The SHORT WAVE Magazine

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INDEX TO ADVERTISERS

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CONTENTS

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FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT-WAVE Magazine

EDITORIAL

Complexion *It is widely believed that Amateur Radio is one of the few human activities that takes no heed of race, colour, creed, social distinction or politics — and over the world as a whole, this was in fact almost true until about 1930.*

But since then human freedom has ceased to have the meaning in many parts of the world that it still has in this country today. The dictatorships behind the Iron Curtain have had to be guided by strictly political considerations in their dealings with the serfs absorbed into their systems or brought under their control. This means that in a country like Czechoslovakia, or Poland, or Rumania, or Bulgaria, or the " German Democratic Republic " (the indirect cause of much of the present world uncertainty) an amateur must be politically pure before he can be licensed—and, of course, " political purity " means, first and foremost, a whole-hearted acceptance of the regime.

It is easy to take the view that such matters are of no concern to anybody on this side of the Iron Curtain. Certainly, nothing can at present be done for those on the other side. However, because of the very nature of radio, there is a considerable degree of conformity throughout the world of Amateur Radio. Though it is extremely difficult for there to be personal contact through the Curtain, the fact remains that amateurs of all countries are more or less compelled to work together as regards transmission techniques, frequency bands and procedures—because radio waves do not recognise country boundaries or ideological barriers.

So it can truly be said that Amateur Radio still preserves its international character in the broadest sense. But it is also true that over a very large part of the world Amateur Radio has been drawn into the arena of politics, with all that is implied by that melancholy reflection.

Austin Forsyth G6FO.

WORLD-WIDE COMMUNICATION

Combined Grid Dip Oscillator and Absorption Wavemeter

SENSITIVE AND SELF-POWERED, COVERING 1·7-90 MC

F. G. Rayer (G3OGR)

THIS is a dual purpose unit, and may be used either as a grid dip oscillator, or as an absorption wavemeter. As is generally known, a grid dip oscillator (GDO) can be employed to find the resonant frequency of a tuned circuit — which includes aerials and ATU's, as well as receiver and transmitter circuits with power off. When the unit is operating as an absorption wavemeter, the circuit being investigated has to provide RF. This application is therefore useful for checking oscillator or transmitter circuits and determining approximate frequency with the equipment working, or to evaluate harmonic levels roughly.

The circuit is shown in Fig 1, and consists of two sections. The oscillator is in a small aluminium box, and employs plug-in coils, as is usual with such equipment. Four coils will cover 1·7 mc to 36 mc, and an additional coil may be wound for 36-90 mc, if required. This facility is useful for checking a transmitter for harmonics and Bands I and II.

The right hand part of the circuit forms the power supply, with meter. When the unit is being employed as a grid dip oscillator, the meter is shunted to draw 1 mA full-scale. Grid current is kept at roughly 0·5 mA (the exact figure is unimportant) by adjusting the potentiometer, R3. This potentiometer is particularly necessary with the 36-90 mc coil, where the intensity of oscillation, and consequently grid current, varies considerably with tuning.

Application — GDO

For grid dip operation, the coil is coupled loosely to the circuit to be checked, and the tuning is rotated until a *dip* in grid current shows resonance. After locating the approximate tuning position, the GDO is moved away slightly, to reduce coupling as far as possible, because tight coupling affects tuning slightly. It is possible to check the resonant frequency of aerials and RF chokes as well as ordinary tuned circuits. In many cases the GDO coil can be brought near enough to the circuit under test, to give enough coupling. If the circuit to be checked is very inaccessible, a link can be used for coupling; this can consist of about two turns of wire each end of a short feeder, but the loops must be kept reasonably clear of plug-in and other coils, to avoid over coupling. It is a matter of experiment and experience to get the most accurate readings.

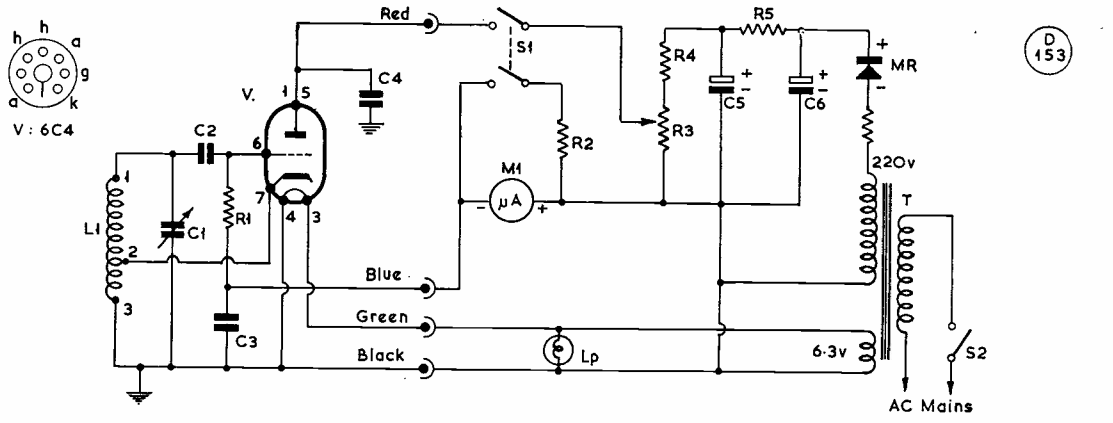
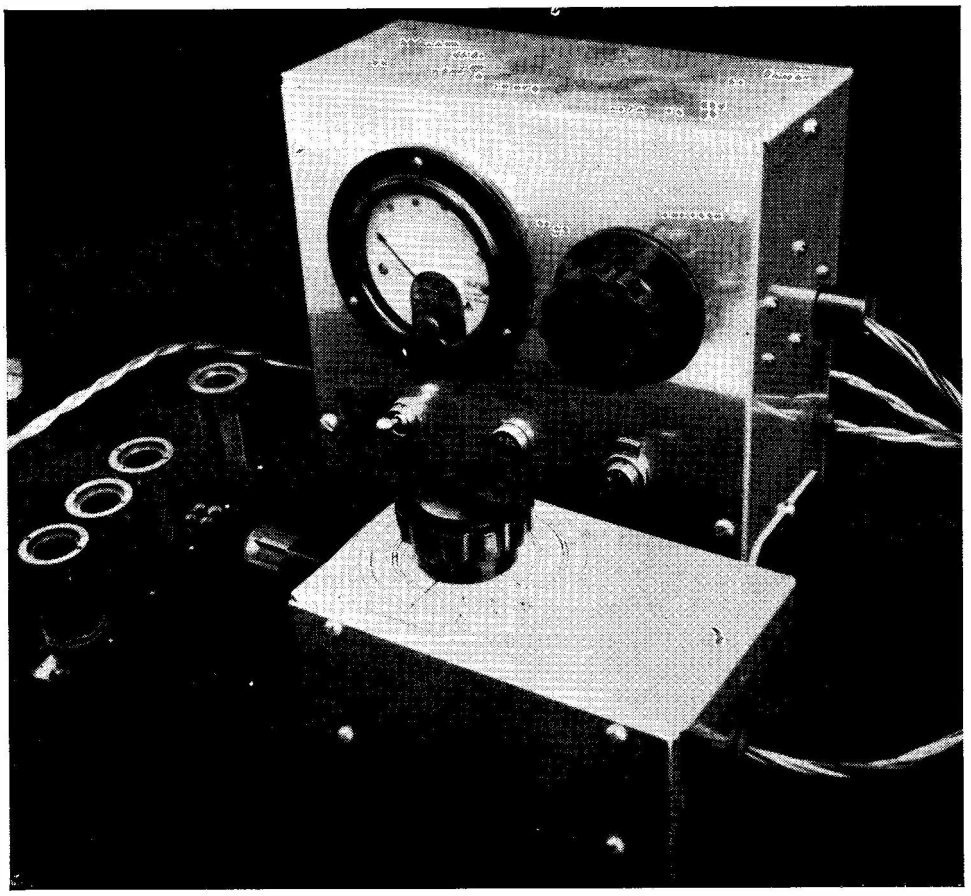


Fig. 1. Circuit complete of the combined Grid Dip Oscillator and Absorption Wavemeter described in the article. For the latter application, achieved simply by switching at S1, the valve functions as a sensitive diode detector, indication being on the meter, as when the instrument is being used as a GDO. By means of plug-in coils, a wide frequency range can be covered, and by making the power supply and meter indication separate, the mobility of the instrument is limited only by the length of the 4-way lead connecting the two boxes. *Note: Resistor connecting to MR— is R6.*



The instrument complete as described in the article; it can be used either as a grid dip oscillator or as a sensitive absorption wavemeter. In both cases, resonance tune is indicated on the panel instrument. The tuned circuit and the detector/oscillator valve are contained in the box in the foreground, which is used as the "test probe." The plug-in coils are the Eddystone miniature type, and are wound to cover a wide frequency range—see table below.

Absorption Wavemeter

When the 2-pole switch S1 is opened, HT is removed from the 6C4 anode, and the 1 mA meter R2 shunt is disconnected. The unit then works as a sensitive absorption wavemeter, the 6C4 operating as the rectifier. It is then necessary to couple the plug-in coil to the oscillating or other circuit, and tune for *maximum* meter reading. The plug-in coil must be kept well clear of transmitter or powerful oscillator

Table of Values

Fig. 1. Circuit of the GDO/Wavemeter

C1 = 75 $\mu\mu$F, min. var.
C2 = 100 $\mu\mu$F, tub. ceramic
C3 = .01 μF, disc
C4 = .002 μF, disc
C5 = 16 μF, elect.
C6 = 8 μF, elect.
R1 = 22,000 ohms, ½w.
R2 = Meter shunt (*see text*)
R3 = 70,000-ohm var. potentiometer
R4 = 6,800 ohms, 1w.
R5 = 1,000 ohms, ½w.
R6 = 390 ohms, ½w.
S1 = 2-pole, 1-way
S2 = 1-pole, 1-way
MR = Contact cooled metal rect., 220-250v., 20-40 mA
T = Xformer, 220v. 20 mA, 6.3v. 0.5 amp., or similar
Lp = 6.3v. pilot lamp
M1 = 100 μA FSD m/c, or 0-1 mA
V = 6C4
L1 = Plug-in coils (*see table opposite*)

COIL VALUES

(For L1 in Circuit Fig. 1)

(1) **1.7-3.8 mc:** 105 turns 34g. enamelled, close-wound, tap at 20 turns.
(2) **3.2-7.3 mc:** 48 turns 26g. enamelled, close wound, tap at 10 turns.
(3) **7.3-17.0 mc:** 27 turns 26g. enamelled, wound at 21t. per in., on threaded former*, tap at 9¼ turns.
(4) **16.0-36.0 mc:** 8½ turns 26g. enamelled, wound at 21t. per in., on threaded former*, tap at 3¼ turns.
(5) **36-90 mc** (*approx.*): 2½ turns, 20g. enamelled, ¾-in. diam. self supporting, turns spaced at about 10t. per in., centre tapped.

Note: Coils (1) to (4) are wound on Eddystone miniature 4-pin plug-in coil formers, those marked* being grooved at 21 turns per inch. Coils (1) and (2) are on smooth-side formers. Coil (5) is approximate only and will have to be shaped to achieve the desired frequency coverage. Windings on Coils (1) to (4) should be tight, with end turns cemented.

circuits, as the instrument is sensitive. Low sensitivity can be achieved by turning the potentiometer R3 towards zero, and closing the switch to shunt the meter.

Power Pack Details

This was constructed in a (Home Radio of Mitcham) "universal chassis" box 6 in. x 7 in. x 3 in., with an extra 6 in. x 7 in. plate for the back. The actual dimensions are of little importance. A convenient panel layout is suggested in Fig. 2.

The contact cooled rectifier, mains transformer, 8 + 16 μF condenser, and socket are all bolted to one 3 in. x 6 in. side — *see* photograph. Only 0·3 amp. for the indicator lamp and 0·15A. for the valve will be required from the heater winding. The HT voltage is not very important, but will need to be around 120v. to 180v. or so maximum. A 220v. converter transformer is satisfactory, and a 20 mA current rating for the HT secondary is ample. The HT control potentiometer R3 can be anything in the neighbourhood of 50K to 100K; if the grid current readings are always excessive, a fixed resistor R4 can be added between potentiometer and smoothing condenser. The values shown were found suitable, but are in no way essential.

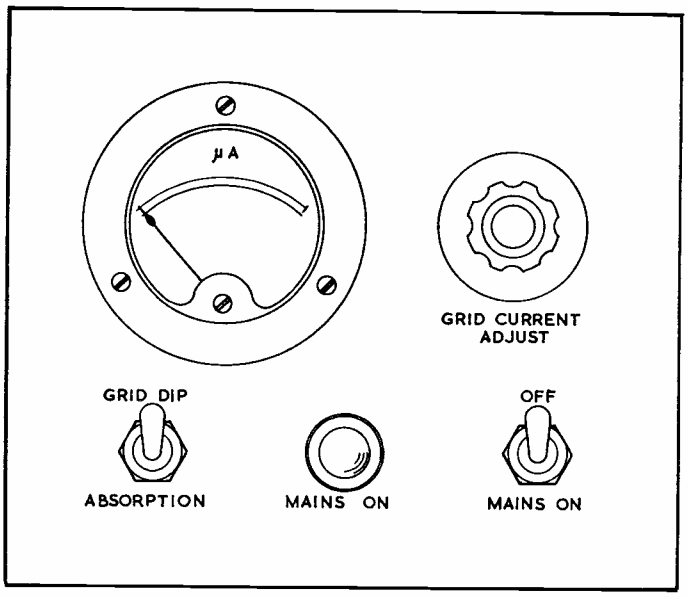
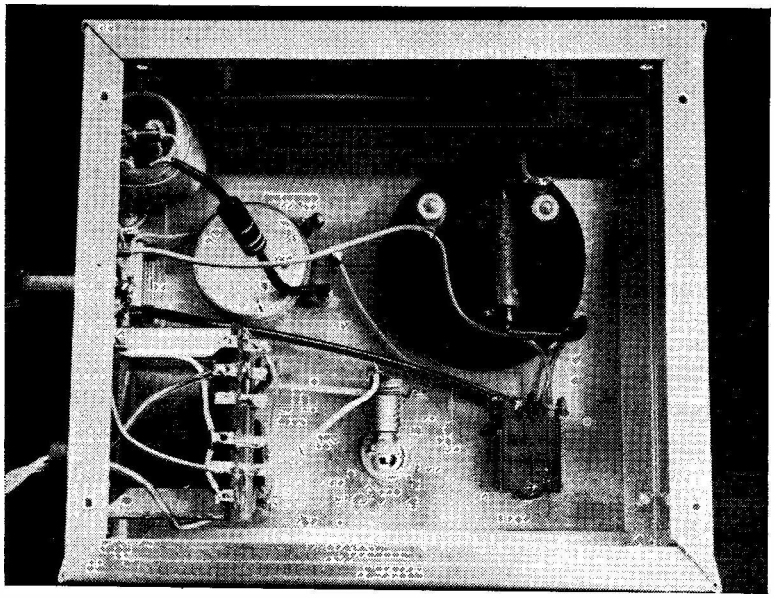


Fig. 2. The panel layout actually used for the instrument as described. Any other suitable arrangement can, of course, be adopted, the objective being to keep the box no larger than is necessary.



Construction of the meter box, which also incorporates the power supply for the instrument. The inter-connecting lead consists of a 4-way cable, long enough to give the probe end of the device its mobility.

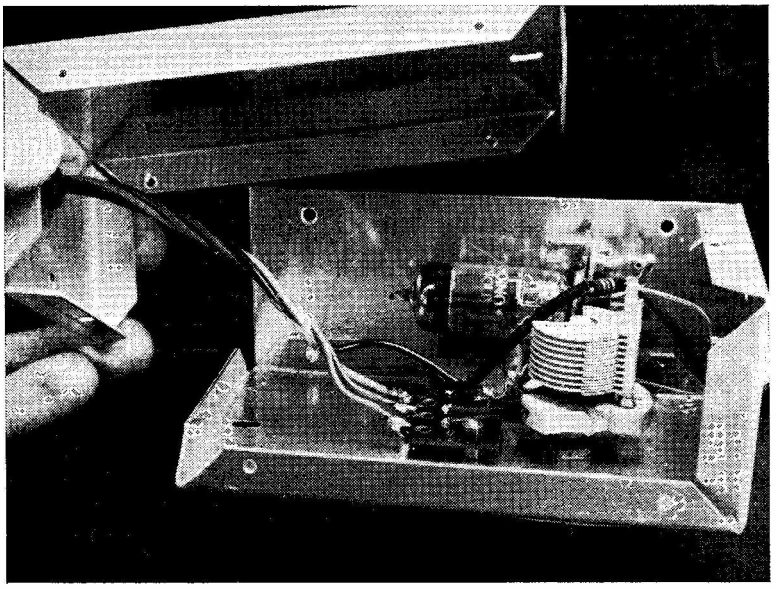
The 1 mA meter shunt need only be approximate, and a 47-ohm resistor R2 will suffice for a 100 μA 500-ohm meter. A 0-1 mA meter would give equivalent results for grid dip use, but would be less sensitive in the absorption wavemeter application.

Four leads are necessary between power pack and oscillator, and they are coloured for identification. Multi-way connectors to fit valveholders can be readily obtained.

Oscillator Construction

A 7 in. x 3 in. flanged chassis side had both flanges cut 2 in. from one end, which was then bent at right angles, to take the plug-in coil holder. The oscillator is completely built and wired on this member, before fitting. A similarly-shaped side forms bottom and second end, and a 5 in. x 4 in. spare plate is cut to form two 5 in. x 2 in. sides. The finished box is thus 5 in. x 3 in. x 2 in.

Inside the oscillator section, the 6C4 holder is mounted on a small bracket — *see* photograph. A tag strip anchors the flexible leads, green going to pin 3 (heater) and red to pins 1 and 5 (anode). The condenser, C4, moving plates tag of condenser C1, and socket 3 of the coil holder are all wired together by the shortest route, and down to chassis. Other connections should also be short and rigid. Completely assemble the box *before* attempting calibration.



Inside the tuning box of the GDO/Absorption Wavemeter, showing the general construction. The valve is a 6C4, and power is fed in by a loose lead to enable the instrument to be freely used. The switching for GDO to Absorption is on the meter box, which also contains the power supply.

Fig. 3 shows connections for all coils, point 2 merely being a tap on the continuous winding from 1 to 3. Coil details are not critical, but grid current will be rather low if the taps are too near point 3.

The Eddystone miniature formers are ¾ in. in diameter. The two larger coils have smooth ribs, but the smaller coils are threaded at 21 turns per inch. The four coils for 1·7 mc to 36 mc are shown in the table.

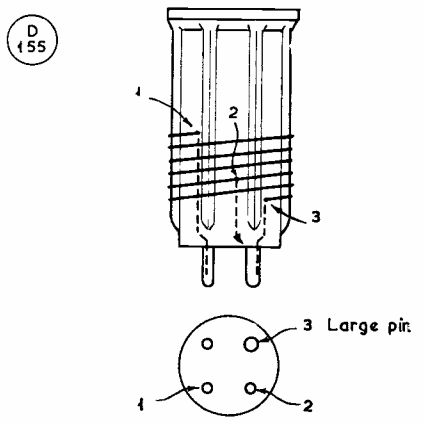


Fig. 3. Coil winding procedure for the GDO/Wavemeter. Turns data are given in the table, on p. 345, with approximate frequency coverage.

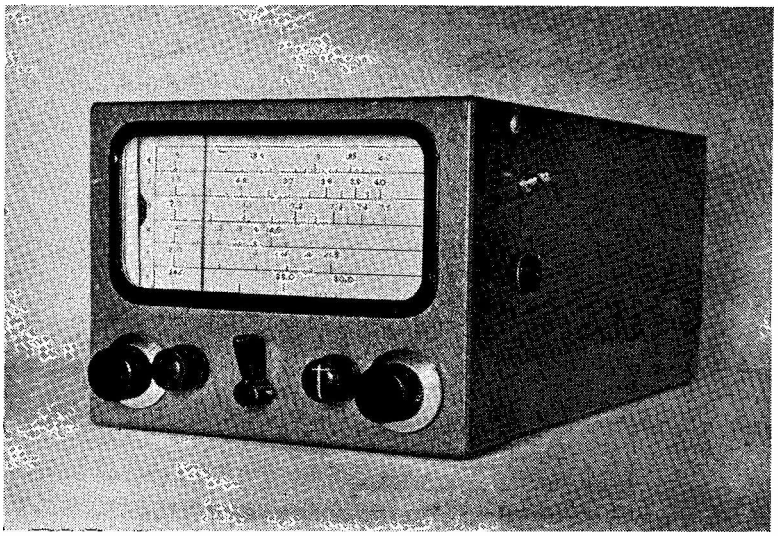
The tuning scale is of smooth card, approximately 3 in. x 3 in. The cursor is transparent, with a scribed line each end. Its ends are of dissimilar length, and the scales are drawn to suit, to avoid reading against a wrong scale. The scale is held by four self-tapping screws. After calibration, set the cursor at a marked point, remove the knob, and fit a piece of transparent material 3 in. x 3 in. on top of the scale. The knob with cursor can then be replaced, and a check made that it indicates correctly.

Calibration

Various means will suggest themselves for calibration. If a calibrated wavemeter is available, this can be used, the instrument being set for grid dip operation. A signal generator is another possibility, tuning both generator and grid dip oscillator beats in on a receiver. An accurately calibrated communications receiver may be used alone, throughout the bands available, the receiver itself being checked against WWV or MSF. If a crystal frequency marker is employed with the receiver, accuracy will be increased by its aid. For Bands I and II, a squeak on TV or VHF/FM transmissions will provide calibration points.

Mobile Receiver for Six Bands

DOUBLE SUPERHET, FULL BANDSPREAD—DESIGN AND CONSTRUCTION



General view of the six-band mobile receiver designed and constructed by G3GMN. This is a double-conversion superhet (see circuit Fig. 1) and the size overall of the prototype as described and illustrated here is 6 ins. wide by 4½ ins. high by 12 ins. depth behind panel. The constructional layout is shown in the accompanying photographs.

H. ELSWORTHY (G3GMN)

This is the companion unit to the Mobile Transmitter described by the same author in the May 1961 issue of SHORT WAVE MAGAZINE. *It is a 10-valve double superhet of modern design, giving full coverage of the six amateur bands only—that is to say, it is not a conventional type of short-wave receiver for general listening. Though designed as part of a completely home-built mobile installation, which has itself been very successful, obviously the circuitry and construction could be freely adapted for a good amateur-band receiver for fixed station operation. Hence, this article will be of more than mobile interest.—Editor.*

BEFORE starting to build the receiver described here an experiment was carried out with a simple converter fed into a BC-453, which was itself modified to receive signals on about 1·6 mc. The result of this investigation proved that sensitivity was good in the 20-30 mc range; second channel interference was very slight at 30 mc, and found to be considerably better than the station receiver, which has an IF of 465 kc; on changing the converter for one to cover 1·7-4·0 mc, it was found that IF break-through was apparent at 1·850 mc and became progressively worse as the intermediate frequency was approached; thus, a simple aerial trap was made up, and this effected a considerable improvement.

It was also found that some form of audio limiter was essential, especially when using headphones; the lack of AVC was distressing when tuning across strong signals. As regards cross modulation, some was present at 1·9 mc.

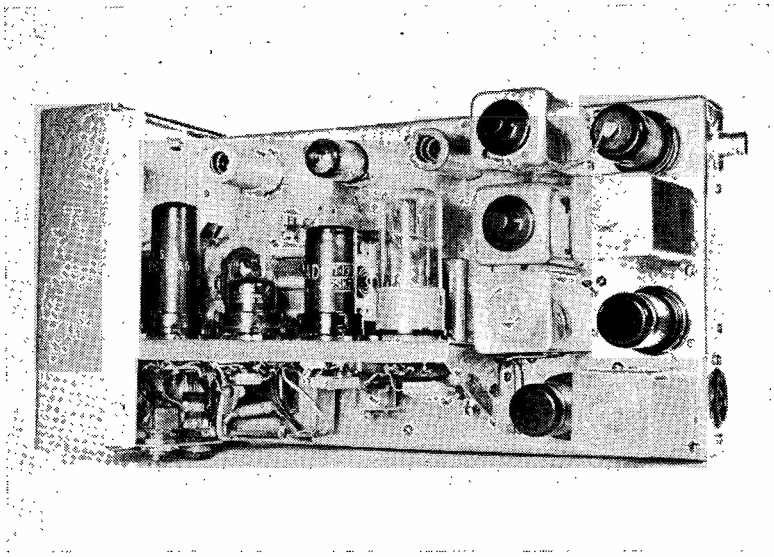
The size of the BC-453, with its controls located on one end of a rectangular case, appeared to be nearly an ideal shape for fitting into the average car.

With all these factors in mind, the final design was evolved, as described and illustrated here.

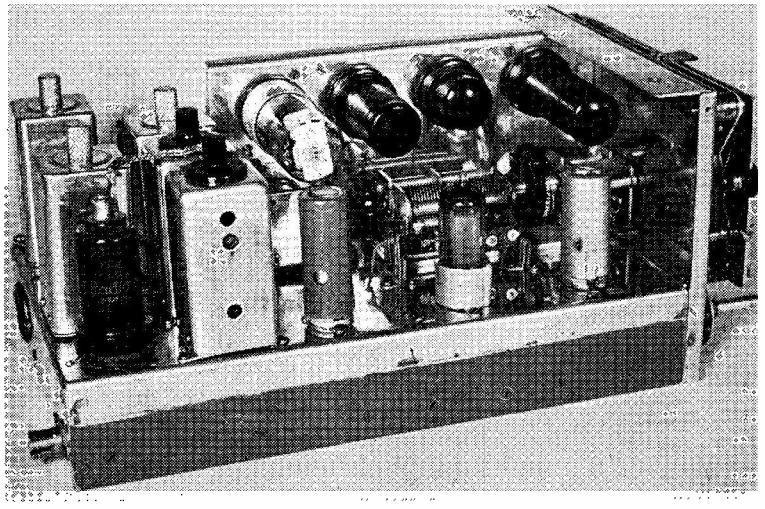
Construction

The cabinet measures 6 ins. wide x 4½ ins. high x 12 ins. deep. It is made up in three parts: (1) chassis with a panel attached; (2) cover for the chassis; (3) front cover housing for the dial drive pulley mechanism and scale plate, with pointer and traverse gear.

The fitting together of these three parts forms the complete receiver assembly. The general construction can be gathered from the photographs.



Plan view of the G3GMN/M receiver, with the IF stages to the right and the RF and 1st Mixer stages at upper left.



Left-hand side view of the chassis of the six-band mobile receiver, panel assembly to the right. The neat and compact layout can be appreciated from this view, the chassis being 12 ins. long by 6 ins. wide.

