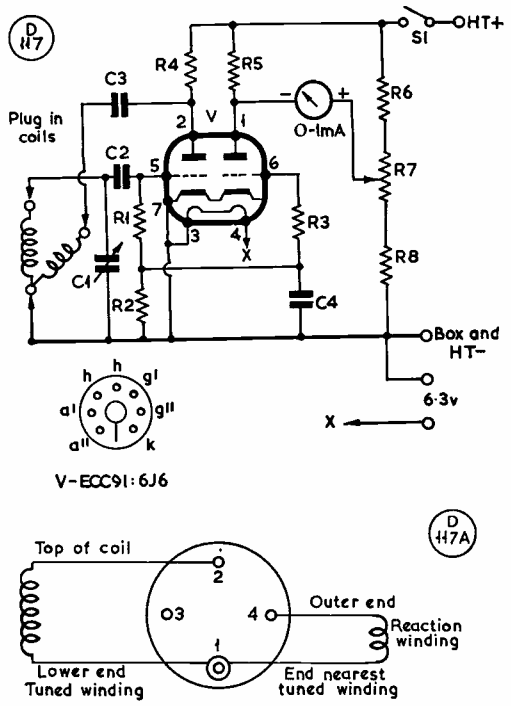
When the lid of the Eddystone box No. 650 used in the model is screwed in place, the box becomes almost airtight. To prevent the temperature rising to an undesirable degree, it is necessary to drill a few ventilation holes in the lid and in the box, particularly in those parts adjoining the valve.

The Coils

The correct type of coil former to employ is the Eddystone Cat. No. 763, which is fitted with a four-pin base to match the socket specified. Since the requirements are by no means critical, it will not be difficult to make coils for the higher frequency ranges. Unfortunately, dust-cored formers are not available, hence for the lower frequency ranges a considerable number of turns will be necessary, involving the use of fairly fine wire. Even so, a range extending well up into the medium wave broadcast band can readily be obtained.

Details are given in the panel for constructing the five coils required to give a range from 30 mc to approximately 1,000 kc.

Solenoid winding—that is, single layer with the turns touching or nearly so—is adopted for the coils "LB" through to "W," spacing the wire slightly in the case of the "LB" and "Y" coils. On the "W" coil, the coil former



Circuit of the GDO described in the article; it is a great deal more sensitive than the usual arrangement because the second triode is used as a meter amplifier. The coil connections are shown below, pin 1 being the earth point, pin 2 the grid connection, and pin 4 the C3 end of the reaction winding. The former is the Eddystone No. 763 4-pin miniature.

COIL WINDING TABLE

Equivalent to Eddystone Coil type	Tuned winding, turns	Reaction winding, turns	Wire gauge, s.w.g.	Spacing between coils
LB	4	3	26	$\frac{1}{16}$ in.
Y	14	4	30	$\frac{1}{16}$ in.
R	30	7	30	$\frac{1}{16}$ in.
W	70	12	36	$\frac{1}{16}$ in.
P	130	20	36	*none*

accepts comfortably in a single layer the 70 turns of 36 gauge enamelled wire but some degree of pile winding, *i.e.*, winding turns over each other, becomes necessary to get on the large number of turns in the "P" coil. If coverage of a further and lower frequency range is wanted, a greater degree of pile winding must be used, with the number of turns in both windings increased in proportion. It is not advisable to use wire of a gauge much finer than No. 36, as it becomes difficult to handle

and will not stand up so well to wear-and-tear.

Coming to the actual winding procedure, holes are drilled with a 1/16-in. drill at appropriate points in the former, in line with the pins to which the wires will be taken. The wire is first threaded through the hole nearest the base and then again through pin 4, to which it is soldered. The reaction coil is then wound on near the base of the former—no special care is necessary and the turns can well touch and overlap. This completed, a loop of wire is formed, passed through the second hole and drawn through pin 1, which is the largest of the four. After drawing taut, the wire is soldered to this pin. The tuned winding is next added, winding in the same direction, taking the end of the wire through the top hole in the former and soldering it to pin 2.

It is desirable to fix the turns firmly in place, especially on the ridges of the former, with polystyrene cement, to ensure that calibrations once made hold good. A spot of the appropriate colour painted on the top of each completed coil will aid quick identification, or labels fixed with "Sellotape" will serve the same purpose.

Initial calibrations should be made against the scale of a wide coverage communications receiver and curves prepared on graph paper. The graphs will last longer if pasted on to good quality cardboard.

The measured figures for the first three coils —"LB," "Y" and "R"—should match up fairly well with those quoted in the table but the winding on coil "W" has been deliberately adjusted to allow coverage on the one coil of the 1·8 mc and 3·5 mc amateur bands, and, in the prototype, the frequency runs from 2,000 kc at 70° to 4,000 kc at 15°. The "P" coil, wound as specified, gives a range from 990 kc at 100° to 2,000 kc at 22° but the way it is wound may lead to some variation of these figures.

Using Commercial Coils

The second alternative is to adopt the "Globe King" series of coils recently introduced by Johnsons Radio, Worcester. Three are available and between them give a coverage from 30 mc to 3 mc. They are fitted to a standard four-pin base of the type used in the older variety of valve. A good point is that a protective cover is fitted over the winding. Also the constructor should have no great difficulty in making up one or two coils on old valve bases to extend the frequency range in a lower direction.

It will, of course, be necessary to substitute a different socket, in the shape of a standard four-pin valveholder, in place of the miniature socket specified. The reaction winding in the "Globe-King" coil is not electrically connected to the tuned winding, as is the case in the Eddystone type of coil, hence to use it in the specified circuit, the earthy end of the reaction winding should be jumpered across to the earth pin at the socket.

Further particulars of these coils can be obtained from the manufacturers, whose address is St. Martins Gate, Worcester.

Power Supplies

The power requirements are, of course, quite small—6·3 volts 0·45 amps and 150 volts, 4-6 mA—and it would be a good idea to build a small power unit into a second die-cast box, bolted to the first, or better, fitted with a socket to match up with a suitable plug on the GDO box. Such a unit was envisaged (especially as further instruments on the same pattern are being constructed for higher frequencies) and a single plug-in power unit would serve throughout. Rectification and smoothing would present

Frequency Calibrations

(A)

DIAL Reading	LB mc	Y mc	R mc	W kc	P kc
100	16·20	7·00	3·05	1450	820
90	17·00	7·40	3·20	1520	860
80	18·20	7·90	3·43	1610	910
70	19·60	8·50	3·70	1730	970
60	21·40	9·30	4·00	1870	1045
50	23·50	10·25	4·40	2050	1130
40	26·40	11·50	5·00	2250	1240
30	30·00	13·20	5·70	2520	1365
20	(26·—32 mc)	15·50	6·70	2860	1520
10	-	18·50	7·90	3300	1675

(B)

DIAL Reading	LB mc	Y mc	R mc	W kc	P kc
0	16·20	7·00	3·05	1450	820
10	16·45	7·15	3·10	1470	830
20	17·00	7·42	3·23	1510	855
30	17·90	7·83	3·39	1580	890
40	18·90	8·30	3·60	1670	938
50	20·40	8·90	3·85	1785	995
60	22·25	9·75	4·20	1925	1070
70	24·90	11·00	4·73	2125	1175
80	29·20	12·90	5·53	2450	1325
90	-	16·20	6·86	2910	1530

Calibration figures obtained for the GDO built as described; these are given for guidance only, as readings obtained on individual instruments may vary somewhat if not constructed exactly as specified. The coils are wound on Eddystone miniature plug-in formers and can be selected for the ranges required. The "Globe King" coils are also suitable – *see text*. Table A refers when the dial reading increases with capacity, and B when the dial is fixed to give readings increasing with frequency.

no problem, since metal rectifiers are available and resistance smoothing would suffice. The difficulty lies in the mains transformer, which can and must be of small dimensions.

The HT supply should have good regulation and, if possible, it should be stabilised at 150 volts or so. It is permissible to use 200 volts HT if the resistors R5 and R6 are of high value, but no advantage is gained by so doing and, in general, it is wise to keep the voltage between 100 and 150.

Testing

For the first test, a coil should be inserted in the holder, and, after allowing time for the valve to warm up, the switch S1 closed. All being well, adjustment of R7 will bring the needle of the meter to zero. Touching the coil should cause the needle to rise rapidly, and this is a sign that the circuit is oscillating properly. The zero adjustment will vary from coil to coil, and it is likely that the needle will move slightly from one end of the range to another, but this effect can be disregarded, as it is a smooth, slow movement, very different to the sharp rise brought about when the GDO is operated in the usual way.

Inverse and Direct Dial Readings

There are two ways of fixing the dial—one with the reading increasing as the condenser vanes mesh; the other (180° diametrically opposite) with the reading increasing as the capacity becomes less. In the first case, frequency decreases as the dial reading increases, and it is often more convenient to have frequency and dial reading increasing simultaneously. Two sets of figures, A and B in the panel, are therefore provided, and a constructor can choose whichever method he prefers. The change of capacity over the ten degrees each side of minimum capacity is small, and it is well to ignore the last few degrees. For this reason, the figures in the panel omit readings at zero (inverse reading) and 100 degrees (direct reading).

It was found that " squegging " occurred with the LB coil at frequencies above 24 mc. Probably this trouble would disappear if a lower HT voltage was used, but it was thought desirable to eradicate it by modifying the coil. Two reaction turns were removed from the winding nearest the base, an operation easily carried out.

Uses

For the benefit of those not familiar with the uses to which a grid dip oscillator can be put, a brief recapitulation may be of assistance. The chief application is to determine the resonant frequency of a tuned circuit, as found in receivers, transmitters and many other equipments. It is not necessary that the circuit under test be made to oscillate; therefore no power need be applied to associated valves. Also the tuned circuit can be in its proper place, with other components connected, so that the reading obtained takes into account stray capacities. It is only necessary that the coil on the GDO can be brought into fairly close proximity to the coil under test. When this is done and the dial on the GDO is rotated, resonance will be indicated by a sharp upward kick on the needle of the milliammeter (unless the assumption regarding frequency is a long way out). The coupling between the GDO coil and the test circuit can then often be reduced whilst still maintaining a definite meter reading —such loose coupling permits a greater degree of accuracy. Reference to the curve on the graph then gives the actual frequency.

Aerial Resonance

Another application is to determine the resonant frequency of an aerial system. Considerable information can be obtained in this way—in fact, for anyone with a definite interest in aerials, the GDO is well worth constructing for this purpose alone. The subject is, however, one which merits fuller treatment than can be given in this article.

Vertical Aerial System for All Bands

NOTES ON THE MOSLEY V-4-6 ARRAY

N. P. SPOONER (G2NS)

IF plumbers have in the past found delight in a certain multi-element array, quarrymen should now derive joy from a multi-band trapped vertical radiator that works best when on ground "that is *low* in relation to surrounding terrain." The visitors who descended upon G2NS after he had set up his present (new) QTH evidently believed in the old adage of "the higher the better." They gazed at the new 20ft. Mosley V-4-6 standing flat on a concrete path in the back garden, they shook their heads solemnly, and they exclaimed loudly "It'll never work."

At the time of writing, this particular vertical has been in position for three months and while domestic commitments have been heavy, time short and summer conditions not-so-good, the following contacts at least show promise — On *7 mc:* DJ, EI, G, GI, HB, OH, ON, PA, SM, SP, UB, YU and W1. On *14 mc:* G, KP4, PX1, PY1, PY7, UB5, UJ8, UL7, VE2, VO1, W1-4, W6, W8-Ø. On *21 mc:* CT1, EA7, G, UA3, UC2, VE3, VE4, W1-2, W4, WØ, ZB1. On *28 mc:* Locals. For those who like SWR figures, the 75-ohm coax (which should of course be 52 ohms) gives 1·1 on 7 mc, 1·2 on 14 mc, 1·4 on 21 mc, 1·5 on 28 mc.

Portable, field-day, emergency and expeditionary enthusiasts should welcome this extremely light radiator because its very rapid assembly entails merely pushing together two traps and three lengths of tubing, the whole being secured with four screws. In transit, its longest element is only 7ft. 9in., and with a greatest diameter of less than one inch, windage is negligible and it ignores gales and storms. Its inconspicuous appearance should appeal particularly to city and housing estate dwellers who may find in it the answer to their neighbours' objections to aerial farming.

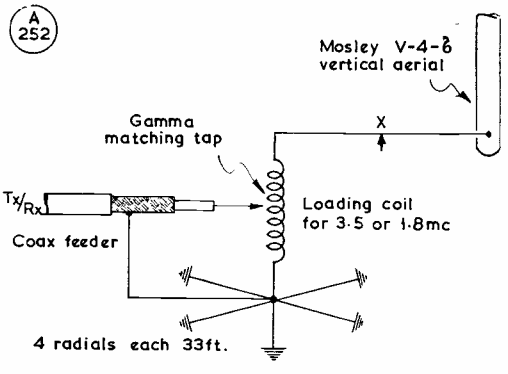
Frequency Coverage

It should perhaps be explained that, as supplied, the quarter-wave Mosley V-4-6 covers 7 to 28 mc, but by the addition of loading coils its coverage can be extended to the 3·5 and 1·8 mc amateur bands. For this, the standard theory is simple: A loading coil is placed in series between aerial and earth; it is tuned either by adjusting the number of turns *or* by a variable condenser in series between aerial base and coil; a gamma match is obtained by tapping the inner conductor of the coax feeder up the coil from the earthed end until the highest reading is obtained on a field strength indicator or the lowest on an SWR meter. About six turns in from the earthed end seems the best tapping point on 3·5 and 1·8 mc.

The sketch shows this loading method, both coils being contained (for weatherproofing) in plastic (lunch) boxes with lids. As a rough guide, the writer found that a 3·5 mc coil consisting of 32 turns of 14 gauge wire, spaced $\frac{1}{8}$in., on a 4in. former hit the band at 3,550 kc, while 26 turns in circuit gave 3,750 kc. For 1·8 mc operation, another coil with 35 turns of 18 gauge wire, spaced $\frac{1}{8}$in. on a 2in. former, was placed in series with the 3·5 mc coil. The SWR readings on both bands were 1·1 and although much lower inputs are invariably used, no difficulty was found with the pi-tank output when loading to 150 and 10 watts respectively. The first CQ on 3·5 mc raised an OZ, that on Top Band produced immediate U.K. replies.

Installation

There is one necessity that may at first appear tiresome. In a vertical system of this sort, the "missing quarter-wave" has to be represented by four 33ft. radials, each terminated in an earth rod and if possible fanned out like wheel spokes on the ground. Where this is not practicable, the radials may be bent to fit the space available. In the writer's case,



Loading up the Mosley V-4-6 for operation on the LF bands. With the appropriate coil in position — see text for 3.5 and 1.8 mc values — tuning is effected either by adjusting the number of turns or by inserting a variable condenser at point X. The loading coils for these bands can be built into weather-proof boxes with plug-in connectors.

they are pegged down at the edges of two 30ft. × 10ft. grass plots, with the aerial itself based on a central concrete path.

A final point concerning the heavy-duty Amphenol coax socket and plug supplied with the aerial—small-diameter coax feeder is not too happy with these and the writer accordingly cut a new "grounding strap" from a piece of tinned strip, soldered the base ends of the radials to side projections purposely left on the strip and drilled the centre of the "strap" to take a more-familiar Belling-Lee standard coax socket. This new grounding strap with radials and socket was then attached to the aerial base and the whole bolted down to a flat piece of board resting on the concrete path.

The slim, straight silhouette of this vertical array tempts one to position it close in to the transmitter. Its makers say "No, put it out in the clear"—and to avoid possible line resonances on the lower frequency bands make the feeder at least 50ft. long.

Twenty-Five Watts of Audio

ECONOMICAL MODULATOR DESIGN

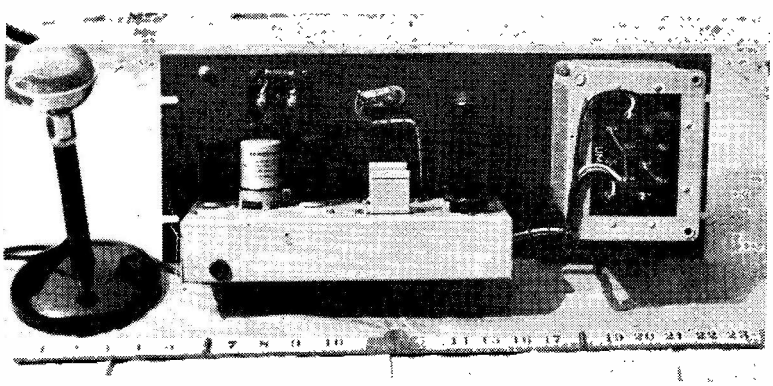
J. TALBOT (G3MVY)

THIS article describes a compact, economical audio system which can be used to modulate any of the commercial or home-constructed transmitters having a single valve of the 807 or 6146 type in the PA stage. Tests have been carried out using this modulator in conjunction with the CW version of the K.W. "Valiant" transmitter, and a Cosmocord MIC-22 table microphone.

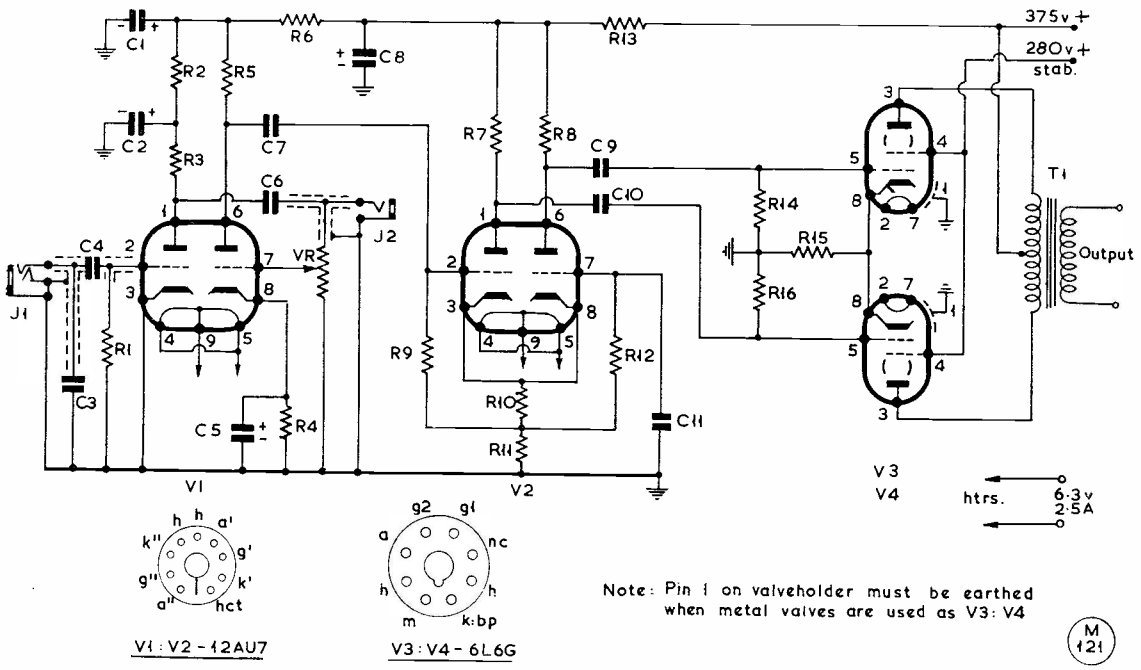
No claim is made for any originality in the circuitry. Nevertheless, as consistent reports of good speech quality have been received, it was felt that a description of the modulator might be of assistance to amateurs unfamiliar with audio circuitry and in need of up to 25 watts of good audio.

The first two stages consist of two halves of a 12AU7 (or ECC82) double-triode connected in cascade to give a high overall voltage gain. The input circuit should be found suitable for most communications-type crystal microphones. It will be noted that the cathode of the first stage is directly earthed, without the use of a cathode resistor. This greatly reduces the possibility of hum troubles caused by heater emission and whilst this deviation from the norm would probably be unsuitable for use in a high fidelity amplifier it is quite acceptable for AT station communication purposes. Condensers C4 and C6 have a high reactance at low audio frequencies while C3 cuts the high-frequency response in order deliberately to limit the range of audio frequencies passed to that necessary for clean, intelligible speech. This also has the very desirable effect of minimising side-band interference with other stations working on adjacent channels. Additionally, C3 serves to by-pass any RF that may be picked up on the microphone cord. These three capacitors, C3, C4, C6, should be physically small, the tubular ceramic type being ideal, in order to minimise hum pickup.

The additional jack socket shown in the circuit diagram is provided to enable a record player or tape recorder to be connected. (The Amateur Transmitting Licence permits us to radiate recordings of AT station transmissions, under the conditions stated in the Licence.) The frequency response of subsequent stages is fairly wide so that reproduction of recordings will not be "coloured" unnaturally. The gain potentiometer VR is used to adjust the signal



Impression of the general layout above chassis of the speech-amplifier/modulator described by G3MVY in the accompanying article. Provided the input side is properly screened, and layout of the parts approximates to the circuit diagram, any convenient form of construction may be adopted for apparatus of this sort.



In this circuit, the speech amplifier values are chosen to restrict audio response to the speech-frequency range, though "quality" output (for a tape-recorder or pick-up) can be obtained by using the jack position J2. As a modulator with a crystal microphone at J1, any RF amplifier running up to about 50 watts input can be fully controlled with good communications-quality speech.

level from both input sources.

Driver Coupling

The use as a phase splitter of a transformer with a split secondary is extravagant when a Class-AB1 output stage is intended and the risk of induced hum trouble is ever present. At least five basic circuits employing valves as phase inverters are available. The type most used in amateur equipment is the "concertina," in which half the valve load is in series with the valve cathode. The cathode-coupled phase inverter described here, however, will provide useful gain and also a greater output voltage. None of the components is critical in value but the two anode load resistors, R7, R8, should preferably be within 5% of one another for best results. These will probably still show a slight difference, in which case the value of R8 should be greater than that of R7. Another double triode, 12AU7/ECC82, is used in this position, V2.

The output stage takes push-pull 6L6's in Class-AB1. The use of a separate stabilised screen grid supply is recommended, but it is not strictly necessary unless the last ounce of power is called for. Under normal conditions a nominal output of 25 watts is obtainable. The common cathode resistor R15 does not require a by-pass capacity providing the output valves are reasonably well matched. It is a convenience to provide a 0-100 mA meter with a switch so that either one or other of the cathode currents can be monitored independently and rough checks for balance of output made.

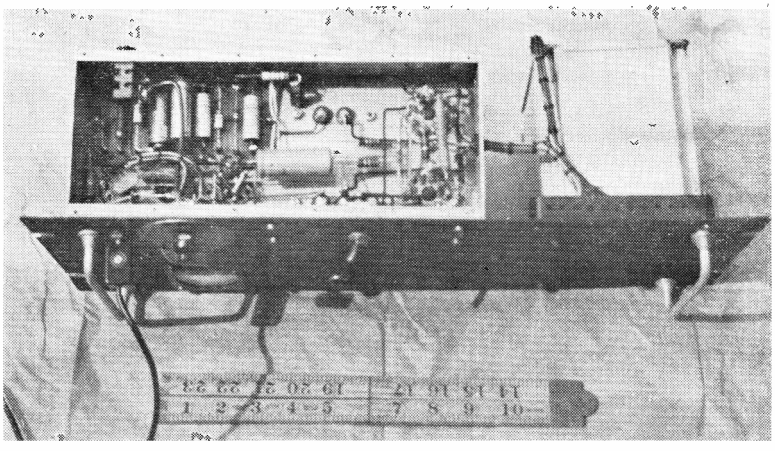
Table of Values

Circuit of the 25-watt Modulator

C1, C2	16 μF 350v. D.C. Electrolytic	R11	47,000 ohms, 1w.
C3	100 μμF	R13	4,700 ohms, 3w.
C4, C6, C7	·001 μF	R15	250 ohms 3w.
C5	50 μF 12v. D.C. Electrolytic	T1	Woden modulation transformer type UM1 or UM2
C8	8 μF 450v. D.C. Electrolytic	VR	0.5 meg. potentiometer
C9, C10, C11	0.1 μF 350v. D.C. paper tub	J1	Shorting jack socket (microphone)
R1	4.7 megohm, ½w.	J2	Open jack socket (pick-up, etc.)
R2, R5	100,000 ohms, ½w.	V1, V2	12AU7 (or ECC82)
R7, R8	100,000 ohms, 1w.	V3, V4	6L6G, GA (or metal) or EL34
R6	68,000 ohms, 1w.		
R3	220,000 ohms, ½w.		
R4, R10	2,200 ohms, ½w.		
R14, R16, R9, R12	470,000 ohms, ½w.		

Connections to Woden transformers when modulating 807 or 6146 valves at 50 watts D.C. input with push-pull 6L6's, 9,000 ohms anode-anode load: Anode V3 to 1; Anode V4 to 6; PA Anode to 7; PA HT to 12. Modulator HT, Pins 3 and 4 strapped together: Connect Pin 8 to Pin 9.

The use of 6L6's is not absolutely necessary. They are obtainable cheaply as surplus, but if brand-new valves are in mind, EL34's cost less than new 6L6's and should greatly increase the available output if the HT voltage is raised. The only likely circuit changes are in the cathode bias resistor, R15, and the tapping points on the modulation transformer.



As constructed by G3MVY, the 25-watt modulator unit is mounted on a standard 19 ins. by 7 ins. rack; this view is with the bottom cover removed. Other forms of construction are possible, such as the open chassis with or without a screening cover, and this is always a matter of individual preference.

The Woden type UM2 universal modulation transformer was used in the writer's unit as it happened to be available. The ratings are, however, within the capacity of a Woden UM1 which will prove satisfactory, and the cost is considerably lower.

