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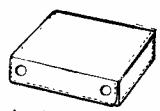

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INDEX TO ADVERTISERS

SHORT WAVE MAGAZINE

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CONTENTS

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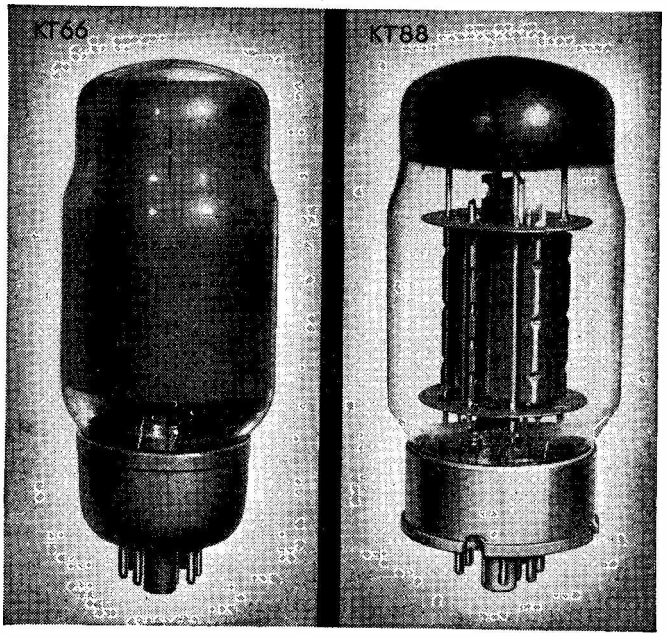

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The SHORT WAVE Magazine

EDITORIAL

Forty

Those who have ever hunted on 40, whether as old timers or newcomers, know that it remains, as it always has been, the most remarkable of our bands.

In the early days, it was (as " 45 metres ") virgin ground for the pioneering DX operator, and much valuable work was done on it by amateurs in proving that consistent long-distance communication was possible. When the HF area of the spectrum was rationalised by international agreement, 40 metres became the happy hunting-ground of most of the world's radio amateurs, and was always full of good signals. It was carefully used, too — as a European phone band by day, and an international CW/DX band by night. Later, Forty degenerated somewhat, becoming a sink into which was poured every sort of rough or slap-happy transmission, both on CW and phone. The band lost its DX characteristic and acquired a bad reputation amongst serious operators.

To take a turn round Forty now may suggest that things have not improved overmuch. But in fact careful and objective listening will disclose that 40 once again represents a fair cross-section of the active amateur population — which is itself a cross-section of the whole community. In the phone area, one can hear all sorts of things being talked about, in a variety of accents, but with all the blather there is also to be found much good sense and sound technical knowledge. In the CW section, beginners take their first steps, conducting laboured QSO's alongside slick operators who sound as if they know it all. Late in the evening and in the early morning, when the BC occupancy is at a minimum, once again the DX breaks through and those who know how to use Forty are there to take advantage of it. We are then right back to the early days, when this band carried most of the world's DX traffic.

Truly, for any radio amateur, life begins on Forty !

Austin Forsyth G6FO.

The R.107 RF/IF Packs

AMATEUR BAND APPLICATIONS

A. D. TAYLOR (G8PG)

The R.107 is a well-known ex-Army receiver of good repute. The RF and IF assemblies, as separate units, have recently been released on the "surplus" market. They are described here, and our contributor also gives details on how to connect up and align the units. Their use as part of a double-superhet is discussed, with information on how a single-switch station change-over system can be arranged. Many of the points covered in this article will also be of immediate interest to owners of complete R.107 receivers.—Editor.

THE RF and IF packs which form the essential part of this well-known ex-Army receiver have become available on the "surplus" market at a very reasonable price—*see* recent Anglin advertisements in *Short Wave Magazine*—being especially cheap when bought less valves. They are units which will be of considerable use to the amateur, and the purpose of this article is to describe them briefly and then to give sufficient practical information to enable the purchaser to get them working. Certain possible modifications are also suggested for those who are more advanced in the conversion of "surplus" equipment.

Technical Description

The RF pack consists of the "front end" of the R.107, comprising an RF stage, mixer and local oscillator. These cover the range 1.2 to 17.5 mc in three bands. The pack is sold complete with calibrated dial and 50:1 ratio slow motion drive, but less all control knobs. A four gang, 300 $\mu\mu$F per section tuning condenser is included, a double tuned band-pass circuit being used between the RF and mixer stages. Inputs are provided for either a long wire aerial or low-impedance feed, such as a doublet.

The "IF/OP unit" is in fact the complete "back end" of the receiver. It consists of two 465 kc IF stages, a combined 2nd detector and 1st audio stage, a second audio stage and a BFO. A switch in the IF circuit provides either narrow or broad selectivity and a very effective 900-cycle audio filter can be switched into circuit to provide extra selectivity for CW reception. A functional switch provides AVC/Manual/BFO selection and the RF and AF gain controls are also mounted on this chassis, together with a "crash limiter." Two audio outputs are provided, one at 70 ohms and one at 600 ohms. The output level is adequate for working a small loudspeaker.

A muting relay is also fitted on this chassis. It is operated from the HT line (no external supply required) and has one set of make-and-break contacts and one set of change-over contacts. The former earths the grid of the last AF amplifier valve when the relay is operated and, in the unmodified receiver, the latter can be used to give sidetone from an external source *via* the normal output transformer.

From the foregoing it will be realised that the two units as described here amount to the R.107 receiver complete, less only the power pack, cabinet, speaker and control knobs. The power pack is also available as a separate item.

Power and Valve Requirements

A power pack is required which will deliver 12v. AC at 1.2A. and 250v. DC at 80 mA. (The 6.3 volt heater valves used are wired in series-parallel, hence the 12v. supply.)

Valve types are as given in Table I.

Table I

DESIGNATION	TYPE	FUNCTION
V1A	EF39	RF Amplifier
V1B	EF39	Mixer
V1C	EF39	1st IF Amplifier
V1D	EF39	2nd IF Amplifier
V2A	EBC33	Local Oscillator
V2A1	EBC33	BFO
V2B	EBC33	Demodulator/1st AF
V2B1	EBC33	2nd AF Amplifier

The position of the various valves is shown in Fig. 1. Should it be desired to rewire the receiver for "straight" 6.3 volt operation, this is quite obvious except for the local oscillator valve V2A. For a 12-volt supply the heater of this valve is wired in series with that of V1C, the 1st IF amplifier, the circuit being completed *via* the interconnecting tagstrips. If the LT circuit is to be re-wired for 6.3 volts, do not disturb the wiring to V2A heater, but rewire the runs to V1A and V1B heaters, using tag 2 on tagstrip A as the "live" 6.3 volt input tag. On completion of the wiring, strap tags 2 and 7 on tagstrip A together and V2A will function correctly. This point is very important as the earthy side of V2A heater is returned to ground *via* the cathode tap on the local oscillator tuning

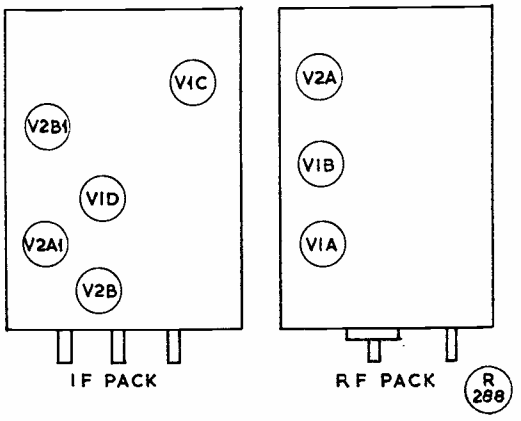


Fig. 1. Positioning of the valves on the IF and RF packs of the R.107 ex-Army receiver. These packs are obtainable separately as "surplus" items.

coil, being strapped to the cathode at the valve base.

Interconnections

The tagstrip on the rear of the RF pack is tagstrip A. Looking at the IF pack from the rear, the left-hand tagstrip is B and the right-hand one C. On each tagstrip, reading from left to right when looking from the rear, the first horizontal row of tags are 1 to 4 in that order, the second 5 to 8 and the lowest row 9 to 12.

Tagstrips A and B provide the interconnections between the RF and IF packs, while Tagstrip C is used for the external power, head-phone and muting connections. Interconnections are as follows: A1 to B1 (HT+); A2 to B2 (live 12v. AC); A3 to B3 (earth, HT−, earthy 12v. AC); A4 to B4 (AGC line); A5 to B5 (MVC line); A6 to B6 (HT+ to mixer valve screen); A7 to B7 (heater run between V1C and V2A).

The remaining tags on these strips are not used, but it is important to note that some of them serve to anchor HT dropping resistors and are therefore at high potential. Connections given above are for 12-volt heater operation.

Connections to Tagstrip C are made as follows: C1 to HT+; C2 to live side of heater supply; C3 to earth, HT− and earthy side of heater supply; C4 to one side of a single pole, single throw muting switch, the other side of which is earthed; the "On" position mutes the receiver; C5 not used; C6 600-ohm output if required (return connection made to earth); C7 70-ohm headphone output (earth other phone lead); C8 not used; C9 external sidetone monitor input (earth other side of monitor output); C10 to C12 not used.

In addition, four other connections must be made. On the front, right-hand side of the RF pack one single lead and one twin lead are brought up through the chassis. These are the long-wire and doublet aerial connections respectively. They should be connected to a suitable terminal block. A single insulated lead will be found at the rear right-hand corner of the IF pack. This is the connection between the first IF transformer primary and the mixer valve anode. It must be soldered to the tag mounted on top of the RF chassis at the rear left-hand side, immediately behind the local oscillator valve screen.

Finally, some unwanted leads must be attended to: On the RF pack, two leads will be found immediately behind the tuning dial assembly; these can be connected to a suitable lampholder and a 12-volt dial lamp run from them. On the IF pack, a large cable-form runs to the front of the chassis where it is left unterminated. This was originally intended to connect to the usual Army type of test panel mounted on the front of the receiver. All these leads should be cut off at source and removed.

Controls

A large knob, preferably with a handle, should be fitted on the slow-motion drive spindle. When first brought into service this drive will be stiff, due to the grease being thick, but it frees quickly with use. Use of a lighter grease is *not* recommended as it will almost certainly introduce dial slip. The spindle immediately beneath the main tuning drive is the wave-change switch, which gives Band 1 to the left, Band 2 in the centre and Band 3

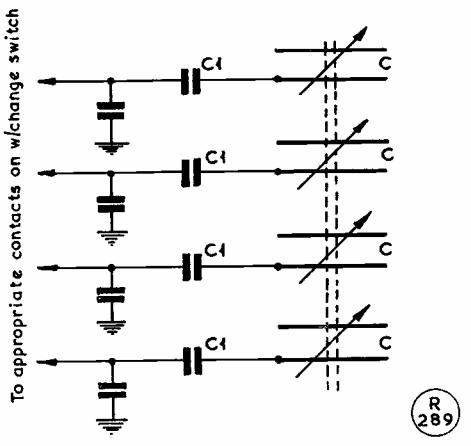


Fig. 2. Method of obtaining improved band-spread when using the R.107 RF/IF packs as part of a double superhet. Capacities marked C are the existing 300 μμF sections of the 4-gang tuning condenser, and those marked C1 are all 75 μμF 1% silver mica condensers.

to the right. The spindle to the right of this switch is the aerial trimmer control.

There are seven controls on the IF pack. Reading left to right, the top row provide BFO pitch control (with slow-motion drive), a BFO/Manual/AVC switch, and an AF gain control. The toggle switch in the middle of the panel controls the crash limiter (down for "On") and the three lower spindles bring in the audio filter (turn to the right for "On"), RF gain and selectivity (turn left for "Narrow") respectively. Eight knobs will be required for these controls.

Peaking Up

All units seen so far by the writer have been brand-new and in sealed cartons. His own were wired up as described in earlier paragraphs and functioned as soon as switched on. When checked against an existing R.107 of known performance the only detectable difference was that the dial calibrations on the new units were about 40 kc out. This was soon traced to a slipped pointer on the slow motion dial. Nevertheless, a little time spent in peaking the various tuned circuits still further improved the performance.

The correct procedure is as follows: Set the IF selectivity switch to "Narrow," the functional switch to manual and the RF gain control to a point which does not overload the receiver. Inject a 465 kc test signal between the mixer valve control grid (top cap) and earth, then adjust the trimmers on the IF transformers for maximum output. When the IF circuits have been aligned, set the BFO panel control to mid-position, put the functional switch to "BFO" and vary the BFO coarse tuning control (reached through the hole in the front panel under the BFO fine tuning knob) until the BFO is tuned to zero beat with the 465 kc test signal.

The RF end of the receiver can be set up by injecting test signals into the dipole input terminals and lining up the coil pack trimmers at frequencies of 16.8, 6.8 and 2.6 mc for Bands 1, 2 and 3 respectively. The Band 1 trimmers are the lowest trimmers on each coil box and the Band 3 trimmers the highest, while the local oscillator circuits are found in the rearmost box. The threaded rods located below the trimmers control copper discs used to vary the coil inductance at the LF end of each range. They can be used to peak the circuits at 7.6, 3.1 and 1.3 mc respectively for the three bands covered, but should *not* be screwed in too far, otherwise circuit Q may be lowered. Warning: When making adjustments remember that the fixed vanes on the second section of the four ganged condenser and on the associated trimmer are at HT potential.

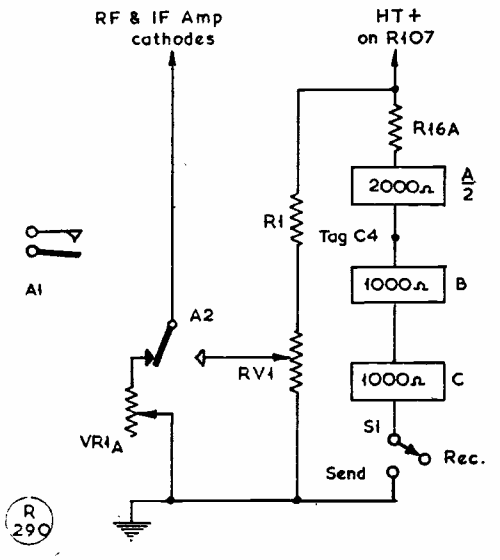


Fig. 3. Suggested muting and control circuit — see text. A/2 is the existing relay in the IF pack; B is external HT control relay; C the external aerial c/o relay; S1 is the send-receive switch; VR1A the existing RF gain control; R1 is 200,000 ohms, 1-w.; R2 is a 50,000-ohm potentiometer; and R16A is the existing 15,000-ohm 3-watt resistor.

Uses for the Units

As they stand, the two packs provide an excellent general-coverage receiver for the transmitting amateur or SWL.

For the more experienced operator, the IF pack alone provides a most useful IF and audio strip to put behind a home-built "front end." To see what the receiver is really capable of, however, the two units should be used together as the rear portion of a double superhet. This is done by feeding broad-band converters with an IF in the range 1.6—1.8 mc into the receiver, the tuning being done on the R.107 over the range 1.6—2.0 mc. Under these conditions a really potent double superhet can be produced. As the HF bands on the R.107 RF pack would not then be required, band-spread can be enormously increased by inserting 75 $\mu\mu$F condensers between the 4-gang condenser and the wavechange switch, as shown in Fig. 2. The R.107 alone is then used for Top Band work (the band covering 65 degrees on the dial), and the R.107 plus-converter combination for the higher frequencies. The fixed condensers should be of the 1% tolerance type and with the values quoted the receiver can be peaked up over the 1.6—2.0 mc range. Only four connections within the RF pack need be unsoldered for this conversion.

The IF pack relay can be used in conjunction with two external 1,000-ohm relays to provide full station control. It is only necessary to place the new relay coils between the existing coil and earth. At the same time, the connections to the existing relay contacts can be modified to provide proper receiver muting *plus* monitoring of the outgoing signal. This is done by removing the existing wiring from both sets of relay contacts, then rewiring them as indicated in Fig. 3, which illustrates the complete control and muting system. The send-receive switch shown is a toggle mounted in one of the trimmer access holes on the IF pack front panel. To set up the monitoring circuit it is only necessary to put the switch to "Send" and then adjust RV1 until a comfortable level of sidetone from the transmitter can be heard in the phones.

Conclusion

The writer feels that these two units are among the most useful surplus items to appear on the market for a long time. It is hoped that this article will assist other amateurs to make full use of them, and that it will be helpful to those readers who—following the author's note on the R.107 in the December 1957 issue of *Short Wave Magazine*—have written asking for hints on servicing existing receivers.

A Simple Z-Match

DESIGN, CONSTRUCTION, SETTING-UP AND OPERATION

T. W. BLOXAM, B.Sc., Ph.D. (GW3LJS)

ACCURATE matching between aerial and transmitter has become increasingly important, not only to ensure the maximum transfer of power to the aerial, but also to minimise TVI from excessive standing-waves and the damage which they can cause in low-pass filters. Considerable interest has been shown in the writer's Z-Match, and it is hoped that the following description will provide some practical information on its construction and operation.

A Z-Match covering all amateur bands from 3.5 to 30 mc, without coil-changing or switching, was described in *QST* for May, 1955, and in later editions of the ARRL *Handbook*. The writer has adopted the ATU section of the Z-Match, but the standing-wave indicator (or, more correctly, the forward and reflected power indicator) is of simpler design and is known as the Monimatch (*QST*, October, 1956). A more recent version of the Monimatch is described in *QST* for February, 1957; but the writer has incorporated the earlier model into his Z-Match, with some modifications. The Z-Match performs four main functions: (1) an ATU; (2) a dummy load; (3) a standing-wave indicator; and (4) an RF power meter.

The ATU Section

The operation of the ATU section of the Z-Match can be understood by referring to Fig. 1A, where L3 is the LF coil, L5 the HF coil, and C4 the tuning condenser.

On the LF bands (3.5 to 7 mc) the two sections of C4 are effectively in parallel across L3 and, since the inductance of L5 is low in comparison to L3, the former coil acts as a short-circuit (Fig. 1B). The inductance of L3 is such that the tuned circuit resonates at 3.5 mc when C4 is near maximum capacity (about 500 $\mu\mu$F), and on 7 mc near minimum capacity. On the HF bands (14 to 30 mc) C4 acts as a split-stator condenser in conjunction with L5, while the comparatively high inductance of L3 is shunted across the tuned circuit, forming a high impedance at these frequencies (Fig. 1C). When L5 has the appropriate inductance, 14 mc can be tuned near maximum capacity and 30 mc at about minimum capacity. The coils L3 and L5 are wound on 2 in. diameter ceramic formers (from a TU5B unit), and are mounted at right-angles to each other. Two output coupling coils are required, one for the LF and the other for the HF bands (L4 and L6 respectively). *See* Fig. 2.

It is evident that this circuit will in fact tune the whole frequency spectrum from 3.5 to 7 mc and 14 to 30 mc. A similar type of circuit is used in the writer's transmitter for grid and

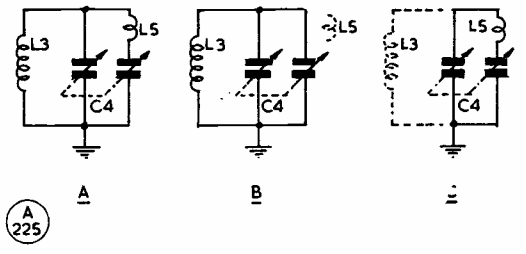


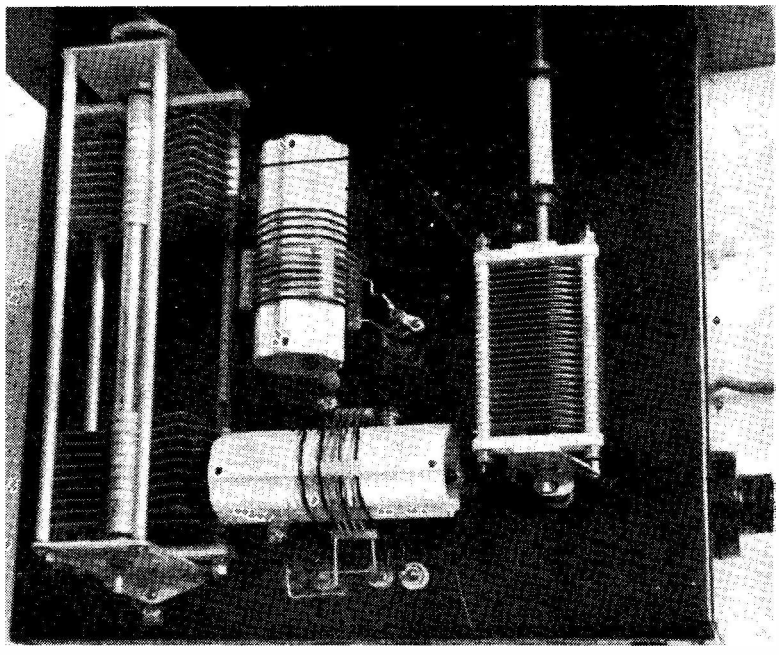
Fig. 1. Basic circuitry of the RF tank section of the Z-Match Unit. (A) is the ATU circuit, with link couplings omitted; (B) is the ATU equivalent circuit for the range 3.5 to 7.0 mc; and (C) is the configuration for 14-30 mc.

anode all-band tuners. The inductance values of L3 and L5 are adjusted to avoid coincidence of C4 settings which might occur at 3.5 and 14 mc, and at 7 and 30 mc.

There is, however, no reason why a more conventional coil-changing or switched tuned-circuit should not be used; but the specification for the coupling coils (L4 and L6) should be maintained.

The series variable condenser C3 serves to tune-out the reactance of the load and provides an impedance match between the transmitter and ATU for varying output impedances. This condenser has a maximum capacity of 500 $\mu\mu$F (Johnson, 500E20), and is a type available on the "surplus" market. The split-stator condenser C4 was made from a "surplus" Johnson (1000E35) single-section .001 μF variable condenser with 0.08 in. vane spacing. The bars supporting the stator plates can be removed and replaced by 2BA rods which carry each set of stator plates. The rotor plates occupy each end of the rotor shaft, the intervening space being filled by a sleeve of polystyrene or metal tube. After approximately aligning the rotor plates with the two sections of stator plates, the rotor assembly is locked tight and re-mounted on the end-plates. The final, accurate meshing and spacing of the plates can easily be done by moving the stator plates along the 2BA rods and locking into position with 2BA nuts. The final assembly comprises 9 stator and 9 rotor plates per section. The capacity was checked on a Q-Meter and the end stator plates were bent to obtain the same capacity per section over various settings of the condenser. However, alignment by eye will provide a reasonable match in most cases. The photograph gives a good idea of the general arrangement of these condensers.

The ATU section of the Z-Match could be used alone or in conjunction with an output indicator such as an RF ammeter, neon lamp or field-strength meter. One of the difficulties in using the latter method of indication is the fact that a "maximum RF" reading may be due to radiation from feeder lines, which in most cases are closer to the indicating device than the actual radiating portion of the aerial system. In these circumstances it is possible to tune for maximum RF output in the form of standing-waves on the feeder!



Chassis layout of the Z-Match Unit designed by GW3LJS. The large two-section condenser on the left can be fabricated from a readily available "surplus" type, as described in the text. The L1, L2 assembly and the 80-ohm dummy load resistor R3 — see circuit Fig. 2 — are mounted sub-chassis. The unit is intended for high-voltage operation at full power; for inputs of 75-80 watts with up to 800v. plate HT, condenser spacings could be scaled down.

Standing-Wave Indicator

The standing-wave indicator is not calibrated to read the actual standing-wave *ratio*, but serves only to indicate when minimum reflected and maximum forward power has been achieved during the tuning operations. It is most important that the standing-wave bridge circuit be kept well away from strong RF fields. This is accomplished satisfactorily by mounting the bridge and associated components beneath the chassis. All wiring associated with the bridge is run in screened wire.

The bridge comprises a $\frac{1}{4}$ in. o.d. copper tube 12 in. long (L1) soldered directly to the coaxial input socket (P1) at one end, and to the ceramic switch (S2) at the other. The tube lies between two parallel strips of metal 13 in. x $\frac{3}{4}$ in., spaced $\frac{3}{4}$ in. This arrangement serves to maintain a characteristic impedance of about 80 ohms over the length of the tube. A piece of 14g. copper wire $11\frac{1}{2}$ in. long (L2) is aligned

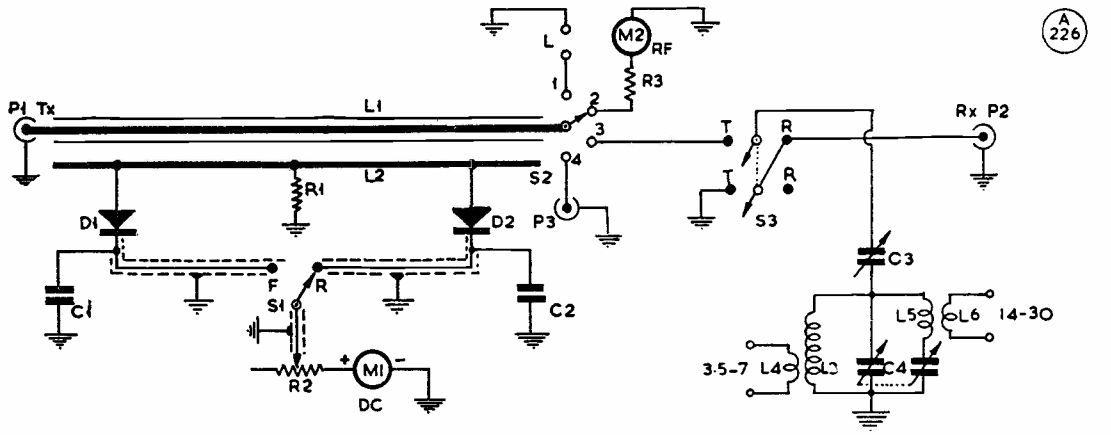


Fig. 2. Diagram of the Z-Match unit designed and described by GW3LJS. It provides for receiver coupling as well as transmitter matching into the load, and incorporates an ingenious four-band network L3-L4, L5-L6 which enables five bands to be covered without coil changing. S3 is the aerial change-over for "send-receive," and S2 functions as explained in the text, which also gives full details on setting-up for correct operation of the matching unit. R3 is a high-dissipation dummy load resistor, the current through which is read off M2 for transmitter output power calculations.

parallel to, and about $\frac{1}{4}$ in. away from, the copper tube. This wire is supported at its centre point by soldering to a tag mounted on a stand-off insulator, to which R1 can also be connected. The indicating meter (M1) is a 0-500 microammeter, but sufficient output will be obtained to operate a 0-1 mA meter, although readings will tend to be low on 3.5 mc. The crystal diodes (D1, D2) should not be soldered to the 14 SWG wire (L2) at this stage but a few turns of each wire-end is wrapped round L2 so that the connections can be slid back and forward through a point about $4\frac{1}{4}$ in. from the centre of the wire.

Dummy Load and RF Output Meter

The dummy load is an integral part of the bridge and consists of a non-inductive carbon resistor R3 of nominal 80 ohms resistance. These resistors are available on the "surplus" market and are rated at 50 watts. However, they will withstand the full output from a 150 watt transmitter *for short periods* without serious overheating. An RF ammeter (M2) is wired in series with the 80-ohm resistor (using the shortest possible leads) and provides an approximate indication of power output ($W_{out} = I^2 \times 80$).

In addition to the 80-ohm dummy load provision is made for switching in an external load such as a 100-watt lamp. This is useful when long tests are to be made on the transmitter without radiating. The lampholder is of the normal domestic type fixed to the side of the chassis and can be seen in the photograph, at lower right.

Table of Values

Fig. 2. Circuit of Z Match

C1, C2 = .001 μF ceramic
C3 = 500 μμF variable (*Johnson* 500*E*20)
C4 = 250 μμF per section, split-stator
L1 = 12in. copper tube, ¼in. o.d.
L2 = 11¼in. of 14g. copper wire spaced ¼in. from L1
L3 = LF coil (3.5-7 mc), 12 turns 16g. copper wire, 2in. diameter, 3in. long
L4 = LF link, 7 turns 16g. copper wire, 2½in. diameter, 2½in. long.
L5 = HF coil (14-30 mc), 4½ turns 16g. copper wire, 2in. diameter, 2½in. long.
L6 = HF link, 4 turns 16g. copper wire, 2½in. diameter, ¾in. long.
D1, D2 = Crystal diodes
M1 = 0-500 μA, DC
L = External load socket (lamp)
S1 = Meter switch, forward and reflected power
S2 = Load switch, ceramic
S3 = Aerial change-over relay and switch
P1 = 80-ohm transmitter input
P2 = 80-ohm receiver coaxial input
P3 = 80-ohm coaxial line output
R1 = 50 ohms, ½-watt carbon
R2 = 20,000 ohms, carbon pot.
R3 = 80 ohms, 50-watt carbon
M2 = 0-2A, RF, thermocouple

Switching

The switch which selects the various loads is a single-pole four-way ceramic wafer. A "receiving" type ceramic switch will serve since no large voltages are developed at this point. It is advisable, however, to switch off the transmitter before altering the position of the switch since arcing will soon ruin the contacts. The four switch positions select: (1) external load; (2) internal 80-ohm load; (3) aerial load impedances up to about 2500 ohms; and (4) direct feed to an 80-ohm load, *e.g.* a dipole.