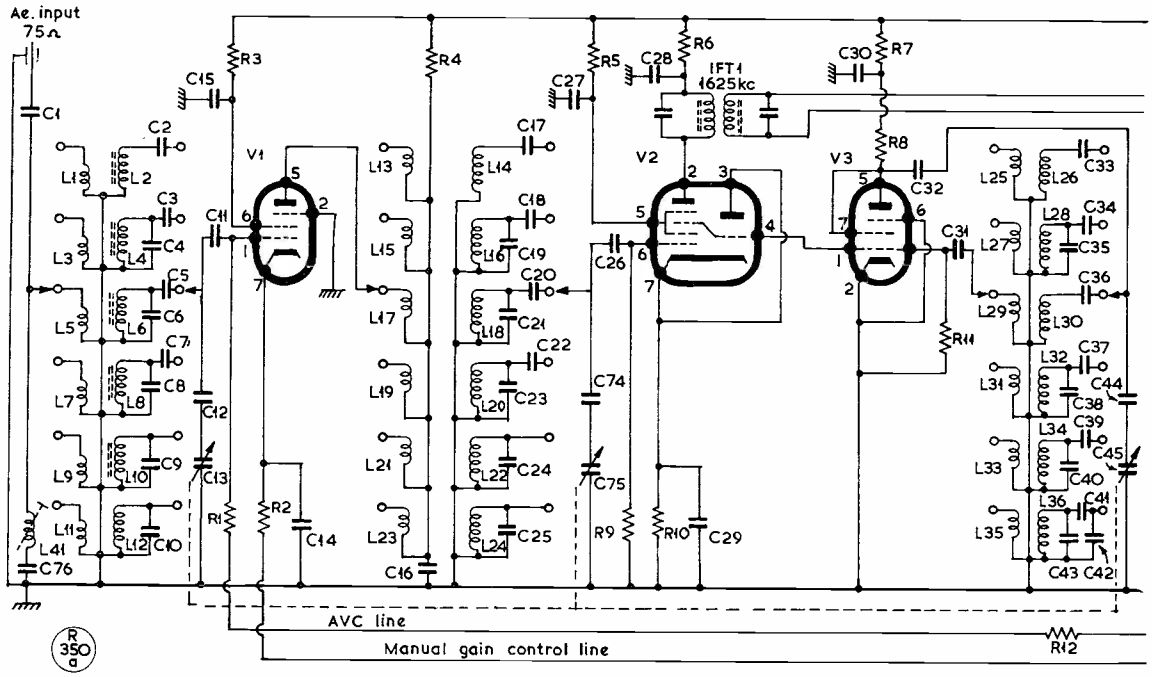
The Circuit

This follows the accepted pattern now popular for amateur band superheterodynes—the RF amplifier, 6BA6 (V1), gives adequate gain at 30 mc; V2, ECH42, is the mixer stage (triode section not used); V3, EF91, is a triode-connected first oscillator in a Hartly circuit with tuned anode, its output at 1·625 mc being fed through IFT1 into the grid of the second mixer, a 12K8 (V4); second conversion takes place here by mixing from the triode section, which is set up as a fixed oscillator on 1710 kc. The coil required for this frequency was made to fit within the framework of a "Command" type IF transformer, while retaining the existing air-spaced trimmer for adjustment to the final frequency.

It could be argued that at this stage some advantage would be gained by the use of a crystal controlled oscillator. However, in practice after a thermal drift lasting a few minutes, the general stability is very satisfactory, even for the reception of SSB signals on 28 mc.

This second oscillator is by no means as vulnerable to drift as the first oscillator, which

[*continued p. 352*

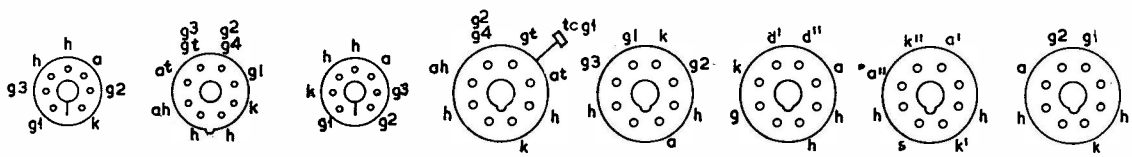


RF, Mixer and 1st Oscillator stages.

COIL WINDING DATA

L1, L13 — *10 metres:* 3 turns 38g. enam./DSC wound at cold end.
L2, L14 — *10 metres:* 9 turns 24g. enam., close wound.
L3, L15 — *15 metres:* 3 turns 38g. enam./DSC, wound at cold end.
L4, L16 — *15 metres:* 12 turns 30g. enam., close wound.
L5, L17 — *20 metres:* 3 turns 38g. enam./DSC, wound at cold end.
L6, L18 — *20 metres:* 15 turns 24g. enam., close wound.
L7, L19 — *40 metres:* 6 turns 38g. enam./DSC, wound at cold end.
L8, L20 — *40 metres:* 25 turns 28g. enam. close wound.
L9, L21 — *80 metres:* 8 turns 38g. enam./DSC, wound on cold end.
L10, L22 — *80 metres:* 35 turns Litz, weave wound into single pie.
L11, L23 — *160 metres:* 12 turns 36g. enam./DSC, wound on cold end.
L12, L24 — *160 metres:* 50 turns Litz, weave wound into single pie.
L25 — *10-metre Oscillator:* 3 turns 38g. enam./DSC, wound at cold end **L26,** 8 turns 20g. enam., close wound.
L27 — *15-metre Oscillator:* 4 turns 38g. enam./DSC, wound at cold end **L28,** 12 turns 20g. enam., close wound.
L29 — *20-metre Oscillator:* 4 turns 38g. enam./DSC wound at cold end **L30,** 15 turns 24g. enam., close wound.
L31 — *40-metre Oscillator:* 5 turns 38g. enam./DSC, wound at cold end **L32,** 22 turns 28g. rayon-covered enam., close wound.
L33 — *80-metre Oscillator:* 6 turns 38g. enam./DSC, wound at cold end **L34,** 20 turns Litz wire, weave wound.
L35 — *160-metre Oscillator:* 12 turns 36g. rayon-covered enam., wound at cold end **L36,** 30 turns Litz wire weave wound into single pie.
L37 — *1710 kc Oscillator:* 25 turns 30g. enam., close wound over cold end **L38,** 55 turns 30g. enam., both coils wound on BC455 IF former assembly; original trimmer retained in parallel with L38, for adjustment to 1710 kc.
L39, L40 — *85 kc BFO unit:* Unmodified ex-BC453 85 kc BFO coil unit.
L41 — *1.625 mc IF Trap:* 60 turns Litz wire, weave wound into single pie.
IFT1 — 75 turns Litz 9/47 wire on primary and secondary on Aladdin ⅛-in. dia. slug formers, in 5/16-in. wide single pie, each winding. Coils spaced 1¼-in. between centres, with 130 $\mu\mu$F in parallel, resonance adjustment on coil slugs. Mounted in BC455 type IF transformer can.
IFT2, IFT3, IFT4 — All ex-BC453 85 kc IF transformers, unmodified.

Notes: Except where stated, all coils wound on .406 dia. Aladdin type formers, with slugs, complete with mounts. Wave change switch built up from set of parts consisting of three wafers, each 6-pole 2-way, with click plate and shaft of required length.



R 350 c

Fig. 2. Base connections for the valves used in the G3GMN 6-band double superhet receiver. They are all readily available types.

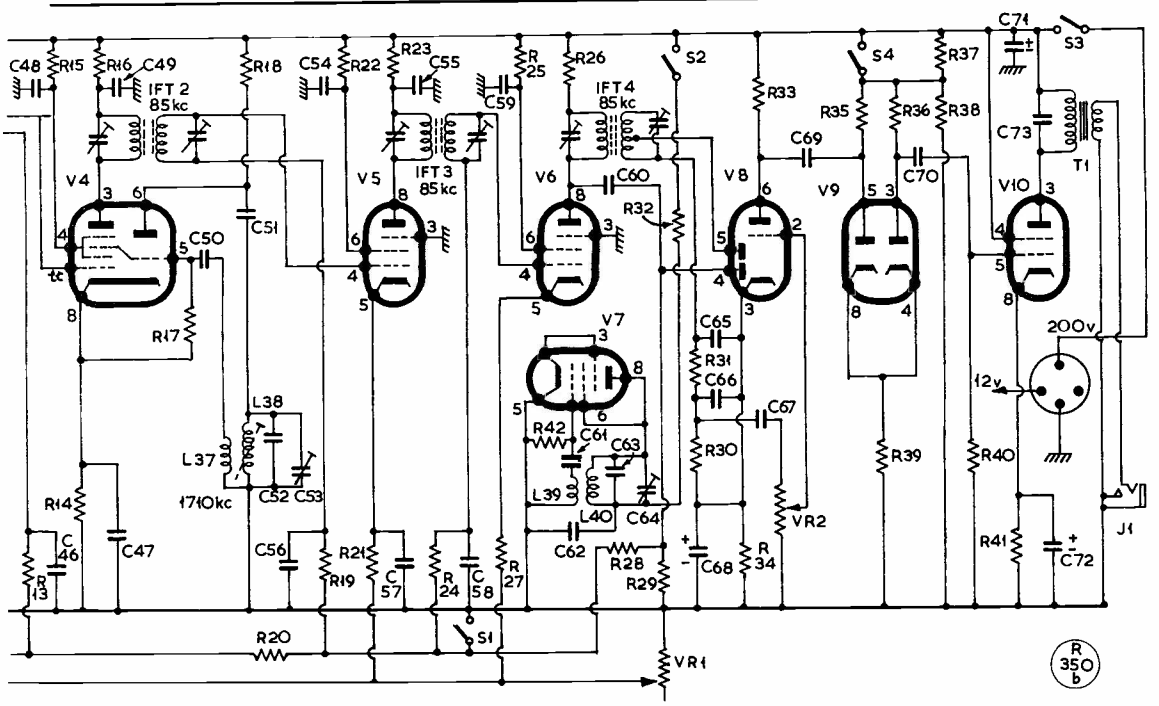


Fig. 1. The circuit of the G3GMN 6-band Mobile Receiver. It is a 10-valve double superhet (IF's, 1.6 mc and 85 kc) and the basic design, constructionally or otherwise, could easily be adapted as an efficient home-built receiver for fixed-station working, since it covers amateur bands only, with ample band-spread on each. All necessary details are given in the tables. To set up a receiver of this kind for maximum performance on each band, a signal generator and output meter would be necessary. Selectivity and image rejection are good on the prototype (itself derived from much preliminary experimental work), the single RF stage gives ample sensitivity, and the oscillator stability is such that SSB phone can be copied easily on all bands, using the BFO technique.

Table of Values

Fig. 1. Circuit of the G3GMN/M 6-Band Receiver

C1 = .001 μF tub. paper
C2, C5, C11, C17, C20, C26, C31 = 50 μμF, silver mica
C3, C4, C6, C8, C18, C19, C21, C23, C24, C34, C36 = 30 μμF, silver mica
C9, C40 = 60 μμF, silver mica
C7, C10, C22, C50, C60 = 100 μμF, silver mica
C12, C44, C74 = 75 μμF, silver mica
C13, C45, C75 = 75 μμF var., ex-RF 27 unit
C14, C15, C27 = .002 μF, 350v.
C16, C28, C29, C30, C46, C47, C48, C49, C54, C55, C56, C57, C58, C59, C62, C67, C69, C70 = .01 μF, 350v.
C25, C37 = 65 μμF, silver mica
C32 = 250 μμF, silver mica
C33 = 47 μμF, silver mica
C35 = 20 μμF, silver mica
C38 = 35 μμF, silver mica
C39, C65, C66 = 500 μμF, silver mica
C41 = 150 μμF, silver mica
C42 = 40 μμF, silver mica
C43 = 30 μμF, neg. coeff.
C51, C52 = 300 μμF, neg. coeff.
C53 = 35 μμF var. trimmer, ex-BC455 IF
C61 = 200 μμF, silver mica
C63, C64 = ex-BC453 BFO coil unit (*see notes*)
C68, C72 = 25 μF, 25v. elect.
C71 = 8 μF, 350v. elect.
C73 = .001 μF, 750v. wkg.
C76 = 500 μμF, silver mica, part 1.6 mc IF trap.

R1, R9, R12, R13, R19, R20, R24, R28, R30, R33 = 0.5 magohm, ¼w.
R2 = 68 ohms, ½w.
R3, 17, R31, R42 = 50,000 ohms, ¼w.
R4, R6, R7, R16, R23, R26 = 5,000 ohms, ¼w.
R8, R32 = 20,000 ohms, ½w.
R10, R14 = 300 ohms, ½w.
R11, R18 = 25,000 ohms, ½w.
R15 = 75,000, ½w.
R21, R27 = 330 ohms, ½w.
R22, R25 = 100,000 ohms, ½w.
R29 = 1 megohm, ¼w.
R34 = 3,000 ohms, ½w.
R35, R36 = 1 megohm, ¼w.
R37 = 15,000 ohms, ½w.
R38 = 35,000 ohms, ½w.
R39, R40 = 0.5 megohm, ½w.
R41 = 1,000 ohms, ½w.
VR1 = 10,000 ohms, var., RF gain
VR2 = 0.5 megohm AF gain

S1, S2, S3 = 4-pole, 2-way
S4 = Single pole toggle
IFT1 = 1.625 mc IF xformer
IFT2-IFT4 = 85 kc xformers, ex-BC453
J1 = Close-cct jack
T1 = Small spkr. xformer, 48 : 1
V1 = 6BA6
V2 = ECH42
V3 = EF91
V4 = 12K8
V5, V6, V7 = 12SK7
V8 = 12SQ7
V9 = 6H6
V10 = 12A6

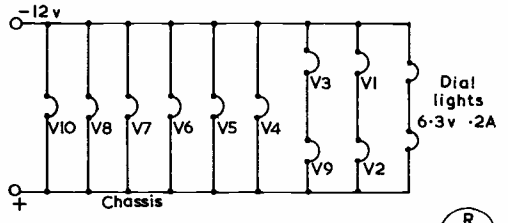
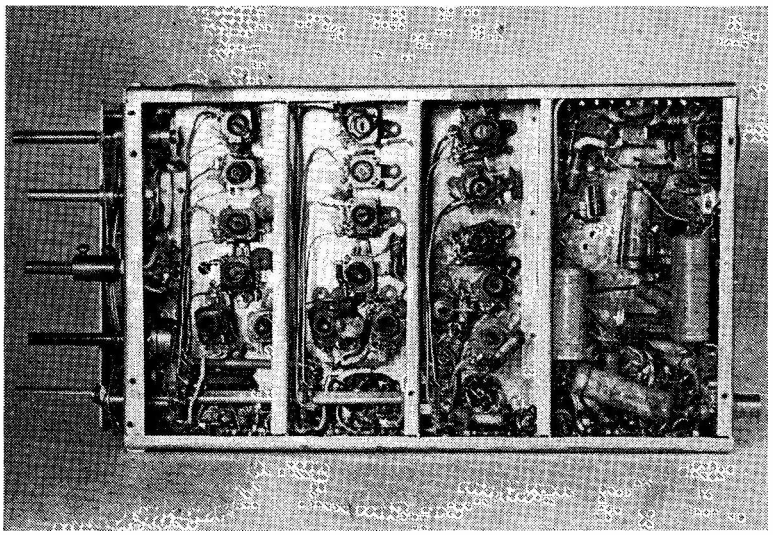
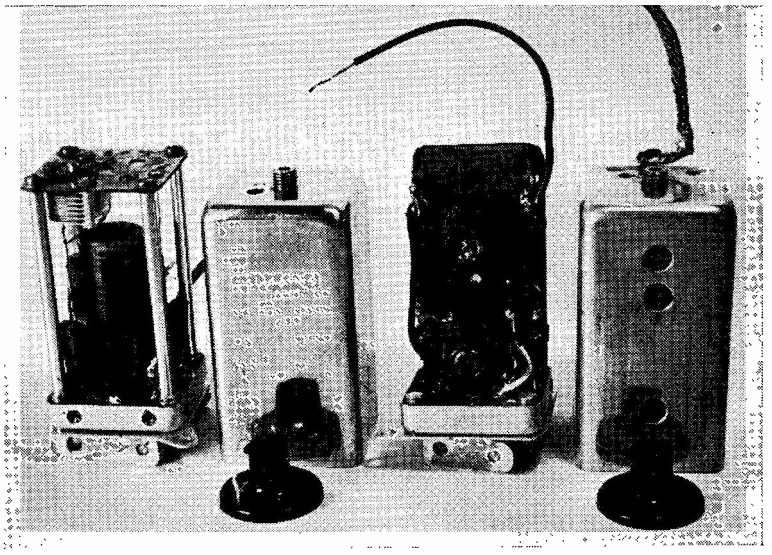


Fig. 3. Heater line connection for the six-band mobile receiver designed by G3GMN, for a 12-volt DC supply.



Under-chassis view of the six-band amateur receiver for mobile operation. Left, RF section; second compartment from left, mixer stage; third compartment, oscillator section; the fourth compartment from the left is the IF assembly.



The 1710 kc oscillator coils (L37, L38 in Fig. 1) at left, constructed in a BC-455 IF transformer can. At right, the 1.625 mc IF transformer IFT1, wound on 3/8-in. diameter Aladdin coil formers and enclosed in a BC-455 IF transformer can. Winding details are given elsewhere.

is required to maintain good stability on all bands covered. It is therefore essential that the mechanical stability of the RF circuits as a whole be of an extremely high order if the receiver is expected to take SSB signals on the HF bands when the vehicle is on the move.

In order to achieve this stability all coils must be securely bolted to the chassis plate and the leads that connect the coils to the wave-change switch are made with 18g. enamel wire. After all the coils have been wound and checked for frequency coverage they should be dressed with a coating of acetone clear varnish, and the slugs sealed with wax after the final alignment is complete.

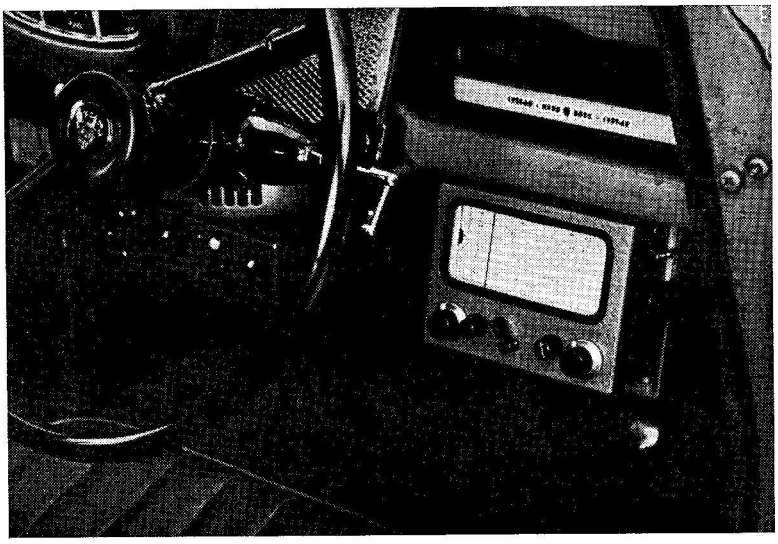
The gang tuning condenser C13-C75-C45 used was taken from a surplus RF-27 unit, and has a capacity of 75 $\mu\mu$F per section; a small fixed condenser is wired in series with each section.

The frequency coverage for the full traverse of the 5-inch scale is as follows: *Band 1,* 1·8-2·0 mc; *Band 2,* 3·5-4·0 mc; *Band 3,* 7·0-7·5 mc; *Band 4,* 14·0-14·5 mc; *Band 5,* 21·0-21·5 mc; *Band 6,* 28·0-30·0 mc.

The remainder of the circuit follows stan-

dard practice, though a point worthy of mention is in connection with the AF noise limiter 6H6 (V9); adjustment to the degree of clipping required is by the potentiometer network R37, R38 across the HT supply, and it will be found that the greater the HT voltage on V9, the less will be the clipping action. Some constructors may prefer a variable control in this position whereby the level of clipping can be fully adjustable.

In operation the mobile receiver is powered from a small rotary converter, giving 200 volts at about 50 mA for an input of 12 volts at 1·8 amps. from the 12v. car battery. The heater drain is 1·7 amps., making a total of 3·5 amps.—*see* Fig. 2.



In the G3GMN/M installation, the receiver is carried in a shaped tray fitted as shown here. The control unit and 6-band transmitter (already described in previous issues) are visible at lower left of the wheel.

This receiver was built as a companion unit for the Six-Band Mobile Transmitter described in SHORT WAVE MAGAZINE for May, 1961.

GREAT CIRCLE CALCULATIONS FROM MERCATOR'S PROJECTION

FORMULÆ AND WORKED EXAMPLES

G. C. Moore (G3MCY)
Flt.-Lt., R.A.F.

THE new *International Radio Amateur Map**, in common with most atlases and navigational plotting charts, is constructed on Mercator's Projection. This projection, while having many advantages, does not permit the direct measurement of great circle bearings and distances.

Radio waves follow great circle paths across the surface of the earth, and the difference between the great circle bearing and the bearing measured on a Mercator's projection can be quite considerable. It is necessary, therefore, for either navigational or Amateur Radio applications, to determine the difference between the two bearings.

It is possible to calculate the great circle bearing

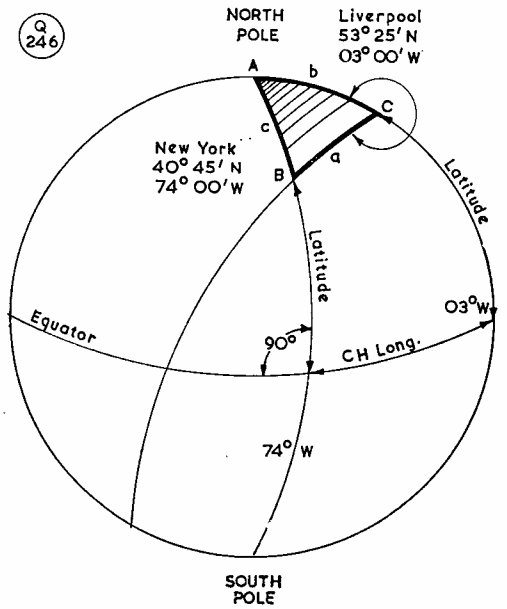


Fig. 1. The data upon which the calculations given in the text are based. The accuracy of the method is limited only by the exactitude with which the lat./long. is known of the points to be joined. C is the bearing angle.

* Publications Dept., Short Wave Magazine, Ltd., price 8s. 6d., post free.

and distance between any two points on the earth's surface by recourse to simple spherical trigonometry. In addition, a great circle bearing alone may, in most cases, be calculated by use of the graph shown in Fig. 2.

Bearing and Distance by Formula

This method is very accurate, although some may consider it to be too cumbersome for AT use. However, for those who subscribe to the "do-it-yourself" principle, an example is shown herewith.

In order to calculate the great circle bearing and distance between any two points, it is first necessary to determine their positions in latitude and longitude. This information can be quickly obtained from the Mercator map or chart. The first step is to calculate the great circle distance by application of the haversine formula, the distance found being used in the sine formula to determine the great circle bearing.

Example *(See Fig. 1)*

What is the great circle bearing and distance of New York (40° 45'N 74° 00'W) from Liverpool (55° 25'N 03° 00'W)?

Haversine Formula:

hav a = hav (b⌒c) + sin b x sin c x hav A
In Fig. 1 — A = (74°— 3°) = 71°
b = (90°— 53° 25') = 36° 35'
c = (90°— 40° 45') = 49° 15'
a = Gt. Circle dist. = ?

hav a = hav (b⌒c) + sin b x sin c x hav A
= hav 12° 40' + sin 36° 35' x sin 49° 15' x hav 71°
= **0.16443**
∴ a = 47° 51'
= 2871 nautical miles (1° = 60 nautical miles)

$$\text{to convert to statute miles} \times \frac{76}{66}$$

= **3,306 statute miles**

Sine Formula:

$$\frac{\sin a}{\sin A} = \frac{\sin c}{\sin C}$$

$$\sin C = \sin A \times \sin c \times \operatorname{cosec} a$$
= sin 71° x sin 49° 15' x cosec 47° 51'
C = 75°
in Fig. 1 true bearing = 360° — 75°

∴ **Great Circle bearing is 285°**

It should be remembered that the angle C does not necessarily give the value of the great circle bearing, which must always be measured in a clockwise direction from North.

Great Circle Bearing by Rapid Method

For most amateur purposes, knowing the great circle bearing alone is sufficient. In most cases, over the distances normally applicable to VHF and UHF working, this can be determined rapidly by graphical means.

On a Mercator's map or chart a straight line between two points is known as a "rhumb line" (R.L.). A rhumb line is a line which cuts all meridians at a constant angle. Except in the case of the equator or a meridian of longitude, a great circle appears not as a straight line but as a curve which is *convex to the nearer pole.* The angular difference between the rhumb line bearing and the great circle bearing is called "conversion angle," abbreviated C.A. Therefore, if the rhumb line bearing and conversion angle are both known, then the great circle bearing can be quickly calculated. This is done as follows:

On the Mercator's chart a line is drawn joining the home station to the distant station. With a protractor centred on the home station and reading clockwise from North, the rhumb line bearing of the distant station is measured.

To calculate conversion angle, all that is required is a knowledge of the change of longitude *(ch. long.)* and the mid-latitude *(mid. lat.)* between the two points. In calculating the change of longitude, if the two points are on opposite sides of the Greenwich Meridian, the sum of their longitudes is taken. (If the result is greater than 180°, it is subtracted from 360°.) If they are on the same side of the Greenwich Meridian, the smaller longitude is subtracted from the larger.

By entering the graph in Fig. 2 with the *ch. long.* and *mid. lat.*, conversion angle can be quickly read off. The great circle bearing is obtained by applying conversion angle to the measured rhumb line bearing. It will be remembered that on a Mercator's chart a great circle appears as a curve which is convex to the nearer pole. As can be seen from Fig. 3 (which is greatly exaggerated), if the rhumb line bearing is between 000° and 180°, conversion angle is

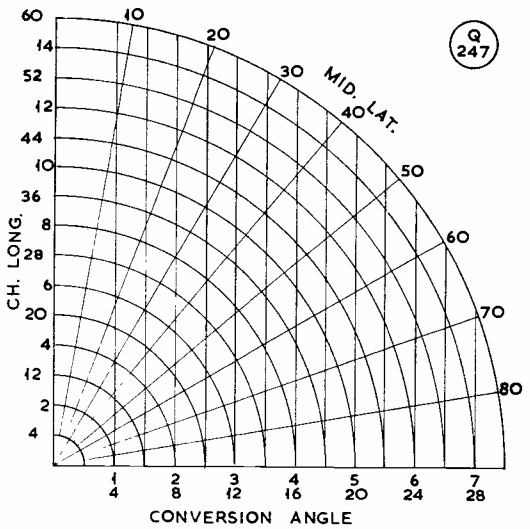


Fig. 2. G3MCY has worked out this chart so that the Conversion Angle (C.A.) can be read off quickly. For larger values of Ch.Long. the outer set of figures should be used, and the conversion angle taken from the outer scale.