For CW operation provision was made for disconnecting the 6L6 screens. In spite of what the valve manuals say about open-circuiting electrodes this has proved an entirely satisfactory procedure; it was done by means of a double-pole switch ganged to the gain control, the spare pole operating a 6·3 volt panel light.

As regards construction, the component layout is not critical. As always in audio equipment, the only necessary precaution is keeping signal leads short, particularly in early stages. A screen should be fitted for the first 12AU7 and preferably for the second also. It is likewise desirable to provide a bottom cover for the chassis, or direct RF pickup may cause trouble. Experience with several modulators of similar design has shown that lack of a bottom cover plate sometimes causes difficulties in operation on certain bands, often intermittently. The microphone cord must be well shielded, with the outer conductor of the cable earthed at the input jack.

Finally, let it be said that the case or chassis of the unit must itself be earthed in order that all these measures be effective.

Feeding the Top Band Dipole

THE PRACTICAL CONSIDERATIONS

R. WALMSLEY (G3IBB)

There is a popular misconception that the radiation resistance at the centre of a dipole is always in the region of 75 ohms. In the case of a Top Band dipole, this is far from true at the heights commonly obtainable at AT stations. For instance, a dipole cut for 160 metres, at a height of 30ft. or 40ft., will have a radiation resistance at the centre in the region of 15 to 20 ohms only. Such an aerial fed with 75-ohm line will result in loss of power, high standing waves and poor efficiency.

Consider the radiation from a horizontal dipole: Some of the waves will be reflected from the ground and induce another current in the aerial on passing. Assuming the power delivered from the transmitter remains constant, these induced currents caused by the reflected wave will add to or subtract from the original aerial current, giving a greater or smaller value of aerial current depending on the phase and intensity of the reflected component. As the power to the aerial from the transmitter has remained unchanged, the radiation resistance has therefore changed and may be greater or smaller than the radiation resistance of the same aerial in free space. As both the magnitude and phase of the induced current depend on the height of the aerial above earth, it follows that the radiation resistance will also depend on height. A graph showing radiation resistance as a function of height is shown in the diagram.

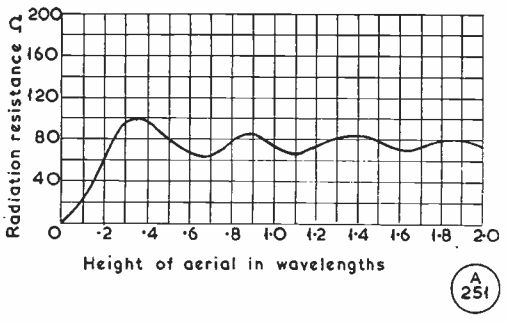
[over

From this graph it will be noticed that at heights greater than 0·2 wavelength the radiation resistance will not vary greatly from 75 ohms, the value of a dipole in free space. On amateur bands other than Top Band heights greater than 0·2 wavelength are easily obtained. For example, a dipole for 3·5 mc at a height of 33ft., *i.e.*, 0·25 wavelength high, will have a radiation resistance of 75 ohms. The same height would be 0·5 wavelength on 7 mc and again the radiation resistance will be 75 ohms. However, on Top Band, 33ft. will be less than 0·1 wavelength high, and the radiation resistance will be less than 20 ohms—in the region of 15 ohms, in fact.

Feeding a 160-metre dipole which is too low with 75-ohm feeder can result in a standing-wave ratio of 5:1—yet there are few who are fortunate enough to obtain heights greater than about 30ft. to 40ft. This situation is worse than feeding a dipole of 75-ohm radiation resistance with 300-ohm line, when the SWR would be 4:1.

Recommended Solution

A convenient method of increasing the radiation resistance of a dipole is to fold it. Assuming that the wires forming the radiator are close compared with a wavelength, and that the diameters are the same, a single fold will increase the radiation resistance by a factor of four times. This means that the 15 ohms at the centre of the dipole will now be 60 ohms, and feeding it with 75-ohm line will result in a SWR of 1·25:1 which is a great improvement.



The well-known diagram showing the effect of aerial height on radiation resistance. A half-wave aerial is assumed.

There is also a marked increase in bandwidth of the folded dipole compared with the ordinary dipole—a useful factor indeed on Top Band.

The construction of a folded dipole need not be complicated. It must be remembered that the two elements in the fold are virtually in parallel and therefore do not act as a transmission line. The radiator and feeder can be made with 75-ohm flat twin feeder, and the weight will not be much more than that of a single element type. To cut down cost, the writer has used plastic covered flat lighting flex fed with cheap TV type coax. It was found that a 250ft. top resonated at 1,850 kc and loading with the normal pi-coupler the system works well.

It is of interest that the measured loss of 100ft. of the cheapest coax was 0·4 dB at 2 mc, when correctly terminated. This is less than a twelfth of an S-point, which is negligible.

Semi-Automatic Morse Key

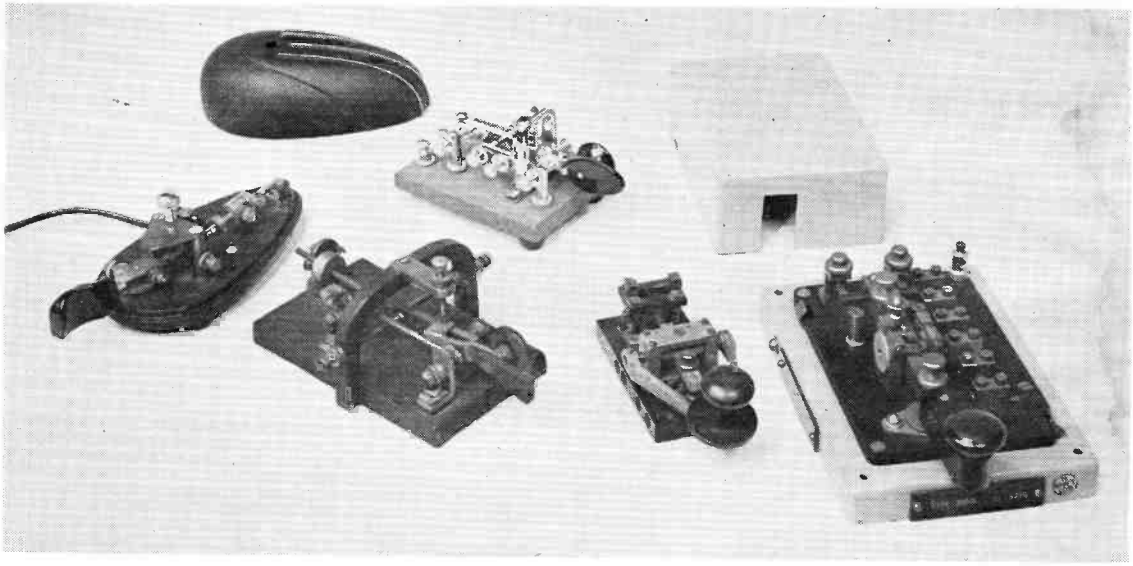
FOR WIDE SPEED RANGE—CONSTRUCTIONAL DETAILS

E. CHICKEN (G3BIK)

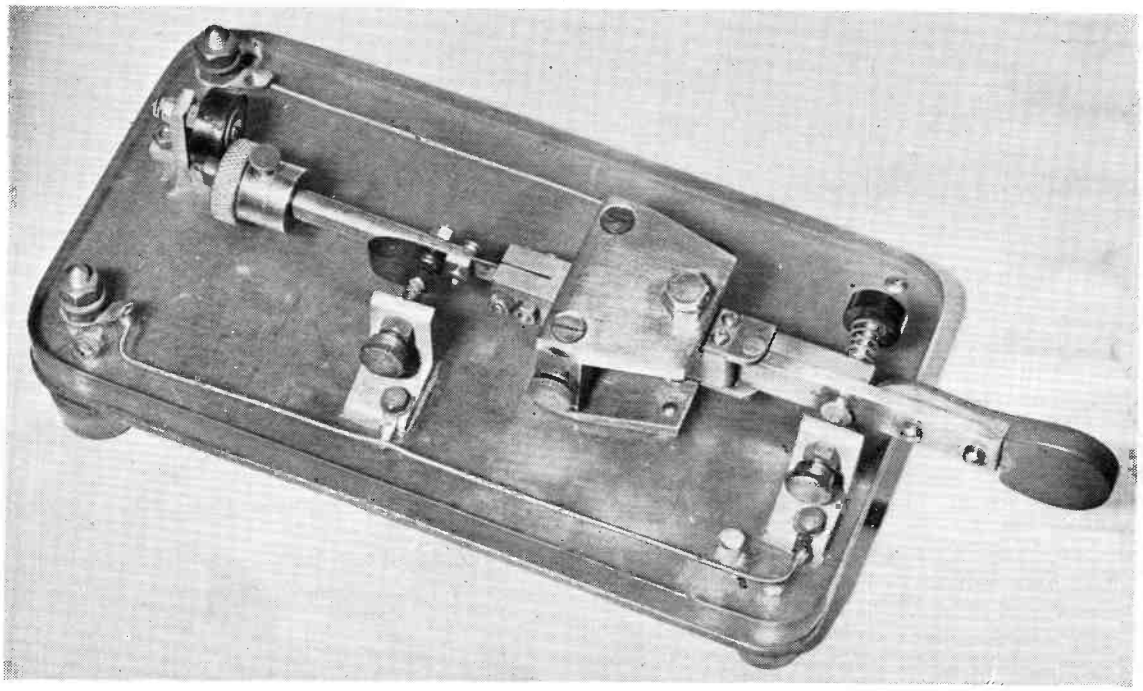
THIS very effective semi-automatic Morse key was constructed by the writer entirely from parts salvaged from the junk box. The base is a piece of thick perspex, with a brass backing plate to add weight. Four rubber instrument feet are fitted to prevent the key slipping on a polished surface. All the bolts fixing the various component parts to the base plate are countersunk into the underside of the perspex base to obviate undesirable short circuits. (A small dollop of wax over each of these bolt heads would be an additional safeguard.)

Most of the working parts of the key are of brass, which is easy to cut, drill or tap, and is, of course, a good conductor. The four keying contacts were either removed from old relays, or made from bits of silver, shaped and soldered to the appropriate parts. An adjustable dash tension spring is fitted, but the tension of the main arm return spring is fixed, determined by test, as this simplifies the construction. Spring leaves from an old relay were used to make the dot trembler and dot contact springs.

Damping of the trembler arm is effected by an annular piece of steel having a quarter-inch diameter central hole, which hangs loosely on a 6BA bolt; when the trembler arm makes



Collection of Morse keys of three different types. At left, the Eddystone speed-key, with its lozenge-shaped cover removed; immediately to its right in the foreground is a pre-war home constructed semi-automatic key of the type described in the article; the plated job behind is a modern vibro-keyer, made by the American Vibroplex Co., for operation in conjunction with an electronic keying unit such as the Hallicrafters HA-1, which has a speed range of 10-65 w.p.m.; on the right are two straight keys, one a Marconi design having three sets of contacts and a protective cover, and on its left a small ex-R.A.F. key of pre-war pattern, made by S. G. Brown and having platinum contacts.



The neat finished appearance of the semi-automatic Morse key made by G3BIK and described in his article. The action on such a key is quite different from that of the straight or "pump-handle" variety; once it has been acquired, the average operator can send better Morse for longer periods than is usually possible on a straight key. The operation of a semi-automatic key is very definitely something that must be learnt with an audio oscillator on closed circuit, and not over the air!

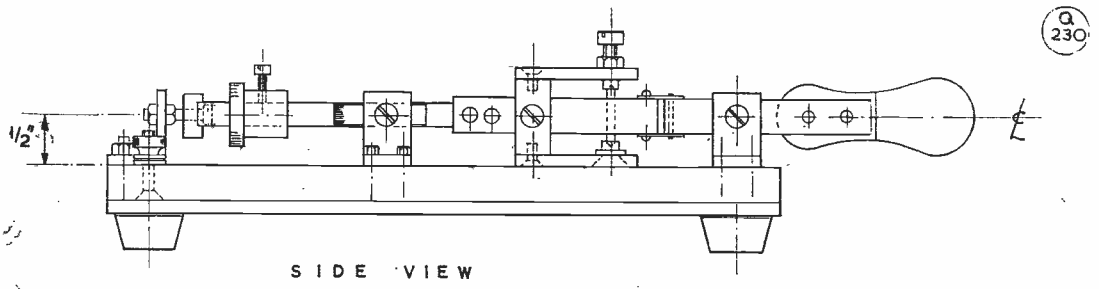


Fig. 1. Side view showing general construction of the semi-automatic (dash-dot sender) key described by G3BIK. The photograph on p.411 depicts the finished appearance, and all parts required (most of which can be made if they cannot be found in the junk box) are listed separately opposite.

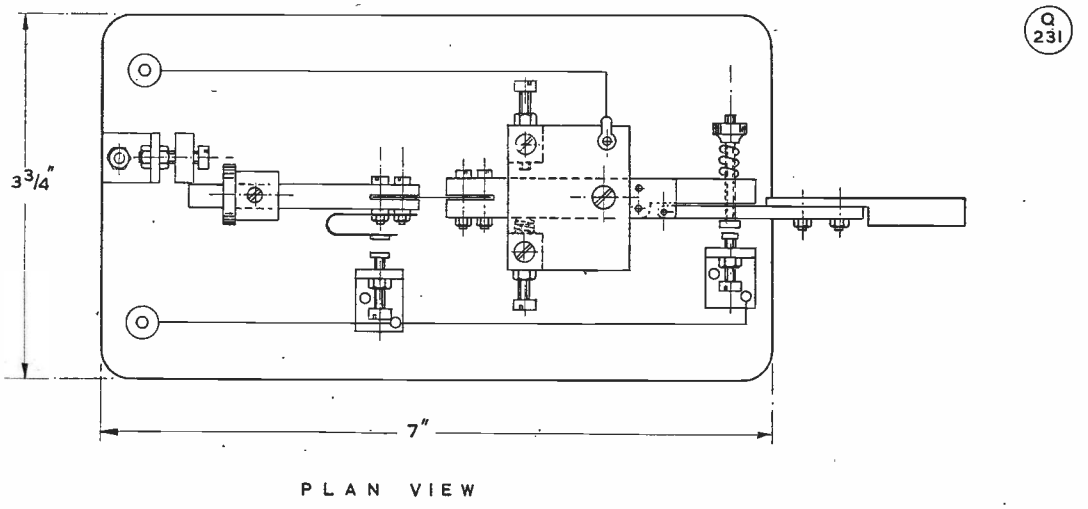


Fig. 2. Plan view of the semi-automatic key, showing arrangement of the parts. The dot-sender is carried on the vibrating arm, the period of vibration and hence the speed of the dots being controlled by adjustment of the sliding weight and the position of the end stop. The dash contacts are at the paddle end.

contact with the weight, it kills the vibration instantly.

The bearings for the main moving arm are made from 2BA bolts with a 1/16-in. dia. hole drilled $\frac{1}{8}$-in. deep in the end face of each. A piece of 1/16-in. dia. steel pin $\frac{3}{4}$-in. long is tight-fitted vertically through the main arm, to form the main pivot pin, which sits into these holes. If so desired, the pivot pins may be separate $\frac{1}{4}$-in. lengths fitted into shallow holes on the top and bottom of the main arm.

A similar system is used for the pivoting of the dash moving member, except that the pivot pins are approximately 1/32-in. dia. and are sited in holes in the upper and lower bearing plates. A small blob of solder is used to cover the outer sides of these bearing holes, to retain the pivot pins. These bearing plates are either bolted or soldered to the main arm.

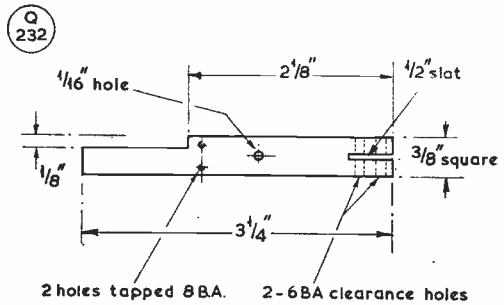


Fig. 3. The main moving arm, Item 17, for the G3BIK key should be constructed as shown in this sketch.

For the moving dash contact, a 6BA × 1in. bolt, with its silver contact soldered to the head, is tapped into the dash moving arm. It then passes through a clearance hole in the main arm and the pressure adjusting spring is retained

by a terminal nut.

Adjustment of the main arm travel is obtained by the two bolts tapped through the side pillars, with lock nuts. The main arm return pressure spring is made slightly longer than the exposed portion of the adjusting bolt, and sits over the bolt, bearing against the side pillar and the main arm. The main dimensions of the completed key can be deduced from the drawings.

The writer's model as illustrated weighs 2½ lbs. and has a speed range of 20-45 words per minute, depending upon the setting of the weight.

LIST OF PARTS

For Automatic Key

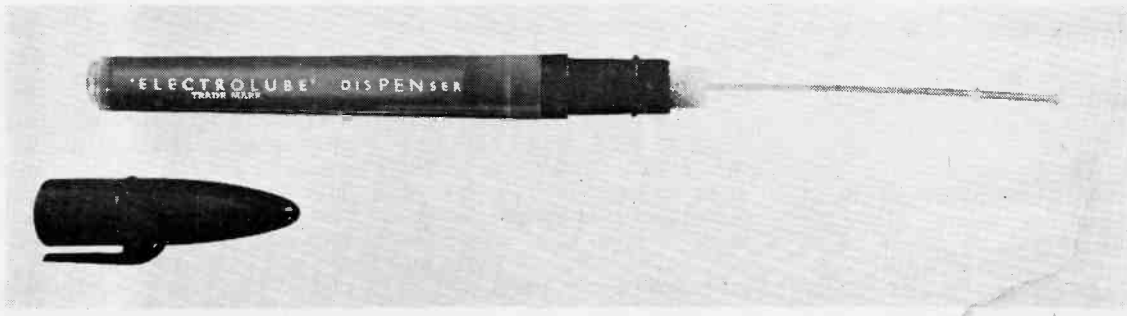
Item

1 Perspex base plate, 3¾″ × 7″ × ⅜″.
2 Brass base weighting plate, 3¾″ × 7″ × ⅛″.
3 4 rubber instrument feet, ¾″ dia. × ⅜″ high.
4 Damper holding bracket, ¾″ × ¾″ × ⅛″ angle alum. ¼″ wide.
5 6BA × ¾″ fixing bolt and nut for *item 4*.
6 Spindle for damper weight, 6BA × 1″ bolt and nut, with 2 washers.
7 Damper weight, ⅝″ dia. × ¼″ thick MS washer, ¼″ hole, with PVC tape round periphery.
8 Dot trembler arm, ¼″ dia. × 2½″ steel.
9 Bob weight for dot speed control, large 0BA brass terminal.
10 Fixing bolt for bob weight, 6BA × ½″.
11 Trembler spring leaf, 1¼″ × ¼″ × 10 thou.″ spring steel.
12 Fixing bolts for trembler spring, 4 off, 6BA × ½″.
13 Dot contacting spring, 1¾″ × ¼″ × 5 thou.″ spring steel.
14 Bracket for fixed dot contact, ¾″ × ¾″ × ⅛″ × ½″ long angle aluminium.
15 Fixing bolts for *item 14*, 2 off, 6BA × ½″ and nuts.
16 Fixed dot contact screw, 4BA × ¾″ bolt with nut.
17 Main moving arm, ⅜″ square brass × 3¼″ long.
18 Dash moving member, ⅛″ × ⅜″ × 2⅛″.
19 Bearing plates for dash moving member, 2 off, ½″ × ⅜″ × 1/16″ brass plate.
20 Fixing bolts for *item 19*, 4 off, 8BA × ¼″ bolts.
21 Moving contact bolt, 6BA × 1″ with end terminal nut.
22 Moving contact spring.
23 Fixed dash contact bolt, 4BA × ¾″ and nut.
24 Bracket for fixed dash contact, ¾″ × ¾″ × ⅛″ × ¼″ wide angle alum.
25 Fixing bolts for *item 24*, 2 off, 6BA × ½″ and nuts.
26 Dash paddle, Tufnol 2″ × 1″ × ¼″.
27 Fixing bolts for dash paddle, 2 off, 6BA × ⅜″ C/S and nuts.
28 Top and bottom plates for main arm bearings, 2 off, 1½″ × 1¼″ × ⅛″ brass.
29 Fixing bolts for bottom main arm bearing plate, 3 off, 6BA × ½″ C/S.
30 Top and bottom bearing for main arm, 2 off, 2BA × 2 bolts and nuts.
31 Main arm pivot pin, ¾″ × 1/16″ dia. steel.
32 Side pillar ⅜″ square brass, ¾″ long, 2 off.
33 Fixing bolts for *item 32*, 4 off, 4BA × ¼″ C/S.
34 Adjustable stop bolts for side pillar, 2 off, 4BA × ¾″ and nuts.
35 Spring for main arm return, 3/16″ dia. × ⅜″ long, 4 turns.
36 Main terminals, 2 off, 2BA × 1″ bolts and nuts, C/S.
37 Rubber feet fixing bolts, 4 off, 4BA × 1″, passing through perspex and brass base plates.

THE SMALL ADVERTISING

Once again, we have in this issue a fine spread of attractive items in the Small Advertisement pages. As regards the readers' advertising in the September issue, a subscriber writes as follows: *I had my copy and sent a cheque on the Friday for a receiver I wanted; the cheque was returned on Monday because the set had been sold on Friday morning! How fast does one have to move to secure a bargain?*

While undoubtedly many would-be buyers are disappointed every month, what this means is that if you have anything good to sell at a fair price, you cannot do better than offer it through the Readers' Small Advertisement section of SHORT WAVE MAGAZINE. The rates are only 3d. a word, with a minimum charge of 5s. Each month, many £100's worth of equipment changes hands through our small advertising.



The Electrolube Dispenser enables low-resistance lubricant to be applied to the most inaccessible places — such as switch contacts and tuner units — with the certainty that the surfaces will be sealed against corrosion. A sharp pull on the cap releases the flexible probe tube; by squeezing or flexing the reservoir an individual spot, or stream, of lubricant can be applied to the target area. Th Electrolube Dispenser, with its refillable reservoir, can be used to lubricate small electrical apparatus of every kind.

DX COMMENTARY

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

MOST of our correspondents seem surprised and pleased at the considerable improvement in conditions since last month. We are most noticeably entering the autumn/winter period of good DX, which, of course, will seem more and more conspicuous each year as the conditions *overall* gradually fall off.

One point about the eleven-year sunspot cycle — the "trough" should be less noticeable on each cycle because of the undoubted improvements in aerials, transmitters and receivers over each eleven-year period. The increasing popularity of SSB operation will also help to liven things up, since it is generally considered that SSB's gain over AM may be as low as 3 dB when conditions are spectacularly good, but as high as 9 dB when they are really bad. The reasons for this are many and complex, but it does appear to be well founded on fact.

May we appeal once more to readers to separate out their DX worked from their general comments? And also to limit their lists of DX to the stuff that really *can* be called DX? Here, again, we see signs of progress; a lot of the calls (PY's, LU's, W6's and so on) that would have been called DX not many years back are now hardly worth inclusion in any lists except those for the LF bands.

DX Gossip

First, the DX-peditions expected in the near future. W4BPD's itinerary is planned like this: *October 6-16,* VQ4; *October 17,* leaving for the Seychelles with WØAIW and party; *October 20-22,* VQ9HB; *October 23,* Platte Island (VQ9); *October 24,* Coetivy Island (VQ9); *October 28-30, Agalega Island* (VQ8); *November 1-2,* Farquhar Island (VQ9); *November 3-4,* FB8, Madagascar; *November 5,* Isles Glorieuses (FB8); *November 6-10,* Astove Island; *November 7-21,* Aldabra Island (VQ7); *November 22 - 25,* Comoro; *November 29 - December 5,* Tromelin. If this mammoth programme can be run to the published schedule it will surely be a monumental piece of organisation!

Frequencies for the VQ9 section of the operation are as follows: *CW,* 28020, 21020, 14020, 7020 kc; *AM,* 28420, 21220, 14120 kc; *SSB,* 28620, 21420 or 21220, 14349 or 14120 kc. 500 lbs. of radio gear was shipped to the Seychelles last June, and more will be picked up in VQ4. All transmitters run at 100 watts.

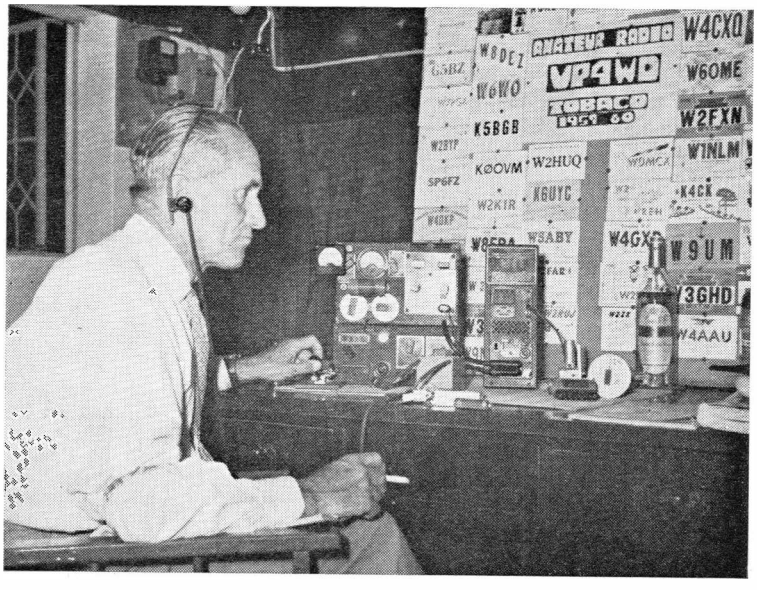
VP9L, with four other operators, promises activity from the British Virgin Islands for about a week, starting on October 28. No further details as yet.

