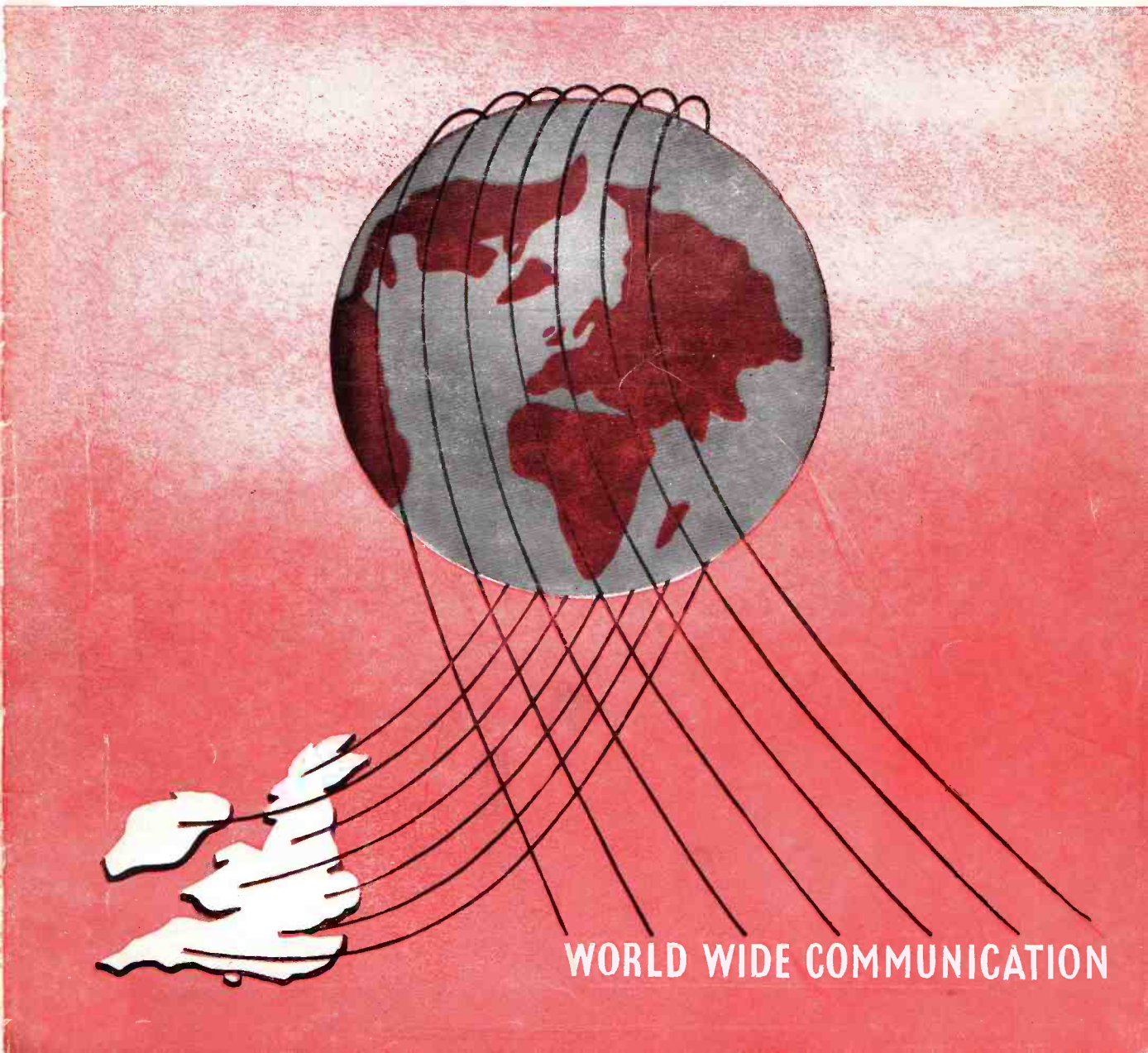
The SHORT WAVE Magazine

2/6

VOL. XIV MAY, 1956 NUMBER 3



INDEX TO ADVERTISERS

SHORT WAVE MAGAZINE

VOL. XIV MAY 1956 No. 153

CONTENTS

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

Advertisement Manager: P. H. FALKNER

Assistant Editor: L. H. THOMAS, M.B.E. (G6QB)

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

Annual Subscription: Home and Overseas 30s. post paid.

AUTHORS' MSS

Articles submitted for Editorial consideration must be typed double-spaced with wide margins on one side only of quarto or foolscap sheets, with diagrams shown separately. Photographs should be clearly identified on the back. Payment is made for all material used, and it is a condition of acceptance that full copyright passes to the Short Wave Magazine, Ltd., on publication.

FOR THE EXPERIMENTER AND THE RADIO ENGINEER

The SHORT WAVE Magazine

EDITORIAL

Torch *Six months ago in this space, we were able to discuss the awakening of the DX bands, with the heavy increase it would bring in amateur traffic across the world. With Ten, Fifteen and Twenty now well open for most of the time, the true pattern of radio amateur activity is becoming clear to many who, though they have held licences for some years, have never previously experienced such conditions. For them, it is a matter of making hay while the sun shines — which, in this particular context, it should do for another three years at least.*

On the other hand, there are many experienced amateurs who have been through it all before — and more than once. The pattern of DX conditions changes as time goes on. For the individual, this is no different from the way the pattern of life itself changes as the years pass. History goes on repeating itself, in the most astonishingly predictable fashion.

In our world of Amateur Radio, what does this mean ? One result will be that during the next two or three years a whole new generation of DX lions will emerge, to take over from those who established the standards of the last decade. For another result, we shall see that the very pressure on ether space will encourage a large section of the fraternity to develop an interest in quite different spheres of Amateur Radio activity — experiment, construction, UHF/VHF, mobile, to mention only a few — so that they, too, will gain new experiences and produce new ideas, thus making their contribution to progress.