Adjustment

The bridge is adjusted at 28 mc since at this frequency the sensitivity and balance of the

circuit is more critical than at the lower frequencies. With S1 set to read "reflected power" and S2 switched to the 80-ohm dummy load, switch on the transmitter. Tune and load the PA in the usual way, but if necessary reduce the RF output in accordance with the rating of the 80-ohm dummy load. Adjust R2 to give a convenient reading on M1 and move D2 back and forth along the 14g. wire L2 until the lowest reading is obtained on the meter. Solder D2 into position at this point. To balance the other side of the bridge the input and output connections must be reversed. This can be done by plugging the transmitter output into P3 (switch to position 4) and attach the 80-ohm dummy load across P1. With S1 set to read "forward power" adjust the position of D1 for the lowest reading on M1, and solder the diode at this point. Disconnect the 80-ohm load from P1 and re-solder it back into position.

Operation

The adjustment of the standing-wave indicator and ATU is the same on all bands, the primary object being to obtain the minimum reflected power which coincides with maximum forward power delivered to the load. The transmitter is first connected *via* S2 to the 80-ohm dummy load, tuned and loaded-up in the usual way. With the aerial connected to the appropriate output link S2 is switched to the aerial and S1 to read "reflected power." Tune C4 for the lowest reading on M1, followed by C3, which will reduce the reading still further. Readjustment of C4 will now be necessary due to the detuning effect of C3 and a final adjustment of the latter will also be required. By alternate adjustments of C4 and C3 a *null* or zero reading will be obtained on M1, the sensitivity of which can be continuously adjusted with R2 as the deflection gets progressively lower. The sharpness of the *null*-point will depend very largely on the type of aerial in use, while the latter will also affect the various settings of C3 and, to some extent, those of C4. The approximate settings for C3 and C4 using a "Collins" aerial are given in the table, both dials having maximum capacity at 100 divisions.

CONDENSER SETTINGS

Band	*C3*	*C4*
3.5 mc	35	90
7.0 mc	16	10
14.0 mc	28	75
21.0 mc	12	30
28.0 mc	5	15

A final check can be made by switching S1 to the "forward power" position (watch the meter!) and making slight adjustments to C3 and C4; this time for *maximum* deflection. If the bridge has been properly adjusted the maxima will agree with the *null* position obtained on "reflected power." Hence in practice the meter is seldom used in the "forward power" position, all adjustments being made towards obtaining a *null* reading on "reflected power."

A good match between transmitter and aerial will be evidenced from the PA plate current and tuning, which should be the same as that obtained originally on the 80-ohm dummy load. Should the PA require substantial retuning the cause may be due to: (*a*) the transmitter having an output impedance other than 80 ohms; (*b*) high-frequency parasitic oscillation or excessive harmonics; (*c*) incorrect adjustment of the bridge; (*d*) RF pick-up by L2 from some source other than L1. The cure for (*b*), (*c*) and (*d*) is obvious. In the case of (*a*) the number of turns on the PA link-coupling may be incorrect. No difficulty should be encountered in matching a pi-section PA tank circuit to the Z-Match.

Since few practical dipoles have a centre impedance of 80 ohms the Z-Match will generally improve the matching, a point which can soon be verified by comparing the reflected power obtained *via* the ATU with that when the aerial is connected directly to the 80-ohm output socket. If the receiver has an 80-ohm input impedance the ATU will also improve reception, while an attenuation of some 30 dB can be expected with TV channel harmonics. If a low-pass filter is used it should be located between the transmitter and Z-Match.

K.W. ELECTRONICS, Ltd. — G5KW RETIRES

We are asked to announce that, consequent upon the dissolution of their partnership, the business of K.W. Electronics, Ltd., is being carried on by Mr. R. G. Shears, B.E.M., A.Brit.I.R.E. (G8KW), as Major K. E. S. Ellis (G5KW), has given up his interest. Under the direction of Mr. Shears, K.W. Electronics, Ltd., will continue the business policy already established, with an expansion of activities.

GB3PRS, Preston, Lancs.

This callsign will be in use by the Preston Amateur Radio Society during October 15-18 inclusive, from a local exhibition. It is hoped to have GB3PRS on all bands 10-160 metres, depending upon conditions and activity. All contacts will be QSL'd by a special card. The hon. secretary of Preston A.R.S. is G3DWQ—*QTHR*.

The TCS Transmitter -Receiver Assembly

NOTES ON DESIGN AND CONSTRUCTION, AND AMATEUR BAND APPLICATIONS

B. M. JOHNSON (G3LOX)

This article discusses a useful and interesting item of ex-U.S.N. equipment, which has been available on the "surplus" market for some time. Our contributor gives much factual information on the circuitry and operation of the TCS apparatus, which covers the 160-80-40 metre amateur bands on both transmitter and receiver.—Editor.

ONE of the best buys on the "surplus" market today is undoubtedly the TCS series of transmitters and receivers; they were designed and originally built for the U.S. Navy by the American Collins Company, though later several other contractors also made them. As far as the writer can ascertain, the series was numbered consecutively from TCS-1 to TCS-13. The U.S. Navy numbers were: 52245 for the transmitter, and 46159 for the receiver. The letters prefixing the Navy number is a code denoting the manufacturer, *e.g.* COL-52245 is a Collins-built transmitter, CHI-46159 a Hamilton receiver. Although minor differences may be noted in the construction and layout, as between one manufacturer and another, all the units with the above Navy numbers are basically the same and interchangeable, irrespective of the TCS number.

The TCS series was supplied to the U.S. Navy for duties similar to the British W/S19., *e.g.* /P and /M from tanks, trucks and similar vehicles. The TCS was also used as emergency radio aboard merchant ships. Although intended to work as a single inter-connected unit, the transmitter and receiver are in fact physically separate, and it is proposed in this article to deal with them individually.

TRANSMITTER TYPE 52245

The transmitter consists of a VFO/Buffer-Doubler/PA with an integral push-pull modulator; there is provision for four switched crystals as an alternative to the VFO. The frequency coverage is in three switched bands, as follows: Band 1, 1.5 to 3.0 mc; Band 2, 3 to 6.0 mc; Band 3, 6 to 12.0 mc.

When used in conjunction with its receiver, the TCS transmitter has full "push-to-talk" or CW "break-in" facilities. In its unmodified form the transmitter will run to about 35 watts input on Phone and 80 watts or so on CW. The power requirements for the standard transmitter are as follows: HT (1) 400 volts DC at 200 mA; HT (2) 220 volts DC at 40 mA; LT 12 volts AC/DC at 2½ amps.; Relay supply 12 volts DC at 1 amp.

Exciter Circuit

Reference to Fig. 1 will show the circuit of the VFO, crystal oscillator, and the buffer/doubler stages that form the RF exciter section. All the valves in this stage, V101, 102, 103, are 12A6's. (The designation of valves and components in this article follows that which will be found used in the actual units, many of the components being marked.) V101 is the oscillator, the familiar Hartley type; it is continuously tunable from 1,500 to 3,000 kc, the tuning being effected by C101. Being designed for mobile work under active service conditions, the mechanical and electrical stability of this VFO is outstanding; it will take considerable vibration with no appreciable change in note and will accept up to a 10% variation above or below the normal line voltage for a frequency shift of as little as .01%. Referring again to Fig. 1, it will be seen that the oscillator function is controlled by a six-position switch, S104. When this switch (Oscillator Selector) is turned to the "MO Test" position, HT is applied to the anode and screen of the VFO and buffer/doubler stage (V101, V103): this permits netting. With the switch in the "MO" position, the stages will only operate *via* the relay K103, which is part of the push-to-talk arrangements. The remaining four positions on the switch select the crystals (up to four) which, used in conjunction with a 12A6 (V102), form the crystal oscillator, available as an alternative to the VFO. The switch, S104, removes the HT from the oscillator not in use. The crystals are ground to be in the same range as the VFO, *i.e.*, 1.5 to 3.0 mc; they are the 3-pin TCS Type 249.

When the bandswitch, S101, is in position 1 or 2 (1.5 to 3 mc), the anode of the oscillator—VFO or crystal—is untuned and is directly resistance-capacity coupled to the buffer/doubler, V103; in these two positions the output of the oscillator is in the range 1.5 to 3.0 mc, which is the fundamental frequency of the VFO. When the switch is turned to Band 3 (6 to 12.0 mc), a tuned circuit consisting of L103, C101 and C107 is coupled to the anode

of the oscillator. This circuit resonates at the second harmonic of the VFO; on Band 3, therefore, the output of the stage is doubled to the range 3 to 6.0 mc. V103 is the buffer/doubler. On Band 1 the stage operates as a straight amplifier and as a doubler on Bands 2 and 3. The appropriate inductance for the frequency doubler, L104, L105 or L106 is selected by the switch S101, which is ganged to the bandswitch in the oscillator section.

The PA

Referring to Fig. 2, it will be seen that the PA consists of two tetrodes in parallel; the valves used are 1625's which, with the exception of the heater voltage and the base, are the same as 807's. (1625's require 12.6 volts at .45 amps. for their heaters.) The PA valves only work in parallel when the system switch on the front panel is set to the "CW" condition. In the "Voice" position the switch S105 disconnects the heater voltage from one of the PA valves (V105). Therefore on Phone the PA consists of a single 1625. It should be noted, however, that the anode and screen HT remains on the unused valve. These considerations apart, the PA stage of the TCS transmitter is quite conventional. Auto-bias is obtained from the resistance R107 and R112. The PA tank circuit is formed by L107 and C116. S106 is ganged to the bandswitch in the exciter and doubler, and it selects the appropriate taps and padding

Table of Values

Fig. 1. RF Exciter and Buffer-Doubler, TCS Tx.

C101A	= 360 $\mu\mu$F	R103	= 100,000 ohms
C101B,		R104,	
C101C	= 280 $\mu\mu$F	R115	= 1,500 ohms
C102	= 75 $\mu\mu$F	R106	= 6,800 ohms
C103	= 30 $\mu\mu$F	R114,	
C104	= 40 $\mu\mu$F	R116	= 47,000 ohms
C105,		R125	= 47 ohms
C108,		L101	= 1.5-3.0 mc
C111	= .001 μF	L102,	
C106	= .002 μF	L107	= 1 mH RF choke
C107	= 25 $\mu\mu$F	L103	= 3.0-6.0 mc
C109,		L104	= 6.0-12.0 mc
C124	= .006 μF	L105	= 3.0-6.0 mc
C122	= 50 $\mu\mu$F	L106	= 1.5-3.0 mc
C123	= 250 $\mu\mu$F	V101,	
R101	= 1 megohm	V102,	
R102	= 22,000 ohms	V103	= 12A6

(Note: Circuit element numbering is in accordance with original.)

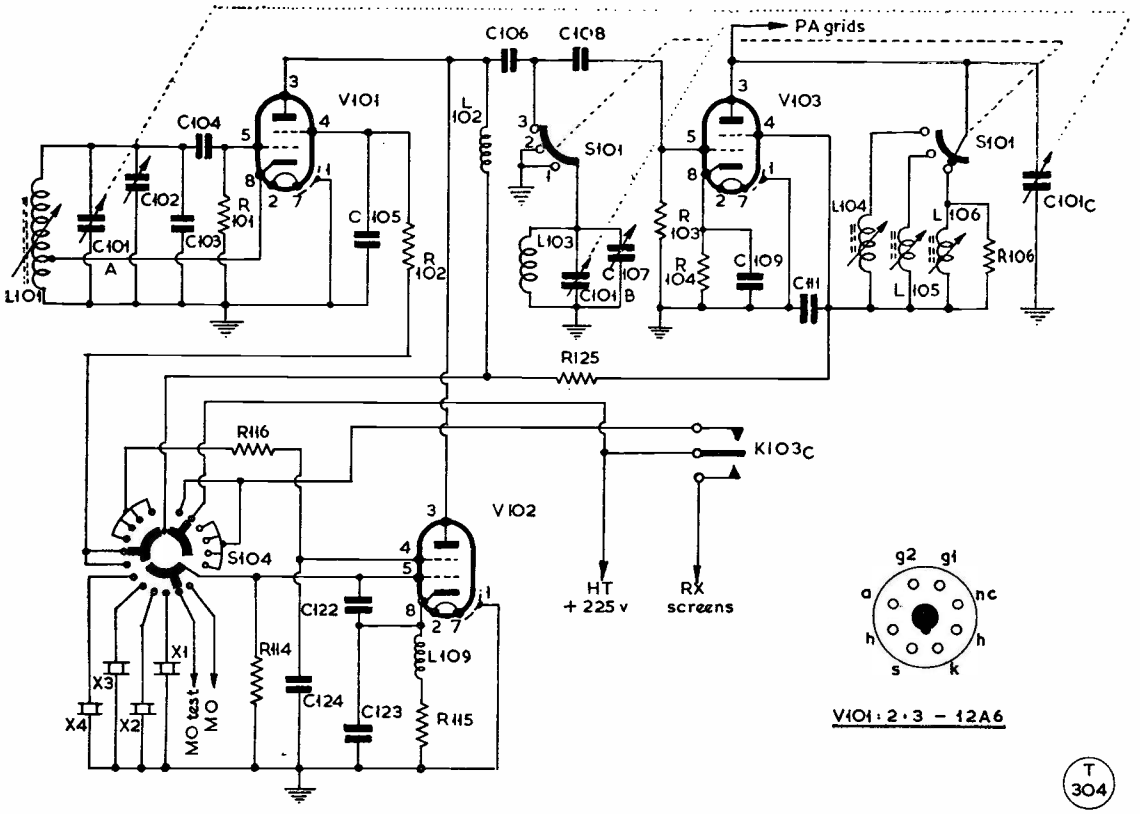


Fig. 1. RF exciter and buffer-doubler section of the TCS transmitter unit, which uses 12A6's in all three positions. Either crystal or VFO operation can be selected by switch S104, and the output frequency by S101. The PA section is shown in Fig. 2, and the whole transmitter is inter-switched with a corresponding receiver unit, to make the complete assembly.

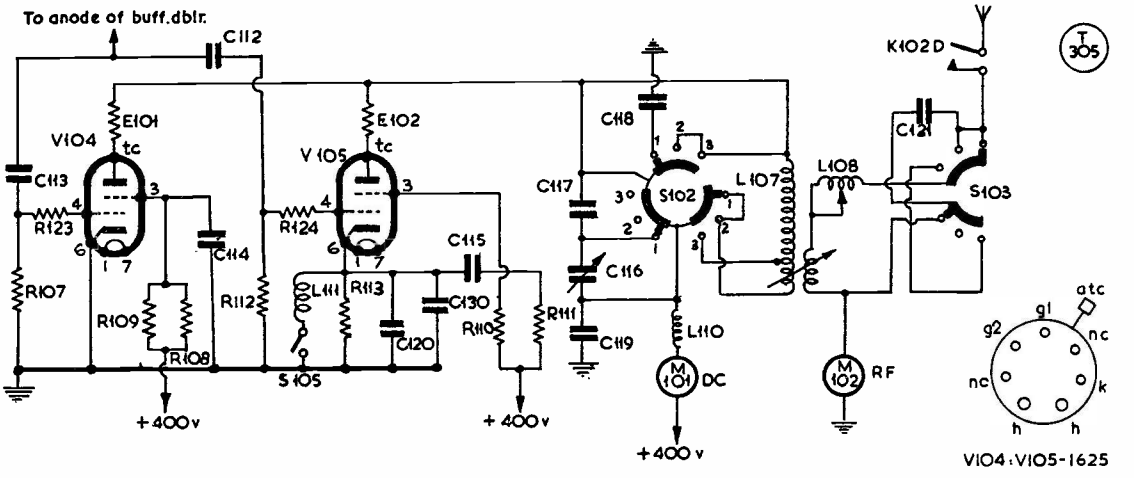


Fig. 2. The RF power amplifier section of the TCS " surplus " transmitter. The valves, V104/V105, are a pair of 1625's in parallel; these are 807's with 12v. heaters. On CW both valves are driven, but for phone one is switched out, the PA circuit then being as shown in Fig. 3. All values are given in the table, and it should be noted that circuit element numbering is in accordance with the original; many of the circuit references are given on the transmitter chassis. The TCS is not self-powered, so that a separate HT/LT supply must be provided; the connections are shown in Fig. 4.

condensers on L107. This tapped coil (L107) covers the entire frequency range of the transmitter, 1.5 to 12.0 mc.

Aerial Coupling

The tank coil L107 is coupled to the aerial by a variometer which controls the degree of coupling between the aerial and the PA tank. The " Antenna Loading " inductance, L108, is in series with the aerial. The switch S103 is the " Antenna Condition " switch and it connects the padding condenser C121 either in series or parallel with the aerial. The meter M102 is an RF ammeter; some of the TCS transmitters have this meter in the aerial lead and not, as shown in Fig. 2, in series with the earth. The relay contact shown, K102D, is part of the aerial send/receive change-over.

The TCS aerial coupling and loading circuits enable almost any aerial to be matched and loaded.

The Modulator

The TCS transmitters are among the few on the " surplus " market to have an incorporated modulator. The circuit of the audio stage is given in Fig. 3. It consists of a pair of 1625's operating in Class-B push-pull, modulating the PA (V104) on plate and screen *via* the transformer T102. There is no pre-amplifier, the 1625's being driven direct from the microphone transformer T101, which is designed to work with a carbon-button microphone of about 100 ohms. Auto-bias and the energising voltage for the microphone develops across the resistor

Table of Values

Fig. 2. Circuit of the PA section, TCS Tx.

C112, C113	= .001 μF	R108, R109, R110	= 47,000 ohms
C114, C115	= .002 μF	R113, R123, R124	= 47,000 ohms
C116	= 425 μμF	L108	= 0-30 μH, var.
C117	= 630 μμF	L110	= 1.0 mH RFC
C118	= 50 μμF	M101	= 0-200 mA DC
C119	= .01 μF	M102	= 0-3 amps., RF
C120, C130	= .008 μF	E101, E102	= Anti-parasitic chokes
C121	= 500 μμF	V104, V105	= 1625
R107, R112	= 22,000 ohms		

(Note: Circuit element numbering is in accordance with original.)

R118. The " Emission Selector " switch, S105 (Fig. 2), which, as has been mentioned, cuts the heater volts from the parallel PA valve when placed in the " Voice " position, also switches *on* the heaters of the two modulator valves, V106 and V107. It also places the modulator valves on the HT rail *via* the relay contacts K101B, though no HT will be available until the push-to-talk switch is closed and the relay K102 applies the HT. When the transmitter is switched to the " CW " condition, the modulator valves have neither HT nor heater volts applied; it follows, therefore, that when changing from one function to another, time must be allowed for the heaters to warm up.

All the supplies to the transmitter are fed through a 16-pin Cannon plug, Type SK-C16-23½AC. The connections will be found in Fig. 4.

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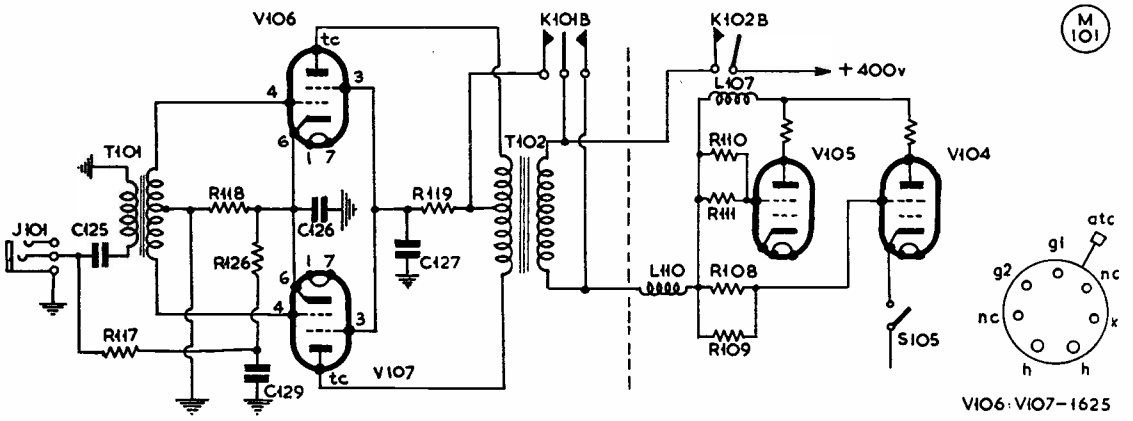


Fig. 3. Modulator arrangement in the TCS transmitter, using a pair of 1625's, V106/V107. As explained in the article, the speech output with a carbon microphone and the circuit as shown here leaves something to be desired, and it is better to drive the 1625's with a separate high-gain speech amplifier suitable for a crystal microphone.
(*Note: In this diagram, V104 should be shown in the V105 position, S105 being as given under* V105 *in Fig.* 2.)

TCS RECEIVER TYPE 46159

The TCS transmitter has a companion receiver, U.S. Navy number 46159. The size, panel lay-out and construction are very similar to the transmitter. The frequency range is identical. As the receiver is a conventional seven-valve superhet it is not proposed to deal with it in any detail here, but merely to give the valve line up and the plug connections. The valve run is as follows: RF, 12SK7; Mixer, 12SA7; Osc., 12A6; 1st IF, 12SK7; 2nd IF, 12SK7; Det/BFO, 12SQ7; Audio, 12A6. The IF is 455 kc.

It will be seen from this that the receiver has a separate oscillator valve (12A6). On the front panel will be found a switch marked "Oscillator Selector," and one of four crystals can be used as an alternative to the IF oscillator. The crystals are ground to be 455 kc above the signal frequency. It is doubtful whether in the ordinary way this facility will be required (it spot-tunes the receiver), so the switch will be left in the "MO" (IF Osc.) position. Other controls on the front panel are: HT on/off, BFO on/off, CW pitch, RF gain/AVC on/off, LF gain, Bandswitch, and the main tuning control. When the BFO is on, the AVC is inoperative. The power and control circuits from the transmitter arrive *via* a twelve-pin Cannon plug, Type GK-12-23½AC.

Though designed to work in conjunction with the TCS transmitter, the receiver, with the exception of the power supply, is self-contained. The receiver is muted during transmission by cutting off the HT to the screens of the RF and IF valves. The relay K103 in the transmitter switches the HT from the exciter to the receiver screens when the push-to-talk switch, or the CW key, is open. The relay rests in the receive position.

So much for the two major units of the TCS equipment. Apart from the Rx/Tx as described, there were several power supplies made for the series; these are rather rare (particularly the 230 AC mains unit) and inclined to be expensive; however, a list is appended for those who may be interested.

Table of Values

Fig. 3. TCS Tx Modulator section

C125, C126	= 4 μF	T101	= 100 ohms, push-pull to grids, mic. xformer
C127	= 0.25 μF	T102	= 6000/6000 ohms mod. xformer, 20w.
C129	= 2 μF	J101	= Mic jack
R117, R126	= 470 ohms	V106, V107	= 1625
R118	= 330 ohms		
R119	= 20,000 ohms		

(Note: Circuit element numbering is in accordance with original.)

TCS AUXILIARY EQUIPMENT

Item		*US Navy No.*
416T-3 Dynamotor	12v. DC input	21770
416T-4 Dynamotor	12v. DC input	211035
416T-4 Dynamotor	12v. DC input	21881
Motor Generator	24v. DC input	21826
Motor Generator	32v. DC input	21775
Motor Generator	115v. DC input	21776
Motor Generator	115v. AC input	21777
Motor Generator	230v. DC input	21827
Rectifier Unit	115v. AC input	20218
Rectifier Unit	230v. AC input	20242

THE TCS ON THE LF AMATEUR BANDS

The TCS equipment can be used " as is " on the three LF bands ; all that is required is a suitable power supply—the requirements will be found in the foregoing notes. The pin connections for both the transmitter and the receiver plugs are given in Fig. 4. Unless you are very lucky, the units will *not* have plugs when purchased, so they will have to be modified. The correct plugs can be obtained new from Films & Equipment, Wardour St., London (but *not* at " surplus " prices!). The types to specify are: Transmitter, Cannon SK-23c-½ ; Receiver, Cannon GK-12-23½AC.

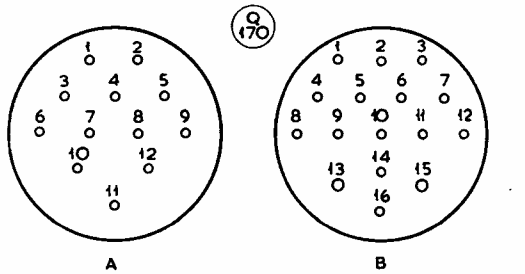


Fig. 4. Connector layout for the TCS units ; the key is given in the table.

TCS UNIT CONNECTION SEQUENCE

See Fig. 4.

(A) Rx Plug from Front	(B) Tx Plug from Front
1, Not used	2, Rx aerial
2, 225v. DC	4, Key, or send switch
3, RF screens	5, Test grid mA
4, Not used	7, To 12 via interlock
5, 12v. heaters	8, Mic. across J101
6, Earth	9, Earthed on send
7, Not used	11, HT to Rx screens
8, Joined 12	12, As 8
9, Speaker	13, 12v. AC, heaters
10, Joined 11	14, 225v. HT
11, On/Off, remote control	15, Common earth, and heaters
12, On/Off other side, joined 8	16, 12v. DC for relays (*Pins* 1, 3, 6, 10 *not used*)

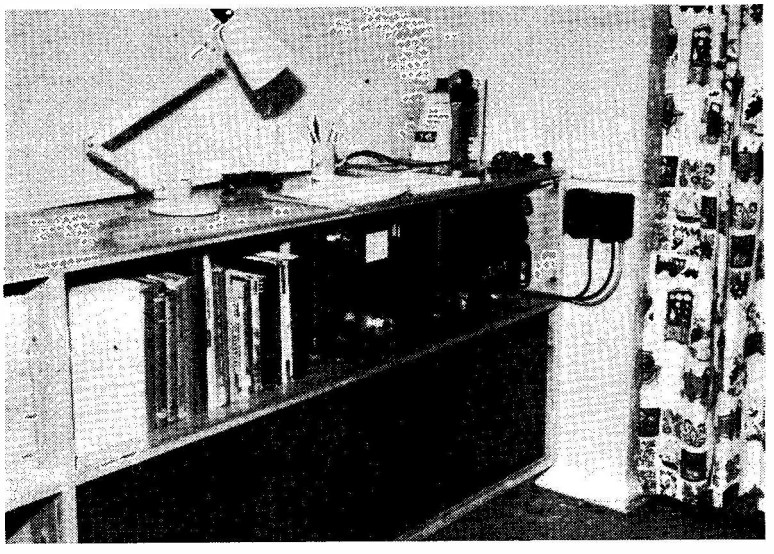
Modulation

A carbon button microphone will modulate the transmitter to about 80%, but the system is a little marginal, to say the least. A vast improvement in both the quality and depth of modulation can be achieved by the addition of a pre-amplifier. The writer removed the mic. transformer, T101, and disconnected J101 —*see* Fig. 3. R118 in this circuit was returned directly to earth. The leads from the 1625 grids, taken from tags 3 and 5 on T101, were then connected to the tip and ring of the jack J101 (this jack requires the small GPO " sleeve, tip and ring " plug). The tip and ring of the jack are insulated from earth.

An external pre-amplifier consisting of two EF37A's and a 6SN7 phase inverter was found to work very well, with ample gain, using either a ribbon or moving coil microphone.

Having disconnected J101, the push-to-talk and CW key will now have to be taken to pin 4 on the supply plug (Fig. 4b), and earthing this pin will put the transmitter on to transmit. No additional wiring is needed as this pin was originally in parallel with the mic. switch.

