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# SHORT WAVE MAGAZINE

(GB3SWM)

Vol. XXII SEPTEMBER, 1964 No. 251

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EDITOIAL

Flashback: Twenty-five years ago this issue, the editorial — entitled "Shadow", and signed as at the foot of this page — discussed the impending close-down of Amateur Radio activity and the part radio amateurs would play consequent upon the war about to break out with Hitler's Germany, the threat of which had been hanging over us all through a glorious summer.

On September 3, 1939, the Post Office started on their task of going round all U.K. amateur stations (there were about 3,300 then licensed) and collecting what was necessary to render them inoperative for transmitting purposes.

More than six years were to pass before that gear could be returned — and in all too many cases there was no claimant for the little collection of valves, crystals and meters which had been put carefully away in a box labelled with the owner's name and callsign.

For SHORT WAVE Magazine, of course, it likewise meant a complete cessation. Our story has been told before. It was not until March 1946 that the first post-war issue of the Magazine appeared, again with the same signature at the foot of the editorial page, to pick up the threads of Amateur Radio from where they had been left in September 1939. In the U.K., the first amateur band to be opened was ten metres, and the very first post-war constructional design we published was for a 10-metre transmitter (using mainly pre-war components).

All that is now history, as 18 years later we look upon a world which, though still seriously troubled, is at least free of any threat of the imminent total war we faced 25 years ago. But preparedness is still just as essential now as it was then and, as far as the radio amateurs of today are concerned, the best contribution they can make is to do as their fathers (and, in many cases, their mothers) did — join either a reserve formation of one of the three Services, or their local Civil Defence unit.

WORLD-WIDE COMMUNICATION
TWO-METRE TRANSMITTER

FOR MOBILE, PORTABLE OR FIXED STATION WORKING
— TRANSISTORISED SPEECH AMPLIFIER AND MODULATOR
— CIRCUITRY AND GENERAL DESIGN

M. ALLENDEN (G3LTZ)

This is an interesting practical approach to the construction of transmitting apparatus for the two-metre band—on which so many newly-licensed amateurs are making a start. While it is not supposed that our contributor’s design will be copied in detail, his ideas are such that many constructors will wish to incorporate some of them in their own gear.—Editor.

The unit to be described has been in use for over a year and represents the author’s approach to the usual mobile problems of lowest power consumption, maximum power output and minimum space. The control box is added to show one method of switching and metering, and although it is unlikely that anyone would wish to duplicate this exactly, it does suggest one method of achieving the necessary control.

Circuit Description

Transmitter: Referring to the circuit diagram at Fig. 1 it will be seen that the line-up is fairly conventional. V1 is a triode pentode, the triode being used as a third overtone oscillator with switched xtals to give a choice of two channels (to combat QRM) and the pentode section is the frequency tripler. The three neon tubes, of the small indicator variety, are included to avoid a change of frequency with varying engine speed, a condition that used to exist before their inclusion. V2, an EL95, is used as a frequency doubler and was found to be a very effective valve for this particular position (an EL91 has been used here, but it has a lower anode voltage than the EL95). L3 in V2 anode circuit has to be very tightly coupled to L4 in V3 grid and is interwound with it (see photograph). L4 tunes with the stray and input capacity of V3 to 144 mc. The power amplifier, V3, is a double tetrode type QQV03-10—it will be noticed that the screen is not bypassed for RF as this was found to be unnecessary. R15, the HT feed to L5, is a small wirewound resistor, which acts also as an RF choke.

Test Points: Test points are included to monitor and tune the transmitter, either with an external 50 microamp, meter, or the meter built into the control unit via pin 8 on PL1.

SWR Unit: This is included as a useful aid to tuning, aerial matching and monitoring. It is built as a sub-assembly on a piece of printed circuit board, and is shown full size with details in Fig. 2. Forward and reflected power can be monitored, and the meter

General view of the G3LTZ transmitter in its case (left), with the control unit, constructed as a separate item — see text and Fig. 3. The PA is a double-tetrode, and some constructional details behind the panel and under the chassis are shown in the other photographs.
Layout of the two-metre Tx above the chassis. The large iron-cored item is the modulation transformer, and the smaller one is the driver transformer, T1 in the circuit, and wound to have a ratio of 20:1. The rectangular unit next to the modulator transformer is the aerial/power change-over relay. Note the vertical screen between the speech-amplifier/modulator side and the RF section, with the push-pull OC36 transistor modulator in the upper compartment.

presentation is again in the control box via pins 6 and 7 on PL1.

Aerial Switching: A small relay is used for switching the aerial from "transmit" to "receive," and no trouble was experienced with SWR despite the fact that it was not a coaxial type. A second pair of contacts switches negative 12v. to the modulator on "transmit." The relay coil is energized by returning one end to common earth, and is done via the control unit in this case, but it could be a push-to-talk arrangement on the microphone, or a foot switch.

Heaters: Trying to get a valve to do what you want functionally and then trying to combine this with similar voltage heaters and yet the lowest possible current combination is difficult; partial defeat is admitted here, and the use of R18 is to compensate for the 0.2 amp of the EL95 in series with the 0.3 amp ECL80.

Modulator: To keep the stand-by consumption as low as possible, an all-transistor modulator is used, and it is only powered during the "transmit" period.

The circuit is a conventional Class-B push-pull arrangement, with RV4 adjusting the standing current to TR4 and TR5 during the no-signal condition. TR3 is the driver stage, and although an OC36 is shown, any transistor that can produce 500 milliwatts would suffice. The pre-amplifier is built into the microphone case and receives its power from the transmitter via a 3-way cable, PL2 and SK7; with this arrangement no trouble can be experienced with RF in the front end of the amplifier. The microphone used is a low impedance electro-magnetic type.

Construction

Without squeezing too hard, all the components are comfortably housed in a case 6½in. x 4in. x 5in. The actual "case" was a tin which had contained medical supplies, the lid of which was stiffened with a 14g. aluminium facia panel. The chassis is a flat 14g. aluminium piece 6½in. x 4½in. with suitable brackets to attach the front and rear panels. An 18g. aluminium screen shields the transmitter portion from
the modulator. The photographs show the placement of the parts and not much further explanation is needed—but the arrangement of the PA grid coil should be noted, since it was found that this gave the best drive out of many configurations tried.

The power transistors TR4 and TR5 are mounted on the chassis, using mica washers to insulate them. The driver TR3 is on a small sub-panel under the chassis, near the microphone input 4-pin socket. The various tuning condensers are arranged so that they are all accessible via holes in the case when the transmitter is in situ. This allows tuning at any time using the control unit meter. Remembering that this is a mobile unit all screws and nuts are locked with a spot of enamel, and it is probably worth recording that the installation has withstood the worst of Belgian cobbles without anything coming adrift.

The control unit is made from an Eddystone diecast box, the 41in. x 3in. x 2in. deep version; the original lid is discarded, the four 4BA tapped holes filled with Araldite and then re-drilled and tapped 6BA. A 16g. plate is then cut to fit into the box to give a recessed panel. The box is mounted on the steering column to give easy access to the main control knob and to allow a good view of the meter.

Tuning

Power is supplied from a temporary power supply of +250 volts DC and 12-6 volts AC. If 12-6 volts is not available, the heaters can be temporarily arranged in parallel to accept 6-3 volts AC (12-6v. can always be obtained by connecting two 6-3v. windings in the correct phase). Wedge RLA in the "energized" position, connect a 5-watt 80-ohm carbon resistor or suitable non-reactive dummy load to SK1. Note: Lamps can be used, but with a non-reactive load (as with a correctly matched aerial) a different set of tuning and loading conditions will be needed. The loop is a 6-inch length of 70-ohm coax, double coiled, with the outer insulation removed. The inner pick-up wire is 6 inches of 30g. enamelled, connected across Dl, D2—see Fig. 1.

Table of Values

| C1, C2 | C4, C6 | C7, C9 | C11, C13 | C19, C20 | C21, C22 | C14 = 0.002 µF disc cer. | C16, C17 = 0.001 µF tub. cer. |
| C5, C6 | C8, C10 = 5-25 µµF air trimmer (Philips) | C18 = 100 µµF elect., 25v. | C23 = 1,000 µµF elect., 12v. |
| R1, R2 | R3 = 4,700 ohms, 1-w. | R4 = 2,700 ohms, 1-w. | R5 = 5,000 ohms. |
| R6, R7 | R8 = 47,000 ohms, 1-w. | R9, R10 = 82,000 ohms, 1-w. |
| R11 = 560 ohms, 1-w. | R12 = 82 ohms, 1-w. | R26 = 270 ohms, 1-w. |
| R13 = 8 ohms, 1-w. | R14 = 2.7 ohms, 1-w. | R27 = 7,200 ohms, 1-w. |
| R15 = 100 ohms, 1-w. | R16 = 270 ohms, 1-w. | R28 = 820 ohms, 1-w. |
| R17, R18 = 475 ohms, 1-w. | R19 = 150 ohms, 1-w. | R29 = 8,200 ohms, 1-w. |
| R20 = 47 ohms, 1-w. | R21 = 220 ohms, 1-w. | R30 = 2,000 ohms, 1-w. |
| R25 = 1,000 ohms, 1-w. | R26 = 10 µµF elect., 6v. | R27 = 50 ohms, 1-w. |
| R28 = 100 -ohm | R29 = 1,000 ohms, 1-w. | R30 = 5,600 ohms, 1-w. |
| R31 = 1,000 ohms, 1-w. | R32 = 150 ohms, 1-w. | R33 = 270 ohms, 1-w. |
| R34 = 82 ohms, 1-w. | R35 = 82 ohms, 1-w. | R36 = 82 ohms, 1-w. |
| R37 = 82 ohms, 1-w. | R38 = 82 ohms, 1-w. | R39 = 82 ohms, 1-w. |
| R40 = 82 ohms, 1-w. | R41 = 82 ohms, 1-w. | R42 = 82 ohms, 1-w. |
| R43 = 82 ohms, 1-w. | R44 = 82 ohms, 1-w. | R45 = 82 ohms, 1-w. |
| R46 = 82 ohms, 1-w. | R47 = 82 ohms, 1-w. | R48 = 82 ohms, 1-w. |

Notes: All resistors carbon, except as stated. T1* is of ratio 20:1, 0.4 sq. in. core, pri. 200 turns 30g., sec. 10 turns 24g. centre-tapped. T2** is 200-250v. pri., sec. 16v. centre-tapped (RadioSpares). All valves, diodes and transistors are Mullard types.
Fig. 1. Circuit complete of the two-metre transmitter described by G3LTZ. It is a four-stage arrangement, taking a QQV03-10 in the PA, and incorporates a built-in SWR indicator. The speech-amplifier/modulator is all-transistor, with OC36's in the output position. A transmitter of this type is suitable for mobile or portable working, and for fixed-station operation under QRP conditions. The detail for the SWR unit is given in Fig. 2.

**TABLE OF COIL VALUES**

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<th>Coil</th>
<th>Description</th>
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<td>RFC</td>
<td>18 turns 30g. close-wound on 1w. carbon resistor body.</td>
</tr>
<tr>
<td>L1</td>
<td>27 turns on 1-in. dia. slug-tuned former, 26g. close-wound, tapped 6t. from grid end.</td>
</tr>
<tr>
<td>L2</td>
<td>41 turns 18g. silver-plated copper, 3/16-in. dia., spaced out to about 1/2-in.</td>
</tr>
<tr>
<td>L3</td>
<td>2 turns 18g., wound on centre L4, spaced about 1/5-in.</td>
</tr>
<tr>
<td>L4</td>
<td>5 turns 16g., centre tapped, spaced over 1/10-in. total length with centre gap to take L5.</td>
</tr>
<tr>
<td>L5</td>
<td>4 turns 14g. 3/16-in. dia., spaced over 1/10-in. total length, with centre gap to take L6.</td>
</tr>
<tr>
<td>L6</td>
<td>2 turns 18g. close-spaced, to 3/16-in. diameter.</td>
</tr>
</tbody>
</table>
Fig. 3. Circuit arrangement of the control unit for the G3LTZ two-metre mobile transmitter, with its associated cable connections. S1 is 3-p, 4-w rotary; S2, 1-p, 4-w; M, 50 µA meter; Sk1, 8-way min. socket; Sk2, coax socket; R1, 3.9K; R2, 100K; RV1, 25K pre-set; and LP1, LP2, min. 12v. pea lamps, white and red.

modulator. The potentiometer RV1 is set to give lowest distortion and this will be when the total collector current of TR4 and TR5 is approximately 60 mA; this should kick up on speech to about 750 mA; the actual peak collector current will be around 1.5 amps. Final testing can only be applied when all the interconnecting leads, power supplies, etc., are all assembled in the actual vehicle in which the gear is to be used.

This article has not set out to describe a complete mobile installation as such. Obviously the transmitter described could be run as a fixed or portable unit with an appropriate mains or battery power supply. The author uses a transistorised inverter for the mobile PSU which only comes on during “transmit.” The receiver is all-transistorised, requiring only 12v. DC at 100 mA for power, and a G3JAM converter is included in the receiver. The total power consumption of the installation is: on “Rx,” 100 mA approximately; on “Stand By,” about one amp; and on “Transmit,” approximately 3.6 amps.
SIMPLIFIED ELECTRONIC KEYER

USING TWO TRANSISTORS, WITH SPEED AND MARK-SPACE RATIO CONTROL

E. DAVIES (G3PGM, ex-MD7RCS)

This keyer is a compromise between the basic dot-dash generator and the more complicated type of EI-Bug involving many valves or transistors, and in some cases demanding a stabilised PSU for successful operation.

No originality is claimed for the circuit as it is basically as used in timing devices; with some slight modifications it was made suitable for use as a CW keyer. Several models have been built up and have functioned without any trouble at all.

It is necessary to have some sort of paddle-action keying control available, and details of this need not be given as such a control is a matter of individual preference—and what can be made up to give the paddle-action. Some operators like a built-in paddle, while others prefer a separate control, mounted on a heavy base and connected to the “works” via a 3-core cable.

Circuit Action

In this circuit, to form a dot the paddle is pressed to the right; battery negative volts are then applied to the 12 \( \mu F \) condenser \( C_1 \) (the speed control) and the base of the transistor, which makes \( TR_1 \) conduct hard; collector current then flows and operates relay \( R_{y1} \). As this relay closes (to \( A_2 \) contact) it cuts off the neg. supply. But \( C_1 \) still holds a charge, and so keeps \( TR_1 \) hard on till this charge drops below a certain level. When \( C_1 \) is discharged, \( TR_1 \) stops conducting and \( R_{y1} \) opens again (to \( A_1 \) contact). At this point, if the paddle is still held over, another dot is formed—and so on, until the paddle is released.

To form a dash, the very same action takes place except that extra capacity is brought in to hold \( TR_1 \) on longer during the discharge period. Since a dash is three times as long as a dot, it follows that three times the capacity is required, which is \( 36 \mu F \). Having got \( 12 \mu F \) (\( C_1 \)) already in circuit, it is only necessary to bring in an extra \( 24 \mu F \) (\( C_2 \)) when dashes are being made, with the paddle to the left.

This is done by means of a diode \( D_1 \) placed across the key contacts in such a way as to conduct only when dashes are needed. Many diodes are not much good for this because they have a poor front-to-back ratio, which makes the action of the keyer erratic. The solution is to use the base-emitter junction of an audio-type transistor, which has been found excellent. The base is taken to the dash-contact and the emitter to the dot side of the paddle control. The collector is left open-circuit, so that the transistor functions as a diode.

Keying action should now be giving dots and dashes, with only the dot-dash ratio requiring adjustment for reasonable “following” over the normal range of keying speeds. This ratio is best adjusted by putting a small condenser, of about \( 3 \mu F \), in turn across \( C_1 \) and \( C_2 \). In prototype models of the keyer, this value was found to give a reasonable degree of correction.

With \( 3 \mu F \) across \( C_1 \), the ratio would be:

- **On Dash**, \( 12 + 24 + 3 = 39 \mu F \)
- **On Dot**, \( 12 + 3 = 15 \mu F \)

This gives a ratio of approximately 2.6:1, for Short Dashes.

With the \( 3 \mu F \) across \( C_2 \), the ratio would be:

- **On Dash**, \( 12 + 24 + 3 = 39 \mu F \)
- **On Dot**, \( 12 \mu F \) only

This gives a ratio of approximately 3.3:1, for Long Dashes.

These values give a tolerance of about 10 per cent, which should be within the average component tolerances. Obviously, this additional capacity (not shown in the circuit diagram, because it might be across either \( C_1 \) or \( C_2 \)) can be a variable factor within certain limits.

Final Adjustment

The keyer was found to be “heavy” in its action, due to the fact that the transmitter on which it was tried had a separate keying relay; it turned out that

![](image)

Table of Values

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
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<tr>
<td>( C_1 )</td>
<td>12 ( \mu F ), 12v.</td>
</tr>
<tr>
<td>( C_2 )</td>
<td>24 ( \mu F ), 12v.</td>
</tr>
<tr>
<td>( R_1, R_2 )</td>
<td>1,000 ohms</td>
</tr>
<tr>
<td>( R_3 )</td>
<td>5,000 ohms, speed control</td>
</tr>
<tr>
<td>( R_4 )</td>
<td>100-500 ohms, depending on ( R_{y2} )</td>
</tr>
</tbody>
</table>

Relays and paddle in “rest” position

R1, R2 = 500-ohm high-speed relay

TR1 = Any audio-type transistor

TR2 = Similar to TR1, used as diode (see text)
Carrier level indication (CW or phone) in Tx tests result in a burnt-out meter. Have to be taken not to over-couple, which could affect quality. A 0-1 mA instrument is used, care will always have to be taken not to over-couple, which could affect quality. As used in portable transistor sets—alternatively, a rod could be one of those small telescopic aerials incorporating the 1.5v battery, and the RF pick-up required amateur bands. Any diode can be used at the switched coil-pack, L1-L6, is made up to cover the desired frequency range. A transistor amplifier after the diode detector is usually the case. With a semiconducting material, the diode detector may be added, and the controls—speed and mark-space ratio, and on-off switch—along one side. Layout and construction are, of course, not at all critical but, whatever your own keying speed may be, the relays should be of the light, quick-acting type.

The result is a small but efficient keyer, extremely simple to build and very reliable, with most of the trimmings found in more expensive electronic types. One last word if you have never handled an El-Bug before: Practise its operation on an audio oscillator, and get yourself keying-perfect, before you try it with a transmitter on the air. And “keying-perfect” means not just the ability to make “CQ de G3XYZ,” but the ability to hear a CW QSO without faltering.

(Editorial Note: This article is based on a contribution by G3PGM to the July, 1964, issue of Mercury, journal of the Royal Signals Amateur Radio Society.)

RF MONITORING UNIT

The circuit shown here—by G5ZT, in a lecture to the Plymouth Radio Club—is of a more than usually sensitive RF indicator/monitor device, having a transistor amplifier after the diode detector. Using a 100 µF variable condenser at C2, a switched coil-pack, L1-L6, is made up to cover the required amateur bands. Any diode can be used at D, and almost any RF transistor will do for TR.

The device can be built as a self-contained unit, incorporating the 1.5v battery, and the RF pick-up rod could be one of those small telescopic aerials as used in portable transistor sets—alternatively, a piece of stiff wire about 18ins. long would do.

Coupling to the RF source (Tx, or transmitting aerial) will, of course, be found to vary from band to band for adequate meter indication. If a good quality 0-1 mA instrument is used, care will always have to be taken not to over-couple, which could result in a burnt-out meter.

Applications of the device include: Comparative carrier level indication (CW or phone) in Tx tests on the same band; the meter will show speech peaks on SSB, and also whether modulation is in the right direction on AM; in bad cases, it will detect harmonics being radiated off the aerial; and with an AM signal on tune, speech will be heard in the phones.

Circuit of the RF Indicator/Monitor, for which values are given in the text. As explained, it has a wide range of useful applications as a checking device.

With a telescopic-rod pick-up, calibration marks could be put on to ensure “correct exposure” for the different bands; if the unit is always used in one position with a given degree of pick-up exposure, any falling off of Tx output on that particular band would be immediately detected.

If the dial of C2 is calibrated, a reasonably accurate wavemeter is available for checking that the Tx is in the band—though calibration will be affected by coupling and (with 100 µF for C2) the tuning for the 21-28 mc bands will be pretty sharp. In other words, an RF monitoring unit of this sort is a very handy item to have on the bench, particularly as it involves no external leads (except when phones are plugged in).

Values are: C1, 100 µF; C2, 100 µF variable, with slow motion and calibration dial; C3, 0.02 pF; R1, 10K ; R2, R3, 1K ; D, any detector diode; TR, any RF transistor; M, 0-1 mA moving-coil meter (0-500 µA for more sensitivity); and L1-L6, coils made up as required, with switching.