And there will also be a large number of happy chaps, in Amateur Radio for the fun of it, who will take things as they come, quite unconscious that they are contributing anything, and certainly with no idea that they are carrying a torch to hand on to anybody.

Fortunately, they are in the majority. Indeed, it is they who make — and in the last four decades have consistently made — the most important contribution of all.

Austin Forbes G6FO

The "DX-Pilot" VFO-Exciter

SWITCHED, LEVEL OUTPUT ON 14, 21 AND 28 MC BANDS—AMPLE DRIVE FOR 150-WATT PA OPERATION—HARMONIC SUPPRESSION—SELF-CONTAINED POWER SUPPLY—FULL DESIGN AND CONSTRUCTIONAL DETAILS

J. N. WALKER (G5JU)

This is a VFO-Exciter, to SHORT WAVE MAGAZINE *specification, which will be of exceptional interest to the constructor who wants a high-grade unit to take full advantage of the possibilities now open on the DX bands—20, 15 and 10 metres. It has been designed as a self-contained, fully screened, table-top assembly and gives enough RF output to drive a following PA stage to the full 150 watts. Design features include automatic gain adjustment to ensure level output on the three bands covered, low harmonic generation, and all practicable precautions against TVI. While it is intended that the design should be copied in detail—and to this end ready-drilled metal work has been arranged for—the experienced constructor will, of course, be able to adapt it to his own requirements. It is intended to publish, in due course, constructional details for a 150-watt PA unit, in a matching cabinet, to follow this particular VFO-Exciter.—Editor.*

THIS instrument has been designed essentially for use in the three main DX bands—14, 21 and 28 mc—which are all now showing much activity. It has been said before, and will bear repeating, that the quality of the outgoing signal is of prime importance when seeking to work DX. A weak signal with any ripple on it, or with any tendency to chirp or otherwise lacking clear-cut characteristics, is liable to get lost in the noise and interference which are usually present. And a signal which drifts about is nothing but a headache, and will be ignored by most other operators.

The clear, steady signal, even if weak (and no one can guarantee always to put down a strong signal over long distances) is the one a distant operator will select, and the "*DX-Pilot*" is intended, as the title implies, to create just such a signal. To this end, five valves (seven if the rectifier and stabiliser are included) are employed, and although some may think the number excessive, their use does give that assurance of first-class performance.

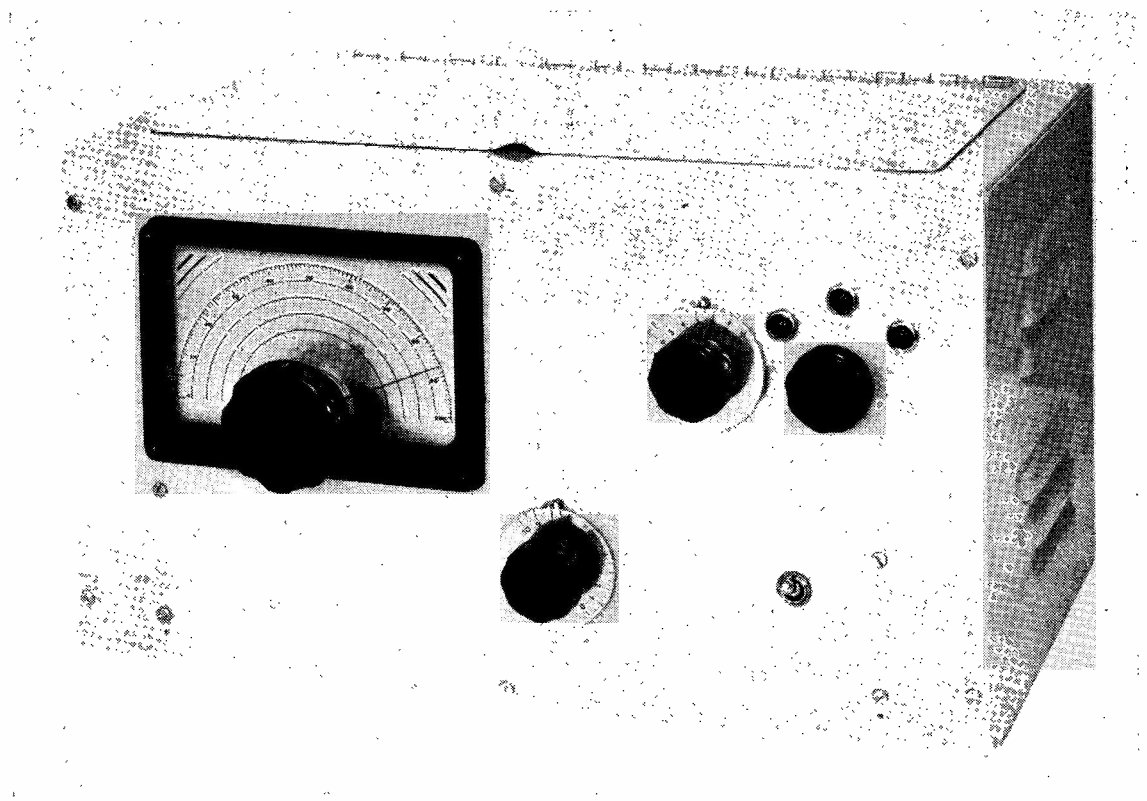
In other directions also the "*DX-Pilot*" should fill many an active amateur's needs. The controls have been reduced to a minimum, making the instrument convenient to operate, whilst the output is well maintained over the three bands. The unit is compact, is fitted with its own power supply, and is designed to drive a PA stage to the full 150 watts without the use of any further intermediate stages. Later, a companion PA unit will be offered to work direct from this Exciter.

Precautions have been taken to reduce to a minimum the production and radiation of unwanted harmonics, and, provided similar precautions are taken with the following PA, no difficulties should be experienced from interference to television receivers of good design.