TA1DB, claiming to be W1FFB, seems to be a phoney, as the latter call is not at present issued to anyone . . . AC5CQ showed up early in September around 14150 AM . . . EP1AD is on every day, 1330-1430 on 14090 kc.

C1AAK claims to be in Peking . . . VR1B is on the three HF bands between 0600 and 0800, also week-ends at 2200 . . . VKØWH (Macquarie) is on 14 and 21 mc AM, but will answer CW calls on his frequency . . . CR10AD is expected on the air soon.

FP8BO (VE2AFI) made about 1200 contacts during a month's stay . . . FP8BH, 8BM and 8BP have also been around considerably . . . ZM7DA was heard calling CQ, long after the expedition was over. Likewise a joker signing 9S4F has been reported. Also, KX6CA, on 21 CW, is not the real one, who is inactive.

VR3KD, who supplied some very welcome activity from



VP4WD/G3TA

CALLS HEARD, WORKED and QSL'd

Christmas Island, has now returned to England; QSL *via* K5ADQ . . . YU on SSB was made possible during September, by YU7LAA, a QRO station using Collins gear from the International Trade Fair, Zagreb.

4S7NX, who used to be very active, has rebuilt and should be letting fly again very shortly . . . KA2YP is another station due to be "re-activated," but KA2RR is now off the air.

YA1AO, after a vacation, is back on the air . . . VK9MV is ex-ZC3AC and still on Christmas Island . . . VS4FC is active on 14 mc CW.

G3JJZ heard ZS1RM saying that she would be operating from ZS8, October 7 onwards; frequency 14030, Europeans to call above 14035 kc . . . IC1CN hopes to get country status . . . IS1MM has been on 7010 kc.

From G2DC: Danny Weil is still signing HC2VB from Guayaquil and *will* visit Galapagos, Clipperton and the Marquesas, but is behind schedule; he should be signing HC8VB around October 5.

AC5CQ was operated by VU2CQ for about a week, starting September 6; he ran about 800 watts on 14160 kc, but had receiver trouble and only worked 30 stations or so. This was passed on by GW3AHN, who also says that CR6CA hopes to operate not only from CR5, but also from Annabon Islands, Dahomey, Togoland, Nigeria and Gabon, in that order; SSB, AM and CW; will not answer calls on his frequency; and the length of stay at each place depends on results.

The "HM9A" mentioned last month as a possible phoney might be genuine, as HL9TA reports that Korean nationals will be issued with HM calls, and HM9A was scheduled to start up from Cheju Island (not a new one!)

ZS6IF is due to be signing /ZS9 between November 5 and 14 . . . The Zanzibar expedition by VQ1HT and VQ1SC was postponed from its original date of September 8, but was probably all over before you read this.

The VKØ distribution has now been established (by G3NWT in QSO with VKØPM) as follows: On *Macquarie Is.* VKØIT, VKØRL, VKØWH; *Mawson Base* VKØBH, VKØJC, VKØJH; *Wilkes Base* VKØAB, VKØCX, VKØKJ; *Davis Base* VKØED, VKØJM, VKØPM. Between them these chaps work CW, AM and SSB on all bands 10, 15 and 20 metres. VKØWH has been heard working G's on 15m., and VKØJH is particularly anxious to QSO the U.K. on 14 mc AM phone. VKØPM is mainly on 10m. and 15m., using AM, and it was on *Ten* that G3NWT had the contact with him.

DXCC Countries

Another new batch of score-counters is announced by ARRL; all the following will in future *count as countries:* Dahomey, Niger Republic, Volta Republic, Ivory Coast, Tchad, Central African Republic, Congo Republic and Gabon. On the debit side, French West Africa and French Equatorial Africa (FF8 and FQ8), which formerly embraced all the foregoing units, will be deleted. Credits for the new ones must not be sent before December 1, and the various "starting dates" are all during August. In the absence of resident operators in many of the above, we don't need a crystal ball to prophesy another crop of DX-peditions, once the political situation has cleared.

Arising out of this, W6NTR tells us that Tchad is represented by FQ8HW, Ivory Coast by FF4AB, Central African Republic by FQ8HO, and Congo Republic by FQ8AQ, 8AR, 8AX, 8HF, 8HL and 8HV.

Talking of DXCC countries, the latest official list credits ZL2GX and W1FH with 300! A terrific achievement by ZL2GX, in competition with all the U.S. beams and kilowatts. And W6NTR

FIVE BAND DX TABLE
(POST WAR)

Station	Points	3.5 mc	7 mc	14 mc	21 mc	28 mc	DXCC	Station	Points	3.5 mc	7 mc	14 mc	21 mc	28 mc	DXCC
G3FXB	854	77	136	231	239	171	273	G8DI	357	38	69	108	79	63	138
G2DC	845	90	124	246	216	169	276	G2BLA	351	38	67	80	87	79	133
G3FPQ	815	74	118	231	228	164	258	G3JUL	351	27	66	87	78	93	142
G5BZ	797	66	121	272	206	132	281	GB2SM	350	20	33	85	104	108	186
G3DO	701	25	51	253	191	181	280	G3DNR	327	11	30	94	107	85	140
GW3AHN	680	16	55	206	253	150	271	G3BHJ	304	8	29	47	145	75	168
GI3IVJ	677	42	70	196	202	167	241	G3LKJ	303	8	20	48	111	116	153
G3BHW	663	15	45	211	223	169	255	G3WP	302	17	34	104	35	112	156
G3ABG	610	57	93	191	141	128	215	G2DHV	301	22	36	139	71	33	161
G2YS	542	73	93	171	120	84	190	G3GHE (Phone)	289	13	29	44	121	82	153
G3LET	538	41	123	192	127	55	212	G2CWL	276	21	29	78	117	31	154
GI3NPP	535	25	57	147	185	121	219	W3HQO	262	4	9	95	120	34	210
G3IGW	493	51	83	118	123	128	176	G3JVU	262	27	44	96	50	45	116
G6VC	486	40	60	161	135	90	192	G3JSN	257	32	48	56	64	57	103
GM2DBX (Phone)	433	34	31	162	105	101	178	G4JA	240	36	52	83	53	16	126
W6AM (Phone)	431	23	62	286	49	31	286	G3JFF	238	20	57	109	43	9	116
MP4BBW (Phone)	415	1	5	195	134	80	210	G3NAC	232	17	38	65	77	35	107
G3KMA	406	33	83	129	94	67	163	G3NFV	224	12	25	27	72	88	129
G3DQO	406	24	52	183	105	41	192	G3NWT (Phone)	221	4	12	4	124	77	151
G3LHJ	392	19	40	115	147	71	181	G3JJZ	197	26	43	89	30	9	110
G3NOF (Phone)	363	8	16	76	141	122	173	G3LZF	182	11	20	54	48	49	118
G8VG	358	77	136	231	239	171	273	G3IDG	179	15	20	45	52	47	82

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

writes that Jock of ZL2GX now says he will "retire" from serious DX competition. The top G's on the list, by the way, are G2PL and G3AAM, both with 293. Leading Phone station is PY2CK with 297, followed by VQ4ERR with 292. So it's obvious that 300 on phone will eventually be notched up. What do these fellows do then? Start all over again with 10 watts?

Top Band Activity

G3FS (Sidcup) has found conditions pretty poor, with lots of static, and DX signals difficult to read; it *has* been a bad summer for QRN, certainly.

GW3NAM (Barry) was naturally delighted to receive a report from G3MBS, now serving with the R.A.F. in Cyprus; his signals were heard there at 2350 GMT on August 27, with a 339 report. G3MBS operates from ZC4AK and hopes to make some Top Band skeds, as they have a 150-watt licence and a long wire; the ZC4AK rig is on the air on Top Band—*see* later.

G3JFF had hoped to make WABC before returning to sea from his leave, but he only got as far as 59 worked! He was lucky with GM3JEQ/P (Wigtown), GW3NWQ/P (Caernarvon) and GM3NNO/P (Kirkcudbright). Now he has to wait until December for the next batch.

G3JEQ himself modestly suggests that some of the Top Band scores may have increased on account of his portable activity; in a very stout effort, he put *ten* of the rarer counties on the air, covering 2700 miles and working until after midnight every night; all cards will be QSL'd on receipt; meanwhile G3JEQ himself is stuck at 97/97 until someone rows over to Sark!

G3NVO (Middlesbrough) heard ZC4AK on CW (2250 GMT on September 3) but couldn't raise him; however, he did work several new Scottish counties, thanks to various portables . . . G3NAA (Chelmsford) winkled out G3OAA/A in Hereford, and GC3KAV was another new one . . . G3OAG (Prestwich) raised GM3JEQ/P in six counties, plus several other new ones including EI7AF; he says that Top Band has often sounded as full up as Forty, with CW "solid" from 1·8 to 1·9 mc. That is how it should be at this time of year.

G3MXJ (Gravesend) has had a most interesting report (unconfirmed as yet) that he was heard by VS5GS at 2200 GMT on August 14, RST 449-559. Gordon Scott of VS5GS is mostly on 21 mc phone, but is keen on Top Band and has a transmitter—he intends to be active soon. Meanwhile, G3MXJ is hoping to put up a balloon-supported wire for this winter's DX tests.

G2DF (Warrington) wonders if he is the first to claim a WABC with an indoor aerial. He almost certainly is—and very nice work, too.

G3HGY (Coventry) recently made a tour of Scotland, working /M as well as /P and covering over 1000 miles. He wants to thank all the GM's met and worked, particularly GM3COV (Caithness), with whom he spent nearly a day. Nairn proved a very popular county, and two nights' working from there were very busy.

G3NFV (Ashtead) will be operating from Hunts. on October 8, calls being G3NFV/P and G3OCA/P, phone and CW, all cards QSL'd. Likewise, he hopes to go to Hereford and Montgomery on either October 22/23 or 29/30, same call-signs.

Forty Metres

Possibly the most interesting thing about this band at present is the speculation about its future, when the total width becomes 100 kc. We casually suggested a few months ago that the CW fraternity would have to compress themselves into 50 kc, and this has brought two reactions: Highly indignant one from the CW men, who say they will use all the 100 kc, or any vacant spaces that ever happen to present themselves; and an equally indignant one from the Phone men, saying that if the CW stations encroach on "their" territory (whatever that may be) they will retaliate by moving right down to the LF end.

Thus we have the following alternatives, which should provide some food for thought:

(*a*) CW 7000-7050, Phone 7050-7100.
(*b*) CW 7000-7025, Phone 7025-7100.
(*c*) CW 7000-7100, Phone 7000-7100 kc.
(*d*) Whole band CW only.
(*e*) Whole band Phone only.

Work it out for yourselves; we are inclined to think that *(c)* will take charge, with a free-for-all over the entire band. Possibly the most sensible solution for the future would be to designate the whole band as available for SSB only! Whichever alternative you consider, there are going to be a lot of hot-under-the-collar types explaining that their solution is the

Short Wave Magazine

DX CERTIFICATES

The following have been issued since the publication of our last list, in the July, 1960 issue:

FBA

No.	185	G8PX (Oxford)
	186	OK1AEH (Prague)
	187	OH5PB (Sunila)
	188	G3JUL (Ashford)
	189	DL7HC (Berlin)
	190	K2CPR (Pennsauken, N.J.)
	191	DL2UY (B.A.O.R.)
	192	UA6LI (Rostov/Don)

PRA

No.	10	W2GT (Rochelle Park, N.J.)
	11	K6CQM (Palo Alto, Calif.)

WABC (Top Band only)

No.	214	GW3NAM (Barry, Glam.)
	215	G3HQT (Morden, Sy.)
	216	G2ZZ (London, E.6)
	217	G3LZE (Torquay)
	218	G3NNO (Leeds)
	219	G3NTI (Ness, Wirral)
	220	G2DF (Warrington, Lancs.)
	221	G3MBM (Bath)
	222	G3NJB (Theydon Bois)

WBC (Overseas only)

No.	175	W1EIO (Berwick, Maine)
	176	K9EAB (Peoria, Ill.)
	177	OH5PGP (Kotka)
	178	OH5PB (Sunila)
	179	HA5KDQ (Budapest)
	180	ZD2JKO (Zaria, N. Nigeria)
	181	OK1AMS (Kladno)
	182	K2CPR (Pennsauken, N.J.)

WFE

No.	46	W5LGG (San Antonio, Tex.)
	47	G3BNC (Southsea, Hants.)

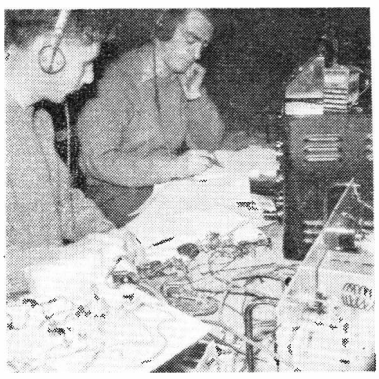
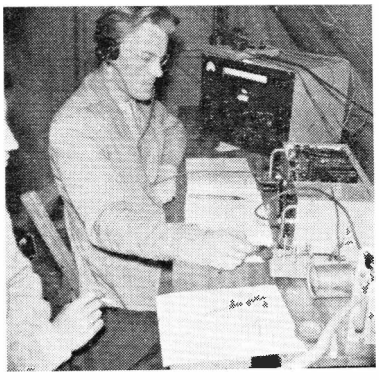
WNACA

No.	247	OK1CX (Prague)
	248	GW3GWA (Wrexham)
	249	G4LX (Newcastle-on-Tyne)
	250	G3FMN (Frimley Green, Sy.)
	251	G3JUL (Ashford)
	252	SP9RF (Cracow)
	253	XE1AE (Mexico City)
	254	G3KAY (Norwich)

Details of MAGAZINE DX AWARDS and CERTIFICATES and the claims required for them appeared in full on p. 26 of the March, 1960 issue.

Overseas claimants may send either (*a*) A check list, without cards, duly certified by the Hq. of their National Radio Society, or (*b*) An uncertified check list, from which any or all cards may be called in for scrutiny by us. U.K. claimants must send the relevant cards for each award.

All claimants must include sufficient return postage for the cards and Certificate — five IRC's in the case of overseas claims.


When the Cambridge University group, signing G6UW/P, went on safari into the wilds of Huntingdonshire, they established their base camp in the hinterland near Warboys, where the R.A.F. built a remote-controlled wireless station some 20 years ago. In these photographs we see, left, G3OBT on the key with G3MDR checking the log; centre, G3MIK working Top Band stations in need of the rare county of Hunts.; and right, G3MGB and G3LAS (paddling the key) hard at it on the HF bands. Power was from a PE-set, and the main transmitter was a 5-band rig built by G3LAS. The "physical wiring diagram" at lower left in the first photograph is described as G3MDR's transistorised electronic dot-and-dash maker.

only one, and that all others are futile, presumptuous, ill-considered, irresponsible, selfish, moronic, impracticable, or all seven at once. We withdraw completely and leave it to the Occupying Powers!

DX on Forty and Eighty

GI3NPP, working CW on *Forty*, raised KP4ANJ, OHØNE, OX3DL, PX1PF, TF5TP, UN1AX, YV5HL, ZA1KC, ZB1FA and 3V8CA. G3JFF worked FF8BF and YO3LM.

G3FXB (Southwick) had a spell of CW and booked in MP4BCV, UL7KKB, UH8BI, VQ4HT and 4X4JU . . . G3ABG (Cannock) thought LF - band conditions "fantastic" on August 29-30; on *Forty* CW he raised MP4BCV, 5A5TA, ZC4SR, VS9OA, YV4AX, and PY7VHA; he QSY'd to *Eighty* with 5A5TA, and having worked him there tried *Top Band*, but that one didn't come off, although they both heard the same OK2 at 589. 5A5TA, often on *Forty*, will QSY to 1825 kc on request—so try him for 160-metre DX.

G2DC raised UL7KKB, LX3EN, W's, VE's, PY5OF and UAØAG on *Forty*: LX3EN for a new one on *Eighty*. G3JLB (Gravesend) heard VS9OA and EA4CR on *Eighty*.

SWL Peter Day (Sheffield) has now logged 189 prefixes on *Forty* CW during this year; he considered it the star band of the month and logged 5A2CV, UAØAG, KP4AMT, ZC4ZB, CT2BO, UL7OA, CX2TF, VP3RS, LU3DCJ, W7QMU/VE8, ZL4IH and KV4CI/MM. The last six were heard on September 4, when conditions were disturbed and produced good skip from South America.

The DX on AM Phone

The 21 mc band seems to have been the most popular choice for AM work, and DX has been quite good, as the lists show. However, 28 mc turned out to be far from dead, though nothing very startling appeared.

It is most noticeable that the AM types seem to raise quite a different set of DX stations from the CW exponents; and those who use both modes therefore collect the best of both worlds.

G3NWT (Sandiacre) says that VK6QL is still making 28 mc contacts with G's—thanks to his large V - beam; also that GW3ITD/MM's voice was heard from LU3BU; and that G3QD raised the elusive K6CQV/KS6 briefly. A ZS was heard calling ZD9AM on 21 mc phone.

G3OGO (South Croydon) is very newly licensed, and was thrilled to work from G3NWT's station as G3OGO/A . . . G3HTA (Exeter) thinks things are looking up, especially on 14 mc late in the evening. He has been hearing ZL3JO over the long path, around 2100-2200.

GW3AHN (Cardiff) worked K6CQV/KS6 on a very "bare bones" rig, as he is removing components from it to complete his SSB outfit. From now onwards he will be using that mode. From the lists it's obvious that SSB is competing with AM on *Twenty*, but that AM phone on *Fifteen* is still pretty terrific.

AM PHONE DX WORKED

28 mc Band

DJ3VG:	DL3RO/EP, VP6EB and 6PV, CX2DT, LU, PY.
G3BHJ:	EA8CN, UA6JAO, UP2KCB, UW9CR, VU2PS.
G3LHJ:	T12OE, PY2DI, ZS3L, ZS6AEA.
G3GHE:	DL3RO/EP, VK6, VQ2 and 5, ZE, ZL, ZS.
G3NOF:	CR6AT, GW3ITD/MM (Rio), OR4TX, VP8EM, VQ2CH, 4EU, ZE5JA, ZS1AB/M, ZS3D, 3L, 5A2TQ, LU, PY, W's.
GI3IVJ:	CR6DA, DL3RO/EP, PX1PF, ST2AR, ZS3Z, 9M2EZ.
G3NWT:	OR4TX, SVØWV (Rhodes), VU2PS, VK6QL, ET3MA, VQ5GF.
G3OGO/A:	OR4TX, VQ4DW, ZE2JA.
G3DO:	PY7LJ.

21 mc Band

G3MCN:	VP2GU, CP5EL, UI8AG, FR7ZD, TG9TI, FQ8AE, VS5GS, HI8DGC, DU6IV, XW8AL, PZ1AR, CR7DN.
G3BHJ:	CE3IF, FA2TW, FF7AB, HI8DGC, JA1ACB, KL7BZO, MP4BCV, PZ1AX, SV1AR, VEØNC, VE8RS, VP6WR, VQ2DC, 4RF, VS1GZ, VS9ADL, 9AJW, VU2BK, YA1BW, ZD1AW, 9N1MM.
G3LHJ:	AP2AD, FR7ZD, KC6GJ, PZ1BE, VQ51B, YA1BW, 9M2GA, 2GV, 9N1MM.
GI3NPP:	FR7ZD, HP1SB, KC6GJ, UAØLA, VR2DS, 9N1MM.
G3GHE:	AP2AD, 2Q, VK8NE, VR2AS, 2BC, 2DS, VS1KD, 1KF, 1GQ, 9M2GA, 2GW, YA1AO.
G3HTA:	UJ8KAA, 9K2AD, VP8FG, 8EH, VP3EFG, 3MC, XE3CW, CP5EL, ZP5LS, PZ1BE.
G3FXB:	CP5EL, FF4AC, 7AB, FR7ZD, HH2CD, KS6AK, VR2AS,

2DS, XW8AL, 4S7YL, 6O2AB, 9K2AX, 9U5KU, UH8BN.

GI3IVJ: CE5AR, DU1SA, FF8CK (Mali), FQ8HL, IM1RIF, TI5RV, VP2AR, VP4RL, VP8EM, VR2DE, 6O2AB, 9K2AD, 9M2GV, 9Q5GX, 9U5FW.

G3NOF: AP2AD, VS9AJW, ZD2JKO, 5A3TW, 5TA, 9G1BA, 1CC.

G3NWT: VKØPM, OR4TX, VP8EH, YA1AO, AP2Q, DU1AP, VR2AS, 2BC, 2DS, FR7ZD, ET2VB, 9N1MM, 9Q5HZ/M/VQ5, 9Q4HW, KG6AJF, VP3EFG, ZS3D, K4HNX/AM.

G3OGO/A: 9Q5OA, VP8FA, PZ1BE, FF4AA/M, YA1BW, 9M2GW, 9G1CC, FF7AG, ZP5CF, VU2BK, VS9AJW.

G3DO: FR7ZD, UH8BN, FF7AG.

G3NFV: SVØWT, 6O2AB, EA6AY, VS5GS, AP2Q.

14 mc Band

G3GHE: CT2AH, HI8DGC, HK3LX, VE8TR.

GI3IVJ: CX4AW, FG7XG, HH2RV, VP5BL, VK's, YV5ABL, ZL's, 3A2BT.

G3FXB: DL3RO/EP, MP4BCV, UO5PK, VP5AR.

G3HTA: OY5S, VK's, ZC4AK.

The DX Bands on CW

G6VC (Northfleet) collected ZP9AY for a new one, and received his QSL *via* the famous W2CTN, who now acts as QSL manager for at least 44 DX stations.

G3LHJ (Newton Abbot) found the HF bands quite good, with even *Ten* showing promise but pretty unstable. G3BHJ (Norwich) worked all three bands, and tells us that AC5CQ had to go off CW owing to receiver trouble, and worked AM only.

DJ3VG (Delmenhorst) was active in the Asian Contest and was intrigued by the scheme of numbers giving the age of the operator ; most of them, he found, were under thirty. Incidentally, a certain Cheltenham operator, we are told, still has a red face after joining in and using serial numbers 01 and 02 for his first contacts . . . the youngest operator on record ? By the way, YL's and XYL's used " 00 " !

VU2XG was pleased to raise FB8XX and 8ZZ, as well as VQ8BC, on 21 mc ; but *he* says that when Russians started asking him how old he was, he practically told them to mind their own business . . . He is still working his father (G8VG) pretty regularly, but finds it getting tougher.

G3JVL (London, W.5) raised a few new ones, and has just finished a transistorised El-Bug, which works very well.

GI3NPP (Dungannon), who sends a couple of very nice CW lists, comments on the number of stations signing " Fixed Portable " from nice locations during this month. He himself is using a rhombic (300 feet per leg) and results are so good that he now plans to put up a second one ! That's the way.

G3WP (Chelmsford) still confines himself to early-morning CW on 14 mc, and remarks on the absence of W signals these days (but one morning since he wrote his letter we noted the whole band full of them as early as 0700!).

CW DX WORKED

14 mc Band

G2DC: K7GMZ/EP, KH6DMP, 6BRR, 6DSW, OD5CT, 5LA, UAØAG, VR2AD, 2DK, VU2XG, VK1-6, ZL1-4.

G3FXB: DU7SV, EP1AD, FQ8HW, IC1IN, OR4TX, VS9OA, ZS7M.

G3JJZ: CX4CZ, EL4A, FP8BM, FQ8AG, IC1IN, KR6KZ, K6JK/KR6, OHØNE, SU1IM, UA1KAE, ZE3JJ/ZD6, ZK1AK, M1/W4BPD.

G2YS: IC1IN, YA1AO.

G3WP: FP8BX, VK1JE, VK2-5, ZL, KL7, 5A4TK, OD5CN, 3A2BT.

G3LPS: DU1OR, 7SV, EL4A, OA4KF, OR4TX, VP8CC, JT1KAB, VEØMK, FP8BO, ZS3AZ, MP4BCV, ZE3JJ/ZD6, VS1GZ.

G3GMK: 3A2BW, FP8BD, 5A2CV, VE8DM, VK's.

VU2XG: K4ORQ/EP, EP1AD, MP4TAC, ZD2GUP, ET3AZ, 9K2AD.

G3JVL: HZ1AB, VK2 and 4, PY7, OE6 and OH7.

DJ3VG: UJ8AI, UH8BI, 4S7EC, VS6EN, UM8FZ, VU2XG, ZS3AZ, EP1AD, VK1JE, EL3B, OX3UD, SU1AL, YV5AFR.

G3BHJ: HZ1AB, UA3KAM, UM8KAB.

G3LHJ: FB8CE, OR4TX, UJ8AC, VEØMK, KZ5TS, XZ2TH, VK's.

GI3NPP: AP2CR, CR9AH, DU1OR, FP8BM, 8BO, FY7YI, HZ1AB, SM3BPY/9Q5, SP2LV/XZ2, UPOL8, VE4CA/SU, VK5BW/8, VP3AD, 4TR, VS9OA, YI1RK, ZE3JJ/ZD6, ZS7M, VQ9HB, 6O2AB.

G3JFF: EA8BW, WA6KMT/KL7, VO1AW, 3A2BW, F9UC/FC.

GI3IVJ: CE3CB, CX4CZ, HC1IT, KM6BI, ST2AR, VK5BP/8, VP2VA, ZD1AW, ZK1AK.

21 mc Band

G3LHJ: FB8XX, KG6AJT, KL7DJU, 7DQF, KP4VB, VS6BJ, ZS7R.

VU2XG: FB8XX, FB8ZZ, VQ8BC.

G3LHJ: JA1ACB, MP4BCV, UA1FL, 9AA, 9VB, 9VX, ST2AR, UL7AB, UJ8KAA, 6O2AB.