Circuit of the thief-terrifier devised by G3BA for the protection of his /M installation (and his car, which is a Triumph ‘‘Herald’’). When any of the doors are opened, the horn blares forth if Sw is at “on,” and is calculated to start somebody running. This switch is fitted in some secret position on the exterior of the car—such as under a wing, or in the radiator grille—and is put to “on” when the car is left. If it is forgotten when out shopping, the resulting hou-ha can be embarrassing!
CONVERTING THE B.44
FOR OPERATION ON THE
4-METRE AMATEUR BAND

From Notes by GM3OTF

WITH the availability of the ex-Army B.44 Transmitter-Receiver Mk. II on the surplus market at very reasonable prices, many amateurs will have acquired them and be considering the conversion possibilities for operation on our 70.1-70.7 mc band.

The following is the procedure followed by GM3OTF to convert his B.44:

In the original, the unit will be found set up on a particular crystal frequency (which probably varies from unit to unit) and on the Tx side the crystal oscillator V11 (see block diagram Fig. 1) multiplies by 6 to give the output frequency. For 70 mc working, it is more convenient to use a crystal in the 7 mc range, multiplied by 9 to get into the 70 mc band. For this, it will be necessary to bridge the small trimmer (C56) across the anode coil (L12) of the CO stage with an additional capacity of about 15 µF; the CO can then be resonated to three times the xtal frequency; the driver stage V12 can also be taken to x3 this frequency by adjustment of (C60), and the PA will then be found to resonate at the required output frequency by re-tuning its trimmer (C65). The PA output passes through an elaborate filter network to a coil feeding into the aerial; this can be adjusted by means of a slotted screw on top of the filter box. Indication of RF output and aerial resonance is given by meter on the front panel, controlled by a push-button marked “Check Tx.”

This completes the modifications of the transmitter side, but the Rx section involves rather more work if variable tuning is to be obtained.

The block diagram for the B.44 Tx/Rx unit is given below. The modification shown here is to the multiplier stage V10—see text for detail—which is in the receiver side, and is made tunable to cover the 4-metre band. Le is the existing coil, across which is placed the twin-gang condenser Ct, mounted on what was the loud-hailer socket (point P). A short coax lead takes this capacitor into V10, in which Ce, Re are as in the original (see text) and Cd is the screen decoupling condenser. This makes the B.44 receiver tunable over the 70.1-70.7 mc band, on which it is most effective, though the Tx output (2 watts RF) is relatively low, since the permitted power on four metres is 50 watts.

Receiver Modification

The Rx is a double-superhet having a first IF of about 15.25 mc and a second IF of 2.65 mc. For amateur purposes it is, of course, most desirable that the receiver tuning should be variable, and to make this possible the following alterations were carried out by GM3OTF:

Looking at V9, the Rx crystal can conveniently be around 6+ mc, and is used only to inject about 18+ mc for the second IF. An 8 µF condenser (C16) will be found already in position between the anode of the oscillator V9 and the cathode-sup. grid of the second mixer V3, and this wiring is left in position. The green wire which goes from the first oscillator transformer (TR10, V9) to the second multiplier grid (V10) is removed. A 47K resistor is put across the grid of V10 to ground, and the screen...
of this valve is strapped to its anode, the screen decoupling condenser (C45) being taken out; thus the existing screen resistor (R30) becomes the HT feed for V10, now to function as a variable-frequency oscillator.

The anode feed to V10, which is via its oscillator coil (L14), is removed, as is the small trimmer (C41), and the circuit is then arranged as shown on p.401 herewith. In this, the elements marked Le, Ce, Re and Cd remain as in the original. The existing coil Le is then tunable to provide variable injection to the first mixer, at around 54.5 mc. On the front panel will be found a jack for a loud-hailer; when removed, this will provide a suitable point (P in diagram) at which to mount a small twin-gang condenser, connected to Le by a short length of coax, as shown in the circuit.

It will be necessary roughly to align the Rx signal frequency circuits by GDO, also the second IF coils in accordance with the crystal frequency used; a simple arithmetical calculation will give an idea of the frequency involved.

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G9BF CALLING

**Hot Stuff, Right Off The Cuff!**

Huge success this new series now guaranteed — rude letters reduced to trickle (less than 100 a week, anyway), though Editor still crusty over space, what about Parametric Amplifiers, Masers/Lasers, and such. But what earthly use that esoteric stuff in comparison real practical gen by me G9BF, now busy compiling long lists exotic EU/DX — example YU, LZ, UV, YO, HA, etc., etc., etc. — not within reach Big Boys scratching after weak Pacific stations never heard anyone close. Only fly G9BF ointment failure old flame SUSIE respond — G9BF still carrying candle for SUSIE though flickering a bit now.

Remarkable new results by old pal AV2PBE, described as Reheated TV. He uses Ch.23 vision signal as modulation his UHF Tx, producing wabbly BBC-2 picture on all TV screens in neighbourhood, irrespective whether tuned BBC-1, ITV, ATV, Radio Caroline, Spanish bullfight or whatever. AV2PBE claims this uncanny effect due new anomalous propagation mode discovered and exploited by him. Some viewers round about not too satisfied but BBC highly delighted enormous compulsion increase BBC-2 watchers.

Pal MO1FFI not letting clay stick to boots, either. New six-channel PA consists broad-banded rotary turret tuner taking 813 for each freq. area, involving six 813's, controlled by handwheel selector (having bands marked in mgs, of course). This PA giving such FB results — and so much light and heat — that MO1FFI planning extension to double up on 813's. This fine PA, guaranteed to put about 5 amps. RF into anything, incorporates electro-mechanical techniques ("patents pending") much too difficult for beginner comprehension. Beginners advised start with 807's in broad-banded rotary turret tuner controlled by handwheel selector with band positions marked in mgs.

**Mobile Note**

If the transceiver is to be operated mobile (for which it is very suitable, using a Green & Davis 1/4-wave whip for 4 mires) another slight modification will have to be done, as most cars have their electrics at positive to chassis. Under the power-pack panel, the two feed leads to the vibrator unit should be reversed, and the voltmeter and RF indicator diode connections also changed over; the latter will be found in the filter box.

(Editorial Note: Even if the main circuit diagram, which should come with the set, is not available, these modifications can be carried out by identifying the various stages from the block diagram, and going by the instructions. The block schematic and the element references here, (in brackets) are in accordance with the official R.E.M.E. diagram, called "W.S. B44 Mk. 2 Circuit." It helps to have this — unfortunately, we are not able to supply it.)

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NEW BOYS ON THE AIR

About a year ago, William Longmire (Thornton Cleveleys, Lancs.) started to take an interest in Amateur Radio. He joined the Blackpool & Fylde Club; sat the R.A.E. last May; received his pass slip on July 21; took the Morse Test on July 24, with a pass confirmed on August 4; and on August 18 he was licensed as G3TKL. The point of particular interest about all this is that—G3TKL is 70 years of age! We congratulate him, and hope that he will have many years of happy retirement, with Amateur Radio to keep him alert and vigorous. His letter to us was dated August 19. Under that same date, we also had a letter from Vincent Lear (Wallasey, Ches.) notifying his new callsign, G3TKN, and mentioning that as he is only 15 years old, he is the youngest licensed amateur on the Wirral Peninsula. So congratulations to him, too, and we hope these two will meet over the air!
We still have many amateurs who prefer the skill of telegraphy; many others take the easier path of telephony; increasing numbers prefer teletype. Of the three, telegraphy requires the greatest skill, because it takes little effort to operate teletype, SSB and AM equipment, but you have to practice patiently to acquire skill to handle telegraphy at any decent speed. It's a sort of additional language, unspoken and completely unreadable to the unskilled.

(W3AX in "Autocall," Washington, D.C.)

What could happen if the Amateur Service fails to hold its ground at Geneva? The answer is anyone's guess. Envious eyes are turned to our 20-metre band and what is left of 40 metres; 80 and 160 metres, largely neglected by amateurs in Africa and non-exclusive, could be lost to us. It is easy to envisage what can happen to the remainder - at least a reduction in size, cuts in bandwidth, cuts in power and facilities, or total loss. Perhaps the most effective part that we East Africans could play would be to send a delegate to Geneva, or a contribution towards the expenses of the experts of Region 1 who will be going.

(Editorial in "QTC," Radio Society of East Africa)

There are three types of people in Amateur Radio: a few who make things happen; a lot more who watch things happening; and the vast majority who just don't know what the heck goes on.

(Ancient Proverb)

Ever been annoyed by a Russian commercial in the amateur bands? If so, there's not much to be done about it. Russian amateurs who made this same complaint were informed that the Soviet Government does not operate transmitters on any amateur frequencies.

Believe it or not, it is 33 years since STC and L.M.T demonstrated microwave communication across the English Channel. The commercial link between Lympne and St. Inglevert opened three years later, in 1934.

It is not generally known that, after the Skopje disaster, German amateurs got together and shipped half a ton of radio equipment and valves as replacements for YU stations damaged in the earthquake. D.A.R.C. handled the effort, but DL2OU and DL9KG did much of the hard work in packing and despatching.

(I.A.R.U. Region 1 Bulletin)

We chuckled when we found that the time-switch mechanism on the TNT was wired in such a way that the battery was across the switch instead of in series. If our good friends had spent more time studying the rudiments of Ohm's law, instead of the racing results, they would have been more successful in their dedicated task of assassination.

("Marcogram," Montreal)
THE PRACTICAL APPLICATIONS
OF SEMICONDUCTORS

IN THE AMATEUR STATION

Part V

AUDIO AMPLIFIERS (I)

M. I. DAVIS, B.Sc.

THE aim of this particular article in the series is purely to give as many useful audio amplifier circuits as possible. Very little theory will be entered into, and any constructional details given will be for guidance only.

We consider amplifiers in two sections. The first covers Class-A circuits, including both low-level amplifiers and single-ended output stages, while the second deals with the Class-B configuration, and describes low- and high-power output stages, including the increasingly-popular transformerless amplifiers. The reasons for the mounting popularity of this type of audio amplifier are not difficult to determine.

Principally, the omission of the two split-secondary transformers is the main asset, since these components, in a high-power, high-quality amplifier, are bulky, expensive, and often difficult to obtain; they are also prone to hum pickup and to "ringing." The whole circuit (less power supply, of course), can be built on tagstrips or a piece of printed board. Further, it is much more likely that the amateur possesses a very large range of resistors and capacitors than that he has to hand exactly suitable transformers for any given design.

Offset against the advantages of compact, inexpensive, efficient, lightweight circuits, it must be admitted that at least one n.p.n. transistor is required. The author did, however, make some comments apropos this point in a previous article, and n.p.n. transistors are no longer the rarity they used to be in the amateur's repertoire.

Low-Level Class-A Amplifiers

Let us consider, then, the simplest of all circuits using a three-terminal active device; the single-stage, common-emitter Class-A amplifier, the circuit of which is shown in Fig. 1A. It must be mentioned that this is not intended to be a practical circuit; this comes later. At present we are merely interested in choosing suitable values for C1, C2, R1 and R2. No protection against thermal runaway is provided in this circuit.

We choose a supply of 9 volts. For Class-A operation, the quiescent value of the collector voltage should be half the supply voltage, i.e. 4.5 volts. If the collector current is chosen as 1 mA, then a collector load of 4.5K is required; so, to the nearest preferred value, R2 should be 4.7K. Suppose the β of Tr1 is 50. The quiescent base current will be

\[ \frac{9-V_{be}}{1/50 \ mA} \]

and so R1 must be \[ \frac{1}{2} \times 4.7 \times 1000 \]

or so for a germanium transistor) R1 will be about 470K.

The value of C1 depends on the lower 3 dB frequency required, and on the input impedance of the amplifier; the former may well be 50 c/s, and the latter may, for this purpose, be taken to be 1K.

Then C1 = \[ \frac{1}{2\pi \times 50 \times 1000} \]

= 3 µF approx.

The value of C2 will be the same if we are feeding an identical stage; if this is not the case, then C2 will have to be calculated as above.

Input and output resistances are both dependent on load and source resistances, amongst other things, and are not straightforward to calculate accurately. The current gain of the stage is equal to the β of Tr1, and the stage voltage gain may be roughly approximated to:

\[ G = \frac{\beta \times R_2}{R_{in}} \]

if the source and load resistances are fairly small. Two typical practical single-stage common-emitter amplifiers are shown in Figs. 1B and 1C. They illustrate the two different ways of reducing the possibility of thermal runaway.

In Fig. 1B, a pair of resistors provides the base current, not from the supply rail, but from the collector. This forms a DC feedback path, and reduces the risk of thermal runaway. If only one resistor were used, the gain of the stage would be very much reduced by this negative feedback. To overcome this, we split the resistor into two, and decouple the mid-point with C3, a capacitor whose reactance is low at signal frequencies. R1 and R2 are made equal to compromise between shunting the collector load, or the input terminals, with C3.

This system works best with low output voltage swings, and thus is not really suitable for a large-signal amplifier, but it is widely used in low-level amplifiers.

Moving now to the arrangement of Fig. 1B, let us suppose that we make the collector swing 1.5V, in either direction, and hence bias the transistor so that, drawing 1 mA of collector current, the quies-
cent voltage is \(-1.5v\). Then \(R3 = 4.7K\), and the base current required is \(1/50\) mA, (again assuming a current gain of 50). Now the collector voltage is \(-1.5\), and since \(Vbe\) is about 0.4v., then 1.1v. across \((R1 + R2)\) must provide this current. Thus

\[
\frac{1.1}{R1 + R2} = 55K.
\]

So to the nearest preferred value, both \(R1\) and \(R2\) should be 27K. A value of 6 \(\mu\)F for \(C3\) will decouple the junction of these two resistors for most audio frequencies, and \(Cl\) and \(C2\) can be as in the previous case.

Although an OC71 is specified for \(Tr1\), any LF low-power transistor would be suitable. This, broadly speaking, is true for all the low-power circuits given, the only proviso being that the device used is not too noisy under operating conditions. If noise turns out to be a problem, it may be worth using a low-noise transistor such as the GE1-106.

The circuit of Fig. 1C has also been designed for 1 mA collector current. With \(R3 = 1K\), the emitter will be at 1 volt, allowing 8 volts for \(Tr1\) and \(R4\). In order to make the quiescent base voltage only slightly dependent on base current, we arrange for the parallel resistance of the potential divider \(R1/R2\) to be small, so that the bleed current is about ten times the base current.

Since \(Ic = 1\) mA, and \(\beta\) is still assumed to be 50, \(Ib\) is twenty microamps, and the divider chain bleed current is 0.2 mA, so that 0.22 mA flows in \(R1\), and 0.2 mA in \(R2\). Assuming that \(Vbe\) is small, the base and emitter voltages are equal, i.e. one volt. Thus 8v. across \(R1\) must produce a current of 0.22 mA, making \(R1\) 33K, to the nearest preferred value. Similar considerations with \(R2\) (one volt and 0.2 mA) lead to \(R2\) being 4.7K.

\(R4\), the collector load, might again be 4.7K. Since \(R3\) would cause a large amplitude of negative feedback, and hence degenerate the gain of the stage, \(C3\) is used to decouple it. The parallel combination should have an impedance of less than 20 ohms at the lower 3 dB point.

Having briefly covered the basic details of common-emitter amplifiers, let's consider their practical applications. Note first that no mention has yet been made of transformer coupling. The author prefers not to use audio transformers except where absolutely necessary, and whilst it is not his intention to foist this outlook on readers, it does seem that the specified transformer is never to hand. For that select band of initiates who successfully "roll their own," or have a supplier with a wide range on the shelf — fine, by all means use transformers. Anyway, transformer-coupled circuits will be mentioned later.

Fig. 2 shows a typical low-level amplifying stage. Such stages are to be found immediately following a detector, microphone, tape head, or pickup. Crystal mikes and pickups like to "see" an input resistance of more than 250K, and this can be provided by connecting \(Rin\) (330K) in series with the input. \(C1\) can then be as low as 0.1 \(\mu\)F. Other high-impedence inputs can also be dealt with in this way. For low-impedance sources, however, \(Rin\) should be omitted, and \(C1\) increased to about 12 \(\mu\)F depending on the bass response required.

Further examples of this type of circuit occur later when we consider the overall diagrams of

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* It is hoped that this concept of "negative current" does not confuse readers. It is simply handy for p.n.p. devices.
level to drive a following valve stage. This arrangement is in the emitter, so as to give the correct output being placed in rather between base and earth. Instead of the load resistor input is applied between base and emitter, and not at first glance to be an emitter follower, it operates back is provided by the emitter-base resistor. This may be picked up. Note that feed-side, and this implies that if long leads are used, coax. The detector should not be earthed on either leads connecting the detector to the amplifier should be used. Care must be taken to avoid wiring errors and accidental shorts—transistors supply; voltages much higher than this should not occur. Noise should not be excessive. Even though the noise figure is higher than that for a valve circuit, the overall noise in the receiver is likely to be very much higher than the noise generated in this stage.

The unit is designed to work from a 250-volt supply; voltages much higher than this should not be used. Care must be taken to avoid wiring errors and accidental shorts—transistors hate 250 volts in the wrong places! As shown in the diagram, the leads connecting the detector to the amplifier should be either a short twisted pair or a short length of coax. The detector should not be earthed on either side, and this implies that if long leads are used, hum and/or RF may be picked up. Note that feedback is provided by the emitter-base resistor. This is an interesting circuit, in that although it seems at first glance to be an emitter-follower, it operates rather like a common-emitter amplifier, since the input is applied between base and emitter, and not between base and earth. Instead of the load resistor being placed in the collector circuit, however, it is in the emitter, so as to give the correct output level to drive a following valve stage. This arrangement provides a voltage gain of between 250 and 400, and takes less than 1 mA of current from the HT supply.

A useful preamplifier is shown in Fig. 4. This circuit appears by courtesy of Newmarket Transistors, Ltd., and uses one n.p.n. and one p.n.p. transistor. The output impedance is sufficiently high to drive a valve stage, and AC negative feedback is supplied from the emitter of Tr2 to the base of Tr1 via C4 and R6. DC feedback to stabilise the working points of the transistors is applied via the collector-base resistors of 560K to both transistors.

A practical point to bear in mind is that the circuits used as microphone pre-amplifiers are sufficiently simple and lacking in bulky components to be built on a small piece of Veroboard and placed inside the microphone case in many instances. A miniature battery capable of running the unit for many hours would make the assembly quite self-contained. In this way, the audio signal/noise ratio appearing at the main amplifier or modulator will be very much improved, especially where long microphone cables are necessary.

Transformer-coupled Class-A amplifier

A circuit which may be of interest to readers engaged in mobile work is shown in Fig. 5. It is an output and driver stage intended for a hybrid valve-transistor receiver, producing about three watts of audio. Unfortunately, because of the Class-A configuration, the efficiency is invariably less than 50 per cent, and the power transistor dissipates more than six watts. A heat sink of at least 12 sq. in. of blackened aluminium is therefore required. R5 should be adjusted until the quiescent current with no signal is between 400 and 500 mA; it may be necessary to change the value of R5 and R6 to accommodate transistors with very low or very high current gains.

The emitter resistor of Tr2 (R7), which is left undecoupled to provide feedback, may conveniently be made by winding the appropriate amount of

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Table of Values

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>100 µF, 12v.</td>
</tr>
<tr>
<td>C2, C3</td>
<td>0.1 µF, 200v.</td>
</tr>
<tr>
<td>C4</td>
<td>0.1 µF, 12v.</td>
</tr>
<tr>
<td>C5</td>
<td>0.047 µF.</td>
</tr>
<tr>
<td>C6</td>
<td>25 µF, 12v.</td>
</tr>
<tr>
<td>R1</td>
<td>1,500 ohms</td>
</tr>
<tr>
<td>R2</td>
<td>15,000 ohms</td>
</tr>
<tr>
<td>R3</td>
<td>560,000 ohms</td>
</tr>
<tr>
<td>R4</td>
<td>220 ohms</td>
</tr>
<tr>
<td>R5</td>
<td>10,000 ohms</td>
</tr>
<tr>
<td>R6</td>
<td>33,000 ohms</td>
</tr>
<tr>
<td>R7</td>
<td>500,000 ohms</td>
</tr>
<tr>
<td>R8</td>
<td>500K</td>
</tr>
</tbody>
</table>

---

*Fig. 4. A pre-amplifier unit using negative-positive-negative and positive-negative-positive transistors, known as n.p.n. and p.n.p. types respectively. These are fundamental definitions, and determine which way round the supply battery is connected—or the transistor is wired in circuit.*
Table of Values

Fig. 5. Output stage for hybrid mobile Rx

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>0.5 μF</td>
</tr>
<tr>
<td>C2</td>
<td>100 μF, 6V</td>
</tr>
<tr>
<td>C3</td>
<td>500 μF, 6V</td>
</tr>
<tr>
<td>C4</td>
<td>100 μF, 25V</td>
</tr>
<tr>
<td>R1</td>
<td>47,000 ohms</td>
</tr>
<tr>
<td>R2</td>
<td>10,000 ohms</td>
</tr>
<tr>
<td>R3</td>
<td>750 ohms</td>
</tr>
<tr>
<td>R4</td>
<td>470 ohms</td>
</tr>
<tr>
<td>R5</td>
<td>500-ohm, preset</td>
</tr>
<tr>
<td>R6</td>
<td>10 ohms</td>
</tr>
<tr>
<td>R7</td>
<td>0.5 ohm (see text)</td>
</tr>
<tr>
<td>T1</td>
<td>Driver, 24:1</td>
</tr>
<tr>
<td>T2</td>
<td>Output, 3:1</td>
</tr>
<tr>
<td>LS</td>
<td>3-ohm</td>
</tr>
<tr>
<td>Tr1</td>
<td>OC71, or equiv.</td>
</tr>
<tr>
<td>Tr2</td>
<td>OC28, OC39, OC35, OC36, V30, V30/P, or similar</td>
</tr>
</tbody>
</table>

Fig. 5. A hybrid mobile receiver output stage for which all values are given in the table.