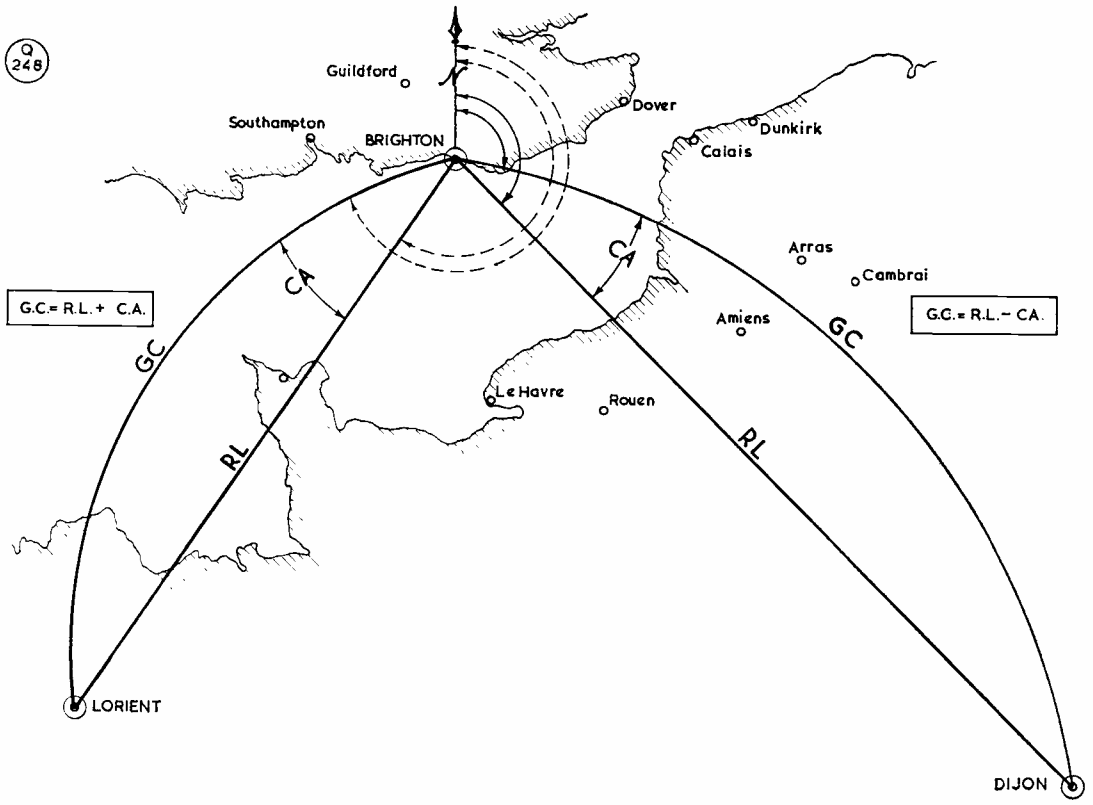


Fig. 3. Outline map showing application of the method of great-circle computation from a Mercator's chart, as explained by G3MCY in his article. It should be noted that all measurements are made clock-wise from the north point.

subtracted; if the rhumb line bearing is between 180° and 360°, conversion angle is *added*. This applies to cases in the Northern Hemisphere. In the Southern Hemisphere the opposite sign would apply.

Example:

What is the great circle bearing of Cyprus (35°N 33°E) from London (51½°N 00°E/W)?

Change of Longitude	=	33°
Mid. Latitude	=	43¼°
C.A. (from Fig. 2)	=	12°
Rhumb line bearing on Mercator	=	125°
Less C.A.		12°
∴ **Great Circle Bearing** (near enough)		**113°**

ARTIFICIAL-IONOSPHERE INVESTIGATIONS

It is reported that when the Israelis fired their first scientific rocket, to a height of 50 miles, on July 5, it "released a cloud of sodium particles" at the top of its trajectory. Presumably, this cloud was used for radio reflection tests—with what result, has not been divulged.

The much-talked-of "needles project," in hand for the U.S. Air Force and criticised by many other agencies and authorities interested in outer space, is a somewhat similar idea. A trail of 350 million or so dipoles, presumably "resonant at the frequency," is to be laid round the earth at a convenient height for reflection tests to be made. It is said by the critics that, if this works, it will not only cause intense VHF interference but will also affect the work of the radio astronomers. On the other hand, the protagonists for the "needles" idea maintain that effective reflection will only take place at the resonant frequency, that the diffusion of the dipoles will be such that other frequencies should not be affected, and that, in any case, they propose to use a metal that will dissolve in six months or so by chemical decomposition—just in case the cloud of tiny dipoles is found to cause havoc. And there the matter rests.

INTERESTING OBSERVATION

"It was found that in the United States, largely due to the size of that country's defence programme, great advances had been made in the sciences associated with electronics." (Mr. Edward Rosen, chairman of Ultra, Ltd., in his report to shareholders.)

VALVES FOR RF AND IF AMPLIFIERS

NOTES ON CHOICE AND DESIGN OF CIRCUITS

J. B. DANCE, M.Sc.

RF and IF amplifier circuits are essentially similar except for the fact that RF circuits are usually tuned to operate at the incoming signal frequency, whilst IF circuits normally operate at one fixed frequency which is independent of the signal frequency. In some complex receivers, however, the IF may be variable within a certain band of frequencies. Whilst the conventional circuits are normally used for RF and IF amplification, better results can sometimes be obtained if the constructor is familiar with the basic principles of RF amplifier design.

Choice of Valve

If an RF or IF valve will at any time be required to handle a large signal, it is advisable to use a variable-*mu* or remote cut-off pentode in order to avoid intermodulation distortion, Such valves will handle a much larger signal than sharp cut-off pentodes and are therefore almost always used in the IF stages of superhets and the RF stages of broadcast receivers.

The use of a variable-*mu* valve in the conventional circuit of Fig. 1 also enables the gain to be varied over a wide range of values. It can be shown that the gain of any RF or IF stage is almost exactly proportional to the mutual conductance (*gm*) of the valve used. The mutual conductance of a variable-*mu* valve decreases with increase of the negative bias on the control grid. For example, the mutual conductance and the gain of a 6BA6 valve decreases by one hundred times when the control grid voltage changes from —1 volt to —20 volts, assuming that the screen-grid voltage remains constant.

If a sharp cut-off pentode is used in the circuit of Fig. 1, some variation of gain will be possible, but not so much as that which can be obtained with a variable-*mu* valve. An increasing negative bias (provided by the cathode resistor) causes a reduced screen grid current to flow and this results in a smaller voltage drop across the screen resistor. The screen voltage therefore increases and this gives a sharp cut-off valve some of the characteristics normally associated with a variable-*mu* type.

This effect can be largely eliminated by the use of a potential divider in the screen circuit. One extra resistor (about 47K ohms) is required between the screen and earth, and the screen dropping resistor should be decreased to about 27K ohms, 1-watt, for the 6K7 type of valve. When this circuit is used, the screen-grid voltage does not increase very much when a negative voltage is applied to the control grid. The valve will cut off more rapidly with increasing bias than the same valve used in the Fig. 1 circuit. If a rather limited AGC voltage were available in a receiver, it would produce more effect on the gain of an IF valve which obtains its screen voltage from a potential divider than it would on the same valve used in the circuit shown in Fig. 1.

Table 1 shows a list of some valves which are commonly used as RF or IF amplifiers together with their mutual conductances and suitable values of their screen and cathode bias resistors. These resistor values are not very critical. Variable-*mu* valves generally have rather lower values of mutual conductance than sharp cut off valves and the maximum amplification which they can give is therefore appreciably lower. Valves with a large mutual conductance generate a comparatively small amount of noise and are therefore very suitable for use as RF amplifiers in high frequency receivers where the level of noise generated must be kept to a minimum. Still less noise can be obtained from special circuits, *e.g.*, cascode amplifiers.

If a valve is chosen which requires the same anode and screen voltages, a single capacitor will suffice for decoupling both the anode and screen. In addition, no screen resistor is required. Valves for use in high selectivity IF amplifiers should have a high anode resistance so that the damping on the tuned circuits is small.

The use of miniature valves at high frequencies (above 20 mc) is to be recommended, as the short leads to the electrodes have a smaller inductance than those of octal valves. Some valves, *e.g.*, the 6AK5, have two separate cathode connections for the input and output circuits in order to minimise high frequency feedback. The input capacitance should be low in a valve used as a first RF amplifier.

The new "frame grid" valves, owing to their very high mutual conductance, offer interesting possibilities for obtaining about twice the usual amplification from RF or IF stages (*see* EF183 and EF184 in Table 1).

Decoupling

The four decoupling condensers shown in Fig. 1 are marked C. The value of these capacitors, chosen for any RF or IF circuit, must be such that almost all of the high frequency current travels through the capacitor and only a very little through the cathode, AGC, screen or anode decoupling resistor. This will then prevent unwanted coupling, oscillation, etc. If a cathode resistor has a value of 200 ohms, the cathode decoupling condenser should present an impedance of not more than about 10 ohms at the frequency concerned. The impedance of a condenser at a frequency of f cycles per second is

$$\frac{1}{2\pi fC}$$

where π is 3·14
and C is the capacitance in farads.

A 0·1 μF condenser presents an impedance of about 3½ ohms at 465 kc and is therefore quite suit-

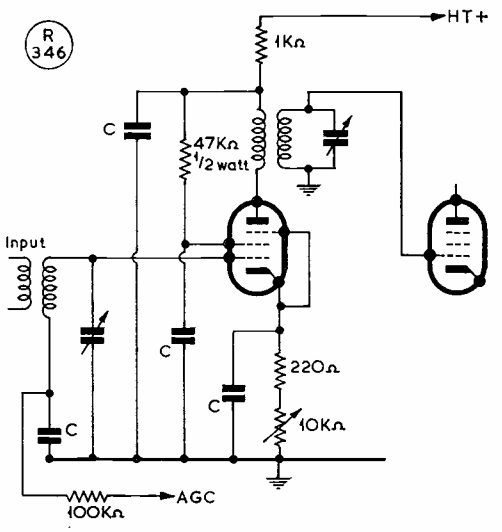


Fig. 1. A typical RF amplifier showing the values of resistor suitable for most valve types used in this position. Optimum values are shown in the Table.

able for decoupling at this commonly used IF. Such a condenser is, in fact, reasonably satisfactory for decoupling at frequencies between about 200 kc and 15 mc.

If an IF of 1·6 mc is being used, however (in order to obtain better image rejection and/or to reduce the effect of pulling of the oscillator frequency by the signal), ·01 μF condensers may be used for decoupling.

At frequencies above about 20 mc, ·002 μF condensers are quite adequate for decoupling purposes. It is, in fact, not wise to use much larger condensers at high frequencies than really are required, because larger condensers normally have a greater *inductance* than smaller ones. This inductance (which even the wire leads of the capacitor increase somewhat), can entirely alter the behaviour of a condenser at high frequencies so that it cannot efficiently decouple a circuit. Good quality mica or ceramic condensers are preferable to paper types at high frequencies, as their inductance is usually lower. Best of all are the ceramic feed-through capacitors which are fitted through a hole in the chassis, as their inductance is very small indeed. However, such condensers always have a rather small capacitance value and are therefore suitable for decoupling only at high frequencies.

Difficult problems may arise when circuits have to be decoupled efficiently from 100 kc to 30 mc, as in the RF stages of a wide-coverage communications receiver. A suitable compromise, on the large side, must then be adopted for the decoupling capacitor values, probably ·05 μF in the case mentioned.

At very high frequencies even the heater leads must be decoupled, as shown in Fig. 2. The heater decoupling capacitor may have a value of about ·001 μF; a feed-through type is by far the best. The other decoupling component, the heater choke, consists simply of about ten turns of insulated rigid wire.

Coupling

Coupling in RF and IF amplifiers is normally (but not always) achieved by means of the magnetic field developed between two coil windings. It is conventional to use an untuned anode winding (primary)

VALVE TYPE	*gm* (*mA./volt*)	ANODE VOLTAGE	SCREEN VOLTAGE	CATHODE RESISTOR (*ohms*)	SCREEN RESISTOR (*ohms*)	TYPE OF BASE
Variable-mu valves						
6K7, EF39	2.0	250	125	270	47K	Octal (with top cap)
6SK7	2.0	250	100	270	56K	Octal
6BA6, EF93	4.3	250	100	68	33K	B7G
EF183 (frame grid)	13.0	200	90	120	22K	B9A (Noval)
Sharp cut-off valves						
6AC7	9.0	300	150	160	68K	Octal
EF95, 6AK5	5.1	180	120	200	27K	B7G
Z77, EF91, 6AM6	7.6	250	250	180	—	B7G
EF80	7.4	170	170	180	—	B9A (Noval)
EF50	6.5	250	250	150	—	B9G
EF184 (frame grid)	15.0	200	200	180	—	B9A (Noval)

Table 1. Some valves commonly used as RF or IF amplifiers.

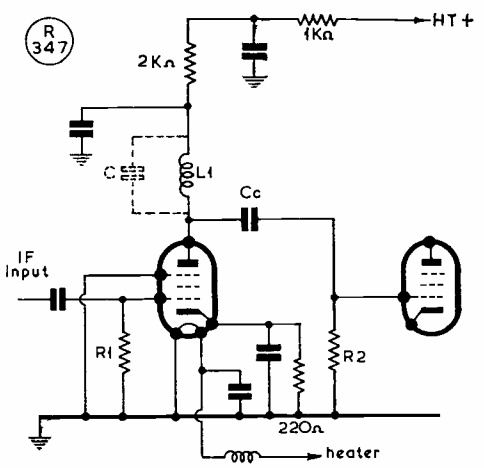


Fig. 2. A broad-band IF amplifier for use at high frequencies, notes on which are given in the text.

and a tuned grid winding (secondary), as in the circuit of Fig. 1 for the RF amplifier. In an IF amplifier, however, a capacitor is usually placed across the anode coil so that both the anode and grid circuits are tuned.

If a receiver employed one or more RF stages in which both primary and secondary windings were tuned, the number of sections required to be ganged in the tuning condenser would be much larger. The moving vanes of some sections of the tuning condenser would have to be isolated from earth, or alternatively the HT supply to the valve anode would not be able to flow through the tuned circuit. The task of ganging RF stages in which both primaries and secondaries were tuned would be a most difficult one. It is for these reasons that the grid circuit of RF amplifiers is normally tuned and the anode circuit left untuned.

The IF stages are used to provide amplification and selectivity. If single tuned circuits were used in the IF stages of a receiver, the selectivity obtained would only be about half of that which could be obtained from the same number of stages employing transformers in which both windings were tuned. If high selectivity is desired, it may be advantageous to cascade two or three transformers between two valves.

Sometimes wide bandwidth IF (or fixed tuned RF) amplifiers are required (such as in television or radar). It is then usual to use only one tuned circuit between each valve, as shown in Fig. 2. R2 loads the tuned circuit *via* the coupling capacitor, Cc; this loading can be altered, together with the selectivity by altering the value of R2. At such high frequencies it is often convenient to use a coil of wire for L1, the capacitor C (shown dotted) consisting of stray valve and circuit capacitance only. If L1 contains ten turns of half-inch diameter slightly spaced from each other, the resonant frequency will be of the order of 50 mc. The absence of a tuning capacity enables a high inductance/capacitance ratio to be obtained, and the gain is therefore quite high. At very high frequencies the suppressor grid should be connected directly to earth and not to the cathode, as this reduces coupling between the control grid and the anode and thus makes troubles due to undesired feedback less likely.

THE SPECIAL-ACTIVITY SCHEDULE

On p.255 of the July issue of SHORT WAVE MAGAZINE we mentioned, among others, the Liverpool and District Amateur Radio Society's engagement at the Liverpool Annual Show, for which they had GB2LS on the air—for three days. Their report on the event mentions that over 42,000 people visited the Show, that GB2LS attracted much attention, that the station made nearly 400 contacts in 40 countries on phone and CW under appalling weather conditions (it rained continuously for three days and nights!) and that all stations worked have had a special QSL card—also that it is hoped recipients will QSL in return, for display at the GB2LS stand next year. Mosley Electronics loaned a V-4-6 aerial array, and Tx/Rx equipment (all lent by members) included a Tiger HF-200, K.W. Vanguard, Labgear LG.50, Eddystone 888, and an AR88. Round our *DX Zone Map* was displayed a number of QSL cards received from last year's appearance at the Show. Altogether, a very creditable effort by the Liverpool group, by which they not only made Amateur Radio a reality to a large section of the local public, but also enrolled new members to their own society.

Further to the note on p.324, August, the following Special-Activity events are scheduled, all to show Amateur Radio to the public:

September 6-9: Derby and District Amateur Radio Society will be operating GB3ERD at the Drill Hall, Derby, for the S.S.A.F.A. Exhibition, when all bands from Top to Two will be worked; contacts will be appreciated with any stations hearing GB3ERD's "CQ," on whatever band.

September 9: A group consisting of G2RF, G3BJD, and G3MRV/A will be running a small exhibition station on 10-80 metres inclusive at the Sellafield Area Sports and Recreational Association's ground, Egremont, Cumberland.

September 23: The Blackwood (Monmouthshire) Amateur Radio Society will operate GW3KYA/A on all bands 10-160 metres on the occasion of the Rover Scout conference and exhibition to be held in a local school. It is hoped that other Scout stations will look for GW3KYA/A during the afternoon, but QSO's will be equally welcome with anyone who cares to call GW3KYA/A.

September 27-30: The Cheltenham Amateur Radio Society will have G5BK/A on the air from the local Hobbies Exhibition; contacts will be welcomed on all bands.

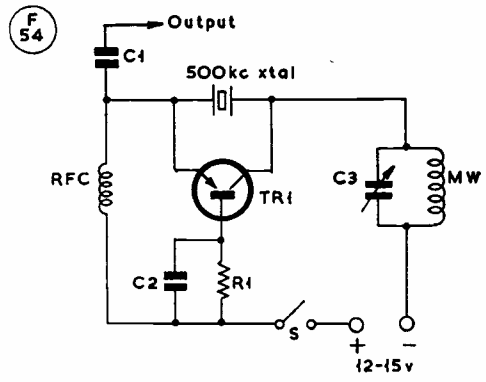
MARKER OSCILLATOR UNIT

USING A TRANSISTOR CIRCUIT

ONE of the most useful items about the station is a harmonic oscillator capable of producing beats of known frequency in the receiver. There are relatively complicated circuits for this, where a 100 kc bar is used with a multi-vibrator or harmonic amplifier, and also simpler arrangements in which the crystal is connected in the standard CO circuit.

The diagram shows yet another variation on this theme — a 500 kc crystal in a transistor oscillator circuit, capable of producing beats at 500 kc intervals right up to 30 or 40 mc, though it is true that, as the frequency goes up, so the beats get weaker and they may be difficult to identify right at the HF end of the receiver tuning range. However, so long as it does not stop the crystal oscillator, or make the circuit "squeg," tight coupling into the receiver is quite permissible, *e.g.*, with the output of the oscillator connected directly to the receiver aerial terminal, in which case it might be necessary to reduce the value of C1.

Any transistor suitable for IF applications can be used at TR1 and, with an active 500 kc crystal, there should be no difficulty in making the circuit oscillate strongly on the fundamental. This is achieved by the tuning of C3, MW being a standard medium-wave BC coil or IF transformer winding, such as can be found on any discarded broadcast receiver chassis. Surplus items such as the Dinghy Tx/Rx contain the 500 kc crystal—or an FT-241A 54th harmonic 27 mc crystal has its fundamental on 500 kc exactly.

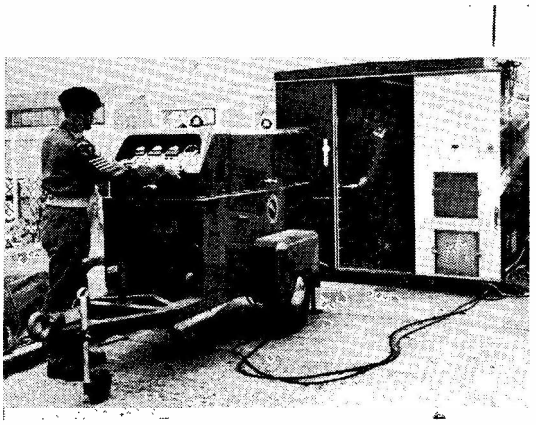


Circuit of a 500 kc marker unit in a transistor oscillator circuit, as described in the text. At this frequency, standard BC components can be used for the tuned circuit C3, MW.

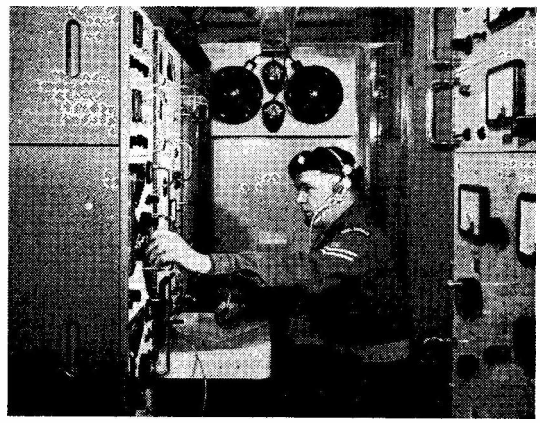
Values for the circuit shown are: C1, 100 $\mu\mu$F; C2, ·002 μF; C3, 500 $\mu\mu$F (from BC Rx tuner); R1, 470,000 ohms; RFC, 2·5 mH RF choke. Polarity on the power supply is, of course, very important, and the adjustment on C3 and the loading at C1 should be such that the circuit goes cleanly into oscillation when the switch S is made. Construction? Well, that's pretty simple, too. Either a home-made printed-circuit board, or mount the whole thing on a small aluminium chassis, the size of which will be determined by the physical dimensions of the condenser C3; in fact, everything can be mounted on and around C3.

MALAYA's AMATEUR POPULATION

The latest issue of the Malaya/Singapore licence lists shows that there are 55 known VS1's—VS1AB to VS1KZ—of whom about a dozen are Singapore nationals; one, VS1JE, is the xyl of VS1GT. Singapore is an independent member of the Commonwealth, but is a very small state (224 sq. miles) with a relatively large population (1,612,000). The neighbouring Federation of Malaya has 57 licensed 9M2's —9M2AC to 9M2UW—spread over an area of nearly 51,000 sq. miles, and lost in a population of 6¼ million. These figures make the VS1 density look pretty high.



The power unit for the Racal transportable station, designed for field work with NATO Forces, is self-contained on its own towing trailer.



Inside the signals office of the Racal HF transportable station, with the receivers and control console at left, and the transmitter unit at right.

DX COMMENTARY

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

HK2YO

FOR the benefit of those readers who are still orbiting their first eleven-year cycle on the air, we recently dug out some old log books with the intention of making a few comparisons. Precisely 11 years ago (September 1, 1950) was easy to find; then, thinking in terms of two solar cycles, we realised with a shock that exactly 22 years ago we were enjoying September 1, 1939 . . . the day on which an Austrian paperhanger named (what was it?) Schicklgrüber gave us an enforced QRT of over six years. So that was one sunspot trough that we know little about! For those who are young enough not to know exactly what happened then, on September 1 our licences were " determined " (officialese for suspended or cancelled) and polite representatives of the GPO called and removed most of the transmitting part of our gear . . . and what a job they would have today! (There were less than 3,000 of us then.)

Making a third cycle of it and looking up the log for September, 1928, we found plenty of DX, but thought that the conditions of operating in those days were so different that the comparison would mean very little. So we'll stick to September, 1950, just eleven years back.

1950 Conditions

Since the 21 mc band had not been opened then, we find, as now, that 14 mc carried most of the DX, with 7 and 3·5 mc improving fast. Stray QSO's, from the log, included the following on 14 mc: W6 and 7 (1600-1700); ZL, VK, KL7 and VE8 (0645-0850); JA (1750); XZ (1550); LU, CE and PY (2230-2330); VP4 (0015); VU (1530); ZS (1750); VS6 (1630); VK6 (1600); VQ3 (1945); and lesser lights like ZC4, SU, JY, MP4 and so on, practically all day. Excursions on to 7 mc came up with a few DX pieces such as W and PY (2100-0100); VU (2310); VP8 (2330); ZL4 (0840); ZL1 and 3 (0710-0800); VP4 (2330); ZE (1900); VQ4 (1830).

The DX on *Eighty* consisted almost entirely of W's late at night and early in the morning, except for a surprising QSO (579 both ways) with VQ4HJP at 2335. On *Top Band*, GM's, GI's and GW's were occasionally being worked on CW from 2200 onwards.

Now there's not a single surprise in all this (except, possibly, the VQ4 on Eighty); the conditions must have been very much like those we are experiencing now. The fact that there wasn't a single 28 mc entry in the log for the month of September, 1950, shows that the DX state of that band must have been much as it is now.

What *can* be said, to cheer you up, is that the same log for the month of October was very much more interesting, and, for November, better still, even with some good 28 mc openings.

From time to time we will have another dig in the past, to see how things compared with the present —and it will be quite surprising if they don't roughly keep pace with one another. Certainly there is no cause for alarm and despondency about what the present cycle is doing . . . what we *should* be really sad about is the way that good old 40-metre band has been carved up —it used to be so easy to work DX there that one retired from the other bands when the QRM was rough, and worked the stuff on Forty instead! But now we have 21 mc, for what it is worth (which is still quite a lot, fortunately).

CALLS HEARD, WORKED and QSL'd

DX Around the World

Franz Josef Land: The elusive UA1KED is due to stay there for two years; the rumour that he would leave in August was unfounded . . . VP5FP is now in *Mauritius*, awaiting the arrival of a ticket; he expects to visit various other islands during his off-time periods. And another

VQ8 plans to go to *Rodriguez* later in the year, with VP5FP probably tagging along with him . . . A *Cayman Islands* expedition by W4QVJ and others is scheduled for late September or early October . . . FS7RT *(St. Martin)* is said to be operating SSB on 14347 kc, listening for calls around 14250.

Willis Island (VK4): the 1961-62 change of crew included no one interested in the likes of us, so there's no chance of activity until June, 1962, except for a possible DX-pedition . . . *Tonga* (VR5): a VK4 was planning to visit here and to operate thence by August 12—duration of stay unknown . . . *Gabon* (TR8): TR8AA said to be active on AM, 21 mc . . . Gabon activity has also been mentioned by 5N2AMS, but his hoped-for permits for Dahomey and Volta Republic have not yet turned up.

Cook Is. (ZK1): ZK1AK, who has undoubtedly spread more ZK1 contacts around the world than anyone else that has ever been there, should by now have returned to New Zealand, where he will reside permanently as "just another ZL." *Middle East:* Colin of ZC4CT is planning a trip for November, which will take in at least four countries; the calls will be MP4BDK, 4MAL, 4QAU and 4TAP. Mainly CW, with three or four days at each spot. *Kamaran Islands:* One of the VS9's plans to put this spot on the map for the first time, signing VS9KAC.

Pacific Activity

Mike Matthews, G3JFF, is breathing down Bryan Bisley's neck when it comes to registering far-flung call-signs. So far he has collected VS1HU, 9M2MA, VR1M, VR2EA and VR4M—a nice exciting lot. He writes from Fiji, where VR2EA took the air and made 183 contacts on 14 mc the first week-end (G3AAM was the *only* European); he has a word of praise for the W's, who laid off while he called Europe.

Around September 16 he moves to the Gilbert and Ellice Islands and hopes to activate VR1M—but if he can't make it this time, he will be there for a longer stay from February onwards. In October he will be going to New Hebrides for a fortnight and hopes to put YJ1MA on the air for a week-end. November 30 sees him in Auckland for six weeks.

General comments: 28 mc almost useless for /MM operation, though some contacts were made between Singapore and Fiji; the 7 mc Sunday net is full of very active VR2's. VR2AP is on 14 mc SSB, VR2BC on 21 mc AM, and VR2AS, 2DK and 2EA operate CW, all bands. Mail for all Mike's call-signs should go to Radio Supervisor M. J. Matthews, H.M.S. *Cook,* c/o GPO, Suva, Fiji—but his VR1M cards will be handled by GW3LQP.

More DX Gossip

From G2DC come the following snippets: Danny Weil and *Yasme III* will not get away on September 1, as hoped, but W6HVN is joining him and they will be testing the gear under that call . . . 5N2AMS has had no luck with Dahomey, and his Togoland ticket has been withdrawn . . . VU2XG is closing and returning to G-land . . . 9G1DT (ex-W3OVU) plans to visit Dahomey and Volta . . . The AC3, KS4 and ZL3DX/FK8 expeditions all appear to be "off."

And from GI3NPP: FO8AC is back on the air after one year's QRT . . . KJ6BV is also reactivated, this time on 14 mc CW . . . "AC3AA," worked by many on 21 mc, was a pirate.

From G3LZK: KP4AOO intends to operate from the Caicos Islands with the call VP5CD, in December; mostly 14 mc CW, but other bands will be tried. (His Stateside call is W8URO, his father K8LHL, and his mother K8NGR!)