So much for Phone operation. CW can be worked with full " break in " (BK) if desired, but there are snags in this ; the relays are rather noisy, and if the rig is used in a living-room this can be very irritating to the other occupants. If the keying speed goes much above 15 w.p.m. the sending sounds a bit ragged, as the relays do not follow well. Careful adjustment might cure this, but after fiddling fruitlessly with these relays, the writer abandoned BK and simply keyed the cathode of the PA. As it was not intended in the interest of TVI to run more than about 40 watts



As this photograph shows, the TCS equipment makes quite a neat living-room installation. G3LOX has a BC-453 run as a " Q5'er " to improve the receiver side, as explained in his article, which gives a lot of practical information on the TCS assembly. The power supply and auxiliary audio amplifier (see Fig. 3) are in the lower cupboard. In effect, G3LOX has his whole station fitted in a book-shelf, the top of which serves as an operating table.

or so on CW, the parallel PA valve, V105, was removed and the cathode of V104 keyed. A small shorting jack was fitted next to the microphone plug on the front panel. The jack is in the PA cathode, and when Phone is required the plug is removed. (If a break-jack cannot be found, a shorted plug can be used in place of the key, or the key can be locked down.)

For Top Band the input must be reduced; the writer uses a separate low power HT supply as the most convenient solution.

The Receiver

The receiver requires no modification, with the exception of the plug. The output is about 500 ohms and will, with a suitable transformer, drive a speaker with ample gain. The sensitivity is very good; the selectivity, however, is not all it might be, but a BC-453 as a "Q5'er" takes care of this. An insulated lead is twisted round pin 4 (diode anode) of V206 (detector) and taken, well screened, to the aerial of the BC-453. (For further details of the "Q5'er" application see page 465 of the November 1956 issue of *Short Wave Magazine*.)

If an S-meter is considered essential a suitable design will be found on page 39 of March 1957 issue of the *Magazine*.

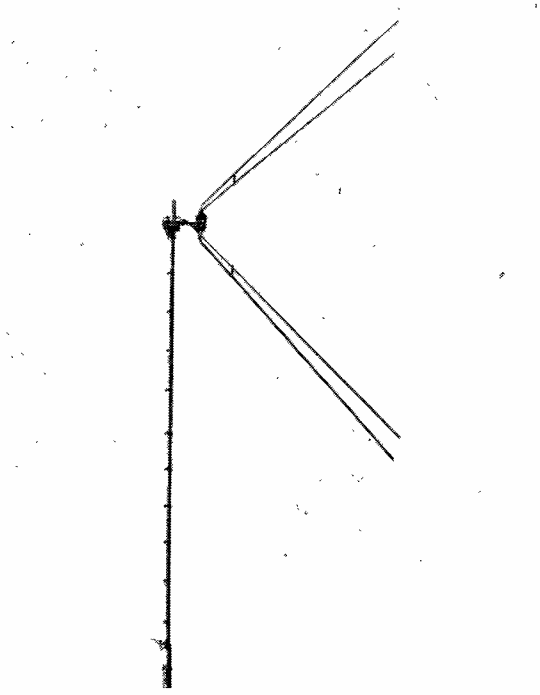
Conclusion

The TCS units offer a compact amateur station for our LF bands, with all the facilities one requires for efficient working on either phone or CW. It can be arranged as a neat living-room rig, either as an alternative to a main station, or as a starting point for a newly-licensed operator who wants to get on the air quickly.

The writer has been using TCS units for about two years and so far no TVI has been reported; however, two apparently identical transmitters may differ one from the other in this respect.

No rare DX has been raised (or sought), but many fine QSO's have been enjoyed, invariably with good reports both for the signal strength and the phone quality; CW reports have always been T9.

The construction of the units is of the highest class, and for the price of a second-hand DX receiver you can have a complete station.



The new Labgear "Spacematch" TV aerial, for Bands I, II and III. By using space impedance termination in a V-beam configuration, Labgear claim a Band III performance equivalent to a six- or seven-element array of the conventional type. The aerial is inherently broad-band and due to the frequency relationship between Bands I and II, the element lengths can be chosen to make the system half-wave on Band I and full-wave on Band II. On Band III it operates as a space impedance terminated array. A single feeder is all that is required.

STEREOPHONIC SOUND: FURTHER BBC EXPERIMENTAL TRANSMISSIONS

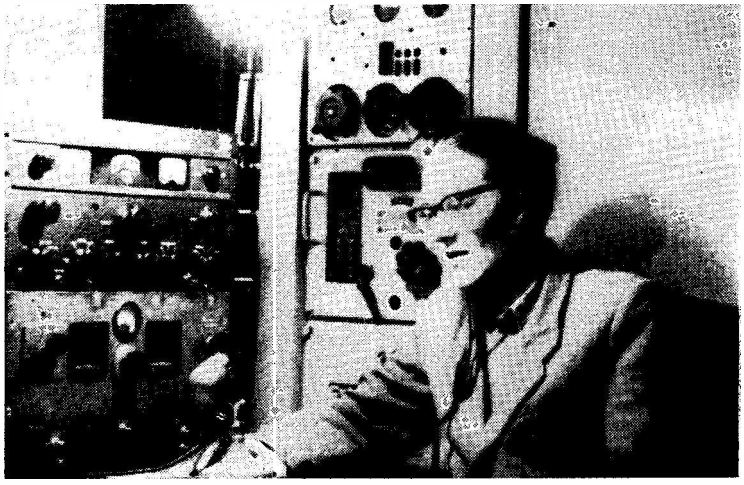
During May last, the BBC broadcast two experimental transmissions in stereophonic sound, and many listeners reported satisfactory results. In view of the success of that experiment and the widespread interest in recent developments in stereophonic recordings on tape and on disc, the BBC has decided to carry out a further series of experimental transmissions starting in October. It is likely that there will be a transmission between 11 a.m. and 12 noon every other Saturday morning. At first, recordings will be used for these transmissions, but it is intended to introduce live programmes later.

The Third Programme transmitters, both medium-wave and VHF, will be used for one channel and the BBC television sound transmitters for the other (without interrupting the Trade Test Transmission on vision). Listeners who have a television receiver and either a medium-wave or, preferably, a VHF receiver, can take part in the experiments by using one receiver for each channel. The speakers of the two receivers should be six to eight feet apart, and the listener should be roughly equidistant from each. As the television sound transmitters will correspond with the right-hand channel, the television receiver should be on the right and the sound receiver on the left.

Although these experiments require a separate transmitter and receiver for each channel, the BBC is studying methods of transmitting stereophonic programmes from a single VHF transmitter. If it is found possible to introduce such a system in the future, the necessary receiving apparatus will include twin amplifiers and loudspeakers, such as are already available for the reproduction of stereophonic tapes and discs.

DX COMMENTARY

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



UA3KBO

MOST of us feel, no doubt, that if we were given dictatorial powers we could soon put right anything that is wrong with the world, and particularly with our own hobby of Amateur Radio. The truth is that this, the most democratic of all hobbies, suffers from the very fact that it depends on so much voluntary co-operation from all concerned. Rules and regulations could do very little to improve the present state of the art, even if they were obeyed (which is unlikely) by the uncivilised minority who make life so hard for the rest.

Thus within our strictly-enforced bands we have CW bands that are not all CW, phone bands that are not all phone, shared bands that are not shared (unless you consider that a lion can "share" his cage with a couple of rabbits) and all sorts of transgressors who can't be got at because their own administrators simply couldn't care less. (Yet if an amateur should stray outside the limits, all sorts of people raise a bellow of rage, and can get something done about it quickly.)

One of the new problems coming up within our bands is the state of affairs that prevails when SSB and AM phone are sharing the same frequencies, and it is mostly this that has led VQ4ERR (Nairobi) to make some very interesting suggestions. He himself is a noted DX-chaser on phone (265 worked, and third in the DXCC Honour Roll), so he knows the problems all right. His suggestion is, in effect, a further sub-division of the 14 mc band into a CW-only section (14000-14100 kc), a foreign AM-only section (14100-14200 kc), a USA AM-only section (14200-14250 kc) and thereafter a number of sub-divisions embracing USA SSB (rag-chewers), USA SSB (DX-hunters). USA "Pacifics" only, and other innovations at the HF end such as a 10-kc "fraternisation" band for SSB/AM.

It seems an excellent scheme, apart from the obvious difficulty of ever enforcing it (democratically!) and we quote it at this early stage because it is obvious that something of the sort must come sooner or later.

Had we the dictatorial powers we referred to earlier on, we would set aside a 10-kc "Klots' Corner" wherein all the T4 things could congregate—but we can hardly expect them to do that by invitation. Meanwhile we are cogitating over the VQ4ERR scheme and would very much welcome all comments. After all, one might say that Civilisation is entirely a matter of living with self-imposed restrictions for the greater good of the greater number . . . the question is, do we want to civilise ourselves any more, or would it be a bad thing?

Along with this we have a plea from VK2BA (Balgowlah), also for the partitioning of the 14 mc band, but in terms of the CW section this time. He would like to see a large slice for USA and two smaller slices, one for the rest of the world and the other for DX-peditions and "rare ones." The USA would probably be the last to complain about having part of the CW band cleared of their own signals in order that they can work the DX more easily. Once again, such a plan has got to be democratically agreed by all concerned, which takes time and patience. If you have ever attended a Parochial Church Council meeting . . .

CALLS HEARD, WORKED and QSL'd

The Month's DX

Not terribly bright again, with conditions extremely variable and activity rather low on the whole, but picking up. The 28 mc band has not yet really come to life, though it has been wide open on occasions, while 21 mc has been brilliant on some days and almost useless on others. It's been that kind of a summer! One firmly

hopes that by the time you read these remarks, all will be well for the DX season and the rash of Contest week-ends that is about to break out.

Hard on our heels is the annual **VK/ZL Contest,** the CW event running from October 11, 1000 GMT until October 12, 1000 GMT, and the Phone section immediately after our publication date—October 4-5. Rules are as ever—well-known enough by now for further explanation to be unnecessary.

And don't forget the Phone Section of the *CQ* World Wide DX Contest, October 25, 0200 GMT to October 27, 0200 GMT —details on p. 310, August.

DX Gossip

ZL3DX was expected to arrive on *Chatham Island* around mid-September, whence he intended to operate SSB only, but promised to answer CW or AM calls. If this trip didn't come off, he proposed to catch the next boat, in about a month. . . . ZS6GV has planned to go to the *Seychelles* (VQ9) shortly, and thence to "some other exotic spot". . . . VQ8AJ/C will be on *Chagos* until the end of the year, and then possibly to *Rodrigues.*

Danny Weil operated from *St. Kitts* as VP2KF, with a beam and a kilowatt—next operations are from *Antigua* (VP2AY) . . . VK2FR is at present in hospital in Sydney, but expected to return to *Lord Howe Island* in the near future. . . . VS1FJ tells us that an expedition to *Car Nicobar* (VU5) is only awaiting the arrival of the licence, and things look quite favourable.

LA2JE/P will be on *Hope Island* (Spitzbergen) for another year. . . FK8AS awaits licence authority for a trip to *Wallis Island* (FW8). . . . A *Galapagos Islands* DX-pedition was planned to start about September 19, but may have been delayed. Operators, WØAGO, ØLUX and ØWGF, each signing HC8 with his own call letters, mostly SSB. The first batch of 3000 cards is already printed!

Two DL's have arranged to operate from *Luxembourg* during the CW week-end of the "CQ Worldwide DX Contest" (November 29-December 1). Calls will be LX1RK and LX1KA, all bands, CW only, twenty-four hours a day.

ZL1ABZ hoped to be working both phone and CW from the *Kermadecs* from September 27 onwards—14320 kc.

So much for the DX-peditions and the super-rarities. Now for the "ordinary" DX Strays. A new generator for CR1ØAA will be shipped from Hong Kong before you read this. VS5BY is reported on 14300 kc, SSB, from Brunei. . .

W3ZA/3W usually operates from 1100 to 1200 GMT, mostly on 14310 kc. . . . YS1MS and FB8BB are two new DX-ers also on SSB. . . . VS9MA works phone on 21302, 21225, 21120 and 21451 kc. . . . AC4AX is quite active, but phone only — around 1215 GMT, 14100 kc. . . I1ZCT hopes to operate during the *CQ* Phone Contest (October 25-27) from either San Marino or Monaco. . . . VR3A is temporarily off the air, having broken his leg and returned to Australia; all being well, he hopes to be back soon.

All the VR3's on Christmas Island have had their permits suspended, it seems. . . . TI9AC, ZD9AF and VPØAA were a trio of phoneys. . . . JZØHA is on 14 mc phone and CW, JZØDA on 7 and 14 mc CW, JZØPA and ØPB on 21 mc phone. . . . ZD3G (ex-VS9AG) will shortly be starting up from Bahrein. . . . KX6BT promises to work all bands, 3.5 to 28 mc, on CW this coming winter.

HS1C will be on 21 mc phone shortly. . . . FL8AC is now QRT, leaving no FL8 activity, possibly for a long time. . . . ACØAA (giving QTH as Sinkiang) sounds too good to be true, and probably is. . . Another clever one is KFØAC, giving QTH as "Witi, Tesmer Island." Some of these types certainly use their imagination, both for the call and the QTH. . . . HC4IM, reported by many 'chasers in 14 mc CW, is W6GTO.

ZE3JO is back from his 5,000-mile holiday trip, during which he operated from VQ2, 3 and 4, but

FIVE BAND DX TABLE
(POST-WAR)

Station	Points	3.5 mc	7 mc	14 mc	21 mc	28 mc	Countries
DL7AA	901	113	171	244	198	175	259
G3FXB	766	73	131	215	197	150	245
G5BZ	738	64	118	254	181	121	260
G2DC	694	78	102	230	164	140	232
G3DO	648	24	45	240	169	169	264
GW3AHN	610	16	55	188	219	231	240
G3WL	523	41	91	176	124	91	202
W6AM	514	30	58	284	86	57	284
G3ABG	495	45	83	169	112	86	193
G2YS	492	71	87	163	109	62	180
GM2DBX (Phone)	425	34	31	160	102	98	176
G6VC	394	34	51	147	94	68	169
G3JLB	367	43	50	95	89	90	163
W6AM (Phone)	363	13	32	258	39	21	258
G3INR	332	46	59	128	62	37	138
G3FPK	327	30	71	117	71	38	140
G3JZK	316	16	55	73	110	62	154
G3IGW	314	44	65	91	66	48	122
G6TC	302	17	67	127	59	32	143
MP4BBW (Phone)	276	1	5	88	117	65	141
G2BLA	272	32	50	66	69	55	110
G2YV (Phone)	270	12	27	83	95	53	138
G3LET	270	11	49	136	57	17	147
G3JJG	265	38	45	94	53	35	113
G8DI	260	25	56	73	62	44	112
G3HQX	242	15	37	74	52	64	109
G3DNR	236	10	21	87	57	61	112
G2DHV	231	21	27	126	42	15	135
VO2NA	169	13	17	85	40	14	91
W3HQO	156	3	5	28	76	24	94
G3KXT	150	8	6	41	13	82	109
G3IDG	114	11	15	29	27	32	50
G3DNF	112	6	29	38	28	11	50

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

not from VQ5 or ZD6 as originally intended. He had one or two shaky QSO's due to QRM from nearby lions!

VR3C, KX6CG and KB6BH all on 21 mc phone, 1100. . . . KC6AN (Truk) on 14 mc SSB. . . . ZK2AB on 21250 kc phone, early mornings. . . . YA1AA on 21 mc phone, using 5 watts and a broadcast receiver. . . . AC4AX (CC on 14100 CW and 14152 kc phone) runs 15 watts, 1200-1400 GMT only. . . . VP2MR (Montserrat) was W6ITH/FS7RT. (These items from SWL P. Day.)

Latest gen. on Danny Weil, direct from G2DC (who has had more than 150 contacts with VP2VB since he sailed from Poole): Having worked from St. Kitts as VP2KF from August 28 to September 4, he set up on Antigua as VP2AY on September 9, and should still be there when you read this, as he intended to stay for a month. In early October he will leave for a two months' cruise which will cover Montserrat, Dominica, St. Lucia, St. Vincent and Grenada, in that order, spending about ten days in each place. Different call letters for each one, but if you know the frequencies you can't miss him.

TOP BAND COUNTIES LADDER

(Starting Jan. 1, 1952)

Station	Confirmed	Worked
G2NJ	98	98
G3JEQ	96	96
G6VC	96	96
G3JHH	92	93
G3FNV	91	92
G2AYG	88	88
G3KEP	85	85
G2CZU	79	79
G3DO	75	75
GM3COV	68	70
G3LBQ	61	67
G2CZU (Phone)	61	62
G3KEP (Phone)	59	62
G3JSN	49	62
G3LEV (Phone)	39	47
G3LNR	36	48
GW3HFG (Phone)	30	40
G3LNO	23	41

Claims for this Table can be made in accordance with the notes on p. 256 of the July, 1958 issue.

During July, the Army Wireless Reserve Squadron was on annual training at Blacon Royal Signals Camp, Chester. The A.W.R.S. is composed almost entirely of radio amateurs, and while in Camp they run their own station on the amateur bands. Here is G8PG, a well-known contributor to "Short Wave Magazine", operating GB3AWR. Other members of A.W.R.S. are G3EJF, G3FDU and G3KLX.

Main CW frequencies are 14075 and 21075 kc; best times for U.K. stations are 1700-2000 GMT on 21 mc, 0600-0700 or 2100-2300 GMT on 14 mc. Phone mostly at the HF end, including SSB. Call at least 10 kc *low* if you want a reply.

Some CW and SSB operation came from HV1CN during mid-September, when the station was operated by a W1. Unfortunately it only lasted four days and was not publicised in time, but just the same it caused one of the biggest pile-ups in history. His operating hours were restricted, but the Faithful were there, not only waiting for him, but actually calling before he started up! Easiest way to work him seemed to be to reply on CW when he was on SSB on 14315 kc. . . . QSL to W1TYQ with stamped addressed envelope.

Ten Metres

We have actually had one or two openings to the States this month, and the band may well be wide open by the time this is in print. Certainly it is showing signs of coming to life for the season. G2DC (Ringwood) has noted evidence of the re-awakening, but his only new one was UQ2AN; others worked were CR6CK, VP7BT, PY1HQ, ZE1JV and the W's when it was open for them.

G3FPK (London, E.10), using the band for 'cross-town ragchews at 2200 GMT, has been told of the W6-7 openings he has missed! ZE2JA was very consistent on phone, 4X4's were colossal and working W's when the latter were inaudible here, and DL4's were melting his input coil. CW activity is very low, but F, PY, ZE and CX were raised for new ones. G3FPK hopes to knock up a "ZL Special" for Ten this season.

G3DNF (Wembley) has the rig on this band at last, but now has a receiver problem. However, he worked ZE1JV with no trouble. G3WL (Plymouth) also got his 30 watts to ZC4. GW3AHN (Cardiff) remarks on some notable "W" openings: on CW he worked CR6CK, and phone brought him CX, PY, SU, VQ2, VQ4 and ZS's.

GI3JIM (Belfast) worked phone with CR6CA, VQ3PBD, 4DS and 5EK, and UA9SA. [Over

Fifteen Metres

Now here we have had a real DX band again, without having to wait for openings, although those dratted commercial noises spread wider and louder every day, it seems. Fifteen is in danger of becoming the compost heap of the ether, what with parked jammers, parasitics from same, jingle-bells just flagrantly pirating the frequency and harmonics from all over everywhere.

However, through all this lot GW3AHN's phone raised FS7RT, KR6HP (Miyakojima Island), OR4VN, VK9CP, VP2LB, VR2AS and 2AZ, VS9MA, ZD7SA and ZP5CF, to say nothing of AP, HK, OA, VP9, VQ3, ZD6 and all "the usuals." CW accounted for LA2JE/P, VP2AY, VP7NA, VP8CV and 8DL, and VR2DG.

G3BHJ (Norwich) worked ET2, FE8, KR6HP, OQ5, VP2LB, VP6's, VP8DK, VQ2 and VQ4 on phone, while CW netted FA8, JA, KL7, and UA9. GI3JIM, on phone, raised CE, CR7, HC5MT, KB6BH, OQ5, VK5NE, VKØKT, VP2MR, VP6BS, VQ4DT and VR2AZ. G3DNR (Broadstairs) collected HB9, EA8, ZB2 and ZP for new ones.

G3JLB (Gravesend) only had "a few bursts" on 15 metres, but worked HI8GA, ST2AR and VK9LE, while the gotaways included FM7WU, JZØFB, FB8ZZ and VP3HAG. G3ABG (Cannock) used more CW than phone, and collected EL1P, FO8AI, ST2AR, SVØWY, VK5NO, VP2KF, VQ3HD, VQ5EK and ZE1JV. Phone accounted for CR7LU, 9K2AJ and 9K2AX.

G3FPK found the mornings poor whenever he was around, and his only new one was a CN8. He *hates* the "terrific carrier which breaks out in a rash" and makes the lowest 20 kc difficult to use, but says that anyone needing the "rare" W7's should scan the novice section.

G2DC found the band improving daily, opening earlier and closing later. Three all-time new ones were EA6AW, FB8XX and VP8DG; new for the band were VP2KF, VP2AY and LA2JE/P. Others worked were CM, CR7, HC, JA, JT1YL, KL7, LU7ZS (South Shetlands), VP7's, VK's, VS1FJ, VS6AE, VS9MA, VQ's, TI and quite a lot more.

Twenty Metres

G3IGW (Halifax) made his best catch of the month when W3ZA/3W came back to a CQ, on CW. Best one heard, otherwise, was TG9AD on CW. G6VC (Northfleet) worked a Funny signing OM5KT and said to be "near Algiers" (2258 GMT).

G3ABG, on the key, rolled in F2CB/FC, FF8's, HB1UE/FL, KL7's, KV4, KZ5, LU, PY, VP2KF, VQ3, VS1, UJ8KAA and OR4VN—a nice mixed bag. On phone he had a good three-way with 3A2BF and 3A2BN—from a CQ!

G5RV (Chelmsford) is back in the U.K. after three years around the Caribbean, and expects to be home for some months before departing again. Although he has foresworn "serious" country-chasing, he collected FB8ZZ (1600), VQ8AJC (1520) and XW8AL (1720) for three new ones, the last being on phone; he also worked several of his Latin-American friends. Those who have not received his PJ5AA or PJ5CA cards (although they were all sent off) may obtain duplicates on request.

G3FPK found a new one in FQ8AP (IGY Centre, Box 793, Bangui), who counts as Oubangui for DUF. He says there is some really good stuff on the 20-metre band from 1800 onwards; one evening he called JA8FO, and UAØKDA (Zone 19) came back. A little later he raised UAØRK in Yakutsk to clinch the deal.

G2DC has put up a new ground-plane and is surprised to find it better than either his 275ft. long wire or his beam. New ones worked were VP2KF and 2AY, SM5WN/LA/P (Svalbard); others included CO, KH6, KL7, VP7, VP9, VK's, TI's, UAØAZ and ZK1AK.

New for G3JLB were ET2KY, FP8AV, ZK1AK, VP2KF and HC4IM. GI3JIM, on phone, collected YS1MM, XE1AAP, YV6BK, HK1EQ, TI2LO, KZ5US, HP1JF and CX9CO. G6PJ (Sheffield), on CW, raised FK8AS, KR6QW, HK, TI9, TG, XE, CX, KG6 and others. Outstanding signals were noted from VQ9AS, XW8AI and VKØKC. G6PJ describes himself as a "D5" type! (*See* p. 385, September.)

One solitary contact on this band is recorded by GW3AHN—with VP2KF. G2YS (Filey) worked ZK1AK, VQ8AQ, LA2JE/P, UAØAZ and LA7BE/D.

Forty Metres

We have quite a few interesting snippets concerning *Forty* this month. For instance, G6VC had one night session and was rewarded by working HI8BE and KP4AOO, with VP3VN as a gotaway. G3WL collected ZD7SA, and G3ABG raised OY7ML.

G3LNR (Nottingham) reports for 40 metres only, on which he worked LA6CF/MM, north of OY-land and again when near TF, also a W3; heard were ZL, CM, CX and KP4. G3LNR is now "QRO" with 30 watts.

G3IGW finds the QRN is not so bad, and there's plenty of W, PY and KP4 traffic but few new prefixes. G3FPK worked LU6ZI on Deception Island; heard CX, FC, FF8, VP3VN, VQ4, UG6, ZA1KC (weak but genuine) and ZP5AY—also a Funny signing "HV4AW."

G2DC finds 40 worth checking if he is up early or late, and has worked all W districts, with outstanding signals from W6MOJ, W6YMD and W7FB; VE6SZ has also been good, and PY6 and 7 have been ten-a-penny.

G3LPS (Blackburn) worked ZL4GA, UM8KAB and a UD6; he found W's breaking through earlier than last month, and the West Coast audible in the early mornings (a W6 was working an XE at 0600). G3LPS can now claim his WAC for Forty after six months' operating on the band, mainly in the summer months. As he says, if more DX stations would come on, it would be a really good band after midnight.

G3MJL (London, W.7) didn't work much DX, although he has already raised a W1 and received the card. He has a new TVI-proof rig under way and hopes shortly to come to terms both

with his neighbours and the 7 mc band.

ZD7SA is often to be heard on 7015, also VP8BT on 7018 kc. Other quite rare DX has been worked by overseas stations, but not from G-land.

Eighty Metres

G2DC reports 3A2BM for a new one, together with the usual W's and VE's; he never listens late on the band without hearing VE1ZZ. . . . G3JLB gives the tip to watch for 4X4KK, who is on Eighty quite regularly. . . . Apart from these, the band still seems the sacred preserve of the ragchewers rather than the DX-chasers.

Top Band Topics

The first of W1BB's 160-metre bulletins is to hand, and Stew proposes to be on *every* Sunday morning, 0500-0730 GMT. He will be on 1810 kc, calling and listening for alternate five-minute periods. . . . *do not* call on his frequency, for you will not only have no chance of being heard, but will mess things up for everyone else. All reports on his signals will be welcome.

During the summer, W6KIP and ZL3RB have been running regular tests, during which W6KIP was heard well in New Zealand on practically every occasion, but ZL3RB was never heard by Alex in California. The strange thing about these tests is that W6KIP was roaring through so well that he could hear his own signals coming back (*via* ZL3RB's 14-mc phone) and yet no other W's could be heard there—not even WWV or broadcast stations!

ZL3RB logged ZL5AC from the South Pole on a sked, but neither he nor other ZL's nor W6KIP were able to get through. Yes, we are still talking of 160 metres!

K6ENL of Fair Oaks, Calif., is keen on 14 and 21 mc phone and likes YL contacts. Some of her U.K. QSL's include cards from G2LU, G3GV, G5JF, GI4NU, GI4RY, GM3AJY and GW4CX.

The W's have now lost their 1875-1900 kc segment of the band, but it was hardly usable on account of Loran. The important segment for the coming winter will of course be 1800-1825 kc, as always.

Meanwhile, the sport of county-chasing is beginning again. Many more WABC's will be claimed this winter, and we have a large number of G3M's on the band for the first time—watch their progress! G6VC still needs Perth and Sark to complete his list. . . . G3LCI has added Merioneth and Westmorland. . . . G2CZU also worked Merioneth for his last Welsh county, as well as GI3KVD (Derry) on phone; the only English counties he has not worked on phone are Westmorland and Northumberland. G2CZU, of course, collected the first all-phone WABC; several others are coming up the ladder nicely, with G3KEP on the 59 mark.

G2DC had a surprise QSO with 3A2BM (G5MP at the key), who naturally gave him a new one for the band. G3IGW has found the QRN pretty terrific, but says the best time for the GDX has often been around 2000, rather than later.

Sheepskin Department

For some months now we have been moaning about the Sheepskin racket, and the impossibility of keeping pace with all the strange new "awards" that arrive from Outer Space, or somewhere. It's interesting to note that the September issue of *QST* publishes details of *forty-eight* of these things, forty-six of which we have never even heard of before.

Meanwhile we can only shrug our shoulders and mention the Shizuoka-A Certificate (work five stations in the Shizuoka Prefecture, Japan, and send 6 IRC's to JA2JW, communications manager of Shizuoka Amateur Radio Club).

Next comes the TDV ("Worked Diploma Valencia"), for which Europeans have to work 10 stations in Valencia (5 if outside Europe and North Africa). Four IRC's for this one, to EA5EL, Box 453, Valencia. [Over

Others we hear tell of are the OC6MN Award, the P6MNA, the Conch Net Certificate, the SOS and the WASCARC. If you have the time, the IRC's and the inclination, you need spend no more on wallpaper for the rest of your life. (And if you want something really euphonious, how about the Cremona Stradivarius Award, for three I1 stations in Cremona?)