Circuit

The primary oscillator utilises a standard cathode coupled Colpitts circuit, with a resistive anode load. Such a load has a very definite advantage in that it is not frequency-conscious, hence the impedance is substantially constant over the whole frequency range covered. The output is low (as is desirable) since otherwise the buffer stage is liable to be driven beyond the recommended Class-A mode. An unusually small value of coupling condenser acts towards the same end and also assists in isolating the oscillator stage.

The next stage is a buffer in action as well as in name. It is *not* expected to perform partly as a buffer and partly as a frequency multiplier or amplifier. There is, of course, some small degree of amplification, but again it is reduced by using a resistive anode load. The screen



The "DX Pilot" VFO-Exciter described in detail in the article. Self-contained for power, it gives sufficient RF output on three bands — 14, 21 and 28 mc — to drive a following PA to full input. Stability and keying characteristics are excellent, and in the design, all possible precautions have been taken against TVI. The band selected appears in one of three coloured panel lights above the band-change switch. A matching PA unit for this Exciter is to be described in a later issue.

voltage, common to both valves, is stabilised, and ample decoupling is included.

For good frequency stability, a *double-bearing* tuning condenser is used in the actual frequency determining circuit, and, whilst possibly it presents some added work in mounting, this condenser should still be retained in those cases where individual constructors may decide to modify the circuit in other ways.

The oscillator coil itself is unusually small physically, has a small external field and possesses a high value of "Q." The dust-iron core permits a small variation of inductance, which is useful when it comes to adjusting for the right degree of bandspread across the full sweep of the slow motion dial.

The stability has been found good enough to make unnecessary the use of any correction by means of a negative temperature co-efficient condenser.

The oscillator operates in the 3·5 mc band and following the buffer is a doubler stage to bring the frequency into the 7 mc band. To avoid tuning complications, the output circuit of this stage is broad-banded by the simple expedient of using two over-coupled circuits. The anode side is tuned to the centre of the band with a small trimmer, whilst the grid circuit is made self-resonant with the stray capacities. The inductive field of these coils is minimised by using a former of small diameter.

Thus far in the circuit, receiving valves of the Brimar 6AM6 (miniature) type have been quite suitable to generate the comparatively low RF voltages, but from here on it is necessary to develop some power. Hence, the valves in the following stages must possess two main characteristics — high power sensitivity and greater plate dissipation. For the next stage the Brimar 5763 is an excellent choice. The values of inductance and capacity in the anode circuit of the 5763 are such as to permit tuning to both 14 and 21 mc without switching. Resonance at 14 mc occurs with the condenser nearly at maximum capacity and this position is selected when using either the 14 or 28 mc band. At a lower dial reading resonance is found at 21 mc.

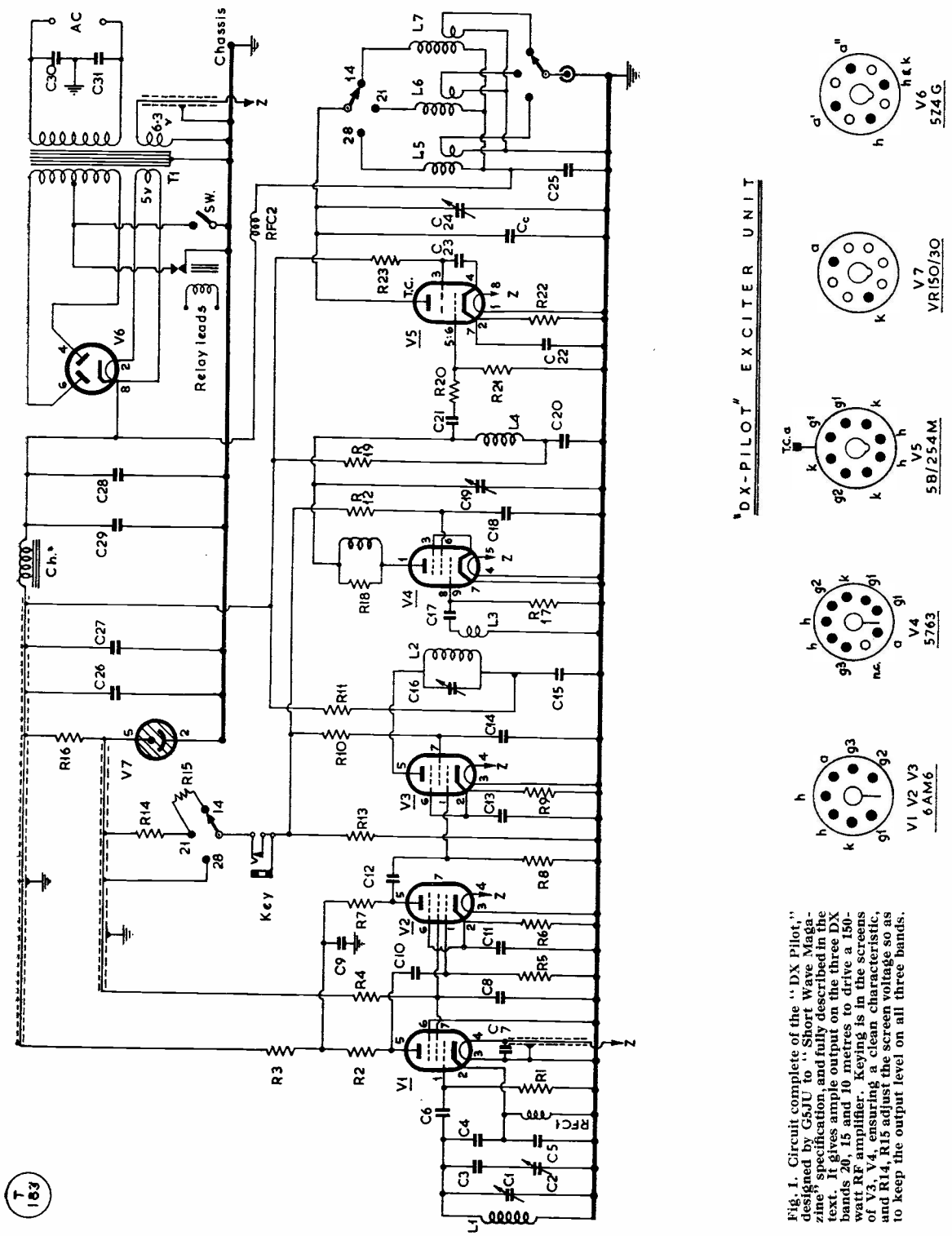


Fig. 1. Circuit complete of the "DX Pilot," designed by G5JU to "Short Wave Magazine" specification, and fully described in the text. It gives ample output on the three DX bands 20, 15 and 10 metres to drive a 150-watt RF amplifier. Keying is in the screens of V3, V4, ensuring a clean characteristic, and R14, R15 adjust the screen voltage so as to keep the output level on all three bands.