GI3NPP: ET3AZ, FP8BM, KØSLD/KW6, KØTEP/KW6, KR6JM, VK5BP/8, VK9GK, 9XK, XE1AX, 3V8CA, 9K2AD.

G3JFF: VE6SZ, W7WQR/VO2.

GW3AHN: CR5AE.

G3JJZ: SVØWZ/Crete, VP2VA, VQ3HZ, ZE3JO/ZD6.

G3FXB: KØSLD/KW6, UJ8KAA, YA1BW.

G2DC: FQ8HI, 8HP, CR5AE, ET3AZ, KØTFP/KW6, JA1-7, KR6JM, PJ2CK, VK1-8, VS6BJ, VU2JA, 2XG, XZ2TH, ZE3JO/ZD6, YA1BW, 6O2GM, 6AB, 3V8CA, ZP5LS.

G3NFV: 3V8CA, UAØKAR.

The DX on SSB

One fact that is becoming most noticeable is that SSB is attracting not only the AM operators but also many of the dyed-in-the-wool CW men. Most mornings on *Twenty* one can hear nets which include many of the VK's whose

TOP BAND COUNTIES LADDER

(*Starting Jan. 1, 1952*)

Station	Confirmed	Worked
G2NJ	98	98
G3JEQ	97	97
G6VC	96	96
G3APA	85	90
G3ABG	81	82
G3JJZ	78	80
G3MCY	74	75
G3JVL	73	83
G3NFV	73	76
G3LHJ	71	77
G3FS (Phone)	69	72
G3MXJ	67	74
G2DF	63	69
G3NBT (Phone)	61	64
G3NNO	60	76
G8VG	59	67
GM2HIK	59	67
G3NTI	58	60
G3NVO	57	72
G3JBU	52	52
G3JFF	47	59
G3OAG	44	54
G3NJQ	43	47
G3NMZ (Phone)	39	52
G3LZF	34	56
G3NAA	34	54
G3NNO (Phone)	28	48
G3MXJ (Phone)	25	43
G3NOW (Phone)	17	36
G3ABG (Phone)	17	33
G3NPB (Phone)	14	35

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

CW signals used to be conspicuous around the band. The very morning of writing these words, for instance, G6QB joined in with VK3CP, 3JK, 3NR, 4YP and VE3BWY . . . six life-long brass-pounders caught up in the new mode.

One of the major attractions of SSB is that the whole business is so slick ; just one pair of call-signs and one is either in the QSO or out of it. No long-winded calling as on CW, only to be answered by someone completely different whom one probably doesn't want to work anyway ! The combination of SSB and CW appears to cover practically everything, and it is obvious that the AM carrier-wave is doomed for eventual extinction. (And now to our bomb-proof shelter before the brickbats arrive.)

ZS6DK (Johannesburg) has been on SSB for two years, and is still disappointed at the small number of G stations using it ; he has worked " practically every country in the world " but only three G's to date ; he adds that OK1FF is very active, and also EAØAC, who is for the moment off the air and rebuilding. ZS6DK uses a Central Electronics 10-B, feeding a pair of 807's.

MP4BBW (Awali) sends his usual colossal list of stations worked ; since putting his beam up in July he has raised 100 countries, all on 14 mc.

SSB DX WORKED

14 mc Band

MP4BBW: 9N1GW, WA6GMM/KG6, PZ1AX, VE6AAE/SU, W8UTQ/3V8, BV1USC, KH6AWS, VQ5FS, CX2AX, CT3AV, VS4JT, HC1KA, FP8BH, 8BO, OY7ML, UL7JA, 9N1SM, KC4USV, VQ9TED, ZS7P, ZL4JF, XE1AE, 3A2BT, CR9AH, TG9AD, YN1TAT, W3ZA/EP.

GI3IVJ: AP2CR, CE3DY, HC1KA, IC1IN, KG1BA, KW6CL, OHØNC, OY7ML, PZ1AX, TI2PI, VP2AB, VE6AAE/SU, W3ZA/EP, YV1CS, 3A2BW, 3V8CA.

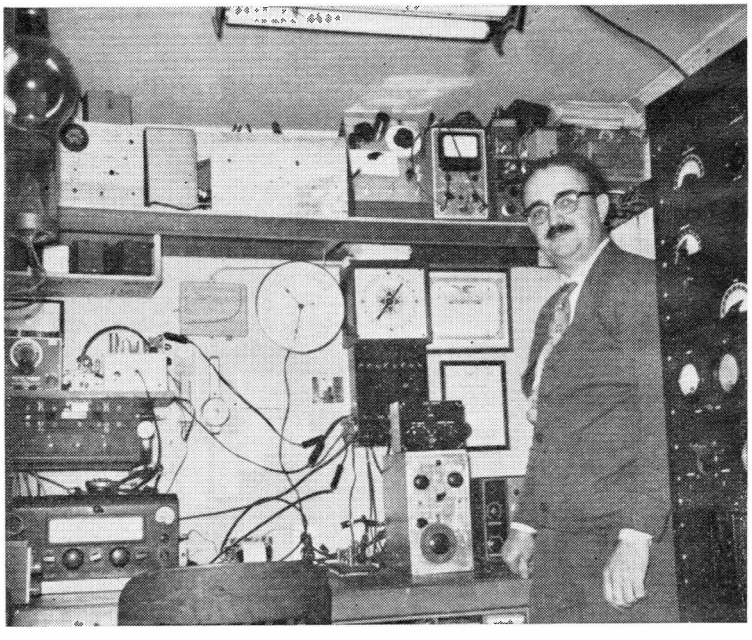
G3NOF: IC1IN, 5A5TA, W's.

G6QB: KG6FAE, KL7BFW, KX6BQ, KX6CG, XE1DE, KH6, VK, ZL.

G3DO: CT3AV, EL1K, HC1KA, IC1IN, KC4USH, KV4BQ, KW6CL, LX3EQ, TI2HP, UL7JA, VP9DC, VQ9TED, VE6AAE/SU, W5QJ/ELØ ZE5JJ, 8JQ, 3A2BW.

21 mc Band

GI3IVJ: K6CQV/KS6, PY1AQT, TI2EV, VS6BE.



K2BWR of Pleasantville, N.J., is an enthusiastic 160-metre operator. His aerial is a 260-ft. doublet over a salt-marsh and the PA is an 813 ; all the gear is home-built, and 16 countries have been worked on Top Band.

Photograph W1BB

Miscellany

G3CED (Broadstairs) was told by UW3AO that the UW prefix is being allocated to newly-licensed Moscow amateurs ; presumably the UW9's are also newly-allotted calls. Also from G3CED : a " Ham-Hop " meeting is being arranged in Dublin with ZS1R and XYL, G3CED himself, and local amateurs. The Scandinavian Division of the IHHC met in Denmark recently, with delegates attending from LA and SM ; OH2OO represents Finland.

G3EJF (Bury) points out that Rockall is not really an island, but just a pinnacle of rock rising sheer from the sea ; he suggests that compulsory reading for would-be visitors is *Rockall*, by James Fisher. He also says that our strictures on operating practices in Europe can likewise apply to G's, and quotes a YO station who called " CQ Pacific " and was answered by a G station. He came back with " G3H . . de YO . . . So England is in Pacific ; Tnx for QRM ; SK." Another red face . . .

ON4QX reminds award-hunters of the two Antwerp awards—WOSA and HOSA, valid for contacts made after 1953. European stations have to contact six

WPX MARATHON

(Starting January 1, 1960)

CW Only		Phone Only	
G6VC	322	G3GHE	299
G8DI	305	MP4BBW (*SSB*)	284
G3JVL	269	G3DO (*SSB*)	233
G3LAS	249	G3LAS	219
VU2XG	249	G3LHJ	166
G4JA	204	G3MCN	145
G8VG	194	G3BHJ	142
G3LZF	178	G3NFV	125
G3WP	158	GM3NQB	107
G3NWF	151	GM2DBX	92
G3LHJ	148	G8VG	83
G3DQO	146	G3NFV	83
G3DNR	110	G2FQW	68
G3MGL	108	G6VC	49
G2BLA	103	G3DNR	49
G3JFF	103	G3NWF	47
G2BP	95	G4JA	42
G3GMK	78	G3MGL	17

(Stations not reporting for three consecutive months will be deleted)

stations in Antwerp to qualify.

VK6AJ (Perth) is the former G3JJX, and has been out there for three years. He finds Zone 29 in constant demand whenever he shows his face on the air, but the W's arrive in swarms: Asia and Pacific DX are reasonably easy, Africa very strong at certain times of the year. But—and this is really why he writes — he hardly ever gets into Europe and the U.K. He very much wants to work G's, and he is to be found around 14030 kc (CW) at 0700-0800, particularly Saturdays and Sundays. He sticks to CW, being a radio announcer by profession!

Pirates again: G3IUG (Poole) is getting QSL's from all over the place, for the 14, 21 and 28 mc bands, and has to return a large number of them; someone is obviously using his call, and he suggests that the gentleman concerned should take the RAE . . . The recent note to the effect that G3HIO was being pirated by "someone in the Nottingham area" has brought a letter from G2HIO, who lives there himself. Naturally he has no connection with "G3HIO," but he hopes to check the cards concerned against his own log. G3's are so numerous these days that foreign stations often become careless about copying calls, and forget that there *are* also plenty of three letter G2's.

G3ABG tells us that *four* local pirates (in the Cannock area) were successfully prosecuted early in September . . . others please note!

'Way back in 1935, G5QA (Exeter) started a schedule with ZL2OU; with the exception of the war period, it has been running on a daily basis ever since! They have now had nearly 5,500 QSO's, at 0840 clock time on 14 mc CW.

Grafton Radio Society, the organisers of the WALT (Worked All London Town) Award, announce that the first claim has been received and confirmed. The very first WALT goes to G3FS (Sidcup). Requirements are contacts with 65 of the 118 London Postal Districts: on 1·8, 3·5, 7 and 144 mc for U.K. claimants, and all bands for the rest of the world.

And so we come once more to the sign-off, with grateful acknowledgments to W4KVX's "*DX*"; the WGDXC *Bulletins*; *The Western Radio Amateur*; the *FEARL News*; and our many individual correspondents. There's never any lack of news—the chief difficulty lies in condensing it sufficiently into the prescribed amount of space. But we still want it all—so please send in your next offerings by the deadline date of **first post on Friday, October 14.** Address it, as always, to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Until next month we wish you 73, Good Hunting and—BCNU.

A Letter to The Editor

ON THE SUBJECT OF QSL'ing

Dear Sir,

I sit here wading, not too patiently, through roughly 500 QSL cards which have accumulated during the last couple of months when I was too busy to attend to them, and I am, at last, forced to air my views on the present QSL system.

The amount of time, expense and labour expended on this for the benefit of others is too fantastic to be appreciated by an operator of a non-rare station and the whole business needs a good overhaul, or the majority of rare DX stations will certainly cease QSL'ing altogether or go off the air.

The quota of QSL cards at GD3FBS is round the 15,000 mark, which is real work even if everything is straightforward. However, add to this the scarching and loss of time occasioned by mistaken dates, years, times, and the too-frequent use of my callsign by pirate stations (who operate during the times when my station is dismantled, or when I am on holiday, or even when I am on another band). Add further the trouble caused by inaccurate dates, years, and callsigns (anything that resembles "3FBS" comes my way) and the fact that half the world puts the date before the month whilst the other (this is not peculiar to the U.S.A.) works *vice versa*, and you have a complete shambles in a busy station, and the urge to discontinue QSL'ing becomes very real.

In my case, for every card received for a contact I get slightly over one from listeners, accompanied in some cases by an impudent demand for a card. In addition to the Bureau flow I receive many cards direct but without IRC, though the obvious expectation is a return card *via* the same method. I also receive many second and third cards frantically demanding mine after I have already sent it. This often requires a second but unnecessary card. Then there is the fast-worker who sends a card for a time and band where I have been working, obviously hoping I haven't kept a strict log and that I will give him the benefit of the doubt; also the fellow who is not sure whether I have been working him after a call but takes a chance with the card.

I have come to the conclusion that the real cause of the trouble is the multiplicity of sheep-skins for which any sort of a confirmation will suffice. So I offer the following suggestions which I hope will be seriously considered.

They are only two in number, but it would be as well to understand, first, what a "wanted" station faces before passing any comment. There are some 25 licences in the Isle of Man and about half-a-dozen active stations; some of these latter do not QSL, so that the stations who do are in great demand. This really means that they must work the world on every band then double up on listeners' cards—quite an impossible situation.

First and foremost of the changes should be that the station requiring the QSL should be responsible for the supply of *card and postage*, relieving the wanted station operator of any expense or trouble other than the checking of the log entry and the confirmation by signature, station stamp or embossing (GD3GMH uses this method for SWL cards).

Secondly and most important, every station should quote a serial number of log entry (a much more effective method of checking logs than dates and times) and a contact cannot thus be valid unless the number quoted agrees with the log number—this idea could be extended to Contests with good results.

With these two radical changes, no station would object to handling large numbers of cards because, first, only the station requiring the card would be put to any expense and he would fill in all the details ready for signature or what-have-you, and though the receiving station may not be interested in the "Work All Back-Room Boys Certificate," he would hardly object to confirming the contact after a glance at the log. Secondly, the reception of the serial number would be a guarantee of RST, whereas at present where some stations have only received part of the transmission they give "R OK" and substitute "OM" for the other chap's name when in doubt.

I am aware that there is nothing new in the first suggestion, as I have been receiving reply-paid cards for some considerable time in small quantities. Some of the Dutch types are a QSL with a reply-paid and ready filled in QSL attached which requires only the confirmation and posting (postage is prepaid). It is this that should now be the general rule, though I appreciate the fact that it will cause the disappearance of those fancy "individual" cards which we are used to seeing! My own are not very impressive, but have cost me some £25 to date. (Some of the cards supplied a year or two ago by the local Tourist Board cost 10d. *each!*) However, the sheep-skin chaser is not interested in floral designs, so why worry about design.

I am very keen on the idea of serial numbers in the log for the following reasons: The size of the number immediately illustrates the activity of the station. Secondly, applied to Contests it represents an infallible check. Thirdly, it would not give away the number of points already obtained by a station. Fourthly, as a prevention of phoney claims for contacts, it is the final answer. I have received cards without any indication of date or time, or in some cases year, but if they had to quote a serial number the sender wouldn't bother and the other station would be relieved of the trouble of handling them. Finally, a serial number received OK would allow for any mistake in time, date, or year which at present cause the utmost confusion.

I would like to hear some of your readers' views and if they agree about the serial numbering of QSO's, the sooner we get it started the better.

H. Grist, GD3FBS

Douglas, Isle of Man.

• • • The Mobile Scene • • •

HETTON, BUXTON AND LINCOLN RALLIES

AT the Hetton Show, Co. Durham, on August 20—which was attended by a record crowd of more than 10,000, in fine weather—Amateur Radio was represented by the Houghton-le-Spring and District Radio Club, who had their own accommodation on the Show Ground, with stations signing G3CKC/4 on Top Band and G3KBM/A on 40 metres. It seemed that about half those visiting the Show itself also came round to see the AT station set-up, from which they heard Europeans being worked on Forty and mobiles being talked in on 160 metres. Though some 120 licensed amateurs and SWL's identified themselves, the attendance of actual mobiles was lower than expected, with few long-distance travellers. However, on the whole it was a very satisfactory day from the Amateur Radio point of view, and many personal QSO's were made or renewed.

* * * *

Buxton Mobile Rally

Although mere statistics do not reflect the success or otherwise of a rally event, the joint committee of the South Manchester Radio Club and the Stockport Radio Society were gratified by the attendance of over 300 visitors at their Rally on August 28. There were about 75 cars equipped for mobile working, and of these 41 entered for the mobile-radio treasure hunts. These are a special feature of the Buxton organisation, have always proved popular and were equally appreciated again this year.

Control stations were in operation on Top Band and two metres, as well as at both ends of the treasure-hunt route. The winner of the mobile competition, against 22 entrants, was G2AKR/M, with second place taken by G2ALN/M, who also came second last year; he must try to do better next time! In the non-mobile competition, with 18 entrants, the winners were the XYL's of G2ALN and G3KTL, as a partnership, with G2BJT as runner-up.

The Derby County Police provided an excellent road safety demonstration, which included a beautifully constructed model village. There was also a manufacturers' display of radio equipment, and a model field-day station shown by the Stockport group attracted much attention.

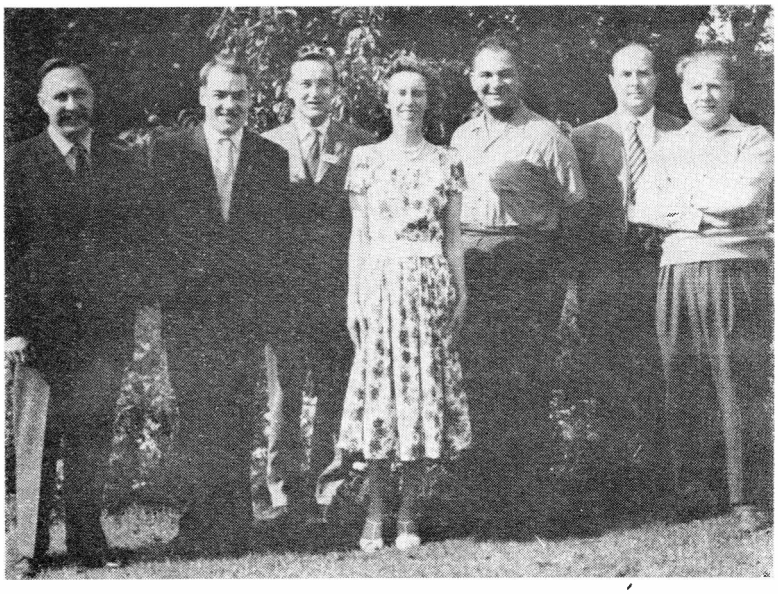
Presentation of prizes was by the XYL of G2CDN/M, of London, to those who had been successful in the prize draw as well as the competition entrants. Prior to the event, the BBC gave it valuable publicity in their "The Week Ahead" programme, which included a recording of a mobile QSO between G6DN/M and G3NOA/M.

* * * *

For the Hamfest and Mobile Rally at Lincoln on September 18, providentially the weather was most pleasant, and between 250 and 300 people gathered for a well-organised and enjoyable afternoon. While the men took in a lecture on "Transistor Circuitry," the ladies were treated to a "demonstration by an expert beautician"—we don't know what this means, but we are assured that it was good! After tea, the travel prizes were presented, and the draw for the raffle made. Then came the Junk Sale, conducted by G3FGY, this being a traditional feature of the Lincoln Hamfest. During the morning, before the scheduled meeting, there was a big gathering at the home of G3LWY/G3ESR, at Saxilby, near Lincoln, also now a traditional feature of this Rally.

* * * *

And so we wind up on "The Mobile Scene" for this season—which has been so very successful and enjoyed (we calculate) by something like 8,000 people



For the Lincoln Hamfest and Mobile Rally on September 18, the weather was sunny and warm. This group was taken at the QTH of G3ESR/G3LWY, near Lincoln, where there was a meeting en route to the Hamfest. Left to right are: G3MND, G3LYO, G3KYH, G3LWY, G3NMR, G3FQH and G3ESR.

The talk-in station for the Mobile Rally organised by the Houghton-le-Spring Radio Club for the Hetton Show on August 20 signed G3CKC/A. Operators were, left to right, G3KBM, G3CKC and old-timer G2TG.

in all, attending what were essentially social events organised by and for radio amateurs. To the organisers especially, great credit is due for the immense trouble they took to ensure success. And now some at least will be thinking about next year's Rally, and what they can do to make their event even more successful.

With the March issue of SHORT WAVE MAGAZINE we shall, all being well, be returning to the subject of Mobile Rallies. By then, we hope to have a few dates for next year's earlier meetings. Rally organisers are urged to get their dates fixed in good time and to let us know them by the middle of February, so that clashes can be avoided and adequate advance publicity given.

THE SPARKINSON EFFECT

OUR learned friend Professor Sparkinson, who gave up the active side of Amateur Radio while he still held the call-sign SPK (1911), has spent most of his time since then studying the ethical and metaphysical aspects of the subject. Although he has not yet been able to formulate a simple Law, he has made a preparatory statement. The complex variables involved have made his work difficult, but the following specimen phenomena can all be grouped under the heading of the "Sparkinson Effect," mostly derived from the Law of the Perversity of Inanimate Objects.

Operation : The amateur's practicable hours of operation are such that the station he most wishes to work is either *(a)* Inaudible because of propagation conditions, or *(b)* Unconscious on account of the time difference.

Aerials : The amateur's garden will normally run at right-angles to the direction in which he wishes most to erect an aerial. Arising from this—if he acquires a house with a large enough garden to take *all* the desired wires, he will find that he has to spend so much time gardening that he is never on the air.

Interference (TVI) : The amateur's neighbours will be interested only in that TV channel on which his most troublesome harmonic is audible. This still holds good if they have to change their entire outlook and switch from BBC to ITV, or *vice versa*.

Competition : After the amateur, displaying patience and restraint beyond the call of duty, finally seizes an opportunity to call the rare station that he has stalked for hours, the said station will sign "CL" and go off the air until next day.

Construction : The one variable condenser in the cupboard that will fit the apparatus being built will tune the selected coil to a frequency just short of that which it is desired to cover.

Size and Value : If, for example, a 50K, 2-watt resistor is urgently needed, the resistor box will yield *(a)* Several 50K 1/10th watt specimens, and *(b)* One 50K, 14-watt type, six inches long and one inch thick.

Solid Geometry : A used chassis, requisitioned for a new piece of work, will display *(a)* The right number of holes in the wrong places, or *(b)* The wrong number of holes in the right places, or *(c)* The right number of holes in the right places, but all of the wrong size.

Connections : A two-pin plug, tried in a two-pin socket for the first time, but unidentified as regards polarity, will be the wrong way round at least 80% of the time, although the theoretical odds are 50%.

Gravity : A valve accidentally dropped was a good one if it flies to pieces. If it remains undamaged, it was unserviceable in the first place.

Power Failure : When a house fuse blows, it

will be the last one to be investigated. Even if the usual order is deliberately reversed, this will still hold good. Starting at the middle and working out to both ends does not help matters, either.

These are but a few of the better-known effects, selected at random from a catalogue which has taken years to prepare. Every active amateur can think of several more, but it is difficult to summarise them all and to formulate a Law.

Our own private summary consists of three words—"You can't win." Others will no doubt suggest themselves. But a pre-knowledge of the effects will always be helpful, and even if you can't win, you can occasionally cheat, and thus save a little time and money. Whether the Inanimate Objects will hit back in the long run, making you wish you hadn't flouted the laws of nature, is at present difficult to determine. Perhaps a Volunteer Study Group — or even that body beloved of a certain organisation, A Small *Ad Hoc* Committee—may eventually be formed. *L.H.T.*

CONSTRUCTION OF COILS

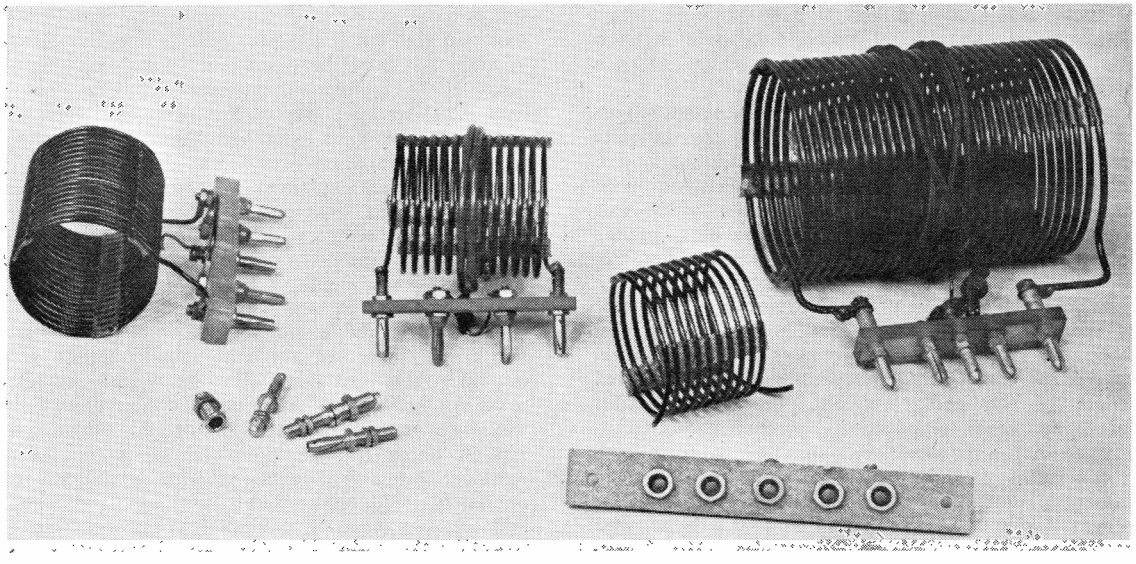
PRODUCING A NEAT JOB

FOR amateur-band transmitting coils, 14 SWG tinned copper is probably the ideal size, combining good surface area with mechanical strength, but at the lower frequencies such a gauge may result in a coil which is physically too large. Especially is this so for Top Band working, where a compromise must be accepted. Where possible, however, it is desirable to use a gauge not smaller than 16 SWG. At one time silver plating was considered essential for maximum efficiency, but it is very doubtful indeed whether the improvement is measurable in the HF range and whether the gain justifies the cost at any frequency lower than about 400 mc.