Miscellany

G3BHJ is back after his trip in the States, where he was the guest of WØFQY and enjoyed the "fabulous hospitality" of many more W's. He had some 45-m.p.h. mobile QSO's from W2ZLX/M in New York, but he was even more thrilled by 70-m.p.h. contacts effected by WØFQY/M through Missouri. G3BHJ sampled the well-known Kilowatt-QRM, and says that the 7 mc phone band tops all others for congestion. Conditions were poor on the whole, and once, when a solitary Cornish station popped up at S9 on a completely dead band, it seemed that the skip was just reaching that far.

G6VC had personal visits from ex-ZD3G (now an MP4), and VP9CD and his XYL. In passing he wants to know how you get cards from UH8KAA, UI8AG and UJ8AF, short of going to fetch them?

G3ISX mentions that G3FJU, until recently 9K2AQ, is now in Tripoli awaiting a 5A call. All 9K2AQ cards have been dealt with, and other arrivals will be answered as received—he worked 105 countries in less than four months. G3FJU himself has been QRT for twelve months now, and the character using the call and giving his name as Bill and QTH Rugby is definitely no good!

G3FPK fears that his possible trip to 3A2BT is now off, as he can't find anyone free to accompany him, and doesn't intend to go alone.

G3JZK was operating as G3JZK/YU2JH during August — no formalities were necessary and he could have acquired a YU call easily. He thought conditions out there were worse than in the U.K., with the HF bands dead for much of the time, but cards arriving from ZC5AL, DU7SV, UAØLA and UF6 cheered him up somewhat.

News from Overseas

VS1FW (Kranji) tells us that conditions have not been too good. He came on the air in June with a home-brewed 35-watter, a long wire and a CR-100, using CW only, and has now worked 61 countries on 28-21-14 mc. Best of late were FB8ZZ, VQ8AJC, KC6JC, ZC3AC, FO8AT on 14 mc; YN1AA, FB8XX, OR4VN on 21 mc; and CR9AI and VK2HW on 28 mc. VS1FW also reports that VS9MA is being operated by 4S7DT, who hails from Burnley, and that W3ZA/3W is in Viet-Nam and "cleared" by the FCC for working USA, although his permit may not be renewed when it expires at the end of the month.

W3HQO (Philadelphia), whose home town is Kidderminster, is now on SSB on 14 and 21 mc and would like some Midland QSO's in that mode. The only one up to date has been G3LFF (Droitwich).

W6AM (Long Beach) shoots up to 284 worked (258 on phone) with the help of some more VP2's. W8DLZ (Grand Rapids) says he's had wonderful luck this summer, what with SM8AQT, VK9VM, VP2LO, YVØAB, VK2AYY/LH, VP2VB, ZK1AK, FU8AG and FO8AT (all 14 mc) and UF6KAC and VS1BB/VS9 on 21 mc.

ON4QX (Antwerp) is quite hot under the collar about country-counting and says "It is quite foolish that an American, on an island, working the DX is approved immediately as DXCC, whilst by us an OQØ is simply browbeaten." OQØ, he continues, has postage stamps, administration, examinations and control *of its own*—yet it is airily grouped with OQ5! ON4QX collected the fifth WAZ in Belgium, and now holds 17 awards; he recently worked phone for the first time and made WAC in two hours. His total is 185—all 14 mc CW.

OY7ML (Thorshavn) writes that the only activity outside that town is from OY1R (Klakksvik), who is on 28-21-14 mc CW and QRP phone. OY2H in Thorshavn runs 18 watts, CW only; OY2Z is their QRO phone specialist and "well-known everywhere." OY5S is also phone-only, mostly 14 mc, but sometimes 21 mc as well. OY7ML himself runs 75 watts, mainly on CW, and his favourite band is 20 metres.

G3GZN writes from Gibraltar and tells us that ZB2U is the second in command of the Europa Lighthouse, and works mainly 14 mc; at present QRT for a rebuild. A possibility is a small Top Band rig for experimental beaming into the U.K. G3GZN himself is returning after four years on the Rock, where he has never been able to get on the air owing to power troubles.

DL7AA (Berlin), staking a new claim for the Five-Band with a terrific points total of 901, mentions, among others, ZD7SA on 7, 14 and 21 mc, and now has 253 countries confirmed; for phone-only Rudi can claim 142C for 172W. DL7AA keeps his lead position by real multi-band operation—his latest claim shows movements in four out of the five bands. Yet his total of different countries worked is not by any means the highest.

SWL Recordings

G. P. Watts (Norwich) now has 248 countries confirmed, in 40 Zones, thanks to QSL's from ZM6AS, YVØAB, VQ8AJC and VS1BB/VS9 . . . L. D. Strange (Sutton Coldfield) remarks on a full-scale opening of Ten to the USA on September 1; on the same band he logged CR6CK (CW) for his 189th country. Best on Fifteen were AP2L, VP8DL and VR2AZ on phone, with ZD2GWS on CW. On Forty he heard EA6AW, K6EWL and UD6FB.

P. Day (Sheffield) had some fun during the Aurora display on September 4, with 21 mc signals coming in at S9 plus, but unreadable owing to flutter. Airmail QSL's from KB6BH and VS9MA cheered him up, and he logged CR7AD and FB8ZZ (Ten phone), KB6BH, KW6CA, VS9MA, VR2's and FS7RT/PJ2MC (Fifteen phone), KC4USH (Twenty phone), and PY4AX, VE1ZZ and UC2AA on Eighty CW, plus W1LLE on

phone.

J. W. Bluff (Harrow) mentions a few rare ones, such as VR1A (Twenty CW), AC4A (same but doubtful!), AC4AX (Twenty phone), YA1AA (Fifteen). He also heard CN8FV on Forty phone, and quite a good bunch on Ten which included ZD2WW, ZD6RM, ZS3B, CR6's, CR7's FB8ZZ, VU2PS and VK's.

J. L. Marshall (Leeds) preferred Fifteen, which gave him FB8XX, OQ5IE, SVØWT, VP2MR, VP6GD, VQ3KQ and VS6CW. Twenty provided only MP4BBT.

S. R. Smith (Crewe) logged ZS8I on Fifteen, HKØAI on Twenty, and CR6's and 7's on Ten—all phone. VQ8AQ was heard on Twenty CW (1800) . . . R. E. Pulling (Liverpool) found ZD1USA, KR6HP, 9K2AJ and 9K2AZ on Fifteen phone, and VQ4ERR, 4X4 and LU on Ten . . . Does anyone know anything of "T8TK"? Several SWL's query this one, heard on Twenty.

C. N. Rafarel (Birmingham) found FM7WU, HH2FC, LUØAC and XE2BV on Ten; KR6HP, VK9LE, FB8ZZ, VR2AS and FE8AP on Fifteen; FO8AC, VP5EI, KM6BI and 3A2BF on Twenty—all phone . . . M. J. Prestidge (Birmingham) reports a whole gaggle of KC4's on Twenty SSB, also W3ZA/3W, MP4BBW, KR6USA, 6JR and 6DS, HZ1AB and the VQ4's and 5's. CW fetched in VQ8AQ, OY7ML, ZK1AK, KS6AG and "ACØAA"! KB6BM and VP2LB were new on Fifteen.

R. Baines (Gillingham) reports FO8AT, CX9CO and lots of VK/ZL, W6 and W7 in the mornings on Twenty; VK1TV, OQ5IH, OD5A and other VK's on Fifteen; and VQ4, 4X4, ZC4, CR6 and AP2AF on Ten. SWL Stewart (New Barnet) is a 14-year-old who has been listening for one week and logged CO2JL and ZP5JX on Ten; 9K2, 9G1, OQ5 and OA on Fifteen; TI's, ET3FH and HK4DP on Twenty . . . G. I. Knight (Aberdeen) is one year older, and from his long list we pick VE3BQL/SU, VR2AZ, XW8AI and 8DL on Twenty; JZØPB, OR4OR, TG7JD, VQ9GU, VS9MA and HL9KT on Fifteen. The two XW8's were suspect, being very strong at 2200 in the American phone band.

The equipment at LU1HB, Rio Ceballos, includes an Eddystone 888A receiver and a home-built transmitter running a pair of 807's in the PA. His aerial for 21 mc is a 3-element beam.

Note for SWL's

This is important: Now that the DX is becoming so plentiful on all bands, our short-wave listener correspondents are asked to note that we cannot possibly find space for reports that amount only to long lists of call-signs heard. The SWL's can be extremely useful to all readers by making special note of anything *unusual* for any band, with time and frequency; by passing on items of DX gossip heard on the bands, such as details of new expeditions being planned, and so on; and for information about any new stations that suddenly appear. For such purposes we are only too glad to give them space, and credit, but for routine DX calls-heard, run-of-the-mill stuff, we shall have no use at all. Thanks, SWL's, and your co-operation will be appreciated.

Late Flashes

OK1MB has written to SWL Prestidge to the effect that the OK7ZH/OK7HZ expedition will be in Albania for the first week in December, with its two KWM-1's and two trucks, using SSB on 14300 and 21400 kc, and also working CW. The rigs will be tested under mobile conditions during October and November, signing OK7ZH/M and OK7HZ/M.

VP2DA, 2DJ, 2GV and 2LB all active on 21 mc AM. . . . FK8AS all ready for *Wallis Island*, but can't go until he gets the licence. . . . VK2FR out of hospital and back on *Lord Howe Island*. . . . The HC8 (*Galapagos*) expedition was due to leave on September 22, and should be in full swing by the time you read this. . . AC4AX now has two frequencies, 14160 and 14098 kc (also quoted as 14152 and 14100!)

ZL3DX is already on *Chatham*

Island (he arrived September 6) and works on 14315 kc SSB as ZL3DA; during CW periods he remains on SSB but monitors 14050-14100 kc for CW calls; he peaks around 0800 GMT. . . . ZS6IF/7, with ZS6APQ as second op., worked about 800 stations during a five-day stay in Swaziland. . . "TI9AC" actually sent cards to the stations he worked, but they were signed "Phineas X. Phoney," told the recipient he had been taken in, and suggested he check his beam bearings. . . The cheek of it! . . . KFØAC is another one—F for Foney. . . FU8AD, 8AE and 8AF will all be operating before long.

ZL3VB, who *lives* on Chatham Island, will be on 14040 kc CW shortly . . . MP4DAA is said to be on *Das Island*, in the Persian Gulf. . . W4HBY/KS4 is often on 7 mc, only working 14 occasionally. . . . VS1GL/VU5 may possibly be on by the time you read this (or they may even have been and gone).

Acknowledgments, as ever, to the *DX Bulletin* (W4KVX), the West Gulf *DX Club Bulletin* and to many of our correspondents, including several of the SWL's, who pass on all the gossip and rumours that they hear.

And on a purely personal note, your commentator completed 12 years of writing *DX Commentary* with the last issue—so now we have embarked on our thirteenth year with the column! Thanks for all the support and encouragement, without which this feature would be thin indeed.

So that is it for this month, and you have a little longer this time before you need sort out your current items, as the deadline for November is **Friday, October 17, first post.** We look forward to a bumper crop of DX news, and are pretty confident that conditions will be well on the up-swing by the time to write again. Everything, as usual, to "DX Commentary," SHORT WAVE MAGAZINE, 55 Victoria Street, London, S.W.1. Please keep the call-signs out of the text as far as possible, and list the DX worked, on each band, at the end of your letters. SWL's please note the special appeal to them, a few paragraphs back. So, for now, Good Hunting and 73.

THE MAGAZINE CLUB CONTEST — MCC

As announced on p.441 of this issue, the Thirteenth Annual Top Band Club Transmitting Contest —known as the "Magazine Club Contest," or MCC —takes place again this November. It is a CW-only event, open to all Clubs or any club group, and is a fast-and-furious affair lasting for twelve hours spread over two week-ends. Non-club operators who enjoy CW working are specially invited to be on for the Contest, as they can give the Clubs those vital single-point contacts which usually decide the issue.

AMENDMENTS AND CORRECTIONS

In the article entitled "Amateur Station Oscilloscope" in the April 1958 issue, the rectifier units specified for Fig.5 on p.69 should have been Brimar K3/40. And in G3CGQ's article in the September issue, on the "Two-Metre Table Topper," condenser C25 in the circuit on p.347 ought to have been shown as a split stator; it is so described in the table of values. In the circuit of Fig. 3 on p.348, there should be a connection between the phone-tag of S1B and the centre tap of the mains transformer. The container finally used was *not* an AR88-type, but a "well ventilated steel cabinet 18 ins. x 13 ins. x 7½ ins." as stated on p.353.

"VERY SAD STORY" — EVEN HAPPIER SEQUEL

Going back to those items on p.357 of the September 1956 and p.371 of the September 1957 issues of SHORT WAVE MAGAZINE, we are happy to be able to report that the reader in question, having recently passed his Morse Test, is now on the air with a new G3 callsign, which appears in "New QTH's" in the current issue. We note this because it is a triumph of perseverance, as our reader, who is not-so-young, took the R.A.E. *twelve* times before he secured a pass; at his age, the Morse Test also was not at all easy for him. However, all is now well, and much credit for this success is due to G3FRW (Warsop), who did the coaching for both examinations.

"GD3HIK" NOT IN I.o.M.

An extraordinary case of piracy is reported from the North of England. It seems that a duly-licensed G3 in the Lancashire area has adopted the callsign "GD3HIK," and has even had QSL cards printed for this station, purporting to be in the Isle of Man! He is said to use an assumed voice, and even to have QSO's with himself, to make it all seem real. Naturally, the perpetrator of this foolish deception having now been identified, the matter is in the hands of the Post Office. "GD3HIK" has been cutting his capers on Top Band, to the great annoyance of other Lancashire stations on 160 metres as, apart from this callsign nonsense, he over-modulates heavily, sprouting whiskers all through the band, and is suspected of using excessive power.

AMATEUR RADIO EXHIBITION

For this Exhibition, to take place during November 26-29 at the Royal Horticultural Old Hall, Vincent Square, London, S.W.1, some 16 manufacturers and suppliers of equipment in the Amateur Radio field have already taken stand space, and in addition there will be a number of exhibitors representative of publishing interests, the Services, and specialised amateur activity. The total number of stands so far allocated is 28. Enquiries respecting stand space and the Exhibition generally should be made to: P. A. Thorogood, 35 Gibbs Green, Edgware, Middlesex, who is manager and promoter. At last year's Exhibition, more than 7,000 visitors passed through the turnstiles.

SSB Topics

IDEAS AND CIRCUITS FOR T-R SWITCHING — DX NOTES AND SSB CONTEST RESULTS

Conducted by J. C. MILLER, DL4SV/W9NTV

This month, "SSB Topics" appears with a new hand at the helm. The reason is that, with his extending business responsibilities and commitments, G6LX (who is now DJØBM) has found it increasingly difficult to get sufficient time both to run the feature and to keep in touch, on the air, with SSB activity. He has been of material assistance to us in finding his own successor, and we are now able to introduce DL4SV—an active and very experienced Sideband operator of many years' standing—as the new contributor.

In welcoming Jim Miller, readers will, with us, also wish to thank Ron Glaisher for the very able manner in which he has conducted "SSB Topics" for the last two years. During this period, his contributions have done much to extend SSB activity and interest, not only on the European scene, but over much of the rest of the world as well.—Editor.

IT was just ten years ago this month—October 15, 1948, to be exact—when the writer first called CQ, using the newly-constructed single-sideband exciter and old Class-C amplifier converted for linear operation. The carrier had been carefully balanced-out and the exciter adjusted for maximum suppression of the lower sideband. How strange it seemed to see the RF amplifier plate current meter swing upward with speech, just the same as on the now unused Class-B modulator meter. The amateur publications described the system as "single sideband suppressed carrier," or "SSSC"—and it was that lack of carrier that was the cause of the trouble! QSO's were few and far between during those early days, until one learned the trick of carrier insertion. By returning the carrier to its proper level, it was possible to explain to the uninitiated the prescribed method of receiver tuning and adjustment for proper demodulation of the strange signals, while many others listened and found, to their amazement, that the "quack-quack" stuff *could* be copied on a normal receiver. Then came the first two-way single sideband QSO. This was an experience which will long be remembered! The superiority of SSB over double-sideband AM in its ability to get through under the most difficult conditions, and the tremendous effectiveness of QRP, immediately became apparent.

And what has happened to SSB in the last ten years, this "experimenter's technique" which was believed to be too complex in design and much too difficult to receive to be accepted by the average amateur? Admittedly, a more difficult technique than other forms of phone, the fact that SSB's inherent advantages have continued to sell themselves to an ever-increasing number of amateurs is obvious. On-the-air experience with SSB transmitting and receiving equipment has shown that SSB transmissions are the most QRM-proof phone signals, as well as the least troublesome in creating QRM, that are known. After operating under widely varying conditions, one never ceases to be amazed at how well SSB always seems to be heard.

Many have found a renewed interest in Amateur Radio through SSB. The usual newcomer's reaction is "This is the most thrilling experience since my first QSO!" And, with a smile of satisfaction, your new conductor greets the newcomer with a hearty welcome to the ranks of Sideband, realising that the long period of missionary work is completed. SSB now speaks for itself.

The T-R Switch

The electronic "T-R" (transmit-receive) switch is a subject of interest frequently heard discussed by SSB operators. While many amateurs are now successfully using a T-R switch of some kind, it has recently become apparent, through queries received by letter and during on-the-air QSO's, that the newcomer to SSB is frustrated by a lack of readily available information on the subject. In this month's technical discussion, "SSB Topics" will describe the purpose, design and application of some of the more popular circuits currently in use.

It is well known that most of the properties possessed by an antenna as a radiator also apply when it is used for reception. The use of a transmitting antenna to provide optimum performance for reception is made possible by this reciprocal behaviour. Amateurs have long used manual and electrical switching systems, such as knife switches or antenna relays, for changing the antenna over from the transmitter to the receiver.

The SSB operator soon learns that voice-controlled break-in operation has many advantages over the manual switching arrangements which are usually

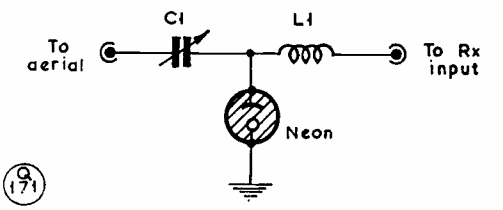


Fig. 1. A basic T-R (automatic send-receive) switch, using a series-resonant circuit and neon bulb. C1 is 50 μμF, and L1 is of 28g. on a ¾-in. diameter former, as follows: For 3.8 mc, 90 turns; for 7 mc, 45 turns; for 14 mc, 27 turns. The action of the circuit is explained in the text; it is applicable to any amateur Tx/Rx change-over situation.

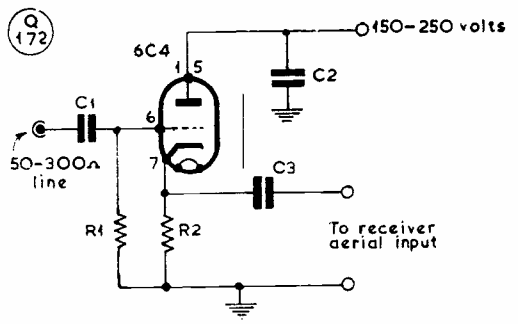


Fig. 2. A cathode-follower T-R switch. Resistors are 1-watt non-inductive, and the input and output circuits should be screened to prevent feed-through coupling. Values are: C1, 50 μμF, 500v.; C2, .005-.01 μF; C3, .01 μF; R1, 1 megohm; and R2, 500 ohms.

associated with the AM type of operation. With the installation of a voice-controlled system, the need for rapid and frequent antenna change-over has created a requirement for an improved antenna switching technique which should automatically switch the antenna from transmitter to receiver without noisy moving parts, provide an instantaneous shorting path to protect the receiver input circuit during transmission and be positive in its switching action.

In recent years some of the engineering features of radar antenna switching have been adapted and modified to produce practical and inexpensive automatic switches for the amateur. The T-R switches described in the following notes are electronic devices designed to permit the use of one antenna for transmitting and receiving in true break-in operation, as can be achieved with voice-controlled SSB or CW break-in. The inherent delay limitations and other undesirable characteristics usually associated with electro-mechanical switches are eliminated through *full electronic operation.* Some of these designs are surprisingly simple, and all may be easily constructed in the amateur workshop and put into operation with the minimum of difficulty.

Self-Powered Valveless T-R Switch

A compact, inexpensive basic T-R switch requiring neither valve nor external power is shown in Fig. 1. This simple device provides all of the functions of a change-over relay, without affecting the impedance of the antenna transmission line when the transmitter is operating. In this circuit the transmitter is connected to the antenna at all times and with the final amplifier biased beyond cut-off, there will be no effect on the receiver during periods of reception. The series-resonant circuit, L1-C1, represents a short circuit connecting the transmission line to the receiver. When the transmitter operates, the RF voltage from the line is coupled to the neon bulb, which in turn lights when its ignition voltage is exceeded. The voltage regulating properties of the gas-filled neon bulb limit this voltage to about 50 to 60 volts maximum, at which point ignition occurs. If the bulb were not present, the peak voltage would damage the receiver. Since the receiver coupling condenser is very small in value, the detuning of the transmitter due to the action of the neon bulb is negligible.

The resonant circuit, L1-C1, must be low-C for the voltage across the neon bulb to be high enough to fire the bulb as soon as possible. This circuit is sufficiently broad to cover a phone band without re-tuning and should be set up for the maximum received signal. The neon bulb must *not* have a series resistor in its base. If there is any question regarding this point, the base should be carefully removed and the bulb examined. (Boiling water will usually serve to soften the cement holding the metal base to the glass bulb.) A ¼-watt neon will be adequate for transmitter powers of up to 75 watts. A rating of 1 to 2 watts must be used for higher powers.

It is suggested that you make sure that the final amplifier is really cut off, as shot-effect noise will be coupled into the receiver if any plate current flows during the transmitter idle time. It should be noted that this circuit does not provide gain—in fact, there will be an insertion loss increasing with frequency. However, the writer used this unit for several years on eighty metres with entire satisfaction. In some cases it may be necessary completely to screen the T-R circuit to prevent possible radiation of harmonics producing TVI.

Cathode-Follower T-R Switch

A simple design using a single valve in a cathode-follower circuit provides a high degree of protection for the receiver, requires no circuit adjustments and

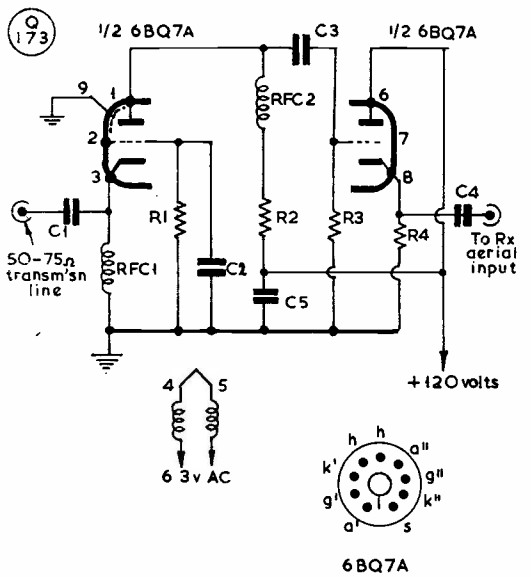


Fig. 3. A much more refined type of T-R switch, using a twin-triode. Values are: C1, 500 μμF; C2, C4, .01 μF; C3, C5, .001 μF; R1, 1 megohm; R2, 1000 ohms; R3, 50,000 ohms; R4, 100 ohms; RFC1, 2.5 mH; RFC2, 21 μH (10-metre) RF choke; Htr.4/5, bi-filar wound. All resistors are ½-watt non-inductive. RFC2 is a single-layer VHF-type RF choke, and is not critical; the special bi-filar choke, in the heater leads, is explained in the text.

produces comparatively little signal attenuation. The circuit shown in Fig. 2 consists of a simple resistance-capacitance coupled cathode-follower "preamplifier," which may be assembled in a small box and attached directly to the antenna-ground terminals of the receiver.

The theory in using a cathode-follower is based on its inherent low output-impedance characteristics, which provide a reasonably close match to the average receiver antenna input-impedance. Tuning of the T-R switch output is therefore not required. As the input impedance of the T-R circuit is high, the valve will absorb minimum RF power during transmission, with negligible effect on the transmission line. The high-resistance grid-leak prevents any loading on the line, even when the valve draws grid current. The 6C4 anode input varies from 2·5 watts, when the transmitter is idle, to as much as 1 watt with 200 volts of RF applied to its grid. It is impossible to develop sufficient power to result in damage to the receiver under these conditions. The voltage breakdown rating of the 50 $\mu\mu$F condenser, C1, and the voltage that may safely be applied between the grid and cathode of the 6C4 are the factors that limit the RF voltage which the circuit can handle.

The time constant of the 50 $\mu\mu$F coupling condenser with the 1-megohm grid-leak R1 is sufficiently short to provide instantaneous recovery. The lead between the T-R valve and the receiver antenna terminals should be as short as possible and screened to prevent the possibility of stray pick-up.

The insertion loss averages about 4 dB throughout the 3 to 30 mc range, which can be tolerated when compared with the overall increase in gain and signal-to-noise ratio afforded through the use of the transmitting antenna.

Twin-Triode Valve T-R Switch

A broad-band electronic switch providing fully automatic and instantaneous switching from 3·5 to 30 mc, with the additional feature of no attenuation to received signals, has been in continual use at DL4SV during the last three years.

As indicated in Fig. 3, this T-R switch utilises only one valve to serve two functions. The original

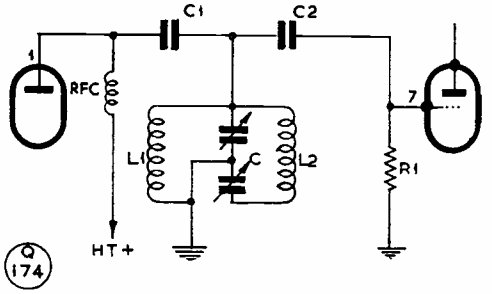


Fig. 4. A modification of the twin-triode T-R switch which will improve the gain and add selectivity to the original circuit. Condenser C is approximately 400 $\mu\mu$F per section, and can be a split-stator receiving type. C1 is 150 $\mu\mu$F; C2, .001 μF; R1, 50,000 ohms; RFC, 21 μH, as in Fig. 3; L1, 19 turns 18g. on 1-in. diam. former, spaced to 5/8-in.; L2, 23 turns 16g. on ½-in. diam. former spaced out to 1½-ins. length.

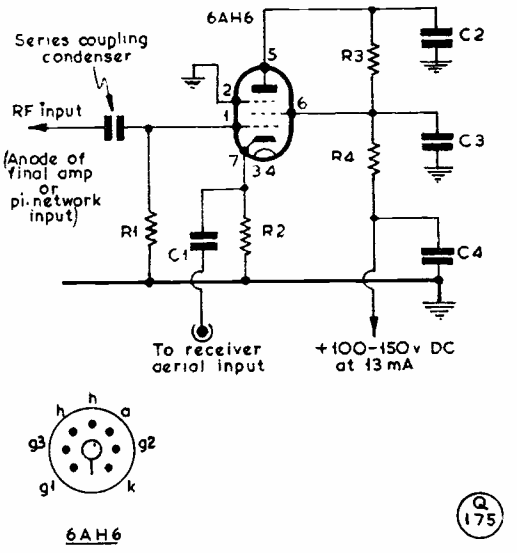


Fig. 5. A transmitter tank T-R switch. Such a unit should be mounted in a screened box, with the valve also screened; all leads to the receiver and external power source must be fully screened, too. Values are: C1, C2, C4, .01 μF; C3, .001 μF; R1, 1.2 megohms; R2, 220 ohms; R3, 1000 ohms; and R4, 270 ohms. Resistors can be all ½-watt non-inductive, and the condensers the disc ceramic type.

unit used a type 6BQ7A; however, a 6BQ7, 6BK7, 6BK7A, 6BZ7, ECC-85, PCC-85 or other similar VHF twin triode, designed for the popular "cascode" RF circuit application, will perform with equal or improved effectiveness.

The first triode section is used as a broad-band grounded-grid RF amplifier during reception, and as a self-biasing cut-off stage during transmission. The DC voltage drop across the 2·5-m. RF choke provides the operating bias for this triode under receiving conditions. When RF power from the transmitter arrives at the cathode, the grid develops a high bias voltage across the 500,000-ohm grid resistor, effectively cutting off the valve during transmission periods. This, of course, results in essentially non-conductive operation.