From G3NAC: R.A.F.A.R.S. plan to put three stations on the air from French Somaliland (FL8), operating 24 hours a day for two weeks in early October; SSB, AM and CW will be used, and only calls 10 kc up or down will be answered, unless notification otherwise is given over the air. QSL's *via* bureaux, or direct on receipt of s.a.e.'s or IRC's . . . PY7YS/P will work from Fernando de Noronha for a week in November, then also from Trinidade for a week (PYØ is no longer used there) . . . VS9APH now on SSB, and VS9AAC due to start up at any moment.

That Band!

It sounds rather like an old music-hall ditty—"What shall we do about Ten?"—but it is the burden of a good many letters. A surprising number are in favour of trying to stir it up as a local band, during its dead spells, but most people think its range will be

P & Z TABLE

STATION	PREFIXES WORKED	ZONES WORKED
	CW Only	
G2DC	458	40
GI3NPP	438	40
G3WP	381	36
G3HZL	379	40
G3ABG	336	40
G2BLA	327	39
GW3CBY	280	23
G3JWZ	270	38
G3LZF	238	34
G3IDG	236	27
G2BP	234	32
ZC4CT	223	29
VK6AJ	199	36
GW3MLU	198	31
G2HLU	154	25
ZC4SG	146	27
G3OQK	145	17
	Phone Only	
G3DO	639	40
MP4BBW	458	40
G3GHE	400	39
G3NWT	382	39
GB2SM	370	37
G3MCN	352	38
G3LKJ	347	38
G3BHJ	326	37
G3NFV	293	37
G3ABG	261	32
G3JWZ	154	34
G3HZL	140	26
GW3MLU	138	26
G2BLA	115	21
G2FQW	99	6
G3WP	80	25

rather restricted, ground-wave absorption being so high.

G2BJY (Walsall) speaks for himself and suggests a nightly Activity Period between, say, 2100 and 2200. Also, possibly, Sunday mornings. And his idea of a Sunday contest for inter-G contacts on Ten is quite interesting. Mostly active on Forty CW, G2BJY has also spent some time calling "CQ Local" on Ten, without, as yet, a single reply or even an SWL report . . . but he's going to keep it up.

G3IDG (Basingstoke) says it's not his idea of fun to spend hours on the band calling CQ, but if something can be organised to promote activity, he will be on the spot. "Activity Sundays" would be a good thing, he suggests, with a reminder that CW is still used as a means of communication!

G3WP (Chelmsford) promises to "keep the band warmed up"; G3NWT (Sandiacre) says he will support any contest; and he comments on ZE2JA and VQ3PBD, both regularly active on ten metres. G3NWT recently worked G5JO (Cambridge), with signals alternately fluttery and rock-steady . . . but G5JO could only receive him on a rhombic aimed on the U.S.A., his other aerials producing nothing! VS9APH, just before this, had been S9, calling a G.

G2HLU (Reading) is also all in favour, and says he has been looking for local stuff for some time; his only success was with a DM2. He, too, asks us not to neglect CW. GM3NQB (Thurso) has got going on 10m. with a ground-plane and is getting good reports from Europe.

GW3IOI (Cardiff) reports a single DX QSO — with VQ2TM. Also strong signals from CT, EA and I. G3NOF (Yeovil) heard several ZE's, VS9APH and a few others with good signals during the afternoons, along with the short-skip.

So much for Ten Metres, then! We feel sure that it will be carrying a certain amount of DX, this autumn and winter, but after it has had a chance to prove or disprove this, we will certainly arrange a Sunday activity period or contest.

Spot Skeds

The other matter mentioned last month (that the DX bands were often open, if only someone would *do* something, especially on 21 mc) has brought a letter from ZS6CR. He works 21 mc exclusively, and says he can usually manage a DX contact by calling CQ on what appears to be a dead band. He will now *listen* on 21 mc for five minutes at 1700 and 1800 GMT every day, and will call CQ, with the beam on Europe, for a few minutes after these listening periods. CW will be used. He would also like a sked with any G on 21 mc, at any convenient time—daily or otherwise, to suit. Get in touch with him direct: E. W. Osborn, ZS6CR, Box 87, Pretoria.

Kick-Back

Some time ago we casually mentioned a rumour that some 4X4's might be operating a station from the Dead Sea, and that the call would probably be 4X5DS. Then, in the July issue (p.249) appeared a statement from Bryan Bisley to the effect that this must have been sour, because the Dead Sea was entirely in Jordan; this was passed on in good faith, but it seems that Bryan was off the beam. VQ5AU, now on leave in the U.K., points out with all due evidence that a substantial part of the Dead Sea *is* in Israel, and in July he actually visited Israeli friends living there! Israel seems to own the lowest part of all (1286 ft. *below* sea level), and has valuable salt and chemical works in the district. So . . . if this 4X5DS affair comes off (or has

". . . . . And for power supply I use a pair of 3V8's in push-pull . . . . . "

LF BANDS TABLE

(Countries Worked)

Station	*3·5 mc*	*7 mc*	*1·8 mc*
G2DC	94	128	12
G3FPQ	85	134	19
G3FXB	78	152	9
G2YS	73	93	20
G3JWZ	52	62	9
G3IGW	51	95	19
G3HZL	44	81	8
G4JA	40	57	7
G2BLA	39	70	9
GW3CBY	29	50	14
G2DHV	25	33	5
G3NYA	23	29	9
G3NNO	23	24	10
G3IDG	16	20	9
G3DRN	13	42	9
G3NFV	12	27	16
G3NPB	8	21	9
G3OQK	5	23	7
G3NYQ	4	24	11
G2FQW	4	33	1

This Table derives from Countries Worked. Order is based on band in first column, changed monthly.

already done so) it's genuine and not to be ignored.

Anniversary

Guglielmo Marconi became the Father of DX on December 12, 1901, when he received the signals from Poldhu, Cornwall, at Signal Hill, St. John's, Newfoundland. (For those interested in more detail, there was a story about this in the April, 1959, issue of SHORT WAVE MAGAZINE). The VO's don't intend to let the 60th anniversary pass without comment, and they plan to hold a week-long celebration in December.

They will operate a station signing VO1MSA ("Marconi's Sixtieth Anniversary"), if they can get that call-sign for the occasion, on all bands from Eighty to Ten, phone and CW . . . no spark, unfortunately! Further details will be forthcoming before the date.

Piracy Again

G3CWL, who also holds the call 3A2DA, asks us to state that the "3A2DA" working 7 and 14 mc on August 5 and 6 was *not* the genuine article. And he adds that 7 mc is not an authorised band for stations working from Monaco; he himself hopes to be there in September, and will be on 14 mc CW between the 7th and 14th of that month.

Many other cases of piracy are reported to us from time to time, but most of them, we feel sure, are due to misread call-signs. Some phone operators sign so seldom and so badly that they make things difficult for themselves; and on the CW side one has only to listen around for a while to hear the most impossible stations being called (usually by Europeans). A few weeks back, in one day, we heard stations calling the following: GI1PK, G1FRK, 3A5QR, C2AAU and K2XXO. (They all make sense, if you work them around a bit—for instance, the first one was I1PKG!)

TEN METRES

Why leave 1700 kc of band-space unoccupied? Use Ten for local contacts, and make use of short-skip conditions for European working, relieving QRM on the other bands. You only need a 16ft. dipole, or an 8ft. ground-plane!

At St. Teresa's (Cheshire) Home, Long Rock, Penzance, G3OGT (left) and G3OHB share an amateur station which helps them to pass the long hours imposed upon them by their condition of incurability. One can imagine what a boon Amateur Radio is in such circumstances. Graham Thomas, G3OGT, and Enid Bottomley, G3OHB, passed the R.A.E. last year, and were soon on the air. They were started from scratch by local Club members who, they say, have given them "wonderful support and encouragement." Their gear now includes an AR88D, a Q-Max B4/40 transmitter, and an HRO, all this having been donated by fellow amateurs interested in the Cheshire Homes. They also put up the aerial system, consisting of a 276 ft. wire, NE/SW, and a Mosley TA-33Jr Tribander rotary beam, the latter being the Mullard Award for 1960. The other Cheshire Homes on the air are G3KQK, Ampthill, Beds., and G3OPY, Staunton Harold, Leics., with the prospect of more coming on as the local difficulties are surmounted.

Miscellany

G3KMA (Hampton) recently worked a station signing TT2LA. He was also working W's and his operating was good, but he gave QTH as "Osgg" and said his name was "Nfu" . . . so we imagine it was another dreary old pirate.

G2BY (South Ascot) is an Old Timer with a strong bias towards CW, and sends in his lists of DX worked, in a very welcome first letter. He writes: "I am surprised that you have not yet commented on the hash station which seems to be centred around 13·9 mc. There are times when this mess completely clutters up the CW end of 14 mc, the hissing sound occurring in waves all the way up to 14150 . . . It's a pity that the powers that-be can't seem to do anything about pirating in our bands." And how we agree—that hash is something nasty that's always with us, apparently. G2BY adds: "Finally, my pet dislikes—Creepy-Crawlies and Contests!"

G3NYA (Sutton Coldfield) has been working "rock-bound" on 3·5, 7 and 14 mc, and has just graduated to VFO; next step is to extend the cover to 21 *and* 28 mc, and on the latter band he hopes that CW will be fostered, possibly towards a WABC ladder, or something of the kind. But he says he'll continue to support *Forty*, despite the congestion.

G3LZN (Warwick) was operating at a local Village Fête, when he had the good fortune to raise VS9MB for a nice 5 & 9 contact; this impressed the visitors considerably and cheered up the operator, since it was his first attempt on 21 mc, with 40 watts and a long wire.

G3MXJ (Gravesend) tells us that he is off to sea shortly as a radio op. He doesn't know the ship, as yet, but promises to keep his ears wide open on Top Band. (He also passes on the tip that ON4 calls have now run out, and they are issuing ON5's.)

[over

Top Band Topics

Still with G3IDG—his change of QTH went off without a hitch. and within 32 hours of arriving in Basingstoke he was on Top Band. Best QSO to date has been with GC3EML in daylight; he finds a new QTH "a most interesting experience." (Incidentally, he asks whether he has to start again on the various ladders . . . the answer is No — not for a move of less than 100 miles.)

G3OLN (Cheltenham) reports for the first time. He has been having his first experience of Top Band and likes it very much, having worked 62 counties between July 9 and August 8 — good going. He has an end-fed half-wave, only 20-25 feet high, but it gets out and he has worked an OK as well as all the G's. Activity is mostly CW.

G3NAA (Chelmsford) collected Phone WABC No. 13 and wants to thank all those whose QSL's made it possible. Latest ones were G3KXQ/A (Rutland), GM5PP/M (Dumfries), GM3AEF/A (Kirkcudbright) and GW3NWR (Radnor). And he comments on the wonderful SSB signal from GI3GRY (Londonderry) and the terrific stir caused by GD5UG/M when he showed up in the Isle of Man.

G3OAG (Prestwich) collected GM5PP/M in Dumfries for a new one, and is now chasing WAGM and WAGI but finds the rare GI counties very difficult. Also, he asks, where are all the GM5's and GM8's listed in the *Call Book?* Well, we presume that GM5PP/M, although strictly a G5, does count as a GM5 for the certificate.

G3NVO (Middlesbrough) also shot his counties score up very nicely, thanks to GM3OBC, GM3IQO/P, GC3EML and others. And he mentions GM5BK/P—yet another GM5! He was pleased to hear so much portable activity going on, and quotes GM3AVA/P, GM3AEF/A, GW3NNO/P in four Welsh counties, GM3OHX/P, GM3NLH/P and GM3FGT/A. He himself went to Roxburgh with G3NVN, 3NVV and 3OHX, whence they signed GM3NVO/P. They ended up with about 60 QSO's despite all sorts of hazards, including rain and gales, and a large white bull!

G3FS (Sidcup) raised three new ones on phone, and now tells us that he is going to Cardigan between September 2 and 15, when he hopes to be operating /A.

G3NFV (Ashtead) is also off, this time to Scotland with G3OCA. They will sign GM3NFV/P and GM3OCA/P on phone and CW from as many rare counties as possible. Dates, Aug. 29-Sept. 7.

Just as this issue was clearing for press, G3ISG (Bristol) reported the schemozzle surrounding GM3FSV/A's 160m. appearance from Shetland, on the evening of August 12. In spite of a pretty shocking display of clottery—people calling on the frequency during QSO's, refusing to follow requests for "5 kc up" or "10 kc down," calling on CW over phone QSO's, and so on—all producing what G3ISG describes as "an ear-splitting jungle of heterodynes," GM3FSV/A did manage to give contacts to a number of G's—but a little discipline and forbearance would have made it much easier and quicker for everybody. As GM3FSV/A was going to be in Shetland for some days longer, no doubt we shall be hearing more about this expedition next time.

Around the HF Bands

As usual, the DX worked is listed in tabular form, leaving this space for sundry comments and remarks accompanying the lists of stations. They are not quite so numerous as usual, but pretty good for a holiday month, and, at that, one with summer conditions still prevailing.

The 21 mc band has been intriguing during the afternoons and early evenings, with quite good and unusual DX to be had fairly easily. At the time of writing it is wide open to North America once more. The 14 mc band has carried all the QRM, all the European short-skip, and most of the Klottery—to say nothing of sundry nasty jamming noises.

Regarding 28 mc, we have

14 mc DX WORKED

SSB

G3NOF: CE3CZ, 3DY, 3HQ, HZ1AB, 1TA, IS1RIF, KL7, KV4, OA4CV, 4DI, OD5CZ, PJ2AA, PY, PZ1AX, UF6FB, UL7JA, UO5PK, UR2AO, 2KCA, VK2ADC, WA2EVH/M, YV9AM, ZB1A, ZS7P.

GM3JDR: EL2G, EP2BB, HZ1AB, 1TA, IS1RIF, IT1RIF, KW6DG, LU4DMG, OA4AX, 4BN, OD5CU, 5CZ, PY, PZ1AY, 1BJ, TI2RFT, UAØBP, UO5PK, VQ2AB, 3GX, 4IE, 4FO, YNØKCV, ØNWO, 9AM, ZB1A, ZE6JA, ZS7P, 7S, 5A4TH, 5TA, 9G1BF, 1DP, 9Q5US.

G3DO: HK2YO, K6CQV/KS6, PK1SX, UA9DT, UF6FB, UO5PK, UW9CC, YNØNWO, ZB1A, ZK2AB.

G3NAC: HV1CN, KL7DPL, UO5PK.

CW

G3MXJ: 4S7EC, VQ2AC, UM8KAB, SM5BUG/9Q5, 5R8AB, EL4YL, KV4CI, 7G1A.

G2VV: OA4BW, VK7RM, HK7YB, 1QQ, CE1AD, UM8KAB, VU2BK, HB1YL.

G5BZ: HP1IE, HK1QQ, UM8KAB, LU1ZN, ZK1AK, JA1CV, UAØKKS, CE5EF, LU, PY, VK.

G3OAG: KV4AA, VP9G/P, IP1TAI, PY4ZG, 5HJ, LX3ZK.

GI3NPP: BV1US, CR7FN, FG7XC, FO8AC, FP8BR, HS1R, IP1TAI, KG6IJ, KH6EDY, LU1ZN, TU2AF, HV1CN, ZD7SE, PX1AB, ZK2AB.

G2DC: EL4YL, FO8AQ, KH6DQ, 6CUP, 6BLX, KR6KS, KZ5MQ, TU2AF, 2AL, VR3L, VR6CB, ZK1AK, 1AR, 6O1LB, 7G1A, 5U7AC.

AM PHONE

G3NWT: HK4BQ, VS9MB, ZE2JA, KG4AO, OA4DT, VP3YG.

G3NAC: EA8CR, FG7XE, MP4TAO, VS9APH, VS9MB, 3A2BF, 9U5PD.

21 mc DX WORKED

CW

G5BZ: VS1FH, 5N2KHK, PY4BC, JA6AKW.

G3OAG: LA1NG/P, KZ5MQ, TI2LA, VS9AAC, VS9MB, LA8LF/M.

GW3IOI: CE1AD, CR7CH, 7IZ, CX2BT, EL4YL, LU, MP4, PY, UL7GL, VQ2EW, 2IE, 2MS, 2W, VQ5IG, VU2XG, W4ORB/MM, ZD6NJ, 6RM, ZP5LS, 5OG, 5N2LKZ, 7G1A.

G2DC: CR6AI, 7IZ, EP2BB, EL4A, HS1R, JA5NC, 6ZU, 6AK, VU2BK, 2XG, ZD6NJ, 6RM, 5R8CQ, 5U7AC, 6O1MT.

AM PHONE

G3NOF: VQ4ASC, 4IE, 4KPB, VS1DO, 1FH, 9ARC, XW8AL, ZD6RM, 5N2AMS, 9M2AD, 2CL, 2FN.

GW3IOI: VP3RW, VS1FE, 9APH, XE1JP, ZD6RM, 9U5PD.

G3OAG: VS9MB, 4X4, VQ4, 9U5AC, IP1TAI, VU2BK, PY, MP4BDC, 9M2CL, AP2MR.

G3NWT: ZD7SE, VP3RW, ZD6RM, HB1YS/FL, VS9ARC, 4S7YL, 5N2BRG, 5A4TC, LU6MP.

already said our little piece; nothing has been worked but the usual South and Central Africans and a VS9 or so . . . but by the time you read this, it might well be more interesting. Keep on looking, that's the main thing.

G2VV (Sunbury) reports that HK1QQ told him in a QSO that he would be on from San Andres Island, signing HKØKK, second week in August—so if you didn't find him, you're too late! Also that OH2A is the Hq. station of the SRAL, active on 14 mc with a fine signal, and that JAØWW/MM has been worked by many G's—he is on a tanker and will QSL on returning to JA.

A few new prefixes for G3WP (Chelmsford), including DJ7, UM8 and HA3, the UM8 completing his set of Russian prefixes; he still finds 14 mc poor in the early mornings (don't we all!) and hates the noise already alluded to by G2BY. G3WP, at present 14 mc only, is contemplating a new aerial and activity on all three HF bands.

G5BZ doesn't believe in mixing radio with holidays . . . in September he is bound for Spain and will be having a look at Andorra, but he says his mind will not be on PX call-signs and he won't even have a radio in the car! G5BZ remarks that KH6EDY (Kure Is.) still enjoys long ragchews with W's and VE's and couldn't care less about Europe; and the reason, he understands, is that his DX enthusiasm was spoilt when a lot of EU klots wrecked his chances of working HV1CN, since when he has lost all interest in DX.

G3NWT remarks that /MM stations on SSB give call-signs very frequently, plus their position, whether you ask for it or not—and he infers that a period "before the mast" is what some of the other non-identifying types need. He also says that MP4DAB is OK for Abu Dhabi; that ZD6RM is back on phone after a year on CW, with ZD6DT QRT; and that VQ4ASC is QRT from Nairobi and may not be returning. Finally, G3NWT was shaken "for one on whose licence the ink is barely dry" to find a relic of his SWL days, dated 1930!

SSB ON TWENTY

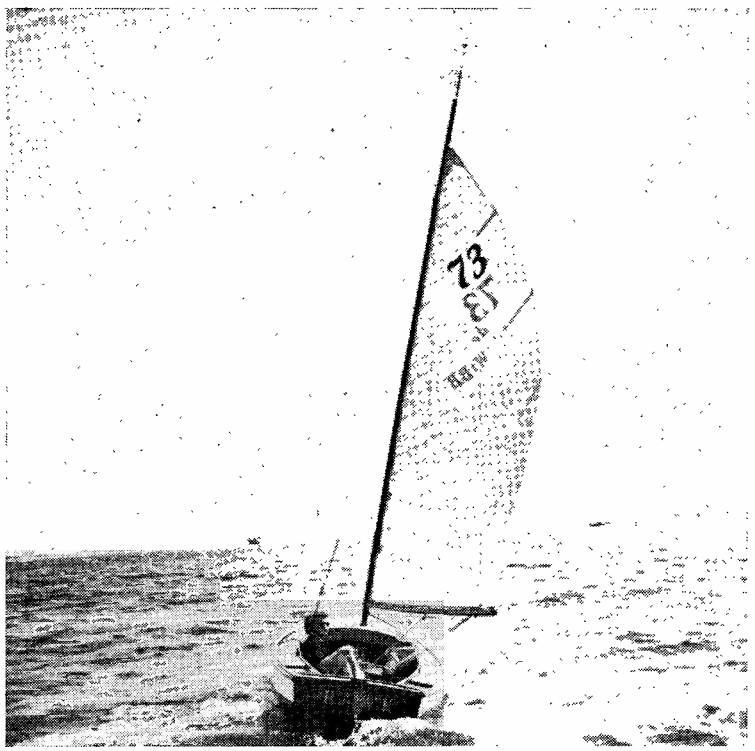
SSB operators are not forced to remain in the congested area between 14300 and 14350 kc. More and more DX stations are using the 14125-14150 region. Why not join them there? This might well become the accepted part of the band for all non-W DX contacts. Get in the habit of using it. If you come on, others will follow.

G3OAG asks whether anyone knows if LJ2K is genuine; we seem to remember that call from some time back, and think he is . . . GI3NPP has recently received cards from KG6IJ, EAØAB, KS6AK, KX6BU and 9K3TL/NZ—a nice lot. He also has his WAZ and his DXCC with 210 sticker, so spirits are high around Dungannon these days.

GW3IOI feels sure that inactivity is the cause of the scarcity of DX at many times on 21 mc. CX2BT and LU6MI can both provide signals that block his receiver, yet they are usually the only two audible from South America; he had been looking for Mexico for years on CW, but finally made it last month with XE1JP—on phone.

G2DC is another with a serious grouse about commercial QRM on 14 mc. As he says, "Starting off at the LF end one has the splatter from the RTTY station which, although outside the band, makes the first few kc's uninhabitable; then you come to HZJ on 14012 CW, then the other RTTY commercial on 14015, another on 14035 and another on 14060 kc. These are the regulars and are on most of the day. They are particularly annoying about 0700-0900, when one is spared the normal short-skip racket and when the Pacific stations are around." G2DC, also, finds it impossible to work KH6EDY, even though another KH6 gives him 589.

G3DO (Sutton Coldfield) found UW9CC, on SSB, a useful new prefix; and he says that 5U7AH is now on 14 mc SSB with low



Many years ago — in our issue for April 1939, to be exact — we published a picture of W1BB over the caption "Out in the sail-boat with junior." Here he is again, still at it, sailing in Massachusetts Bay, under the sail-number "73 de W1BB"! The boat is fitted for local radio communication; the halo antennae are visible at the mast head. W1BB, one of the world's best-known 160-metre DX operators, will be busy on Top Band again this coming season. *A W1BB Print*

power, also that ZB1A is permanently active in this mode.

Forty Metres

That stalwart Old Timer VK5KO is coming through regularly again (he must have given countless G's their first VK on Forty, and even on Eighty). G5BZ worked him at 2100 one night, and G3MXJ raised him three times, around 2200-2300, to say nothing of 5N2LKZ, 3V8AC, MP4BBE, 4X4YL, ZS1JA, TF5TP and SVØWI. He also heard CE, ZL and a few more.

G3NYA says he'll continue to support Forty, despite the congestion. He considers that the "pirate" broadcasters and their ghastly following of jammers have reduced the meagre AT allocation to about 10 per cent of what it should be, and neatly shredded up into 2 or 3 kc strips at that. Once they shut up the band is just crowded but workable, and he has heard 9U5MC (2230), ZL4FB (0550), VK2QL (0700) and VK5KO (2200). The time between midnight and 0600 is the most profitable (especially for G3NYA's 20-watter !), but on the one night when he decided to stay up and see it through, conditions were awful. (Sparkinson's Law, at it again !)

SWL Peter Day (Sheffield) is through the R.A.E. and awaiting the Morse test. Meanwhile, he still listens around on Forty and has logged VK5KO (nightly, 2130-2200 on 7005), JA2LC (2120), KV4CI (2240), FA8JR (0005) and PY 2, 3, 4, 5, 7 and 9 (2130 onwards); he finds the best period to be between 2130 and 2300, and mentions that VK5KO manages several G contacts every evening, usually being the only VK audible.

TOP BAND COUNTIES LADDER

Station	Confirmed	Worked
CW and Phone		
G2NJ	98	98
GM3OM	97	98
G6VC	96	97
G3APA	91	92
GM3COV	87	92
G2CZU	86	89
G3NFV	81	81
G2DF	81	81
GM2HIK	79	85
G3MXJ	78	81
G3NNO	76	88
G3NVO	76	85
G3LWQ	74	86
G3NPB	73	79
G3OHX	71	75
G3OGI	66	73
G3NXQ	61	63
G3NJQ	61	62
G3NNF	57	61
G3IDG	43	48
GW3CBY	42	54
G4JA	33	42
Phone Only		
GM3OM	88	87
GM3AVA	87	89
G3FS	80	83
GM2UU	80	81
G3ISG	80	81
G2CZU	69	69
G3NBT	66	69
G3NAA	63	64
G3NPB	60	65
G3NNF	49	51
G3NOW	42	45
G3NNO	39	62
G3NFV	33	45

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

Our Heading Photograph *(p.360)*

HK2YO is operated by Jaime Ibarra, at Cucuta, Colombia, S.A. (Box 1041, Cucuta), the gear consisting of Gonsett and Globe-Champion transmitters (these are American commercial types), an HQ-170 receiver, and various Mosley antennæ. He has had more than 2,000 QSO's, and works CW and SSB phone. The cards visible in the photograph include the QSL's of G3NUY (we think), GM3JDR and GM8FM. The operating hours, on SSB, at HK2YO are: 14125/14275 kc, 1000-1200, 1700-1900 and 2300-0500; and on 21410 kc SSB during 1100-1900, all GMT. A pretty busy chap, airwise ! His QSL manager is the indefatigable W2CTN.

WPX Changes

Those readers who prefer Prefixes to Countries as a yardstick of DX achievement will be interested in some new thinking on the subject of WPX by *CQ*, the originators of the scheme.

First, the qualifying date has been pushed back to November 1945; so we, who were hitherto out of step with the *official* WPX scheme, as far as the "P & Z Table" was concerned, are now in line with it !

Secondly, those awful bundles of 300 QSL cards will not need to be sent; but the WPX committee reserves the right to demand to view any or all cards for checking purposes. (This is the same procedure as we adopt for the very rarely - claimed *Magazine DX Award.)*

Thirdly, the WPX listings in *CQ* will no longer be confined to CW Only and Phone Only, but a *General* list will be published. Fuller details, including several smaller changes, will be available next month, and the new scheme starts on October 1. (One of the changes will be the elimination of obsolete or superseded prefixes, so there will be some clerical work to be done!)

Late Flashes

7G1A now says he will be active from Mali, 14 CW, first week in September . . . The oft-promised AC3 expedition looks like being definitely off, VU2KV having been refused an AC3 licence . . . VR4CW informed the West Gulf DX Club that "the legal and active VR4's are VR4CB (Phone) and VR4CV and 4CW (both CW)." 4BW is a pirate . . . VR4CW's backlog of QSL's goes back to 1957 . . . In answer to queries about North Korea, JA6YP says there is *no* amateur activity there.

Latest news of the ZL3DX expedition (his third) now reads as follows: He should have been on from FK8 during August, also possibly as YJ1ZZ (New Hebrides). On August 23 he was due to leave for the Solomons (VR4) whence he planned to operate for about fifteen days—so you might still have seven or eight days of grace in which to find him there (14040

and 21040 kc CW; 14306, '348, 21406, '440 kc SSB).