The efficiency at high output levels is also improved by the use of Class-B. Finally, the configuration lends itself to the transformerless technique.

The first exhibit is a typical low-power audio amplifier giving about 200 mW into a 3-ohm speaker (Fig. 6). This circuit illustrates some of the principles mentioned earlier. Tr1 is a Class-A RC-coupled amplifying stage, and the driver is also in this mode (Tr2). In order to reduce the cross-over distortion (a phenomenon present in Class-B stages due to the output transistors not turning off and on at the correct voltage levels) the circuit should be temporarily broken at the point marked X and a milliammeter inserted; with the input shorted, R9 should be

Table of Values

Fig. 6. Transistor Class-B Amplifier, 200 mW.

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1, C2</td>
<td>10, 50 μF</td>
</tr>
<tr>
<td>C3</td>
<td>100 μF</td>
</tr>
<tr>
<td>C4, C5</td>
<td>250 μF</td>
</tr>
<tr>
<td>R1</td>
<td>47,000 ohms</td>
</tr>
<tr>
<td>R2</td>
<td>8,200 ohms</td>
</tr>
<tr>
<td>R3</td>
<td>3,900 ohms</td>
</tr>
<tr>
<td>R4</td>
<td>1,200 ohms</td>
</tr>
<tr>
<td>R5</td>
<td>22,000 ohms</td>
</tr>
<tr>
<td>R6</td>
<td>10,000 ohms</td>
</tr>
<tr>
<td>R7</td>
<td>470 ohms</td>
</tr>
<tr>
<td>R8</td>
<td>1,000 ohms</td>
</tr>
<tr>
<td>R9</td>
<td>see text</td>
</tr>
<tr>
<td>R10</td>
<td>160 ohms</td>
</tr>
<tr>
<td>R11</td>
<td>62,000 ohms</td>
</tr>
<tr>
<td>Tr1</td>
<td>OC71, or equiv.</td>
</tr>
<tr>
<td>Tr2</td>
<td>OC28, OC39</td>
</tr>
<tr>
<td>Tr3</td>
<td>OC35, OC36</td>
</tr>
<tr>
<td>Tr4</td>
<td>OC72, OC81</td>
</tr>
<tr>
<td>LS</td>
<td>3-ohm</td>
</tr>
</tbody>
</table>

Fig. 6. A Class-B amplifier rated at 200 milliwatts, which is adequate audio output into a small 3-ohm speaker. The output transistors can be in the OC72/OC81 category, these being Mullard types in their current range.
adjusted so that the quiescent current is between 1 and 1.5 mA. A suitable starting value for R9 is 10K.

If a 500K volume control is connected to the input, C1 may be reduced to about 0.2 µF, and a crystal pickup (or mike, or a detector circuit) used to drive the setup through a resistor of at least 100K.

This type of circuit is extremely popular, and so little difficulty should be experienced in obtaining T1 and T2. Transformers capable of handling higher powers, however, are more difficult to come by, and it is here that the transformerless circuit comes into its own. These will be discussed in the next offering.

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Do You Know That —

— For testing a filter-type SSB Tx on two-tone, a square-wave multivibrator as shown on pp.212-213 of the June issue of SHORT WAVE MAGAZINE can be used, since it checks the transmitter all the way through, including the filter performance. Injection is at the microphone socket and if the filter is adequate it will remove harmonics of the fundamental frequency—what started as a square-wave will appear at the PA end as a sine-wave. The fundamental frequency of the multivibrator should be chosen so that its second harmonic falls outside the filter passband. (G3IHI).

— A neat and easy way to make printed-circuit boards is to draw the diagram on gummed paper, stick this to the copper side of the board, and then trim out (with a sharp knife or a razor blade) the portions where copper is to be left on. Paint the whole side with the resist and when it has dried, peel off the remaining paper and etch the board with the usual ferric-chloride solution. This method obviates the need for accuracy and a steady hand when painting on the resist to make an original circuit straight on to the copper. (R. Walker, Sheffield, 11).

— With transistor receivers, the front-end TR's can still be blown on "transmit" even with the aerial input shorted. By arranging the switching so that the transistor emitters are disconnected on change-over, this costly effect can usually be eliminated. (M. H. Judd, Peterborough).

— Tyre static can be considerably reduced by running wide strips of metallic paint (lead or conducting) from the tread to the rim, applied to the inside of each wheel, and using graphited grease in the wheel bearings. (G2HKU).

— A neat and effective mobile identification can be contrived by having the callsign mounted on standard motor-cycle number plates, fitted at front and rear of the car. (GM3LRG).

— In addition to the warnings already given about the use of carbon tetrachloride, smoking in the presence of its fumes can be dangerous. Vapour inhaled through burning tobacco can form phosgene, a highly toxic gas. (G3SFL). (We must really keep that old Thawpit bottle in the poison cupboard in future!—Ed.).

— For UHF work, a very effective corner-reflector can be made up using peg-board (a thin hardboard, with a pattern of small holes, as used for window-display purposes) covered with wire-mesh, and then treated with a good outdoor paint or varnish. The result is a strong, light and weatherproof job. (GM3MCH).

— The adhesive known as Styrenestik (available from ironmongers and intended for fixing plastic tiles) has a polystyrene base and sets hard, as a white compound having the appearance of ceramic. On the amateur work-bench it can be used for joining or fixing items made of polythene, and is excellent for securing Tx coil windings, even with heavy-gauge wire. It can also be used as a moulding material and, being supplied in a tube, it is easy to work. (G5U).

— With the BBC's Light Programme transmission being extended to about 21 hours a day, a ready source of power for transistorised equipment becomes almost continuously available. The Light Programme Tx, on either LW or MW, puts down a strong signal all round the country. A simple rectifier arrangement—see p.235 July '63 and p.239 July '56 SHORT WAVE MAGAZINE—with a pick-up circuit tuned to the transmission you receive best, will produce enough volts and mA for any transistor type up to about 6v. working. (The BBC modulation, which is at an average level of only 60 per cent, is easily filtered out by the rectifier action). One interesting practical application of this idea is for the powering of mast-head transistor broad-band VHF amplifiers, as now being used to boost TV reception in fringe areas. Use the mast as the PSU aerial!

Somebody has suggested that this little feature should be called "Nifty Notions." We don't quite go along with that, but we will pay 10s. 6d. for any "Do You Know" idea we can print—even if it is yet another use for empty ball-point pen cases!—Editor.

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DIRECT SUBSCRIBER NOTE

We have a large number of readers who are helpful enough to pay a direct subscription by banker's order. A recent check-up shows that some of these orders have not yet been adjusted to the new rate of 42s. for a year of twelve issues. It would be much appreciated if those who are on banker's order would take the necessary action to make the order payable at the new rate. It would save us an awful lot of paper-work!

AMATEUR RADIO EXHIBITION

This will be during October 28-31 at the Seymour Hall, near Marble Arch, London, W.1, as last year, and once again we shall be there—as we have been ever since these exhibitions started—on Stand 19, near the main entrance. We hope to see you.
NEWCOMERS — R.A.E. SUCCESSES —

QUERIES — DX/TV — TEN METRES — VHF

SWL's — NEWS AND VIEWS

It seems that SWL’s, as a body, are rather better adjusted to a spell of poor conditions than are the transmitting fraternity. At any rate, there are not nearly as many moans despite an extremely dull period over the last two months. Those who thought last summer was bad have had a nasty shock this year—it has been far worse! However, we do know that we are now right in the trough, and it can be assumed that we have nothing but improvement to look forward to from now on.

The fact of the matter is that the SWL fraternity is not quite so completely obsessed with DX as many transmitting amateurs seem to be. So a spell of “non-DX” conditions merely means that they have something different to listen to. In all the large and varied mail received this month there is hardly a single grouse about ionospheric matters—which is strange but rather gratifying.

Of course there are, within the ranks, many keen newcomers who don’t know what really good conditions are like—their experience doesn’t go back as far as that. We promise them that they will have a real treat in the next few years, but they will need all the selectivity they can muster up. Better conditions will mean even more stations on the air—many more—and hence more QRM—much more!

Several newcomers to these columns are welcomed, and most of them appear on the HPX Ladder (not necessarily at the bottom end). C. Crisp (Maidstone), for instance, joins with a score of 355, all SSB, of which he logged 192 in two days! He uses an AR-88 hooked to a centre-fed 250-ft. wire, 60ft. up, which obviously helps. And he asks whether BY3SI is known to be a legitimate one—anyone help?

A. H. Pardoe (Stourbridge) also comes on the Ladder with a score of 323. He has been held up by A-level QRM for some months, but is now flat out to get the prefixes, and doing very nicely. They are pulled in, in his case, by an old R.1155A, almost entirely on Eighty and Twenty. He thinks that amateurs spend too long complaining about poor conditions; if they were to look round a bit more carefully, he suggests, they would find something interesting.

Gil Bunting (Birmingham) has also been a sufferer from A-level QRM, but is now in full swing again on the bands. He had some interesting times with the local club (Dudley), with G3RXK on the air /P for a two-metre field day, and /A at a local garden fête (Gil being the one who climbed the trees for the 500-ft. long wire!). He sends a picture (unfortunately not quite good enough for reproduction) which shows his “Handy Angle” method of construction for a kind of rack-and-panel set-up. Strongly recommended.

Phil Holliday ( Mapperley) and others remark that the Ladder was published in the July issue under the headings “Phone and CW” and “CW Only”—and asks whether this was intentional. No, it was an unfortunate error, and the larger section should have been “Phone Only,” as always. He hopes to join the CW section shortly.

Sunday Queries

1. Buffham (Spalding) heard 9N1MM on Twenty SSB, but as he remembers that our friend Gus used that call last year, he wonders whether it was genuine. Yes, indeed it was—Gus was operating the station, but he didn’t own the callsign. SWL Buffham was awaiting R.A.E. results, by the way, but no doubt he knows by now!

J. D. Williams ( Winchester) is moving to a new QTH half a mile away and is horrified at the idea that he might have to start scoring prefixes, for the ladder, all over again. Certainly not—same operator, same gear, so why cancel out previous successes (unless, of course, you move to quite a different part of the country, which does present a new problem.)

And Colin Waters (Corbridge) asks the really fundamental query that we often have to face: “How do I join the HPX Ladder?” Simply send in your log of prefixes received (not full callsigns), with the total number claimed (we hate counting problem.)

Terry Popham (Exeter) puts up his total by no less than 93, and has serious designs on the top rung of the ladder; he would like to see H. G. Shaw, the “uncrowned king,” start again—perhaps on SSB only—to give some of the others a good run for their money. And he adds that SWL’s on holiday in his area will be most welcome, if they will first await R.A.E. results, by the way, but no doubt they will mean even more stations on the air—many more—and hence more QRM—much more!

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DX-TV

And that leads us, naturally enough, to the TV-chasers themselves. Roy Patrick (Derby) found the end of June a very good period. He doesn’t aspire to pictures yet, but found the sound from Caen, France; from a German station on Channel 1; and from Italy (very strong) on Channel 3. And he says the “Voice of Free Scotland” mobile stations, operating on various BBC channels, have been accused of being “amateur mobiles.” Mobile, perhaps, but not amateur, we hope.

Dennis Boniface (Ripon) says he is heartily sick of seeing bull-fights from Spain, the most consistent country with him; he also watched TV from Poland, Hungary, Switzerland, Norway, Sweden and France, as well as one unidentified test card. A transistor pre-amp for Band 1 has been built, and proved well worth while.

V. H. Woodcock (Edenbridge) sends photographs of pictures from Spain on June 30 (yes, bull-fights!); and of test cards from Sweden and Tallinn (Estonia) on the same date; on the following day he photographed a good test card from Czechoslovakia. The interesting point about his DX-TV reception is that it was all on a standard commercial set, with vertical dipole, only modified to the extent of feeding the Band 1 tuner into the IF’s while the 625-line time-base was in action.

After the Battle

Still more warriors returning to the bands after the horrors of exams! Barry Curnow (Plymouth) has done so to some purpose, and now occupies the top spot on the CW ladder. He says Forty has been extremely good for this purpose, and quotes such DX as VK, ZL, VP2, H18, VS1, CP5 and many others less exotic. And now he is off to investigate listening conditions in Scotland and Northern England.

D. A. Pickup (Preston) “returned to full operation after severe QRN (GCE),” moved his gear to another room and put up a new aerial to celebrate. Result: VSILP on Forty SSB, and, a few minutes later, on Eighty as well. The early morning hours on both bands bring in many W’s on SSB, but with few Europeans working them. The prefix score is now up to 456, and with a 270-ft. wire, four dipoles and plans for other experimental wires, hopes are high.

Malcolm Healey (Horsham) was the glad recipient of “a small piece of yellow paper with a ‘P’ in the right-hand corner”—so now for the Morse test. Meanwhile it’s not all prefix-chasing, as he has heard GI on two-metre Phone, and F8AA on 70 cm CW. The 6-el. beam on Two is being replaced by a six-over-six, and there are thoughts of a 32-el. job for 70 cm. And of the HF bands, SWL Healey confirms that there are too many people saying conditions are very bad, instead of listening to what is being worked by others. On the technical side, he recommends a bit of rebuilding with close-tolerance resistors and capacitors; they cost a bit more, but what a difference they can make to local oscillator and BFO stages. He’s even cured an old HRO of its slow drift!

R. Williams (Birmingham) now has a very high total on the phone ladder (569) and is another who recommends Forty SSB, quoting KC4USB, PJ3CF, VS1LP, VS9MB and 6O2BW. Meanwhile he has built a transistorised practice oscillator and got up to 6 w.p.m. . . .

Ten Metres

An encouraging number of SWL’s reported on the Ten-Metre Activity Sunday (July 12) but their findings have been corroborated in the references to that affair in August’s “Communication and DX News,” so no further comment is needed here. However, D. A. Whitaker (Clitheroe) says that it is reported that DL7AA (Berlin) has worked 70 countries on Ten Metres this year. And B. F. Hughes (Worcester) recently logged 9G1DM calling CQ on 28.5 mc, also F8QQ/M (Nice) on 28.3.

Pete Cayless (Exeter) says he often hears GM3SKX (Shetlands) down there—usually S5-7; and he actually gets QRN on the band, mostly from DJ and F. M. Vincent (Cheltenham), having managed to lug the school radio society’s CR-100 home (on a push-bike!) for the holidays, has heard something on the band most days and most hours of the day; apart from Europeans, he has logged 5B4, 9L1 and ZD7. Since he is in a fringe area for BBC TV, he
gets the nudge when there is sporadic-E about—if the TV goes groggy, he makes for the CR-100 and Ten Metres!

**Permanent SWL's, R.A.E., and So On**

Recent remarks about SWL's who take the Radio Amateur's Examination and still don't appear with a callsign have brought forth quite a crop of letters; and a still greater number who have no intention of taking the examination leap to the defence of the SWL aspect of the hobby.

Stewart Foster (Lincoln) says "I get tremendous pleasure and satisfaction from just listening, and have no desire whatever to transmit. There are already enough people on our overcrowded bands."

Most of those who have taken, and passed, the R.A.E. say that the hold-up is the Morse test. One points out that R.A.E. can be taken only twice a year, whereas the Morse can be fixed at almost any time; another passed the exam. in 1958 but didn't take the code test until 1963 (he's now G3SQV); and the longest gap of all is attributed to G3TGB, who passed R.A.E. in May 1950 and the Morse test on June 12, 1964, just 14 years later!

There are also two or three who say they could never have passed the Morse test without the help of local club members; and even one who admits that since his local club has died, he feels he has practically no hope of ever passing.

On the whole, we are of the opinion that most SWL's who do aspire to transmit, one day, are far more scared of the Morse test than they are of the technical exam. Why on earth don't they fit themselves with a BFO and just listen to the stuff!

Goodness knows, there's no shortage of it. The chief requirement is concentration—and we pass on a valuable, but free tip... it's twice as easy to concentrate with headphones on as it is in front of a loudspeaker.

**QSL's—Again!**

Pete Cayless (Exeter) says his QSL returns overall are between 60 and 70 per cent. From G's alone they are more like 40 per cent for Eighty and 65 per cent for Top Band.

G3MQT (St. Leonards-on-Sea) writes to say that he doesn't throw all useless reports in the WPB, nor does he reply 100 per cent. But in some cases he derives a little satisfaction from sending someone a QSL costing a few coppers for card, envelope and stamp and hopes he is giving someone, somewhere, a little pleasure. "This, I fondly hope, will encourage them to continue in their new-found hobby, and keep them away off pop records and transistor portables, so that they will follow some useful pursuit." And he adds a P.S.: "If I get inundated as a result of this, I'll charge the cost of QSL'ing to the Magazine." (He'll be lucky!)

Laurie Margolis (Ilford) says he has been using a fireguard as an aerial, feeding through about four feet of flex into a Mohican; with this he heard quite a bit of DX on 14 mc and five European countries on 21 mc. He has also done quite a lot of listening on the 41-ft. whip provided, on which he has logged 123 countries this year. All of which proves that outside aerials are very nice, but if you have to do without one—don't despair.

Chris Rees (Hatch End) had his R.A.E. result (successful) presented to him by hand at the local club meeting...now he is flat out for Morse, but handicapped by a receiver sans BFO.

**Shorts**

J. L. Pearce (Basingstoke) and others query a "4X8" prefix heard recently. It emanates from Israel and was either a special or a portable station. (A 4X9 was active last year during a contest).

R. S. Finley (Kenton) says "If I pass the R.A.E. and code test, I think I will start straight off on two metres, as it is much more interesting than 80 metres and Top Band." Not everyone will agree with him, but there's a lot to be said for getting into VHF early on.

While on the subject, M. Vincent (Cheltenham) says he has been making a tape-recording of GW4LU/P in the various counties he has visited. The speed with which he works stations gives the impres-
sion that he is in a contest. SWL Vincent has heard enough counties for the Junior VHF certificate, but the problem is getting the QSLs in.

A. E. Beales (Clacton) tells us of his progress; started with a BC receiver, then a Codar Clipper, then, for nearly four years, an R.107. Now he has a home-built 12-valve double-conversion job, BC-454, BC-455, R.1132 and a 110-146 mc transistor portable. He hopes to add to the main receiver a Q-multiplier, crystal calibrator and other refinements; finally to become a licensed amateur like his brother, who is G3MWO.

Readers are asked to note that the deadline for the next installment (in the November issue) is earlier than usual, owing to staff holidays and other commitments. It will be September 18, which still gives ample time, after reading this issue, to put pen to paper. Which we hope you will do, with the latest news and views of interest to SWL's everywhere. Until then, Good Listening.

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**DESIGN FOR A TEN-WATT MODULATOR**

**HAVING FREQUENCY RESPONSE FOR RESTRICTED AUDIO RANGE**

**J. R. DOWSON**

**WHEN** a new 160-metre transmitter was being built for the local Radio Society, the writer volunteered to put together the modulator for it. This was to be a separate unit with its own power supply so that, although usable as a companion unit to the Tx, when operating from transmitter supplies for field day, /P and similar activities, the total weight could be kept down.

In the final design, this modulator came out to be 14in. wide by 3in. high, and 6in. deep. Because the transmitter itself was of the crystal-mixer type, it was decided to make the accompanying modulator as technically perfect as possible.

**Design Considerations**

As the recommended maximum audio frequency to be passed is 3 kc, the modulator response at this frequency has been made -6 db down relative to 1,000 cycles. It is 16 db down at 7 kc. There is also very little point in transmitting anything below 300 cycles, so the output starts to fall off at 200 cycles.

The resulting frequency response curve is shown in Fig. 1. Of course, it should be realised that though the audio response is restricted, or tailored, in this way, it is in no sense high-level clipping nor volume compression, and this modulator will of itself do nothing to prevent over-modulation.