The second triode section functions as a conventional cathode-follower, to provide broad-band impedance matching to the receiver input, similar to the previously described "Cathode-Follower T-R Switch." This impedance can be from 50 to 300 ohms with no apparent loss in efficiency.

The bi-filar RF choke used in the heater circuit reduces the heater-to-cathode capacity at the first triode. It is made by winding two parallel wires on a ½-inch diameter form, approximately 1½ inches in length. The wires may be No. 26g. solid copper enamel covered. However, neither the wire size nor dimensions of the choke are critical. The form can be of hard wood, fibre or other available insulating material, with the wires anchored through small holes at the end of the form.

It is suggested that the input cathode be screened

from the other circuits to prevent feed-through, and that the unit be installed in a metal box to prevent possible TVI. The valve should be tested to assure full rated emission from both triode sections, as several new valves have been found not meeting this minimum requirement, which resulted in degraded switch performance.

The receiving gain has been measured at between 7 dB on 3·5 mc to approximately 1-2 dB on 30 mc. The actual usable bandwidth is approximately 2 to 45 mc.

This T-R circuit has been duplicated by a number of SSB amateurs, who have reported satisfactory operation on 80, 20, 15 and 10 metres.

Improving the Twin-Triode T-R Switch

After several years of operation, the Twin-Triode T-R proved to be an indispensable operating convenience. However, it was believed that an additional increase in gain would at times be helpful. Operating experience proved that the broad-band circuit did not provide sufficient discrimination against strong "out-of-band" spurious signals, which would occasionally prove troublesome under good propagation conditions. A modification to the original circuit appeared desirable.

The simple addition of a multiband-tuned tank circuit, as shown in Fig. 4, added to the first triode anode circuit proved worth the effort. This permitted tuning of the grounded-grid amplifier for maximum gain and provided the desired selectivity.

In operation, a station is tuned-in on the receiver and the T-R tuning condenser peaked for maximum signal. The circuit permits continuous tuning, without bandswitching, throughout the 10- to 160-metre range. On most bands, if the tuning control is peaked for the middle of the band, retuning will not be required over the entire band.

Transmitter Tank T-R Switch

The previous circuits were designed to be installed in the transmission line between the transmitter and antenna or antenna coupler. A novel method of T-R application was originally described in the June 1957 *QST*, by W3DM, where the T-R switch is considered to be a basic part of the transmitter.

The idea of this circuit is based on the fact that received signals coming from the antenna appear at the anode of the transmitter output valves as a stepped-up voltage. The selectivity of the normal pi-network anode tank circuit also provides discrimination against out-of-band signals, when one considers the transmitter output circuit operated in reverse to be an efficient input circuit for reception.

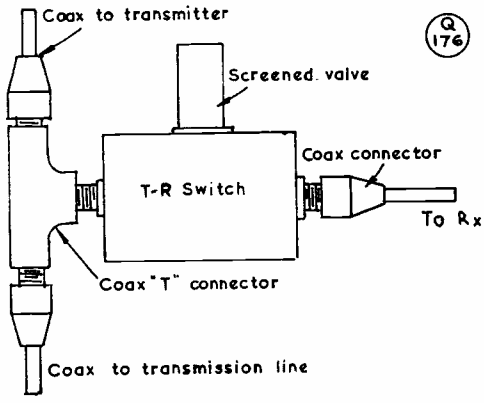


Fig. 6. Suggested constructional layout for the T-R switch shown in Fig. 5. The unit is fully screened and all RF lines are run in coaxial cable. The transmitter output is in effect connected through the T-R switch by means of the T-connector, making for short and direct RF leads.

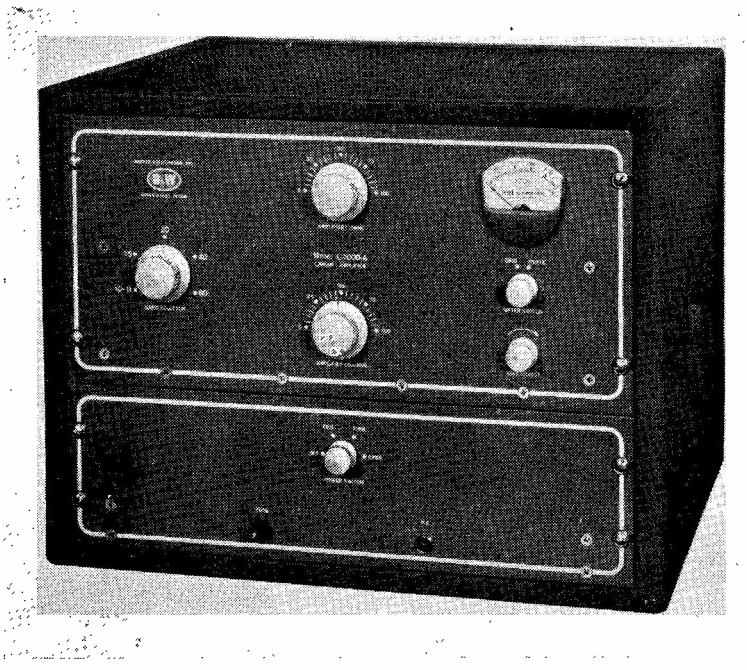
The choice of a 6AH6-type valve met the requirements for good grid-to-anode shielding, high mutual conductance, and the most important factor — the ability to withstand a high grid-to-cathode voltage. The 6AH6 proved capable of withstanding peak RF voltages of 250 volts without showing signs of breakdown.

The problem of how to reduce the high voltage applied to the grid of the T-R valve during transmission was neatly solved by means of a simple capacitive voltage divider, which stepped the input voltage down to a safe value.

G3AAE when signing GC3AAE on the SSB expedition to Alderney, Channel Islands, during the latter part of May this year. With G3BQR, G3IFB and G3JUL to assist, GC3AAE was kept on the air 24 hours a day for a fortnight, using a Collins KWM-1 transceiver with 150w. input, the aerial being a G8KW multi-band system. Between them, the four operators made more than 2,000 contacts in 112 countries on the 14-21 mc bands.

The original circuit incorporated a broad-band output transformer in the valve anode circuit, which would be extremely difficult to duplicate. The circuit shown in Fig. 5 is a modification designed to eliminate the need for this transformer, yet retain all of the features in the original switch. The valve is operated as a cathode-follower to obtain low-impedance output for coupling to the receiver. Of course, the gain in such a circuit is less than unity. However, the advantage of using the extra tuned circuit (transmitter output circuit) ahead of the receiver outweighs this loss.

The switch should be mounted in a metal box with an insulated feed-through terminal provided for connection to the anode tank voltage divider. Power leads must be screened and the T-R switch should be mounted as close to the transmitter tank as is practicable to minimise stray pick-up. The coax cable feeding the receiver should have its shield grounded to the transmitter cabinet at the point of exit.



General appearance of the Barker-Williamson kilowatt linear amplifier, type L-1000, the "insides" of which were shown on page 305, August issue. The band switch is at the left, selecting heavily wound tank coils in a ceramic mounting assembly; the PA tuning and loading capacities are at centre, in line with the operating switch; and the bias control potentiometer is the lower of the two knobs on the right; above the latter is the meter selector switch for reading either grid or plate current in the PA stage.

The T-R switch input capacitance and a series condenser for connection to the anode tank make up the required capacitive divider. The value of series condenser may be calculated from the following formula:

$$C\ (\mu\mu F) = \frac{5000}{\text{DC anode v.}}$$

This is a conservative value suitable for use in a linear amplifier or CW power amplifier. The condenser must be capable of withstanding the tank voltage and should be of a low-loss ceramic or mica type. For voltages exceeding 800, a suitable condenser may be readily fabricated from RG-8/U coax cable, which has a capacitance of 30 $\mu\mu$F per foot. Just measure off the required capacitance by the inch! If you cannot get RG-8/U, or coax of similar capacity, another type of coax will do, provided it will stand the voltage and you know, or can measure, its capacity. The treatment for arriving at the required length is as before.

As this circuit presents a high-impedance for low frequencies, the final tank circuit should be at DC earth potential to eliminate cross-talk at power-mains frequencies. The pi-network tank circuit very conveniently meets this requirement.

As the received signal applied to this T-R is multiplied by the tank circuit gain and then diminished by the capacitive voltage divider, a greater received signal will result with low-power transmitters than with high-power ones. This result is most favourable, as 15 to 20 dB *receiver input gain* may be realised over a direct antenna connection, when using a transmitter of 150 watts or less. This is one time where the U.K. power limit produces a bonus!

This T-R switch also solves a possible TVI problem found in some circuits, as the transmitter output circuit should be designed to eliminate or filter-out harmonic radiation.

A Few Suggestions

In certain installations the transmitter linear amplifier will generate noise in the receiver when using a T-R switch. This is usually apparent when the stage draws anode current under standby conditions — the final valve can then operate as a noise generator, closely coupled to the receiver through the T-R. This most annoying condition can generally be eliminated by taking steps to:

(1) Apply fixed bias to the final valve(s) to reduce the static current to its minimum operating value. (This can often be applied through spare contacts on the voice-control relay.)

(2) Substitute a different amplifier valve. (Some valves are born to be noise generators.)

(3) Remove all amplifier parasitics. (This should have been done before! Use parasitic chokes in the anode and grid circuits and check neutralisation.)

If the noise appears to be generated in the

power supply, some effective measures are:

(A) By-pass the anode of each rectifier to ground with a 500 to 1000 $\mu\mu$F high-voltage ceramic or mica condenser. (This will cut-down on mercury hash.)

(B) Instal hash filters in the high-voltage power supply.

(C) Replace mercury vapor rectifiers with cold-cathode, high-vacuum or Xenon-gas filled rectifiers.

(D) Screen the high-voltage rectifiers. (Remember to allow for ventilation.)

The T-R switches shown in Figs 1, 2 and 3 may be incorporated in transmission lines of from 50 to 300 ohms impedance. It is recommended that low-impedance coaxial cable be used where possible to prevent unnecessary radiation. The maximum standing wave ratio should at no time be greater than 2:1 to prevent the developed voltage from exceeding the heater-to-cathode break-down voltage of the T-R valve.

The coaxial transmission line should pass directly through a coax "T"-connector attached to the T-R switch input. In no event should the coaxial line connecting the switch to the transmission line exceed 4 to 5 inches in length.

While some of the simpler circuits described may not provide optimum performance at all frequencies and under all operating conditions, it is hoped that "SSB Topics" readers will have found sufficient information here to encourage further experiment with the various types of T-R circuits. Your conductor would, of course, be very interested in receiving additional circuitry, data and suggestions on this subject from any reader.

SSB Contest News

A Worked-All-States contest for SSB was scheduled for September 20-21. Unfortunately, this information was not received until after the August issue of "SSB Topics" went to press. It is hoped that those interested SSB operators in U.K. and Europe received the information from W amateurs in sufficient time to participate.

Information on the winners of the *CQ* World-Wide SSB Contest has at last been received. It appears that the "silver cup" award again goes to CN8MM, for the second year in a row! This year he used three separate 3-element beams, on 10 15 and 20 metres, and running 150 watts of SSB, he netted 243,110 points, with 547 contacts in 95 countries, in 56 call areas. All of this in the 24-hour operating period. The official first 25 operators are listed in the table.

News and Views

As the first and only SSB station in Singapore, VS1HS has been enjoying great popularity of late with the Europeans. He has recently installed a new 2-element beam, which he says has helped considerably. A pair of 6146's running at 100 watts is responsible for his outstanding signal, which can usually be heard on 14 mc between 1400 and 1600 GMT.

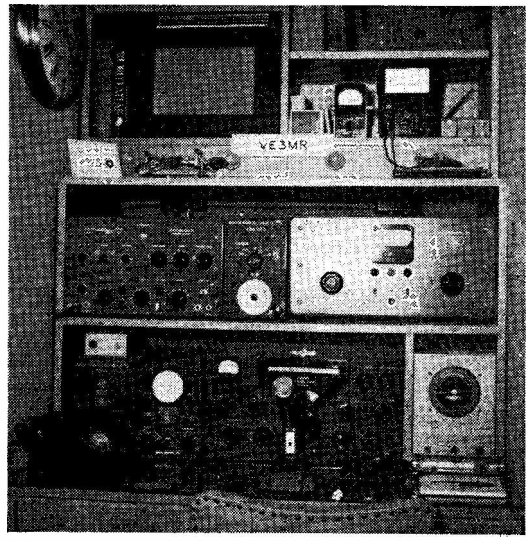
WORLD-WIDE SSB CONTEST

The First 25

	Points		Points
CN8MM	243,110	VK6RU	48,806
HB9IE	202,752	DL4WX	46,536
F7AF	181,480	W4TO	46,050
OD5BZ	171,974	KZ5WZ	45,320
TI2HP	128,949	W6ONP	44,640
ZS6KD	108,100	SM6SA	44,978
ON4DM	100,674	W4JUR	43,344
TG9AD	63,956	W1HKK	39,621
W9EWC	59,249	VE3MR	36,894
W3SW	58,456	KL7PIV	31,291
KG4AQ	52,002	ZL3PJ	30,690
PY4TK	50,520	YV5ABD	24,888
VK3AEE	49,335		

VS1HS also advises that there is much interest among the VS1 group in SSB and that VS1HX, 1EW, 1FJ and 1BO will soon be active. He is looking forward to a trip to 4S7 and the Maldive Islands, although plans are rather indefinite at the present time.

VS6AZ finally broke through with his usual good signal and reported that Europeans have been among those missing throughout the entire summer months. Another outstanding SSB station in the Hong Kong area is our old friend, VS6BE. It seems that he will be on the inactive list for about six months, while completing his commercial airline pilot's examina-



Station of VE3MR, Toronto, who is very active on SSB, and has been heard around under various exotic prefixes.

tions. The local authorities decided that VS6BE's 100-foot tower and wide-spaced 3-element rotary might constitute a flying hazard for aircraft using the new airport runway. We understand that he is looking for a new QTH!

A very impressive list of countries worked has been received from MP4BBW, who now has a total score of 59, with 57 on 14 mc and 21 on 21 mc. He says that 9K2AM/M is now back in Tehran and still hopes to put the first EP/EQ SSB station on the air.

We have recently learned that the ARRL has petitioned the U.S. authorities for expansion of the W-phone band to also include 14300 to 14350 kc. If this becomes a regulation, we will find W's operating throughout the SSB DX portion of the band. The resulting QRM might find a number of the SSB group shifting operations to the 14100-14200 kc range, which, in turn, would draw some of the "DX-minded" W's to the frequencies just above 14200 kc. This would tend to spread SSB activity throughout 20 metres—an interesting situation!

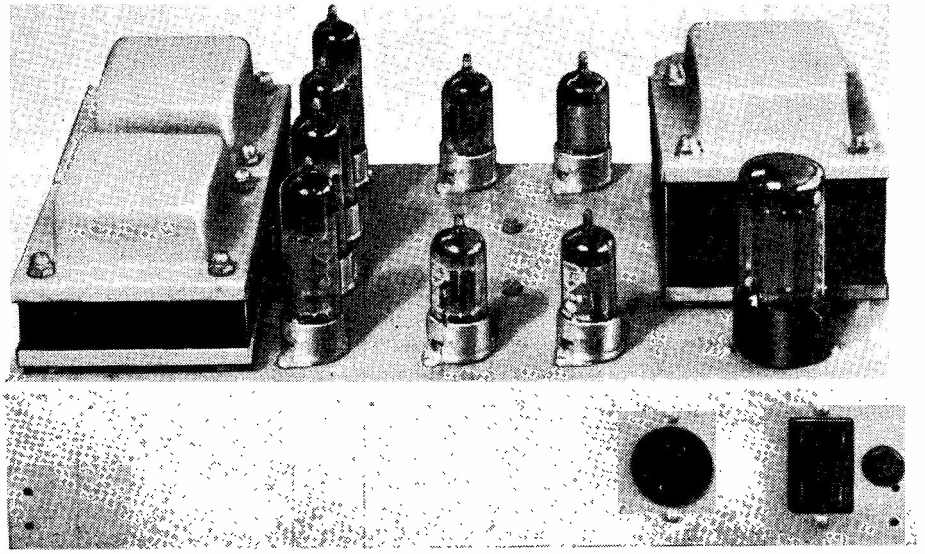
It is hoped that the readers of "SSB Topics" will continue to keep us informed of their latest operating activities, SSB ideas and circuitry, as well as current standing for the "SSB Countries-Worked Ladder," which is being revised to bring it up-to-date—the last appearance of the Ladder was in "SSB Topics" for April, and a good deal must have happened since then!

Remember, your contribution will help to make this column a success! The next SSB feature will appear in the December issue, for which all correspondence should be received by October 31. Address "SSB" Topics," c/o Editor, *Short Wave Magazine*, 55 Victoria Street, London, S.W.1, or direct to your conductor at Mauerkircher Strasse 160, Munich 27, Germany.

The writer wishes to acknowledge with thanks the kind encouragement and suggestions offered by G6LX in the preparation of this column. It is the aim to continue to provide readers with reportage and technical information covering all aspects of SSB, which has been so ably done by G6LX in the past. Vy 73, *de DL4SV*.

LIBERTIES CURTAILED IN CEYLON

Because of political trouble with unlicensed operators, the local authorities have imposed a total ban on 4S7 amateurs, who have had their equipment called in. Of course, the only result of a decree of this sort is that the law-abiding licensed operators are shut down because they are all known to the Government, while the unlicensed (who can be traced only by elaborate detection methods) go on as before. This is a good example of what happens when a weak and unstable administration is panicked into taking what are supposed to be "security measures." We must hope that they will soon be lifted.



Double-channel audio amplifier for stereophonic reproduction. For 200mV input, the amplifier will give up to 10 watts output on each channel, with less than 0.5% distortion in the audio range 40-20,000 c/s. Its power pack provides, to an outlet socket, an extra 300v. at 5 mA and 6.3v. at 1.2A. for a pre-amplifier. The output impedance can be matched into 4, 8 or 16 ohms. The manufacturers are Scientific and Technical Developments, Ltd., of Wallington, Surrey.

ON SAFARI THROUGH EAST AFRICA

EXPERIENCES ON A 5,000-MILE TRIP

M. GEDDES (ZE3JO)

IT may be remembered that in August 1956 the writer was able to operate, while on holiday in Zanzibar, as VQ1JO, as reported in the November 1956 issue of SHORT WAVE MAGAZINE. That trip having been so successful, the opportunity was not to be missed when this year a friend suggested a photographic *safari* through East Africa, with a little /P operation on the amateur bands thrown in. No guns were to be taken—only cameras and radio gear.

The areas visited were Kenya, Northern Rhodesia and Tanganyika, for which the appropriate callsigns were allocated—VQ4JO, ZE3JO/VQ2/P and VQ3JO respectively. The rig consisted of a B2 Tx/Rx with a 100-ft. length of wire for an aerial, and some 14 mc crystals, as operation was on 20 metres only; the aerial was rigged simply by throwing the far end, with its insulator and a piece of cord, over any convenient tree. Operation could be either from the car when stopping merely to admire the view, or from a tent when pulling in for the night. The B2 was run from an accumulator, and the PA input was usually around 20 watts.

In Kenya, VQ4JO/P was used from the Royal Tsavo Game Area, the Amboseli Game Area near Mt. Kilimanjaro, and from Nanyuki, at the foot of Mt. Kenya. From the Ngorongoro Crater and Makuyuni in Tanganyika, the callsign was VQ3JO/P, while from Mpika in Northern Rhodesia the expedition signed ZE3JO/VQ2/P.

From these various locations, a total of some 200 contacts was made, the actual DX worked covering all continents except South America; numerous Europeans were raised, as well as stations in the U.K. Many contacts were, however, lost due to the lack of bandspread on the B2 receiver; this will have to be rectified for any future occasion, it being a well-known failing of an otherwise very good receiver for uncomplicated portable working. From the Kenya locations, numerous W's were worked, though none could be raised while in Tanganyika as the time was not right for the U.S.A. on 20 metres. Unfortunately, activity from Mpika in Northern Rhodesia was curtailed owing to a stone thrown up by a wheel damaging the car battery; this meant using the B2 accumulator on the car, and actually ZE3JO/VQ2/P had to go QRT with a number of stations still on the hook, which was most unfortunate and much regretted by the writer. The best radio conditions experienced were when at the foot of the Ngorongoro Crater in Tanganyika, where signals both ways were something like 2 S-points up on the other locations.

Actually, not a great deal of time was spent on the air. What with photography, visiting the game areas and making camp, one needed one's sleep. A great deal of magnificent game was seen, and while working a G from the Ngorongoro site, VQ3JO/P was being watched by a lion—though the U.K. operator at the other end did not seem to believe this!

For those interested in the statistics, the trip occupied five weeks during June-July last, the car was a Rover 90, U-7624, and the distance covered was just over 5,200 miles, and the writer's share of the cost, all-in, was about £65—and it is probably fair to say that nowhere else in the world could one have got better holiday value for the money.

ANGLO-SWEDISH TELEPHONE CABLE

Contracts have recently been placed with British manufacturers for a new submarine cable system costing about £1½ million. It will be laid between the United Kingdom and Sweden. The new cable, which will be nearly 530 nautical miles long, will have a capacity of 60 telephone circuits, and the system is due for completion in October 1960. The terminals will be at Göteborg and Middlesbrough and 12-circuit groups will be extended, without demodulation to audio frequency, to Stockholm and London. This will provide circuits about 1,100 miles long between the capital cities. Conventional methods of signalling will be employed on the circuits and four-wire switching facilities will be installed in London so that the circuits can be extended to Europe or North America without incurring any additional overall attenuation.

The submarine cable will incorporate some 28 of the new long-distance submerged repeaters designed for use with 0.99 inch diameter lightweight polythene dielectric coaxial cable — which is only suitable for use in very deep water. As a result it has been necessary to develop a new type of cable which differs from conventional 0.62 inch diameter. The centre conductor is a core of mild-steel strands over which is placed a copper tape, instead of being of solid copper. The submarine cable will be extended to the terminal stations at each end by about 9 miles of land cable. This will be of similar construction to the submarine cable except that it will have soft iron tapes added as a screen against electrical interference.

The repeaters, which will be spliced into the cable about every 18 nautical miles along its length and which will amplify signals in *both* directions. differ in a number of respects from those used on the Newfoundland-Nova Scotia section of the trans-Atlantic telephone cable system. In particular, a new type of valve will be employed which will reduce the voltage per repeater from 123 to 75 volts, thus reducing very considerably the power feeding voltage required for the system. Also, the repeaters will incorporate a new supervisory system which will enable measurements of loop gain, noise and inter-modulation products to be made to *each* repeater without taking the cable out of commission. Power feeding and control of the supervisory system will be from the Middlesbrough terminal.

H.M.T.S. *Monarch* will lay the cable and repeaters and the overall testing and lining-up of the system will be the joint responsibility of the British Post Office and the Royal Swedish Board of Telecommunications.

VHF BANDS

A. J. DEVON

Big Aurora and Tropospheric Openings—

Much EDX/GDX Worked and Heard—

Reports for All VHF Bands—

THOSE who were not on two metres during either period September 3-5 or 11-12 missed what were probably the most remarkable VHF openings of recent years—though it is fair to say we have had them at least as good in the more distant past.

The first was an Aurora manifestation, and the second a wide tropospheric covering, so that those who were there for both were able to work the same sort of GDX in two different modes; this sort of thing does not often happen in one month ! To add to the interest—and, to some extent, the confusion—during the first break we had Aurora reflection and good tropospheric conditions more or less simultaneously, though this is not the first time that has occurred.

The Activity Report tells much of the story, but there is a good deal of interesting detail to be filled in. For GM2FHH (Aberdeen) things began to happen on the evening of September 3, when he knocked off G3HBW and OZ3NH by Aurora; his other QSO's, including those interesting LA contacts, were made late on the 4/5th. At SP5AU (Warsaw)—whose report we were very glad to have—tropo. conditions had been good all the afternoon of the 4th; he uses Dresden TV as his marker signal, incidentally. By 2045 GMT, the Aurora was visible from Warsaw as two great walls of light, one almost due north, and the other about 20° west. After a CQ call on 144.65 mc, he worked the EU's shown in his calls h/w list—nice going, with SM4NK at about the 600-mile mark.

An outstanding feature of this particular Aurora opening was the length of time it lasted. With SP5AU, from 2100-0200 GMT; with G5YV, during 2126-0213; with ON4BZ, between 2300-0130; at G5MA, it went on until 0215 GMT on the 5th. He also caught the earlier one, 2230-2330 GMT on September 3; though he heard GM2FHH, Bob made no QSO then; his Aurora contacts, as given in his calls h/w list, were all obtained the evening after.

At ON4BZ, the first Aurora signals to appear on September 4 were the GI's, after which, for him, things were better with Scandinavia, though SP3PD and SP5AU were solid S7 signals for the short time they were coming through—needless to say, Guy tried very hard to raise them. He wants to get out of that hot seat in Countries Worked ! The best signal heard at ON4BZ was GM2FHH—" colossal, and steady as a rock from beginning to end."

From G5YV, we also have a most interesting report. During the Aurora session he worked nine DX stations, and heard nineteen more — *see* Activity Report—including HB1RG who, says Harold, did not seem to be much interested in the U.K., as he took G2XV for his only G contact (which puts Gerry up to 14 worked in the Countries table). At G5YV, HB1RG was first heard at 2208 on the 4th; he was still RST-554 at 0216 on the 5th; and in Leeds, DL1FF was another very consistent signal throughout the opening.

As might be expected, Bob of G5MA made the most of his opportunities, and remarks that for him the most thrilling QSO was with GM3BOC/A, for the very rare county of Sutherland. The only contact that was not quite solid was with GM4HR, who faded down before the last overs. G5YV also registered GM3BOC/A, making Harold now 79C in the All-Time, and well out in front.

The Tropospheric Opening

The record shows that the barometer started rising about noon on September 10, being high and steady by mid-day on the 11th and keeping like that until the early morning of the 13th, when a long, slow fall set in. During the early evening of Friday 12th, conditions started to build up, and by the late evening, a marvellous opening to GM had developed—most unusual in the tropospheric mode, as all regular VHF operators of long standing will know.

G3LTF got home to Mill Hill to find GM3FGJ/A calling CQ at 2100 GMT; a near-QSO resulted, and then GM3EGW was heard at 579; again no QSO, but G3LTF was rather mortified to be told later, by G5KG, that GM3EGW had been calling him. Both from G3LTF and G3LTF/A some good EDX contacts were made during the period—*see* calls h/w lists—with F3NJ as the best DX distance worked.

The opening of the 12th brought G5MA four GM contacts at the one session, three of them representing new counties for the All-Time: GM3EGW was worked on phone, for a very solid QSO—which shows how conditions were when it is remembered that G5MA is located south of London ! Bob also followed the G3KUH/P expeditions into Westmorland and Cumberland, working him for both counties and three times in all; other very good GDX included QSO's with G3IOE and G6JY in Newcastle, and G2FO for Co. Durham, while the GD3UB schedule has yielded some 70 both-way contacts over the 265-mile path.

From PE1PL (The Hague) they also report good tropo. conditions during September 12-13, with numerous EU's heard or worked. Some of the more interesting of PE1PL's contacts were earlier in the month, when they worked HB1RG (Mt. Chasseral) many

times, also HB1IV and a number of DL's. More U.K. stations also were encountered during the period, as the Activity Report shows.

European VHF Contest

This was staged over the week-end September 6-7 and, as it fell out, came between the two spells of superlatively good conditions. This was very bad luck for all concerned, participants and organisers, and once again proves what has often been said here—that these contests are nearly always inconclusive and disappointing because it is impossible to predict conditions; it would, in fact, be pure coincidence if a really good opening *did* occur during a contest. For U.K. entrants this year's event was somewhat slow, though there were the usual very loud signals from /P stations scattered about the country, and a few south-easterly G's scraped one or two EU contacts; the PE1PL boys report that though normally they work several F's and G's every day (and some of them twice a day) for the Contest they could only make one U.K. contact—with G2ANT! EI2W (Dublin) only managed 11 Contest QSO's, none of them at any great distance, and mentions G6XM as his most consistent signal.

It seems, however, that something of a tropo. opening did develop over the Continent, and there was plenty of DL activity; a particularly interesting Contest QSO reported was that between PAØEZ and OK1VR; the latter has previously been mentioned in this space as an active VHF operator and a possibility for a new country from the U.K.