W4ORB is off on a two-month tour of South Africa, and hopes to be able to operate from some of the rare ones; he can also be found on 21 mc as W4ORB/MM, using the little station which he had at VP4WI for some time.

More from FP8

W2EQS, that well-known Top Band enthusiast, will once more be operating from St. Pierre with his call FP8AS, on all bands *including* One-Sixty. Frequencies for CW will be 28050, 21050, 14050, 7010, 3510 and 1801 kc—also SSB, frequencies for which will be notified during the CW operation. In his letter he says the dates as "last week of September and first two in August" . . . we assume (and we hope we are right) that this actually means "last week of September and first two in October," QSL to: FP8AS, Charles M. O'Brien, 48 Prospect Avenue, Westwood, N.J.

"CQ" World-Wide DX Contest

The time for this popular event draws near—and when we say "popular" we mean on a world-wide basis, since it has drawn very poor support from the U.K. over the last few years. We will be giving the rules in detail next month, and meanwhile, to warn you, here are the dates: Phone Section, 0200 October 28 to 0200 October 30; CW Section, 0200 November 26 to 0200 November 28. How about making an effort to put the U.K. on the map this year?

And that seems to be it for another month. Activity should be increasing from now on, as holiday-makers return and inveterate gardeners decide to fire up the rig once more. Conditions, too, will be improving. We look forward to a bumper crop of reports for next month.

Meanwhile, thanks as always to the many sources of information that have been drawn on, including the WGDXC's *Bulletins*, W4KVX's *DX*, the NCDXC's *DX-er*, the FEARL *News* and our own readers, to whom due acknowledgment has, in most cases, been made in the text. Keep it up—in fact, step it up—and be in time for next month's issue, for which the deadline is **first post on Friday, September 15.** You have a week longer than usual, but don't let this hold you up to the last minute, *please!* For November (or, how time flies!) the closing date for this piece will be *October 13.* Address everything to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. And until then, Good Hunting, 73 and — BCNU.

SUBSCRIBER PROCEDURE

We are frequently asked "How can I become a subscriber to the Magazine?" meaning what forms have to be filled up or the conditions imposed. The answer is easy: *None*; just send us a remittance for 33s., with name and address, saying with what month the subscription is to begin. And if the inquiry is on behalf of a reader overseas, the price is the same based on sterling equivalents, or $5.00 U.S., post free for a year of 12 issues.

ENGLISH ELECTRIC HIGH-VACUUM VARIABLE CONDENSERS

One of the first applications of an English Electric U200/10 vacuum capacitor is in the grid circuit of the penultimate RF stage in one of the BBC's HF transmitters at Daventry. The vacuum condenser, which has a capacitance of 5·5-206 $\mu\mu$F and overall dimensions of 9½ ins. by 3½ ins., replaced a conventional 5-37·5 $\mu\mu$F air-dielectric condenser which was 12 ins. long x 4 ins. square. The extra available capacity has meant that only one coil change is required to tune the transmitter from 21 mc to 6 mc. Beside the circuit advantages of a high maximum peak RF voltage (10 kV) and a high maximum RF current (20 amps. r.m.s.) the vacuum condenser has the practical advantage of not being affected by atmospheric dust. The accumulation of dust on the plates of an air-dielectric condenser can cause flash-over but, as the vacuum type is completely sealed, internal flashover from this cause cannot occur. The condenser plates are in the form of two sets of concentric cylinders, and their relative axial positions are controlled by the rotation of a shaft at one end. Accurately-machined screw threads reflect an axial movement for expanding or contracting metal bellows which transmit the motion directly to one set of cylinders; the inner surface of the bellows is at atmospheric pressure and the outer surface at a very high vacuum.

U200/10 vacuum capacitors have also been ordered for use in six 100 kW HF transmitters at the BBC's Overseas transmitting station at Skelton, Cumberland.

THE "NEW QTH" LIST

The pageful or so of new call-sign/addresses and changes of address that we publish each month is made up strictly of those who send us the details for publication. All information we receive for "New QTH's" is passed on to the Chicago publishers of the *Radio Amateur Call Book*, for which we are agents for Europe and the U.K. To be sure of getting into the earliest possible issue of the international *Call Book*, let us have the information without delay.

LISTENING FOR SATELLITES

The big Russian show-piece space shots always have one transmitter on 20·006 mc — that is, just a shade HF of WWV — so are easy to hear as soon as the news breaks. The best way of tuning them is to find WWV on 20·00 mc dead with the BFO in, and then go into the quiet area on the HF side. When the orbit is right for Northern Europe, signals are usually strong and unmistakable, with a pronounced Doppler shift effect.

SWL • • • • • •

THE RECEIVING STATION — READERS' OPINIONS — THE HPX SCORING — DX IN THE FUTURE

DO you run a "Short Wave Receiving Station"? Or are you just a Chap With A Receiver? And what's the difference? A friend of your Scribe's was recently spending some time looking through a pile of SWL reports, and (being one of those who know nothing of us and don't speak the language) he was overcome with this "receiving station" idea and seemed to visualise these cards as coming from places like Tatsfield or Rugby. He was soon disillusioned on that point!

To go back into the past for a minute or three . . . your Scribe was started on the downward path towards a lifetime's slavery to Amateur Radio by A Receiving Station, which belonged to an older relative. In those days the term was no misnomer. There it was—all of it—occupying one side of a biggish room. Ebonite panels, beautifully polished, mounted on insulators; brightly shining filaments of valves (many of you have probably never even seen a "bright emitter" in full emit!); stud-switches; coils with sliders on brass rods; tuning condensers, totally enclosed in wooden boxes, with extension rods inches long; transformers in little mahogany boxes; *three* pairs of headphones, and, for state occasions, a conical-horned loud-speaker. *Beautiful!* Who wouldn't give up stamp-collecting, gardening or even sleep for such a hobby?

Well, that really *was* a Receiving Station—but, truth to tell, the whole lot didn't do a fraction of what a rather battered BC-348 or fifth-hand S.640 would do today. The receiver consisted of two RF stages ("HF" stages then), a detector, and two audio stages (known in those days as "note magnifiers," of all things). All five valves were of identical type—triodes, of course. Each one of them took the best part of one amp. at 6 volts, and played a not inconsiderable part in lighting the room. The coils with studs on were the aerial coupling coil ("ATI" or aerial tuning inductance) with the reaction coil in the detector circuit; the bigger ones with sliders were the actual tuning coils; the range of the thing was from 300 metres upwards, probably finishing round about 30,000 metres, because the oscillation of the detector was plainly *audible* up at that end of the range, and the frequency must have been about 10 kc. Anyway, Bordeaux transmitted on something like 23,000 metres, and one *had* to hear that station—with the longest wavelength of them all—and a few more degrees on the massive brass-vaned tuning condensers took one to 30,000 metres.

Kilocycle-bred youngsters should note that although the difference between 23,000 and 30,000 metres sounds fine, it's actually about 7 kc—work it out for yourself.

But we digress: The point is that this wonderful, beautiful array of wireless apparatus was, by present-day standards, the most useless, inefficient heap of cumbersome junk that one could imagine. The amplification at the front end—though incredibly tricky to achieve, with every stage neutralised and separately tuned—was just about negligible. The "magnification," as we call it, at the other end succeeded in producing speech quality that would hardly be tolerated on the telephone today. But most of the listening was to Morse, anyway. (Note that we didn't say "CW"—most of it was spark!)

This Thing of Beauty was the downfall of quite a number of adoring schoolboys, your Scribe among them, all of whom attempted to emulate it. Some managed to make a crystal set occupy a space of roughly ten feet by four; others, more ambitious, started straight in with a single-valver, complete with filament-control rheostat itself as big as a modern transistor portable. And all these offspring from the master design (here is the interesting point) were *Wireless Receiving Stations.* With them we used to roam the world (well, parts of it) and had Stephen Potter been active at the time, his ideas of One-Upmanship would have been drastically modified. The sixteen-year-old who could tell the rest of his form on a Monday morning that he had heard "the Dutch Concert" on the previous afternoon grew at least six inches taller and was treated with suitable deference for weeks afterwards. ("The Dutch Concert" was a regular transmission from The Hague, PCGG, on Sunday afternoons, and in those pre-BBC days was sometimes the only music one could hear "by wireless" during the whole week.)

Thus the conception of a Receiving Station was started . . . and with little justification, for more often than not there was nothing within except just a receiver. Nowadays, with your three receivers, frequency-meter, grid-dip oscillator, oscilloscope, tape-recorder and all the miscellaneous gear that makes *your* station better than anyone else's, you *are* justified in applying the "Station" label to it all . . . but you may not have quite the fun we did in 1922 with that row of bright-emitting searchlights!

READERS' FORUM

The usual wide variety of subjects is covered in our readers' letters this month, and replies to queries must of necessity be brief, so that the topics of general interest may be given fair coverage.

A. Griffiths (Solihull) was successful at the May R.A.E., and is now tackling Morse. In putting in his new WPX score, he remarks on the difficulties of collecting such prefixes as GM4, 5, 6 and 8, GW4 and 6, and so on. That's what makes it interesting! He is also on the VHF trail, with a modified RF-27 and a vertical dipole, feeding into his AR88 at 6·5 mc.

D. F. Catherwood (Liverpool) asks whether a change of QTH means starting the ladders all over again. No, not with us, it doesn't! A new correspondent is *Paul Mitchell (London, N.8),* who has an 80-metre dipole, a 10-metre dipole and a 134-ft. wire about 350 yards south of Alexandra Palace (sounds

like a good QTH); he has been an SWL for three months, a BCL for six months, and is already studying for R.A.E.

On the HPX chase, *P. J. Weyell (Richmond)* logged an SPØ (who is known by us to be genuine) and an ON5 (who is probably OK). He comments that *Twenty* is now the happy hunting-ground, *Fifteen* having been poor for some time . . . but it will come back.

R. J. C. Coats (Cowie) has now modified his CR100 according to the gen. in the April 1960 issue of SHORT WAVE MAGAZINE, but found it unnecessary to replace the output transformer, as a 2·5 ohm speaker can be connected across tags 9 and 10. Regarding a recent query about how to log all these prefixes, he says that he uses the table in the *Radio Amateur Operator's Handbook* (price 3s. 10d. post free from our Publications Dept.), writing the prefix alongside the country as each new one is heard, with the appropriate totals in the "band" columns.

H. M. Davison (Ashstead) has been listening on *four* metres, using an RF-27 and his HRO with an indoor dipole; he has heard eight stations on that band. He, like many others, is in favour of an SWL Receiving Contest, and suggests that one should be organised when a transmitting contest is on. The duration, though, should be short. (We have been thinking on the lines of two or three periods of one hour each, at various times during one of the world-wide contests.) The trouble, as always, is verification . . . an awful lot of people *imagine* they have logged a call-sign correctly at one hearing! There is really no check on the imagination, unless a sufficient number of entries is received to enable all doubtful call-signs to be eliminated by common consent.

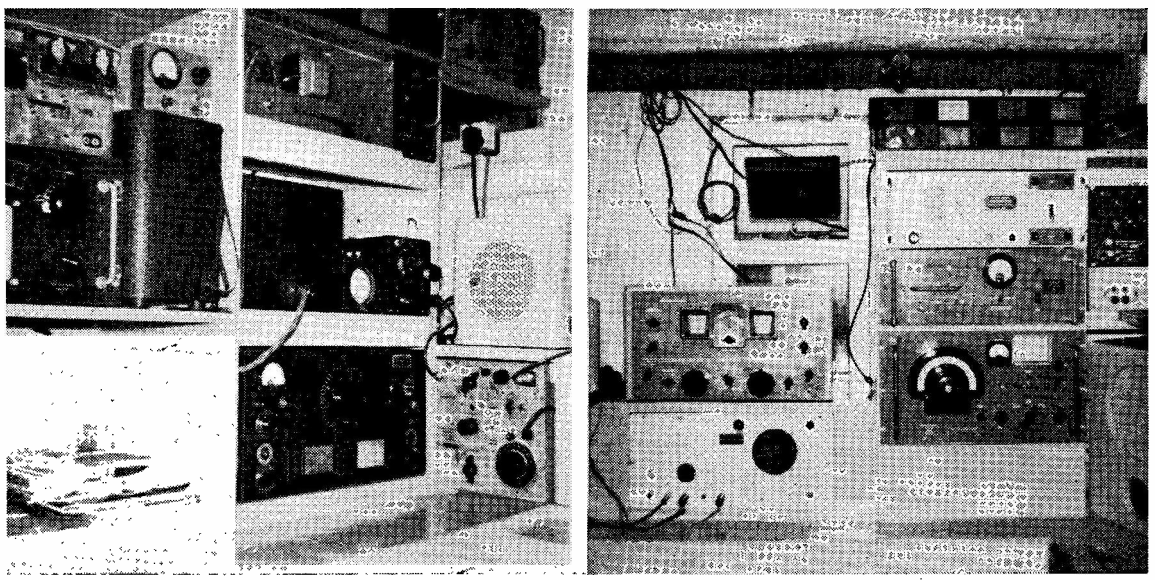
H. G. Shaw (Heswall) boosts his WPX score on Phone to 556, and says it's now becoming hard going; however, he recently booked in FM7AQ for his 200th country. *Michael Box (Weymouth)* has added an LM-10 frequency meter and a receiver Type 52 to his former equipment, and hopes to get an HF-bands converter completed before the DX season really opens; he will be taking the "52" on a trip round Wales during his holiday.

Michael O'Dare (Torquay) runs an HRO and two aerials—a 67-ft. end-fed and a 14 mc dipole. In one year he has logged 153 countries, mostly on 14 SSB and 21 mc AM phone, the HRO proving perfectly suitable for SSB reception. On *Forty* he has heard W1-6, KH6 (SSB) and HP3, and on *Eighty* he has logged W's, VE's, KP4 and PZ1, all between 2300 and 0100 on SSB; he is also keen on tape-recording, and learnt Morse with the aid of his recorder.

After this summary of the shorter letters, we now come to the more voluminous efforts, each one accenting one particular problem or subject.

An Old Timer Speaks

G8IX *(Stoke-on-Trent)* is a regular follower of this section, and says "If only we had had it 40 years ago—in those days we had no help whatever, and even had to make our own variable condensers, as you know. Which is why I am always willing to assist the SWL and anyone who shows any interest in Amateur Radio. I always QSL a SWL report, and I correspond with SWL's regularly." [over



The well-equipped receiving station of SWL G. A. Hill, 67 Uxbridge Road, Hampton, Middlesex. The main receiver is an HRO-MX (left-hand view), which works with an aerial tuning unit having taps for all amateur bands 10-160 metres; also available to go with the HRO are a Q5'er and an RF-24 Unit for 10/15 metres. The right-hand photograph shows the Hammarlund HQ-129X, used mainly for SSB reception, also an ex-Govt. VHF receiver, and an audio amplifier. The Rx outputs are taken to a distribution panel for feeding out to either or both of two speakers. The aerials in use at this interesting station include a 67 ft. wire, a 10-metre dipole, a two-element beam for VHF, and a centre-fed multi-band doublet antenna.

He goes into the subject of aerials for confined spaces, and says that he has been very successful with shortened dipoles, made by winding wire on a round piece of wood (about 2-in. diameter) and sprung out into a spiral, which is supported, when hung up, by string through the centre. The string is attached to the ends and also to the centre T-piece to which the feeders are soldered.

If you wind roughly a quarter-wave of wire into each of two coils, fit a T-piece at the middle, and then open the thing out to whatever the width or length of your room may be, you can hang it on hooks, and even move it around to opposite corners for directional purposes. G8IX uses open-wire feeders and an ATU with this arrangement; 72-ohm coax would not necessarily provide a good match, the dipole being somewhat unconventional!

Newcomer Speaks

Roy A. Nicholls (London, S.W.4) writes for the first time, to say that he has been interested in radio for three months, during which time he has built a successful TRF receiver, now being dismantled in favour of a superhet. Not being able to find a suitable beginner's circuit, he took an RF stage from one circuit, a frequency-changer from another, and so on, and hopes the final concoction will work. (So do we, and no doubt it will!)

He hopes that by the time this one has served its purpose, we will be publishing something suitable, in the way of circuitry, to bridge the gap between the TRF job and the elaborate double-superhet. Various queries on aerials follow, which we hope to deal with in a comprehensive article on the subject—possibly next time. He has an idea for a helical whip sticking out of the window (30 feet up) and asks whether the height of the aerial above the *receiver* matters much, to which the answer is — No, it doesn't, in the practical case, but coupling between Rx and aerial is an important factor.

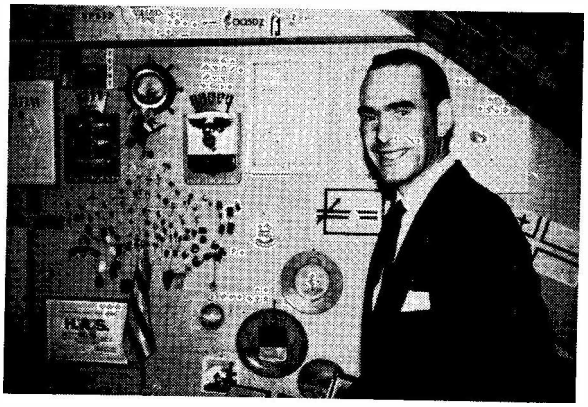
G. Docwra (Brighton) also writes for the first time and hurriedly stakes himself a place on the HPX Ladder. (His score was 99 when we raised the starting figure from 100 to 150—now he has 151 he nips in smartly in case it goes up again!) His story in brief: First interested in radio at 10, acquired an R.1155 at 13 (not really for short-wave work), but soon found it glued to 7 mc, not chasing DX, but listening to the amateur rag-chewing. Then acquired a German war-time set which band-spreads 3·5 mc very nicely; also found that the R.1155 worked on 14 mc. And so to an R.208 . . . followed by a gap (G.C.E.!) Next, listening to DX, and then the R.A.E., with a pass. Morse is the current study . . . and there you probably have, in a nutshell, the typical biography of a radio amateur (and we wish him many years of successful DX'ing and all the other pursuits that go along with it).

SWL — TVI

D. G. Evans (Denton) reports on recent activities, and says that until recently he has relied mostly on the 7 mc band for DX, but in summer the hours become rather late; 14 mc is much more interesting around 2200-2300, and he has transferred. A while back he made a super-regenerative SW receiver to test a transistor for cut-off, and with a foot of wire he could hear quite a few stations, so decided to try it on VHF; it worked so well that BBC TV was blotted out over a wide area—so *don't* try that one! He would like to see more transistor ideas for the SWL, and also wants to know whether the tunnel diode is in general supply yet (so far as we know, it is not). And finally he asks when one can expect to hear South Africa on 7 mc, to which the answer is in the winter evenings, after dark (meaning at almost any time between 1800 and midnight—if you're lucky). There probably isn't much activity there—but the VQ4's were easily workable in this country on 7 mc last winter, often as early as 1800, holding their own with the European QRM.

Facing the Future

C. N. Rafarel (Poole) has been assessing the various rather doleful predictions concerning the sunspot cycle, and after due reflection he says that the fact that our hobby is going to be more exacting



These two photographs show, on the right, SWL Eskil Eriksson, of Enskede, near Stockholm, and (at left) some of his collection of QSL cards — he is pointing to one from AC4NC. Eskil has a great number of SWL radio trophies, and as a keen listener to the amateur stations of the world, has now reached a score of 239 countries confirmed on phone, with 256 heard.

SWL • • • • • •

continued

in the future is a proof that it is worth while—and it may become *more* interesting, rather than less. Meanwhile, he has applied himself to his latest love—DX TV reception—with some quite remarkable results which we shall be describing in the next instalment of "SWL."

Bob Griffiths (Ventnor), still at the top of the HPX Ladder, has been on the sick list, with a bit more free time than usual. He tackles 14 mc SSB on an HRO with a general-coverage coil, and wishes he had the band-spread variety; finds the W's on 7 mc SSB completely swamped by broadcast and the like; and wonders whether 28 mc *will* come into use as a more or less local band—if so, what sort of ground-wave ranges can be expected—this depends on a lot of things, and can be anything from 10 to 50 miles. For real DX on phone he feels (as many do) that the best bet will be 14 mc SSB, without much in the way of alternatives.

Final note: living in a holiday resort like Ventnor, Bob Griffiths has quite a few callers; he asks that they should always drop a line first, just to save themselves lost visits. (Two called when he was ill and he couldn't see them.) This applies to all SWL visits during the holiday season—it is both courtesy and common-sense to drop a warning card first.

R. B. Headland (Liverpool) sends in the first instalment of gen. on his station. He has been an SWL for about four years, and his receiver story has been a BC-348Q (bought from G8RI, who started him off on Amateur Radio merely by being heard accidentally on a BC set); then a Minimitter converter working into the BC-348; now an Eddystone S.750. Main interest is searching for rare ones on 21 and 14 mc CW and sending, direct, the most full and helpful report than can be concocted. He has heard 40 Zones and 240 Countries, of which 169 are confirmed by QSL cards; some of his DX items published in the New Zealand magazine *Break-In* brought forth a letter from ZL2FS, who was staggered to see that SWL Headland lived in the house in which he (ZL2FS) was born, many years before! Ambitions: To own a tape-recorder, to put up some good aerials to replace the 14 mc folded dipole, and to reach G. P. Watts' QSL score of 300!

John Ingham (Halifax) runs an Eddystone S.358 and an R.109 for portable work. He wonders whether it is possible to add three RF stages to the 358, and whether the local oscillator would then cope? (But why *three,* for goodness' sake? Two should be plenty, and one good one would be a great advantage, but three would be a real handful.) He has built a GDO, which was no trouble, worked first go, and is most useful when experimenting with converters and the like. On the competitive side, he would like to see a Top Band counties ladder and an HABC Certificate; finally, he asks whether anyone has heard the "comic calls" EKØEK, FB3KBW, BJØCX, YD5ASA and OU6AJ—all 14 mc AM and SSB. At a guess, we should identify that lot as VKØEK, SP3KBW, DJØCX, YV5ASA and LU6AJ . . . which leads us to a statement we have intended to make for a long time—*that SWL's whose return of QSL's is poor might well be the victims of this sort of misinterpretation.* It's not always their fault—the transmitting men are often very lax—but it's not worth sending any kind of report unless you are *positive* about the call-sign. In a way, it's a test of whether you are hearing him really well, or just "squeezing" it to the limit.

Correspondence from short wave listeners is welcomed for this feature, the next appearance of which is in the November issue. Good photographs of SWL stations can be used and are paid for on publication; prints should be accompanied by adequate descriptive notes. The closing date is September 27 and all mail should be addressed: "SWL," c/o The Editor, Short Wave Magazine, 55 Victoria Street, London, S.W.1.

HPX LADDER

(Starting January 1, 1960)

Qualifying Score — 150

SWL	PREFIXES
PHONE ONLY	
Bob Griffiths (Ventnor)	619
H. G. Shaw (Heswall)	556
J. E. Kennedy (Widnes)	490
A. W. Nielson (Glasgow)	462
D. G. Evans (Denton)	440
C. N. Rafarel (Poole)	428
R. J. C. Coats (Cowie)	412
G. V. Moss (Greenhithe)	403
M. Phillips (Theydon Bois)	391
G. Brown (Bishop Auckland)	371
D. Edwards (Birkenhead)	359
P. J. Weyell (Richmond)	353
M. T. Bland (Oakham)	348
I. K. Gurney (Chalfont St. Peter)	335
D. Hanson (Whitehaven)	332
A. Griffiths (Solihull)	277
D. Quigley (Cowes)	271
W. J. Atherfold (Southwick)	259
D. Ward (Burton-on-Trent)	257
K. Scott (Birkenhead)	252
H. M. Davison (Ashtead)	252
H. Warburton (Aldershot)	247
D. Bell (Woodthorpe)	220
D. F. Catherwood (Huyton)	201
R. Ashby (Hinckley)	201
A. Halfacre (Norwich)	179
G. Brown (Durham)	153
G. Docwra (Brighton)	151
CW ONLY	
R. B. Headland (Liverpool)	414
C. Harrington (Hounslow)	392
M. Phillips (Theydon Bois)	344
H. Warburton (Aldershot)	314
P. J. Weyell (Richmond)	294
D. G. Evans (Denton)	285
H. M. Davison (Ashtead)	251
B. D. Simpson (Stockport)	240

(NOTE: *Listing includes only those who reported for this issue or the July issue. Failure to report for two consecutive issues will mean removal from the list. Next list — November* 1961, *continuing as above, from January* 1960).

DX Predictions

In spite of all that's being said about the current sunspot cycle, its approaching trough and the probability of a lowish peak for the next one, we still have plenty of DX to look forward to. The relatively poor conditions of the past month or so have been partly due to the normal summer falling-off; so the autumn and winter are bound to show a worthwhile improvement.

In particular, the 21 mc band should become much better, with frequent openings across the North Atlantic path, and with more consistent DX from the Far East and even, perhaps, the Pacific. And 28 mc will undoubtedly open up on occasions, even if only

on the North-South path. But even *that* is interesting, with all the new African countries yet to be logged on that band — and, after all, ZS and CE are considerable DX in terms of distance, if not difficulty.

It is pretty safe to say, at this stage, that 14 mc will undoubtedly be the main DX band, although "opening hours" will be more like those we have been used to for 21 mc over the last few years. 7 mc will, as always, yield plenty of DX from mid-evenings onwards (VQ4's were coming in excellently last year for the whole evening—PY's and W's from 2100 onwards).

The two LF bands will also be worth watching, since the W's will be active on Sunday mornings on Top Band (0500-0800, in the sector between 1800 and 1820 kc), and the SSB DX should be fairly buzzing during late evenings and early mornings on 3·8 mc and upwards. (For working the W's, our own SSB operators gather around 3790-3800 kc, with the W's themselves on the other side of the fence—3800 kc upwards.) Judging by last year's efforts, VE1's, W1's and W2's will be there from 2300 onwards; more DX districts will be easier to receive in the early mornings, from 0600 to 0800.

All this adds up to quite a lot of variety in your listening, and you can, of course, add the 21 and 28 mc bands, which won't by any means be dead, although there will be such an accent on 14 mc for the really varied DX. And, as always, those who still retain interest without much caring how many thousands of miles they are covering will have masses of stations to listen to on all bands. (Top Band, with its limited range, is no less interesting than 14 mc when it's open for the whole world, as far as the really versatile listener is concerned.)

So go ahead—get your aerials checked over before the bad weather comes; polish up the pins on your ATU coils; squeeze the last drop of gain out of that receiver and prepare for an interesting DX season to come.

G. L. Douce, 45 Bradstock Road, Kings Norton, Birmingham 30, describes himself as an old-timer SWL — at any rate, he started in 1921, in the crystal receiver days, when our coils were wound on cardboard formers 12 ins. long and 4 ins. in diameter, tuned by sliding contacts, using a zincite crystal with its copper cats whisker for detector. After graduating to the early valve receivers and starting to collect QSL cards, SWL Douce built himself, in about 1930, a 30-line mechanical scanning TV receiver, which worked. He now has a converted R.1155N with 21-28 mc converter, an Eddystone S.840A, and a tape recorder. To round off his experience, G.L.D. has started working for his transmitting licence and hopes to be on the air in due course — all we can say is that after all these years he jolly well ought to be, and good luck to him!