A good signal-to-noise ratio is also very desirable in any modulator unit of this sort, and in the final version measured noise is -60 dB at 5 watts output. This result is dependent to a large extent on the earthing arrangements for each stage, and the use of good-quality high-stability resistors in the first stage.

The circuit of Fig. 2 shows that the microphone feeds into half an ECC81, functioning as a low-noise voltage amplifier. Presupposing the use of a crystal microphone, a high input impedance is provided—

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**Table of Values**

<table>
<thead>
<tr>
<th>C1, C2</th>
<th>8-8 µF, elect., dual cap. 450v.</th>
<th>R9</th>
<th>12,000 ohms</th>
</tr>
</thead>
<tbody>
<tr>
<td>C3, C4</td>
<td>16-16 µF, elect., dual cap. 450v.</td>
<td>R10</td>
<td>220,000 ohms</td>
</tr>
<tr>
<td>C5, C7</td>
<td>10 µF, 400v.</td>
<td>R13</td>
<td>470 ohms</td>
</tr>
<tr>
<td>C8</td>
<td>0.05 µF, 400v.</td>
<td>R17, R18</td>
<td>270 ohms, 3-w.</td>
</tr>
<tr>
<td>C9</td>
<td>0.01 µF, cer.</td>
<td>R19, R20</td>
<td>47 ohms</td>
</tr>
<tr>
<td>C10</td>
<td>100 µF, cer.</td>
<td>T1</td>
<td>Mod. xformer, ex.</td>
</tr>
<tr>
<td>C11, C12</td>
<td>50 µF, elect., 50v.</td>
<td>T2</td>
<td>300-6-300v. 100</td>
</tr>
<tr>
<td>R1</td>
<td>3.6 megohms</td>
<td>V1</td>
<td>4/ECC91</td>
</tr>
<tr>
<td>R2</td>
<td>1.500 ohms*</td>
<td>V2A</td>
<td>ECC81</td>
</tr>
<tr>
<td>R3</td>
<td>100,000 ohms*</td>
<td>V3, V4</td>
<td>EL84</td>
</tr>
<tr>
<td>R4</td>
<td>10,000 ohms</td>
<td>V5</td>
<td>EZ280, or similar</td>
</tr>
<tr>
<td>R5, R10, R15, R16</td>
<td>47,000 ohms</td>
<td>R1</td>
<td>100,000 ohms</td>
</tr>
<tr>
<td>R6</td>
<td>470,000 ohms</td>
<td>R2A, R2A</td>
<td>2A</td>
</tr>
<tr>
<td>R7</td>
<td>250,000 ohms, log potentiometer, gain</td>
<td>V3</td>
<td>ECC1</td>
</tr>
<tr>
<td>R8</td>
<td>220,000 ohms</td>
<td>R5</td>
<td>E05</td>
</tr>
</tbody>
</table>

*Notes: All resistors rated 1-watt, except as stated for R17, R18. Resistors R2A, R3A must be high-stability. For T1, any suitable modulation transformer can be used, such as the Wodene UMO.*

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![Fig. 1. Measured frequency response curve, taken at two watts audio output, for the speech-amplifier/modulator shown at Fig. 2 and described in the article. It is intended to give an adequate speech characteristic under amateur-band conditions.](image-url)
C6. The gain control R7 feeds into V2A as a second voltage amplifier, and thence into V2B as the phase-splitter. A degree of negative feed-back is obtained for V1-V2A by the action of the un-bypassed cathode bias resistors (R2, R9), and in fact the total harmonic distortion at 10 watts output is about 0.1 per cent at 1,000 cycles.

Phase-splitter V2B drives a pair of EL84's (V3, V4) in push-pull. The modulation transformer as originally used was the well-known ex-SCR522 item, but if a more modern ultra-linear C-core transformer is available, total distortion could be further reduced.

Considerable work has been put in on the development of this modulator, as it was felt that any Club equipment should set an example in terms of on-the-air results. Those who have worked G3LRS (of the Leicester Radio Society) may agree that it does perform well.

A possible modification that would be an advantage is volume-compression or high-level clipping, as examination of the output using an oscilloscope shows that over-modulation is only too easy to obtain!

Detailed layout diagrams and so forth have not been given here because it was felt that few readers would be likely to want to duplicate the particular form of construction used in the writer's case. The point is that anyone using the circuit and adopting all the usual precautions in the construction of high-gain audio voltage amplifiers (V1, V2A in this circuit) should be able to duplicate the results this modulator is giving.

**MAGAZINE CLUB CONTEST—"MCC"**

What will be the 19th in the series of Top Band Club Contests organised by SHORT WAVE MAGAZINE—and attracting an increasing entry each year—will be taking place over the week-end November 14/15. The rules will appear in the "Month with the Clubs" section in the October issue. Since non-Club contacts score one point—and the number of these could decide the winner—any 160m. CW operator who fancies himself on the key is invited to join in the mêlée. This is a short-period contest, played off at a furious rate, and the operating standard is high.

**"ONE-WATT TRANSISTOR TRANSMITTER"**

G3AM (Barnstaple), author of this article in the August issue of SHORT WAVE MAGAZINE, mentions that he is still working EU's on 80m., though conditions have not been too good during the last month or so. He has now had well over 200 contacts. His colleague, G3NSC, has built a Chinese-copy and on its first test OZ was worked. G3AM suggests that those interested in the circuit would find that increasing the PA bias resistor R13 (see p.331, August) to 180 ohms and driving a bit harder results in better efficiency and a little more RF output.
A MULTIMETER IN THE
IMPEDANCE TRIANGLE

FOR IMPEDANCE,
INDUCTANCE AND
REACTANCE MEASUREMENTS

G. A. W. PARTRIDGE

MOST experimenters have a multimeter, which is
an essential instrument for serious workers. It is
a good investment to spend a little extra and obtain a
reliable meter. For electronic work the sensitivity should
not be less than 10,000 ohms per volt DC and 1,000 ohms
per volt AC.

The applications of such an instrument can be
increased beyond the usual voltage, current, and resist-
ance measurements by using it in conjunction with
the Impedance Triangle illustrated in Fig. 1. For
example, even an LF coil can be tested by this method.

First of all, its resistance is checked by simply
applying the resistance range of the meter to it. This
will reveal any breaks in the winding and if a coil-to-
earth test is carried out, any weakness in the insulation
will be shown up by a low reading. In the following
calculations the resistance of the coil is taken as 250 ohms.
The base of the triangle, (R) therefore, is now known.

The hypotenuse which represents the Impedance (Z),
or the combined resistance and reactance to AC at a
specified frequency, is determined with the aid of the
circuit shown in Fig. 2. A non-inductive resistor of
known value is connected in series with the coil and a
suitable voltage at a specified frequency applied to the
combination. The current I is calculated from:

\[ I = \frac{E}{R} \]

For example, the voltage (E) across R which is, say,
100 ohms is found to be 30 volts, then:

\[ I = \frac{30}{100} = 0.3 \text{ amp.} \]

(If the multimeter has an AC current range, this
calculation can be omitted as I could be measured by
connecting the meter in place of R.)

The Impedance is calculated from:

\[ Z = \frac{E}{I} \]

If E, which is the voltage across the coil is found to
be, say, 90 then:

\[ Z = \frac{90}{3/10} = 300 \text{ ohms} \]

Completing the Triangle

Two sides of the triangle are now known. The
third side \( X_L \) is the Inductive Reactance, or the resistance
the coil offers to AC only at a specified frequency:

\[ X_L = \sqrt{Z^2 - R^2} \]

In this particular case \( Z = 300 \) ohms
\( R = 250 \) ohms

\[ X_L = \sqrt{(300)^2 - (250)^2} = 166 \text{ ohms} \]

This completes the triangle and thus gives three useful
facts concerning the coil. There is, however, other
information available.

Measuring Inductance

The Inductance (L) for example can be found from:

\[ L = \frac{X_L}{2 \pi f} \]

where

\[ \pi = 3.142 \]
\[ f = \text{frequency in c.p.s.} \]

If the coil is connected to a 50-cycle supply, L will
be:

\[ L = \frac{166}{2 \times 3.142 \times 50} = 0.53 \text{ Henry} \]

(Note: The inductance of smoothing chokes may
differ because they are usually tested with a DC current
flowing through them.)

The cosine of the angle \( \theta \) represents the Power Factor
of the coil which is always less than one, but the higher
it is the greater the efficiency.

\[ \cos \theta = \frac{R}{Z} \]

In this case \( \cos \theta = \frac{250}{300} = 0.83 \text{ P.F.} \]

Finally, the angle \( \theta \), which can be found from a set
of cosine tables, is the angle of lag or the phase relation-
ship between the current and voltage. In this case it
will be 33-90°.
The impedance triangle and how it can be used. The derivation of Fig. 1 is explained in the text and from this, inductance and capacity values can be worked out using only a multimeter.

Other Measurements

A good multimeter is most helpful when the larger condensers require testing. Fig. 3 shows how a circuit for such tests is set up. It closely resembles the coil circuit in Fig. 2. (Electrolytic capacitors cannot be tested in this way as they are designed for DC working only.)

Here again, the current I is found from:

\[
I = \frac{E}{R}
\]

In this particular case it is 3/10th amp.

The capacitive reactance \(X_c\), or the resistance to AC at a specified frequency, is found from:

\[
X_c = \frac{E}{I}
\]

If \(E\) is found to be, say, 95.4 volts:

\[
X_c = \frac{95.4}{3/10th} = 318 \text{ ohms.}
\]

\(X_c\) can also be found from:

\[
X_c = \frac{1,000,000}{2 \pi f C}
\]

where

\(C\) = Capacity in microfarads.

A 10 \( \mu \)F condenser connected to a 50-cycle supply would have a Capacitive Reactance of:

\[
X_c = \frac{1,000,000}{2 \times 3.142 \times 50 \times 10} = 318 \text{ ohms.}
\]

The capacity gives a good idea of the condition of a condenser. Any deterioration usually affects this value. It can be checked with the circuit in Fig. 3 and then calculated from:

\[
C = \frac{I \times 1,000,000}{2 \pi f E}
\]

For example:

\[
C = \frac{0.3 \times 1,000,000}{2 \times 3.142 \times 50 \times 94.4} = 10 \mu \text{F} \text{ approx.}
\]

It must be remembered that the power factor of a good capacitor is almost zero, which is quite the opposite to a coil, and the phase relationship will be almost 90° lead.
TRYING THE HF BANDS

BY MODIFYING AN LF-BAND TRANSMITTER

E. J. WILBY (G3RZX)

FROM observations over the past year it would seem that the average amateur begins on 160 and 80 metres using low power, the Tx being the familiar VFO, Buffer and PA.

On these two LF bands the newly licensed amateur can be heard discussing his envisaged "big rig" and plans for operating the other bands. However, as in the writer's case, these plans do not always quickly materialise as at this early stage more constructional work would mean curtailment of precious operating time.

This being the case, it was decided to investigate the possibility of operation on 40, 20 and 15 metres using the one and only transmitter—a simple 160-80 metre VFO using an EF91, an untuned EF91 buffer and a TT11 in the PA, running a maximum of 15 watts input on 80 metre Phone.

First job was to modify the pi-output coil which covered 160 and 80 metres. Tappings were introduced so that turns could be shorted to cover 40, 20 and 15 metres.

A 7 mc coil was wound on ⅝ in. former, tuned by a small trimmer and connected between the VFO anode and earth, via a blocking condenser C1 to avoid shorting the HT. Using this arrangement, with the VFO grid tuning 80 metres and the PA on 40 metres, it was found that 15 watt could be obtained and immediate contacts were made with G and EI, reports varying from S7 to S9+.

Getting on Twenty

Leaving the VFO stage in this condition attention was turned to the EF91 buffer. Another ⅝ in. diameter coil tuned to 20 metres by a small trimmer was connected between the buffer anode and earth via a similar blocking condenser C2, the PA of course now being tuned to 20 metres as well.

Once again it was found that about 15 watts input could be obtained and a tentative "CQ 20 metre Phone" brought back ITTAR with a report of 5 and 9+ for the very first 20-metre contact. Subsequently during the next few days DJ, ZB1, EA, LA, SM, OH, F and HB were worked with reports of S6 to S9+.

Would it work on 15 metres? The buffer and PA were tuned to 21 mc, but output was rather lacking. However by putting the VFO anode on 10.5 mc satisfactory operation was obtained, although due to the state of the band only local G contacts were made. G3KNA at 12 miles distance reported signals at 5 and 8.

What about 10 metres? One day while working 20 metres it was discovered that 10 metres was open for short-skip. A 10-metre coil was promptly put in the PA, and using it as a doubler from 20 metres, contact was established with two DJ stations.

No really startling DX results were obtained, but it will be agreed that bearing in mind the simplicity of the equipment these EU contacts were quite pleasing — within a couple of hours of deciding upon this scheme contacts had been made on three "new" bands.

Incidentally the aerial used in each case was 120ft., end-fed directly from the pi-output, and about 24ft. high.

So there you are — go ahead and give it a try. You will have a lot more to talk about when you return to the peace and quiet of Top Band!

For Readers' Small Advertisements, see pp.440-447

The Hammarlund HQ-180A general-coverage receiver is described as "a significantly improved version of the HQ-180." This new Rx tunes 540 kc to 30 mc, and features calibrated band-spread on all amateur ranges within its coverage. It is triple-conversion from 7.85-30 mc, and dual-conversion on the LF range; the refinements include slot filter, sideband selection, vernier-tuned IF, separate linear detector for SSB reception, variable-attack AVC, and a crystal calibrator.
THANKS to the many readers who have expressed their approval of the new format of this feature. At least nine out of ten have said that they consider it an improvement; the remainder are mostly “don’t-knons,” although a few admit to disliking the new title after all the years of “DX Commentary.”

A few years back it seemed that the only bands of real interest were 14 mc and 21 mc, with a few outbreaks of 7 mc DX and some passing references to Top Band. Nowadays we have turned completely inside-out, and most of the space these months seems to be occupied by Ten Metres and Top Band. With all the short-skips nonexistent so painfully evident, 14 mc has practically usurped the former position of 7 mc as the nonsense Band. Occupied by Ten Metres and Top space these months seems to be nowadays we have turned completely inside-out, and most of the space these months seems to be occupied by Ten Metres and Top Band. With all the short-skips nonexistent so painfully evident, 14 mc has practically usurped the former position of 7 mc as the nonsense Band. Occupied by Ten Metres and Top space these months seems to be nowadays we have turned completely inside-out, and most of the space these months seems to be occupied by Ten Metres and Top Band.

Top Band has its own appeal—an elusive one, but mainly a matter of being able to work DX that should really be impossible, especially with ten watts. And 28 mc is a queer phenomenon, with almost a quasi-VHF atmosphere about it. How far does the ground-wave go, and where has the sporadic-E patch gone this time, and so on. More and more are becoming fascinated by it, but we notice that very few decent beams were in use by the large number of readers who supported the Activity Sundays. Most of them ran lowish power and a piece-of-wire; and if they had all been able to operate with the full 150 watts into a real beam, results would have been completely different.

It is also pretty obvious that quite a few receivers are not all that they might be on 28 mc; when two readers report from the same town on the same day, one having heard several African countries and some Europeans, while the other thought there was nothing on the air at all, one doesn’t have to look far for the reason.

There is a possibility that 28 mc will be a DX band again in as short a time as two years. Any time spent between now and then on livening up the gear will be well spent; likewise some activity now is highly desirable. Let “them” know that we do use this band.

Ten-Metre Activity

Although our pre-arranged Activity Sunday was ‘way back in July, quite a lot of mail concerning it did not reach us in time for comment last month. (Some because of postal delays, and some from abroad.) The following is a brief summary.

5N2JKO (Zaria) started up at 1135 with ZE2JA and 5B4MO; also heard 5B4AK and YU6ZAA on AM, 5B4JF on CW. Next session started at 1645 and brought QSO’s with 5B4, ZE, VQ2, and then, when the band opened to Europe, DL9VZ, 11BAT, DL7AA, 11IT, F3RG, G8KW, 4CM, 3CAZ, 3BYV, 3KEA, 3JZK and 3GKZ. (SSB, AM and CW, mixed.)

G2CDI was also heard, but nearly all those heard or worked were near London. 5B4AK, the RAF Club Station in Cyprus, worked HZ2AMS at 0853; then, from 1230 onwards, Y02VA, VQ2AS and 2DT, UB5AHG, ZE3JJ, UB5DIR (all AM) and 9L1NH on CW. Not a single G heard!

VQ2GJ (Kitwe) used CW only. He heard a G as early as 0919, but could not copy. Until lunchtime, nothing but other VQ2’s. At 1307, raised F3RG, then on with DJ7PW, F3AT, F8KJ, DL1EQ, HB9UB, G3KSL, DL6EY, G2DC, DL7BQ. All with a dipole and 100 watts.

VQ2WR (also in Kitwe) says that at least seven VQ2’s were active. For him the band opened at 1315, first to 5B4 and then to DL7HN and DL7PW. After that, YU6ZAA, SM7ACB, DL1MI, G30HP, 5N2JKO, HB9UB and F8KJ . . . with a Viceroy and Minibeam.

VQ2AP worked G6XH and G8UG on SSB, also 5N2JKO; apart from these, only 11, DJ and OE, VQ2BC raised G2DC on CW.

ZONE-BAND TABLE

<table>
<thead>
<tr>
<th>Station</th>
<th>G2DC</th>
<th>G6QB</th>
<th>G3GW</th>
<th>G3DO</th>
<th>OH3NY</th>
<th>G3NOF</th>
<th>G3PEK</th>
<th>G3OLN</th>
<th>G3RDC</th>
<th>G3PLQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zones Worked</td>
<td>28 mc</td>
<td>21 mc</td>
<td>14 mc</td>
<td>7 mc</td>
<td>3.5 mc</td>
<td>1.8 me</td>
<td>25 mc</td>
<td>21 mc</td>
<td>14 mc</td>
<td>7 mc</td>
</tr>
<tr>
<td>Total Zones</td>
<td>5</td>
<td>11</td>
<td>17</td>
<td>21</td>
<td>10</td>
<td>8</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

(Entries for this new table are invited; scores are postwar, i.e. starting from any time back to January 1946.)
for his only G, though he also heard G3KHE. Others worked were 5B4’s, II’s, YO, DJ/DL, F and HB9.

VS9AMN raised other VS9’s, HZ2AMS (1116) and a bunch of DL’s—no G’s either heard or worked. So much for the overseas logs; now for a very compressed version of a large batch from the U.K.

**G3PMR (Retford):** Two locals worked on CW—nothing else heard. SWL. M. Harrison (Manchester): About a dozen locals logged, nothing else. G3SGH (Canterbury): Worked locals, and heard ZD6RM at 1408. G3WP (Chelmsford): Heard about six G’s, G3GZI on CW being the furthest.

**G3PVK (Welwyn Garden City):** Worked six G’s with 40 watts AM, to 60-ft. wire and loft dipole. The following evening he heard CT1KK, CT1TX and 9L1HX. G3CWL (Leatherhead): worked G’s and II1Z; heard several G’s plus G3AHN, DL6RM, CT1DU, VQ2BC and VQ2GJ. G3OZT (Southampton): Worked locals and heard HZ2AMS (1408) and a VQ2. G3JRL (Sheffield) worked G’s, heard VQ2WR, VQ2AP, HZ2AMS and ZD6RM . . . KW-2000 and 3-el. wire beam in roof-space.

**G3OHP (Rochester) worked G’s on CW and SSB, plus HZ2AMS, 5B4CZ and VQ2WR (1400-1500).** VS9AMN was also heard, but not a single European station. G3LZZ (Shipley) worked locals only; he remarks that 10-metre openings seem to precede TV QRM from Europe by a few hours—pitifully not the other way round.

**G2ABK (Spilsby)** heard only two stations, both G’s. GM3OWU (Midlothian) a G3MM (Altrincham) worked G’s on AM—nothing else heard or worked. G3OAL (Dudley) worked G’s up to 60 miles, heard 9L1IJ and 5N2JKO; the following day he worked HB9SF, 9G1EI and 9L1NH.

**G3GZI (Maidstone)** reported last month, but added a note to say that on the following day (July 13), from 1615 onwards, he worked PX1AI, PX1VW, II, DL and 9L1NH; he also heard ZD3A, 9L1HX, G2DC (Ringwood) just about scooped the DX pool (on the 12th) by working ZD6RM, VQ2BC, VQ2GJ, and hearing ZE3JJ and ZE3JO (all between 1315 and 1430).

A summary of all this, together with last month’s reports, is a little difficult. But it seems that it was a pretty poor day, and only the unusual amount of activity made it at all worth while. African and Middle East stations were the only real DX, and their signals only fell in certain areas. Europeans, likewise, were rather freakish, and heard only by a select few. But all very interesting and worthwhile.