The amount of drive applied to the final valve needs adjustment according to the frequency and mode of operation—that is, with the final valve acting as a straight-through amplifier (on 14 and 21 mc), or as a doubler (as on 28 mc). All the available drive is required on 28 mc, but on 14 and 21 mc the amount of drive can be reduced, with benefit in the way of reduced harmonic production. The reduction needs to be greater on 14 mc as V4 is more efficient when acting as a doubler instead of a trebler, as on 21 mc. The necessary adjustment could be made by means of a potentiometer in the screen grid circuit, but this would mean another panel control. It is more convenient to wire fixed resistors of appropriate values to a wafer on the frequency selecting switch, so obtaining automatic adjustment. In actual fact, mainly to secure a good keying characteristic, control is applied to the screen grids of both V3 and V4.

And so to the final stage, where a Brimar type 5B/254M valve (miniature 807) is employed. This valve takes up little space, is most efficient and generally very suitable for the position.

The main problem encountered here was to draw off power on each band with equal efficiency. Originally it was intended to use a pi-coupled output network feeding into the coaxial cable link. To avoid another panel control and the need for yet another tuning adjustment, the idea was to use switched fixed condensers, the values of these being chosen according to the frequency. Results were most disappointing, both with fixed condensers and then with a variable condenser wired in experimentally. Power transfer was poor, whilst anode, loading and grid tuning adjustments affected one another very considerably, making tuning-up a slow job. Probably the load (the coaxial cable which fed into the grid circuit of the PA through a one-turn loop) was far from showing a constant and resistive 75 ohms.

Various other experiments were made. One was incremental tuning—three separate coils, with the inductances adding as switched in. Another was the use of a single coil with taps, but nothing was found as consistent *on all three bands* as the familiar system of *three separate coils*, each fitted with a single-turn coupling link.

At the anode of V5 is provided a very direct by-pass for higher order harmonics, which are those generally liable to cause interference on television channels. This by-pass consists of a short length of ¼-in. diameter coaxial cable which passes through the chassis close to the valve, thus avoiding long paths from the upper deck of the chassis to the inside. The inner conductor is soldered to the anode lead, close up to the anode cap, whilst the outer is taken to the earth point at the valve holder (*Cc. Fig.* 1).

Around the band selector switch are fitted three coloured signal lamps which serve the dual purpose of showing the exciter is "alive" and indicating the band which has been selected. All switching is carried out with a single two-wafer assembly. The wafer nearer the panel is of resin-bonded insulation and has two poles and three positions. This looks after

Table of Values

Fig. 1. Circuit complete of the "DX-Pilot" VFO-Exciter

C1	= 140 $\mu\mu$F variable	R1, R15, R17	= 47,000 ohms, ½ watt
C2	= 100 $\mu\mu$F variable	R2, R7	= 10,000 ohms, 1 watt
C3, C6	= 100 $\mu\mu$F silvered mica	R3, R19	= 1,000 ohms, 1 watt
C4, C5	= 1425 $\mu\mu$F silvered mica	R4	= 15,000 ohms, ½ watt
C7, C8, C9, C11, C13, C14, C15, C18, C22, C23	= .002 μF Hi-K or Cascap	R5, R8	= 120,000 ohms, ½ watt
		R6, R9	= 300 ohms, ½ watt
C10	= 10 $\mu\mu$F silvered mica	R10, R12	= 1,000 ohms, ½ watt
		R11	= 5,000 ohms, 1 watt
C12, C21	= 50 $\mu\mu$F silvered mica	R13	= 330,000 ohms, ½ watt
		R14	= 10,000 ohms, ½ watt
C16	= 3-30 $\mu\mu$F concentric trimmer	R16	= 15,000 ohms, wirewound, 5 to 10 watt
C17	= 200 $\mu\mu$F silvered mica	R18	= 22 ohms, ½ watt
C19	= 100 $\mu\mu$F variable	R20	= 10 or 12 ohms, ½ watt
C20, C25, C27, C29, C30, C31	= .005 μF moulded mica 1000 volt.	R21	= 56,000 ohms, 1 watt
		R22	= 300 ohms, 1 watt
C24	= 50 $\mu\mu$F variable	R23	= 30,000 ohms, 1 watt
C26, C28	= 8 μF electrolytic, 450v. wkg.		