GETTING INTO THE MARKET

For the best price, the fairest bargains and the quickest response, use our Readers' Small Advertisement Section for trading in used apparatus. The minimum charge is 5s. (20 words, address to count) and 3d. a word thereafter. Box number addresses are charged an additional 1s. 6d., and advertisements in heavy type (bold face) cost another 25% on the basic charge. Draft your advertisement clearly, using full punctuation and accepted radio abbreviations, and send it, with remittance, to: Advertisement Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SATELLITE TRANSMITTING FREQUENCIES

The frequencies used by the various American and Russian space vehicles—of which there are a good many now in orbit—are 20, 40, 54, 108 and 324 mc, also the band 136-137 mc (which is an international allocation for this specific purpose). The Winkfield out-station, in Berkshire, of the Radio Research Station, Slough, now has a very elaborate aerial installation for working over these frequencies, including interferometer layouts for 20, 40 and 108 mc. The American *Transit* satellites, transmitting on 54 and 324 mc, have enabled differential frequency shift observations to be made, yielding valuable data on ionospheric irregularities.

KEEP UP THE FLOW

With further reference to that paragraph item, "Cleaning Up Forty," on p.72 of the April issue of SHORT WAVE MAGAZINE, we have reason to know that the course of action suggested is beginning to have effect. It will be more so if the flow of individual complaints is maintained. The point is that a polite official letter, through the usual channels, can be as politely acknowledged—and then put in the pending tray. But if a large number of individual letters is received on the same subject, the thing begins to become a great deal more worrying — which is the effect we want! There is no need for any radio amateur, anywhere in the world, to stand any nonsense from Egyptians, Chinese or Pakistanis on this particular matter.

VHF BANDS

A. J. DEVON

Some Good DX Openings—

Activity High, but Conditions Variable—

Manchester VHF Convention—

Station Reports and The Tables—

AT the moment of writing, there has been no further news of the EA4URE effort, but we hope to have an account of their experiences in time for our next—certainly, the shape of the barograph trace for the period August 13-20 (*not* shown on the curve overleaf) held out no great hope of an opening; in fact, the weather for VHF/DX conditions was just about as bad as it could be during that particular week. We know that a number of U.K. stations kept the schedule, and there is no doubt that had there been any chance of a contact, it would have been made. The general reaction, however, is "not a sossidge"—well, that's how the luck goes in planning for DX on VHF! It is sheer joss, because it is bound up with the Wx, and even the well-placed south-westerly stations, looking over mainly a sea path, would have needed to be in a patch of good tropospheric conditions covering from about the Bristol Channel to the northern part of the Iberian Peninsula; and when we do get these conditions (as has often happened in the past) the EA's are not there.

However, there have been some very good GDX chances during the period, starting with an Auroral opening on July 18, the duration of which was about 1800-1930, with the second phase lasting for 15-20 mins. around 2300, times BST; contacts made then included G/GI and G/GM, and are mentioned in the station reports. As regards tropo. condx, July 24 was a very good evening, and on July 30, the two-metre band was open across England all day—these results fit the barograph trace quite convincingly. Conditions were also good on the evenings of July 20, 22-23, 26 and 29 and, north of the Border, on August 2, 10, 13-14; GM is, of course, too far north for our barograph trace as shown here to be of much significance; it can really only fit across England south of the Pennines. For the record, July 24 and 30 are given as the outstanding evenings both in G and in GM. So if you were on your holidays then, you missed quite a lot in the way of interesting GDX and, of course, some of the nearer EU's.

Stalking in The Highlands

Years ago, when your A.J.D. was quite a lad, this would have meant deer-stalking. Nowadays, for us-lot at least, it means finding effective VHF sites in rare GM counties, and calls for just as much skill, patience and hard work in the preparatory stages. All sorts of things can go wrong, and usually do, but nevertheless, some outstanding results are achieved. One of the recent successful expeditions was that undertaken by G3OSS, signing GM3OSS/M/P, as applicable, while he worked through the counties of Lanark, Dumfries and Stirling during July 24-27. This was actually the northerly loop of a motoring holiday that took him through the Welsh Border counties and GW on the way up and Rutland and Huntingdon on the journey home. GM3OSS/P was in Lanarkshire on July 24, when the band was well open, and so had the satisfying experience of working 43 stations, 35 of them being G's, with G5MA and G6AG as best DX—and, for a change, both Bob and Mac were no doubt pleased to work GM3OSS/P on CW.

On this long trip, G3OSS used both phone and key, under mobile-static and mobile-rolling conditions; one of his CW contacts was with the car doing a steady 60 m.p.h. You may ask how this is possible, and isn't it dangerous—the answer is that G3OSS is one of our sightless *confrères*, and it is his xyl who does the driving and the route-finding, puts up and takes down the aerial, sits on watch at lonely sites, sometimes in warm sunshine but more often in pouring rain, and so makes a large contribution to the success of these /M, /P adventures. To Fiona must go a fair share of the credit, as Angus would be the first to agree. We are glad to have them both in the VHF fraternity.

Manchester VHF Convention

As announced here in our last, the North-West VHF Group (chairman G3EGK, and not as previously stated) are arranging a big meeting, for those interested in VHF, on October 14, at the Grosvenor Hotel, Deansgate. One of the attractions will be a trip to Jodrell Bank, in two parties of 30 persons each, for which bus transport is being provided at a small *per capita* charge; the tour of the station will last about an hour, and those fortunate enough to get in on this will not only see round one of the most important and interesting radio stations in the world, but will also be given an outline of the Jodrell Bank programme for space exploration. Those who are not able to join the Jodrell Bank parties will be shown a film of the station, with an expert's lecture by G3BAK on VHF aerial systems.

Bookings for the meeting, at 17s. 6d., to include exhibition and dinner, should be made through: T. H. Davidson, G3AGS, 101 Grange Drive, Blackley, Manchester, 9, as soon as possible; he can also arrange hotel accommodation if sufficient notice is given.

For the occasion, the chair will be taken by W/Cdr. A. J. E. Forsyth, O.B.E. (G6FO), Managing Editor of *Short Wave Magazine*. (Whether or not this can be classified as an "attraction," your A.J.D. would not know, but he has fallen in with the wishes of the organisers by mentioning it.) The hon. secretary of the North-West VHF Group is: J. G. Barnes,

TWO METRES

ALL-TIME COUNTIES WORKED LIST

Starting Figure, 14

From Home QTH Only

Worked	Station
79	G5YV (787)
77	G6NB
76	G3CCH
74	EI2W
72	G3KEQ, G6XM
71	G5MA
70	G3HBW
68	G2CIW (315), G3BW, G3GHO
67	G3BLP (908), G3EHY
66	G2OI (585), G3IUD (302), *G5BD*
65	G6XA (333), GM3EGW (276)
63	G2FJR (542), G3FAN (1,000)
61	G3HAZ
60	G3IOO, G3DMU
59	G3KPT*, G4SA
58	G8OU
57	G3JWQ (536), G8SB
56	G3WW (770), G5DS (654), G8VZ
55	G2HDZ (495), G2HIF, G5BM, GW5MQ
53	G2AJ (519), G3LHA (387), G4CI
52	G2NH, G3FZL, G6RH, G6XX, GW2ADZ
51	G5ML
50	G3ABA, G3GSE (518), G3NAQ
48	G3FIH, G6TA (487)
47	G3DKF, G5WP
46	G3MTI (242), G4HT (476), G5BY, *G6YU*
45	G2AHP (647), G2DVD (362), G2XC, G3BJQ, G3GFD, G3MPS, G5JU, G6GN
44	G3BK, G3DVK (282), G3NBQ (218), G8DA
43	G2DDD, G2FCL (322), G3BA, G3BNC, G3COJ, G3DLU*, G3HWJ, G3KHA (262), G3KQF, *G3KUH*, G3NNG, G3WS, G4RO, G5DF, GW3MFY
42	G2HOP, G3CO (422), G3DO, G3GSO, G3IER, G6CI (220), GW3ATM
41	G2CZS (282), G2FQP
40	G3AYC, G3CGQ, G5MR (366), G8KL
39	G2IQ, G3GBO (434), G3LTF, G3LTN, G3JAM (437), G3OSS, G3VM, G8IL (325), GC2FZC
38	G3APY, G3CKQ, G3HTY, G5UM (768), G8VN (190)
37	G3FNW, G2FZU (180), G3DLU, G3LAR (435), G3MAX, GC3EBK (260)
36	G2DCI (155), G3CXD, G3DLU*, G3IIT, G6CB (312), G8DR (354), G8IP
35	G3FYY (235), G3HCU (224), G3OJY, G4LX
34	G3AEP, G8IC, GM3DIQ
33	G2BHN (128), G3FIJ (337), G3FUR, G3HHY (125), G3HWR (368), G3IOE, G3OHD
32	G3HIL, G8QY, G8VR
31	G3HXQ, G3ICO (118), G3KPT (180), G5RP
30	G2AHY, G3FRY, G3GOP (208), G3GVF (129), G3IRA, G3KEF (110), G3OBD, G5NF, GW8UH
29	G2CVV, G3AGS, G3AKU, G3OBB
28	G3ITF, G4JJ/A, G8DL, GM3BDA
27	G3CVO (231), G3DAH, G3ISA (160), G3JGY, G3LTF/A, G6GR, G8NM, GI3GQB, GM3LDU, GW3GWA
26	G2BRR, G3CFR (125), G3MED, G3NNK, G3SM (211), G3YH, G4MR (189)
25	G3JHM, G3JMA, G3JXN (220), G5SK, G6PJ
24	G3FD, G3FEX (226), G3FXG, G3FXR
23	G2AXI, G2DHV, G3CWW (260), G3HSD (168), G5PY, G8VN (125)*
22	G2DRA, G3AGR (135), G3ASG (150), G3BPM, G5AM
21	G2AOL (110), G3BDQ, G3DVQ, G3IWJ, G6XY
20	G3EYV
19	G2HDR, G3GCX, G5LQ (176)
18	G3DBP, GC2CNC
17	G3EGG, G3MHD (195)
16	G3FRE, G3MLS
15	G3IWA
14	G3CYY

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

* New QTH

G3AOS, 5 Prospect Drive, Hale Barns, Cheshire, who will be glad to deal with enquiries.

September Contest

There is just time to remind you that the Region I VHF Contest takes place over the week-end (Sept. 2/3) you may be seeing this —essential details were given on p.318, August, with an additional note from Fred Lambeth, G2AIW, that *all* licensed radio amateurs are eligible to take part, and that multiple-operator stations must be entered under one callsign only.

As already explained, we are making a U.K. Contest of this event. All you have to do is to send in a claimed score according to the rules, scoring being at the rate of one point per kilometre of distance to each different station worked. For the conversion from miles to kilometres, we will accept kilometre-distances based upon 60 miles to 100 km., so that mileage distances should be multiplied by 5/3 to get the kilometres. (This is not exact, but near enough for the purpose.)

All entries (for our Contest) should be in by September 20, *latest*, so that we can cover the event in the October issue.

The Tabular Matter

More than 40 movements have been taken into the Tables shown this time, with another dozen or so claims held for the final appearance of Annual Counties in the next "VHF Bands"—as that table does not close till after this goes to press, there is no point in showing it this month. Further claims will, of course, be accepted for all counties worked up to August 31.

Station Reports

GM3LDU (Clarkston, Renfrews.) is one of the active Scots, reporting that in 25 days' operating to the middle of August, he heard or worked stations over 100 miles distant on 20 days; GDX for him is a QSO over 200 miles, and for this he gives July 24 as the best evening, with many stations heard, including G5MA and GI3FJA, and G3MED worked. A lot more could have been identified if either they had *(a)* Signed on CW, *(b)*

Used more modulation, or *(c)* Signed intelligibly.

On this problem of identification, we have an odd letter from somebody calling himself "Just an SWL" and signed "Thomas Howard (Mr.)," drawing attention to gabbled callsigns, neglect of CW and the tendency of some two-metre operators to hold an over for many minutes, and then sign in a rush, with the call lost in the noise. We can only assure this SWL that these have been well-known phenomena on VHF for years, and that they have been inveighed against for as long.

G3LQR/T (Colchester) has been on 70 centimetres since January, the score being 35 stations worked in three countries and 14 counties, on phone and CW, with a QQVO6-40 PA on 434·5 mc, a 64-ele stack, and an A.2521 RF pre-amp. for the converter. On the ATV side, he gets pictures from G3NOX/T at 37 miles. G3LQR reports that the ON4/5's use 433-434·2 mc, and the F's 434·9-435·5 mc.

G3NAQ (W. Bromwich) claims for the Tables, and got a nice EDX contact with F8MX/A on August 2/3. G3OBD (Poole) also puts in claims, and describes a /P foray on August 15 in the hope of hearing EA4URE. G5ZT (Plymouth) keeps the regular skeds going with G3JGJ, G3LTN and GC2FZC, and reports working F2LQ; he is still very active /M.

GM3IKO (Falkirk) reports some interesting 70 cm. tests with GM3JYY (Slamannan); after more than a year of experimenting, they have established 100% contact, any time, over hilly country, using 10-watt rigs at both ends, with RS-59 reports both ways. GM3IKO's receiver is a TV set front-end modified for working on either 144 or 430 mc—an interesting idea, this; modified R.1132A's are also available. They are on every evening 10.0-11.0 p.m., and also on Sunday mornings 11.00-13.00; contacts and reports wanted from anyone at any distance.

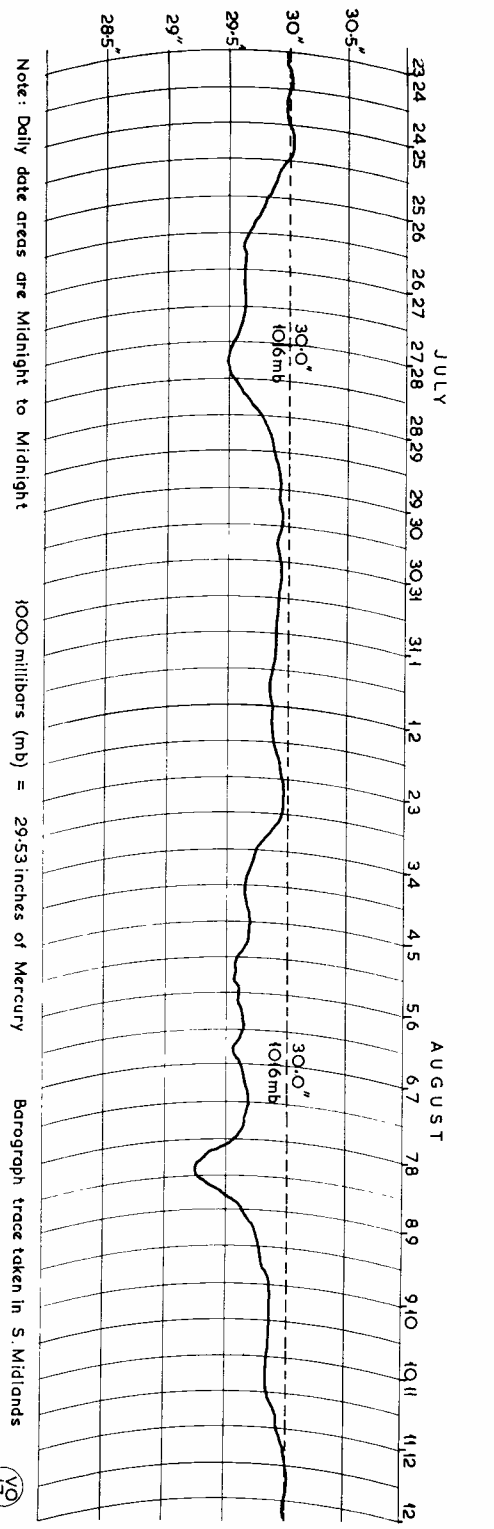
G2CIW (Birmingham) found the Aurora opening on July 18, with G3JYP and GM4HR worked, and GM3GUI heard; on the 30th, when tropo. conditions were good, G5ZT was S9, and stations worked included four GW's ('3ATM, '3MFY, '8NP and '8UH) also GI5AJ; the 70 cm. band produced contacts with G3FP, G3JMA, G3KEQ and G3NOX/T. G3MTI (Malvern) mentions GW3OSS/P for Flints., on the north-bound leg of the latter's odyssey, and is thinking about attempting a /M VHFCC. G3OHD (Petts Wood) found G3MLE/A in Suffolk on August 9, and was also glad to get G3ILD for Co. Durham, earlier in the period; he mentions August 10 as "providing a good minor opening into PA." G3GSO (Derby) writes to bring himself up-to-date in the Tables, remarking that GM3OPW/P gave him a new country as well as another county. G3NAE (Bournemouth), now running a 12-ele stack outside in place of the indoor Quad, reports much improved results thereby; he also is now organised for 70 cm.

Back Again

After five years off the two-metre band, G5AM (nr. Ipswich) is on again with the gear "spring cleaned" and a new 4-ele w.s. flat-top at 20ft. Well, as so many people want Suffolk . . . anyway, we are very glad to hear him back.

G3JMA (Harlow) runs some interesting skeds: With G3JGJ, Moretonhampstead, S. Devon, nightly at 8.0 p.m., on 144·98/144·10 mc, which produces almost 100% contact, varying from 549 to 589; with G3ILD (Darlington, Co. Durham) on Fridays at 8.30 p.m., always S5-8 on phone; and with G5QA (Exeter) at 9.45 p.m. on Mondays, Wednesdays and Fridays on 70 cm., which yielded a two-way QSO on August 9; G3KMP (Hastings) has also been worked (Aug. 8) on the 430 mc band, for a first contact. G3JMA has got to 21C in the Seventycem Table, his gear for that band consisting of a 5894 PA running 55w., a 40-ele stack at 50ft., and a G3BKQ-type converter (SHORT WAVE MAGAZINE, July 1954) with an A.2521 RF stage in a trough, into an HRO tuning 22-28 mc on the IF side. By his results, this is evidently a pretty effective set-up.

For G6XA (Leamington Spa), the period has been rewarding; by being on regularly, he worked



SEVENTY CENTIMETRES

ALL-TIME COUNTIES WORKED

Starting Figure, 4

Worked	Station
36	G2XV
28	G3HBW, G6NF
27	G3JWQ, G3KEQ. G5YV
26	GW2ADZ
25	G3HAZ
24	G2CIW
23	G3BKQ, G6NB
21	G3IOO, G3JMA, G3KPT
20	G3HAZ
17	G3MPS
16	G2DDD, G3LHA, G3MED
15	G2OI, G3NNG, G4RO
14	G2HDZ, G3FAN, G3LQR, G5UM
12	*G5BD*
11	G3AYC, G3LTF, G6XA
10	G3IRW
9	G5DS
7	G2HDY, G3JHM
6	G3KHA, G3WW, G5QA
5	G3FUL, G3IRA, G3IUD, G3JHM, G5ML, GW3ATM
4	G3JGY

On working four Counties or more on the 70-Centimetre band, a list showing stations and counties should be sent in for this Table, and thereafter new counties worked notified as they accrue

a lot of good two-metre GDX, including GI3GXP *via* Aurora; GI3FJA by tropo. on July 20; G3OSS from various locations in GW and GM; several South Wales stations on July 30; G2DTO/P (also on tour in GW and Northumberland) and, on July 22, G3FP and G3KEQ on 70 cm. In the "heard" list are GM3EGW, GM3FGJ, GM3GUI and GM4HR, while G6XA also mentions G3ILD, on SSB phone and a very consistent signal from his new QTH in Co. Durham.

G3KEQ (Sanderstead, Sy.) says "thanks to all the /P boys" for the new counties they have given him for the All-Time. G5UM (Knebworth, Herts.) moves in the Tables and now has 768 different stations worked on two metres. G2DHV/M did a holiday tour through Devon and Cornwall and worked 15S, with 14 more heard (including F8MX, G4IB/M, G3JMA, GW5BI and GW8UH). G3BPE (Bexley) can get on more in the mornings, 9.0-11.30 a.m., than in the evenings and so has few contacts, though unmodulated carriers, coming and going, are often heard; he would appreciate QSO's and morning skeds.

G3OQH (Marlow) says, "I thought it about time a feeble bleep was heard from my hole in the hills" — yes, your A.J.D. knows it well! G3OQH has been on 144 mc exclusively since November, and now runs 40w. to a C1134, modulated by a pair of 6L6's in AB1, the rig being completely TVI-proof; the beam is a 5-ele w.s. Quad-Yagi at 38ft., and the Rx an E88CC cascode RF pre-amp. into an E88CC cascode converter, with a BC-348 tuning the IF. From a most unpromising QTH, 15C and one EU have been worked.

G3GWL (Coleshill) has been on two metres for some years—also from an indifferent QTH at which GB3VHF is barely audible—and runs 45w. into an 829B, with a 5-ele flat-top at 22ft., and a CC converter with an A.1714 RF stage, the main receiver being described as a "17-valve superhet covering 24-30 mc only"; *all* his gear is home-constructed. Incidentally, G3BPE *(QTHR)* and G3GWL *(QTHR)* should get together, as G3GWL is another who is on mainly in the day-time because of shift duties. We shall expect to hear of a QSO between these two before long!

Happily, Herbert of G5QA (Exeter) is back with us again, and pumping full bore on both bands, after having been laid aside for some weeks due to an operation; he is now at 6C in the 70 cm table. G3HS (Faringdon), who does well with 8w. to a QQVO3-10 and a 6/6 at 35ft., remarks that because of "intruders from the Home Counties pitching /P camp on our best sites," it is becoming increasingly difficult for the Harwell boys to go in for contests themselves!

A very interesting report from Louis of G3EHY (Banwell, Som.), now well up in the All-Time, mentions the appearance of EI2A, a new station for Co. Meath, and on regularly; at any rate, G3EHY worked him on 14 evenings out of 15 up to mid-August. EI2A is very well located, runs 35w. to a QQVO6-40 on 145·92 mc (have *you* tuned up as far as that recently!), with excellent modulation, and a good converter; he is constantly improving his gear and Louis says that he comes in quite well under any conditions and has been worked several times when nothing else was to be heard on the band. Good signals from the north at G3EHY have been G3ILX (Barrow), and G3ILD.

Four Metres

Activity on this band is definitely on the increase. G3LZN (Warwick) mentions, heard or worked, G3BNL, G3EHY, G3HRP, G3NUE, G5JU and G5PW. G3NUE (Worcester), now across the Atlantic as an op. on the R.M.S. *Newfoundland*, GNMC, is on 4 metres when at home between trips, running 15w. to an RK-34 PA, modulated by a 6N7, the aerial being a Cubical Quad on a 15ft. pipe-support, and handraulically operated; the Rx is a modified RF-27 unit into a CR-100 at 7·5 mc. About six stations on 4 metres in the Midlands area are workable from Worcester.

Back to Two: G3OJY reports an impending move from Churt, Surrey, to Newlyn, Cornwall—*he'll* have to start all over again in the Tables! G3LTN (Andover) now has a 24-ele array for *two metres*, consisting of a pair of slot-fed 6/6's, phased. He runs a regular 100% day-or-night sked with G5ZT, at 100 miles, and is now fully equipped for 70 cm. as well, on 432·45 mc.

Dead-Line—

For our next, there is a little more time (so your A.J.D. is having a week's sailing, across to places like Cherbourg, perhaps for a close-up QSO with F9JY). For October, the closing date is **Wednesday, September 20,** addressed: A. J. Devon, "VHF Bands," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. With you again on October 6 (wind and weather permitting!).

• • • The Mobile Scene • • •

TOWARDS THE CLOSE OF THE SEASON — DERBY EVENT REPORTED

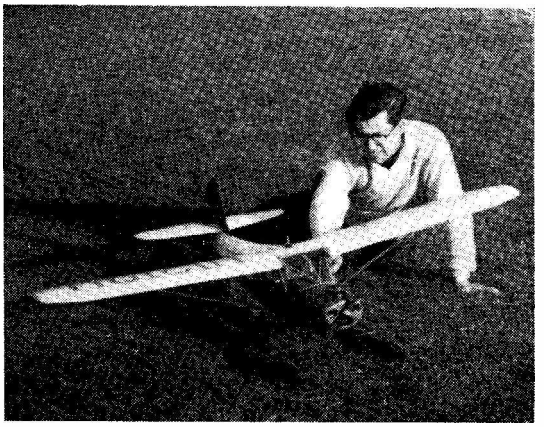
THE mobile season is now drawing to its conclusion so far as big Rally events are concerned, there being only one more scheduled—at Lincoln on September 17. Four others will have been held during August, on most of which we hope to be able to report in our next.

At Derby, the two-day Rally held on August 12-13 took place in reasonably good week-end weather and, though not an unqualified success in every respect—the organisers report themselves as a little disappointed with the attendance at the barbecue and dance on the Saturday evening—it seemed to us to be well supported. There was a large public (non-radio) attendance estimated at 2,500 and, of the 231 cars in the park, 63 were actually fitted mobile. GB3ERD worked 42 /M's on 1930 kc, and ten on two metres; the proportion of mobiles on Top Band was 75%, and on two metres 25%. The number of licensed amateurs signed in on the Sunday was 173, though it was probable that a great many present did not get round to registering. The Saturday figures were 127 signed in, 47 licensed, 24 mobiles.

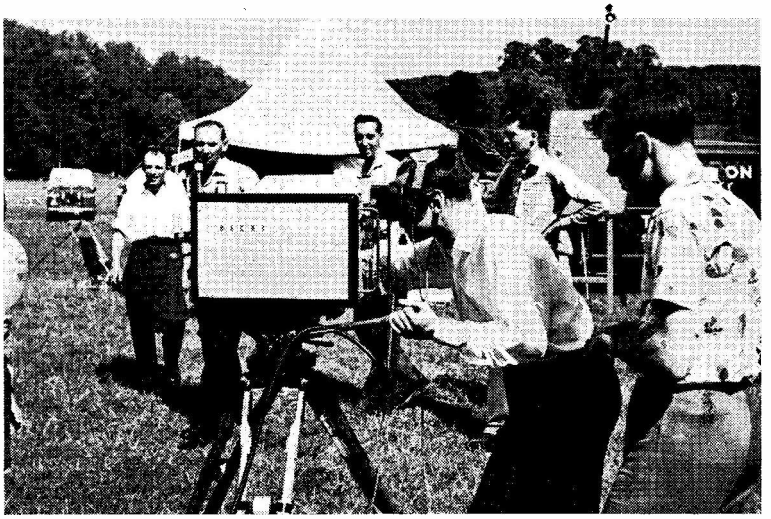
The two big draws were the "Fifty Years of Wireless" exhibition at the Derby Art Gallery, and the radio-controlled model aircraft aviation display, very efficiently laid on by the Derby Model Aero Club. The treasure hunt was not a success, attracting only eight entries, and the organisers also had bad luck with their proposed souvenir booklet—it was not ready in time, so they lost many potential sales at 2s. 6d. each.

Raffle prizes were most lavish, the first three being a refrigerator (won by G3IMP, Leicester), a vacuum cleaner (GM3KJF, Ayr), and a tape recorder (SWL Stratton, Derby), with about 40 lesser prizes as well. G6SN (Birmingham) collected a transistorised signal generator for the best VHF/M installation, and G2ADR (York) got an RC bridge for his 160m. mobile rig. There were also good prizes for the various events organised for the xyl's and juniors (who, in addition, had their own film show).

Only complaint received by the organisers — the Derby & District Amateur Radio Society, with



At the Derby Mobile Rally — the powered, radio controlled model aircraft flown by the Derby Model Aero Club. This fine example of the art of model engineering has a wing-span of 5 feet, and great interest was shown in the demonstration flights.



The amateur-built television camera in use by G3NOT for closed-circuit TV work at the West of England Mobile Rally. The use of local television, with equipment built and operated by amateurs, has been quite a feature of Amateur Radio gatherings this season; it always arouses a good deal of interest.

G3FGY in charge of the Rally arrangements—was in regard to the inadequacy of the P.A. system, understood to be due to a "technical hitch." They say that as they aim to try to improve their planning each year, criticisms and suggestions are genuinely welcomed. For our part, we congratulate those responsible on having, once again, put on a very good show—which, in fact, drew a larger total attendance than last year's event.