**Studying the Bands**

Readers sometimes ask “If these Ten-Metre Activity Periods are so successful, why not arrange something similar for other bands?” The short answer is that there is no lack of activity on the other bands, anyway, and that Ten is at present unique in one particular: That a sudden rash of stations cropping up on the band is welcomed and not cursed as QRM.

All other bands up to One-Sixty suffer, at present, from over-population when conditions are good. Fifteen might just stand some special treatment, but as soon as a little DX crops up, someone is on the trail. (And think how unpopular we should be among the real devotees of Fifteen if we spoil it for them by forcing unnatural activity into the band!)

There is a lot to be said, though, for making a really detailed study, over a period, of one particular band. Some of the really wild DX’ers spend so much time changing bands in search of the elusive one that they miss a lot of interesting things. Earlier in the year, for instance, one could listen on Eighty in the early mornings for seven consecutive days and hear nothing of interest—only to find out that someone who stayed on ten minutes longer had worked some good and unusual DX nearly every morning.

It may be over-simplification, but it is nearly correct to say that each band has its peak times, which vary with the season rather more than with conditions; which don’t vary greatly over a short period, from day to day; but which do vary for different parts of the world. Right through the very worst of conditions, it seems to be possible to maintain a sked with a DX station by correct choice of time . . . and, of course, nothing is such a help to making a DX contact as the certain knowledge that both stations will be on the air at that time, and on a pre-arranged frequency. (On the other hand, some people consider random contacts much more fun.)
The 1964 Top-Band Contest

It has happened at last . . . U.K. stations at the top of the scoring list in an American contest! It was the CQ 160-metre Contest, held on January 25-26, 1964, in the best conditions of the whole winter, as far as Top Band was concerned. To come to the point: G3GRL led the whole world with his score of 43,824 (205 contacts in 15 countries); second was GM3IGW/A with 39,015 (269 contacts in 12 countries). Heartiest congratulations to both!

Next in order were K2DGT (37,100), DL1FF (36,904), W9EWC (35,200), W9AIH (31,588) and VE2UC (31,518). Other high-scoring U.K. stations were G3RBP (20,800), G5ZT (13,618), GI6TK (23,382), and GW3JI (17,532). Though overshadowed by the leaders' figures, all these scores represent pretty terrific Top Band achievement.

An amazing feature of this contest was the breakdown of stations, country by country, which shows the following levels of activity: W/K stations, 904; G, 348; GD, 2; GI, 10; GM, 31; GW, 22. The only other entries of any size worth mentioning were from VE (40), DL (17) and OK (90). But that total of 348 G's still shakes us . . . especially after the notoriously poor response from G-land in other contests, including the CQ Worldwide affair each year.

GM3IGW/A just missed making the highest number of QSO's—his total of 269 was beaten (by W9AIH) by one! The reason why G3GRL won the contest with his much smaller number of contacts was that he worked a fantastic number of W/K and VE stations at ten points a time. Not one of the U.S.A. stations could possibly have worked a similar number of G's.

Altogether a pretty gratifying result, and we are wondering what next January will bring. There is an even chance that conditions will be still better, but that might mean that the QRM assumes more punishing proportions. The main thing, we would say, is to have a vertical aerial, certainly not less than 80 feet high . . . and the gear and operator to go with it!

The Overseas Mail

G6MK—better known as ZS8MK, and later as 5H3MK—is now awaiting a VS9 call in what may turn out to be a new country. To be exact, he is in The Quati State (which describes itself on its stamps as Qu'aiti State in Hadramaut). Despite the VS9 call, this is an independent state with its own flag, its own army, customs, government and Sultan. Nearby is the Kathiri State, similarly independent. G6MK's work, as a doctor, covers both states, also that of Mahra (further east, towards the Omani border) and the island of Socotra.

But there are snags . . . next door is a signals office, with a TCS-13 tied up to a weird wire contraption; and a mountain ridge "ends in the back precincts" (which can hardly be called a garden). The mountains almost screen off the U.K., and the Tx next door seems to have a special click-accenuter circuit built in. However, we hope to be hearing from VS9MK (?) soon.

G3SHH recently arrived in Queensland, and was delighted to find that one has just to produce a G licence or a PMG Certificate at the Radio Services section, and then can choose one's own call.

Reporting the HF Bands
He chose VK4IS and hopes to be active soon. But he wishes he had taken much more gear out, because it seems to be almost non-existent in VK4-land.

LRO E. McPheat (an ex-operator of G3BZU and GB3RN) writes from HMS Afrikander, about 10 miles off Capetown, to say that G's fairly romp in there on 80-metre CW! He sends a long list of Europeans heard (1900-2250) and the G's on that particular day, from 2210 onwards, were G2QB, G3REX, G3OFT and G3EYN. Considerably outnumbered by YU's, YO's, OK's and DJ's, but there just as same. Mac says "If I had a ZS call I'd have a go"—and if anyone especially wants a contact he will try to get one of the locals interested.

WA2WOR (New York City) admits to having been a faithful reader for several years, though he has been inactive on the HF bands. Now he is keen to modify the rig for Sixty, and would like to correspond with Top-Band enthusiasts over here—especially those with experience of "limited space" antennae suitable for city conditions.

5N2JKO says that most of the Nigerian stations are on SSB now. Active are 5N2CKH, 2JEB, 2JSC, 2JWC, 2RJO and himself. And "simmering" are 5N2FEL, 2RFB, 2EGI, 2EBL, 2AAK, 2JWB. QRT are 5N2DFT, 2LMJ and 2RAM. Mike adds that DX/TV is possible there, and on a recent occasion he beamed his TA -33 on a long list of G's on SSB during the favourable period, September-October. (SSB much preferred, as his CW has "gone rusty.")

More Aerial Work
G2DC's usual summer check on his equipment, to bring it up to concert pitch for the contest season, has been spent almost entirely on the aerials. Every bit of the original Quad has now been thrown out; the new three-bander works fine and seems to be so robust that Jack will almost welcome a gale to see how it fares; and a new 45ft. vertical is base-loaded for 3-5 and 1-8 mc, leaving the 7 mc ground-plane for its real purpose. No Zepps or dipoles any more—in fact no wire aerials at all. G2DC passes on a word of thanks for the help he has had from members of the Lymington A.R.S.—"a small club of only twelve in strength, but they are all as keen as mustard."

DX in General
Continuing with G2DC's letter: he found conditions "reasonable"...
during the WAE Contest, except to the U.S.A. Not a single W was heard on 21, 28 or 7 mc, only a few on 3.5 mc and a greatly reduced number on 14 mc. These usually make up the "bulk" score to which one later hopes to apply a nice multiplier. The 7 mc ground-plane did its stuff to the tune of QSO's with VK, CP5, VS1, KC4 and UA0, most of the DX on that band being between 2000 and 2300. The usual complaint about 14 mc remains—too much short skip, exposing all the "crude operating tactics of the mid-EU gangs." Commercials are also on the increase, and there is a "vacuum-cleaner" type of QRM in the early mornings that seems to blanket most of the CW end of the band. All we can do, it seems, is to wait for those sunspots to show up.

GW3AHDN (Cardiff) thinks that W6HVN's condemnation of dishonest DX'ers (reported in the July issue) is a bit too sweeping. Some of the "big guns" may operate in the manner he complains of, but most of them, according to Tom, are pretty considerate in their operating. Just another case of the whole suffering for the sins of a minority! And he adds that we seem to have an upsurge of petty dictators at present, telling us that one should not do this or that... our licences tell us what we can or can't do and if we conform to these regulations and the normal human courtesies, surely that is all that is required of us?

"One of the delights of Amateur Radio (after sampling service or commercial radio) is the lack of regimentation... we are, after all, only like a crowd of youngsters 'playing' at radio; in other words, AR is of no great importance, except perhaps to ourselves... let us participate without interference from petty dictators who have an exaggerated idea of their own importance."

GW3AHDN says that the new DXCC list now shows a total of 340 countries (314 current and 26 deleted). No one has yet worked them all, and no USA station can work Cambodia or Indonesia, both on the banned list, as far as they are concerned.

G3NOF (Yeovil) found 14 mc carrying nearly all the DX, with very little in the early mornings since July. But the South Africans have started coming in during the early evenings, with South America later and (occasionally) VK's and ZL's around 2300. AP2MI and 9X5GG, both on SSB, were new ones for him. Other snippets from his letter: The IARC, in addition to the well-known 4U11TU in Geneva, hold the following calls—F0MM, DJ0ITU and HB9AEQ/M... 9Q5CM is a keen philatelist, and appreciates a good selection of different stamps on direct QSL's; he will reciprocate... FH8CD is on 14275 kc SSB, around 1745... G3IZD (H.M.S. Mohawk) and G3NIR (H.M.S. Dido) both operated /MM on 28 mc; SSB heard on 7 mc from 7Q7PBD, VK's and PY's... YK1AA operates daily, 14268 kc, 1300-1600; Fridays 0300-0600.

Top Band Doings

A friend remarked that it was the boys with no space who would carry off the Top-Band DX this season—because if they couldn't manage a half-wave they would make real efforts to put up a good vertical, which is liable to be much better. Certainly the half-wave at a height of 20ft. isn't all that good for low angle radiation; even 60ft. isn't really high enough. So—out with those sky-hooks for the upwards part, and those oil-drilling rigs to match them in a downward direction. (No space means no radials, too!)

Meanwhile, new ones show up from time to time. GW3FSP and G2CUZ both worked LA2VF on August 9; G2NJ got OZ1JB, and heard OZ7BL, on July 24. G3PMR raised OY7BS on August 7, and didn't hear anyone else even call him.

Meanwhile, on the super-DX front, Stew of W1BB has been carrying off the honours again. He raised ZS6BCT for the first summer DX of this season on July 15; then came a First, with 9L1HX, on July 26 (Stew thanks G3PLQ for this one, as it was he who worked on 9L1HX when he made port at Freetown). On July 29 came another First, when VQ2AS got on the band and worked W1BB.

Another major event was on
June 27, when JA3AA, using the Japanese spot frequency of 1880 kc, worked VS1LP. This is believed to be the first JA contact anywhere on One-Sixty!

VE2UQ was on a long trip, and carried out tests from near the North Pole and, later, from Thule, Greenland. No luck from either, but from Prince Edward Is., as VE2UQ/1, he worked quite a bunch of W’s and VE’s, and also GM3OUV/P, who was at Black Isle (Ross and Cromarty).

G3OUV himself reports that the trip was very successful, and he made 245 contacts, with 107 stations (VE2UQ/1 was, of course, the best DX). He worked from eleven counties in GM, found the standard of operating good, and wants to thank all concerned for making his holiday enjoyable... and especially GM3EGW, who helped them out of a tight corner!

G3SJJ (Nottingham) asks whether the G3 stations are going to have their own ladder for Top Band counties. It was planned to start one towards the end of the year, when activity really gets going, and when there are a substantial number of G3T stations also on the band. So watch for the G3S/T ladder in due course.

G3REA (Warrington) joins the select band of those who have worked all counties, thanks to GM3OUV/P (but he hasn’t got the 98th card yet!). Kirkcudbright was the last one, and, for good measure, he got it again (from GM3KEP/P). The whole lot took nearly two years, and G3REA wants to thank all the portables who made it possible.

G5JN (Colwall) has been in the “98 spot” before, and now rejoins the ladder. He says “Seekers after Hereford will find me almost daily—QSL’s strictly reciprocal.” He is now well up on the Phone ladder, too.

G3PLQ writes from the m.s. Perang, still on the West Africa run. Having enticed 9L1HX on to the band (see note about W1BB), John is now working on 9G1 and TU2. His July log, which just missed last month’s issue, shows a load of G’s heard at various points down the Africa coast, but when he got to a distance of about 1,600 miles from London the log reads “Where have they all gone?” Nothing left but DHJ! G3PLQ will be back in the U.K. early in September, then off again on the same ship for her next trip.

**Strays**

SWL Derek Poulter (Morden) logged four W’s on Ten, between 1440 and 1500 on August 2—all on AM. The reason for these rare openings is still in doubt. Then, on Twenty, he heard 6O6BW put out a call; an unidentified voice shouted out “DX on the band!” and W’s appeared from everywhere. (Seems they now have a Private Ear on the job!)

G3IDG (Basingstoke) likes the idea of a Ten-Metre Contest, and also, possibly, a Ladder for Counties and Countries worked. And he suggests bonus points for CW contacts, to encourage a little more key-punching on the band (good thing!). We are seriously considering some such idea, to run through the six winter months... scores to be published month by month. And then, as G3IDG says, in two or three years the band will be jam-packed with W’s, and everyone will wonder what all the fuss was about.

G3NPB, really a keen Top-Band man, monitors Ten pretty often, and has heard no DX recently, but says he was “staggered” at the amount of European activity on July 13—DJ, CT and the like until well after midnight, all at 9 plus.

**Harmonic Trouble**

G3ORP (Maidstone) says that locals in the Medway district are thoroughly fed up with the strong Harmonic Trouble on 1960 kc of “Radio Invicta,” a pirate station off the Kent coast which works on 980 kc. The fundamental is S9 plus 20, but the harmonic is a good S9. (“When they ask for requests they’ll get a strong one from me, and it won’t be for a record!”)

**Newcomer**

G3TGE (Studham, Beds.) is about the newest of the “new boys” to report. He says that all his equipment has been more or less copied from Magazine designs; and with a Top Band rig feeding a 120ft. wire, he worked 27 counties in his first three weeks on the air. A 60-watt multi-band job is now on the way, and the DX will doubtless follow. We shall be glad to report on it.

**DX News from All Over**

Gus, the Globetrotter, will soon be in the news again. On his way out to AC3-land he proposes to join forces with HZ2AMS for some operation from 8Z4 and 8Z5... and another stop-off in AC4 is now being mentioned. He is possibly linking up with Hammarlund in their popular “DX Pedition of the Month” scheme.

The following rarities are known to be on the air—perhaps not too regularly, but at least sporadically:—FB8WW (Crozet), mostly 14050 kc CW; FB8YY (Adelie), 14025 CW; VK0PK (Macquarie), 7020 kc CW at 0730; ZS2MI, 14270 kc SSB almost daily, 1500; FH8CD (Comoros), 14275 SSB, week-ends; 7G1L, 7G1IX and 7G1EZ, all 14 mc CW, 1800-2200 GMT most days.

Possible forthcoming DX-pedicitions include these:—PY9, not to Trinidad Is., but to St. Peter and St. Paul Rocks, and to Las Rocas Islands—probably in October... Sardinia—IS1 calls will appear from 1ICWN and 11NU, September 4-7... Rodrigues Is., by the 5Z4 gang—imminent or already completed.

A prefix change is forecast for the Faoerios; the OY’s are expected to become XP’s this winter, when a new government takes over the administration from Denmark. Faeroes postage stamps will then be issued.

WPX-Hunters, who become practically phosphorescent when a new prefix crops up anywhere, can generate their own aurora over these: U4WHZ, 4XJ1U, HZ5TYQ, DU3DO, 9M4LX (ex-VS1ILX), DM0HAM, F0AF.

VK9DR (Christmas Is.) is reported as putting strong sigs. into W5-land on 7 mc (1130 GMT)... VK9WP is said to be en route for that rare spot Nauru, for a two-year tour of duty... YA4A is reported on 14110 kc CW, almost
daily at 1700-1800 GMT, looking for SSB replies on the same frequency.

There are now at least seven active stations in Saudi Arabia—HZ1AB, 1AM, 1HZ, 1SS, 2AMS and 3TYQ, and 7Z2KE... VR4AO is said to be very active on 14025 kc CW, best times for Europe being 1400 (short path) and 2000-2200 (long path)... XE4 (Socorro): This expedition which has been on and off for months, is now postponed until November on account of the hurricane season.

HB9GW is said to have a licence for operation from Bear Island, whence he will show up as HB9GW/LA/P... OZ4FF is active from Bornholm Island... and SMICXE is on Gotland Is.

**All Those Islands**

Talking of islands, that proposed award which was mentioned last month under a fantastic set of initials has now settled down as the "Islands-on-the-Air" Award, with the neat abbreviation of IOTA. The starting date for the race is to be January 1, 1965, and copies of the Iota Directory will be available before then.

Strong points in its favour are as follows:—The geographical boundaries are permanent, not man-made and subject to alteration; the political situation will have no effect upon them; "local trips" by amateurs from a nearby country will become feasible, but world-wide DX-peditions will still have lots of scope; and those who become island-chasers in a big way need never retire, even as conditions improve. More of this from time to time, as it is an award we most definitely approve of (unlike most of them!).

**VK/ZL Contest**

Don't forget the dates for the VK/ZL/Oceania Contest, which will be under way immediately after the next issue appears. October 3-4 for the Phone event, and October 10-11 for the CW, starting and finishing at 1000 GMT for the two 24-hour periods. The rules were mentioned last month.

The 25th YLRL Anniversary Party, open to YL's and XYL's anywhere in the world, will run on October 21-22 (1700-2300 GMT) for the CW half, and November 4-5 (same times) for the Phone half. And the 16th YL/OM Contest takes place on February 20-21 (1800-0500 GMT) for its Phone half, March 6-7, same times, for the CW.

**Operating Notes**

It has been suggested that the occasional paragraphs appearing under this heading should be described as "Lids' Corner," but we have (so far) managed to resist the temptation. Last month some space was devoted to VQ2W's plea for full break-in on CW, giving the operator the full consciousness of what the others on the same frequency are up to. G3REA disagrees violently with VQ2W's suggestion that "you can listen to the competition, know exactly when they stop, and then sign with your own call on a clear frequency." He says "I thought we favoured short calls, not this game of last-across which exasperates so many of us... if we all do as VQ2W suggests, any DX station might as well read a good book for all the QSO's he'll get."

Maybe he has scored a point there, but in the present state of the art the DX station need not worry—there will not be a score of "full-BK" stations on his frequency, all calling after the others have finished. Probably, from the DX man's point of view, the first period of the heavy pile-up is pretty good waste of time, and the odd single call sticking out at the end, so to speak, is the only readable one. But the plan only remains good as long as there are few people who are equipped to do it. Conversely, when we all work full BK there will be no excuse for a multiple pile-up, anyway.

One of our current hates is the DX'chaser on SSB who is not content with breaking-in with a short, snappy call, but has to give (a) his bare callsign; (b) full phonetic version; and (c) for good measure, a completely different phonetic version. The whole thing takes far too long—to the impatient listener on the frequency it sounds like about ten minutes—and lots of them do it all the time. But we mustn't get worked up again on this business of phoney phonetics—it's bad for the blood-pressure. The finest exponent of the art that we have heard for years was KJ6BZ— "like Kay Jay Six Bee Zed." What a treat to copy after all the Zan-zibars, Limas and Sierras!

We have enough natural-born lids all over the place, who will never learn. What a pity if people who have become good operators should start back-sliding with some of these awful modern habits.

**Late Flashes**

GM3I GW says that G3RBP has worked ZE3JO on Top Band, and confirms that VQ2AS, ZS6BCT and ZS9G are all QRV around 1809 kc. G3I GW himself has worked PY and LU on Eighty (2300) and CP5EZ, V51LP, VK5NO and UJ8 on Forty... ZL4JF (Campbell Is.) is on Forty CW again (0615)... 4W1D (HB9AAW) is on 14005 CW and 14110 kc SSB... KB6BP is now active as KB6BP/KS6, 14330 kc SSB (0700)... HZ2AMS is homeward bound and will later be an HZ3.

**Sign-Off**

That's it for now, then, until the next deadline of first post on Monday, September 14. We imagine that conditions will be on the up-grade between now and then, and hope for lots of news for the next offering. Address everything to "Communication and DX News," Short Wave Magazine, 55 Victoria Street, London, S.W.1. We wish you a good month of DX-ing (and communicating!) 73 and—BCNU.
RALLIES AT BARFORD, NEWQUAY, DARTMOUTH AND SOUTH SHIELDS REPORTED IN PICTURES—ALL WELL ATTENDED— SOME VERY GOOD EQUIPMENT SHOWN

THE MOBILE SCENE

TT is getting towards the end of the Rally season which—in terms of attendances, the enthusiasm for /M working and the excellence of much of the mobile gear shown—has been the best on record since we first started writing about Mobile, ten years ago. There are now nearly 1,600 U.K. amateur operators licensed /M, covering between them all bands from two metres to 160m. It would probably be accepted as fair comment that too many of them are on Top Band, and that not nearly enough /M’s are exploiting the possibilities of four and ten metres. The latter, in particular, will become very interesting as a mobile channel when, during the next year or so, 28 me opens for regular DX. It will then be possible to sit in your car and work into VK2 or W6.

The 4-metre band is just about ideal—as 10 metres is at the present moment—for general working around the U.K. As things are now, on either of these bands it is simply a matter of getting out on to high ground with a quarter-wave vertical whip, worked against the vehicle in the ground-plane mode, to make very satisfying GDX contacts with relative QRP. The popularity of Top Band as a /M channel rests solely upon the fact that, at any given time, there is more U.K. activity on it than on ten or four metres.