The first thing to decide before making a transmitting coil is the amount of inductance required to cover the desired frequency range in conjunction with the amount of capacity known to be available. The actual diameter is by no means critical—2 ins. to 2½ ins. will usually cover most requirements. By reference to the charts and formulæ given in most text books, and in particular in the *Radio Amateur's Handbook*, it is then possible to determine the number of turns required; the gauge of wire most suitable; and the winding length, bearing in mind that the wire should be spaced its own diameter apart.

Construction

With these details settled, the next step is to construct a suitable mandrel. This can be made from round wood, such as curtain pole, having a diameter equal to that required for the coil. Cut off a piece about 6 ins. long and make a diagonal cut right through the length, so that you are left with two



Transmitter coils made by the method suggested in the article and illustrated in Fig. 2. The three small coils were all cut from the same length of winding, the finished appearance of which, after stripping off the former, is shown by the unmounted 10-turn section; this winding is of 2 ins. diameter, has three spacing strips cut from polystyrene sheet, and the wire is 16g. enamelled. The larger coil, made in the same way, is 3½ ins. in diameter, is of 14g. enamelled wire, and has four spacing strips; it is a 30-turn centre-tapped winding, with a four-turn link. All these coils are rigid, very low-loss, and suitable for RF stages running 150w. and more. Items such as plugs, sockets, insulating material, wire and sheet for making mounts can be obtained from various suppliers to the Amateur Radio market.

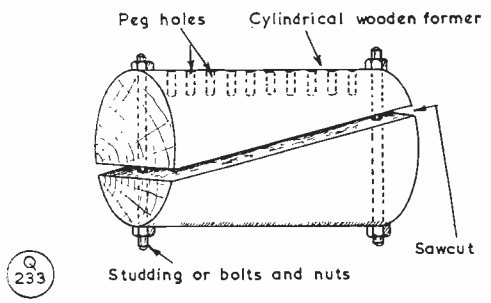


Fig. 1. Construction of a wooden mandrel, as described in the text, for winding transmitting coils. This is a re-usable former, and coils of different turns value can be wound up on it as and when required, the size being limited only by the length of the former.

wedge-shaped half-rounds. Place these together again to re-form the original shape and secure with wood screws at each end or by means of screwed rods and nuts (after drilling to receive the rods). Drill a series of holes in line down one piece, spaced about half-inch apart and of a suitable diameter to accept pegs made from nails with the heads sawn off. It is worth while going to a little trouble over this, because such a mandrel may be used over and over again in the production of coils having this diameter and up to a maximum length as measured between the two outside peg-holes.

The next stage is to cut and prepare the coil supports, consisting of $\frac{3}{8}$-in. wide strips of the insulating material chosen and of a length slightly greater than the length of the projected coil. Three of these should be a minimum, four perhaps better. One of these should be drilled $\frac{1}{4}$-in. hole at each end, later to receive banana plugs, to which the ends of the coil will be secured.

Next, it is necessary to work out the actual length of wire which will be required, from the formula $2\pi rn$, π being 3·14, r the radius of the coil, and n the number of turns, and to measure off slightly more than this total from your reel. (For a really neat job, it is also a good plan to measure off a similar length of string of approximately the same diameter as the wire being used, but this is not essential.)

The actual winding process requires a fair amount of space for a coil of any size, and is usually best done in the garden. Fix two pegs in your mandrel spaced just sufficiently to accommodate the calculated length of the coil; set out the three or four insulating strips equidistantly around the circumference of the mandrel, securing them in place with a few turns of cotton at each end or a turn of insulating tape, and retire to the garden with the prepared mandrel, wire, string and a pair of wire cutters. Loop one end of the wire to a strong nail or hook in a wall or fence and tie one end of the string to the same support. Lay out both wire and string in a straight line, hitch the far end of the wire round the handle of the cutters and gradually take the strain on the wire until you feel it stretch and can see it to be pulled beautifully straight.

Hitch the wire and string round the first peg and start winding under tension by rotating the mandrel, winding from the top, so that you can watch that the wire is going on evenly, with the string acting as a spacing guide. Keep your weight on the wire by leaning slightly backwards and draw yourself gradually towards the termination. On reaching the end, take a half-turn round the second peg to prevent the wire from springing undone, cut off the surplus inch or so attached to the support and wind off the string.

The next process is to apply a dab of a suitable cement ("Durofix" will do) at each point where the wire crosses the strips, and, as additional strength, bind the first and last turn to the drilled strip by means of cotton, which should also receive a dab of cement. When quite dry, remove the cotton or tape binding the strips to the mandrel, take out the screws or bolts holding the mandrel together and, with a light hammer, gently tap the thin end of one of the mandrel sections, when both sections may then be withdrawn from the coil. All that now needs to be done is to screw a pair of banana plugs into the holes provided in one of the strips, and to lock-nut the ends of the coil to the plugs. The result is a rigid, low-loss coil of excellent appearance.

Using Cardboard Mandrels

If you are in an immediate hurry for a coil (as most of us are!) and do not want to go to the trouble of preparing a mandrel for permanent use, you can form the coil on a piece of cardboard tubing of the required diameter, this being broken out after the coil has been made. (By the way, very useful for this purpose is the stout cardboard tube in which we send out the *DX Zone Map*; it is about $2\frac{1}{2}$ ins. in diameter by 28 ins. long and is quite strong enough.—*Editor.)* The permanent insulating strips for the coil itself are set out round the tube, as previously described, the wire stretched from the anchoring point, and the turns laid on by "winding towards you," as already explained. When the coil has been formed and the fixative is hard-dry, the cardboard tube is simply collapsed by destruction—tearing it in a few places and twisting it inwards. The formed coil will then slip off.

While about it, you can make yourself a coil a full 24 inches in length, a section of the required number of turns for the job in hand simply being cut off. You are then left with a nice length of spare formed coil, which can be cut as needed. In this way, in one energetic spasm, the writer made himself about two *yards* of coil, $2\frac{1}{2}$-ins. in outside diameter, using 16g. enamelled wire spaced two wire diameters. This was several years ago, and there is still about a foot of coil left! Sections from the original lengths have been used in all sorts of transmitters.

After making one or two coils by the method described here, you will find you can put the turns on accurately enough to dispense with the cord for spacing the turns.

Another Method

In the case where a coil is required for one of the higher frequency bands, having only a small number of turns, the following method will give equally good results: Prepare three or four strips of perspex or polystyrene more or less as before, and on one of these centre-punch a line of dots, spaced twice the diameter of the wire to be used and of the same number as there are turns. Using this strip as a template, set all strips up in the vice, staggering them very slightly lengthwise ; with the punch marks as centres, drill a line of holes, using a clearance sized drill relative to the wire diameter. Measure up and stretch the wire as previously described, and wind the required number of turns, close-spaced, on any convenient former having a diameter slightly smaller than the required coil diameter. (The pantry will generally provide a suitable bottle for this job!) Let the coil spring back to its natural shape and cut off the misshapen ends. Thread the formers on to the wire, taking care not to distort the shape of the coil, and continue this process until all holes are occupied. Space out the formers equidistantly round the coil and complete by cementing at each junction point as before. The ends of the coil can be shaped suitably to be attached to banana plugs or any other form of termination decided upon.

Radio Frequency Chokes

These are necessary in almost every circuit, but unless correctly designed may sometimes cause unexpected trouble. It is not unknown for a choke or one section of a choke, if "pie" wound, to form, in conjunction with an external capacity, a resonant circuit on its own which may cause parasitic oscillation of a most undesirable nature. The remedy, of course, is to break up the resonant circuit or circuits by changing the characteristics, generally by substituting a choke of different shape or design. One very simple way of making up an efficient choke is as follows:

A former must be prepared, consisting of an ordinary lead pencil and an odd number—five or seven—of household pins. These are stuck into the pencil so that they radiate outwards like the spokes of a wheel. The wire can be enamelled or cotton-covered and of about 28 SWG. Winding is accomplished by weaving in and out of the pins round and round, so that a flat "pancake" is built up to a diameter of about one inch. The outside turn is temporarily secured by a turn round one pin, and the wire is cut off with an inch or two surplus for connecting up. Give each side of the pancake a smear of "Durofix" or other suitable cement, and, after a period allowed for drying, remove the pins and slip the coil off the pencil.

Repeat the whole process until three or four similar coils, or pancakes, have been built up. The exact number of turns is not important so long as there are not too few for the frequency it is desired to suppress, and the individual coil sizes may vary slightly—in fact, it is better if they do. The coils are then mounted on a suitable former—a piece of perspex rod is ideal, but at the lower frequencies a wooden skewer or even a pencil will serve. The sections are spaced out about a quarter-inch apart and cemented to the former and wired up in series. It is important to see that all coils are placed so that their windings are in the *same direction* and that the inside turn of one coil is connected to the outside

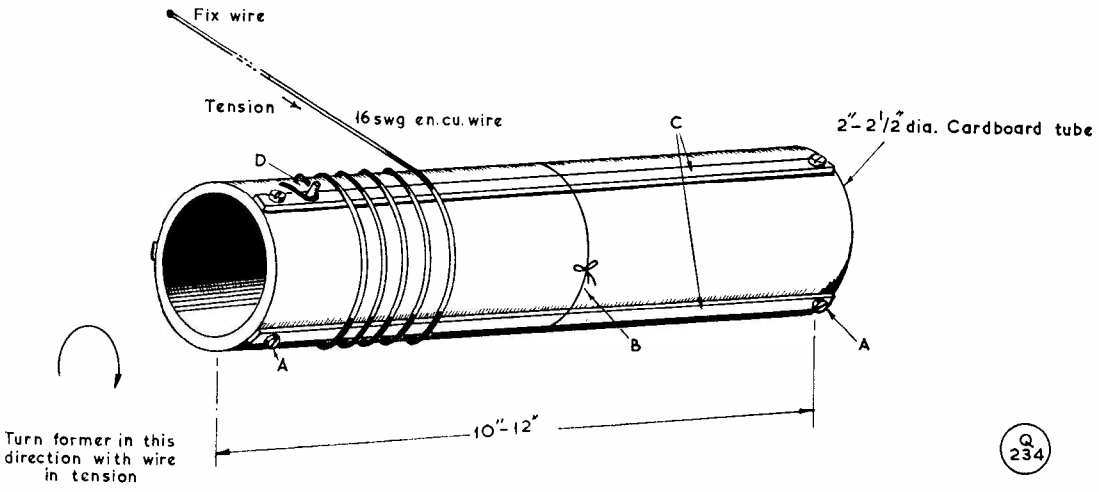


Fig. 2. Illustrating method of transmitter coil construction using a temporary cardboard former (which can be expendable) for making up the coil. AA are screws for securing, temporarily, the insulating strips CC, of which at least three and preferably four should be used ; B is a thin cord fastening to hold the strips against the former until the coil is completed ; D is the anchorage point for the first turn. The coil is formed by working out the total length of wire needed for the whole coil, pulling it out straight and free from kinks, fixing the end to some suitable support, and then winding evenly by walking towards the fixing point with the wire in steady tension. When the winding is completed, polystyrene cement is run over the insulating strips to secure the turns, after which the cardboard former can be pulled or broken out. If a former of sufficient length is available, and there is enough space to stretch the wire, a "yard of coil" can be made in one operation, from which coils of different turns value can be cut off as required.

turn of its neighbour, otherwise the inductances will tend to cancel out and the device will be ineffective.

Fast Winding

When winding up coils having a large number of turns — such as single-section RF chokes, or low-frequency receiver tuning coils — don't forget the old method of the hand drill mounted in a vice, with the coil former secured in the chuck. Then, you just turn the handle slowly and feed on the wire. It takes a little practice to get even tension.

Finally, a hint or two about soldering when in the vicinity of plastic or other easily-damaged material. This is best done by making use of what is known as a "heat shunt"—which consists simply of gripping the wire to be soldered firmly in the jaws of a good-sized pair of pliers, the wire being held close to the soldering point and between this point and that requiring protection. The effect is for the mass of metal comprising the pliers to conduct the greater part of the heat away and to prevent it from running up the lead to the possible detriment of the adjacent plastic former. Always use a good hot, clean iron, and be sure that both surfaces are nicely tinned beforehand, so that the job can be completed quickly and tidily.

(Editorial Note : The materials for the construction of transmitting coils — plugs and sockets, cement fixer, insulating strip and wire—as described here can be found in the current catalogues issued by the firms of Home Radio (Mitcham) and Southern Radio (Sorad).

RADIO EQUIPMENT IN CABLE-SHIP "MONARCH"

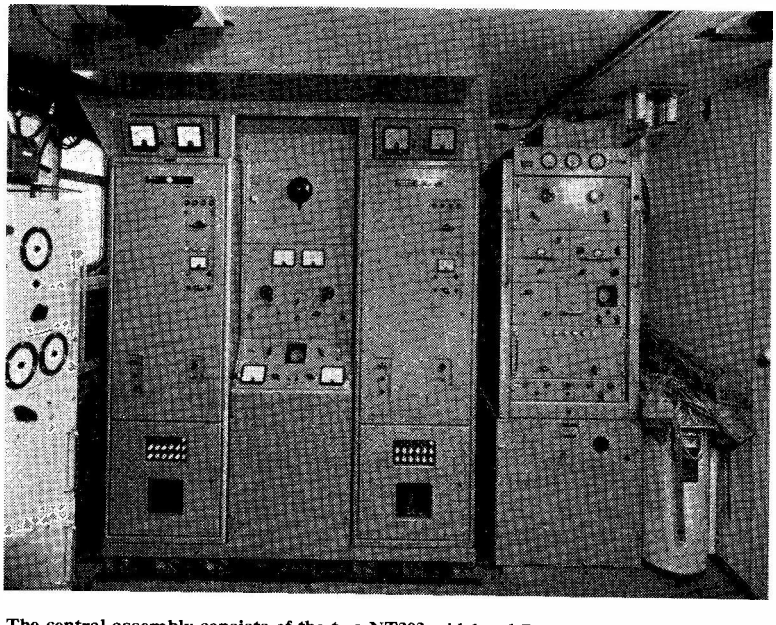
UNIQUE MARINE INSTALLATION

MARCONI'S Wireless Telegraph Co. Ltd. have recently completed a very comprehensive radio communication installation in the G.P.O. cable-laying ship, H.M.T.S. *Monarch*. Part of this installation is of unusual technical interest, in that it is believed to make *Monarch* the first ship in the world to be equipped with HF transmitting gear which embodies a main RF amplifier having no tuned circuits. This facility is incorporated in a new equipment developed by the Marconi Company, the wideband RF amplifier Type NT203. This provides a substantially constant power gain over the whole of the range 1·5-24 mc, and therefore needs no re-tuning when the working frequency is changed. Two of them are used in parallel without difficulty in H.M.T.S. *Monarch*. Other radio communication equipment in the ship includes two 1 kW HF independent sideband transmitters, Type NT201, and a 10w. simplex/duplex VHF transmitter/receiver, Type NTS402.

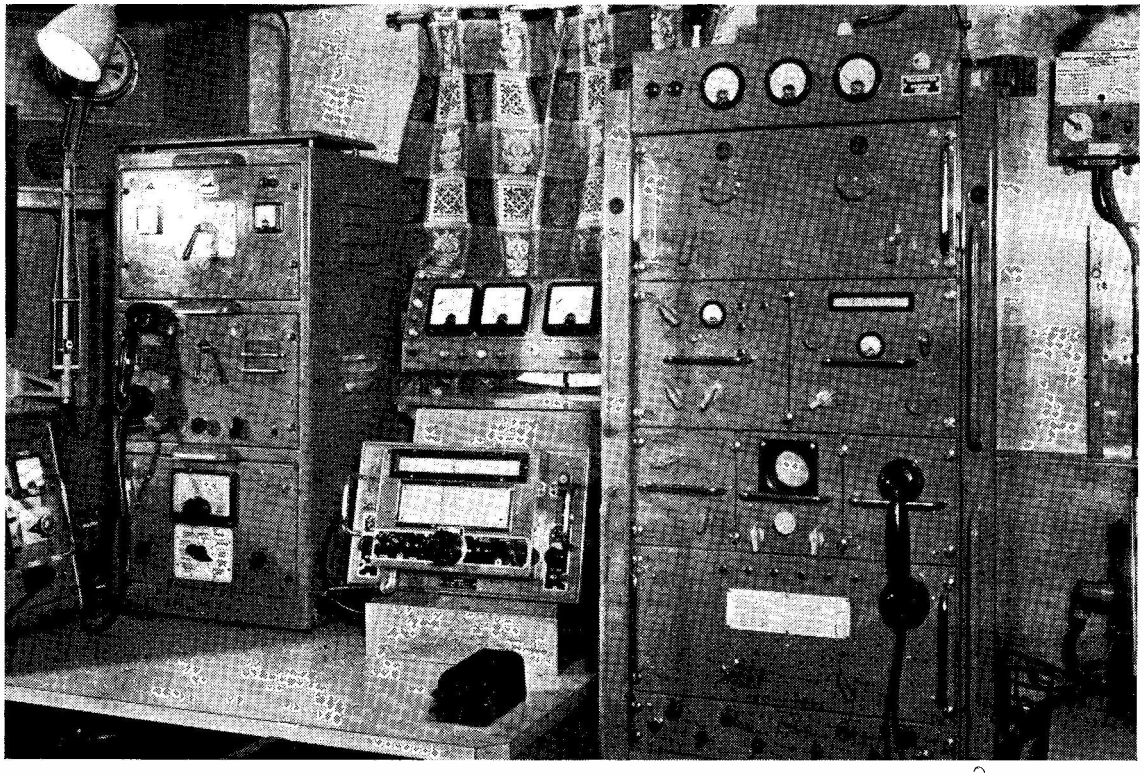
Another important feature is the flexibility of the installation. Either of the NT201 ISB transmitters can be used as independent 1 kW equipment, or can provide (from their primary stages) a low-level drive for the NT203 wideband RF amplifiers. The latter, when operated in parallel, provide a peak envelope power of 2·8 kW on SSB working, and feed a 35-ft. whip aerial *via* a band-switched aerial matching unit.

The NT201 transmitters and the NT203 wideband amplifiers will be used, not only for normal ship-to-shore communication, but also to provide an essential continuous communication link by radio with the cable terminal stations whilst *Monarch* is engaged in cable-laying or repair. The VHF transmitter/receiver, Type NTS402, enables the ship to communicate on the international inter-ship, port control and public correspondence frequencies.

Each NT203 unit embodies a wideband amplifier with its associated control system and power supply unit. The two NT203's are connected in parallel by a special combining system for the provision of a



The central assembly consists of the two NT203 wideband RF amplifiers, which can be operated in parallel ; between them is the control and monitoring unit. The transmitter on the right is the NT201, which can be used either by itself as a 1 kW spot frequency Tx or, from its low-level stages, as a driver for the NT203's, which in parallel give a p.e.p. of 2.8 kW. These transmitters are remote-controlled from the operating position, to which monitoring indications are repeated.



Radio room of the G.P.O. cable-ship "Monarch," fitted with the latest Marconi Marine equipment. In the assembly at left is the "Albatross" transmitter/receiver for local VHF R/T working, with the "Electra" receiver at centre. Above this is the remote control and indicating panel for the NT203 wideband RF amplifier; the cabinet on the right contains the NT201 ISB transmitter. Note the Morse key; most of the traffic with deep-sea ships is still worked by CW telegraphy.

peak envelope power of 2·8 kW continuous two-tone rating. A particular feature of the NT203 is its ability to accept conditions of fairly wide load mismatch without damage. The amplifier is stable under conditions of a 2:1 mismatch, and closes down in the open circuit condition. The input may be short-circuited without disturbing the stability. Reflectometer units are provided to indicate forward power and the voltage standing wave ratio on the feeder system. The bandwidth and frequency coverage are the same, namely, 1·5 to 24 mc. Over the whole of this band the power gain is substantially constant. The overall gain per amplifier at any frequency within the band is at least 40 dB; the input power necessary to produce the full peak envelope power is therefore less than 100mW at each amplifier. Under steady signal conditions, *i.e.*, with key down, the RF power output is 700 watts.

The amplifier is essentially linear, and although there are no tuned circuits to discriminate against harmonics, the general level of the second harmonic relative to the continuous-wave carrier is generally better than – 40 dB.

A particularly striking result of the absence of tuned circuits is the ease with which units can be banked in parallel to provide increased power. This is illustrated in the H.M.T.S. *Monarch* installation, where the two amplifiers are run in parallel on any frequency in the band 1·5 to 24 mc without any adjustment to phasing or gain.

Mechanically, the amplifier is divided into two sections, the upper of which comprises the final stage, the penultimate stage, the reflectometer and power indicator drive unit. The lower part of the cabinet contains the power supplies. The final stage unit is air-cooled from an external source. Should the supply of cooling air fail, the main contactor automatically opens to remove the AC supply.

Brief Circuit Description, NT203

The input to the amplifier is *via* a 70-ohm coax cable; it is converted to a push-pull drive by a ferrite-core transformer, after which it is fed to the penultimate stage amplifier. This consists of a distributed amplifier using nine pairs of E180F valves operating in Class-A. The anode load for each pair is a chosen impedance at a particular point in a balanced transmission line consisting of lumped constants. A similar transmission line is used in the grid circuit of the valves. The signal is fed to the final stage through a ferrite-core transformer which provides a 70-ohm output impedance.

At the input to the final stage the signal is again converted to push-pull and feeds another distributed

amplifier consisting of eight pairs of 4X250B air-cooled tetrodes working in a linear mode approaching Class-A. Full metering of valve circuits is provided to facilitate adjustment and servicing. Output is taken *via* a ferrite-core transformer to a coaxial line at 50-ohm impedance, and into the 35-ft. whip aerial.

The two wideband amplifiers are separated physically by a central frame housing a switching unit, a coil unit, a monitor unit providing continuous CRT check on RF output waveform, and RF load units with RF power measuring probes.

The bottom section of the cabinet houses the power supplies, consisting of three main units. One of these provides the grid bias and stabilising for the 300-volt and 150-volt supplies, whilst the second is an HT tray containing the AC contactors, the subsidiary circuit fuses and three banks of silicon rectifiers. The third comprises the HT transformer assembly. All fuses have associated failure indicators.

Remote Control Facilities

The supply control circuits are locally controlled, but the amplifiers may be opened up or closed down to traffic from the remote position. Indication of whether the equipment is "unready," "ready" or "busy" is provided by lamps, whilst the RF indicator and voltage standing wave ratio meters are duplicated at this position. The NT201 1 kW transmitters can also be brought from the "stand-by" to "operational" condition from the remote control position, and likewise operated from there.

Additionally, *Monarch* is fitted with the normal Marconi Marine installation, comprising two "Globespan" high-power transmitters, two "Mercury" and two "Electra" receivers, a "Reliance" emergency transmitter, an "Alert" emergency receiver, an "Autokey" automatic keying device, and "Albatross" radiotelephone equipment.

AMATEUR LICENCE FIGURES

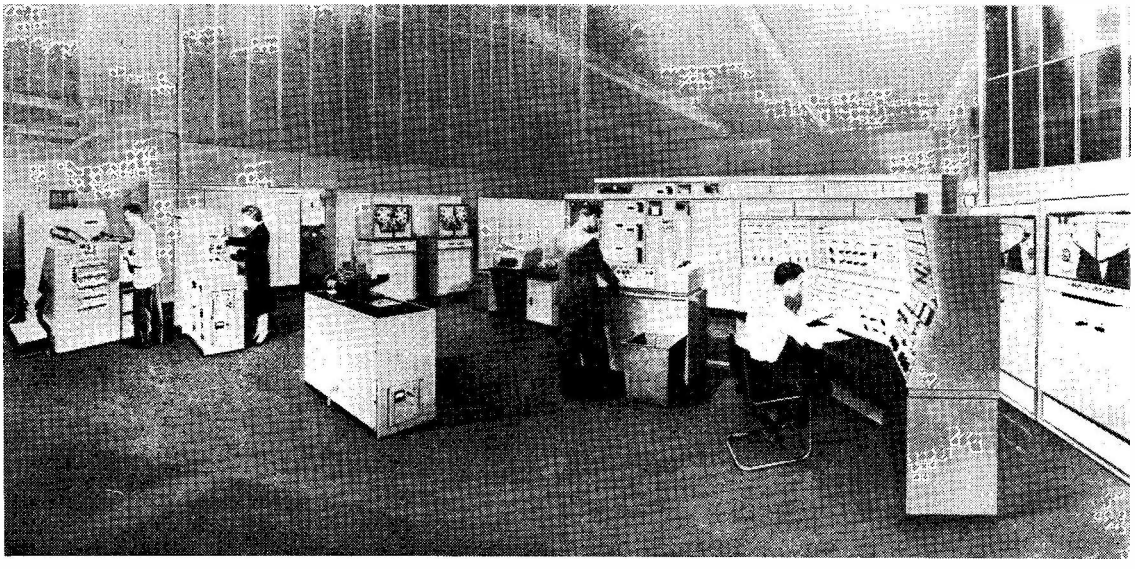
We are informed by the G.P.O. that as at the end of August, the total of U.K. Amateur Transmitting Licences in issue was 8,821. The mobile permits totalled 913, and those for amateur TV transmission 77. It should be noted that the grand total is not the sum of these figures; a normal Amateur (Sound) Licence must be held before an application can be accepted by the Post Office for either /M or ATV facilities, both of which involve an additional charge.

SPECIAL MOSLEY DESIGN FOR RECEPTION

The well-known aerial manufacturing firm of Mosley now offer an antenna system specially designed for general short-wave reception over the range 11-49 metres (6-27 mc approximately), in which lie not only the 7-14-21 mc amateur bands, but also seven of the principal short-wave broadcast bands, for which the aerial is primarily intended. Known as the SWL-7, it is a wire assembly incorporating the trap system, and requires only a single coax feeder connection to the receiver. It is supplied complete with a length of feed line and comprises a relatively compact array which will operate effectively on the short-wave broadcast bands 11, 13, 16, 19, 25, 31 and 49 metres. Manufacturers are Mosley Electronics, Ltd., 15 Reepham Road, Norwich, Norfolk, from whom full details can be obtained.