SP5AU Looks This Way

In the course of his report on the Aurora opening, SP5AU (Warsaw) mentions that he calls CQ to the west *every evening* at 2015 GMT, listening 2020-2025. He runs a daily schedule with DL3YBA, and has worked a number of EU's in DL, OK, SP and in Russia. Like everyone else he constantly hears weak and unresolvable phone carriers.

SP5AU is on 144.65 mc and is very well equipped for VHF. He

TWO-METRE ACTIVITY REPORT

Lists of stations heard and worked are requested for this section, set out in the form shown below, with callsigns in strict alphabetical and numerical order.

G3BDQ, St. Leonards-on-Sea, Sussex.
WORKED: DL3NQ, F2DE, 3ND, 3NJ, 3SK, 8GH, 8MX/A, 8YO, 9CQ, 9EA/P, 9ND, 9QW, G2DTO/P, 2JF, 3DIV, 3LTF/A, 4DC, 5MR, 6HH/M, 6NF/M, 8RK, ON4DW, 4PE, 4ZH, PE1PL.
HEARD: F8SX, G2XV, 3FAN, 3LTF, 5KW, 5NF, 6NB, 6YP, ON4BZ, 4EY, 4HN. (*August* 22 *to September* 13).

GW3MFY, Bridgend, Glam.
WORKED: F8MX/A, G2ADZ, 2DTO/P, 2JM, 2MR, 3ARK, 3BA, 3FIH, 3HAZ, 3HBW, 3HXN, 3JGJ, 3KEQ, 3KHA, 3MA, 4DC, 4PS, 5DF, 5DW, 5MA, 8VZ, GC2FZC.
HEARD: F9EA/P, G2AHP, 2AIW, 2ANT, 2BHN, 3ABA, 3DOR, 3FEX, 3FZL, 3GKH, 3GVC, 3HCU, 3ICO, 3IER/P, 3ION/P, 3IZD, 3JWQ, 3KPT, 3LTF, 5US, 6NB, 6XM, GB2RS, 3IGY, GW8MQ. (*August* 16 *to September* 15; *all stations heard also called*).

Aurora only

WORKED: G3JZG, 5YV,
HEARD & CALLED: G2NY, 2XV, 3DVK, GM3EGW. (*September* 4-5).

G2FJR, Sutton Bridge, Lincs.
WORKED: DJ3NRP, G2FNW, 2NY, 2QY/P, 3BBR/P, 3DVK, 3EKX, 3GFD, 3GSO, 3JIT, 3IRS, 3IWJ, 3JMA, 3JMS, 3JZG, 3KHA, 3KQF, 3LTF/A, 3MNQ, 4MK, 5YV, 5YV/P, 6JY, 6LI, 6XT, 8VZ, GW2HIY, 5CP/M, ON4FG, 4OZ, 4ZS, PAØCML, ØEZ, ØQC, ØWAR. (*August* 19 *to September* 14).

G3LTF, Mill Hill, London.
WORKED: F3LP, 3NJ, 8MX, 9EA/P, 9JY, G2AHL/P/M, 2AHY, 2ANT, 2BDX, 2CZS, 2DTO/P, 2DUS/M, 2FNW/P, 2XV, 2YC, 3APY, 3AYC, 3BA, 3BVU/P, 3CGQ, 3DF, 3DVK, 3EKX, 3ENY, 3EVV, 3FD/P, 3FUL, 3GFD, 3GOZ, 3GSO, 3HRH, 3HZK, 3ION/P, 3IRS, 3JAZ, 3JGJ, 3JHM, 3JR, 3JWQ, 3JXN, 3JYT, 3JZG, 3KEQ, 3KEQ/P, 3KHA, 3KMT/P, 3KUH, 3LCH/P, 3LHA, 3MED, 3MEO, 3MEV, 3MNQ, 3MNR, 3MPS, 3PV, 4DC, 4KD, 5CP/M, 5DF, 5KG, 5MA, 5MR, 5OB, 5OX, 5YV, 6LI, 6SC/P, 6SN/P/M, 6XM, 6YN, 8AL, 8LM/P, 8SB/P, GC2FZC, 3EBK, GM3FGJ/A, GW8UH/M, ON4XT, PAØLQ, ØWAR, PE1PL.
HEARD: F8LO, 8LX, 9QW, GI3GXP, GM3EGW, ON4BZ. (*August* 24 *to September* 14).

SP5AU, Warsaw, Poland.
WORKED: DL1RX, 3YBA, 6QS, ØHH, SM4NK, 5AY, 5BDQ, 5BRT, 5MN, 5UU, 5VL, 6BTT, 7BCX, 7BIP, 7BZX, 7YO, 7ZN.
HEARD: DJ1EY, DL1FF. (*Aurora, September* 4-5).

ON4BZ, Brussels, Belgium.
WORKED: DL1FF, 6QS, GM3EGW, SM7BHE, 7BIP.
HEARD: GI3GXP, 5AJ, GM2FHH, 3EGW, 3LAV, LA4RD, 7AE, OZ3NH, 7BB, SM6BTT, 7BCX, 7YO, 7ZN, SP3PD, 5AU. (*Aurora, September* 4-5).

PE1PL, The Hague, Holland.
WORKED: G2ANT, 2FNW, 2HCG, 2NY, 2XV/P, 3APY, 3BDQ, 3CFK, 3EVV, 3IRS, 3JMA, 3JWQ, 3LTF, 5KW, 5YV, 6FO, 6XM. (*August* 18 *to September* 13).

G3HZK, Bushey Heath, Herts.
WORKED: F8MX, G2DTO/P, 2FNW, 2FNW/P, 3BVU/P, 3CFK, 3DVK, 3EKX, 3GSO, 3HA, 3HYH, 3IUD, 3JGJ, 3JWQ, 3LHA, 3MNQ, 4JJ/A, 5YV, 6JS, 6LI, 8MW, GI3GXP, GM3LAV.
HEARD: G2BVW, 2HCG, 2NY, 3ALC, 3BA, 3CCH, 3ENY, 3HAZ, 3IKV, 3IWJ, 3JZN, 3KUH, 3LAY, 3LZN, 3MAX, 6JY, 6SN, 6XX, GM2FHH, 3EGW. (*August* 9 *to September* 9).

G3DVK, Rawmarsh, Yorks.
HEARD: DL3YBA, 6EZA, G2MR, 3HBW, 3JZG, 3KEQ, 5MA, GI5AJ, GM2FHH, 3EGW, 3LAV, 4HR, GW3MFY, 8SU, ON4BZ, PAØMZ, ØNL, SM6BTT. (*During Aurora, September* 4-5).

SWL Davis, Prestatyn, Flints.
HEARD: EI2W, 6A, 2FCL, 2HCJ, 2HGR, 2NY, 3CCF/P, 3HWC, 3IKV, 3IWJ, 3JAH, 3KUH/P, 5BN/A, 5TH, 5YV, 8SB/P, GB2RS, GD3UB, GI3GXP, 5AJ, GM3HRH/A, GW2HIY, 5CP/M, 3AOS/M. (*August* 1 *to September* 12).

GW3MDK/A, Prestatyn, Flints.
WORKED: G2FCL, 2HCJ, 2NY, 5YV, 8SB/P, GI5AJ, GW2HIY. (*September 7 only*).

G3LTF/A, Chelmsford, Essex.
WORKED: F3LP, 8GH, 8MX, G2ANT, 2CD, 2CZS, 2DTO/M, 2FJR, 2FM, 2HCG, 2NY, 2XV, 3BDQ, 3CFK, 3EJO, 3FD, 3GOZ, 3GVC, 3HZK, 3IRS, 3JMA, 3JWQ, 3JYT, 3JZG, 3KHA, 3LHA, 3VI, 5DT, 5KG, 5OX, 6LI, 6XM, 6YP/M, 8SK, ON4FZ, PAØCML, ØLQ.
HEARD: G3ENY, 3GFD, 3JGJ, 3KFD, 3MED, 3MNQ, GC2FZC, GI3GXP, ON4HC. (*August* 20 *to September* 15).

G5MA, Gt. Bookham, Surrey.
WORKED: DL1SN, G4LX, GI5AJ, GM2FHH, 3BOC/A, 4HR, PAØMZ.
HEARD: DL6QS, GI3GXP, GM3EGW, 3LAV. (*Aurora, September* 4-5).

G5CP/M, in North Wales.
WORKED: EI6A, G2FCL, 2FJR, 2NY, 3IKV, 3KFD, 5DW, GD3UB, GI3GXP, 5AJ, GW2HIY. (*August* 23 *to September* 2).

G5CP/M, in Notts./Derbys.
WORKED: G2DTO/P, 2FNW/P, 3BNL, 3DVK/P, 3ENS, 3EVV, 3HBW, 3HRH, 3JWQ, 3LTF, 3MNQ, 5YV, 6XM. (*September* 6 *only*).

G8VZ, Princes Risborough, Bucks.
WORKED: G2ADZ, 2DMN, 2FJR, 2FNW, 2HGR, 2NY, 3BVU/P, 3DKF, 3DVK, 3ENY, 3HRH, 3ION/P, 3JWQ, 3JZG, 3KHA, 3KMT/P, 3KPT, 3KUH, 3LHA, 3LOK, 3MED, 3MNQ, 5DW, 5YV, 6XM, GW2HIY, 3MFY, 8UH. (*All over* 50 *miles; August* 23 *to September* 14).

G3KUH/P, Westmorland.
WORKED: G2FCL, 2HCG, 2NY, 3AGS, 3DVK, 3GFD, 3HA, 3HWS/A, 3HYH, 3IKV, 3IWJ, 3JWQ, 3KFD, 3KQF, 3KYT, 3MAX, 3MED/A, 3MNQ, 5DW, 5MA, 5YV, 6XM. (*August* 31, *September* 2-3).

G3KUH/P, Cumberland.
WORKED: G2FCL, 2HCJ, 3GFD, 3HWS, 3HYH, 3IKV, 3ILX, 3IUD, 3IWJ, 3JAH, 3JWQ, 3KJM, 3KYT, 3LAY/M, 3LIS, 3MAX, 3MED, 3DW, 5MA, 6XM, 6XX. (*September* 1-4).

G3KQF, Derby.
WORKED: F8MX, G2CRL, 2CVV, 2DMN, 2DTO/P, 2FJR, 2FNW, 2XV, 3BA, 3BNL, 3DKF, 3DVK/P, 3FD/P, 3GSO, 3HXN, 3HZK, 3IRS, 3JFT, 3JGY, 3JMA, 3JR, 3JWQ, 3JXN, 3JZG, 3KAG, 3KEQ, 3KFD, 3KMT/P, 3KPT, 3KUH, 3KUH/P (Westmorland), 3LAY, 3LCV, 3LGJ, 3LHA, 3LHW, 3LYD/A, 3MAX, 3MED, 3MNQ, 4PS, 5BQ, 5DF, 5GN, 5KW, 5YV, 6JY, 8SB/P, GM3EGW. (*August* 19 *to September* 15).

G2AHY, Crowthorne, Berks.
WORKED: G2DTO, 3ASU, 3DKF, 3DOR, 3FP, 3GSO, 3HRH, 3JMA, 3JWQ, 3KND, 3KRR, 3LCH, 3LTF, 3MEV, 3MPS, 4PS, 5DF, 6OU.
HEARD: G2ANT, 2GG, 2HCG, 2IT, 3ABA, 3ATK, 3EGV, 3EKX, 3FAN, 3FMA, 3HBW, 3ITF, 3JFR, 3KFR, 3KQF, 3LGJ, 3LOK, 3YP, 5MA, 5NF, 5YV, 6NB, 6NW, 6XM, 8AL, 8UZ, 8VZ.

SWL Winters, Melton Mowbray, Leics.
PHONE: EI2W, F8MX/A, G2ATK, 2BVW, 2CRL, 2CVV, 2DCI, 2DTO/P, 2DMN, 2FJR, 2FMO, 2FNW, 2FNW/P, 2HCG, 2HCG/M, 2HGR, 2XV, 3ABA, 3APY, 3APY/M, 3AYT/M, 3BA, 3BNL, 3BU, 3CCF/P, 3CGQ, 3DKF, 3DVK, 3DVK/P, 3EEO/A, 3EKX, 3EVV, 3FAN, 3FZL, 3GFD, 3GGR/P, 3GSO, 3HA, 3HBW, 3HXN, 3HXS, 3HZK/M, 3HYH, 3IKV, 3ILX, 3IRS, 3JGY, 3JMA,

3JMA/M, 3JWQ, 3JXN, 3JZG, 3KEQ, 3KEQ/P, 3KMT/P, 3KPT, 3KQF, 3KUH, 3KUH/P, 3LHA, 3LHW, 3LOK, 3LSA, 3LTF, 3MED, 3MNQ, 3MPS, 3NT, 4JJ/A, 4MK, 5BF, 5CP, 5CP/M, 5DF, 5GN, 5HB, 5JU, 5KG, 5KW, 5MA, 5ML, 5ML/M, 5PP, 5YV, 6JS, 6JY, 6LI, 6NB, 6XM, 6XT, 6YU, 8CZ, 8SB/P, 8VZ, GB2RS, ON4BZ, PAØEZ, ØQC, PE1PL.
CW: G2ANT, 2FJR, 2FNW, 2NY, 2XV, 3BNL, 3CCH, 3DVK/P, 3ENS, 3EVV, 3FIB, 3FZL, 3GFD, 3GSO, 3HBW, 3HZK, 3JWQ, 3JZG, 3KEQ, 3KQF, 3JXN, 3LLE, 3LTF, 3MED, 5CP, 5KG, 5KW, 5MA, 5YV, 6JY, 6XM, 6XX, 8VN, GB3IGY, GD3UB, ON4BZ, PE1PL. (*August* 16 *to September* 16).

GM2FHH, Aberdeen.

WORKED: DL1FF, 6QS, G2AIW, 3FZL, 3HBW, 4DC, 5MA, GI5AJ, LA4RD, 7AE, OZ3NH, PAØMZ, SM6BTT. (*Aurora, September* 3-5).

G5YV, Morley, Leeds.

WORKED: DL3YBA, 6EZA, DM2ABK, GW3MFY, OZ3M, PAØMZ, SM6BTT, 7BCX, 7BZX.
HEARD: DJ1VK, DL1FF, 3SN, G2XV, 3FZL, 3KEQ, 5MA, GI5AJ, GM2FHH, 3EGW, 3LAV, GW8SU, HB1RG, ON4BZ, 4TQ, PAØNL, SM7BAE, 7YO, 7ZN. (*Aurora, September* 4-5).

G3JWQ, Ripley, Derbys.

WORKED: G2BMZ, 2CVV, 2DMN, 2DZH, 2FCL, 2FM, 3AQX, 3BJC, 3BNL, 3GKH, 3JMS, 3KYT, 3LCH/P, 3LDW, 3LYD/A, 3LZN, 4KD, 8DR, PAØCML, ØLQ, ØQC. (*Recent new stations worked only*).

runs 500w., the PA being an LS-180 (a Telefunken type) neutralised triode driven by an 829B, preceded by the usual xtal multiplier chain. The beam is a 24-element array fed by 300-ohm line, and his converter is a CC cascode with a 6J4 g.g. pre-amplifier. He talks of improving the transmitter by substituting a pair of QB3/300's for the LS-180. For those who feel they could usefully run a schedule with him, he is QTHR in the latest *Call Book*, and reads and writes English.

VHFCC Elections

Before going on with any more gossip, we must record the latest admissions to the VHF Century Club. The following have, so to speak, satisfied the examiners: G. Goeschlberger, OE2JG, Salzburg, gains VHFCC Certificate No. 224 with 100 cards from seven countries—DJ/DL, HB, OE, OK, ON, PA and YU, by far the greater number of his contacts being with German stations. Apparently, there are about a dozen OE's on two metres, and of the OK's, OE2JG shows cards from nine, mainly 1K's, *i.e.* "Klubs."

Certificate No. 225 goes to J. W. Hobbs, G3JQN, of Croydon, Surrey, whose proportion of cards is 90 U.K. to 10 European, representing seven different countries worked. No. 226 is for G. V. Farrance, G3KPT, West Bromwich, who shows 9 cards from four countries outside G. To get his 100 cards, W. Bates, G3EJO, Birmingham, who has Certificate No. 227, says he made 3,000 contacts with 250 different stations, all QSL'd 100% on first QSO. J. Anthony, G3KQF, Derby, with Certificate No. 228, has been on two metres since Christmas 1955, and has worked some 174 stations in six countries for his 100 cards. No. 229 goes to H. Crowther, G3HA, Bradford, mainly for G's, but he has eight cards from three EU countries.

Annual Counties

Final placings for the year to August 31 are shown in the Table; once again, G5MA takes the lead, for the third time running, and this year with a better total of counties worked in the 12-month than on the two previous occasions. (If Bob is going to make a habit of this, we shall have to start him with a handicap of — 10 counties !).

The annual marathon began again on September 1st, for the year to August 31 next; some 8-10 claims are in already for the new Table, which will be started in the next issue. We shall be very glad to see entries from some of the more recently-licensed operators, many of whom are very active and could make a good showing.

Comments — Out of Context

"As a result of the recent activity, I have now worked five countries, but still only four counties" (G3BDQ) . . . "I heard eight countries, all called, but only GW3MFY came back and I lost him in QSB" (G3DVK) . . . "A QSO with SP5AU was not possible; I am so sorry !" (ON4BZ) . . . "Now running 150w. to an 8/8 on 144.040 mc, and will have 600w. on 145.80 by the time this is in print" (GM2FHH) . . . "I now have nine countries heard on the band, and have 68 cards" (SWL Winters) . . . "The contest was disappointing. Nine stations worked in 14 hours' operating—is this a record ?" (GW3MFY) . . . "GM2FHH at 2325 GMT on the 4th was the loudest A-signal ever heard here; at least as strong as any local" (G3HBW) . . . "After my remarks last month about unnoticed Aurora, I managed to miss the big opening" (G3KUH) . . . "There is only one thing wrong with my beam—it won't hear GD, though I listen each evening at the appointed hour" (G2FJR) . . . "Modern standards on two metres appear to be more and more power with, in some cases, uncontrolled mod." (G8VZ) . . . "I am looking especially for EI and GD" (G2FCL) . . . "Active /M frequently from North Derbyshire" (G5CP) . . . "I'll be looking for G stations on two metres" (SP5AU) . . . "When everyone else seemed to be chasing to the east, I put the beam north and raised GM3EGW, for a very

TWO METRES

ANNUAL COUNTIES

Final Placings for Year to August 31, 1958

Worked	Station
60	G5MA
58	G3HBW
57	G3KEQ
46	G8VZ
45	G3GHO
40	G3JWQ
35	G2CIW
34	G3KUH
32	G3KQF
31	G3KPT
30	GM3DIQ
28	G3GSO
27	G3MAX
26	G3MED
25	G3KHA, G8DR
24	G2AHY
18	G2HDR
17	G3DLU, GW3MFY
15	G3CKQ, G3JGJ, G3MLS

This Annual Counties Worked Table opened on September 1st, 1957, and ran till August 31st, 1958. First placings for new Annual 1958/59 will appear in November.

welcome FB CW QSO" (G3KQF) . . . "I found it hard going at first but eventually made seven Auroral QSO's" (G5MA) . . . "My beam fell down" (G6FO) . . . "I called many EU's without success and got the impression that most of them were only interested in new contacts" (G5YV) . . . "The daily skeds were maintained from August 18 to September 13, and conditions were not bad" (PE1PL) . . . "I worked PAØCML on the 10th and got his QSL on the 12th; G stations please note!" (G3LTF) . . . "The ZS chaps further south hear CT1CO calling CQ on 50 mc, but he doesn't seem to listen for replies" (VQ4EV) . . . "After a busy day harvesting under a strong sun and cloudless sky I found the glass was high at 30.2, so I telephoned GM6WL" (GI3FWF).

GI/GM on Seventycems

We are very glad to be able to report the first home-station or ground-to-ground — as distinct from /P—contact between GI and GM on Seventycems. This was achieved by GI3FWF (Lisburn) and GM6WL (Glasgow) on the evening of September 12, over a 115-mile path, after (for GI3FWF) several *years* of trying, first with GM5VG and latterly with GM6WL. As GI3FWF explains, this time they found the right conditions.

GM6WL was running 36w. to an *indoor* array, and peaked to S9 on phone at GI3FWF, who was using 20w. to a 14-ele stack with screen reflector; his CW was 549 in Glasgow. Actually, GM6WL was well received three evenings running, September 10-12, and was also heard by GI5AJ, who was alerted by GI3FWF and worked GM6WL cross-band 144/430 mc on the two evenings September 10-11. The paths are, of course, very far from being line-of-sight, or anything like it, and in fact there is ground rising to 1,000 ft. a.s.l. in the direction of the get-away from Glasgow.

As we know, both GI3FWF and GM6WL have worked hard on 70 cm for a matter of years so that their success is particularly gratifying.

G3KPT (West Bromwich) also reports on the 70 cm front; he is on 433.56 mc, has got into the Table, and reports 10 stations worked during the period, with G2HDJ, G3GZM and G3IOO heard on that band.

Results on 23 Cm

It will be remembered that G3FUL (Luton), assisted by G3BVU and G3CGQ, has done a good deal of /P work using SEO equipment on 1250 mc, with two metres as a talking channel. On September 7, G3FUL was on Dunstable Downs with his 23-centimetre receiver, while G3BVU and G3JZW motored the transmitter (also belonging to G3FUL) out in the general direction of Gloucester.

Very strong 23-cm signals from G3BVU/P, at sites in Oxon. and Warwicks., were received by G3FUL, and later the range was extended to Glos., a maximum distance of 52 miles, though with a weaker signal. Using this portable-mobile procedure, with two metres as the other channel, the group have now worked no less than six counties on the 23-centimetre band—of course, always from selected sites, as the 1250 mc signal is very susceptible to path interference. As time goes on, they are hoping to extend the range and coverage. The gear used is quite simple, and has been described in SHORT WAVE MAGAZINE.

Other Station Reports

G2FJR (Sutton Bridge) has changed to a slot-fed 4/4 at 38 ft.; the old 6-ele beam with plane reflector was wont to collect about 7 sq. ft. of solid ice in the winter, and was not safe. GW3MFY (Bridgend) wonders if operators in, say, the London area, ever have any practice at "straining their ears for weak signals"! He spends three hours on the band every evening, and asks that people should tune up to 145.35 mc.

G3KUH (Rotherham) says that up there they are being seriously bothered by somebody who "swishes about the band with a super-regen. Rx which produces an S9/T7 note": this must be quite maddening, especially as it can be cured (or at any rate, minimised) by putting an aperiodic RF stage in front and screening the oscillator. G3KUH wants to apologise to those he could not hear while on his /P expedition, due to hash from a faulty Rx power unit.

In a survey of results on his G3JWQ schedule, G8VZ (Princes Risboro') shows that, in general, signal levels were higher through August 1957 than for the same period this year. G3BDQ (St. Leonards), who has worked 42S of which 19 are EU's, reports that he is now using the coiled Lecher-line PA tank system advocated by G3CGQ—*see* p.349, September—and that it works very well with a QQV03-20A. For a beam, G3BDQ is trying a 4-ele Quad in the roof-space.

GW2HIY (Holyhead) writes that he is on "mainly after 11.00 p.m.," and shortly he will be moving frequency to just above 144.45 mc; he runs 30w. with an 832 PA, and the aerial is the J-Beam design consisting of three stacked slots with six reflectors—a distinctly "gainy" array. His Rx is a CC cascode with a 6AM4 g.g. RF stage. G3MAX (Manchester) goes up 13C in the All-Time, and worked eight stations in addition to the 14S giving him a start for the 1958/59 Annual. G2FCL (Morecambe) is on again and very active after two years' QRT consequent upon a change of QTH. G2AHY (Crowthorne) writes in after several quiet months, and says he is getting interested in 70 centimetres. G8DR (London, N.W.2.) reports with claims of 25/27 for the Counties tables, he not having started on two metres until March last, since when he has worked 178 stations.

Conclusion

It has been a longer and more interesting story this time, and some of the Tables have been squeezed out. Thanks for all the FB reports, and pse be ready with another for **October 22**—to A. J. Devon, "VHF Bands," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Till November 7, then . . .

AMATEUR RADIO IN NEW JERSEY

AS RECENTLY EXPERIENCED BY

R. F. G. THURLOW (G3WW)

RUDYARD Kipling wrote "What should they know of England who only England know?" Now the Editor asks the same question in regard to Amateur Radio after the writer's recent trip to America. Flying to New York on August 8, outside the International Airport a 75m. mobile-equipped car was about the first thing seen, but it "got away" without contact. Later, K2QWG, Ray Miller, of Plainfield, N.J., arranged a trip (in his air-conditioned car) to the Cortland Street district of New York. Scores of radio junk shops were visited and in Arrow's, Terminal's, and Harrison's Radio Stores most of the legendary new transmitting and receiving gear used by American amateurs was seen and handled.

Equipment for mobiles is comprehensive, while the amount of reconditioned amateur gear offered made one wonder how they manage to sell anything new in the first place. It seems the answer is that many people must always have the latest type of equipment as soon as it is produced, and with the very extensive indulgence in hire-purchase the cost was not a very great consideration.

The Collins KWM-1 mobile/fixed transmitter for 14-30 mc, with 175 watts p.e.p. input on SSB and 160 watts on CW, now used by many DX expeditions, was examined, admired and coveted—but not at $820 *without* power supplies, at the exchange rate of $2.8 only to the pound sterling.

After meeting W2QYS and K3BVZ, K2QWG offered the hospitality of his home on the wooded slopes of a hill; *en route* a large radio store at Mountainside, N.J. was visited, exhibiting further types of transmitters and receivers, so that one felt most of the equipment advertised in *QST* and *CQ*, except the Heathkit range, had been seen! K2QWG's wife herself holds a Novice licence and their next-door neighbour is Mrs. Natalie Emil, KN2GTJ, who uses a Hallicrafter S.100 Receiver—even the minister of their local church is a K2, active on 75 metres!

The hours sped by all too rapidly—spent either in enjoying their lavish hospitality or working the North American continent with his modern gear on 21 mc. The receiver was a Collins 75A-4 double superhet for the HF amateur bands, with AVC on SSB and CW, separate detectors for AM and SSB, passband tuning and direct calibration, which was a delight to handle on both AM and SSB contacts—but it costs $695! Some phone patching was indulged in while with K2QWG. The 200-watt AM signal was put out by a Johnson's Valiant Viking covering 10 to 160 metres with three 6146's in parallel in the final amplifier. This is a table-top transmitter, small by our present general standards, but with 275 watts input for CW or SSB, the latter with an auxiliary SSB exciter. A Hallicrafter HT.32 transmitter/exciter for the 10 to 80 metre bands gave 114 watts p.e.p. on SSB from two 6146's in parallel, and some 60 watts on AM. With its built-in voice controlled relay switching and Bridged-Tee modulator many satisfying SSB QSO's were made across to the West Coast, and a higher powered Linear Amplifier would merely have been a luxury, as the three element Moseley Triband beam was most effective.

Both transmitters were fitted with silent aerial change over coax relays of small dimensions, AC operated, with an external DPDT switch made by the Dow Key Co. of Thief River Falls, Minnesota, and costing between $10.90 and $15.65 depending on complexity of external switching required—a very tempting fitting to bring home to Europe. This was the SSB rig on which he had worked G3WW at the home QTH in England. Nothing was heard from Europe on this occasion chiefly due to the difference in time.

High Priced Gear

A recent sample survey carried out in America shows that the E. J. Johnson Co., of Waseca, Minnesota, with their Viking range, and the Heath Company of Benton Harbour 12, Michigan, supply almost equally the great majority of the amateur needs. Johnsons offer their gear, including mobile transmitters and medium and high power (1 kW) linear amplifiers, generally in both kit and "wired and tested" form, while Heathkit have a wide range of amateur electronic gear in kit form only and only from the factory at that. As examples the "Viking Valiant" costs $349.50 as a kit and $439.50 wired and tested; the "Viking Ranger," 160 to 10 metres with 75 watts CW or 65 watts phone, is $229.50 and $329.50 respectively—compare our "K.W. Vanguard" at 50½ guineas and 62 guineas respectively (by dividing the dollars by 2.8). The Heathkit "Apache" transmitter kit for 150 watts phone and 180 watts CW, with provision for SSB transmission through the use of a plug-in external single-sideband adapter, costs $229.50 and the well-known DX-100 phone and CW transmitter kit for all amateur bands, with a pair of 6146's in parallel in the PA, costs $189.50. At the same time compare the price of our Eddystone 888A at £110 with the 754-A receiver at $695—say, £250!