LIST OF PARTS

1 Chassis, Panel and Cabinet, as detailed		*Philpott's Metalworks*
1 Mains Transformer, 350-0-350 volts, 120 mA, plus LT's.		
1 Smoothing Choke, 10 or 15 Henry, 100 mA.		
1 Full Vision Dial	*Cat. No.* 598	*Eddystone*
2 Direct Drive Dials	*Cat. No.* 844	*Eddystone*
1 Knob, Bar type	*Cat. No.* 846	*Eddystone*
1 Variable Condenser 140 $\mu\mu$F (C1)	*Cat. No.* 586	*Eddystone*
1 Variable Condenser 100 $\mu\mu$F (C2)	*Cat. No.* 738	*Eddystone*
1 Variable Condenser 100 $\mu\mu$F (C19)	*Cat. No.* 585	*Eddystone*
1 Variable Condenser 50 $\mu\mu$F (C24)	*Cat. No.* 588	*Eddystone*
1 Coil Former (for L1)	*Cat. No.* 847	*Eddystone*
1 Coil Former (for L2, L3)	*Cat. No.* 763	*Eddystone*
1 Coil Base (for L2, L3)	*Cat. No.* 707	*Eddystone*
2 Coil Formers (for L4, L6, L7)	*Cat. No.* 646	*Eddystone*
1 Flexible Coupler	*Cat. No.* 893	*Eddystone*
1 R.F. Choke (RFC1)	*Cat. No.* 737	*Eddystone*
1 R.F. Choke (RFC2)	*Cat. No.* 1022	*Eddystone*
1 Yaxley Switch, 2 wafers (one ceramic, one paxolin) 2-pole, 3-way		each wafer *Sorad*
3 Indicator Lamps, different colours, and bulbs		*Sorad*
1 Insulated Jack		*Igranic*
2 Octal Valveholders (for V6, V7)		*McMurdo*
3 B7G Valveholders (for V1, V2, V3)		*McMurdo*
1 B9A Valveholder (for V4)		*McMurdo*
1 B8G (Loctal) Valveholder (for V5)		*McMurdo*
3 Valve type 6AM6 (V1, V2, V3)		*Brimar*
1 Valve type 5763 (V4)		*Brimar*
1 Valve type 5B/254M (V5)		*Brimar*
1 Valve type 5Z4G (V6)		*Brimar*
1 Valve type VR150/30 (V7)		*Brimar*
1 Coaxial Socket and plug to match		*Belling-Lee*
1 Toggle Switch S.P. on/off (netting switch)		
1 Relay — *see text*		
2 feet ¼in. diameter coaxial cable.		

screen-resistor and lamp switching. Spaced suitably away from the panel is a ceramic wafer, one pole taking care of the anode circuit switching, the other the selection of link windings.

The power supply follows normal lines. The HT centre tap to chassis connection is broken with the instrument at "stand-by," but this circuit can be completed for netting by a switch on the panel. Normally the relay (shown lower right in the under-chassis photograph) closes the circuit when it is actuated simultaneously with other relays controlling the change-over from "receive" to "send." A stabiliser provides regulated HT voltage for application to the screen grids of the first four valves.

Construction

The unit is built into an assembly consisting of aluminium panel, chassis and cabinet, supplied by Philpott's Metalworks and obtainable from them with the major holes already made, if desired. The dimensions are shown in the drawings. The chassis is plain metal whilst the cabinet and panel are finished grey stove enamel. Ample room is provided and construction is in consequence rendered easier than if all the parts had to be fitted into a confined space. It is appreciated that some readers will make use of existing external power supplies, feeding them in through a socket mounted at the rear. In such a case, it will be well to employ an internally fitted filament transformer but the overall size of the cabinet can, of course, be reduced.

For those who like to start from scratch, the drawings give the positions of the major components on the panel and on the deck of the chassis. Two components—the netting switch and variable condenser C19 — pass through both the panel and the front wall of the chassis and naturally the holes for these will have to be made to register accurately.

No dimensional positions are shown for the holes in the rear wall of the chassis because they do not have to be exact. As can be seen in the photographs, the output coaxial socket is well over to the side nearer the output stage, whilst the keying jack and mains and relay leads outlets are near the centre. A piece of metal 2ins. by 1in. is cut out of the rear of the cabinet to give clearance to these latter holes.

Any mechanical strain associated with the oscillator tuning condenser assembly is liable to show up as drift, and it is well to go to some trouble to ensure accurate mechanical alignment of C2 to the spindle of the driving head. The rotor of C2 is insulated from the