* * * *

The **Lincoln** Hamfest and Mobile Rally on **September 17** will start from 1.30 p.m. at the North Kesteven Grammar School, North Hykeham, which is four miles south-west of Lincoln, on the A.46 Lincoln-Newark. The talk-in stations will open at 11.0 a.m., with G3MUL/A on Top Band and G4BU/A on 80 metres. Buffet refreshments will be continuously available. There will be a raffle and prize events, and G2UK will show a colour film of his travels. Further information from: Mrs. F. E. Woolley, G3LWY, Rochmount, 10 Sturton Road, Saxilby, Lincoln.

At the Derby Mobile Rally on August 13 — left to right: G3ODW, G3OCX, G6MN ("Old Man QSL"), and G2DTQ. G6MN was, in fact, the original printer of QSL cards for U.K. amateurs, having started this service in the 1920's. *A G5CP Print*

A good idea at Harewood, for the Northern Mobile Rally, for which there was a record turn-out in fine weather.

SOME VULNERABLE FREQUENCIES

As is, or should be, well known to everybody by now, we inhabit Top Band and Eighty on a shared basis. From the latest issue of the I.T.U., Geneva, official *List of Coast Stations*, following are the main frequencies being used by neighbourhood-stations in these bands:

In the U.K.: *Humber Radio*, GKZ, 1869 and 3778 kc; *Lands End Radio*, GLD, 1841 and 3610, 3624, 3778 kc; *Niton, I.o.W.*, GNI, 1834 kc; *North Foreland*, GNF, 1848 kc; *Portpatrick Radio*, GPK, 1883 kc; *Stonehaven*, GND, 1856 kc; *Wick Radio*, GKR, 1827 and 3617 kc.

In Northern France: *Brest*, FFU, 1806 and 1876 kc.

In The Netherlands: *Scheveningen Radio*, PCH, 1890 kc (main), also 1862 and 1934 kc (intermittent), and 3687 kc.

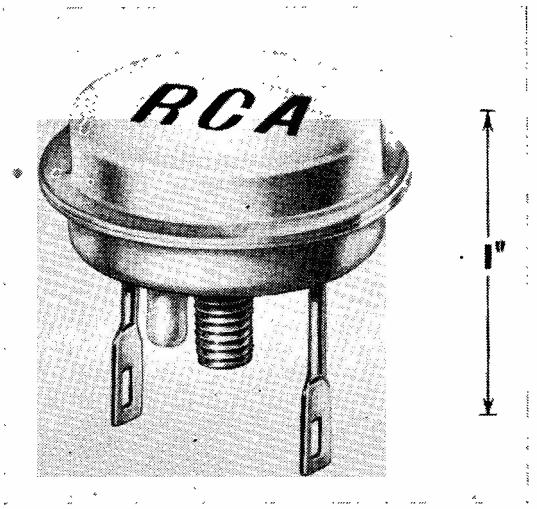
In Northern Germany: *Kiel Radio*, DAO, 1883 kc; *Norddeich Radio*, DAN, 1918 kc (intermittent).

In Denmark: *Blavand Radio*, OXB, 1813 kc; *Lyngby Radio*, OXZ, 1806 kc; *Thyboroen Radio*, OXN, 1834 kc (intermittent).

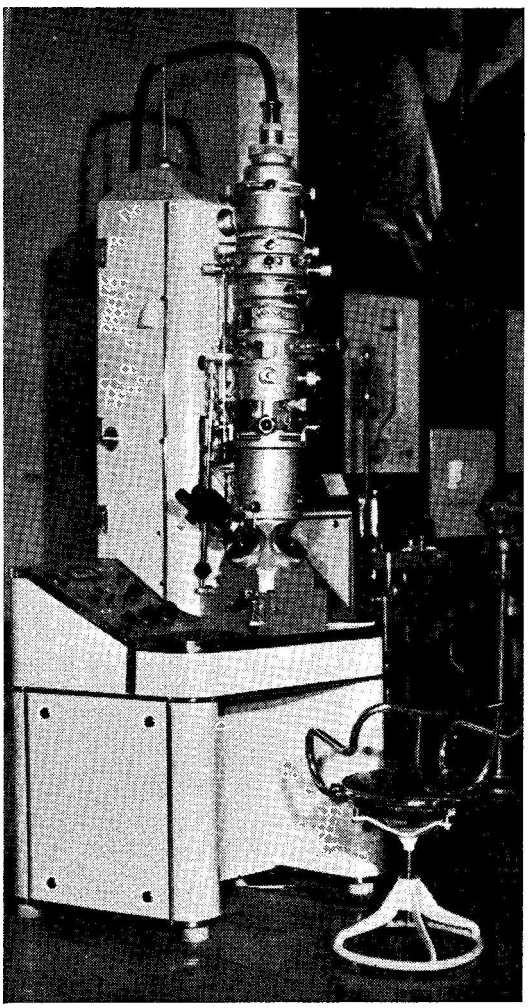
Broadly speaking, so far as amateur working is concerned, these frequencies only become vulnerable after dark, and then only if the amateur station is on or very close to the frequency. Most of the stations

named are in the ½-kW category, so are not likely to be much affected by Top Band 10-watt amateur stations—though under certain propagation conditions there have been a few complaints by European coast stations in the 1800-2000 kc area of interference by amateurs. In any event, in practice the coast station transmissions are so strong after dark that amateurs automatically avoid them, because of the QRM factor the other way!

For the forthcoming Top Band Trans-Atlantic DX season, it is clear that W/VE stations should avoid 1806 and 1813 kc *(W1BB to note!)* as Brest FFU, in particular, is very strong in the U.K. in the early mornings and, by virtue of its geographical position on one of the main sea routes, is in almost continuous operation (usually with a heavily over-modulated signal).



The new RCA 2N2015/2N2016 silicon power transistors are rated at 150 watts dissipation and operate at voltages of 100-130v. They are diffused-junction n-p-n types, and have a wide variety of applications in LF circuitry, the cut-off frequency being 25 kc.



One of the scientific instruments shown at the recent Soviet Exhibition at Earl's Court was an electron microscope giving a magnification of 200,000 times. A specially designed filter protects bacteria under observation from being affected by the action of the microscope.

BITTEN AGAIN!

A very new "New QTH" is that of G3PCI—but in his letter notifying it for publication, G3PCI explains that actually he was VS2AL from 1937 until 1951—indeed, VS2AL was featured in our "Other Man's Station" series in the October *1938* issue of SHORT WAVE MAGAZINE! On retirement to England in 1951, VS2AL was relinquished. For ten years, the bug lay dormant, then suddenly it bit again — so SWL E. Blomfield sat the May 1961 R.A.E., passed it, and is now back on the air as G3PCI with a Heathkit DX-100U and a Mosley Tribander—working into VS1 on the 15-metre band and looking for 9M2 contacts! We offer salutations to G3PCI (*ex*-VS2AL), not only because he is back in the fold after all these years, but also because he is a survivor of that notorious Siam Railway affair during 1942-45 when, as G3PCI puts it, he was "working for the Japanese, so did not get any radio." And we know what horrors that period of captivity entailed for so many Englishmen, in the power of little yellow devils who thought they were going to win.

SCOUT RADIO EVENT

The fourth annual Scout Jamboree-on-the-Air takes place during the week-end October 20-22. Some details were given on p.323 of the August issue. All who are interested in taking part in this international Amateur Radio event are asked to get in touch with: L. R. Mitchell, G3BHK, Katoomba, Tyneham Close, Sandford, Wareham, Dorset.

NEW QTH's

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

DL2BX, J. R. Mitchell *(ex-G3OKM),* 1st Bn. Durham Light Infantry, B.F.P.O. 45.

G2BSW, R. J. Ward, 69 Bromsgrove Road, Studley, Warks. *(Tel.: Studley 110.)*

GM3LMX, T. W. Mitchell, Falkirk, Stirlingshire. *(QSL via G3LMX.)*

G3OFW, H. A. C. Blake *(ex-ZC4TB),* 100 Horn Lane, Acton, London, W.3.

GM3OLQ, Daniel Stewart's College Radio Society, Queensferry Road, Edinburgh.

G3OSR, P. F. Hughes, 1 Cromwell Road, Blackpool, Lancs.

G3OSW, G. Waters, 5 Woodbine Terrace, Corbridge, Northumberland.

G3OVL, M. Hubbard, 151 Coulsdon Road, Old Coulsdon, Surrey.

G3OXV, C. A. Earl, 1 Mayfield Drive, Ashby Road, Daventry, Northants.

GM3PAE, N. V. Clarke, 43 Jordan Lane, Morningside, Edinburgh.

G3PAU, B. J. Bestwick, 51 Greythorn Drive, Wilford Hills, West Bridgford, Notts.

GM3PBA, J. S. Martin, 10 Oliphant Court, Lochside, Dumfries, Dumfries-shire.

G3PBH, D. I. Ralph, 17 Garfield Avenue, Dorchester, Dorset.

G3PBP, R. F. Oxley, M.B.E., A.M.I.Plant Engrs. *(ex-ZD4CP/9G1CP/ZD1RO),* 24 Windsor Crescent, Northampton, Northants.

G3PBQ, M. Keen, 63 Sheffield Road, Sutton Coldfield, Warks.

G3PBR, A. L. Green, 21 Watford Road, Northwood, Middlesex.

G3PBS, A. Perella, A.R.I.B.A., 14a St. Catherines Road, Littlehampton, Sussex. *(Tel.: Littlehampton 1084.)*

G3PCG, D. M. Askew, 3 Uppertown, Bonsall, Matlock, Derbyshire.

G3PCL, M. S. Shaw, 9 Daver Court, Mount Avenue, Ealing, London, W.5. *(Tel.: Perivale 0439.)*

G3PCP, W. H. Ward, 167 Stanley Park Avenue, South, Anfield, Liverpool, 4.

GM3PCQ, I. D. Crawford, 137 Grieve Street, Dunfermline, Fife.

G3PDC, R. H. Curwen, 53 Karslake Road, Penny Lane, Liverpool, 18.

G3PDK, G. J. Newnham, 84 Norbury Court Road, London, S.W.16.

G3PDK/A, G. J. Newnham, 125 Mildmay Road, Chelmsford, Essex.

G3PDS, W. R. Lawrence, 6/445 New John Street, West, Newtown, Birmingham, 19.

G3PDT, C. V. Taft, 239 Hagley Road, Edgbaston, Birmingham.

G3PDZ, D. G. Gibbons, 50 Green End, Sawtry, Huntingdonshire.

G3PEC, N. J. Carter, 4 Green Man Court, Green Man Lane, Feltham, Middlesex.

CHANGE OF ADDRESS

G2BAT, D. Phillips, Firdowne, Gomeldon Hill, Salisbury, Wilts.

G2DHV, G. V. Haylock, M.I.R.E. *(ex-DJ©AA),* 28 Longlands Road, Sidcup, Kent. *(Tel.: FOOtscray 1649.)*

G3AHE, G. James, 19 Trafalgar Street, Cheltenham, Glos.

G3APB, A. S. C. Mathews, 27 Wraxall Road, Warmley, Glos.

G3GZN, E. Buckingham, 17 Woodfield Drive, East Barnet, Herts.

G3HHT, F/Sgt. J. A. Bassford, 48 Graydon Avenue, Donnington, Nr. Chichester, Sussex.

G3IAG, R. F. Pilkington, 22 Ely Road, Littleport, Cambs. *(Tel.: Littleport 487.)*

G3JFE, L. Pearson, 300 Scalby Road, Newby, Scarborough, Yorkshire.

GI3JOZ, J. E. Williamson, 21 Melrose Terrace, Londonderry, N. Ireland.

G3JQL, J. S. Haggart *(ex-GM3JQL),* 28 Firsview Drive, Duston, Northampton, Northants.

G3JWZ, A. Rowley, 1 Selby Avenue, St. Albans, Herts.

G3KMO, M. A. Birch *(ex-VS6DD),* Sorrento, White Lane, Ash Green, Aldershot, Hants.

G3KQE, D. Heathcote, 22 Argyle Street, Atherton, Manchester, Lancs.

G3LDJ, K. Day, 6 Regent Road, Kirkheaton, Huddersfield, Yorkshire.

G3LFY, K. J. Salter, 361 Sandyfields Lane, The Straits, Sedgley, Dudley, Worcs.

G3LMK, G. V. L. Johnson, 37 Hinckley Road, Stoney Stanton, Leicester, Leics.

G3NGF, Rev. A. W. Shepherd, 121 Main Street, Asfordby, Melton Mowbray, Leics.

G3NJB, World Association of Methodist Radio Amateurs and Clubs (WAMRAC) Headquarters, 121 Main Street, Asfordby, Melton Mowbray, Leics.

GD3NJK, V. J. de Bono, M.D. *(G3NJK/ZB1VJ),* Senior Medical Officer, R.A.F. Station, Jurby, Isle of Man.

G3NMH, H. E. Perkins, 15 Horncastle Road, Louth, Lincs.

G3OAM, Rotherham and District Radio Club, c/o The Atlas Hotel, Rotherham, Yorkshire.

G3OLV, A. S. Coombes, 113 Blenheim Gardens, Wallington, Surrey.

G5LH, F. Thompson *(ex-G3SD),* 29 Sandringham Avenue, Benton, Newcastle-on-Tyne, 12. *(Change of call-sign.)*

G8TK, A. L. Browning, 26 Highfield Lane, St. Albans, Herts.

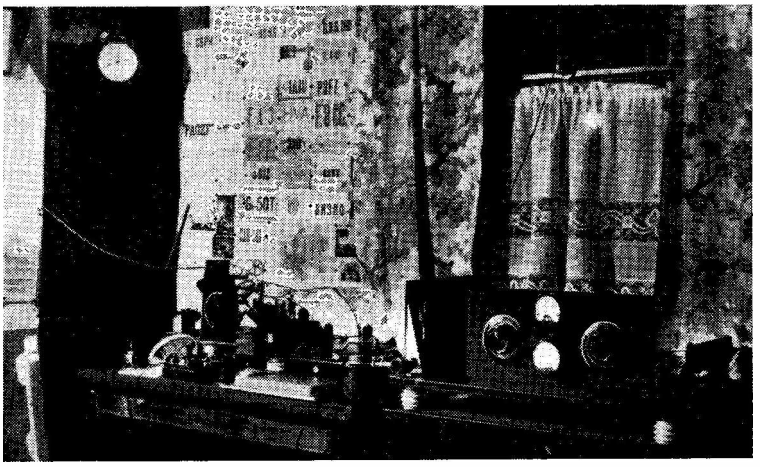
G8WC, J. S. K. Stephens, 59 Redhill Road, Rowlands Castle, Hants. *(Tel.: Rowlands Castle 436.)*

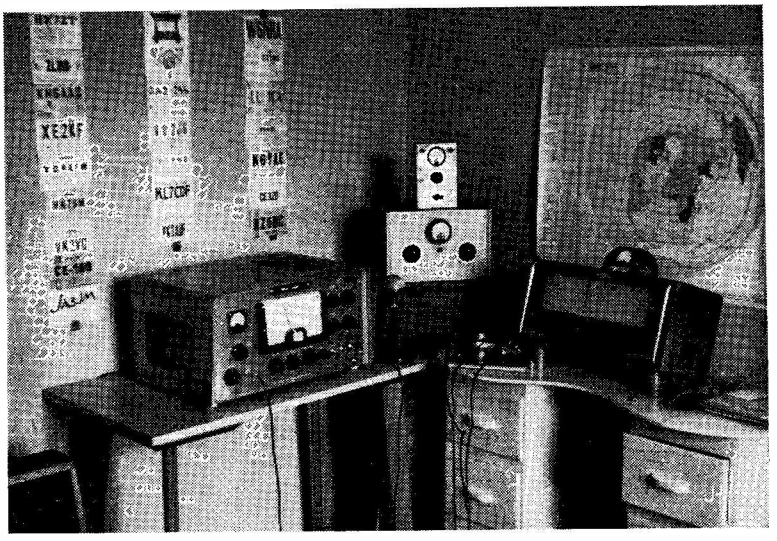
AMENDMENT

G3PAZ, S. W. Law, 11 Chisholm Road, Croydon, Surrey.

THE OTHER MAN'S STATION

G2BY





THIRTY-TWO years ago, the station of G2BY—H. E. Whatley, now of The Coppice, Llanvair Close, South Ascot, Berks.—was founded in the corner of a bedroom, as shown in the upper of these two photographs. The layout will be familiar enough to many who may read these lines: A tuned-plate tuned-grid (TPTG) self-excited oscillator, using simply a DE5B in what was thus a single-valve CW transmitter, and having the 68 ft. aerial tapped directly (in the true meaning of "end-on") into the plate (or tank) coil; this arrangement, conventional in those days, called not only for very careful tuning of the SEO Tx, but also involved a mounting technique which insulated the transmitter, mechanically, from the shocks or vibration which otherwise would put a "judder" on what ought to be a T9 note on the 40-metre band. A later improvement, at G2BY, was the change to an LS5B (a very bright emitting low-impedance triode), a heftier valve capable of giving more RF output, as proved by a neon placed beside the tank coil. His receiver was the well-known and much-beloved 0-V-1, which meant a reacting detector into one stage of note magnification, or LF amplification, or "audio one-step"—of course, actual listening was always on headphones, and to copy weak DX on CW, very careful handling of the receiver and its reaction control was essential. The dab-hands of those days could do it in their sleep, and they turned in DX logs which now would sound impossible on the equipment used.

In 1929, the power supply at G2BY was accumulators (accs.) for LT, with a rotary converter, giving about 350v. from those same accumulators, for HT. Every few days, the accs. had to be humped round to a battery station for charging. The machine itself was wrapped in a pair of thick blankets to muffle the noise. Happy days, with the hum of the rotary converter following the keying as the load went on and off, and the DX rolling in on the 0-V-1 on a dead-quiet 40-metre band. It's not like that now!

Later on, about 1930, G2BY modernised—to a crystal-controlled transmitter using a Goyder-locked PA (too complicated to describe here) and got a *mains lead* (the significance of this will be lost on anyone who has never been off an AC supply) into his shack from a grateful neighbour for whom he did "wireless repairs"—which meant keeping the neighbour's BC receiver going.

The set-up as it is today, more than 30 years later,

is shown in the lower picture—a K.W. Electronics "Victor" transmitter, on left, built from the kit, and on right an Eddystone 888A receiver. Station equipment includes a Z-match coupler, a home-built SWR meter, and a GDO for aerial adjustments. The aerial system consists of a 68-ft. top, centre-fed for 7 and 21 mc, with a parallel 14 mc dipole slung 4 inches below on perspex spacers, the common feeder being 85 ft. of coax; the main 68-ft. run is 40 ft. high; the system is operated on 3·5 mc by adding end lengths to the 68-ft. top, these ends being allowed to droop down at about 45°. The system as a whole amounts to a four-band centre-fed array, which gives excellent results on the 21-14-7-3·5 mc bands; for 10 metres, a two-element beam is available, fixed up in the roof space, and aimed on the U.S.A.

COURSES FOR THE R.A.E.

In addition to the list already published on p.329 of the August issue of SHORT WAVE MAGAZINE, here are some more centres at which R.A.E. instruction is being given during the coming session, for the Examination to be held next May:

Beckenham: At the Beckenham Evening Education Centre, 28 Beckenham Road, Beckenham, Kent, a course in Radio Theory and Practice commences on September 22; enrolment September 12-13, at the Institute. Further information from: M. D. Bass, G3OJE, 42 Clevedon Road, London, S.E.20.

Bognor Regis: At the Bognor Regis Technical Institute, Southway, Bognor Regis, Sussex, on Wednesday and Friday evenings, 7.0-9.0 p.m., covering R.A.E. Theory and Morse, commencing on September 20; enrolments during the week September 11-15. Further details from: E. J. Pearcey, G2JU, Spindrift, Marine Drive, West Wittering, Sussex.

Bradford: At the Bradford Technical College, Bradford, 5, a course of lectures will be given on Wednesday evenings, 7.0-9.0 p.m., by D. M. Pratt, G3KEP. Further details and registration fees from the General Office, Technical College *(Phone: Bradford 25763).*

Cleethorpes: Evening classes on Radio Theory for the R.A.E., on Practical Radio Construction, and Morse Code for the G.P.O. Test will start towards the end of September; enrolment for these courses will be at Elliston Street School, Cleethorpes, between 7.0 and 8.0 p.m. on September 18. Further information from H. Watson, G3HTI, 19 Hinkler Street, Cleethorpes, Lincs.

Derby: At the College of Technology, Kedleston Road, Derby, on Monday and Friday evenings, 7.0-9.0 p.m. Classes will include Theory and Laboratory work; they commence on September 25, and enrolment is during September 18-20, the inclusive fee being 35s., or 15s. for juniors. The course will be conducted by F. C. Ward, G2CVV from whom further information can be obtained at: 5 Uplands Avenue, Littleover, Derby *(Tel.: 21931).*

London: *Battersea,* at the Spencer Park School, Trinity Road, S.W.11, covering the entire R.A.E. syllabus with no prior knowledge of radio assumed, classes are on Monday and Thursday evenings, 7.30-9.30 p.m., the fee being 20s. Additional classes are offered in the design, construction and operation of transmitting equipment (for those who have passed the R.A.E.), and in beginners and advanced radio/television design, testing and fault-finding, and the construction of a closed-circuit TV system. Classes start on September 25; enrolment September 18-22 at Spencer Park School for the R.A.E. course, and at the Battersea Institute, Latchmere Road, Lavender Hill, Battersea, S.W.11, for the other courses. Details and further information can be obtained from the Principal, at the latter address.

London: *Chingford,* at the Senior Evening Institute, County High School, Nevin Drive, Chingford, London, E.4, R.A.E. classes will commence on September 25, 7.30-9.30 p.m.; enrolment September 18-20, 7.30-9.0 p.m. at the address given.

Manchester: At the Openshaw Technical College, Whitworth Street, Openshaw, Manchester, on Tuesday and Thursday evenings, in R.A.E. Theory, Practical Work and Morse, starting on September 26, enrolment September 18-19. Apply in the first instance, with s.a.e., to: M. Barnsley, G3HZM, Greenways, 11 Cemetery Road, Denton, Manchester.

Port Talbot, Glam.: R.A.E. classes to be held at the College of Further Education, Port Talbot, commencing towards the end of September. Details from: H. G. Hughes, Clyne, 20 Austin Avenue, Porthcawl, Glam.

Rickmansworth: At the William Penn Secondary School, Mill End, Rickmansworth, Herts., on Thursdays 7.30-9.30 p.m., commencing on September 21, with G2YS as instructor. Enrolment during week September 11-15. Further details from: West Herts. College of Further Education, Queen's Road, Watford, Herts.

Stockport: R.A.E. course to start mid-September, with G3FYE as instructor in Theory. Apply in the first instance to: G. R. Phillips, G3FYE, 7 Germans Buildings, Buxton Road, Stockport.

Wembley: At the Wembley Evening Institute, Copland School, High Road, Wembley, classes will be on Mondays, and will include Morse Practice 7.0-8.0 p.m., and Theory, 8.0-10.0 p.m., the course starting on September 18; enrolment, at the school, will be during September 11-14, 7.15-9.15 p.m.

If your particular locality has not been mentioned in the two lists now published, read the paragraph item "R.A.E.—Centres of Instruction" on p.330 of the August issue, and try your local Education Authority. *Now* is the time to do it, as work will be in full swing before the end of this month.

THE MONTH WITH THE CLUBS

By "*Club Secretary*"

(Deadline for October issue : September 15)

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

ONE of the pleasant sidelines arising from the compiling of this feature is the perusal of all the various Newsletters, Club Circulars, and, in the case of the larger clubs, monthly " magazines " covering all kinds of topics. What makes this interesting is the fact that there is nothing stereotyped about these various publications, which range from single sheets giving details of past and future meetings to 32-page journals covering every imaginable subject.

One of those in the latter category is *Contact,* the journal of the **Slade Radio Society,** which we pick at random for this month's comment. Contents of the July issue cover the North Midlands Mobile Rally, a fine article on " Antennae for the Amateur," a page on Coils and Wavelength, the Technical Secretary's report, some information on D-F Tests, notes on the general life of the Club and a hair-raising article on a new aerial system comprising two Moebius Strips welded together with de-oxidised non-arsenical copper wire and having a radiation resistance of 72 mhos (to feed it you turn a length of coax inside out!).

Such publications entail an enormous amount of work for the editorial team, in this case consisting of four members; and they cannot fail to have an extremely good effect on the prosperity of the club, since they help to hold together those members who cannot regularly attend meetings. Without in any way belittling the many other club publications, we should like to congratulate **Slade** on *Contact.*

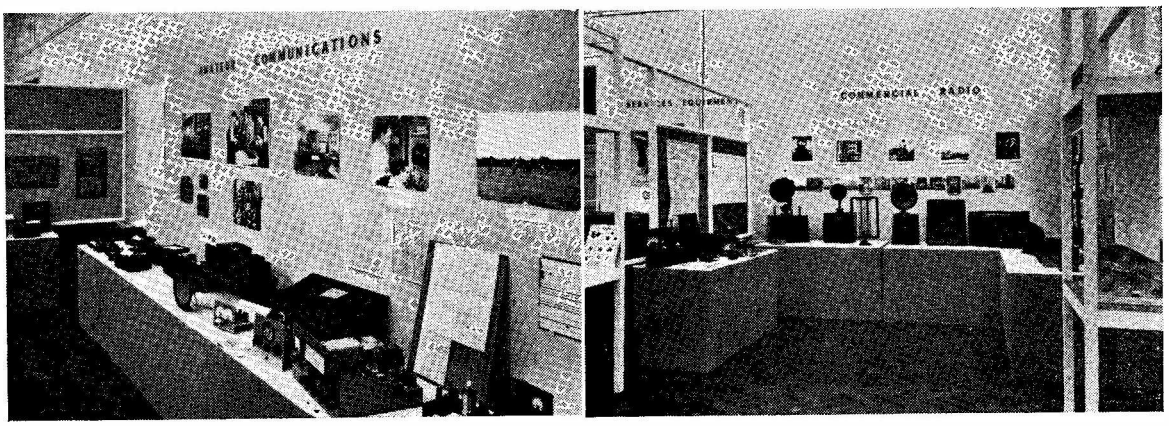
Barnet, having closed for the holiday season, re-open with their AGM on September 26, 8 p.m. at the Red Lion Hotel, Barnet. **Crystal Palace** are holding a Hi-Fi and Audio Evening on September 16; on the 5th the Morse class will be given at the QTH of G3FZL.

Clifton had a very successful field day on July 23, with seven portable stations out; their second one will be a QRP affair, to be held on September 17. On the 22nd, G3JJC will be talking on Astronomy.

Civil Service organised visits to the North Foreland ship-to-shore radio station, GNF, and to the BBC, during their summer activities. The winter session opens on September 5 with a talk by G6FI on The Early Days. Subjects for later meetings include Tape Recording, Crystals, Propagation by Satellite Reflection, Batteries and many others. Informal meetings are held every third Tuesday of the month, usually with a taped lecture. Visitors and prospective members always welcome.

Hastings will meet on September 12 for talks on Circuit Impedance Points and GDO's, plus a Short Quiz arranged by G3BDQ; on the 26th the discussion will be on straight and superhet receivers, with a talk on a TRF receiver project for the junior members.

Newbury, having run a " Gadget Evening " on



At the Derby & District Amateur Radio Society's exhibition, " Fifty Years of Radio," at the local Art Gallery, the space on the left was devoted to amateur gear, from an original coherer receiver (far left) to the latest double-superhet amateur band equipment. Likewise, as shown by the photograph on the right, there was an interesting display of vintage commercial broadcast receivers, starting with the early types of crystal set, complete with headphones. This was a very enterprising effort, arranged in connection with Derby's jubilee celebrations.