While much of the gear to be seen in G/M installations is very good—and includes all-band and SSB rigs—far too much is pretty bad, with slap-happy disposal of units and crazy aerial systems. A mobile station in a van or an old car is too often the sort of outfit at which one does not want to look too closely. This is not to say that all mobiles in vans or old cars are bad—some of the smartest /M rigs we have seen at Rallies are in elderly vehicles which are obviously in first-class mechanical condition and the pride of their owners. But if you see a dirty, bashed-about, van with an untidy protuberance on the roof, you can be sure that the gear inside is equally unsafe to operate. It would help to clean up this situation if, next season, Rally organisers were to give a booby-prize for the worst installation seen on the ground, selected by a tour round the car-park, without entries being invited! Never mind whose feelings are hurt—with so many licensed mobiles on the road, it is essential that (a) their vehicles and their outfits should be safe, and (b) there should be no accidents which would bring amateur mobile radio to the notice of the sensation-press—the Daily Yell, the Evening Screech or the Sunday Dirt Sheet could (and would) make a Big Thing of any accident in which an amateur working /M could be said to be involved.

THE MOBILE RALLY CALENDAR

Events now scheduled are dated below, and bring us to the end of a very successful Rally Season. Note that the Reading meeting is a change of date, to avoid a clash, and that the Harlow rally is a new event brought in since last month. And if any reader should be making the Dutch affair during September 12-13, we would be glad to have a report, with pictures.

September 12-13: International Mobile Rally Weekend organised by the Dutch amateur group, full details of which were given on p.366 of the August issue, it now being too late to apply for the special PA/M licences.

September 13: RSGB Mobile Rally at Woburn Abbey, Beds.

September 20: Annual Mobile Picnic, Reading Amateur Radio Club, at the Childe Beale Trust Pavilion, Lower Basildon, nr. Pangbourne, Berks. Talk-in stations will be operating on 160m. and 2m. Car screen stickers and any further details can be obtained from: R. G. Nash, G3EJA, 9 Holybrook Road, Reading. (Visitors should provide their own refreshments.)

September 27: Harlow and District Radio Society Mobile Rally, at Magdalen Laver Village Hall, near Harlow. Talk-in will be on 160m., by G3ERN/A, opening at 10.0 a.m. A full and interesting programme has been arranged.


The prize-giving at the Cornish Mobile Rally, Newquay. G3NVJ watches his trophy for the safest mobile installation.
Scene at the South Shields Mobile Rally on July 5, with the sea in the background. They had an attendance of 300 or so in about 75 cars, of which 28 had mobile installations—only one of which, GINAOM from Dewsbury, was on two metres. The weather was cool and showery but in spite of that a number of events were run off—including a test on knowledge of the rules about /M operation and safety; driving and parking competitions; and a transmitter test involving accurate frequency setting. Another competition was a Morse test! Among the attractions was a surplus-gear stall, which did very well.

For the Torbay Mobile Rally at Dartmouth on August 9, the prizes were presented by old-timer GSSS, seen at centre in this picture.

Among other conveniences, bar facilities are provided at Barford. This year's A.R.M.S. Rally was somewhat down on attendance, due probably to other big events also taking place on July 5.

For the Torbay Mobile Rally, G5LMG/P provided the VHF talk-in and was located at a high point about 5 miles from the site. The gear consisted of a Wilbers 2m. Tx (the earlier pattern), a CC converter into a BC-454 and a 4-ele Yagi.

They also had a QSL tree at Dartmouth.

More Rally pictures overleaf.
An impression of the aerial layout at Barford, viewed from the rear of the Rally enclosure. The lattice mast carries the beam for the local MARS station AJ1AH.

At the Torbay Mobile Rally, at the Royal Naval College, Dartmouth, on August 9, the prize for the best home-constructed /M rig went to G3NBT (Sidcup, Kent). It is a 160m job, with the modulator as a separate unit (above the gear box) and the car is a Morris 1100.

G3GMN of Cheltenham, who takes so many of our Rally photographs, has a very nice /M rig of his own - an SSB transceiver covering all bands 10-160 metres. It won him the prize for the best home-built installation at the Cornish Mobile Rally.

General view of the car park for the Cornish Mobile Rally, Pentire Head, Cornwall, on July 26, when they had a total attendance of about 200 people in hot and sunny weather - in fact, it is described as "little short of tropical." Some 45 of the cars were fitted /M, of which eleven were on two metres. The talk-in was by GB3CRG, specially installed for the occasion, and working three bands simultaneously.
WELL, quite a number of interesting things have happened since last we met. For one thing, EDX/GDX conditions have been quite good, even if variable, and for another the G3BA/G4LU expedition round those Welsh counties was not only a great success, but sparked off considerable activity.

Then, during the evening of August 11, one of the big tankers was moving up Channel for Rotterdam, with LA2PH/MM on 144-43 mc and making a number of QSO's, which were as unexpected as they were interesting for the G's concerned; however, conditions were such that his coverage did not extend much beyond the Midlands, with G3SIC coverage for the G's concerned. As regards working, and the Two-Metre Firsts, which have not been shown for a long time and need bringing up to date. (This should all be possible when we finish with "The Mobile Scene," after October. Editor.)

Some keen chaps are hoping to catch the last of this glorious summer weather by going off on expeditions. GM3OHH/P plan to catch GDX contact. (Worcester) as probably his best GDX contact.

The Tabular Matter

A while back (p.302, July) your A.J.D. made one of those loose statements that almost always land one on the putty—to the effect that “G3LTF is an almost unassailable position in Countries Worked.” Well, just too late to catch August, in comes a letter from Gaby Felix, ON4FG (Bornem) giving details of his EDX contacts with GC2TR (GC at last), the EA4AO encounter by MS (already reported), and a new first-time QSO with LZIDW via the Geminids on July 12, which took them four hours (after five different MS tried). This means, of course, that Gaby goes to 25C in Countries, putting him right in the unassailable position. Congratulations, too. The loose ones between G3LTF and ON4FG are now EA, GD and YU. So both Peter and Gaby will have to work hard to decide that lead position.

As regards the Two-Metre Annual, it is not shown this time because, as usual, we shall have the final placings for the year in the October issue—this is because new counties could have been worked between the deadline for this issue (August 21) and the year-end, August 31. So please let us have any final claims in time for the next "VHF Bands." (Those already made are being held for the final listing.)

And, of course, the new Annual Counties worked table, for the year from September 1 to August 31, 1965, has already opened—if enough work has been done during the first fortnight or so of September, we may even have sufficient claims in to start the New Annual with October.

In the 4-metre All-Time, for which there were several new claims this month, G3IUD and G3OHH are doing very well—incidentally, this shows how things are moving on the 70 mc band, on which G3OHH has now worked 169 different stations; he started when the band opened, and has been consistently active.

Attempts to make space for the Two-Metre All-Time seem always to be baulked—but it will appear and, indeed, it must, for there is now a very large number of claims in hand, and we can tell you that EI2W is in front with 94C. Other tables for which space must be made are the Seventy-Centimetre and the Two-Metre Firsts, which have not been shown for a long time and need bringing up to date. (This should all be possible when we finish with “The Mobile Scene,” after October. Editor.)

News and Gossip

G2JF (Ashford, Kent) reveals that he has been running tropo-scatter skeds with DJ2BE (Hanover) for the past 15 months, which have been very successful in that over their 400-mile path signals are usually there, even if only readable with difficulty. Jim
TWO METRES
COUNTRIES WORKED
Starting Figure, 8

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<td>G3AEP</td>
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<td>39</td>
<td>G3AGS</td>
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This Table records Counties Worked on Four Metres, on an all-time basis. Claims can be made as for the other Tables, e.g. a list of counties with the stations worked for them, added to from time to time as more counties occur. QSL cards or other confirmations are not required. Totals in excess of 100 different stations worked should be claimed and will be shown in brackets after the call.
(Purley), G3SML (Earl Shilton, Leics.), G5UM (Knebworth, Herts.), G3LAS (Berhamstead), G3AHB (Slough) and EI2W (Co. Dublin) put in claims for the various tables, all of which have been taken in.

There is a small but enthusiastic group of stations active on 70 cm. in the Ches./Lancs. area; they include G3EK, G3KMS, G3LIO/T, G3OTA and G3SXC/T. G3EKP (Belthorn, Lancs.) is also on two and four metres.

G3KQF (Borrowash, Derbys.) reports that he was able to work the GW boys in six counties out of the seven without a schedule; he says that from his point of view the interesting thing was that he had no difficulty in getting good reports with 25w. of NBFM—whereas other stations, much nearer, appear unable to find, or to resolve, his signal. (He and G3PKT had better get together about these problems.)

G3OWA is now on from a new QTH at Coulsond, Sy. and says he finds 4m. activity much increased; consistent signals with him are G3BNL, G3IUD and G3OHH, all well to the north. G3OWA has 138 different stations accounted for on the band.

From Dartford, Kent, G3CO, having worked the GW/P party all through their tour, says he would "like to see what they could do from GM"; Jack found their signals tended to be better during the morning sessions.

Having now booked in everything south of the border except Alderney and Sark, he hopes the G2GC boys will help him with them during their September 5-7 visit.

G3PBV has got going from Northampton, and has made a good start from the new QTH; the beam is to be a 10-ele long Yagi at 40ft., so he should be a pretty potent signal. G3JOE (Newcastle) reports that generally things have been pretty good on two metres up North, with a number of new stations worked; he finds G2JF and G3NUE (Worcester) to be very consistent signals.

From Coventry, G3LHA reports that his new 16-ele colinear stack is doing very well on two metres, and quite a lot of GDX has been worked. On 70 cm., the locals run Thursdays as their night-on-the-air, with about eight regular supporters, one of whom is G2CIW (Birmingham) who remarks that in general things have been disappointing as regards DX openings on two metres, though he has heard a certain amount of GDX; Jack keeps going on 23 cm. with G3KFD and G3NBQ, but it needs a spell of good conditions to get them outside the local area on that band, too.

G8VN (Leicester) divides his time between two metres with the indoor beam, still doing very well, and 4-metre mobile, which is getting more interesting. In the 2m. Annual, he is at 29C, with only the 16w.

We are very sad to have to record the passing of GM3OL, Kirkcud., who was one of the pioneering Scottish amateurs on VHF in the early 5-metre days, and had kept to VHF ever since.

In Conclusion—

Your A.J.D. will be off on a few days' leave by the time you see this—but will be back again for the October deadline which must be Friday, September 18, with everything addressed: A. J. Devor, "VHF Bands," Short Wave Magazine, 55 Victoria Street, London, S.W.1. Allah be with you till we meet again on October 2. 73 de A.J.D.

SPECIALY ON THE AIR

Following are the special-event arrangements as notified to us by close of press. If there are any more to appear in the October issue, information should reach us by September 11 latest.

GB3CRC, September 5: Cheshunt & District Radio Club phone field-day, at Goffs Lane Playing Fields, Cheshunt, operating on 80-160m., looking for local-station contacts and requesting SWL reports, which will be QSL'd by special card. QTH: B. B. Charge, 64a High Street, Waltham Cross, Herts.


GB2ASH, September 19-20: Echelford Amateur Radio Society (Ashford, Middx.) will be operating an exhibition station on behalf of the Staines & District Boy Scouts Association. Information from: L. Seaman, G3AFT, 40 Park Road, Ashford, Middlesex.

GB3UCL, October 5-15: Operated by the University College, London, Amateur Radio Society for the College Freshers' Conference, running all bands two metres to Eighty. Contacts with other College and University stations will be particularly welcome. A special QSL card is being issued, and the QTH is: D. J. Bradshaw, G3UX, Amateur Radio Society, University College London Union, Gower Street, London, W.C.1.

G3COY, October 10: Station to be put on in connection with the University of Keele Students' Mart. Freshers are invited to contact either G3COY or G3SMD, at the University, as to what facilities the Radio Society has to offer.

H89RAS, till October 25: Amateur station installed specially for the Swiss National Exhibition, Lausanne, operating all bands 10-80m. U.K. contacts and visitors will be specially welcome and, for those likely to be in Switzerland during the period, there is an Amateur Radio gathering every Friday evening, 8.30 p.m., at the Hotel de l'Europe, Lausanne, at which HB's will be glad to meet visitors. Further information from: B. H. Zweifel, HB9RO, Chemin Levant 123, Lausanne.
Above, left, the Heathkit RG-1 and matching speaker working with the new Green & Davis 2-metre converter, having an IF of 24-26 mc, this being tuned on the RG-1 Band F position. It has proved a very effective combination, since the G. & D. converter is sensitive and gainy, having a 6CW4 RF stage, while the RG-1 as the main Rx has all the necessary tuning refinements. GB3VHF at 75 miles is a strong and reliable signal using only a Turnstile omni-directional aerial. Below, right, the G. & D. converter out of its cabinet. It is very well designed, mechanically and electrically, with the RF and mixer circuits kept "in the air" above the chassis plate, and is self-contained for power.
THE OTHER MAN'S STATION

THIS is the station of G3MEF, Thomas Wylie, M.I.R.E., 17 Manor Park, Barnstaple, Devon—who has had an extremely varied and most interesting career in radio.

Starting in 1912, in Glasgow, with spark-coil and coherer, he has been through it all, including some early experiments with spark telephony! Gaining a 1st Class PMG Ticket in 1917, he went to sea as a wireless operator in a ship fitted with a Telefunken 4-kW quenched-gap spark Tx and crystal Rx, later becoming chief operator on the old City of Lahore. Remaining at sea till 1927 (and loving every minute of it), sailing all over the world in all sorts of ships, he resigned from the Marconi Co. and went to Canada to take charge of the Toronto BC station CKNC. The next step was an appointment with the Canadian Government Radio Administration, leading to varied responsibilities, such as radio aids to marine navigation and the control of a frequency monitoring service. Continuing ill-health, the result of war strain, and several severe operations, meant resignation in 1956 with a sickness pension, and retirement to England.

While in Canada during 1927-'56, G3MEF held VE3WI and VE3WY, and was very active with gear always up-to-date for the period; his main interests at that time were high-speed traffic handling (CW operation) and aerial experiments, for which he had exceptional facilities—5 acres of land, three 100ft. towers, six 60ft. poles, and six 30ft. poles! His reference-aerial was a full-wave 80m. array, 100ft. high, with 129ft. feeders.

The picture shows the present G3MEF layout, at Barnstaple in North Devon, involving a good deal of Heathkit gear (DX-100U Tx, RA-1 Rx, Sig. Gen. and Valve Voltmeter) and another receiver he describes as a “HRO Special”; this is a hotted-up HRO, with modern valve types and an internal 100 kc xtal calibrator. A Codar PR-30X Preselector is also used, modified for automatic by-passing and protection against RF. All the unit inter-connecting wiring is in shielded coax.

As might be expected, the aerial installation is pretty elaborate: A Mosley Tri-Bander; a set of multiple dipoles for 10-80m., with a common feeder; a 3-ele 10m. beam fixed to fire on Boston, Mass.; and a multi-match doublet on a 30ft. swing-up mast, with the two aerial ends sloping down to 9ft. poles, which can be used on all bands and gives excellent results.

Readers everywhere will join us in wishing G3MEF a happy retirement, sweetened by the active interest in Amateur Radio which has held him for more than 50 years.
NEW QTH's

G3SNK, P. Draycott, 66 Windermere Avenue, Kirk Hallam, Ilkeston, Derbyshire.
G3MSRV, R. M. Tatton, 1 Hillview Drive, Corstorphine, Edinburgh, 12.
G3SUS, S. Jacobs, 41 Queenborough Gardens, Ilford, Essex.
G3SVQ, A. H. Yallop, 10 Farley Hill, Luton, Beds. (Tel. Luton 22977.)
G3SNX, Amateur Radio Club, R.A.F. Station, Newton, Nottingham.
G3TAQ, N. H. Bullock, 37 Kent Road, Stowmarket, Suffolk.
G3TBB, J. B. Marsden, 14 Ash Grove, Hor sar forth, Leeds, Yorkshire.
G3TBj, C. J. Webster, Nut Tree Cottage, Ibsley, Ringwood, Hants.
G3CTC, G. F. Kimbell, 36 Tormead Road, Guildford, Surrey.
G3TCX, H. V. Morris, 321 Bromford Road, Castle Bromwich, Birmingham, 34. (Tel. STE 4906.)
G3TDQ, M. C. Morris, 60 Corinne Croft, Kingshurst, Birmingham, 34. (Tel. MAR 2913.)
G3TEY, Miss Patricia Stansfield, 33 Countess Road, Weston, Macclesfield, Cheshire.
G3TDF, R. Youngs, Holm Close, Toft Monks, Beeches, Suffolk.
G3TF, G. W. Fuller, 17 Baden Street, Haworth, Keighley, Yorkshire.
G3TFM, R. Scadden, 38 Court Orchard, Bridport, Dorset.
G3TFR, J. C. Hardstone, 192 Streetsbrook Road, Shirley, Solihull, Warks.
G3TFS, F. J. Sweeney, D.F.M., 58 Grosvenor Road, Epsom Downs, Surrey.
G3TFZ, D. T. Legg, 6 Sycamore Grove, Knowbury, Ludlow, Shropshire.
G3TGL, A. J. Fantham, 92 Grange Farm Drive, West Heath, Birmingham, 30.
G3TGO, B. W. Vaughan, 368 Fulbridge Road, Paston, Peterborough, Northants.
G3TGW, E. Wilders, 28 Highbury Street, Peterborough, Northants.
G3THF, B. McHugh, 27 Slade Grove, Longsight, Manchester, 13.
G8AAA, B. H. Green, 31 Monivea Road, Beckenham, Kent.
G8AFAF, P. B. Blake, 2 Fair View, School Lane, Seer Green, Beaconsfield, Bucks.
G8AAG, B. Carter, 14 Falmouth Road, Whitley Wood, Reading, Berkshire.
G8AAJ, P. K. Hamblett, 234 Shenstone Avenue, Norton, Stourbridge, Worcs.

CHANGE OF ADDRESS
E12W, H. L. Wilson, 23 Rathgar Road, Dublin, 6.
G3BN1, D. L. K. Copnendale, 18 Charbury Road, Shrivemham, Swindon, Wilts. (Tel. Shrivenham 640.)

G3EC, A. G. Martin, 17 The Forstal, Pembury, Tunbridge Wells, Kent.
G3HS, D. T. Boffin, Longcot Road, Woolstone, Faringdon, Berks. (Tel. Uffington 627.)
G3JLJ, L. Beevers, c/o Crown Hotel, Central Promenade, Morecambe, Lancs. (Tel. Morecambe 177.)
G3JSW, D. K. Clarke, 250 Burringham Road, Scunthorpe, Lincs.
G3JTW, Marconi Apprentice Association Radio Club, c/o The Education Office, Marconi House, New Street, Chelmsford, Essex. (Tel. Chelmsford 51359.)
G3KFE, E. P. Essery, 8 Willowfield, Passmores, Harlow, Essex.
G3KYM, H. Stamper, 66 South Close, R.A.F. Station, Medmenham, Marlow, Bucks.
G3LGC, F. Collinge, 62 Surrey Avenue, Shaw, Oldham, Lancs.
G3MCS, W. R. Hawthorne, 12 Roundlands, Lacey Green, Aylesbury, Bucks.
G3MIBG, J. Enderby, 71 Moorhouse Avenue, Glasgow, W.3.
G3NMF, M. Knights, 56 Mill View, Waltham, Grimsby, Lincs.
G3NKC, L. G. Tonkinson, 8 Little Warton Road, Warton, Tamworth, Warks.
G3NRB, N. H. Kempt (ex-GM3NRR), 7 Raiff Green Lane, Datchworth, Knebworth, Herts. (Tel. Knebworth 3438.)
G3NYV, E. H. Coxon, 32 Moss Street, Chadsmoor, Cannock, Staffs.
G3OAH, P. R. Whittlestone, No. 1 Flat, 43 St. Swithin's Road, Bournemouth, Hants.
G3ODH, S. B. Smythe, 4 Hall Drive, Mottram, via Hyde, Cheshire.

AMENDMENT
G3SAJ, J. Barker, 34 Village Way, Ashford, Middlesex.
THE MONTH WITH THE CLUBS
By "Club Secretary"

(Deadline for October Issue: September 11)
(Address all reports for this feature to "Club Secretary")

EVERY now and then an item of club news, or a comment in a club periodical, seems of such unusual interest that it is singled out for a special mention.

This month we note, in particular, that "Sid Warren passed his R.A.E."—a terse comment in QSP (South Birmingham). Hardly noteworthy, one might think, but the facts prove otherwise. Sid Warren had the misfortune to suffer a long and painful illness, followed by the amputation of both legs, and long and depressing periods of treatment. He became interested in listening on the amateur bands, and was fortunate enough to come to the notice of G3PJU and G3JAO (although they consider themselves fortunate to have met him.)