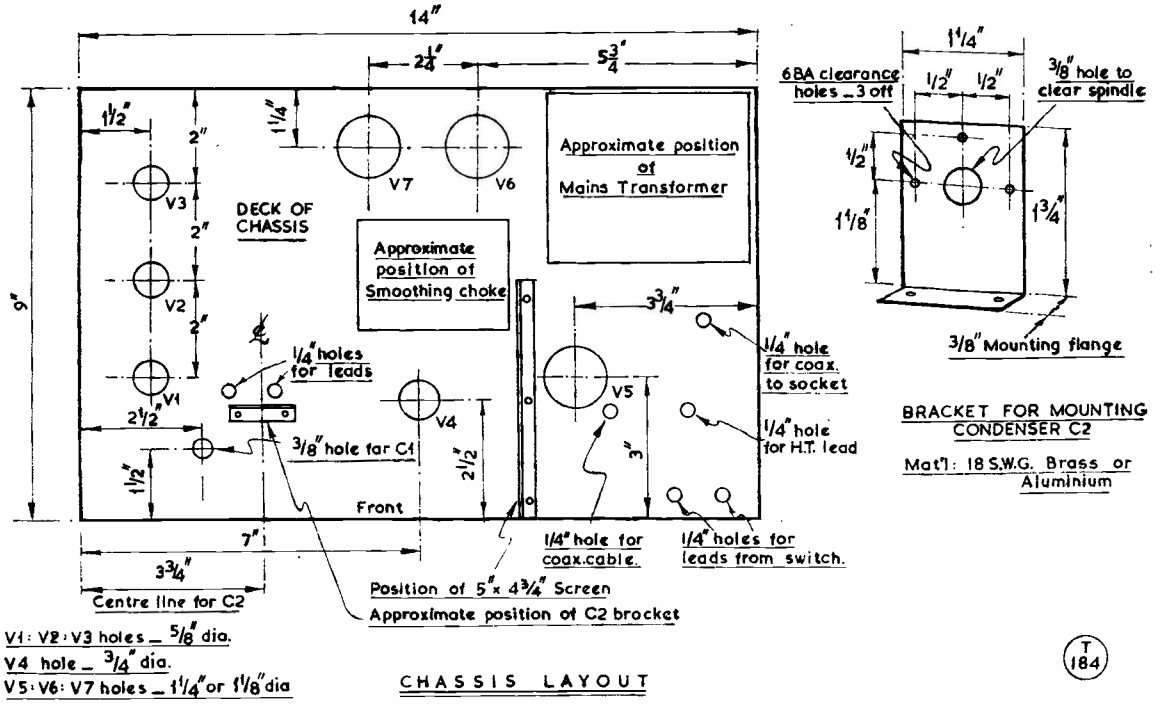
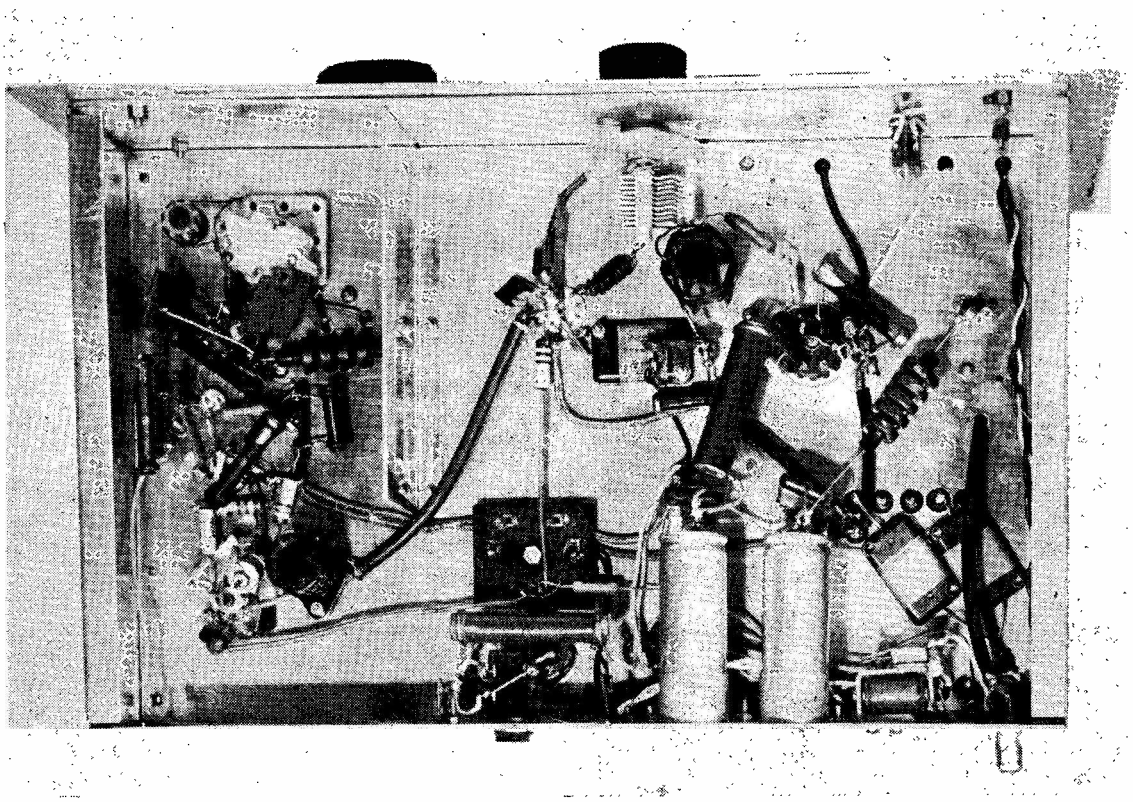


Fig. 2. Detail of the chassis layout for the "DX Pilot," as illustrated in the article. The chassis, with all main holes ready punched, can be supplied by Philpott's Metalworks.



Underneath the " DX Pilot," with the VFO section on the left. The construction is quite straightforward and there is plenty of space for accommodating all items.

bracket at the point of mounting and a separate insulated lead taken from the large tag bolt beneath the rotor bush to the main earth point near the V1 valveholder below the chassis.

Construction is simplified by mounting condensers C19 and C24 directly on the metal, instead of attempting to insulate the rotors. But again direct connections are made from the large tags to the appropriate valveholders, to minimise RF currents circulating in the chassis.

The output stage is in a compartment formed by the mains transformer at the rear, and a sheet of 18 gauge aluminium measuring 5½ins. long by 4¾ins. deep, on one side. No other screening has been found necessary on the top deck, although there was a temptation to fit another screen to enclose the 5763 valve.

On the underside of the chassis is another aluminium plate which screens off the VFO and buffer stages from the other parts of the unit. This piece measures 5½ins. by 2¾ins. (plus the fixing flange) and its position is indicated in the drawing.

The photograph shows clearly the placing of the components on the underside of the chassis. The smoothing condensers and the small relay are bolted to the rear wall, whilst other components are either held in the wiring or soldered to supporting tag strips where these assist towards a more solid construction.

For the writer's particular purpose, the relay needs only one pair of " make " contacts, but some readers may wish to let the relay carry out more than the one operation and then a larger type than the one shown in the photograph will be necessary. Room for it can easily be found on the side wall of the chassis. An article in the March issue of SHORT WAVE MAGAZINE gives much useful advice on this subject.

Coils

The oscillator coil has fourteen turns of 24 gauge enamelled wire, very slightly spaced and wound at the centre of an Eddystone (Cat. No. 847) slug-tuned polystyrene former. It is mounted some ½in. away from the chassis with a long 6BA bolt and spacing pillar, an additional hole being drilled in the flange for this purpose. The coil is thus well spaced away

from metal, as is necessary to keep the "Q" value up.

For convenience, coils L2 and L3 are wound on a Cat. No. 763 former, which plugs into a base firmly fixed to the floor of the chassis, again using spacing pillars. L2 is towards the bottom (pin end) of the former and has 30 turns of 28 SWG enamelled wire. The secondary (grid) winding has 38 turns of 32 SWG enamelled wire. The coils are spaced approximately ¼in. and, as usual, the outer ends are considered "hot" and the inner ends "earthy." The direction of winding is unimportant. An application of polystyrene varnish will hold the turns in position.