"MAKING THE MOST OF METERS"

The third part of this article has been held over, due to pressure on space, and will appear next month.



If you have ever wondered what a high-grade electronic computer looks like, here is an impression of the Model 2400 designed and built by E.M.I. Electronics, Ltd., of Hayes, Middlesex. The work-output capacity of such installations, capable of working a 120-hour week, is many times that of the individuals who serve them.

VHF BANDS

A. J. DEVON

Good Conditions and High Activity—

Success of an Expedition—

Station News and Reports—

IT only needs a glance at the new season's Annual Counties table on p.431 to see that VHF conditions have been good during the period—all those scores were made in about the first three weeks of September, and it is a long time since such a showing has been possible so early in the year. The best spell was during September 4-13, with another build-up over the week-end 24th-25th. On the evening of the 4th, there was a short Auroral opening, unfortunately after the Region I VHF Contest had closed.

For the contest itself, conditions were mediocre but activity much better than might have been expected. Had we had the conditions for it that developed later in the month, the contest would have been quite a party. Nevertheless, some good GDX was worked, particularly on the Sunday morning, when such contacts as G3FD/P with GI3GXP/P and G3FZL with GI3KYP/P were logged; F8MX/A was on, and had made 31 contacts by 1530 on the 4th; he described conditions as poor and progress slow. However, some good scores were noted: G3HGE/P finished up with 102S worked, G3FD/P with 89S, and by 1545 G3LCH/P, on a very good site near Hindhead, had worked more than 130 stations. There were several GW's on, including GW2HIY, GW3KMT and GW3LJP, all busy working stations to their east and south-east. G3HBW, with 90S booked, heard GM3EGW and GM3HLH/A, and worked GI3KYP/P. G2HIF finished up with 71S, having carried on throughout the whole 24 hours. The proposed /P trip to the summit of Snowdon, which was to have been made by one of the northern groups for the contest, unfortunately did not materialise—which was a pity, as it would have been interesting to see if the old "Snowdon magic" still works; and if they had been able to make it, they would have found a BBC bird-watcher up there, who reported Wx conditions as perfect.

During the Aurora break on the evening of September 4, between 2150 and 2210 GMT, G3HBW worked GM3DIQ, GM3EGW, GM4HR and GM6XW, just like that, and had started a QSO with GM3DLU when signals faded out. Later, the band opened again, and Arnold raised GM2FHH for his fifth Auroral contact that evening.

With good GDX conditions developing during the evenings following, the two-metre band was lively on the 8th, when F3LP and F8MX/A were on working G's; on the 10th, some more distant EU's were workable from the southern part of the country, contacts noted being G3LTF/DJ2SY, also DL3FM, and DL1LB in QSO with both G3HBW and G6NB; some interesting GDX was also to be heard, like G4GR down in Newport, Mon., G3HUL from Norwich and G3ILD in Durham. On Sunday, 11th, conditions for GDX were good all day, and in the evening at 1910 GMT G3LTF worked DJ2YD; other QSO's that evening were G3AOS/G3KDG, G3KCB/G3BLP, G5QA/G6XA and G3GHO/G3ILD, all these being in the DX category.

After the 18th, conditions relapsed somewhat, but another marked improvement developed during the week-end Sept. 24-25, Sunday morning, 25th, being particularly good for north-south working, when stations like G3ILX (Barrow), G6UJ (Driffield), G3BAK (Stockport) and GW2HIY were getting right into the London area, where activity was high; GI5AJ was also on, and worked G3HBW at about 11.0 a.m.

Expedition Results

Most of the letters in a large mail comment upon the expeditionary prowess of G3HWR-G3LAR, who put up a very good show indeed as regards results achieved from the rare counties

TWO METRES

COUNTIES WORKED

September 1, 1959 to August 31, 1960

Starting Figure, 14

From Home QTH Only

Worked	Station
53	G3HBW
51	G5MA
50	G2CIW
48	G3LTF
45	G6GN
44	G3NBQ
41	G3KPT, G6XA
38	G3JWQ
36	G3AYC
34	G3LAR
32	GW3ATM
30	G3GSO, G5ML
27	G3HWR
25	GW3MFY
24	G3MPS
20	G3OBB, G3OBD
18	G3CO, G3ICO, G8NM
17	G3NNK
14	G3DLU, G3IOE

This Annual Counties Worked Table opened on September 1st, 1959, and closed on August 31st, 1960. These are the final placings for the year.

they covered. By a stroke of good fortune, they were out on their marathon tour during September 5-18, which just about coincided with the spell of good conditions; added to that was the fact that they took in Huntingdon, Cumberland, Westmorland and Rutland, so that it only needed enterprise to make the most of an unusual opportunity. They certainly did make the most of it. Signing G3HWR/P, G3LAR/M or G3LAR/P, depending on the local situation, 21 stations were worked from the Huntingdonshire site, 58S from Cumberland, 56S when in Westmorland, and ten stations from different sites in Rutland—making in all 145 QSO's with 87 stations, three of which worked them in all four counties: G2ANT, G3HBW and G5MA. Among those who got them in three counties were G3BLP, G3HS, G6XA and G8VZ. Best DX was G3FAN, at about 260 miles.

Their transmitter ran 20w. to a QQVO3-10, with another QQVO3-10 as modulator, the receiver was A2521-6BQ7A-12AT7, CC, into a modified Command Rx tuning 4-6 mc, and the aerial a 6/6 slot-fed J-beam, pushed up to 20-27 feet depending on wind conditions; when signing G3LAR/M, the aerial was a halo on the car.

In their report, G3HWR/G3LAR say they heard many phone carriers too weak to resolve. Procedure was to tune systematically across the band and take stations as they came up; it took anything up to 2½ hours to tune the whole band, with stations calling every few kc, and often for far too long. Inevitably, this resulted in long waits for some people and a number of stations were never worked because they were in QSB or QRM. They feel, on the other hand, that if tuning had been at random, some parts of the band might never have been covered. They always tuned with the BFO on, and found that stations using CW were easily identified in QSB—about half the contacts made were on the key. From the point of view of G3HWR/G3LAR, what might be called operating behaviour varied from the chap who persisted in trying to use phone when his signal was only good enough for CW, through those who failed to appreciate that there was no time for rag-chewing, to the experienced operators who kept it short and repeated the essential information several times if given a report indicating QSB.

From where your A.J.D. sits, G3HWR/P was always a good signal, well operated, and obviously the intention of G3HWR/G3LAR was to give everyone a fair chance and to work as many stations as they could. Altogether, a fine effort on their part, and they can take it that all the work and travelling they put in was very much appreciated.

VHFCC Elections

To keep up with the record, here are the issues to date: VHFCC Certificate No. 274 goes to Willi Kross, DL7FU, Berlin, who shows cards from six countries, with G5YV as the only U.K. station worked.

G. D. Roe, G3NGS, Herne Hill, S.E.24, gets Certificate No. 275, his lot being G's only, all on phone, worked on a Tx running 50w. to a QQVO6-40, into a 6/6 slot-fed Yagi, the receiver being a CC Cascode with a BC-312. For his 100 cards, he made 150 QSO's in a period of about 18 months.

Sasek Milos, OK1AMS, of Kladno, is awarded Certificate No. 276, his cards being from six countries and including OZ7BR for what must have been a good QSO; he shows no G's worked.

For VHFCC Certificate No. 277, P. Gill, G3NRO, Ashford, Kent, shows cards from G, GI, F, ON and PA, all this having been achieved since February; in fact, he worked 100 stations in his first nine weeks on the two-metre band. The Tx runs about 150w. to a pair of 4E27's in push-pull, the receiver is a CC 6AK5-EC91-6AK5 converter into an AR88 tuning 28-30 mc, and the beams have been various, including a 9-ele wide-spaced Yagi on a 25-ft. mast, the whole being of all-steel construction by G3NRO himself. He is now off to VK5 for a tour of duty which will last four years.

The Station Reports

These are numerous this month, and we start with G3LTN (Andover), who has been on two metres for about a year and has accounted for 33C for the All-Time in that period. He is on 144·15 mc, the Tx taking about 70w. in a QQVO6-40A, with series-gate modulation, and the beam is a slot-fed 6/6 at 25 ft. on a site 285 ft. a.s.l.; his Rx is a CC Cascode, A2599 neut. RF stage into an A2521 g.g. RF, followed by a 6BQ7A, with the 4-6 mc IF tuned on a BC-454.

G3GSO (Derby) worked his 20C for the New Annual in the first 12 days of September; as he also got G3HWR/P in Cumberland and Westmorland, and GW3KYT/P for Flints., he is well satisfied with results so far. Likewise, G3HS (Faringdon) is able to put in a good claim for the New Annual, with 25C worked in about three weeks; he runs 20w. to an 829 PA, series-gate modulated, the beam is a 5-ele Yagi at 35 ft., and the Rx a Cascode into an Eddystone 888A. G3HS says that many of the members of the A.E.R.E., Harwell, Radio Club are on two metres, and the following can be found on the band after about 8.0 p.m. most evenings: G2HIF, G3AZT, G3GKD, G3NNG, G3OGC and G3HS himself.

GW3ATM (Nr. Chepstow) moves well in the Tables and runs 80w. to an 829B, CW or phone, with a 4-ele Yagi at 37 ft. and a CC G2IQ-type converter. He is getting ready for 70 cm. and hopes that, with G5QA, they will be able to transfer their regular sked to that band. GW3ATM is also operational on four metres, but on that band is involved in TVI, as the local BBC/TV is on Ch. 5 G3OBD (Poole) continues to make steady progress and is able to claim a rung in the New Annual; on September 8 he was out /M, and with his 8w. raised G3EGK for Cheshire, G3FIJ for Essex, and GW2HIY for Anglesey.

As can be seen, G6GN (Bristol), who is very active, has made an excellent start in the New Annual; he got G3HWR/P for Cumb. and Westmorland, and G3ARS/M for

Rutland, while F8MX/A and F9JY/M, worked during the contest, helped to push things along. G6GN has now turned his attention to 70 cm., the PA being a QQVO3-20A with 20w. input and the beam a 6/6 at 35 ft.; he has already given first contacts to G2XV, G3IRA, G3KFD and G3KPT, and would be very glad to work anyone who wants Glos. (or even a QSO!) on that band.

This reminds us to say that G2XV (Cambridge) is now well out in front in the 70-centimetre Table, with 33C worked on that band; Gerry would probably agree that they have been painfully acquired, as activity on 70 cm. is much lower than it should be; however, he himself has kept at it, and there is no doubt that there are quite a lot more stations on, or coming on.

G3OBB (Christchurch) with his 15w. and the beam pushed a bit higher "when the neighbours were not looking," has got his foot on the bottom rung of the New Annual, and was pleased to work G3MED, F8MX, F9JY/M and F9NW. G2CVV (Derby) makes claims for the Tables, and the Tx now in use is a modified T.1131, into a 4/4 slot-fed, the Rx being A1714-EC91-6AK5, with a 3/6C4 CCO, tuning 28-30 mc on a bandspread HRO.

G5QA (Exeter) returns to the fold with 15C for the New Annual, and raised GC2FZC on September 4. G5MA (Great Bookham, Sy.) lists some very interesting GDX worked during the period: G3CZZ/M, nr. Redruth, Cornwall; G3ILD for Co. Durham and G3IOE in Newcastle; and GW8MQ for Carmarthen, "very rare," as Bob says.

G2CIW (Birmingham) has a good location 580 ft. a.s.l. and finds he can work over the 100-mile mark at any time, so does not regard conditions as above average unless stations at and beyond that sort of distance are very strong. For him, the period of good conditions was Sept. 4-13, during which he worked GM3EGW, GM3HLH/A and GM3DLU, with GC2FZC heard on the 9th and GM3DIQ on the 13th. G2CIW is also active on 70 cm., but has found things quiet on that band, in spite of good conditions; he thinks that, during a good spell, people don't like moving off two metres in case they might miss something—and we would say there's something in that.

G3JWQ (Ripley) stakes claims, from which we notice he has now worked a total of 517 different stations on two metres, 24 of them in the last couple of months or so. G3COJ brings us up-to-date on the G3AYC activities (Ariel Radio Club, BBC), both VHF bands being worked, with 11C on 70 cm. G3KPT (West Bromwich) badly wants a Beds. station for his two-metre scores and, because 70 cm. activity is so low, has been spending some time building a tripler for a band which is even less populated, *viz.* 23 cm.; with this, he is at the stage of having got a pea-lamp to glow. G3MPS (Farnborough) is pleased with his reports since getting the 4X150A PA running at 150w. on two metres, and is now busy finalising the QRO amplifier for 70 cm, also running a 4X150. GW3MFY (Bridgend) suggests that positions in Annual Counties should be determined as much by distance covered as by new counties worked—it might be an idea if we had somebody to do all the arithmetic, but even then it is more than doubtful whether the complication would be justified.

G3KQF (Derby) only needs Cornwall and Norfolk to complete all English counties worked on two metres; he hopes to be on SSB by the end of the year, and puts forward the idea of segregating a portion of the two-metre band for SSB-only, to simplify matters for the future; he wonders what the feeling would be on this? During the September spell, G3KQF worked his share of the DX, and mentions G3NGS as a most consistent signal. G2AHY (Crowthorne) lost his beam in the spring gales, but is back on again with a 4-ele Yagi at 33 ft., T-matched into 300-ohm line, running down the inside of the dural mast.

G3NAE (Bournemouth) has been on two metres since May this year, running 50w. to a 3E29 PA and the receiver a Cascode with the G6TA A2521 pre-amp. stage—*see* SHORT WAVE MAGAZINE, June 1959—into a CR-100. It is interesting to note that his beam is a Cubical Quad, at 40 ft. G3NAE has done well to work 20C for the New Annual, with G3MED as best DX to date. G6XA (Leamington Spa), having worked G3HWR/P in three counties, as well as GC2FZC and F8MX/A, with GM3HLH/A heard, starts the new season with 23C and says there are no complaints from his end.

G3JDN (Reigate) now has a modified version of the Cascode converter described in the July 1960 *Magazine*, with the IF tuning 4-6 mc on an HRO, and says that it gives an improvement of two S-points over his old G2IQ converter; on September 11, he worked F9NW, and earlier in the period found he could get into the Midlands, even though he is badly screened in that direction.

Having started up on two

TWO METRES

COUNTIES WORKED SINCE SEPTEMBER 1, 1960

Starting Figure, 14

From Home QTH Only

Worked	Station
46	G3HBW
40	G3JWQ, G6GN
35	G3KPT
30	G2CIW
28	G3MPS
26	G3KQF
25	G3HS
23	G2CVV, G6XA
20	G3GSO, G3NAE, GW3MFY
15	G3OBD, G5QA, GW3ATM
14	G3OBB

This Annual Counties Worked Table opened on September 1st, 1960, and will close on August 31st, 1961. All operators who work 14 or more Counties on Two Metres are eligible for entry in the Table. QSL cards or other proofs are not required when making claims. The first claim should be a list of counties with the stations worked for them. Thereafter, counties may be claimed as they accrue.

TWO METRES

COUNTRIES WORKED

Starting Figure, 8

18	G3HBW (DL, EI, F, G, GC, GD, GI, GM, GW, LA, LX, OE, OK, ON, OZ, PA, SM, SP)
18	G5YV (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, OK, ON, OZ, PA, SM, SP)
17	ON4BZ, (DL, EI, F, G, GC, GI, GM, GW, HB, LA, LX, ON, OZ, PA, SM, SP, 9S4)
17	G3CCH, G6NB
16	G3GHO, G3KEQ, G5MA
15	G2XV, G3FZL, G4MW, G6XM, PAØFB
14	G2FJR, G2HDZ, G3AYC, G3FAN, G3HAZ, G3IOO, G3JWQ, G3WS, *G5BD*, G6LI, G8OU
13	G3BLP, G3DMU, G3DVK, *G3GPT*, G3KPT, G5DS, G6XX, GM3EGW
12	EI2W, F8MX, G2HIF, G3EHY, G3GFD, G3GHI, G3LTF, G3WW, G5CP, G5ML, G6RH, G8VZ
11	G2AJ, G2CIW, G2CZS, G3ABA, G3CO, G3JZN, *G3KUH*, G3LHA, G4RO, G4SA, G5UD, OK1VR
10	G2AHP, G2FQP, G2HOP, G3BDQ, G3BK, G3BNC, G3DLU, G3GSE, G3GSO, G3JAM, G3KQF, G3MED, G5MR, G6XA, G8IC, GW5MQ
9	G2DVD, G2FCL, G3DKF, G3FIJ, G3FUR, G3IUD, G4LX, G8DR, G8GP, GC3EBK, GM3DIQ
8	G2DDD, G2XC, G3AEP, G3AGS, G3BOC, G3EKX, G3GBO, G3HCU, G3HWJ, G3KHA, G3MPS, G3VM, G5BM, G5BY, G8SB, GC2FZC, GW3ATM

metres last December, G3NNK (Romford) is now able to show 116S worked in 257 contacts. His transmitter, based generally on the design in the September 1958 issue of SHORT WAVE MAGAZINE, runs 20w. input to an 832 PA, plate-and-screen modulated, with plenty of audio watts in hand for any future increase in carrier power, and the receiver is an ECC84 Cascode with a BC-455 tuning 7-9 mc, feeding out at an IF of 2·8 mc into a Top Band Command receiver, which is itself modified to incorporate noise-limiter, Q-multiplier, AGC. S-meter and an extra audio stage. His aerial is a 6/6 slot-fed J-beam at 32 ft., which has shown a considerable improvement over the 6-ele Yagi used previously.

The Tabular Matter

The claims received for the Tables totalled no less than 60, and though we are unable to show the All-Time this month, the appropriate entries have been made and it will appear at the next opportunity. Congratulations to G3HBW on having topped last year's Annual Counties.

Readers generally have responded very well to the request to make their claims on a separate sheet—for which your A.J.D. is duly grateful.

Comments out of Context

"After being an SWL since pre-war days, and a regular reader of the *Magazine* since the first pre-war issue, I turned to listening on two metres, which is rather like the countryside after being in a busy town. I decided that this would be my band when I was licensed" (G3NNK) . . . "I am thinking of going VHF only" (G3JDN) . . . "G3HWR/P did an FB job on their DX-pedition and picked their sites very well" (G6XA) . . . "The QRM on the DC bands drove me to two metres and since coming on in May I have been so surprised at the activity and the very good operating manners of VHF stations, that my HF/LF band rig hardly gets switched on now" (G3NAE) . . . "One thing I do find very annoying is the continuing operation of full-power stations in the wrong part of the band" (G3KPT) . . . "The highlight of the month for most southern stations was undoubtedly the rare-counties expedition by G3LAR and G3HWR" (G3HBW) . . . "The European contest brought me a total of 100 stations worked, though conditions were not good" (G3JWQ) . . . "A point about conditions: I haven't worked an EU since last October, with only F8MX and ON4BC heard, and I've been pretty active" (G2CIW) . . . "I have been pipped for top place in last year's Annual Counties, but feel I have done quite well" (G5MA) . . . "G3OBD is now ahead of me on Counties, but not for long" (G3OBB) . . . "A little improvement here this last month" (G3OBD) . . . "Shall be delighted to give anyone a sked who wants to work Glos. on 70 cm." (G6GN) . . . "I noticed that during the contest Derbyshire was represented by at least ten stations" (G3GSO).

Echo Sounding

The issues of *CQ* and *QST* for September carried reports on the moon-reflection results achieved by W1FZJ/W6HB on July 21, the frequency being 1296 mc. Though this was most interesting, and a very creditable effort, by any standards the gear they were using was elaborate, and could hardly be called "amateur," in the strictest sense.

Coming a lot nearer in, the Ministry of Aviation announced successful trans-Atlantic tests between R.R.E., Malvern, and the Bell Telephone Laboratories in New Jersey on August 29, using the passive reflector *Echo I*, a power of 10 kW and a frequency of 960 mc; with a dish only 20 ft. in diameter, at Malvern, signals of good strength were held for 5-10 minutes on successive orbits.

Last month, we discussed the G3BDQ/F9QE result, apparently by *Echo I* reflection; though there is no reason to doubt its validity, it is fair to say that no further such results have been reported. G3BDQ himself suggests that careful tests should be carried out, using the orbit forecasts given in the *Daily Telegraph* (which presumably will be resumed when *Echo I* is again due to be visible over the U.K.). Such tests call for accurate frequency setting, correct beam directivity, and timing, as the duration cannot be more than about 10 minutes on each orbit.

In Conclusion ——

Which brings us to the end of what we hope is a full report on an exceptionally interesting period as regards VHF operating results. There is no reason why October should not yield further openings. Deadline for our next is **Wednesday, October 19,** and the address is: A. J. Devon, "VHF Bands," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Till November 4, then, 73 and keep after those new counties.

Notes on SELECTED BOOKS

For the Radio Amateur and The SWL

As we are constantly adding to our list of Amateur Radio publications, manuals and handbooks —*see* advertisement p.394 this issue—and there is now such a wide range of technical literature, covering the whole field of amateur transmission and reception, we have prepared review notes on several of the more recent additions, including also a few of the standard texts with which some readers may not be familiar.

All the books mentioned here can be recommended as sound, practical and authoritative on their subjects. Mainly of American origin, their authors are either electronics engineers who have specialised in Amateur Radio, or professional radio men who are themselves holders of active AT station licences —the point being that these days about half of those who operate amateur transmitting stations are professionally engaged in the radio and electronics industry.

The prices quoted are post free, home or overseas surface mail, direct from us and normally from stock. Orders, with remittance, to:

Publications Department,
Short Wave Magazine, Ltd.,
55 Victoria Street,
London, S.W.1

Quad Antennas: This is a 96-page manual covering the theory, design, construction and operation of Cubical Quad beam arrays, starting with a clear description of how the Quad works, and leading on to the methods of putting various home-built systems together, with a good chapter on the problem of feeding Quads. In this book, the practical man will find all his problems about Quads answered in a practical way, while the theoretically-inclined will also find the treatment interesting and instructive. The Quad was originated by an American amateur, W9LZX—it is literally an amateur invention, now extensively used commercially—and it has been simultaneously described as the "greatest aerial development of the age" and the "hoax of the century." As *Quad Antennas* shows, the truth lies somewhere between these two extremes of opinion. It is very well illustrated, with a short index by chapter headings, and costs 23s.

Hints & Kinks, Vol. 6: For many years, ever since 1933 in fact, our ARRL friends have brought out periodically a new edition of *Hints & Kinks*, the present volume being No. 6 in the series. As the title implies, the contents consist of an enormous number of — well, hints and kinks, for the radio amateur's station and workshop. Mainly short items, such as circuit tricks, quick modifications or constructional ideas, they are sorted under twelve appropriate chapter headings, *e.g.* For the Workshop, For the Receiver, For the Transmitter, For VHF Gear, For SSB, For the Mobile Rig, and so on, anything from four to fourteen pages being devoted to the ideas under the various classifications. As Vol. 6 of *Hints & Kinks* runs to 125 pages, with a very complete index, it can be said to be packed full of just the sort of information the active radio amateur requires to improve his equipment and his station. One of the cheapest American books in our list, it is one of the best, and good value for money at only 11s.

S-9 Signals: This is essentially a manual on simple, practical aerial systems, suitable for transmitter or receiver, and is written and compiled for those who want the facts without the theory and have not the money to spend on elaborate arrays, either commercial or home-built. One of the most interesting of these designs is of a multi-band ground plane for 14-21-28 mc. *S-9 Signals* runs to 48 pages in 12 chapters, and costs 8s. 6d.

Surplus Conversion Manual, Vol. 3: We have at last got an addition to the earlier (Vols. 1 and 2) *Surplus Conversion Manuals*, which are still in great demand because they cover so many of the American surplus items that first became available over here. The new Vol. 3 is a larger 88-page production, better printed and with plenty of illustration, and deals in some detail with about 30 different equipments—too long to list here, but including for example the SCR-274 range of Command receivers, transmitters and accessories; the BC-375, BC-457, BC-458, BC-459, BC-624 and BC-696 transmitters; and the BC-312, BC-342 and BC-348 receivers. One of the more interesting conversions suggested is that of the BC-458 as a phasing-type SSB transmitter for 40-80 metre operation, and also the modification of certain other BC-type transmitters as 250-watt linear PA's for SSB. Though some of the equipment dealt with in Vol. 3 of *Surplus Conversion Manual* is not seen over here, much of it is—so, if you already have Vols. 1 and 2, this new volume will complete the set and bring you up-to-date on available information on American surplus. The price is 21s.

Surplus Schematics Handbook: This is one of those publications that can truly be described as "filling a long-felt want"—for it gives the circuit diagram (in most cases with values) and brief descrip-

tive notes on no less than 116 items of U.S. surplus. It is hardly possible to list these in full, but it can be said that *Surplus Schematics Handbook* will give the essential information (circuit and description) on almost any item of American-type surplus likely to be encountered; in other words, it is primarily a source of reference. It is a large compilation of more than 100 pages, and costs 21s.