These two amateurs helped Sid right along the path culminating in his passing the R.A.E., and even managed to obtain permission for him to operate, as G3PJU/A, under their direct supervision. As a result of this, Sid Warren's cheerful voice, despite his handicap, has already become very well known in Midland Top-Band circles.

We are told by the South Birmingham people that dozens of local amateurs and SWL's were more worried than Sid himself during the waiting period for R.A.E. results; however, all is well, and now they await his voice under his own callsign.

This has been quoted at some length because your "Club Secretary" feels that this is the sort of thing that more than justifies the existence of an enthusiastic and active club, anywhere. Our congratulations, to South Birmingham.

Another comment arises from the Third Quarter Programme published by Slade. From this we quote: "Slade has a new look—a streamlined look. In future our lectures will commence at 8 p.m. promptly and terminate at 9.30 p.m. The remaining time until about 10.30 p.m. will be available for ragchew and discussion. All formal business will be restricted to the absolute minimum." Many other clubs we can think of might well take this to heart.

ACTIVITY REPORTS

Cray Valley (Newsletter, August) have planned a full programme. Their September meeting (on the 3rd) has already been held, and was to feature G2MI with some reminiscences. On October 7 G3GJW and others will present "My Shack," with colour slides. Every Friday night at 9 p.m. the local net meets on 1970 kc, and there is a "Natter-Nite" on September 16 at the Coldharbour Community Centre, Eltham (normal meetings are at the Congregational Church Hall, 1 Court Road). The club plans to hold an "Activity Week-End" on October 3 and 4, when all licensed members, as well as the club station G3RCV, will be active on the eight upper amateur bands. Call "CQ Cray Valley," and see who comes back!

Guildford will be busy at the Guildford Show on September 4-5; and then on September 19-20 they will be in action with their club station at the local Model Engineering Society's Open Day (the two clubs share a headquarters now, at Stoke Park, and the Radio Society's Friday meetings begin there at 7.30 p.m.). On September 11 the speaker will be Mr. S. W. Smith, of the GPO Radio Interference Branch.

Blackpool and Fylde announce a Junk Sale (and tidy-up afterwards!) on September 7; on the 14th, Questions and Answers; and on the 21st a talk and demonstration on SSB, by G2DAF. September 28 is an Open Night. All meetings at Pontins, Squires Gate Holiday Camp.

Acton, Brentford & Chiswick have their monthly meeting on September 22, when G3IGM will give a talk entitled "Application of Theory to Practice." 7.30 p.m. at the Hq., 66 High Road, Chiswick.

Reading, whose August meeting was devoted to a description of members' pieces of gear "for use around the shack," will meet next on September 26 to see a demonstration of Green and Davis' gear, followed by a discussion. At the Palmer Hall, West Street, 7.30 p.m.

Surrey (Croydon) hold their Junk Sale on September 8 (Blacksmith's Arms, South End, Croydon); on Sunday, the 20th, their annual Two-Metre D/F Hunt will take place. Rules and entry forms are available from the secretary (see panel for OTH).

Wimbledon had a talk on the Joystick, by G3LRO, at their July meeting. On September 11 there will probably be a talk about Transistors, and on October 9 a Junk Sale.

START PLANNING NOW

For MCC, the Club Event of the Year. Dates are November 14/15, 1700-2100 GMT each day. Rules in full in the October Issue. Clubs never having taken part previously should ask for identification letters—see p.443, October, 1963 issue. All other Clubs will receive identification automatically, and will be listed next month.
Kingston, who gather at 8 p.m. at the YMCA Annex, Eden Street, Kingston-on-Thames, have meetings on September 3 and 17; on the latter date there will be a Junk Sale. Echelford, at the Grammar School, Church Road, Ashford, Middx., start their R.A.E. Course for juniors on September 16, and on the 30th they have a talk on Micro-miniaturisation.

So, if you're interested in the latest developments in the field of radio and electronics, these clubs offer a wealth of opportunities to learn and socialise. Whether it's a talk on Micro-miniaturisation or a Junk Sale, there's something for everyone at these clubs. So why not join in and start your journey into the world of radio and electronics today?
details from the Principal or from G3ADV). Next meeting of the club will be on September 12, at Emmanuel Hall, Wate Street; this will be the A.G.M., and new members will be welcomed. On October 10 there will be a Constructors’ Competition (at the same place).

**South Hants.** held their Southampton Area meeting on August 8, which took the form of a Junk Sale. We also learn from QUA (August) that their part in the big Southampton Show was a great success—more than 40,000 people attended the Show, and many of them must have seen G3SOU/A in operation.

Crawley reports a quiet time during the holiday period, but plans are afoot for a full season to come. On September 23 they will have a film show, and a visit from members of the Southampton group. After the R.A.E., a number of members are happily trying their new rigs out... for the others, a new R.A.E. Course starts in September, with G3PHG in charge!

Radio Club of Scotland continues to produce its very lively GM Magazine, from which we gather that lots of activity is afoot—but there are no details of forthcoming meetings, for which reason we cannot help by publicising them.

Preston will meet on September 8 and 22 at St. Paul’s School, Pole Street. On the first date they will cover the subject of Transmitters, and on the second they will be visited by G2AMV of Birkenhead.

**Northern Heights** will be running a demonstration station at the Percival Whitley College of Further Education during the signing-on week for the new R.A.E. Course (on September 7, 8 and 9)—and what an excellent idea! On the 16th they will have a lecture on Oscilloscopes (Craven Electronics) and on the 30th a Ragchew and Committee meeting.

Crystal Palace (Newsletter No. 105) held an Informal Evening on August 15, and go into top gear again in September, with a talk by G3JTM on Air Traffic Control; this will be on the 19th. There is also a suggestion that the club should combine with Clifton for a joint Christmas function.

Slade are putting on a very special “Television Spectacular” on September 18, when G3JZF will present a closed-circuit TV show, full of interest for both the technical and the non-technical. Three or four cameras, telecine equipment, and a separate viewing room in addition to the large studio, make this sound a very ambitious venture. Visitors welcomed, but please contact G3JZF for full details. On October 2 there is to be an exhibition of members' gear, and October 17 is the date for the Annual Dinner.

G3TBK operating GB3NRC, assisted by SWL's Hull and Fryer, at Magnus Grammar School for the Newark (Notts.) Rotary Club, in connection with their recent Hobbies Exhibition. Under severe QRM conditions about 150 stations were worked in 15 countries, though this total might have been better had there not been a slight misunderstanding, amounting to a permanent technical hitch, in the matter of aerials! This made it difficult to raise even EU/Klub stations on 20m. However, all went well on 80m., for which the gear consisted of an HRO and a K.W. Vanguard. An equipment display completed the School exhibit, and the cards issued for GB3NRC contacts were produced by the School’s own art department. Operators were G3JNK, G3SHY, G3TBK, and G3TM, assisted by a team of SWL's for the logging and QSL-control duties.

Melton Mowbray give notification of their A.G.M., to be held on September 24 at 7.30 p.m., St. John Ambulance Hall, Asfordby Hill. Leeds re-commence activities on September 23, at Swarthmore Adult Education Centre, Woodhouse Square, Leeds 3. On the 30th they will have a Junk Sale, and during the following week a visit to a local airport. New members are sought—they describe themselves as “an informal mixed crowd,” with two or three transmitting members.

Yeovil reports “three entered R.A.E. — three passed”—nice going. Recent happenings have included visits to the rallies at Newquay and Dartmouth, and the Dartmoor mobile picnic. A party enjoyed the Mullard film show and a lecture, held at Taunton, and members recently heard a tape lecture on Electron Tubes.

The inaugural meeting of the Baden-Powell House Scout Amateur Radio Group was held on July 23. A permanent station, G3TGS, will be established there, to demonstrate Amateur Radio to visiting Scouts and to encourage those who are licensed to contact each other. They will meet at 7.15 p.m., on the third Thursday—Baden-Powell House, Queen’s Gate, London, S.W.7. Meanwhile they will be busy organising GB3BPH for the Jamboree-on-the-Air, October 17-18.

Luton have arranged their programme for the coming quarter. On September 8 they have a Test Gear Demonstration; on the 15th a Mullard Film Strip; on the 25th (a Friday) a visit to the Cambridge Group; and on the 29th an SSB evening. October 1...
Alastair Fraser, GM3AXX, produces the "GM Magazine" for the Radio Club of Scotland, a strong and active Amateur Radio organisation North of the Border. The Club is very keen on /A, /P and contest working generally, and here we see GM3AXX operating GM3RCS /A from Glen Urquhart, near Inverness, during a recent trip, when the object was to work as many Club members as possible on 80m. phone. Many QSO's were made, including, in one afternoon, GM3SBI/P on Skye, GM3IGY at Benbecula, and GM3HXC on Orkney, all island stations. Command-type gear was used, and the aerial, badly screened, was a dipole for 3.5 mc.

is fixed for a visit to the club at Shefford.

Bristol report eight or nine passes in the R.A.E.; G3TGU is already on the air, and others will be joining him very soon. Morse classes are going well, also the weekly lectures. In August the club arranged an expedition to Wales, where half a dozen operators combined to activate GW3TAD/P. A long description of "happenings" (unfortunately much too long for this small space) indicates that the proposed kite aerial met a sad fate after a few hours, but plenty of contacts were made with 280ft. of wire suspended between—two sand dunes! Another visit is planned for September 12.

Durham held their first A.G.M. on June 18 and elected their new officers (see panel for secretary's QTH). A Junk Sale, an aerial design competition, and a talk and demonstration on Printed Circuits have filled the time at recent meetings, which are now held on alternate Thursdays at the Bridge Hotel, North Road, Durham. On September 24 there will be a talk on Transistors by one of the younger members; on October 12—note this—a five-day all-band CW contest starts; and the first Club Dinner will be held on October 22.

Stockport ask that secretaries of other clubs within 20 miles should get in touch concerning possible exchange visits, lectures and so on. Future events include a Junk Sale, a Sunday get-together, a Hotpot Supper, and the R.A.E. lectures given by G3FYE at the local evening institute. G3MBQ has taken over the job of secretary (see panel).

North Kent (Newsletter No. 81) recently welcomed Peter Windle (G3HVG, 6Y5XG, etc.), who gave a talk on his experiences in Jamaica. September meetings will be on the 10th and 24th, at the Congregational Church Hall, Bexleyheath. (Note change of secretary—see panel).

Ainsdale have continued through the summer without a break—for the first time, and with good attendances. G8QC and G3PDU recently gave a talk on the wire and-rope aspect of radio—halyards, guys and so on; and G2DQX spoke on 4-metre operation with surplus equipment. Future meetings (all 8 p.m. at 77 Clifton Road, Southport) will be on September 16 and 30.

Bradford, after holding an informal meeting on September 1, will be opening their new session on September 15—7.30 p.m. at Cambridge House, 66 Little Horton Lane, Bradford 3. East Worcs. will have a visit from G3GVA on September 10, when he will talk about Self-Tracking Units (this was the talk formerly announced for July). Old People's Centre, Park Road, Redditch.

Cambridge recently visited the Luton club, held a Picnic Rally at Houghton Mill, St. Ives, and are now planning their AT and ATV demonstrations for Bottisham Fete. On September 4 there is a Junk Sale; the 11th and 18th are Activity Nights (Antennas and "Brush and Scrub"); and the 25th will be "Any Questions?" with visitors from the Luton club.

Sutton Coldfield, having held their first meeting at the new Hq. on September 2, will now continue to enjoy the extra facilities. In co-operation with the 17th Sutton Coldfield Scout Group, they now use their headquarters (behind All Saints' Church), where they have a room about 30ft. by 60ft. and ample space for permanent aerials. Meetings will be on the first and third Wednesdays, possibly augmented by instructional nights on the second and fourth Wednesdays, open to both club members and Scouts. October 7 is booked for aerial erection and putting the club station on the air.

TO WHOM IT MAY CONCERN
It has been brought to our notice that certain firms and organisations are using our Secretaries' Address Panel to circularise Clubs with offers and inducements. This is being done without reference to us and any mention of "Short Wave Magazine" in these circulars should be ignored, as we can accept no responsibility in circumstances over which we have no control.
Cheshunt will have a lecture-demonstration by Messrs. Green & Davis on September 4, and on the following day they have a Field Day, operating GB2CRC from Goffs Lane Playing Fields on 160- and 80-metre Phone. On the 11th, a social evening at the CD Centre (8 p.m.). Members and friends from Harlow and Southgate have been invited.

Grafton open the new season on September 11, after which they go ahead with talks, visits, practical evenings and demonstrations every Friday (7.30 p.m. in Room 35, Montem School, Hornsey Road, Holloway). R.A.E. and Morse tuition are also catered for, on Monday and Wednesday evenings. Full details of all the activities of this old-established and very successful London club are available from the secretary, and visitors are always welcome.

Loughton recently had a very satisfactory session operating four complete stations during Debden Community Week, at the end of which they held their first Mobile Rally—a small “experimental” one which turned out to be most successful. A full-scale affair is being aimed at for next year, and splendid facilities have been offered by the local community centre at Loughton Hall.

R.A.I.B.C. (Radial, August) continue to welcome new members and supporters. R.A.E. successes among their members are also reported. All amateurs enjoying normal health, who feel that they might be able to help the handicapped in any way (periodicals, junk, or in a multitude of small matters) should contact the secretary. An issue of Radial would open their eyes to some of the possibilities, to say nothing of how daunting difficulties are overcome by the disabled.

At Worcester they are busy getting the new Club Hq. to rights; the surrounds have been tidied up and the station gear installed, with various antennae.

INTERNATIONAL DISTRESS FREQUENCIES

Distress calls made in any mode on 500, 2,182 or 8,364 kc on the MF/HF bands, and on 121.5 mc VHF, are accepted by any land, ship or aircraft station, anywhere in the world, that may hear them. These are the international distress and calling frequencies. The oldest, common to all services throughout the world and open to friend-or-foe alike, is the 500 kc channel (600 metres). During the Hitler War, it was usual for the recovery of shot-down aircrew, of either side, to be negotiated by arrangements made on 600 metres. Of course, nobody in authority knew that this was how it was done!

WAMRAC CHANGE-OF-ADDRESS

We are asked to say that the Rev. Arthur Shepherd, G3NGF, who has done so much for the World Association of Methodist Radio Amateurs and Clubs—of which he was the founder member nearly seven years ago—is now at his new QTH at 1, North Street, Crewe, Cheshire, where he will be glad to hear from members. They are running a draw—under Lotteries Act rules—to raise funds, a figure of £60 being needed to clear initial expenses. Of the six members who took the May, 1964, R.A.E., five passed, a very satisfactory result. Meetings are at 7.30 p.m. on Saturdays and slow Morse practice is being given (on two metres). All details from the hon. secretary.

Keele University Radio Society will resume regular meetings w.e.f. the first Monday of term—October 12, 7.30 p.m. in the Sneyd Annex. The moving spirit of the K.U.R.S. is G3COY who, with G3SMD, works hard for the success of the group. They hope that this year’s batch of freshers will include a few licensed amateurs—who will find a station in action all day on October 10, when the new entry reports.

One of the oldest and strongest Amateur Radio clubs in the U.K. is Derby, where they are very well organised (G2CVV has been their secretary for many years now) with an interesting programme taking them through September—this includes visits, lectures and a VHF field day. Their meetings are at the Derby & District College of Art, Green Lane, Derby.

MORE R.A.E. COURSE CENTRES

Further to the courses for the Radio Amateur’s Examination—City & Guilds Subject No. 55—notified on pp.374-375 of the August issue of SHORT WAVE MAGAZINE, below is a further listing.

It is not supposed that this is in any way complete, as there are many such courses arranged locally—at technical colleges and evening institutes up and down the country—which are not publicised outside the district. As explained on p.374, August, an enquiry should be made at the local Education Authority office. Additionally to the suggestions made in August, the reading we recommend for the R.A.E. is A Guide to Amateur Radio (4s. post free) and the Radio Amateur’s Examination Manual (5s. 6d. post free) both obtainable through our Publications Dept., from stock.

For information as to the conditions and regulations under which U.K. amateur licences are issued, apply to: Radio Services Department, Radio Branch, General Post Office, London, E.C.1.

Birmingham: At the Lea Mason Centre, Central Evening Institute, Bell Barn Road, Birmingham, 15, enrolment during the week commencing September 7. Details from: M. A. Brett, G3HBE, 55 Chestnut Drive, Erdington, Birmingham, 24.

Brighton: At the Technical College, starting on September 21, evening courses are being offered for the R.A.E. and the GPO Morse Test. It is intended to have G3TBC (the College station) on the air for the winter session, operated by G3SKI and G6YJ. For the prospectus and enrolment forms apply: Head of Electrical Engineering Dept., Brighton Technical College, Richmond Terrace, Brighton, 7.

Bury: At the Bury Technical College, on Friday evenings, commencing late September; last year’s course produced a 100 per cent pass. Apply for
THE SHORT WAVE MAGAZINE

September, 1964

details: J. Bennett, G3PVG, 21 Harwood Drive, Elton View, Bury, Lancs.

Corbridge, Northumbs.: At the County Secondary School, on Wednesday evenings. Apply: D. W. Blackford, G3NPB, Springfield, Haydon Bridge, Hexham, Northumberland.

Crawley: At the Sarah Robinson Evening Institute, Ifield, on Monday evenings. Enrolment details from: A. J. Gibbs, G3PHG, 6 Dairyfields, Gossops Green, Crawley.

Farnborough (Hants.): At the Technical College, Boundary Road, enrolment September 8-10. Apply for details to: The Principal, at the College.

Glasgow: At the Allan Glen School, Montrose Street, under the Corporation's Department of Further Education, on Tuesday and Thursday evenings, course fee £1, enrolment September 7-10, session commencing September 15, with GM3AXX, GM6MS and GM8MJ as instructors; no previous knowledge of radio is required to start these courses, which have been very successfully run for several years.

London (Beckenham): At the Evening Education Centre, 28 Beckenham Road, on Thursday evenings, commencing on September 24. Full details from: M. D. Bass, B.Sc., G3OJE, 42 Clevedon Road, London, S.E.20.

Norwich: Under Norfolk Education Committee, at the Thorpe Evening Institute, St. Andrew's School, Longfield's Road, Thorpe St. Andrew, on Tuesday evenings for Morse and Wednesday evenings for R.A.E. theory. Apply to: P. J. Gowan, G3IOR, at the Institute, or QTHR.

Plymouth: At the College of Technology, starting on September 17, enrolment any evening 6.0-8.0 p.m. during the previous week. The course instructor will be G3HSP. Further details from: R. Hooper, G3SCW, 2 Chestnut Road, Peverell, Plymouth.

Sheffield: At the Western Road Evening School, Sheffield, 10; starting date and period to be fixed. Apply: J. Bell, G3JON, 25 Edale Road, Sheffield, 11 (Tel. 61281) for details.

Stockport: At the Avondale Evening Institute, commencing September 10. Apply immediately to: R. Phillips, G3FYE, 6 Ross Avenue, Davenport, Stockport.

Stoke-on-Trent: At the North Staffs. College of Technology, College Road, Stoke, starting on Monday evening, September 21, 6.30-9.0 p.m., under G3EHM as instructor. Details from: K. H. Parkes, G3EHM, 28 Grove Road, Heron Cross, Stoke-on-Trent.

As normally all courses start when the winter educational session opens during September, there will be no point in our listing any further centres of instruction—though we shall be glad to give details for any actually commencing after about October 12.

A new wide-range Sine-Square Generator, offered by KLB Electric, Ltd., and available in kit form. It covers 7 c.p.s. to 750 kc for sine, and 7 c.p.s. to 300 kc for square waves. The waveform characteristic is extremely good, and the output on sine is 0-10 volts across 600 ohms, the square wave output being 20v. peak-to-peak on no-load. The outputs have coarse and fine adjustment and the instrument is designated as the PACO G.34.

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New Equipment

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

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COMMUNICATIONS type Rx, suit SWL, electrical bandspread, six amateur bands, grey steel cabinet; incorporates Chapman S0B5 front end, BFO and noise limiter, self powered, £35 10s. Also T.W. Nuvistor 2-metre converter.—Write or telephone R. H. A. Powell, 9 Joubert Mansions, Jubilee Place, London, S.W.3. (Flaxman 3288.)

WANTED: E.M.I. R.A.E. Postal Course, in good condition.—G3JML, 28 Banks Avenue, Golcar, Huddersfield.
WANTED: Most types of second-hand communications receivers, transmitters, etc., especially AR888, BR7400, 888, 680X. FOR SALE: AR75, CR-100, 640, SX-28, DST-100, R.206, HRO, BC-221, R.1155, R.1392, CR-200, etc. Most types of brand new equipment also supplied. Hire Purchase. Generous part exchange allowances. —Write for full details to new address: Brian J. Ayres, 21 Victoria Road, Surbiton, Surrey. (Embridge 3164/2833 or Lower Hook 27142.)