Coil L4, in the anode circuit of the 5763 valve, is wound with nine turns of 18 gauge enamelled wire slightly spaced, the coil being positioned at that end of the former away from the fixing hole. The former is a Cat. No. 646, ribbed, and of 1in. diameter. The wire termination further away from the chassis is "hot" and is taken direct to the stator tag on C19. The other end is held by a tag strip which also takes one end of C20 and one end of R19.

The anode coils in the output circuit have been constructed in a form which permits direct attachment to the band selector switch. L5, for 28 mc, is self-supporting, being made of six turns 14 SWG wire, spaced approximately one wire diameter and with an external diameter of 1in. (The barrel of the slow motion driving head can be used as a mandrel for this coil.)

For the next two coils, a Cat. No. 646 former is sawn through to give two unequal sections (roughly 1in. and ¾in. long). On the smaller part is wound a coil having seven turns 18 SWG enamelled, slightly spaced, whilst the other section holds nine turns of the same wire.

One end of each coil is soldered direct to the appropriate switch contact and the other ends are joined together at a tag strip held at the switch side-rod. The single-turn loops (18 gauge wire enclosed in sleeving) are wound around the "earthy" ends of the coils and are best formed after the latter have been fixed in position. The earthed sides of these loop windings are all soldered to an earth tag fitted to the other side-rod of the switch.

Other Wiring

It will be noted from the Table of Values that the majority of the by-pass condensers are specified as being of the high capacity miniature type, of which two makes are generally

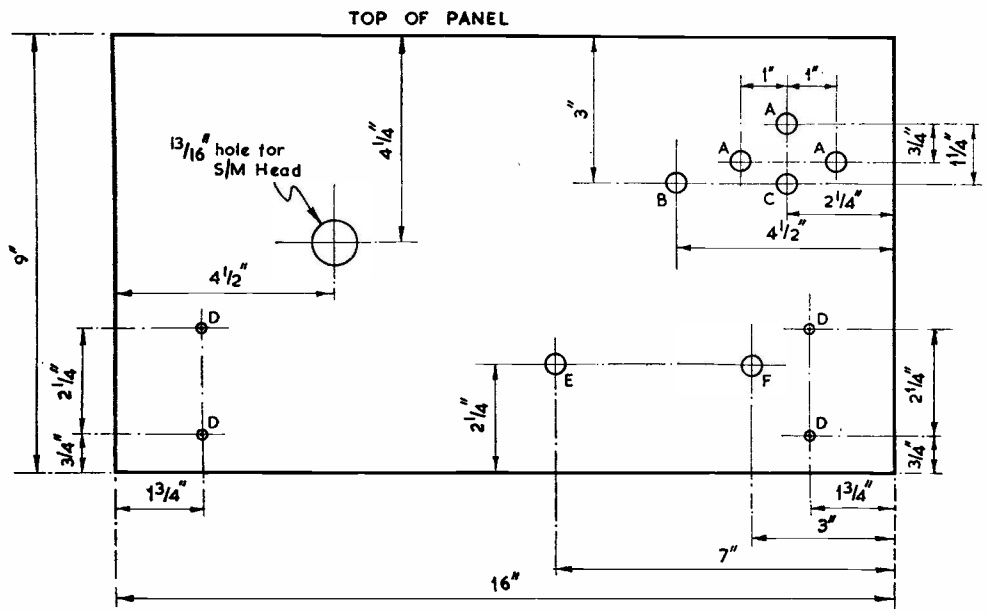
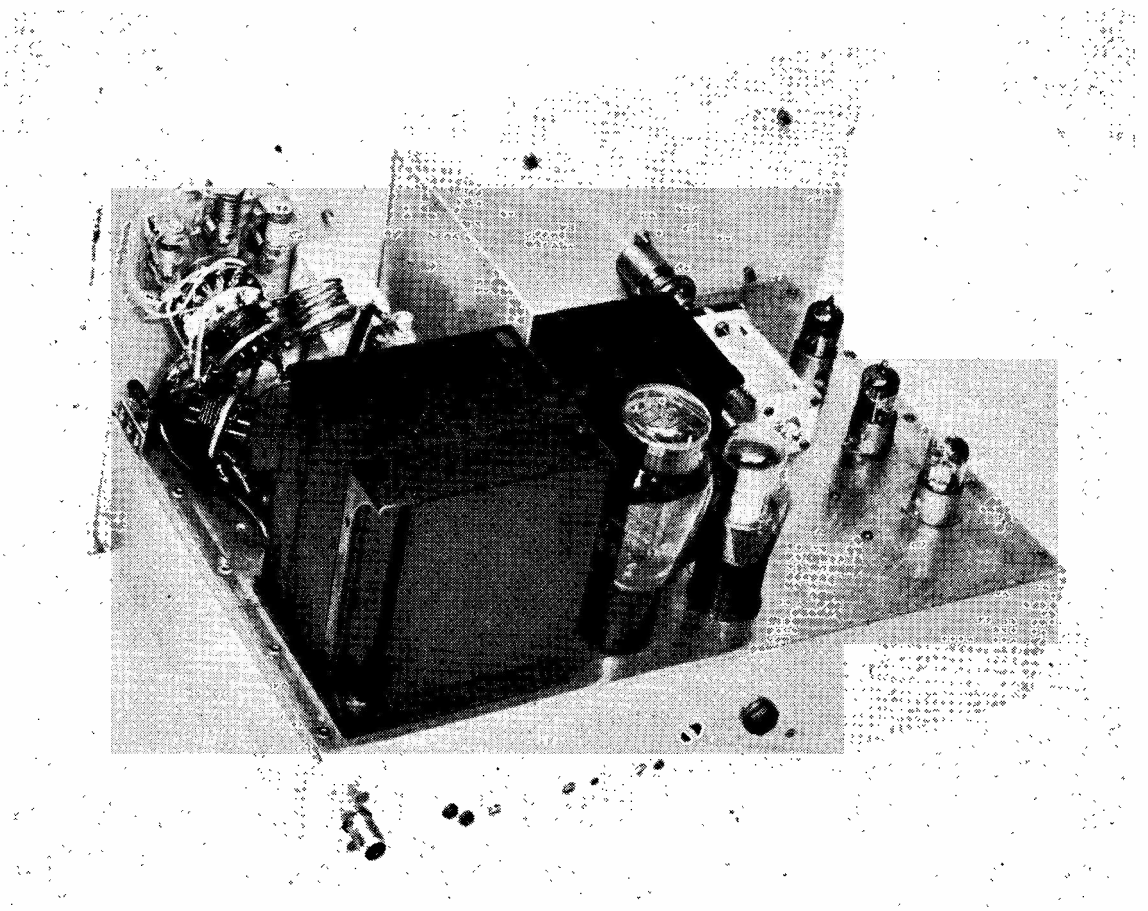