Radio Amateur's Handbook, 1960: For nearly 40 years, the ARRL's *Radio Amateur's Handbook* has been the standard guide to the whole subject of Amateur Radio—from theory to design, through to construction and operation, of receivers, transmitters, aerial systems, test and auxiliary equipment of every sort for the modern AT station. Under 25 chapter headings, the latest edition runs to more than 600 pages, with a large (and very interesting) catalogue section in colour, and many pages of valve data. The coverage is complete and detailed, with hundreds of circuit diagrams and excellent photographic illustrations, the treatment taking in all amateur bands from LF to UHF, and giving numerous constructional layouts for transmitters of different types for low, medium and high-power working. Each issue of the *ARRL Handbook*, as it is familiarly known, is in effect a revision of the previous one, so that the general range of contents is kept up-to-date; though some of the chapters in the latest issue may not look very different from the corresponding parts of the 1959 *Handbook*, as a whole the 1960 edition is very different from that dated, say, 1955 which, though it contains a great deal of sound basic material, is nevertheless five years out of date as regards many of the refined techniques covered in the present issue. The price of the ARRL *Radio Amateur's Handbook* is comparatively low because it sells by the thousand, carries a good deal of advertising, and much of the basic material is taken through from year to year. As a work of reference for the radio amateur—whether beginner, experienced AT station operator or professional engineer interested in Amateur Radio—the *ARRL Handbook* is quite indispensable. It is priced at 34s. in the standard binding, and is also available in a *de luxe* or "library" binding at 44s.

Radio Amateur Call Book: Somewhere about 1922, an American amateur in Chicago, Charles Stimpson, W9TRD, compiled a directory of radio amateur stations, giving callsign and address of all then known to be licensed—a total of a few hundred. Over the years, the *Radio Amateur Call Book* thickened steadily as it kept pace with the growth, world-wide, of the amateur movement; during the pre-war period, it became necessary to issue the *Call Book* quarterly in order to keep it up-to-date, and the last such issue before the war, dated "Summer 1939," contained just under 300 pages to accommodate all the known licensed amateurs in the world. Since then, matters have become much more complicated by the enormous post-war increase in AT stations—so much so that the American listings now come out in quarterly issues running to more than 500 pages each, with some 400 callsign/addresses to the page, the whole of the rest of the world being covered in separate issues appearing half-yearly—called the "Foreign Section (All Countries Outside U.S.A.)"—and listing approximately 95,000 stations in the latest printing. For the *Call Book* publishers, what it all comes to is the problem of keeping the record straight on about 300,000 radio amateurs throughout the world! It is done by having local agencies in all countries—we act for the U.K., and it can be taken that in any issue of the Foreign Section, appearing half-yearly, the G-GW and EI entries are as accurate and up-to-date as any published list can be. In addition to the station addresses, every issue of the *Call Book* also includes much incidental DX data, such as the QSL Bureau address for each country or call area, the Zone location for all prefixes, and alphabetical prefix lists. The issue of the Foreign Section now available (the Fall-Winter) includes all callsign/addresses appearing in our "New QTH" feature up to and including the July issue of SHORT WAVE MAGAZINE. This Section costs 25s. and the American Section, separately, is 41s. 6d., the two together being 60s.

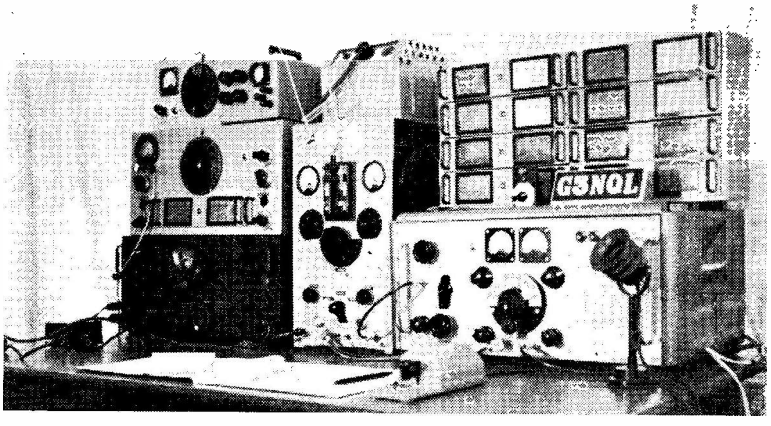
DX Zone Map: The present issue of our *DX Zone Map* is a large, coloured great circle map of the world, centred on London, by which true bearings and distances to any part of the world from the U.K. can be determined against degree and mile/kilometre scales. In addition to showing the 40 Zone areas into which the world is divided for amateur DX purposes, the principal prefixes in each Zone are listed separately from the Map itself. A very large number of place names, mainly the less well-known ones, is given and the lat./long. markings are close enough for places unmarked on the Map itself to be accurately plotted. For anyone interested in any way in radio directivity for any spot on the Earth's surface with respect to the United Kingdom, the *DX Zone Map* is essential. It gives the information quickly and accurately, is a handsome job of print looking well on any wall area of 35 ins. wide by 25 ins. deep, and costs only 9s. 3d., with a *de luxe* linen-backed version at 11s. 9d. It is sent out in a durable cardboard-tube packing to prevent damage in transit.

REPAID AFTER 16 YEARS

During the war, D. W. Hudson, G3BOR, of Shipley, Yorks., was a navigator with R.A.F. Ferry Command, and when in Canada on their ferrying trips he and a friend were given much generous hospitality by a Dorval, Quebec, family called Whitmarsh. Recently, G3BOR was in touch on 21 mc with VE2NV in Dorval and through him found out that Mrs. Whitmarsh was to visit England this year, also the London hotel where she would be staying. G3BOR and his war-time colleague met in London and called on their old friend, much to her surprise and delight. They were able to take her off to stay in turn with their families — thus repaying, through this Amateur Radio contact, the hospitality they had enjoyed 16 years before.

THE OTHER MAN'S STATION

G3NQL



FIRST licensed in September last year, G3NQL—R. Pope, 2 Rosebery Street, Rowbarton, Taunton, Somerset—commenced operations in a spare bedroom at the back of the house; a subsequent addition to the family made necessary a reconversion of the "shack" to provide extra sleeping accommodation. Accordingly all the gear was removed to the sitting room.

The move entailed a change of aerial system and it was decided to erect a 40-metre Zepp, with the feeders running over the roof to a friendly neighbour's chimney and thence to the end of a very small back garden, fastened to a 25 ft. mast with the last few feet bent at 45° and supported by wire attached to another neighbour's clothes post.

A new ATU was constructed at the same time; this can be seen in the centre of the photograph. The top portion contains the ATU proper, with the ganged knife switches providing for series or parallel tuning of the feeders and for earthing of the system. The lower half of the unit houses a side-tone oscillator, with separate tone and volume controls, and the T/R switch which is an ex-T.1154 relay, modified for hand operation and performing all the necessary change-over functions.

The transmitter is home-built and at present is used for 40-metre operation only, with a 5763 as VFO, 6AG7 as buffer (the latter with 6V6 as keyer) pi-coupled into parallel 807's with pi-tank output; 65v. fixed bias for the PA valves is supplied by reversed heater transformer and metal rectifier. A recent addition has been a screen modulator, using a 12AX7 and 6CH6, with crystal insert microphone. The key is a German naval type, *ex* U-Boat! No TVI is experienced—which is just as well in view of the fact that the neighbours, without whose help a 68 ft. aerial would not be possible, are both ardent viewers!

Receivers are BC-348 and HRO—the latter fitted with internal speaker. The '348 has an indoor aerial and the small box on the left of the picture contains headset matching transformer and switching to allow instant change of receivers. Units on top of the HRO are GDO/Wavemeter and monitor 'scope.

For those interested in photography, the exposure for the picture was 3 seconds at F.8 on HP3 film, with two 500-watt lamps providing illumination.

FARADAY LECTURES, 1960-61

Each year, the Institution of Electrical Engineers arranges the Faraday Lecture, a memorial to Michael Faraday, one of the great pioneers in the study of electricity and magnetism. It is a "travelling lecture," in that it is given at various centres over a period of several months. This year's travelling lecturer is L. J. Davies, C.B.E., M.A., B.Sc., M.I.E.E., who is director in charge of research and education for A.E.I. (Rugby) Ltd. His subject is "Transistors and All That." The lecture schedule for the next few months is as follows, and admission is by free ticket obtainable in advance: *November 16,* Temple Speech Room, Rugby (apply for tickets to J. Richmond, 53 Vernon Avenue, Rugby); *December 8,* Colston Hall, Bristol (apply D. Stephens, 7 Clovelly Crescent, Llanrumney, Cardiff); *December 13,* Brangwyn Hall, Swansea (apply C. Evans, 38 Old Road, Llanelly); and *January 24,* Free Trade Hall, Manchester (apply H. Diggle, Transformer Division, A.E.I., Ltd., Southmoor Road, Wythenshawe, M'cr 23). This lecture session continues at various centres until the end of March, and further details will be given in later issues.

ZL AMATEUR POPULATION

Though New Zealand is a country with a comparatively small population (about 2,300,000) the proportion of AT stations is about the highest in the world. The June issue of *Break-In,* the N.Z.A.R.T. journal, includes the "ZL Call Book" for this year; it shows that the country, divided into four radio districts ZL1-4, has just over 2,800 licensed AT stations.

NEW QTH's

This space is available for the publication of the addresses of all holders of new U.K. callsigns, as issued, or changes of address of transmitters already licensed. All addresses published here are reprinted in the 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.

EI7AH, M. P. Power, 53 Morrissons Road, Waterford.

G3OCC, C. Spreyer, 75 Mainridge Road, Chislehurst, Kent.

G3ODZ, P. F. Brown, 20 Malden Road, Watford, Herts.

G3OEA, J. D. A. Cleaver, 72 Oaklands Avenue, Watford, Herts.

G3OEY, K. L. Miller *(VE4DN, ex-DL2UJ),* 5 Colquhoun Road, Larkhill, Wilts. *(Tel.: Durrington Walls 263.)*

G3OFP, G. D. Cunnah, 225 Springwell Lane, Balby, Doncaster, Yorkshire.

GM3OGH, A. Brooker-Carey, The Decca Navigator Transmitting Station, Stanley Hill, Lerwick, Shetland.

G3OGI, M. S. Hodgson, 12 Birchfield Road, Thornhill, Sunderland, Co. Durham. *(Tel.: Sunderland 68172.)*

G3OGY, S. H. Andrews, B.Sc., Oakwood Cottage, Radcliffe Park Road, Salford 6, Lancs.

G3OHI, A. R. Batty, 39 Torkington Road, Gatley, Cheadle, Cheshire.

G3OHP, M. J. Winter, 47 Watling Street, Strood, Rochester, Kent.

G3OHU, E. W. Dyer, 69 Kirkland Avenue, Barkingside, Ilford, Essex. *(Tel.: CREscent 0639.)*

G3OHV, R. J. Taylor, Restholme, Harley Lane, Heathfield, Sussex. *(Tel.: Heathfield 659.)*

G3OHY, R. J. Bennett, 185 Bewley Drive, Southdene, Kirkby, Liverpool, Lancs.

G3OIA, R. Allerton-Austin, Wingfield, Church Hill, Little Common, Bexhill - on - Sea, Sussex.

G3OIH, B. Shields, Jnr., 118 Home Farm Road, Woodchurch, Birkenhead, Cheshire.

G3OII, L. D. Stevenson, 73 Morden Road, Mitcham, Surrey.

G3OIK, A. J. Thornbory, Trood House Hotel, Alphington, Exeter, Devon. *(Tel.: Exeter 75839.)*

GW3OIM, C. Brown, 125 London Road, Holyhead, Anglesey.

GM3OIS, J. G. Morrison, 54 St. Giles Square, Camelon, Falkirk, Stirlingshire.

G3OIW, R. G. Dawson, 8 St. George's Avenue, Birkenhead, Cheshire.

G3OIX, B. E. Dean, 48 Dragon Parade, Harrogate, Yorkshire.

G3OIZ, W. H. Ingle, 1 Queens Road, Littlestone-on-Sea, Kent.

GM3OJC, W. Whyte, 7 Badenoch Drive, Huntly, Aberdeenshire.

G3OJF, R. H. Bates, 61 St. John's Road, Newbury, Berks.

G3OJG, P. F. Gale, 24 Old Garden Drive, Rotherham, Yorkshire.

G3OJI, J. H. Sleight, 15 Peaks Avenue, New Waltham, nr. Grimsby, Lincs. *(Tel.: Humberston 3393.)*

G3OJJ, J. E. Hutchinson, 19 Glenmore Avenue, Chester-le-Street, Co. Durham.

G3OJK, J. R. Bates, 61 St. John's Road, Newbury, Berks.

G3OJN, S. Trengove, 21 Oakfield Road, Falmouth, Cornwall.

CHANGE OF ADDRESS

G3AKU, R. A. Harding, Redmoor, Knights End Road, March, Cambs. *(Tel.: March 3012.)*

G3FHH, J. H. Park, 41 Clarendon Road, Morecambe, Lancs. *(Tel.: Morecambe 344.)*

GM3FIZ, D. M. Sangster, 66 Viewfield Terrace, Lumphinnans, by Cowdenbeath, Fife.

G3GFU, W. H. Otley, 53 Windy Hill Lane, Marske-by-Sea, Yorkshire.

G3GHB, A. T. Eley, 162 Franklin Road, Kings Norton, Birmingham, 30.

G3HFG, D. H. Strudwick *(ex-GI3HFG),* 19 Halton Road, R.A.F. Station, Watton, Thetford, Norfolk.

G3HFP, T. Worton, 61 Haresfinch View, St. Helens, Lancs. *(Tel.: St. Helens 3903.)*

G3ICH, P. N. Pitt, 103 Bellshill Crescent, Belfield, Rochdale, Lancs.

G3IVU, D. B. Coleman, 189 Edge Hill, Darras Hall, Ponteland, Newcastle-on-Tyne.

G3IXK, A. Ayris, 46 Kirkstone Drive, Elbury Park, Worcester, Worcs.

G3JYP, W. B. Capstick, Condensergapp, Bongate, Appleby, Westmorland.

G3KUL, D. Stephenson, 673 Bishport Avenue, Withywood, Bristol 3.

G3LDA, A. B. Fletcher, 7 Lansdown Terrace, Malvern Road, Cheltenham, Glos.

GW3LSB, J. Lloyd-Jones, Coed Derw Bach, Betws-y-Coed, Caerns.

G3LWH, G. Twist, Seekew, Baroncroft Road, Woolton, Liverpool, Lancs.

G3MCS, W. R. Hawthorne, 3 Robinson Avenue, Goffs Oak, Cheshunt, Herts.

G3MDD, B. S. Mudge *(ex-VS6ED),* 26 Pembroke Street, St. Aldates, Oxford.

G3MEA, S. Harle, The Bungalow, Whickham Highway, Dunston, Gateshead, 11, Co. Durham.

G3NAU, Rev. P. R. Heath, The Sacred Heart, Watcombe Road, Watlington, Oxon.

GI3NEX, Rev. Father Nicholas C.P. *(ex-GM3NEX),* St. Patrick's Retreat, Tobar Mhuire, Crossgar, Belfast.

G3NXO, A. D. Watt *(ex-GM3NXO),* 115 St. Mary's Road, Weybridge, Surrey.

G5BZ, G. G. E. Bennett, Lostwithiel, Northdown Road, Woldingham, nr. Caterham, Surrey.

CORRECTION

G3OFD, J. Walton *(ZE7JW),* c/o 74 Holmefield Road, Ripon, Yorkshire.

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for November issue: October 14)

(Address all reports for this feature to "Club Secretary")

NEXT month the Fifteenth **Magazine Club Contest** takes place, and we are constantly informed by Club secretaries and members that this Top-Band event is eagerly awaited almost from the time that the previous one has finally been analysed and discussed.

The rules, in full, are reproduced herewith, and they are virtually unchanged from last year. As always, competing Clubs were invited to make comments when they submitted their logs for the 1959 event; and although a few minor deviations from the rules were suggested, they mostly cancelled themselves out.

The hours seem about right, and convenient for most people; the scoring system is now devoid of ambiguities; and the accent is on the putting out of a clean, strong signal and the efficient operating of the station.

The list of Club Numbers includes over 80 of them; they represent all clubs that have taken part since 1956. There will doubtless be a few more who wish to enter this year, and they may "collect" their number by sending in a request, with s.a.e., as instructed on p.439.

We look forward to another record entry during the week-ends of November 12-13 and November 19-20—and *now* is the time to begin to get organised for the event.

Cheltenham have now arranged an R.A.E. Course, by negotiation with the North Gloucestershire Technical College, and 16 members have enrolled. Morse will be taught at the Club meetings; the technical class will be on Tuesdays, 7-9 p.m. in Room B.11, The Woodlands. The A.G.M. is fixed for October 26, in the Clubroom, St. Mark's Community Centre, Brooklyn Road, Cheltenham.

Cornish have fixed their dinner for November 5 at the Hotel St. Michaels, Stracey Road, Falmouth. Tickets, price one guinea (lucky number included!) are obtainable from the treasurer, Mr. N. Elliot, 11 Belmont Road, Falmouth; two members, both in wheelchairs and partly paralysed, passed the R.A.E. and collected the calls G3OGT and G3OHB—the latter a YL.

Crystal Palace meet on October 8 to discuss the subject "Can AM survive on the DX Bands?"

When Grafton Radio Society, the well-known North London club, held their annual general meeting on September 9, it was an occasion for presentations. Here we see, left to right, G3MFU who was third in the Club's own Top Band contest; G3JVV, the winner; G2AAN, president of Grafton; G2CJN, who for many years has been their hard-working honorary secretary and is largely responsible for the Club's success and who yet found time to be winner of the constructional contest; G3MYG, second to G2CJN; and G3AFC, third in the constructional contest. Apart from Club activities, which include an annual field day on Hampstead Heath, over the years Grafton have run a very successful all-comers class for the R.A.E. and G.P.O. Morse Test.

MCC—FIFTEENTH ANNUAL TOP BAND CLUB TRANSMITTING CONTEST

RULES

1. ***Duration:*** Saturday, November 12; Sunday, November 13; Saturday, November 19; Sunday, November 20. On each of these days between the hours of 1700 and 2000 GMT (twelve operating hours in all).
2. ***Frequency and Power:*** All contacts will be made in the 1800-2000 kc band only, using CW, with a power not exceeding 10 watts to the final stage. All reasonable precautions will be taken to avoid interference with other services using the band.
3. ***Call Signs:*** Where a Club has its own transmitting licence and call-sign, that call-sign is to be used. Clubs without their own call may use a member's station, provided that this is nominated as their official entry by the Club Committee.
4. ***Calling:*** Clubs will call "CQ MCC" and will sign off at the end of each contact with "AR MCC VA."
5. ***Scoring:*** Other Club stations may be worked once on each day of the Contest and will count for *three points each time.* Non-Club stations may be worked once only, during the whole period of the Contest, and will count for *one point* only. Inter-Club contacts will be considered complete after an exchange of six-character groups comprising the RST, the letter "C" (for Club) and the Club's own identification number, as shown in the list opposite. (Thus Mitcham, receiving Stourbridge at 579, would send 579 C28; Stourbridge, getting Mitcham at 569, would reply with 569 C50.)
6. ***Non-Club Contacts:*** Contacts with non-Club stations, counting for one point, will be considered complete with the logging of RST and the other station's QTH. The QTH of the Club (not the identification number) should be sent in these cases.
7. ***Logs:*** Contest logs are to be neatly set out as follows: One side of quarto or foolscap sheets should be ruled into eight columns, with name and call-sign of club on each sheet, headed thus—

   Col. 1, *Date and Time.* Col. 2, *Call-sign of station worked.* Col. 3, *Out-going six-figure group.* Col. 4, *Incoming six-figure group.* Col. 5, *RST out-going, to non-Club station.* Col. 6, *RST incoming, from non-Club station.* Col. 7, *QTH non-Club station.* Col. 8, *Points claimed for contact* (3 or 1). Col. 8 must be totalled at the bottom of each page and the running totals brought forward.

   The last page of the log should contain the following summary: Club contacts (number) at 3 points each, *total figure.* Non-Club contacts (number) at 1 point each, *total figure. Grand Total.*

   Comments on experiences during the Contest, equipment used, number of operators employed, and general impressions are invited, and should be added at the end of the log.
8. Any Club station receiving reports consistently worse than T9 will be liable to disqualification.
9. Logs, addressed to "Club Secretary" *Short Wave Magazine,* 55 Victoria Street, London, S.W.1, must be posted to reach us by Thursday, December 1, 1960. The Editor's decision on the results will be final, and will be published in the January, 1961, issue of SHORT WAVE MAGAZINE.

Halifax have a lecture on SSB on November 1 (by G3LGS).

Liverpool held their A.G.M. on October 4; on the 11th G3MCN will show colour slides of his holiday in the Netherlands; October 18 is Open Night, and the 25th is booked for a talk on TV Studio Work by G3HII. **Mitcham** meet on October 7 for an illustrated lecture on Colour TV, and on the 21st for a description of the DX-100U transmitter, by G3NFV. November 4 is the day of their Junk Sale.

Plymouth are open again after the summer recess, with meetings every Tuesday, and a Junk Sale on October 18. The aerial at the clubroom has been re-sited and it is hoped that results will improve accordingly. **Pontypool** also reopened in September, and meet at 7 p.m. on Tuesdays at the Educational Settlement, Rockhill Road. For the next few weeks they have organised films, film strips, recorded lectures and talks by members, sixteen of whom now have call-signs, with many others not far behind.

Purley had a talk on Radio Control at their September meeting; October 21 is the date of their Junk Sale. **Spen Valley** look forward to a Mullard film show on October 11; the following day they have organised a visit to Trinity Works; and on the 26th the subject is Two-metre Technique.

South Birmingham are proud to have acquired the call G3OHM for their club station, and their club emblem is inscribed accordingly (with an "omega," of course). **Wolverhampton** meet on October 10, 17, 24 and 31. On the 17th and 31st the meetings are at the Club Hq, the first being "Juniors' Night" and the second a talk on Subscriber Trunk Dialling. The other dates are "unannounced" at present.

British Timken were active at the firm's Show, with a new Tx on the three HF bands; despite the weather, which turned the ground into a swamp, they had many visitors; for the future, several visits are planned (including the Radio Hobbies Exhibition), and also a Christmas Dinner.

Harrow will be on the air from the Wembley Exhibition on October 22, with the callsign GB3HAR; the QTH is the Copland School, High Road, Wembley, and there will be no Club meeting the previous night.

The **International Ham-Hop Club** announce their A.G.M. for November 26, the last day of the Radio Hobbies Exhibition; this event may include the annual dinner, and requests for accommodation (also offers of the same) should go in quickly.

Lothians have been in recess since their A.G.M., but meetings have now been resumed, on the second

and fourth Thursdays at the YMCA, South St. Andrew Street, Edinburgh. On October 27 GM3AKN will talk about TVI—probably with demonstration; there is also a meeting on the 13th. **Sutton and Cheam** opened a possible series of lectures on SSB, on September 20. Other items of interest for the future include talks on Two-metre Mobile work, and Morse help (El-Bugs and so on). Interest in SSB is growing, and it is hoped that the proposed series will awaken still more enthusiasm for the subject.

Aberdeen report two more of their younger members through the R.A.E. with the Morse now "on the way"; they promise participation in MCC this year. Meanwhile, October 7 is the date for the judging of their Building Competition; the 14th for a discussion on the same; the 21st for a Grand Sale of Gear; and on the 28th GM3NOV will discuss "Fifteen-Metre Fever—Its Symptoms and Treatment."

Acton, Brentford and Chiswick meet on October 18 to make final arrangements for MCC, after which they will hear a Tape Lecture. Meeting, as usual, at 66 High Road, Chiswick, W.4. **Civil Service** Radio Society will be at the Science Museum on November 1 for a talk by Mr. A. F. Wilkins (Radio Research Station) on The Beginnings of Radar. (Mr. Wilkins was Sir Robert Watson-Watt's personal assistant during his early work.) Visitors are welcome, but should contact G. Voller, G3JUL, at the Science Museum (*KENsington 6371*) in the first instance.

Crawley meet on October 27 for a lecture on Transistor Power Supplies and Modulators, by G3NVB, their chairman. During September they operated G3FRV/P in the Two-Metre Contest, and they are now preparing for MCC in November.

Grafton held their AGM and discussed a most

IDENTIFICATION NUMBERS FOR CLUBS IN "MCC"

C.01 Acton, Brentford & Chiswick
C.02 Bailleul, Reading
C.03 Barnet
C.04 Barnsley
C.05 Bradford Grammar School
C.06 Bury
C.07 Catterick
C.08 Cheltenham
C.09 Chester
C.10 Clifton, London
C.11 Compton Bassett
C.12 Coventry
C.13 Crystal Palace
C.14 Derby
C.15 Dowty, Gloucester
C.16 East Kent
C.17 Edgware
C.18 Grafton
C.19 Gravesend
C.20 Grimsby
C.21 Harlow
C.22 Harrow
C.23 Hastings
C.24 Leeds University
C.25 Leicester
C.26 Liverpool
C.27 Medway
C.28 Mitcham
C.29 North Kent
C.30 Northern Polytechnic
C.31 Nottingham
C.32 Overstone, N'h'mton
C.33 Plymouth
C.34 Port Talbot
C.35 Preston, Lancs.
C.36 R.A.F. Kinloss
C.37 R.A.F. Watton
C.38 Ravensbourne
C.39 Ringwood
C.40 Rugby
C.41 Salisbury
C.42 Scunthorpe
C.43 Sheffield
C.44 Slade, B'ham
C.45 Southampton University
C.46 Southport
C.47 South Shields
C.48 Stevenage
C.49 Stoke-on-Trent
C.50 Stourbridge
C.51 Stroud
C.52 Surrey
C.53 Sutton & Cheam
C.54 Thanet
C.55 Torbay
C.56 Walsall
C.57 Wellingborough
C.58 West Lancs.
C.59 Wirral
C.60 Wrexham
C.61 Harwell (A.E.R.E.)
C.62 Aldershot
C.63 Henlow
C.64 Hartlepools
C.65 Norwich
C.66 Deal
C.67 Wolverton
C.68 Wanstead & Woodford
C.69 Danbury, Essex
C.70 Cornish
C.71 Crawley
C.72 Ainsdale, Lancs.
C.73 Wolverhampton
C.74 Yatesbury
C.75 Exeter
C.76 Aberdeen
C.77 Greenford
C.78 Blackpool
C.79 RAFARS, Locking
C.80 Macclesfield
C.81 Scarborough

Note: This list includes all the Clubs participating in "MCC" for the last four years. Other Clubs desiring to enter for this year's event should write in for a serial number, enclosing a stamped addressed envelope, before October 14 for publication next month. Letters should be addressed "MCC", *Short Wave Magazine*, 55 Victoria Street, London, S.W.1, with an S.A.E.