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VFO Heathkit VF-1U, Geloso Converter, coax TR switch; wanted by Spencer, G3TEZ, 29 High Petergate, York.

FOR SALE: Edystone 888A including mounting blocks, immaculate condition, nearly new, £90. Bagby, 129 Enfield Road, Hunt End, Redditch, Worcs.

R.206, 10-60 mc, old but working, wood case, £5. OSI ‘scope, nearly new, mumetal screen, perfect, £20. RF-27, needs attention, 10s. Quantity good components, cheap to club or school who can collect. Carriage extra all.—Haylock, G3ADZ QTHR, or Havant 5861 after 8 p.m. who can collect.

HEATHKIt Mohican, 9 months old, little used, good condition, buyer arranges carriage, £35 o.n.o. G3HSC Morse record, virtually unplayed, 30s.—Davis, G3TDL, 91 Harbury Road, Dorridge, Solihull, Warwicks. (Tel. Knowle 2413.)

K.W. Match 50-ohm, new, £4. Fair 805’s, new, £1. Heathkit RF signal generator, £9 10s. FL8A Filter, 10s. Commercial LS intercom. unit, mains operated, write further details, £7 10s. All carriage extra. WANTED: Burnell Model S-15000 50 kc SSB Filter.—Alrey, G3GEJ, 14 Brandies Road, Letchworth, Herts.

SALE: TCS-13 TX with Mains PSU, screened cable, modified for two extra bands, £7 10s. Buyer collects or carriage extra.—Yallop, G3SVQ, 10 Farley Hill, Luton. (Phone 22977.)

Six 4X150A’s, also 12 Air Systems Bases. Pair 4CX2550R’s plus bases. One 5894 with 4 bases, also one 4E27. Four Jennings vacuum variables, type ATC, worth £80. Best offer within a week secures, or exchange for good quality Commercial Tx.—Rees, G3SRR, 30 Wentworth Crescent, Hayes, Middx.


FOR SALE: Edystone 680, £50.—Havers, Pineside Farm, Wokingham, Surrey. (Tel. Crowthorne 2050.)

COMPLETE 150-Watt AM/CW station. HQ-120 with preselector; B4/40 driving pair 35T’s, rack-mounted with power supply and Z-Match coupler; VFO unit with master control panel and automatic changover. Vibroplex Super Bug, handbooks, crystals and other equipment. The lot in perfect order, £50. Buyer collects.—G2VD, Watford 27142.
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**MATCHED PAIR OAT DIODES.** 6/- each. P. and P. 6d.

**EDDYSTONE RECEIVER** and spares.

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**SMALL ADVERTISEMENTS. READERS—continued**

**SALE:** Two-metre Halos, made of alloy, price 25s. 6d. including postage. Please state approximate crystal frequency for accurate alignment.—Cochrane, G3RVC, 81 Martyn Avenue, Sutton-in-Ashfield, Notts.


**SALE:** HRO, all coils, PSU, speaker, £17 o.n.o.? Heath Q-multiplier, £4 10s. Miniature 160-metre Tx (August 1962 Short Wave Magazine), £6. 144 mc CW Tx, £8. Xtal Calibrator Type 10, 30s. Carriage extra or collect.—Marshall, G3RKH, 11 Rosyl Avenue, Holcombe, Dawlish, Devon.

**SALE:** Collins TCS Rx, good condition, £5 o.n.o.? Carriage extra.—Bensley, G3PTZ, 25 Wimborn Avenue, Grimsby, Lincs.


**WANTED:** The matching power supply unit for VHF Receiver R.216.—G. McGinley, 43 Lakeside, Taunton Road, Bridgewater, Somerset.

**SALE:** TR1986 Transceiver, all cables, plugs and control unit; requires slight attention, £5 or exchange for R.109 or R.1132.—Lloyd, 15 Fieldway, Hoole, Chester.

**WANTED:** Good portable ‘scope, Heathkit, Serviscope, etc.; will examine, collect 50 miles London.—Box No. 3070, Short Wave Magazine Ltd., 55 Victoria Street, London, S.W.1.

**REPLIES Box 3037, July:** Advertiser regrets that due to large number of offers and enquiries received and confusion caused by postal delays during July, it has not been possible to answer every letter. Except for negotiations in hand as at August 10th, all major items have now been sold.

**SALE:** HQ170 Hammarlund Receiver, unmarked, £80. Two G3HSC Morse records, beginners and advanced, £2 each.—Box No. 3071, Short Wave Magazine Ltd., 55 Victoria Street, London, S.W.1.

**K—W7, as brand new and used few hours only, bargain at £75 for cash-and-carry sale.—Telephone Newcastle 662400, or write G3LH, Thompson, 12 Lyndhurst Road, Benton, Newcastle-on-Tyne 12.**

**FOR SALE:** R.1155B, requires new IF coil and wiring repair due to removal D/F components, £75 cash-and-carry.—Day, 21 Drovers Way, Dunstable, Beds.

**MINIMITTER Mobile Tx and PSU for 160, 80 and 40 metres, mint condition, £20 o.n.o.? Carriage paid.—G13PLL, Phone Limavady 2158.**

**HEATHKIT SB-10U single side-band adaptor, latest unused, £30; OS.1 Oscilloscope, mumetal screen, ditto, £12 10s. Both perfect.—G2BBD, 19 Alsford Road, Purbrook, Portsmouth.**

**FOR SALE:** Halson mobile whip antenna with coils for 80 and 20 metres, little used, £5.—McKaig, 52 Beverley Gardens, Bangor, Co. Down, N.I.
SMALL ADVERTISEMENTS—continued

VANGUARD 160-10 metres, £35.—Worthington, 43 Mount Road, Penn, Wolverhampton.

URGENTLY REQUIRED, October 1961 CQ, your price paid.—M. Whelan, 44 Syngle Road, South Circular Road, Dublin 8, Eire.


WANTED: SSB Tx and Rx, such as Hallcrafters, Collins or similar, also Vanguard. Cash.—Box No. 3073, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: 20 and 80 metre bandsend coils for HRO.—Fabricant, 5 Benscliffe Drive, Loughborough, Leics. or Phone Loughborough 5118 after 6 p.m.

F OR SALE: Viceroy Mk. III Transmitter with CDR and 4-lattice filter, brand new, never been used. Also BC-221 meter and AVO No. 7 meter.—Edgar, 46 Merry Street, Motherwell, Scotland.

F OR SALE: Labgear Topbander, £15; Labgear LG.50 with Labgear LP Filter, £25. K.W. Geloso converter, £15. HRO-5T power pack, spare valves, 8 coils, 40m. BS, £20. All FB condition. Buyers collect.—G3NNGS, 48 Abbotsford Gardens, Woodford Green, Essex. (Buckhurst 0306 evenings.)

G 42U (Minimitter) Tri-Band Beam complete with CDR Rotator AR.22 and desk indicator; both nearly new. Neighbour trouble. Dismantled for transit. Exchange for complete Mobile Station, commercial for preference, must be good. Buyer to collect.—Phone evenings Wokingham 2698. Lewis, West Winds, Arbor Lane, Winnersh, Berks.


D X-40U Transmitter kit, 50 per cent assembled, complete with all components, plans and handbook, £17—or EXCHANGE for good HRO.—Box No. 3075, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

S ALE: Hammarlund HQ-180 in unmarked and perfect working condition, £110 o.n.o.?—Box No. 3076, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: 23 cm. Tripler or Converter or parts, also aerial.—G3GGS, Rope Cottage, Pepperdon, Moretonhampstead, Newton Abbott, Devon.

WANTED: Labgear coax aerial switching unit.— Box No. 3077, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

E XCHANGE: 8mm. Ciné-Projector, battery-operated, and 50p. film and batteries (as-new value £5), for R.220 VHF Rx, unmodified (i.e. 60-100 mc), must be 100 per cent OK.—D. Watts, 52 Edgell Road, Staines, Middx.

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Soldering Irons 30 watts 200/250v., 12/6 each.

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DEPT. 20
BRITISH NATIONAL RADIO SCHOOL
Radio House, Russell Street, Reading, Berks.

SMALL ADVERTISEMENTS, READERS—continued

BRAND-NEW Eddystone EC-10, 4 months’ old. Mint TCS-12 Rx with separate power pack/speaker unit. Top Band Tx. New 78A coax relay. R.114 converter. Valves, components, s.a.e. list. Offers to—Woodward, G3GYR, 77 Sandbach Road, Rode Heath, Stoke-on-Trent, Staffs.

SALE: A complete Mobile Station. DX-40U with high-level plate modulation; with single-switch control, silver and blue front, external 30-watt modulation with pair of KT77’s and also the VF-1U. All done by Tiger’s Ltd., never been used, factory-built. Also RA-1 Receiver, 10-160 metres with Q-Multiplier, crystal calibrator and speaker. Will exchange for radio servicing instruments or take the best cash offer.—James Ash, 9 Craigpark Street, Failey, Clydebank, Scotland.

SALE: R.107 with S-meter, excellent condition, £15. BC-342N with separate power pack, £10. Will deliver 30 miles. Epsom. Assorted transformers, chokes, crystals, etc., s.a.e. for list.—G. J. Knights, Ashar, Cross Road, Tadworth, Surrey. (Tadworth 3247 after 7 p.m.)

MARCONI ELECTRA with PSU, £65. Also Marconi CR-10/8, fitted 6SG7 RF stages and S-meter, £25. Both Rx’s in pristine condition and with manuals. Buyer collects, no offers.—Monkhouse, Pinner 9124.

WANTED: K.W. “Valiant” Tx, with or without PSU.—A. Taylor, 24 Emroch Street, Goytre, Port Talbot, Glam., South Wales.

SALE: Little used G2YH (Tiger) 5-crystal QRO 2-metre Tx, £50; listed £84. Little used G2YH 28 mc IF “Nuvistor” 2-metre converter, £10; listed £16. G2YH overhauled, good AR88LF, £30. Buyers test, collect.—G2NS, 31 Cranleigh Gardens, Bourne- mouth.


WANTED: 80-10 metre AM/CW QRO Tx, good quality, efficient, TVI precautions and reasonable price essential. All replies answered, postage refunded.—Box No. 3079, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

HRO-60, 10 coils, plug-in calibrator, plug-in product detector, with crystal osc., in very good condition, £110 o.n.o.? WG-44 TV pattern gen., £20. 92-A TV Sweep osc., £10. 31-A ‘Scope, £18. TF144G, £15. QST, R.S.G.B. Bulletins, etc., s.a.e. details. Radiovision “Commander” manual, 15s. Various new spares for AR88D; HRO tuning condenser, new, £1 5s.—Burns, Mews Lane, Kirkdubright, Scotland.


HALLICRAFTERS SX-24, has RF, two IF, noise-limiter, crystal variable selectivity, frequency and S-meters, coverage 540 kc to 43-5 mc, with speaker, AC 230v., good condition, £15. Surplus new 32ft. mast aerial ZA/29961, see p.208 June Short Wave Magazine, complete, £2 10s.—Wilcock, 19 Cavendish Avenue, Cambridge.
WANTED: CT-53 Signal Generator, complete with calibration charts; R216 Rx with or without PSU; also CDR Rotator, all must be in new condition.—B.28 and BC-342, HRO coils B/S (4) and GIC (2). Prefer buyer(s) collect Rx’s. Write or call—Walter, 10 Whyke Road, Chichester, Sussex.

SALE: B.28 and BC-342, HRO coils B/S (4) and GIC (2). Prefer buyer(s) collect Rx’s. Write or call—Walter, 10 Whyke Road, Chichester, Sussex.

WANTED: K.W. Vanguard, works assembled, 160-1000 watts, preferably Mark II (new styling).—AR88D, S-meter, £35. HRO, 9 0 RC 0 L.


EXCHANGE: AR88D in first-class condition, as new, for amateur-bands-only receiver.—G3LNG, 35 Sunlight Street, Liverpool 6, Lancs.


SALE: Hallicrafters SX-140 Receiver, 80-10 metres, £30 o.n.o.? HT-40 Transmitter, 80-10 metres, £30 o.n.o.? Both together complete with auto-transformer, £60 o.n.o.? Semi-automatic key, as new, £3 10s.—T. Ford, 23 Hill Close, Ballykelly, Limavady, Co. Derry, N. Ireland.

HALLCRAFTERS SX-100 Mk. II. General coverage and amateur bands bandspread, xtal controlled second conversion oscillator, temperature compensated first, very stable, selectable sidebands, notch filter, 100 kc calibrator, in new condition, with handbook. Hallicrafters HT-27 146v. plate input (p.e.p., two-tonch), five-band output 80-10 metres, CW, AM or SSB; precision VFO, full VOX, excellent CW keying, little used, with handbook. Best offer over £80 for either, will deliver up to 100 miles.—Thompson, G3EDF, Hillcrest, Leaves Lane, Hexham, Northumberland.

EXCHANGE: 2-QV06/40A, brand new in original Mullard boxes, with guarantee. WANTED: UM2 and SCR-522 mod. trans., or £5 cash.—Box No. 3081, Short Wave Magazine, Ltd., 35 Victoria Street, London, S.W.1.

SALE: B.28 and BC-342, HRO coils B/S (4) and GIC (2). Prefer buyer(s) collect Rx’s. Write or call—Walter, 10 Whyke Road, Chichester, Sussex.

WANTED: K.W. Vanguard, works assembled, 160-1000 watts, preferably Mark II (new styling).—AR88D, S-meter, £35. HRO, 9 0 RC 0 L.
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- 70 cms. A251 TROUGH LINE CONVERTER.
  6D54 multiplier G.G. mixer, 6BQ7A cascode.
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  TW-2 10w. TX. Complete with modulator 23 gns.
  TW NU VIVOR CONVERTER (6D54)
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- 4 m.
  TW NU VIVOR CONVERTER. Any I.F.
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  TW 10w. TX. Complete with modulator.
  Same price as 2m. model.

- 160 m.
  TW TOPBANDER. 10w. TX. Complete with modulator.
  Large range of I.F.s.
  £9 gns.

- Mains and Mobile P.S.U.s for the above transmitters, complete with aerial switching.
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G. W. M. RADIO LTD.

MURPHY RECEIVER OUTFIT CAS, AP. 100335. A modern, high quality receiver issued in 1957, covering 59 to 555 kc/s, and 1.47 to 30 mc/s. Two R.F. separate oscillator with provision for crystal control. Three I.F. filters. Three audio plus B.F.O. and noise limiter. Switched selectivity, 8, 3, 1 kc/s, and 200 c/s (audio filter). I.F. is 800 kc/s. Audio 2 watts to 600 ohms. Size: 14" x 13" x 14". Weight: 66 lbs. Supplied complete with power unit for 230 volt AC, 75 watts, 20" x 9" x 14", completely overhauled by R. W. Withers, £40, carriage £1/10/-.

CR100/B28 RECEIVERS. 60 kc/s. to 30 mc/s. crystal filter, B.F.O. Two R.F. and 2 I.F. good condition and working well, £10/10/-, carriage £1.

RELAYS. Ex-equipment, 12 volt coil, make span 50 amp, contacts, 3/6, post 1/6. 1000 ohm high speed, single pole changeover, ideal for remote keying. New, £7/4, post 1/6.

METERS. 2" round, Ex-equipment. 500 microamps, scaled 0-15, 0-600 volts, 0/6, post 1/6. New "2" square 100-0-100 milliams, 7/6, post 1/6.

VALVES, 807. Ex-equipment, 3/6, post 6d.

SILOCON RECTIFIERS. 3 amp. 70 p.i.v. only 6d. each, post 3d. Any number.

230 VOLT A.C. POWER UNITS TYPE 3. Rack mounting for R1392, P104, R132, etc. Outputs 250 volts D.C. 100 mA, 6.3 volts A.C. 4 amps. Good condition, £2/5/- or with mechanical damage to switches, handles, etc., 35/-, carriage either 10/-. All equipment offered is complete but not tested unless otherwise stated. Carriage charges quoted are for England and Wales only.

Terms: Cash with order. Early closing Wednesday.

40-42 PORTLAND RD., WORTHING, SUSSEX

SMALL ADVERTISEMENTS, READERS—continued

EXCHANGE: 605A 8mm. Cine Camera, with normal and telephoto lenses, or "Aldisette 3" fan cooled, 300w. 35mm. slide projector, both as new, for R.206 Mk II and PSU in good working order; or either item plus £15 for R.216 and PSU.—B. Box No. 3083, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.


WANTED: RTTY Receiver Adaptor Field C.F.S., ZA 39834. Also supply unit DC/AC No. 3, ZA 39835 and connectors.—Lt. M. G. Taylor, H.Q. Mess, Dorset House, BEPO 45.


WANTED: AR88D in good condition, full details —any mods.? Possible collection; Plymouth.—Box No. 3085, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: Panda ATU and Woden DTI transformer. All letters answered.—Sharratt, 12 Pebblemooor, Edlesborough, Dunstable, Beds. (Tel. Eaton Bray 297.)

WANTED: Labgear PSU/Modulator unit for LG.300 transmitter, also bandspread coils for HRO.—Littles, 45 Rupert Street, Reading. Berks.


AR88D with S-meter and manual, recently purchased brand-new (now have 75A-4), £60. Marconi CR-150 with manual, £22. Creed 7B page printer, £15. Siemens Tape Printer with governed 230v. AC motor, £9. Signal Generators I-222-A, 8-15 and 150-230 mc, £4. Cos sor type 52, 6-52 mc, £5. Wavemeter W.1310, 160-220 mc, £2. W.11 Audio Type Converter. £3. CFS IF type teletype converter, £5. 7B Teleprinter power unit, £2 15s. SPECIAL ITEMS. R.390A IF strip, two crystals and four mechanical filters, with new temperature controlled permeability tuned VFO, £75. Commercial 100 kc Sideband filter unit, crystal controlled input at 455 kc, in handsome table-top cabinet, with a total of 37 sealed crystals, £75, or £125 the two units, including Sideband amplifiers, detectors, etc. Collins 250 kc by 3-1 kc with special Sideband filter, £12. Collins 500 kc by 6 kc wide mechanical filter, new, £12. Very large range of audio amplifiers, 30w., every possible refinement, £20. WANTED: Hallicrafters R-48 or similar speaker.—A. Fletcher, 62 Moorbridge Lane, Stapleford, Notts. (Tel. Sandiacre 3460.)
SMALL ADVERTISEMENTS, READERS—continued

HEATHKIT RG-1 general coverage communications Receiver, as new, handbook, good performance, factory checked, £29 10s.—Edwards, 444 Ballards Lane, London, N.12. (Hillside 4321.)

FOR SALE: KW-77 Rx, as new, speaker, £90; Eddystone 870A, new, £20; Labgear Topbander, £15; Tx Top Band SSB, xtal phasing, £20; Wurzel Valve Voltmeter and diode probe, £8. Wavemeter R.502 and coils, £7; Elizabethan Tape Recorder, £12; 19 Sets, complete power pack, £2 10s.—A. Thomson, 3 SORT, Sunnyholme, Fairview Road, Basildon, Essex.

WANTED: AR88D or Eddystone 840C Receiver. State full details and price. FOR SALE: MCR1 Receiver, £6 10s.—Box No. 3087, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: Eddystone 870A, 14 months old, mint condition; has jack plug for phones/tape, £20 o.n.o.?—Sqn. Ldr. T. H. Sheppard, R.A.F. South Cerney, Cirencester, Glos.

EXCHANGE: Elizabethan T/R Lz.29, five 7in. tapes, for good Tx. SALE: Joystick de luxe, HRO PSU; offers?—Mortimer, 33 Unett Street, Birmingham, 19. (NOR. 8668.)


WANTED: CDR AR22 (240v. AC) rotor and control unit.—Davidson, 49 Honeycroft Hill, Uxbridge, Middx.


SALE: 36 Set, complete, good condition, £12 o.n.o.?—Buyer collects.—Secretary (Radio Society), e/o Training Office, G.E.C. Telephone Works, Stoke, Coventry.

WANTED: Hollscherieb Printer or Printer/Keyboard machine, e.g. type TB/24-a-32 or similar. Also RTTY Auto-transmitter W.H.Y.? FOR SALE: CR-100 Handbook, G3HSC Morse Record, 30s. each.—B. Robertson, 9 Holbeck Lane, Cheshunt, Herts.

SALE: Complete Minimitter Mobile Station comprising transmitter, control unit, all band converter, whip aerial with 160, 80, 40 metre loading coils and transistorised power supply, £30. TCS Transmitter, fully modified pi-tank, mic. preamp., etc., £10; carriage extra.—Wilson, 15 Lumley Avenue, Skegness. (Tel. 1623.)
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