The second visit, made as the result of a 21 mc AM QSO, was to the QTH of W2QJO, at Yardville, N.J. At Trenton the Radio Store of W2CCO was visited where further examples of Hallicrafter and National Receivers and the Gonset 2m CD Transreceiver were examined. Later, from W2QJO, G8UG and G3KVT were raised on 21 mc AM at 11.30 p.m. BST—and the QRM in the American phone band sounds the same on both sides of the Atlantic. The main station receiver in the radio room at W2QJO (decorated with numerous operating certificates) is a National NC-200 with a Millen R9'er in front for 10m, and a Heathkit Q-Multiplier (kit at $9.95 needing independent small power supply) with a 10-metre 3-element home-made rotary beam. On 2, 6 and 15 metres a RME VHF-152 converter is added; for 15, 20 and 75 metre transmission an unterminated rhombic of 125 ft. each side in each leg is used to a Viking II. This is an all-band 180-watt

CW input and 135-watt phone completely contained, crystal controlled table-topper at $279.50 (or $337.0 wired out) — a very nice job and well made —used by W2QJO with an external VFO.

W2SDT arrived with his mobile-equipped car fitted with an Elmac receiver (as used by G2CDN) and the Viking 60 watt AM/Mobile transmitter for 75 to 10 metres, costing $107·00 in kit form, complete with a Master Mount fibre glass whip and centre loading coil, and a Morrow tuned "hash" filter. Everywhere the "freedom of the junk box" was offered, which was much appreciated and parts not available in England and often specified in constructional articles in American magazines were selected. W2SDT seemed to carry a good junk box in the boot of his car and enjoyed mobile working as he claimed the biggest local collection of written TVI complaints on 21 mc at his home QTH !—where he uses a Hammarlund HQ 129 receiver and a Viking Ranger 65 watt transmitter, with aerials similar to W2QJO.

Other Personal Contacts

After retiring from New York nearly three years ago W2AB, Wm. A. French, has built himself, his wife, and their badly wounded World War II son, a superb ranch-type house in a beautiful location on the edge of the university town of Princeton, near the scene of the battle where the British were defeated in June, 1777.

He has been active on the air ever since 1910 and runs a home built 700-800 watts AM transmitter with p/p 75TH's and is very interested to get on SSB with more than medium power! His present beam, on a telescopic and tiltable mast—a joy to wind up and down and tilt and easily obtainable, but what would be the demand in Great Britain—is to be replaced by a modern Moseley Tribander. The receiver was a Collins 75A-4 with a 3 kc filter as standard fitting, and two other filters can be supplied and switched in.

W2ATE, Chad. R. Knowlton, now of Elm Ridge Road, Pennington, N.J., turned out not only to be ex-W1ATE of Maine and DX Phone Contest fame but a most unassuming person. The Knowlton family came originally from Kent soon after 1520. On the 5-mile drive to his home he detoured to pass the Bell Telephone Co.'s Transatlantic Radio Telephone rhombic aerial farm. His home-built PA and modulator runs the full kilowatt with 3000 volts on both AM and SSB with the Hallicrafter HT-32 as the exciter—a flip of the switches and you are on full power, AM or SSB. Again the receiver was a Collins 75A-4 which has knife-edge selectivity, which seemed a very good recommendation from a contest man. W2ATE also showed the world's smallest Regency 5-amateur-band transitorized converter weighing only 30 ounces—but costing $79.50—with which he had had good results. This visit culminated in the gift of a Barker and Williamson TR switch unit from his junk box!

Time was fleeting, but a special visit was made to New York for a quiet look round the radio shops to purchase a complete fibre-glass mobile whip with spring base mount, a Groth Turn Counter dial for a roller inductance and a rare receiving type "tube" (valve) or two—and it was noted that Japanese microphones were very plentiful.

Efforts to track down even one example of Creative-Transcon Products Vox Box for voice control of a mobile transmitter (as just reviewed in the August issue of *CQ*) proved unavailing and disappointing.

Plans to attend the 10th ARRL National Convention in Washington DC which was being held on August 15-17, and especially the SSB Discussion Meeting and SSB Dinner on August 16, had reluctantly to be abandoned, through a combination of lack of time available from other family commitments, the long distances involved, and the complete lack at that time of any confirmation of provisional reservations. No doubt a golden opportunity was missed of meeting some of the four thousand amateurs who were at the Convention—but one feels they could not be better fellows than the many others met in their homes, or the radio stores.

Some General Impressions

Now how is the American amateur served, as compared with ours ? The sample survey conducted by *CQ* and published in December, 1957, showed that their readers owned transmitters made by 36 different manufacturers, of which Johnson's supplied 29.5% and Heath 20.6%, eight other named firms between 8.9 and 1.7% and the 26 other manufacturers 7.2%. Collins' prices were the highest per unit of equipment, and the Heath DX-100 the single most used piece of equipment, followed by the Johnson Viking II, with 83% of the active amateurs using commercial transmitters. The American high prices must be viewed against their higher monetary standard compared with ours, with very extensive use of H.P. for almost everything. But do not forget the quality of British workmanship and design, or that the rate of exchange is greatly against us if ever it comes to buying U.S. apparatus. Recent U.K. advertisements show that we have some five firms supplying amateur transmitting equipment, but only one in kit form, and no linear amplifiers or complete SSB transmitters. As to receivers, Hallicrafter distributed 33%, National 27%, Hammarlund 12%, Collins 10%, Surplus including BC-348 (but no mention or sight of any AR88), also 10%, Miscellaneous including Heathkit 5%, and R.M.E. 3%. On a straight percentage basis the order of use was Hammarlund HQ-129 (the HQ-170 is now being advertised), Hallicrafter SX71 (SX-101), Collins 75A-4 (more than 5,000 of these have been produced) and National NC-300, all pretty close together. We are offered new Eddystone, Geloso and Minimitter receivers, with one or two HF and VHF converters and one Q-Multiplier, and ex-Government and/or second-hand American and British Service equipment including AR88 and AR77, HRO, SX28, CR100 and so on. We seem to be as well supplied with aerial equipment as they are by six firms, but only one makes lattice masts and no one over here supplies beam rotating mechanism.

New components are far more plentiful in the States and the range very extensive, and while we have one producer just starting to supply mobile

whip equipment, there appears to be scope for a much extended range of mobile whip aerials, tuning coils and spring bases to meet the needs of the 600 mobile-licensed amateurs over here.

We cannot at present purchase commercially made complete transitorized mobile power supplies, or mobile transmitters and receivers or converters; nor silent modern type coax relays, nor lengths of space-wound small coils.

If money had been no object, the writer would have liked to have brought back three particular pieces of equipment: The Collins KWM-1 with the Mobile Power Supply; the Hallicrafter HT32 AM/SSB Exciter, and the associated HT33A linear amplifier.

A Capacity Tester

USEFUL BENCH UNIT

A. R. TUNGATE (G3ELB)

FOR those, like the writer, who have collected and hoarded, among other things, a number of condensers, here is a piece of test gear which, even when connected bread-board fashion, will enable one to sort the good 'uns from the bad 'uns.

Tests required on a condenser which has been shelved for a long period, or has a dash of doubtfulness attached to it, fall into three distinct categories, namely:

(a) Check for short circuit
(b) Check for open circuit
(c) Check for capacity value

Fig. 1 shows the circuit hooked up by the writer for the purpose of checking the condensers at hand. Fig. 2 shows a suggested circuit for a more refined piece of apparatus incorporating the usual safety precautions. In view of the number of accidental "kicks" received from the first model, it is suggested that phase 2 be followed!

Circuit Points

A conventional RC smoothed power pack is employed with an isolating transformer. The heater winding of the transformer serves to give an indication of the unit being "On" through the medium of the pilot light. R2 removes the DC charge on C1/C2 when making AC tests on condensers.

For AC tests, a neon indicator with its limiting resistor R4 is connected in parallel with VR1 and its associated limiting resistor R3. For DC tests, the neon and its limiting resistor only are in circuit.

When S1 is closed, either a DC or an AC voltage is available for test purposes, selected by switch S2.

Assume that S2 is in Posn. 1; condensers can be tested for leaks and short circuits. If the condenser under test is all right, then the neon will not strike, the reason being that the

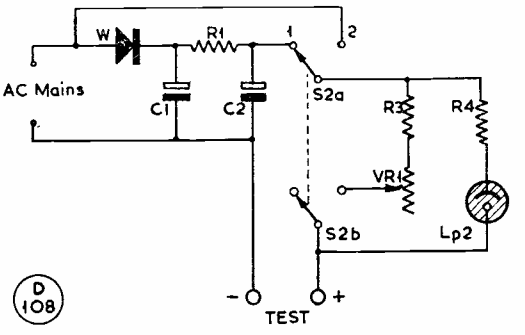


Fig. 1. The experimental layout for the Tester described in the text. This particular arrangement is not recommended for any finalised constructional form, because it is exposed to mains voltage. A better circuit, which is safer and gives the same sort of results, is shown in Fig. 2.

neon and condenser are in series, and the DC continuity path is broken by the condenser, and hence no current can flow. If, however, the neon does strike occasionally, it indicates that the condenser has a high-resistance leak. A rapid flutter or succession of flashes shows that a lower resistance is present, whilst a steady glow indicates a definite short circuit.

Having confirmed the insulation properties of the condenser under test, we now switch to Posn. 2 on S2. At this stage, it should be remembered that a condenser which is open-circuit will, on the DC test, cause the neon not to strike. The next test clears up any doubts on this point. The AC voltage fed to the condenser, *via* the neon and resistor network, will cause the neon to flash at some setting of VR1. This indicates a good condenser with no open circuits.

A condenser with an open circuit will be shown up by the neon failing to strike irrespective of the setting of VR1 throughout its traverse. Thus, a scale put on VR1 can be calibrated against a series of known sound condensers. To add to the usefulness of the unit, a number of carbon resistors can also be inserted between the test terminals, and the scale calibrated accordingly. Resistors of doubtful value can thus be checked.

On calibrating, it will be noted that the scale is cramped at one end, but not sufficiently to

Fig. 2. The finalised circuit for the Capacity Tester, of which full details are given in the article — see table for values.

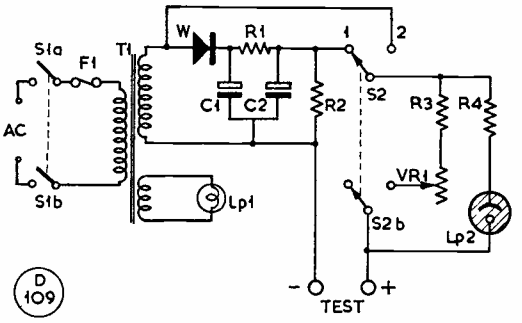


Table of Values

Circuit of the Test Unit

C1/C2 = 16 + 16 μF, 275v. electrolytic (Hunts JFQ255)
R1, R3 = 6,800 ohms ¼ watt (Erie 8)
R2 = 470,000 ohms ½ watt (Erie 9)
R4 = 220,000 ohms ¼ watt (Erie 16)
VR1 = 2 megohm carbon Pot'meter. (Egen)
S1 = DPST switch (Bulgin)
S2 = DPDT switch (Bulgin)
T1 = 250v. HT, 6.3v. LT (Radiospares)
W1 = Westinghouse Contact rectifier Type 18RA
F1 = Cartridge fuse and holder (150mA) Belling-Lee
Lp1 = 6.5v. Pilot lamp
Lp2 = Neon indicator, Bulgin Type G

cause difficulty in reading off a value.

Finally, don't put those electrolytics across the test terminals, and switch to Posn. 2. When testing electrolytics, observe the *polarity* of the test terminals, and remember, only the leaks can be checked here.

All-Band Balun Unit

75 OHMS UNBALANCED INTO 300 OHMS BALANCED

A. C. EDWARDS (G3KGN)

THE transmitter in use at the writer's QTH incorporates a pi-network tank circuit designed for feeding into low impedance coaxial cable — which method of feed must be more or less universal these days for reasons often stated, and which it is not intended to repeat here. This transmitter is *completely* screened and no RF gets out except through the coaxial output socket.

An efficient 3-section low-pass filter giving at least 70 dB attenuation to all frequencies in the TV region follows the transmitter, and as a result direct feed into a ground plane or similar low impedance aerial is possible without any TVI — and that in an area of only moderate TV signal level.

Recently it was desired to feed several aerials with 300-ohm balanced feeder and a matching device was therefore required to match the 75-ohm unbalanced output from the transmitter. As no harmonics were present at the output of the low-pass filter an elaborate fully screened aerial tuning unit was considered unnecessary and the simple balancing and matching network shown in Fig. 1 was constructed.

It is interesting to note that with this circuit the condition for balancing and matching is when $\omega^2 L1.C1 = Z$, where L1 = L2 and C1 = C2 and therefore any combination of

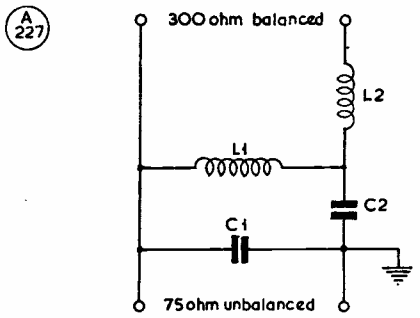


Fig. 1. Basic circuit of the balancing network, for 75 ohms into 300 ohms.

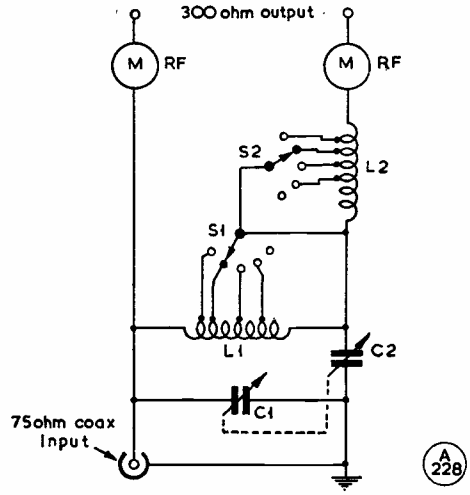


Fig. 2. A practical expression of Fig. 1, for which values are given in the table.. M are 2 amp. RF ammeters.

inductance and capacitance may be used provided they satisfy the above expression, *i.e.* that the inductive reactance is equal to twice the capacitive reactance. Convenient values to use for the various bands are given in the table and the practical circuit as constructed shown in Fig. 2.

Construction is straightforward on an open chassis with a front panel. C1 and C2 are combined as a two-gang 500 $\mu\mu$F receiving type condenser, and L1 and L2 are each 24 turns of 18g. wound 10 turns per inch on a $1\frac{3}{4}$ inch former (actually coils from a TR1196 transmitter) and tapped at 4, 6, 9 and 14 turns respectively. S1 and S2 are also ganged and are of RF24 origin. Where a one or two-band only installation is involved, the table suggests suitable coil data for each band separately.

When wiring up mount L1 and L2 at right angles to each other and see that their respective lead lengths to switches and condensers are about the same, otherwise their inductance values may not be equal.

The network is balanced by adjusting C1, C2 until the thermocouple ammeters in each arm of the line show equal current. Do this for each band in turn and note the dial reading of C1, C2 for future reference.

TABLE OF VALUES

Balun Unit

Band mc	C1 = C2 $\mu\mu$F	L1 = L2 μH	Coil Data L1 = L2
3.5	300	14	29 turns $1\frac{1}{4}$-in. dia. by 2-in. long, close wound
7	150	7	22 turns 1-in. dia. by $1\frac{1}{2}$-in. long, close wound
14	75	3.5	12 turns $1\frac{1}{4}$-in. dia. spaced out to $1\frac{1}{4}$-in. long
21	50	2.2	9 turns as above
28	37.5	1.8	8 turns 1-in. dia. spaced 1-in., self supporting

(Note: Use 16g. enamelled for coils L1 and L2).

A further application of this unit would be that of feeding a receiver with an unbalanced *input*, as is often required when a folded dipole is being used.

"RADIO VALVE DATA"

The latest edition of this well-known reference has been enlarged and made easier to use. It now contains operating data on over 3,000 British and American radio valves, transistors, rectifiers and cathode-ray tubes. Twenty British manufacturers are represented, all of whom have co-operated to ensure that the information given is accurate, comprehensive, and up-to-date. A new feature of this edition is that the valve base connection codes have been included in the index, as well as being retained in the main tables. This allows the user to find the base connections of a valve easily and quickly, without having to refer to the main tables, as was necessary in previous editions. As before, the index also includes a list of equivalents, which has been revised and expanded.

The main tables first of all classify the valves by function (frequency changers, efficiency diodes, etc.), then by manufacturers' names and finally into current, replacement or obsolete types, as recommended by the makers. Within each section the valves are listed in order of their heater voltages. A useful feature of the layout is that it enables comparison to be made between the electrical characteristics of valves from different manufacturers.

Radio Valve Data is an essential tool for every radio designer, service engineer, dealer and experimenter. This is the 6th Edition, and is published by Iliffe & Sons. Ltd.. at 5s. 9d. post free. It is obtainable through our Publications Dept.

RADIO INTERFERENCE REGULATIONS

Regulations designed to reduce electrical interference with wireless telegraphy, including domestic radio and television receivers, are being prepared following acceptance by the Postmaster General of recommendations by the Committee set up to advise him. The Committee has been studying interference caused by industrial, scientific and medical radio-frequency apparatus and has now made its first report. It recommends that there should be regulations covering the manufacture and use of new electro-medical equipment and on the use of existing apparatus of this type; also that those dealing with new equipment should come into force one year after being laid before Parliament, and those dealing with existing equipment in three years.

The Committee has also recommended, in principle, that there should be regulations on the manufacture and use of industrial radio-frequency apparatus. It intends to make further study both of this and of other scientific equipment before making final recommendations.

SWL NUMBERING SYSTEM

Further to the note on p.363 of the September issue of SHORT WAVE MAGAZINE, we are issuing SWL numbers in the sequence G-L001, GM-L002, G-L003, GI-L004, G-L005, and so on, *i.e.* the L-numbers run on, but take the appropriate U.K. prefix. There can thus be no confusion with any other system of SWL identification.

WOBURN MOBILE RALLY

SUNDAY, SEPTEMBER 14 — IN PERFECT WEATHER

THE suitability of Woburn Park as a Rally centre having already been established, it only needed a fine, warm day to ensure the success of this year's event, held on Sunday, September 14. The organisers —the "Woburn Abbey Mobile Rally Group"—got the weather and the attendance. The mobiles came from all parts of the country, and the total attendance, in terms of people on the ground, could not have been less than about 500. Most were in family groups, with a picnic, for which the weather and the setting were ideal. Fortunately for the family man, Woburn Park is the sort of place where there is plenty to do and to see, so the family can be left to themselves if they have no interest in the radio activities.

By arrangement with the Bedford Estate Office, a special Rally car park had been roped off, and this again was divided into two enclosures, one being reserved for the mobiles entered for the competition for the best home-built installation; for this, nearly 60 cars were paraded for the judges. They selected G8TL (Theydon Bois, Essex) for first prize, in his Wolseley OJN-717; G3GXZ (South Wigston, Leics.) was placed second, with Ford Zephyr PNB-554; and G6NW (Hayes, Middlesex), in Ford Thames 261-MMG, was awarded third prize. Judging for this event went on all the afternoon, while people strolled about discussing other people's mobile gear, meeting friends, and making personal QSO's. With the forest of mobile aerials on the ground, there was plenty to see, and to discuss. Among the many well-known callsigns present, old timer and post-war, was Gerry Marcuse, G2NM, surely the G.O.M. of Amateur Radio, and as keen and as active as ever; he had come up all the way from Bosham, Sussex.

As last year, the two-metre talk-in station signed G3FZL/P and had plenty of traffic (but no Aurora opening this time!). For Top Band, G3IIR/P worked the talk-in, and he was very busy indeed from about 11.00 a.m., when the mobiles started coming into range; in fact, the congestion on 160 metres was severe during the morning, and by 12.30 the band was full of /M calls, not all of them succeeding in making contacts. A number of Top Band stations in the Beds./North Bucks. area came on to work the mobiles, and altogether it was a good party, both on the air and off it at the Rally. The organisers are to be congratulated on a very successful and well-managed event; it was after 7.00 p.m before the last of the visitors set out for home.

Finally, readers who operate /M and are not yet in the Mobile Register are reminded that they should send in the necessary details—*see* July-September issues SHORT WAVE MAGAZINE—while those who have taken action since the last List appeared will be entered in the Fourth List, to be published as soon as sufficient cards are received.

CARDS IN THE BOX

Cards are held for the under-mentioned, who are asked to send a large s.a.e., with name and callsign, to: BCM/QSL, London, W.C.1. This is a full and sufficient address for the QSL Bureau operated by us. If publication of the callsign/address in "New QTH's" and the *Radio Amateur Call Book*, for which we are U.K. agents, is also wanted, that should be mentioned when sending for the cards.

G2AWD, 2CPU, 2HBK, 2HRL, 2US, 3AP, 3AWQ, 3BFN, 3CEA, 3FFJ, 3FMU, 3GIV, 3GZN, 3HHI, 3HHL, 3HLU, 3IHK, 3MNR, 3MTI, 3MUT, 3MVF, 3MWI, 3QT, 5VK, 6FU, 6RG, 8FK, GI3MMF, 3ZF, GM3GVJ. 3KIQ, 3RQ, GW3GSK, 3MVE.

ATOMIC TIME STANDARDS

The results obtained at the National Physical Laboratory from a comparison of British and American atomic standards of frequency, or "atomic" clocks, were announced recently. The two standards were constructed quite independently, and although they both employ the same spectral line of the metal caesium, they differ markedly in mechanical and electrical details, and in their operation. Comparisons between the two systems had already been made by means of radio transmission, but two different methods gave different results, and the average result indicated that the British clock was gaining relative to the American clock by seven parts in ten thousand million (which is less than a ten-thousandth part of a second per day). This might be regarded as quite a good result, but it was a bigger difference than had been expected and was large enough to be troublesome in some modern applications of radio. The International Union of Scientific Radio and the International Committee of Weights and Measures stressed the importance of a direct comparison freed from possible errors caused by the radio link.

Two "Atomichrons," made by the National Company, Inc., of Malden, Mass., were loaned for the purpose by the U.S. Army Signal Engineering Laboratory, and the National Company (who are manufacturers of the HRO receiver) also provided a third experimental model. All three have been installed at Teddington, with the National Physical Laboratory standard—caesium resonator. American scientists from the Signal Corps and the National Company have co-operated in taking the measurements.

The results now show that the American standards are, on the average, gaining slightly on the British standard, but by less than four parts in ten thousand million, and the side-by-side tests revealed the cause of a part of this discrepancy. These measurements constitute the most accurate international comparisons ever made and, in addition, provided those concerned with a good opportunity for friendly interchange of experience and ideas in this new field.

NEW QTH's

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

G2AGK, T. Parton, 718-A Alum Rock Road, Birmingham, 8. (*Tel.: EAS 1866.*) (*Re-issue.*)

GW3HXX, L. Jenkins, B.E.M. (*ex-VS6BO*), 26 George Street, Penygraig, Rhondda Valley, Glam.

G3MNE, C. E. Stevenson, 25 Boundary Road, Barking, Essex.

GW3MRI, D. C. J. Green, 36 St. Augustine Road, Heath, Cardiff, Glam. (*Tel.: Rhiwbina 81863.*)

G3MSP, H. J. B. O'n. Western, c/o Sgts.' Mess, R.A.F. Station, Watton, Thetford, Norfolk.

G3MSZ, Amateur Radio Club, R.A.F. Station, Watton, Thetford, Norfolk.

G3MUD, G. K. Drummond, 1 Victoria Street, Gosport, Hants.

G3MVK, L. R. Davies, Holly House, Holly Road, Dawley, nr. Wellington, Shropshire.

G3MVS, L. C. Bodycombe, 21 Grieves Road, Northfleet, Gravesend, Kent. (*Tel.: Gravesend 2586.*)

G3MVX, J. Burke, 72 Quebec Road, St. Leonards-on-Sea, Sussex.

G3MWB, W. C. Povey, 35 Valley Road, Newbury, Berks.

G3MWU, R. Mc.Crerie, 93 Vale Road, Northfleet, Gravesend, Kent.

G3MWY, F. C. Jones, 16 East Way, Shirley, Surrey. (*Tel.: Springpark 4110.*)

G3MXA, B. S. Collins, 1 Dewey Avenue, Aintree, Liverpool, 9.

G3MXH, T. E. Downing, 16 Purleigh Avenue, Woodford Bridge, Essex.

G3MXJ, D. J. Andrews, 42 The Fairway, Gravesend, Kent.

G3MXK, D. R. Paice, 55 Uplands Road, Hornsey, London, N.8.

G3MXO, D. V. Walters, 161 St. Saviours Road, Birmingham, 8.

G3MXT, G. V. Entwisle, 13 Blantyre Street, Winton, Eccles, nr. Manchester, Lancs.

G3MXZ, R. Wesson, 4 Napier Street, Middlesbrough, Yorkshire.

G3MYF, W. H. Walton, 42 Blossomgate, Ripon, Yorkshire.

G3MYG, R. M. F. Inman, 26 Sydney Road, Muswell Hill, London, N.10.

GM3MYJ, J. Graham, Fernlea, Northcote Street, Wick, Caithness.

G3MYS, H. E. Bagguley, Glen Haven, Lime Grove, Forest Town, Mansfield, Notts.

GW3MYZ, P. Nicholson, 22 West View, Mold, Flintshire.

G3MZB, G. A. Ward, 8 Bilsby Close, Ermine Estate, Lincoln, Lincs.

CHANGE OF ADDRESS

EI5P, P. Fitzsimons, 85 Collins Avenue, Whitehall, Dublin. (*Tel.: Dublin 335983.*)

G2BLA, M. A. Pyle, 16 Dudley Hill Close, Welwyn, Herts. (*Tel.: Welwyn 685.*)

GW2CAS, 8 Archer Road, Penarth, Glam., South Wales.

GM2DPW, J. H. McEwing, 33 Hazelwood Avenue, Newton Mearns, Renfrewshire. (*Tel.: Giffnock 5964.*)

G3ASC, E. D. Power, High Pastures, Sweeney Mountain, Oswestry, Shropshire. (*Tel.: Oswestry 500.*)

G3BJN, T. L. Johnson, Ringsfield, Fifth Avenue, Burnley, Lancs.

G3CKQ, B. C. Oldham, 7 Braunstone Lane East, Braunstone, Leicester. (*Tel.: Leicester 824184.*)

G3CLK, K. J. Vickery, 72 The Drive, Bexley, Kent.

G3DOJ, W. J. Omer, 81 Eastfield Road, Burnham, Bucks.

G3GXD, J. E. Burnitt, A.M.I.E.E., Brooklands, Hampreston Lane, Longham, Dorset.

G3HLU, F/Lt. L. G. Foley, D.S.O., R.A.F., 69 O.M.Q., Royal Air Force, Finningley, Doncaster, Yorkshire.

G3HMO, J. M. Osborne, M.A., 61 Eccleston Square, London, S.W.1.

G3IKC, G. A. Leicester, 153 Park Road, Chiswick, London, W.4.

G3ITF, B. S. Freeman, 289 Kempshott Lane, Basingstoke, Hants.

G3JCH, J. Harvey, 343 Ripple Road, Barking, Essex.

G3JIB, D. F. Shaw, 6 Erith Road, Oldham, Lancs.

G3KHE, G. E. Hayes, 19 Monmouth Drive, Sutton Coldfield, Warks.

G3KOG, W. J. Blanchard, 17 Riverview Avenue, N. Ferriby, Yorkshire.

G3KVA, J. C. Hall, 18 Plaford Road, Norwich, Norfolk.

G3KWC, D. Page (*ex-VS6DF*), 5 Rock Terrace, Stamford, Lincs.

G3KXB, D. E. Pantony, Caerglow, Tyland Lane, Sandling, Maidstone, Kent.

G3KYE, J. Orr, 77 St. Benedict's Road, Small Heath, Birmingham, 10.

G3LEL, R. G. Lunt, Parkfield House, Park Road, Meols, Wirral, Cheshire.

G3LXD, J. L. Hawkins (*ex-DL2XH*), 4 Houston Road, Forest Hill, London, S.E.23.

G3MEK, N. Gaunt, 38 Skaife Road, Sale Moor, Sale, Cheshire.

G3MJI, R. G. Ford, Sybden Gt. Gaddesden, Hemel Hempstead, Herts.

G5SN, N. Skinner, 1775 London Road, Leigh-on-Sea, Essex. (*Tel.: Hadleigh, Essex 58335.*)

G8UO, H. Beadle, 12 Cartmel Road, Highfield, Keighley, Yorkshire.