Names and Addresses of Club Secretaries reporting in this issue:

ABERDEEN: W. K. Heggie, GM3NHW, 80 Leslie Terrace, Aberdeen.
ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, London, W.3.
BRITISH TIMKEN: D. G. Chatfield, G3JXU, 55 Bush Hill, Weston Favell, Northampton.
CHELTENHAM: J. H. Moxey, G3MOE, 11 Westbury Road, Leckhampton, Cheltenham.
CIVIL SERVICE: G. Lloyd-Dalton, 2 Honister Heights, Purley.
CORNISH: W. J. Gilbert, 7 Poltair Road, Penryn.
CRAWLEY: R. G. B. Vaughan, G3FRV, 9 Hawkins Road, Tilgate, Crawley.
CRYSTAL PALACE: G. M. C. Stone, G3FZL, 10 Liphook Crescent, London, S.E.23.
ENFIELD: V. Croucher, G3AFY, 15 Nelson Road, London, N.15.
GRAFTON: A. W. H. Wennell, G2CJN, 145 Uxendon Hill, Wembley Park, Middx.
HALIFAX: A. Robinson, G3MDW, 7 Upper Brockholes, Ogden, Halifax.
HARROW: S. C. J. Phillips, 131 Belmont Road, Harrow Weald.
HASTINGS: W. E. Thompson, G3MQT, 8 Coventry Road, St. Leonards-on-Sea.
HULL: G. G. Wray, G3MVO, 93 Wolfreton Lane, Willerby, Hull.
I.H.H.C.: M. Allenden, G3LTZ, 16 Grovefields Avenue, Frimley, Aldershot.
LIVERPOOL: H. James, G3MCN, 448 East Prescot Road, Liverpool 14.
LOTHIANS: L. Lumsden, 33 Hillview Drive, Edinburgh 12.
MITCHAM: M. Pharaoh, G3LCH, 1 Madeira Road, Mitcham.
NEWBURY: J. A. Gale, G3LLK, Wild Hedges, Crookham Common, Newbury.
NORTH KENT: D. W. Wooderson, G3HKX, 75 Mount Road, Bexleyheath.
PLYMOUTH: R. Hooper, 2 Chestnut Road, Peverell, Plymouth.
PONTYPOOL: J. S. Hammond, GW3JBH, 46 High Street, Abersychar, Pontypool.
PURLEY: E. R. Honeywood, G3GKF, 105 Whytecliffe Road, Purley.
R.A.I.B.C.: W. E. Harris, G3DPH, 4 Glanville Place, Kesgrave, Ipswich.
REIGATE: F. D. Thom, G3NKT, 12 Willow Road, Redhill.
SLADE: C. N. Smart, 110 Woolmore Road, Birmingham 23.
SOUTH BIRMINGHAM: J. Bratby, G3GVA, Westmead Country Club, Hopwood, Nr. Birmingham.
SOUTHGATE: A. G. Edwards, G3MBL, 244 Ballards Lane, London, N.12.
SPEN VALLEY: N. Pride, 100 Raikes Lane, Birstall, Leeds.
SURREY (CROYDON): S. A. Morley, G3FWR, 22 Old Farleigh Road, Selsdon, South Croydon.
SUTTON & CHEAM: F. J. Harris, G2BOF, 143 Collingwood Road, Sutton.
WIRRAL: A. Seed, G3FOO, 31 Withert Avenue, Bebington, Wirral.
WOLVERHAMPTON: E. Brindley, 1 Pool Hall Road, Castlecroft, Wolverhampton.

CLUB PUBLICATIONS RECEIVED

We acknowledge, with thanks, the receipt of Club publications as follows: *The New Link* **(Cornish)**; *Newsletter No.* 55 **(Crystal Palace)**; *Newsletter, September* **(Mitcham)**; **Nadars** *Newsletter*, August; *Newsletter No.* 37 **(North Kent)**; *Newsletter*, August and September **(Purley)**; *Radial*, Vol 6, Nos. 6 and 7 **(R.A.I.B.C.)**; Vol. 1, Nos. 6 and 7 **(South Birmingham)**; *Newsletter*, September **(Southgate, Finchley and District)**; *Newsletter*, Vol. 13, No. 5 **(Wirral)**; *News Sheets*, August and September **(Wolverhampton)**; *Natter-Net Notes*, No. 11 **(Hastings)**; *Circular Letter*, August **(I.H.H.C.)**; *Lea Valley Reflector*, Vol. 12, No. 6 **(Enfield)**; S.R.C.C. *Monthly News*, September **(Surrey)**; *Feedback*, Vol. 1, No. 6 **(Reigate)**.

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successful year. G2CJN continues as their secretary, G2AAN as president and G3AFC as chairman. **Hull** will be hearing about BC-348 Mods. (by Gunther Engels, B.Sc.) on October 11 and 25; on November 8 they have a Mullard Film Show, and on the 29th a talk on CW Technique.

Reigate have a Junk Sale scheduled for October 15 at The Tower, Redhill, and October 29 is the provisional date for their visit to Maida Vale BBC Studios. They would appreciate more local activity on their Club Net, Sunday mornings on 1930 kc. **Surrey** (Croydon) will hear about the Eurovision Link on October 11, the speaker being G2FQS. The meeting will be at 7.30 p.m. at The Blacksmiths Arms, South End, Croydon.

Hastings have had two lectures on SSB, by G3BDQ, and the third is arranged for October 25; on October 11 there will be a Film Show, and the A.G.M. will take place on November 8; membership here is now 52.

Wirral have their A.G.M. on October 7; a talk and demonstration on the Minimitter MR44 receiver, by G3LCI, on the 21st, and on November 4 G3ERB will discuss Further Mods. to the TR-1986. Their recent D/F Contest was won by J. Wess, with G8BM second and G3EGX third.

AMATEUR RADIO EXHIBITION

This year's Amateur Radio Exhibition will, as usual, be held at the Royal Horticultural Society's Hall in Vincent Square, Westminster, London, S.W.1, under the management of P. A. Thorogood, G4KD, during November 23 to 26 inclusive (Wednesday-Saturday). It will be opened at noon on Wednesday, November 23, by Brian Rix, who has recently become a BBC *impresario* after making such a brilliant success of the Whitehall Theatre. But not only that—he is also himself a licensed radio amateur; he started pre-war under the AA call 2DQU, becoming G2DQU with a full radiating permit in 1946. The exhibition will display a vast range of transmitting, receiving and auxiliary equipment of Amateur Radio interest, including all that is best on the British market. As always, we shall be there, and our stand will cover the full scope of SHORT WAVE MAGAZINE activities.

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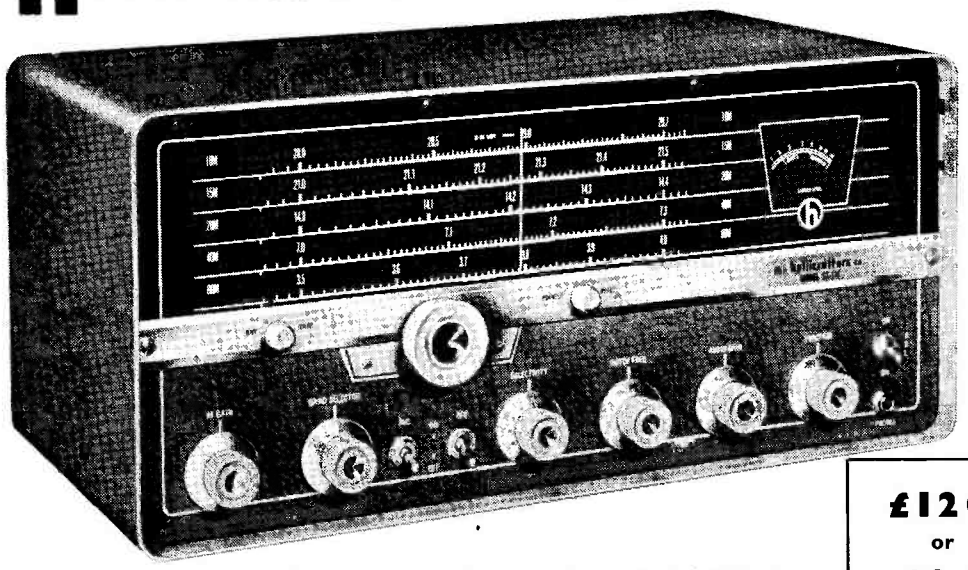

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WOLVERHAMPTON Radio & Television Supplies, 43 Birmingham Road, Wolverhampton, *(Tel. 20315).* 0-0·5 Ae ammeters, 2¼in. square, 8s. 3d. 0-25 amps, 2½in. round, 7s. 3d. 0-40 volt 2¼in. square, 8s. 3d. 0-5 volt, 1 mA movement, 15s. 9d. 50-50 microamps, centre zero, 2½in. round, 13s. 3d. All values potentiometers 2s., with switch 2s. 9d. Var. condensers, miniature, all values from 10-150 $\mu\mu$F, 3s. 9d. each. Assorted nuts, bolts and washers, BA electrical sizes, ½lb. 3s. 3d. Multi-plugs and sockets, 3d. per pin, *e.g.,* 10-way 2s. 6d., postage inclusive; s.a.e. lists.

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MUST SELL, less room at new QTH. DX-40U with VF1U, as new, £25. BC-221, with p/pack, £20. SSB Exciter *(Short Wave Magazine,* Jan. 1959) almost complete, £10. Type 11 Oscilloscope, £10. Many other items incl. 813 PA with HV p/pack, 45ft. dural mast, 4-pillar rack, UM3, Geloso V/101, etc., s.a.e. for list or details to—G3EFD, Hillcrest, Leazes Lane, Hexham, North'd *(Tel. 269).*

MARCONI'S Morse ink recorder, £10. BC-659 Tx-Rx less valves, £1. BC-1033B, £1. ARN-7 Receiver, 70s.—R. V. Wright, 4A Nepal Avenue, Atherton, Manchester.

WANTED: Steel Lattice self-supporting tower.—G3GHB, 162 Franklin Road, Birmingham, 30.

GOING MOBILE? Rotary converter 12 volts inp., 350 volts 180 mA output, 15s. Also lots of other gear cheap, lists s.a.e.—G3JBU, 31 Beverley Crescent, Northampton.

SMALL ADVERTISEMENTS, READERS—*continued*

DENCO DCR19 Rx, bandspread amateur bands, £25, o.n.o.? Triplett Sig. Gen./Freq. Meter combined, £10. ZC1 Mk. II, £7 o.n.o.? New boxed 6146, 30s.; QVO6-40, 50s.; 5763, 15s.—James, 448 East Prescot Road, Liverpool, 14.

20 TRANSMITTING VALVES, TZ40, JAN-CG, DET25, etc., £3. List stamp (would separate). —Sly, 85 Charminster Avenue, Bournemouth.

GONSET COMMUNICATOR 11 2-metre Tx/Rx, £25. Eddystone 740, good condition, £20. BC-348, built-in p/pack, £17. Various Command Tx/Rx. Large selection of meters; valves 5s. 12AU7, 12BH7, 5Y3, 6X5, EF80, etc. Williamson Amplifier, £7 10s. Two converters 220v. DC to 230v. AC, 200w., £5 each. Myford Lathe ML7, 3 chucks (1 grip-true) many extras; new 1/3 h.p. AC motors, offers. S.a.e. details, all plus carriage.—G3IDW, 14 Cricklade Road, Swindon, Wilts.

AMERICAN DX-100, £50. CR-150, resprayed cabinet, £20.—G3GJW, 11 Avondale Road, Mottingham, London, S.E.9.

VHF VALVES: One QY3-125, new, £5; one QY3-125, used, £3; two QQVO7-40, new £2 10s. each; four QQZO4-15, used, 10s. each; two E4103/B/4 CRT's, 1in., £1 each. Transformers: 4000v. 2 mA, 2v. 2A, 4v. 0·2A, £1 10s.; 670-0-670v., 150 mA, 6·3v., 5v., £2. Also T.1131 p/pack, £1 complete. Buyer collects.—G3MEV, 17 St. Margaret's Road, Maidenhead, Berks.

FOR SALE, Panda Cub Tx in excellent condition, £33 o.n.o.? Delivered free within 50 miles Stoke-on-Trent.—G3LNK, 36 Oldfield Street, Fenton, Stoke-on-Trent.

WANTED Marconi Telegraph Key Type 23 or similar, in first-class condition.—Box No. 2351, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

EDDYSTONE 888A, brand new, original packing, for sale due to change of circumstances, £90, h.p. arranged for approved purchaser, but prefer cash deal. Deliver 50 miles radius of Birmingham.—Box No. 2352, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

R.107 RECEIVER and circuit diagram, in working order, £10 o.n.o.?—J. D. McCormack, 328 Garretts Green Lane, Birmingham, 33.

FOR SALE: Eddystone 840A new 1958, little used and in mint condition, offers? — Normington, 1 Clwyd Avenue, Prestatyn, North Wales *(Tel. 2581)*.

AR88D, £40; AR88LF, £35; both in original and excellent condition. Wanted: Hamobile Mk. II, Labgear Top Bander. Hallicrafters 5-10, S19R, S20R and SX42 Receivers, in good condition. —Box No. 2353, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: VHF Converter with continuous coverage from about 20 mc to 250 mc, such as Labgear RV2, suitable for use with CR-100, or National 1-10 Receiver. Must be 230v. AC and in perfect or mint condition.—Roberts, 244 City Way, Rochester, Kent.

SMALL ADVERTISEMENTS, READERS—*continued*

HRO SPARES: Power unit, 50s.; set of nine valves, 45s.; four coils 1·7-30 mc, 84s.; few 1·7-4mc, 18s. W.1191, £4. R1392E/D, £4 10s. Plus carriage/postage, s.a.e. enquiries, please.—G8UO, 12 Cartmel Road, Keighley, Yorkshire.

R. 1475, 2-20 mc, scale length 20ft., xtal cal., amplified AGC, N/L, AF filter complete, guard unit, original mains p/pack, circuits, £25 o.n.o.?—G3NWF, Coed-Bel, Lubbock Road, Chislehurst, Kent.

WANTED Eddystone 680X or BRT-400 in mint condition, reasonable price paid. Will collect anywhere London, or near. — Write G3KPM, 12 Hartham Road, Holloway, N.7 (or phone *NOR. 2139* after 7.30 p.m.).

FOR SALE: R208, good condition, £6 10s. (inc. post), o.n.o.? Wanted: CR-100 and 68P Rx, good condition.—D. Hall, Windrush, Park Homer Road, Colehill, Wimborne, Dorset.

FOR SALE: Minimitter Tx 120 watts Phone. 150 watts CW, good condx., prefer buyer collects, £40. —Crook, 39 Tonge Park Avenue, Bolton, Lancs.

SALE Surplus to requirements, Geloso converter complete with cabinet, PU, RF gain control, excellent condition, £8, plus p.p.—Box No. 2354, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Hallicrafter SX-28 communication receiver, with handbook, good condition, offers? Also phone transmitter, 120 watts, bandswitched 80-10 metres, separate VFO, fully metered (20 meters) complete with power supplies, Z-match, Antenna-match unit, low-pass filter, offers? Or will exchange for good tape recorder.—Box No. 2355, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

GELOSO G207 Rx and 210 TR Tx, in excellent condition, built-in T/R switching, inter-connecting cables, instruction books, the pair £80. Birmingham area.—Box No. 2356, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: Information on the P58 receiver, circuits, etc., also an unmodified HRO receiver. —BM/BTPZ, London, W.C.2.

WANTED: Communications receiver continuously tunable, 90-150 mc approximately, good price for first-class set in working order, power pack not essential (*MALden 6294*).

WANTED: 1957/8 Volume of Newnes *Radio and Television Servicing*. *Short Wave Magazine* Index to Volume X. Copies of *Short Wave Magazine* July '47, April '53. R.S.G.B. *Bulletins*, Jan. '52, May '54. Full price paid.—Box No. 2319, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: LG.300 in good condition. — Price and particulars to G3FPJ, 72 Southfield Avenue, Paignton, Devon.

EDDYSTONE 888, S-meter, blocks, immaculate, £70. Hallicrafters S36A, 27-144 mc, £28. Wanted: Collins 75A, 51J series Rx, any model.—G3NNT, 23 Southport Road, Ormskirk, Lancs.

SMALL ADVERTISEMENTS, READERS—*continued*

HEATHKIT S33 Stereo Amplifier, checked and quality-tested by Daystrom, Gloucester, as new, used 50 hours only, £8 10s. Reason for selling, acquired 15-watt model.—Nicholls, 1 Alfred Road, Bristol, 4.

WANTED: *Short Wave Magazine* for May and June, 1956; buy or loan.—Shewan, 22 Strachan Street, Arbroath, Angs.

SSB Generator Barker & Williamson 51SB, brand new, converts AM transmitter for full SSB results, simple conversion, complete with manual, list price £145. Sacrifice—what offers?—Box No. 2140, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

EDDYSTONE S640 receiver, unmarked, in absolute mint condition, £20. Variac 230v. 18 amp., £8. Buyer collects. — G3NPY, 13 Talbot Road, Skegness, Lincs. *(Tel. Skegness 1589.)*

WANTED: Bandspread Coils for HRO Receiver. Also Class-D Wavemeter, good condition. — Details to J. McEwan, 71 Monument Road, Birmingham 1.

CR150 Mint, £25. Rx78/Tx53 in rack, Mod. 76, ATU126, control units, genemotor plugs, £8. B29, 15 kc to 560 kc, £5. Wavemeter G73, 100 kc to 25 mc, £3. Buyer must inspect, collect, open to offers. — Austin, 75 Snowden Avenue, Long Lane, Hillingdon, Middlesex.

DX40U with VF1U, perfect order, £25; 19 Set, near new condition, with rotary generator, aerial loading coil, control box, mike, headphones, and connecting plugs and cables, £5. AVO Valve Tester, £5. 500 valves approx., tested and boxed. Send for list, s.a.e. Prefer to sell in one lot, offers, must clear. Delivery charge shared. — Meikle, 34 Victoria Road, Netley Abbey, Hants.

EDDYSTONE S640 with S-meter, £20. Also No. 12 Sender, ATU, and manual, £10. Will exchange the above for /M or /P Tx/Rx, 62 Set, B2, etc., offers ?—G3NWJ, 111 Evington Drive, Leicester.

QRT—For sale good Vidicon Camera Tube, complete with base and two scan coils. £20 o.n.o.? Deliver London area.—Apply Box No. 2141, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE, CNY Tx, xtal mike, P/S modulation, 15 watts, 40/80/160, pi-output, £16 or offers ? — Box No. 2142, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

R.M.E. DB22R Preselector 0·54-44 mc, two stages, as new, manual, £8. R.C.A. TE149 Wavemeter, first-class condition, 20 mc-50 kc, usable to 30 mc, VFO 1 kc division, 0·005% accuracy, full extract from manual, £8. Two R2/ARR3, 13 valve FM/Rx, 62-70 mc, easily adapted for Band II, circuit and full modifications, very good condition, £4 10s. each. Advance Constant Voltage Transformers, input 190/260v., output 230v. 150w. £3, 500w. £4. Minimitter Multi-Q, as new, £4. All first-class gear.—Box No. 2143, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SMALL ADVERTISEMENTS, READERS—*continued*

16mm BTG301 sound film projector, trans., 12 in. speaker, mike, in cases, spare spools, valves, lamps, OK home and clubs, perfect condition, cost £250, £86 o.n.o.?—Please write D. Locker, c/o 41 Newfield Street, Sandbach, Ches.

SALE: Panda Cub, Antennamatch, Z-Match, home-brew CW Rx, table; £55, buyer collects. Two 832 valves with 1 base, 30s.—G3KAB, 28 The Vale, Southgate, London, N.14. *(Pal. 7906.)*

SALE: QRO fully-screened 5-band miniature Ph/CW Tx and separate power unit, minus HV transformer, £10. Marconi VVM, accurate 100 mc, £8, o.n.o.? New Philco S/W car radio converter, 30s. Deliver London area.—Box No. 2144, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

TOPBANDER Labgear Tx, 7-valve printed circuit, as new, £10; or exchange CNY/2, VF1U, etc.—Letters please, J. E. Thomson, 16 Coniston Road, Reddish, Stockport, Ches.

FOR SALE: 9 volumes *Radio & Television Servicing.* Vols. 1-5, 1955/56, 1956/57, 1957/58, 1958/59, new condition, £13, o.n.o.?—Abraham, 1 Bassaleg Road, Newport, Mon.

TX, 750 watts CW/ICW, 300 watts phone, VOX, 2-12 mc, two VFO Exciters, PA 2 x 813, pi-output, with PSU, 2150v. 500 mA, 525v., 450v., 385v. stabilised, 425v. neg., 2 x 6·3 and 13v. heaters. All unused, unmodified, ideal conversion job, manuals, spare valves; best offer accepted, space wanted. Taylor Wobbulator, mint, manual, £7. Pair 58 Sets, complete with J.B.'s handsets, batteries, antennae, manual, £3 Lot. Host other gear: Valves, Tfrs, HV capacitors, etc., state wants.—G3IWR, 108 Old Oak Road, Acton, London. *(SHE 3955.)*

FOR SALE or exchange, Gonset G-43, used 3 hours, cost £72, £55 collect—or exchange for S36 or similar receiver.—Write C. Smedley, 20 Coltman House, Greenwich, London, S.E.10.

EXCHANGE Edixa "B" Single lens 35 mm. Reflex camera with 1·9 Quinnon automatic click stop lens, waist and eye level view finders, split image range finder, close up tubes, flash exposure meter, tripod, all in leather cases and in absolute mint condition; Aldis 303 Projector also included; total value over £220. For best SWL station offered. Independent valuation welcome.—Box No. 2345, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: Big Clear out, Transmitters, receivers, chassis, components and magazines, knockout prices! S.a.e. for list. Ham must clear the decks.—Box No. 2346, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

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WANTED: AR77 Wavechange Switch. *QST* May 1958. Command Transmitters BC-457, BC-458 new unmodified.—Morgan, G2HNO. 52 Seafield Road, Southbourne, Bournemouth.

19 SET Mk II, with rotary converter and carrier, working order, £5. Buyer to collect.—Gurney, 78 Bloomfield Avenue, Bath.

SMALL ADVERTISEMENTS, READERS—*continued*

FOR SALE: R107 Receiver, S-meter, instruction manual, £10. Type 36 Transmitter, power pack, modulator, £12 10s. Hallicrafter S-27, requires attention, £5 10s. — Hopkinson, 68 Ombersley Street. *(Droitwich 2256.)*

FOR SALE: Wearite Tape Deck. Model 2A/N, immaculate condition, complete with headlift transformer, £28 o.n.o.? — Davies, 58 Uplands Avenue, Hitchin, Herts.

WANTED: Vibroplex bug, Woden UM2. Sale Labgear Wide Band Multiplier Unit, £3. — G3KEP, 30, Lyndale Road, Eldwick, Bingley, Yorks.

FOR SALE: Correspondence course for R.A.E. plus fully corrected exam. papers, mint condition, cost over £10. Offers!—Box No. 2347, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

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FOR SALE: Panda Cub, £23. Minimitter Mobile radio-transmitter, converter, control box, power supply, antenna, 1960 vintage, perfect, £30. Offers ? —Hurst, 36a Westboro, Wimborne, Dorset.

SALE: RA1B, double superhet, 1620 kc and 465 kc, IFT's R.208, double superhet, mods. as per *Short Wave Magazine,* using CR-100 IFT's. PCR 2m M/W, Top Band, S/W Band. TV tube Type 3/32, unused, kept as spare. Nine vols. Newnes *Radio and Television Servicing.* Also various PSU, plus odd items. Callers, evenings or week-ends. —Offers, please, to J. Joliffe, 36 Hunton Road, Erdington, Birmingham 23.

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MINIMITTER Transistorised 12v. Mobile Supply Unit, 300v. 250 mA, £6 10s.; Minimitter Top Band Mobile Antenna, £3; Master Mobile 80-10 metre variable loading coil, £3.—G3BLO, 11 Strickland Close, Shadwell, Leeds, 17. *(Phone 656247.)*

WANTED: Manual for the RA-10.—Please write to A. St. Amour, 43 Malvern Road, Luton, Bedfordshire.

NEW VALVES, QQV06-40, £2; QQV03-10, £1; 832, 832A, 803, STV 280/40, 10s.; PT15, 211, 5s.; HRO 456 kc xtals, 10s.; postage extra.—Box No. 2350, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

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SMALL ADVERTISEMENTS, READERS—*continued*

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R107 with RF24, good condition; deliver London area; £9 10s. o.n.o.?—Griffiths, 7 Chatsworth Road, Cheam, Surrey. *(Phone: FAI 5929.)*

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FOR SALE: Eddystone 680X Rx, complete with matching speaker and head-phones, £75 o.n.o.?—*(Telephone: Farnham Common 1300.)*

Printed by The Courier Printing Co. Ltd., Tunbridge Wells, for the Proprietors and Publishers, The Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1. The *Short Wave Magazine* is obtainable abroad through the following: Continental Publishers & Distributors, Ltd., William Dawson & Son, Ltd.; AUSTRALIA AND NEW ZEALAND—Gordon & Gotch, Ltd.; AMERICA—International News Company, 131 Varick Street, NEW YORK. Registered for transmission to Canada by Magazine Post. *October* 1960.