August 25, meet again on September 29 for a talk on "Understanding Radio," by G3LLK, which, it is hoped, will provoke some discussion concerning the problems that beset beginners. October 27 is the date for their Construction Competition.

Recent activities at **Northern Heights** have included a Junk Sale and a Film Show; they are also trying to raise funds to provide a receiver for a resident at the Kenmore Cheshire Home (Cleckheaton) by holding another junk sale on September 20. October 4 is booked for a lecture on Two Metres by G8CB. All meetings at the Sportsman Inn, Ogden, Halifax.

Plymouth paid a visit to the Torbay club for an "Ask Me Another" type of Quiz; a return match is to be staged. They propose to approach the Technical School about arranging R.A.E. classes, starting in September, if sufficient support can be mustered.

The programme at **Slade** starts with an Exhibition of Members' Equipment on September 8, at which judging will take place for the Enterprise Trophy and the Craftsman Cup. The Annual Dinner is booked for September 16 (Roebuck Inn, High Street, Erdington—tickets from the secretary). On September 22 the subject of the talk is "How Far can Radio Waves be Heard?"—a special lecture illustrated by slides. September 29 is booked for a Whist Drive, at Club Headquarters.

South Birmingham have two more of their "Club Nights on the Air," on September 5 and 19—subjects by G3NXV and John Harvey. On the 21st they meet at Hq. to hear G3GVA on "Two Metres—Part II." October 19 is the date fixed for their AGM.

West Kent, who meet at the Adult Centre, Culverden House, St. John's, Tunbridge Wells, have a talk on Bandwidth in Communication (G2UJ) on September 8; and a talk-demonstration on Modern Developments in Domestic TV Receivers on the 22nd. October 6 is fixed for an informal meeting.

Wirral have a lecture demonstration on Receivers, on September 6; on the 20th a series of short lectures called "Bits and Pieces" has been fixed. **Wolverhampton** will be hearing about a "Mobile Transmitter-Receiver for Two Metres" from G3ENY on September 11; and on the 25th the subject of the talk is "Moscow"—by Mr. B. Blakemore.

Dudley, a newly-formed club, met for the first time on August 18; a number of local amateurs are behind this venture, and the club aims to foster a general interest in radio, but particularly in home construction of gear. Morse and construction classes will be started as soon as suitable headquarters can be found; meanwhile the meetings will be held at the home of the acting secretary, G3MHS—23 Kent Street, Upper Gornal, Dudley.

Gosport is another newly-formed club, to meet for the first time on September 4, and every Monday evening thereafter, at the Gosport Community Centre, Bury Road. A good programme has been drawn up, covering most aspects of Amateur Radio for young and old members alike. It is also hoped to have a Club Tx on the air in due course, and to run a simple constructional lecture-series for beginners.

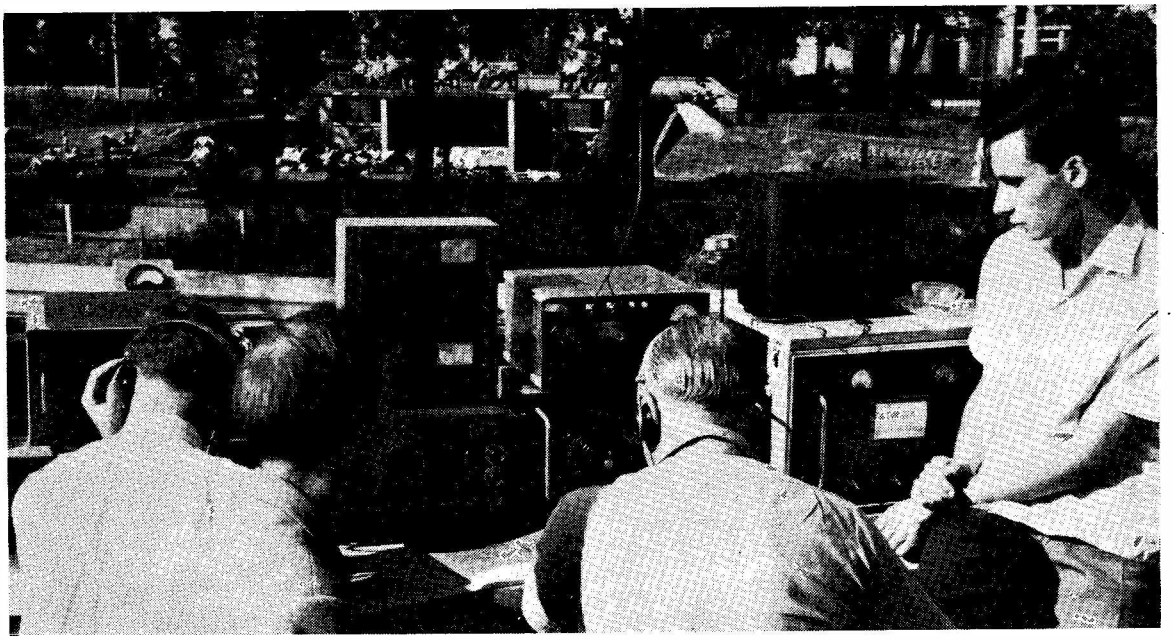
Midland are going to be busy with the MARS/CARS Contest on September 17, and their AGM on the 19th; for October 5 the subject is Flying Spot Scanners; and October 7 is the date of the Annual Dinner, at the Roebuck Hotel, Erdington.

Leeds will be starting their new programme on September 20 with an informal exhibition of members' gear; on the 27th there will be a demonstration of Four-Metre Equipment, and on October 4 a Junk Sale. **Peterborough** meet at the local Technical College on the first Friday, and their programme for the next few months is as follows: October 6, demonstration of D-F equipment; November 2, AGM; December 1, Christmas Party; January 5, Film Show.

Reading joined up with the Oxford and Newbury

Names and Addresses of Club Secretaries reporting in this issue:

ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, W.3.
BARNET: E. W. Brett, G3LUY, 28 Edward House, Edward Grove, New Barnet.
CAITHNESS: W. Hardie, GM3NQB, 24 Brownhill Road, Thurso.
CIVIL SERVICE: G. Lloyd-Dalton, 2 Honister Heights, Purley, Surrey.
CLIFTON: E. Godsmark, G3IWL, 211 Manwood Road, London, S.E.4.
CORNISH: W. J. Gilbert, 7 Poltair Road, Penryn.
CRAWLEY: R. G. B. Vaughan, G3FRV, 9 Hawkins Road, Tilgate, Crawley.
CRYSTAL PALACE: G. M. C. Stone, G3FZL, 10 Liphook Crescent, S.E.23.
DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby.
DUDLEY: D. H. W. Pratt, G3MHS, 23 Kent Street, Upper Gornal, Dudley.
EAST KENT: D. Williams, G3MDO, Seletar, New House Lane, Canterbury.
ENFIELD: V. Croucher, G3AFY, 15 Nelson Road, London, N.15.
GOSPORT: D. J. Gilbert, G3OYL, 45 Queens Road, Gosport.
GRAFTON: A. W. H. Wennell, G2CJN, 145 Uxendon Hill, Wembley Park, Middx.
HOUGHTON: H. Ward, 6 Whitehouse Crescent, Shotton Colliery, Durham.
HOVE: E. M. Large, School House, 9 Frant Road, Hove 4.
GRIMSBY: P. Mason, G3NNN, 213 Clee Road, Cleethorpes.
HASTINGS: W. E. Thompson, G3MQT, 8 Coventry Road, St. Leonards-on-Sea.
I.R.T.S.: T. O'Connor, EI9U, 280 Collins Avenue, Whitehall, Dublin.
LEEDS: D. Dinsdale, 69 Spen Lane, Leeds 16.
MIDLAND: C. J. Haycock, 29a Wellington Road, Birmingham 20.
NEWBURY: J. A. Gale, G3LLK, Wild Hedges, Crookham Common, Newbury.
NORTHERN HEIGHTS: A. Robinson, G3MDW, Candy Cabin, Ogden, Halifax.
PETERBOROUGH: D. Byrne, G3KPO, Jersey House, Eye, Peterborough.
PLYMOUTH: R. Hooper, 2 Chestnut Road, Peverell, Plymouth.
R.A.I.B.C.: W. E. Harris, G3DPH, 4 Glanville Place, Kesgrave, Ipswich.
READING: R. G. Nash, G3EJA, 9 Holybrook Road, Reading.
REIGATE: F. D. Thom, G3NKT, 12 Willow Road, Redhill.
SLADE: C. N. Smart, 110 Woolmore Road, Birmingham 23.
SOUTH BIRMINGHAM: T. W. Legg, Flat 3, 80 Alcester Road, Birmingham 13.
STOCKPORT: G. R. Phillips, G3FYE, 7 Germans Buildings, Buxton Road, Stockport.
SUTTON COLDFIELD: L. E. R. Hall, G3IGI, 24 Calthorpe Road, Walsall.
THAMES VALLEY: K. A. H. Rogers, G3AIU, 21 Links Road, Epsom.
WEST KENT: H. F. Richards, 17 Reynolds Lane, Tunbridge Wells.
WIRRAL: A. Seed, G3FOO, 31 Withert Avenue, Bebington, Cheshire.
WOLVERHAMPTON: J. Rickwood, 738 Stafford Road, Fordhouses, Wolverhampton.
WOLVERTON: D. A. Shepherd, G3LCS, 35 The Crescent, Haversham, Wolverton.



Paddington & District Amateur Radio Society, with a live membership of 30, put on an exhibition of home-built equipment and had a transmitter on the air (G3PAD/A) for the local "Little Venice Festival"; in the course of an afternoon's appearance, arranged at short notice, 10 countries were worked, to the great astonishment of the visiting public, there being never less than a dozen spectators round the stand.

clubs on August 27 for a picnic at Lower Basildon, where a small prize was to be offered for the best equipment on show. On September 30, G5TP will demonstrate and discuss his SSB transmitter, and will follow with a short description of methods of matching modulators to transmitters. Another course of R.A.E. lectures is to be held at the E. P. Collier Evening Institute, if a sufficient entry is received; this course was a great success for the 1961 exam., when the pass figure was nearly 100 per cent.

Acton, Brentford & Chiswick hold their September meeting on the 19th, when G3JEA will describe and demonstrate his new transmitter, incorporating some unusual features. Meeting, as usual, at the AEU Club, 66 High Road, Chiswick.

Caithness are directing their September 5 meeting at the SWL's, with explanations of the Q Code, phonetics and hints on how to listen and send intelligent reports. This winter they plan some two-metre activity with the Orkney stations.

Crawley start their new season's programme on September 27, with G4ZU to tell them about Birdcages and Quads. Three two-metre mobiles, equipped for net operation, are now active in the area, with more to come, and a constructional contest is being organised—judging early in 1962.

Cornish held their meeting of August 2 in the Ambulance Hall, Redruth, when G3XC took along his complete two-metre station and described it in detail; some Shell films were also shown. Next meeting, YMCA Falmouth, on September 6.

Derby have been having a very active season, what with D-F events, outside visits and mobile rallies, culminating in their own event on August 12, which comprised a mobile rally and hamfest. On September 6 they are holding a Junk Sale; on the 20th the subject is Map Reading as an aid to D-F; and the 27th is an Open Night. In between, they have a D-F practice run on September 13 and the D-F Contest for the President's Trophy on the 24th.

East Kent, at present on summer vacation, report the marriage of their secretary (G3MDO), whose XYL has already done much for the club, which augurs well for the future. They meet again on September 26 for the AGM.

Grafton re-open after their recess on September 8 with a "Get-Together" and look forward to a full season with their thrice-weekly R.A.E. and Morse classes and Friday evenings of club activity. These include a monthly SWL Corner, demonstrations,

CLUB PUBLICATIONS RECEIVED

We acknowledge, with thanks, receipt of the following Club publications: **Newbury** (*NADARS Newsletter*, July); **Slade** (*Contact*, July); **A.R.M.S.** (*Mobile News*, July); **Wolverhampton** (*News Letter*, August); **West Kent** (*QLF*, July); **South Birmingham** (*QSP*, July); **Mitcham** (*Newsletter*, July); **Enfield** (*Lea Valley Reflector*, July); **I.R.T.S.** (*IRTS News*, April and June); **Grimsby** (*News Sheet*, July); **Hastings** (*Natter-Net Notes*, No. 22); **Reigate** (*Feedback*, July-August); **R.A.I.B.C.** (*Radial*, August); **Derby** (*Newsletter*, No. 4); **A.R.M.S.** *Souvenir Brochure*, Barford Mobile Rally.

lectures, junk sales and so on, with the use of two Club transmitters (HF and LF bands) and possibly a third coming up for VHF.

Houghton report in for the first time and mention that G3PDM, one of their members who passed the R.A.E. and Morse test this year, gave a talk on RTTY at the August meeting—*see* panel for secretary's QTH. **Hove,** another newcomer, have only just formed themselves, and propose to meet every Wednesday, 7 p.m. at their Hq. in the Marmion Centre, Marmion Road. Those interested in any branch of Amateur Radio will be welcome, and the secretary (again *see* panel for QTH) will be pleased to supply details.

Reigate put on a small exhibition station at a local Fête, signing G3FM/A, but violent electrical storms spoilt the day for them. A welcome visitor to their activities has been a French SWL from Villefranche, who gave an impromptu talk on Amateur Radio in France at their July meeting. The Annual Junk Sale will be held at the Tower, Redhill, on September 16. Two members have passed R.A.E., making eight of them queuing up for Morse proficiency.

Stockport report good attendances during the summer, and several new members enrolled after the club's activity at the Northern Electronics Exhibition, where GB3NEE was put on the air. Nine members were successful in R.A.E. September meetings are on the 13th (judging of the two-metre construction contest) and 27th (talk on Resistors, by G3AYT). Visitors always welcome at the Blossoms Hotel, Buxton Road, Stockport.

Sutton Coldfield have drawn up a full programme which starts off with an Aerial Symposium, led by Vernon Sutton, on September 14, and a meeting devoted to the club transmitter and receiver on the 28th. **Wolverton** re-open on September 1, after which their main lectures will be held on the first Friday of the month, with further activities to be organised. They were active at the local Toc H Fête on August 19, with G3LCS/A on 160-10 metres and G3PBV on two metres, and SWL's displaying their own equipment. They meet at the Science and Arts Institute, Church Street, Wolverton, Fridays.

Thames Valley continue their unbroken series of meetings at the Carnarvon Castle Hotel, Hampton Court, despite a change of management there. The August meeting was attended by 29 members and was an "Any Questions?" event, a great success. The September meeting will take the form of a talk by VS6CJ on Amateur Radio in Hong Kong, and the Carnarvon Trophy constructional contest will take place in October, also the annual dinner.

LABGEAR PRICE CHANGE

We are asked to announce that, owing to increased costs, the prices of the Labgear LG.50, the Topbander, and associated equipment is being increased by 10%.

SMALL ADVERTISEMENTS

(" SITUATIONS " AND " TRADE ")

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

TRADE

QSL CARDS: Buff, blue, pink, green. 100 14s., 250 22s. 6d., 500 40s., 1,000 75s.; samples s.a.e.—Reilly, Panxworth, Norwich, 56.Z.

WANTED FOR CASH: Good clean communication receivers and SSB equipment. Please state price. — Short Wave (Hull) Radio, 30/32 Princes Avenue, Hull. *(Tel. 18953.)*

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

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

WEBB'S LOG BOOK for recording signals heard and worked; 112 pages 9¾in. x 8in., approved format, semi-stiff covers. Excellent value; 6s. 1d., post free, or callers 5s. 4d.—Webb's Radio, 14 Soho Street, London, W.1.

READERS' ADVERTISEMENTS

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

READERS

51J2 COLLINS COMMUNICATIONS RECEIVER, 30 bands, 0·5-30·5 mc, and AM-912/TRC Western Electric Converter. 100-225 mc, tunable. Both first-class condition. £215 the two.—G3JNG, The Huon, Branksome Hill Road, Bournemouth.

HRO, p/pack, B/S coils, £24. 813 mains xfmr, 1250-0-1250v. 0·5A, 10v. c.t. 5A, 5v. c.t. 5A, 6·3v. c.t. 2A, £2. Auto xfmr, 110v./250v., 15s.; 10 Hy. choke, 0·5A, £1. All carriage extra.—G3LCS, 35 The Crescent, Haversham, Wolverton, Bucks.

SALE: Eddystone 740 with S-meter, £25. Minimitter Converter, 3·5-28 mc, £10. Multi-Q, £4. R.1392D, £2 10s. 18 Set, £2 10s. German battery-powered Tx/Rx, 3-7·5 mc, £5. 38 Set, 15s. P.104, less meter, £1. RF-24, 15s. Assorted units, parts, headsets, etc.; callers welcome.—Hardcastle, Rigton Grange, East Keswick, Nr. Leeds.

FOR SALE: ZC1 and Minimitter whip, £7 15s., or would consider exchange for 2-metre gear.—G3LWM, 2 Lambton Avenue, Waltham Cross, Herts. *(Tel. 25571.)*

URGENTLY REQUIRED: Power pack and handbook for R.A.F. T.1154. Also Tx, 80-10 metres, and R.1155, N or B model. — Box No. 2501, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SMALL ADVERTISEMENTS, READERS—*continued*

MUST BE SOLD: Mint Panda Explorer, 150 watts, AM/FM/CW. Tiger Z-Match, LPF; first offer secures. WANTED: 2-metre converter, Tx, etc. W.H.Y.? — Box No. 2502, Short Wave Magazine, 55 Victoria Street, London, S.W.1.

TX, 80-10 metres (VFO Geloso type), 2/807's in PA, modulator 2/807's in Class-B zero bias on same chassis, separate rack-mounted PSU. Will deliver within 20 miles radius, otherwise buyer arranges transport; £20 o.n.o.? — Young, 36 Iris Avenue, Bexley, Kent.

SALE (going QRT): About half-ton of radio transmitting and receiving gear, including wavemeters, power packs, all types of valves, 811, 813, etc., VFO, aerials, vertical 20-ft. rod, 5 years' *Short Wave Magazines*, drawers of spares, tools; in fact, everything for the amateur; price £70 (o.n.o.?) The Lot. No splitting. Lorry delivers.—G3LNK, 36 Oldfield Street, Fenton, Stoke-on-Trent, Staffs.

FOR SALE: Top Band Command Tx and Rx, power supplies, Brookes Calibrator, Phone or CW, to be sold as one lot, £14 o.n.o.?—Drummond, 83 Cheshire Crescent, Tangmere, Chichester, Sussex.

AR88 Vibrator Pack (new, boxed), 30s.; HRO Vibrator Pack (new, boxed), 6v., 25s. 19 Set vibrator/rotary pack, as new, £2. Please add p. & p. WANTED: AR88LF xtal, 735 kc.—Hitchcock, 38 West Road, Spondon, Derby.

WANTED by G3JKF: AR88 cabinets and S-meter at reasonable price; collect within 40 miles.—75 Highams Hill, Gossops Green, Crawley, Sussex.

SALE: Ex-Amateur's Junk Box, 3 tea-chests, BC Rx'ers, 25-watt transmitter and modulator, power supplies, xtals, valves, etc., £7 10s.; buyer collects.—Collis, 197 Upper Bridge Road, Chelmsford, Essex.

EDDYSTONE 750 Receiver, perfect, complete with matching S-meter, speaker, headphones, mains filter, etc., £50. — G. J. Hayes, 138 Douglas Way, Deptford, London, S.E.8.

TEST SET 43, mod. to beautiful 'scope (circuits by Bradley), 50s. SCR-522 transmitter, fully modified 2 metres, 40s. — Bowen, 31 The Crescent, Donnington, Wellington, Salop.

WANTED: Young, Active Amateur, beginning studies at Drama School in London, requires board or share flat from beginning October, 1961. Preferably Earls Court area. — G3MOU, G. F. Morrison, 21 Gardiner Road, Grindon, Sunderland, Co. Durham.

EXCHANGE Geloso G.209 Rx, bandspread 160m. to 10m. AM/CW/SSB, latest job, mint condx, for Eddystone 680X, or other general coverage Rx.—G3NQX, 1 Gib Lane, Hoghton, Nr. Preston, Lancs.

SALE: S.27 Receiver, £20; TCS Receiver, not working, suitable spares, £2. Osmor coil-pack, medium, trawler, short, unused, £1. AR88 mains trans., £1. 350-0-350v. 80 mA, 5v., 6·3v., 15s. Meters, 300v., 50 mA, 0·5A RF, 5s. each; carriage extra.—Vears, 19 Waterloo Road, Epsom, Surrey.

FOR SALE or exchange: Complete transmitting station, including 40w. Tx, AR88, BC-221, 10-metre Quad; also B2 and 58 Tx/Rx portable, 3½w. Amp.—Box No. 2503, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SMALL ADVERTISEMENTS, READERS—*continued*

FOR SALE: Brand-new and boxed 6146 (QVO6/20) valves, bargain at 25s. each ; 6d. postage per valve.—Box No. 2504, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

R.308 Communications Receiver, new and in perfect condition, bargain £18. Can anybody supply output transformer for SX-28 Receiver No. G5513009?—Barnes, 53 Pretoria Road, Tottenham, London, N.17.

R.1475, PSU and Manual, £10 o.n.o.? P.104, £2 10s. 10 vols. *Radio and T/V Servicing,* £10 o.n.o.? WANTED: 36 Sender power and modulator unit.—Crane, 114 Blythswood Road, Ilford, Essex. *(Seven Kings 5326.)*

HEATHKIT DX-40U Transmitter and VF1U VFO, in mint condition, with makers' handbooks ; best offer secures. — Box No. 2505, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

NEW MULLARD, etc., 5s. each: 3/UL84, 2/ECC83, 2/6J7G, 6/ECC35, 3/6V6GT, 2/5Z4GT, 4/U52, 2/6L6GA ; 27 used 12AX7, 27s.; 26 12AU7, 26s.; 60 new lead pencils, 15s.—Box No. 2506, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: Set bandspread coils for HRO. Also HRO manual. — H. Dootson, 237 Douglas Road, Atherton, Lancs.

MANUALS for most Receivers from 8s. 6d.; Eddystone speaker, £3 ; send s.a.e. — Fawkes, St. Chloe Green, Amberley, Stroud, Glos.

TIGER TR 200/HF 10m.-80m., excellent condition; can be seen London area. Offers required.—G8TY, 92 Arlington Road, Southgate, London, N.14.

SWOP two brand-new and unused 6146's, for new or serviceable 4X150A ; cash adjustment, if necessary.—G3OVO, Southend, Beck Hill, Tealby, Lincoln.

R107, good working order, £6 ; carriage paid.—W. Bassi, The Coundil House, Shrewsbury, Salop.

URGENTLY REQUIRED: Top Band Command receiver in good condition.—GW3KZX, as *Call Book,* or ring *CARDIFF 55309* after 7 p.m.

SALE: Elizabethan "Escort" Tape Recorder, £15. New Philips Transcription deck, Model AG2009, with stereo head, £7 10s. Two new Goodmans "Axiom" 10 in. speakers, £6. Pair 12-watt stereo amp. (2/ECC83 - 4/ECL82), less power pack, £4. EXCHANGE: Tx/Rx. — D. A. Justice, 9 Leslie Road, Sheffield. *(Phone : 345372.)*

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SMALL ADVERTISEMENTS, READERS—*continued*

COMPLETE STATION, one-switch control: Minimitter de Luxe, £40; BC-348, PSU, speaker and RF-24, £15. Self-powered relay control unit, £2. Rx, modified RF and AF stages and is really hot. Beam rotator built around cowl-gill motor, suitable transformer included, £7.—G3HWU, 114 Carr Street, Marsh, Huddersfield.

SELLING UP: Valves, transmitting and receiving; loads of other gear, cheap or exchange; s.a.e., please.—Wood, 103 Melbourne Road, Aspley, Nottingham.

SALE: 4-metre all-transistor double-super Rx, "Telecomm," cost £58; new, unused, £25, o.n.o.?—Smedley, 20 Coltman House, Greenwich, London, S.E.10.

KW VALIANT (as new), home-built Denco communications Rx, 500v. power pack, £30.—Balderson, 33 The Crossways, Heston, Middx. *(HOU. 1049.)*

RECEIVER, HRO Junior with power pack, GC coils all amateur bands, prefer buyer collect, £11. B2 Transmitter with power pack, coils, instruction book, five crystals, plus spare transmitter section, £10 complete. Raymart Absorption Wavemeter, 10s.—G8UA, 406 Brunshaw Road, Burnley, Lancs.

HALLICRAFTERS SX-28 Rx, complete with manual, for sale; prefer buyer inspect and collect.—Offers to: GM3HLQ, 140 Glasgow Road, Strathaven, Lanarkshire. *(Tel. 2117.)*

WANTED: 100-150w. all-band 10/160-metre Transmitter, in good working condition, complete with mains power pack; also 12- or 24-volt power pack.—Richardson, 158 Viceroy Close, Birmingham, 5.

WANTED: KW.76 Receiver; Eddystone S.640 with S-meter offered in part-exchange.—G3MXO, 160 Yardley Fields Road, Birmingham, 33. *(STE. 2760.)*

WANTED: Compact Tx/Rx covering 14 mc band, CW/Phone, with internal power supply.—Box No. 2497, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Complete station in good condition; Heathkit DX-40U, with 3 crystals and manual; Heathkit VFO VFI-U, with manual, crystal microphone, CR-100 receiver, Eddystone speaker, Geloso amateur bands converter. The lot, £50; buyer collects.—Carwardine, 17 Royal Road, Sutton Coldfield, Warks.

SALE: Amateur's surplus valves and components, cheap; s.a.e. list.—Box No. 2498, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

R.107 RECEIVER, in excellent electrical and mechanical condition, jack socket for external S-meter, complete with mains lead, official manual, plus RF-24 converter for 10 and 15 metres; £14 (carriage paid).—Walton, Lindley Wood Reservoir, Otley, Yorks. *(Tel.: Otley 2035.)*

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SMALL ADVERTISEMENTS, READERS—*continued*

WANTED: Front Panel for AR88D, in good condition, with no extra holes drilled; your price given; all letters answered.—Tomes, 9 Laitwood Road, Balham, London, S.W.12.

R. 1475 (2-20 mc), original 230v. PSU and manual, £18; or exchange HRO, CR-100, etc.—Bottomley, 36 Bubwith Grove, West End, Halifax, Yorks.

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FOR SALE: Hallicrafters communications receiver, SC-101/A, £130 o.n.o.?—Box No. 2507, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: CR100 Receiver; must be in good condition.—Particulars to: G3ELJ, Claypole, Newark, Notts.

WANTED: Wavemeter Class D.II. — Please state price to: S. Trengove, G3OJN, 21 Oakfield Road, Falmouth, Cornwall.

T/R SWITCH, Buckley, for sale, as new, £2 2s., including postage.—Peattie, 8 Delvine Drive, Upton-by-Chester, Cheshire.

FOR SALE: Eddystone 840A in good condition, £20. Home-built G4ZU beam, complete rotator, feeder, indicator, masts, £7 (buyer to arrange transport). EMI Absorption Meter (Model 408), 1·6 mc to 30 mc, £2. AVO Sig. Gen., 0·95 mc to 80 mc in 6 bands, mains, RF and AF outputs, £5 10s. Briggs & Stratton portable charger, petrol, 4-stroke, with new 12-volt battery, £10. Many others. Inquiries welcome.—Box No. 2508, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

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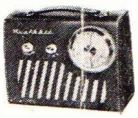
S-33



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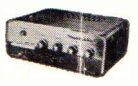

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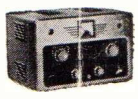

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