U.K. AMATEUR LICENCE TOTALS

We are informed by the Post Office that, as at August 31, there were 8,291 British amateur licences in issue: this represents a nett increase of 129 in the three months June-August this year. There are now 608 /M licences out, and 73 /T. It is still very difficult to reconcile these latter figures with the known mobile and amateur-TV activity! Either a lot of people are keeping very much to themselves, or they are paying for facilities they are not actually using.

THE MONTH WITH THE CLUBS

By *"Club Secretary"*

(Deadline for November Issue : OCT. 17th)

ON the adjoining page we publish the rules for the Thirteenth **MAGAZINE CLUB CONTEST,** which takes place on **November 15-16** and **November 22-23.** Clubs are advised to study them well and to make their preparations for the event accordingly. In particular, we ask them once again to check on para. 6, concerning the Logs, for we can assure them that it will be necessary to disqualify Clubs whose logs do not conform to the very simple rules laid down.

Last year "MCC" attracted the record-breaking entry of 39 Clubs, and this time we confidently expect to see the 40 mark passed. Interested Clubs should *not* leave their decision to enter until the last minute, but start preparing now. Aerial systems can be overhauled while the weather still permits it; Club transmitters may be worked on at the next few meetings; operators, log-keepers and tea-boys can be organised. In short, a well-run Club can enter for this contest on a methodical basis, without the slightest excuse for a last-minute rush.

Newcomers need have no inferiority complex; those Clubs that habitually figure in the top ten have no magic formula to aid them. Good steady operating of a well-designed station should permit the full number of contacts with the other competing Clubs in the time provided, without any break-neck rush or 40 w.p.m. sending.

In any case such a Contest is well worth entering for its own sake—the main object is to give Clubs an opportunity for a pleasant get-together on a friendly competitive basis, rather than to subject them to twelve hours of pain-and-strain! And, of course, it is one way of giving members a chance to gain contest experience.

Brighton will meet on October 7 for two Films on Electric Motors; on the 14th for "Fundamentals, Part IV." and a Morse class; on the 21st for a Recorded Lecture; and on the 28th for their AGM. All four meetings at The Eagle Inn, Gloucester Road, Brighton 1.

Derby will hear a Recorded Lecture on October 8; on the 15th and 22nd they have Open Evenings; on the 29th a Film Show; and from the 17th until the 25th they will be busy at the SSAFA Exhibition.

Flintshire have a Junk Sale and Auction for their meeting on October 6, 7.30 p.m. On November 3 they will run a Film Show—both events at the Railway Hotel, Prestatyn. **Leicester** have a "free night" on October 6, and again on the 20th: on October 13 G3HDG will be giving a talk, and on the 27th the speaker will be G3AWM.

Mitcham are gathering for G6CJ's famous Aerials lecture and demonstration on October 10; on the 24th they will have the Club Station on the air, and November 7 is the date for their Junk Sale. **Tees-side** will hear about Frequency Checking from their secretary, G3JMO, on October 10. Their Annual Supper has been transferred from October 24 to the following day, when it will be held at 8 p.m. at Settlement House, Newport Road, Middlesbrough. All visitors will be welcome; reservations to the hon. sec. (*see* panel). Their recent effort at the Middlesbrough Horticultural and Handicrafts Show was very successful, with G3LXG/A operating Top Band and Eighty, and G3KBD/A on Forty.

Thames Valley hold their monthly meeting on October 8 at the Carnarvon Castle Hotel, Hampton Court, when they will hear a talk about the A.A.'s Radio Communications Dept. They will also have a discussion and *post mortem* on the Club's own field day contest, a September event. Plans are in hand for the Annual Ladies' Festival, to be held at the Club Headquarters on December 6.

Cornish met at the Cornwall Technical College, near Redruth, for their last assembly, at which the topic was Transistors, by G3CZZ. They also ran a station from the Model Engineering Exhibition, in the same town, for a week. H.R.H. Prince Chula of Thailand opened the exhibition and spent a great deal of time on the Club's stand.

Dorking will be meeting during the winter months at the Star and Garter Hotel, Dorking, 8 p.m. on the second and fourth Tuesdays. On October 28 there will be a Film Show. Local stations operate a Top-Band net from 2230 onwards, every Thursday.

Liverpool, who run their own news-letter called "*5 and 9,*" were badly shaken by the closing of the Wavertree Community Centre, where they have met for so long. They have now been able to arrange for weekly meetings (Tuesdays at 7.30 p.m.) at the Salisbury Mission Hall, Queens Drive, Childwall—opposite the Signal House TA Centre, Score Lane. Buses 61 and 81 pass the door. Non-members wishing to visit are asked to note.

Reports for this space must reach us by the date given each month at the head of the article. The club honorary secretary's name, callsign (if any) and full address must be included in the report, which should be sent to: "Club Secretary," Short Wave Magazine, 55 Victoria Street, London, S.W.1. There is no charge for insertion, and we welcome reports from any club group.

North Kent forward their voluminous *News Letter*, from which we gather that their September meetings consisted of a Junk Sale and a Film Show. Final details of the programme for the forthcoming season are being arranged.

Romford are holding a Junk Sale on October 7, a "Tape Quiz" on the 14th, a TV Servicing Demonstration on the 21st and an outside visit (to be announced later) on the 28th. November 4 is booked for a lecture by G8PP on Overseas Communications. **Acton, Brentford and Chiswick** continue to run Morse classes for new members every Tuesday, 7.30 p.m. On October 21 G5LQ will be giving a talk on Low Power working at the Clubroom, 66 High Road, Chiswick.

Aldershot are drawing up their autumn programme and will be meeting fortnightly at The Cannon, Aldershot (alternate Wednesdays). Among other attractions they have a Competition with a prize of £5 for the best piece of home-built equipment.

Bury, meeting at the George Hotel, Kay Gardens, at 8 p.m., announce a Junk Sale for October 14, and a lecture by G2IG on SSB for November 11.

Derby (Short Wave Experimental Society) have a Junk Sale on October 9, a lecture on TV Transmission by G3OZ on the 16th, to be continued on the 23rd, a tape lecture on Mobile Operation on the 30th, and a Film Show on November 6. Meetings are also held on Sunday mornings at 10.30 a.m. with no fixed programme, and the Club Room (Nunsfield House, Boulton Street, Alvaston) is available at any time.

East Kent meet at the Canterbury Technical College, Longport Street, every Tuesday at 7.30 p.m. R.A.E. classes are being given by G3MDO and Morse classes by G3LIG and G3MDT. **Newbury** are holding their Annual Hamfest on October 19, 3 p.m. at Elliotts' Canteen, West Street. Tickets are 7s. 6d. from the hon. sec. and early booking is requested. They will be interested to see Mobile visitors and G3IPR/A will be on 1900 kc, to talk them in. Normal meetings are held every Friday at 7.30 p.m.

Preston are putting on a stand at their Rotary Club's Hobbies Exhibition, from October 15 to 18. Apart from the static display they will be operating GB3PRS on all bands from Ten to One-Sixty during the afternoons and evenings—special QSL cards will be sent out. On October 29 they are due to visit Rediffusion at Inskip, near Preston. The clubroom is at the Fruiterers' Club, High Street.

Lothians meet on alternate Thursdays at 25 Charlotte Square, Edinburgh, and on October 9 a Junk Sale will be held. On October 23 GM3HOQ will talk on Tape Recording, and on November 6 GM3KIG's talk is entitled "Three Years on Five Watts." A party will also be visiting the TV Studios in Glasgow on November 5.

Southgate, Finchley and District meet at Arnos School. Wilmer Way, on October 9 for a talk by G6OT on Stereophonic Recording. GB3SRA, from the Friern Barnet Show, had a successful time despite severe thunderstorms and damage to one

MCC—THIRTEENTH ANNUAL TOP BAND CLUB TRANSMITTING CONTEST

RULES

1. ***Duration:*** Saturday, November 15; Sunday, November 16; Saturday, November 22; Sunday, November 23. On each of these days between the hours of 1600 and 1900 GMT (twelve operating hours in all).

2. ***Frequency and Power:*** All contacts will be made in the 1800-2000 kc amateur band, using CW only, 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 this is nominated as their official entry by the Club Committee.

4. ***Calling:*** Club stations will call "CQ MCC" and will sign off at the end of each transmission with "AR MCC K" or "AR MCC VA." Clubs in contact with one another will identify themselves by giving, after the RST report, "QRA" instead of "QTH," followed by the name of the Club. Abbreviated forms are permitted, *e.g.* "QRA SRC Club" or "QRA Grafton Club," but the word **Club** must be sent in every case. Clubs working non-Club stations will send their QRA and log the other station's QTH.

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 only once during the whole period of the Contest and will count for *one point.* The three points for an inter-Club contact will not be claimed unless the QRA and the word *Club* have been logged. Thus any Club station may be worked four times, for twelve points, but all other amateur stations once only, for one point.

6. ***Logs:*** Contest logs to be set out as follows: Quarto or foolscap sheets should be ruled into seven columns, headed: Col. 1, *Date and Time.* Col. 2, *Call of Station Worked.* Col. 3, *QRA, if Club.* Col. 4, *QTH, if non-Club.* Col. 5, *RST, outwards.* Col. 6, *RST, inwards.* Col. 7, *Points claimed for contact* (3 *or* 1). Col. 7 must be totalled at the bottom of each page and the running totals brought forward.
   The last page should contain the following summary: Club contacts (number) at 3 points each:—total figure. Non-Club contacts (number) at one point each:—total figure—Grand Total. Comments on experiences during the Contest, equipment used, number of operators employed, and general impressions of the event are invited, and should be added to the foot of the log.

7. Any Club stations receiving reports consistently worse than T9 will be liable to disqualification.

8. Logs, addressed to "Club Secretary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1., must be posted to reach us by **Wednesday, December 3, 1958.** The Editor's decision on the results will be final, and will be published in the January, 1959 issue of *Short Wave Magazine.*

aerial. Eight operators were at work during the session.

Stoke-on-Trent meet every Thursday at The Cottage, Oak Hill, but on alternate Thursdays members are transported to the "Country QTH" at Hulme, a small village 750-ft. up, and five or six miles from Stoke. At this spot the work on the single-storey building is now complete, and an aerial farm includes a 250-ft.-long wire—all this sounds to be a very interesting Club project. R.A.E. assistance is available for the next exam., and the Club Tx, G3GBU, will be active in MCC.

Sutton Coldfield now have their autumn programme in operation, and on October 16 there will be a lecture and demonstration on Microphones, by the BBC. The A.G.M. is on November 6, and normal meetings are on the first and third Thursday, at the Y.M.C.A. G3DMV has succeeded G3JFZ as secretary (*see* panel for QTH).

The site near Lake Bala, Merioneth, where members of Wirral A.R.S. signed GW3CSG/A and GW3EGX/A on Top Band during the (very wet) week-end of August 15-16. In this photograph, G3EGX is operating, with G3CSG on the left. Their outstanding QSO was a phone contact with GM3OM, Stirlingshire.

Whitchurch, only recently formed, now have a membership of twenty, and meet in the Old Grammar School Buildings at three-weekly intervals. They have organised a general radio course under the auspices of the Shropshire Education Authority, at the Whitchurch Evening Institute, the instructor being the Club chairman, G3DUC. Visitors and new members will be cordially welcomed.

Wirral will be holding their AGM on October 3, 8 p.m. at 4 Hamilton Square. October 17 will be a Mystery Night — no further details available! Membership is still growing, but there is room for more. Morse instruction and an R.A.E. class are among the attractions. During the week-end October 11-12, a party of Wirral members will be on an expedition to the Lake District, signing G3CSG/A, G3EGX/A and G3LCI/A on all bands, Top to Two inclusive.

Stockport will be hearing about Silicon Diodes on October 8 and consuming a Hot-Pot Supper on the 22nd. Membership is now up to the very healthy figure of 60, of whom several will be taking the R.A.E. course this season. Meetings are on Wednesdays at the Blossoms Hotel, Buxton Road—new members always welcome.

NAMES AND ADDRESSES OF CLUB SECRETARIES REPORTING IN THIS ISSUE:

ACTON-BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, London, W.3.
ALDERSHOT: S. E. Hume, 25 Kingsway, Aldershot.
BRIGHTON: R. Purdy, 37 Bond Street, Brighton 1.
BURY: L. Robinson, 56 Avondale Avenue, Bury.
CORNISH: J. Brown, G3LPB, Marlborough Farm, Falmouth.
DERBY (A.R.S.): F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby.
DERBY (S.W.Exp.S.): J. Anthony, G3KQF, 56 Sherwood Street, Derby.
DORKING: J. Greenwell, G3AEZ, Wigmore Lodge, Beare Green, Dorking.
EAST KENT: D. Williams, G3MDO, Llandogo, Bridge, near Canterbury.
FLINTSHIRE: J. Thornton Lawrence, GW3JGA, Perranporth, East Avenue, Bryn Newydd, Prestatyn.
LEICESTER: P. G. Goadby, G3MCP, 535 Welford Road, Leeds.
LIVERPOOL: W. D. Wardle, G3EWZ, 16 Mendip Road, Liverpool 15.
LOTHIANS: L. Lumsden, 33 Hillview Drive, Edinburgh 12.
MITCHAM: D. Johnston, 23 Woodland Way, Mitcham.
NEWBURY: J. A. Gale, G3LLK, Wild Hedges, Crookham Common, near Newbury.
NORTH KENT: D. W. Wooderson, G3HKX, 39 Woolwich Road, Bexleyheath.
PRESTON: G. Lancefield, G3DWQ, 35 Brixton Road, Frenchwood, Preston.
ROMFORD: L. S. Owen, G3MDP, 53 Applegarth Drive, Newbury Park, Ilford.
SOUTHGATE: A. G. Edwards, G3MBL, 244 Ballards Lane, London, N.12.
STOCKPORT: G. R. Phillips, G3FYE, 7 Germans Buildings, Buxton Road, Stockport.
STOKE-ON-TRENT: W. Luscott, 36 Rothsay Avenue, Sneyd Green, Hanley, Stoke-on-Trent.
SUTTON COLDFIELD: K. H. Varney, G3DMV, 149 Whitehouse Common Road, Sutton Coldfield.
TEES SIDE: A. L. Taylor, G3JMO, 12 Endsleigh Drive, Middlesbrough.
THAMES VALLEY: K. A. H. Rogers, G3AIU, 21 Links Road, Epsom.
WHITCHURCH: D. Earnshaw, G3LHP, Gerharden, Alkington Road, Whitchurch, Salop.
WIRRAL: H. V. Young, G3LCI, 9 Eastcroft Road, Wallasey.

PASSING THE R.A.E.

A survey by the City & Guilds shows that of the 726 candidates sitting this year's Radio Amateur Examination, 335 took a course of instruction beforehand, and 381 did not. Of the 335, 22.1% failed, whereas of the 381, no less than 32.5% failed. The conclusion to be drawn is obvious: If you can possibly take a course in preparation for the Examination, do so. Some notes on the subject appeared on p.325 of the August and p.382 of the September issue of SHORT WAVE MAGAZINE.

OUTING ON TOP BAND

WIRRAL MEMBERS IN MERIONETH

MEMBERS of the Wirral Radio Society operated from the " rare " (Top Band) county of Merioneth during the evening and morning of August 15-16. The calls were GW3EGX/A and GW3CSG/A and the QTH near Lake Bala.

Conditions were foul, in every sense of the word — an S8 static level and the weather normal (raining like fury) — but notwithstanding these deterrents, a goodly number of stations got a contact needed for WABC. Reports were consistently S9 from all points of the compass, and the QSO that made the whole thing worth while was with GM3OM of Stirlingshire, who reported the Wirral signal as RS-58.

The venture was impromptu, without prior organisation or publicity. G3CSG, SWL Evans and G3EGX stowed the gear into Ford Prefect SKC-658 and headed in the general direction of GW working mobile on the way. The site eventually " happened on " was a valley adjacent to the Plas Rhiwaedog Youth Hostel, near Lake Bala, and the kind co-operation of the Warden and his wife did much to make the whole thing possible. The equipment was a Top Band transmitter and HRO receiver. A kite-borne aerial was tried unsuccessfully, due to waterlogging and a lot of time was wasted extricating it from a tree. Finally, the kite wire, end fed and about 300 ft. long, was slung between convenient trees, and GW3EGX/A was on the air. Contacts came thick and fast from 2130 to 0200 BST, when the operators turned in.

It is hoped to be in the Lake District during October 11-12, operating on all bands Top to Two, when the callsigns used will be G3CSG/A, G3EGX/A and G3LCI/A, all members of Wirral.

G3EGX

RECIPROCITY — G/YU

It is understood that visitors to Yugo-Slavia who hold a U.K. amateur licence can obtain a temporary YU callsign without formality, it being only necessary to prove identity, *e.g.* passport, and G.P.O. licence.

" MODULATOR FOR SMALL TRANSMITTER "

Arising from this article, in our September issue, G3JGO (Chelmsford) suggests that with some types of " peaky " microphone, it might be advisable to introduce some top-cut by putting a 270 $\mu\mu$F condenser across R3, and .005 μF across R7. The author of the article, G3KEP (Cottingley), says that this should not be necessary unless the microphone does give excessive output at the higher audio frequencies, *e.g.* some of the deaf-aid crystal types available are actually rejects for this reason. What it comes to, therefore, is that " toppy " speech can be corrected by introducing these additional capacities, which are a matter for experiment with the microphone to be used.

SMALL ADVERTISEMENTS

("SITUATIONS" AND "TRADE")

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

TRADE

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

WANTED FOR CASH: Good clean Communication Receivers and SSB Equipment.—Short Wave (Hull) Radio, 30/32 Princes Avenue, Hull. *(Telephone No. 18953).*

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

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

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

"VANGUARD" Tx 10-80 m., little used, owner gone overseas, £50.—K. W. Electronics, Ltd., Wilmington, Kent.

READERS' ADVERTISEMENTS

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

WANTED TO PURCHASE: Handbook or Conversion Data on TME T.C.S. 12 Rx.—Box No. 2036, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: 150w. Transmitting Gear. 750v. 250 mA power packs, £4. 6ft. G.P.O. type rack, 30/-. Beam rotating mechanism, valves, components.—Seddon, Hollingreave, New Mill, Huddersfield.

FOR SALE: 5 Band CW/Phone self-contained table-topper: VFO/xtal, Labgear WBM, 807 final, Geloso pi-tank, 6L6's Class-AB1 modulator, single-switch relay control includes netting facility, EX-T.1154 1200v. 200 mA power pack. Consider exchange, SX28, AR88 or similar, with adjustment.—Offers and information, s.a.e. please to: G3MJQ, Burdens Cottage, All Cannings, Devizes, Wilts.

SALE: 300v. p/pack, converter for 21 and 28 mc, part-built Tx, absorption wavemeter, quantity valves and other components, £8. Also 5ft. standard rack, £1. Buyer collects. — 52 Robertson Street, Airdrie, Scotland.

SMALL ADVERTISEMENTS, READERS—*continued*

RF26 19/6, RF24 12/6, RF25 9/6, brand new in original cartons, postage 3/6.—R. Jay, 69 Church Road, Moseley, Birmingham 20.

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

PLEASE can anyone help? December 1953 copy of *Short Wave Magazine* wanted, buy or borrow.—Wood, 82 Avenue Road, St. Neots, Hunts.

PANDA PR120V, as new, perfect order, £70. 3-el 10-metre Beam, £8. R.208 Receiver, £6. Variac, £5.—G8TY, 92 Arlington Road, Southgate, N.14. *(Ent. 3219).*

FOR SALE: Marconi B-28 (CR.100), £13.—Phone *GULliver 1487* (London) after 6.30 p.m.

MOBILE EQUIPMENT for sale: Gonset "Super 6" converter, can be used with Car Radio, 12-volt, perfect working order, £15. Mobile Transmitter 10-15-20 metres, with VFO, £15. All suitable for mounting under dashboard of small car.—Farlow, G3BXI, 55 Mount Pleasant Road, Chigwell, Essex. *(HA1 4546).*

WANTED: Eddystone or similar receiver, S-meter, recent model in new condition essential, also radio and Morse course.—Matthews, 40 Braedale Avenue, Motherwell, Lanarkshire.

CLEARANCE of Surplus Gear: Labgear Low Pass Filter, £3; s.a.e. for list, including valves, books, magazines.—Richardson, 170 Orchard Way, Croydon, Surrey.

MINIMITTER purchased late 1956, complete with filter, used possibly 30 hours. Located on centre South Coast, nearest offer to £65.—Box No. 2038, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

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

WANTED: Unmodified Post Office double-current key, with glass cover and send-receive switch.—G2NS, 7 Foxholes Road, Southbourne, Bournemouth, Hants.

TIGER TR60B Table Topper, all bands 160—10, 60 watts Phone-CW. 807 PA, 807's Mod., built-in LP filter, perfect, as new condition, £60; s.a.e. full details.—G2HNO, 52 Seafield Road, Southbourne, Bournemouth, Hants.

WANTED: Circuit for Type R.1355 War Surplus.—ZL1SY, 3 Rutland Road, Panmure, New Zealand.

FOR SALE: 80w. Modulator, 750/350/LT/24v. power pack, complete in case, 1000v. p/pack, Labgear Standing Wave Ratio Meter, Tx, Low-Pass Filter, WB Multiplier, Wavemeter 23-60 mc, cabinets, meters, sundries; s.a.e. list.—Yates, 63 Birley Road, Whetstone, London, N.20. *(HILlside 6994).*

SMALL ADVERTISEMENTS, READERS—*continued*

WANTED : BC-221, preferably metal cased ; also Rx R.103 (Canadian). — Box No. 2040, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE : HRO, rack mounting, ANL, 5 coils (three b'Spread), power pack, £17 o.n.o. Also HRO drive mechanism, with dial Type 78A, Twin coaxial relay, 12/24 volts, silver-plated, what offers? All delivered London Area. — G3BFP, 5 Ridgemount Avenue, Shirley, Croydon, Surrey.

G5RV designed Tx, 80/40/20 metres, 6C4-6SG7-6AG7-6V6-807-6F6-VR150/0, bandswitched, wide-band couplers, power control, £9. S.640 Receiver, perfect, with manual, £18. Etronic 3 waveband superhet case, £4. Over 60 records, most swing/jazz, £4 (s.a.e. list). 10-20 metre pre-selector, £3. ITV Converter (ECC81), 30/-. BC-453 complete, but needs attention, 30/-. RF25 (new), 7/6.—Box No. 2041, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE : Eddystone "888," condition as new, complete with S-meter and mounting blocks, purchased "888A," price £75. — Desmond, G5VM, Compton, Meriden Road, Hampton-in-Arden, Warwickshire.

CR100 new case, dials, tuning scales, manual, twelve new valves, re-aligned Marconi's, £20 o.n.o. — 12 Cleveland Avenue, Mumbles, Swansea, Glam.

750 with S-meter, as new, £45, carr. paid. Wanted : 680X, new condition, Notts.—Box No. 2042, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

EDDYSTONE 840A, 24 months old, hardly used, 15 : performance, appearance, as new, never troubled, original packing, literature, etc., £36 only.—Box No. 2043, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

TU6 Tuning Unit, 6/- ; CR-100 mains transformers, 21/6 ; Headphones, 7/6 ; microphone, 1/6 ; relays, 3/6 each ; BC-625 transmitter, 50/-. P.58 Receiver, £6 10s. 0d. BC-221, TS-174/U, TS-175/U, offers? All new, plus carr., s.a.e.—Wright, 4A Nepal Avenue, Atherton, Manchester.

WANTED : Miniature or sub-miniature Rx and Tx, or Transceiver, covering 40/20 metres, CW or CW/Phone, complete with power supply, must be in first-class condition, full details to.—G3KUB, 23 Hill Farm, Whipsnade, Dunstable, Beds.

[*continued p. 448*

SMALL ADVERTISEMENTS, READERS—*continued*

LUCKY DIP: 64 used valves, 30/-. Seven Telefunken RV.12P.2000, six holders, used, offers? Qualtape Deck, OK speech, 55/-; Rexine case for same, 12/-. Grampian M/C mike, type MCR, with transformer, £3. Two 6in. speakers, 9/6 each; 4in., 6/6. VCR97, 13/6. 1949/51/54/55 *Practical Wireless* complete; 1950/52/53/57 nine missing, offers?—GW3MFY, Avondale, Bryntirion Hill, Bridgend, Glam.

WANTED: Panda Transmitter type PR-120V, with ATU and low-pass filter, must be in good condition, state price. Selling Hallicrafters Super Skyrider SX16, 550 kc to 62 mc, in good working order, offers?—Box No. 2044, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Eddystone 640 receiver, in perfect condition, including spare set of valves and HR headphones, £17.—*Tel. Putney 8041*, or write: Hatton, 7 Grove Mews, Hammersmith, London, W.6.

CR-100 Wanted.—R. G. Bailey, 181 Prince of Wales Road, Coventry, Warks. *(Tel. Coventry 73641).*

CLEARING station on behalf of widow of the late G4GT. Offers invited for: 50w. TVI-proof Tx (80-10 metres), rack and panel construction, 3-tier, KT8C final, mod. p/p KT66, handsomely finished grey and chromium. HRO Rx, with power pack, speaker and coils; BC221-N; Marconi Receiver Tester Type TF88 (mains version) with manual; Top Band VFO-BA-PA; 2-metre Tx (829B) and Rx (both need attention); valves galore, including 810, 813, 832; meters, transformers and components. Send stamp for full list. Will sell only to genuine amateurs or SWL's—no dealers.—G3PV, 29 North Road, Berkhamsted, Herts. *(Tel. 622, day).*

G.E.C. 12-volt mobile Transmitter/Receivers BRT-175, for 70 to 180 mc, fitted with two dynamotors, 20 miniature valves, including TT15, in working order, £5. Also control boxes, dynamos, etc.—G3JTQ, 96 Saxon Avenue, Hanworth, Middx.

WANTED: S-Meter for AR77 Rx. Please state price.—M. Holmes, 6 Angiua House, Paulsgrove, Portsmouth.

GRUNDIG TK5 Tape Recorder with microphone; recently purchased; first offer 43 gns.; delivered.—Bartholomew, 2 Palace Court, Chatham, Kent.

FOR SALE: CR-100, excellent condition, £15, or exchange for receiver of smaller dimensions—HRO, BC-348, etc. — G3JYJ, 2 Madden Avenue, Chatham, Kent.

EDDYSTONE 680, £45; Minimitter Tx, ATU, LP Filter, £50.—G2DTO, Hales, 165 Longley Road, Tooting, London.

EDDYSTONE 840 for sale, as new; set new spare valves, phones; £30 (o.n.o.).—B. Champion, 69 Langley Road, Slough, Bucks. *(Phone: Slough 22194.)*

WANTED: Two-metre Converter, for low intermediate freq.; would consider complete Rx; must be in good condition. Have RF27 for disposal; clean, unmodified; 17/6. — M. Button, 7 Upper Flowerfield, Nunney, Frome, Somerset.

ROTARY CONVERTER, 230 DC/230 AC, 250 watts, £3; VHF Wave Meter G79 with meter, 30/-; Crystal Calibrator, Type 18, £1; Ardente 10-watt Amplifier, 12v. DC, with spare valve kit and mike, £2 10s.; ¾-h.p. 230 DC Motor, £2; TU5B, £1; 3in. Magslip Transmitter with repeater, £1 10s.; 3 to 4 mc BC-610 Tuning Unit, £1; Woden Trans. 425/0/425, 150 mA, 6·3 and 5v., 25/-. New Valves: QQV03/20, £1 10s. (2); 5U4G, 7/6 (2); EF80, 5/- (2); 6SN7, 5/- (2); EF91, 4/- (8). CRT's: 1in. VCR522, 3BPI, 5CP1, all at £1.—Box No. 2045, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: Eddystone ECR Communication Rx, 1·6-32 mc; xtal filter, S-meter; fitted with S/R relay, internal speaker; excellent condition; handbook. Delivery 20 miles. £30 (o.n.o.).—Rooke, 57 High Street, Wootton Bassett, Wilts. *(Tel.: 487, evenings.)*

FOR SALE: All-band Transmitter, 160-10m., band-switched; pair 807's, 75 watts, complete with power supplies, modulator 807's, UM2 Transformer in three-tier rack; £35 (o.n.o.).—P. J. Elliot, G3MFO, 17 Weighton Road, Harrow Weald, Harrow, Middlesex.

740, £25; 840, £30. Carriage paid.—R. Grain, 15 Waverley Gardens, Grays, Essex.

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