Fig. 3. The panel drilling detail. As in the case of the chassis, this can be obtained with the drilling shown here from Philpott's Metalworks, Ltd., who also supply the cabinet, as illustrated, into which the whole assembly is fitted.



Chassis layout of the "DX Pilot." The VFO section is on the right and the output stage, using a miniature 807, upper left, with the band-change switch and coil assembly immediately adjacent to it. Single-turn links are used for coax output connection, and the keying jack is on the rear chassis drop. Brimar valve types are used in all stages.

available. One is the "Hi-K" tubular by T.C.C. and the other the "Cascap" disc type by Plessey. These condensers can be soldered right up to the appropriate points with very small lengths of lead. They take up hardly any room and are most effective in maintaining both efficiency and stability. In some positions where very short leads are in any case not feasible, as for example the by-pass condensers at the "earthy" ends of the coils, ordinary mica condensers are equally suitable, but the small ceramics can be used throughout if desired. Naturally, these wide tolerance condensers are used where the actual value of capacity is not critical and in other applications silvered mica condensers are the correct type.

It should be noted that, in the case of C23, the condenser is wired across pins 3 and 4 of the 5B/254M valve, which is provided with several cathode connections.

The anti-parasitic suppressor fitted to the anode of V4 consists of a 22-ohm half-watt resistor overwound with seven turns of 20 gauge insulated wire. C19 is so positioned that the stator lug and pin 1 of the valveholder come together and the resistor fits between the two points with practically no lead length.

Screened wire is used for the heaters and for the longer lengths which carry HT, the outer screen being bonded down to the chassis at as many points as is convenient. By-pass condensers are fitted across the mains input leads, and, since the electrolytic smoothing condensers offer a relatively high impedance to any RF currents, a mica condenser is connected in parallel with each. It has not been found necessary to attach similar condensers to the other external leads — the relay line and the keying jack—but, in individual cases, the addition of small condensers (the miniature ceramic

type is again very suitable) may be required to prevent the leakage of unwanted RF.

Where possible, wiring (other than the screened leads) is twisted together into a cable. This is the case, for instance, with some of the lamp and switch wiring.

Resistor R15 is soldered directly across the switch contacts, whilst R14 is held by a small tag strip fixed to the chassis immediately below the switch. Fewer wires then have to be led down through the chassis. The wiring to the paxolin section (front) of the switch is of course carried out before the anode coils and links are secured in position.

The special condenser marked Cc in the circuit diagram is, as previously mentioned, made from a 6in. length of coaxial cable ($\frac{1}{4}$in. diameter variety). It passes through the chassis immediately below the point of attachment of the inner wire to the anode—this is about an inch from the anode cap, to prevent the cable touching the hot valve.

Another piece of similar cable is used between the terminations of L3 at the coil base and the grid (*via* C17) and cathode of V4. This prevents radiation from what would otherwise be a long exposed grid lead and also renders unnecessary a grid stopper resistor at the valve-holder. One further piece of coaxial cable runs between the ceramic band selector switch and the coaxial socket at the rear of the chassis.

Testing

After carrying out the usual inspection to ensure the wiring has been carried out correctly and checking that no short circuit exists on the HT line or elsewhere, the exciter is ready for testing.

The frequency swept by the oscillator tuning condenser C2 is too great, by itself, for the HF bands, hence the fitting of the series condenser C3, which has the usual beneficial result of opening out the LF end of each band. The first thing to do is to check the oscillator frequency against a calibrated receiver and bring it exactly to 3500 kc with C2 at maximum capacity. By adjustment of C1 and of the core of L1, it is possible to cause the dial to sweep just the 350 kc of the 14 mc band, *i.e.*, 88 kc on 3·5 mc, with a little overlap if desired. This same adjustment of course covers 21000 to 21525 kc—a little more than the full band—and 28000 to 28700 kc. If the latter is considered insufficient coverage, C3 can be omitted but then the bandspread on the other two bands will be much reduced.

The next adjustment is to C16, in the anode circuit of V3. Some kind of visual tuning indicator is necessary and this can take the form of a milliammeter inserted between the lower end of R17 and chassis, or a voltmeter with a 25-volt range connected across R19.

It will be found that the current rises as C16 is rotated from minimum towards maximum to bring the circuit into resonance. The current will remain practically constant over an appreciable further degree of rotation and will then drop off again. C16 should be set as near as possible to the centre of the flat tuning section, with the VFO dial adjusted to give a fundamental frequency of about 3550 kc. Incidentally, C16 should be connected with the inner cylinder "hot" to RF and the adjustment should be made with an insulated tool, since it has some 300 volts on it.

Resonance of L4/C19 is indicated either with a neon lamp, or by the dip in the reading given by a voltmeter across R19. The dial readings corresponding to output on 14 mc and on 21 mc should be noted for future reference—in the prototype the readings are approximately 7 and $2\frac{1}{2}$ over a scale marked 0 to 10 over 180 degrees.

A load of some kind should be connected to the coaxial socket at the rear when checking the operation of the 5B/254M final valve. A 6 to 8 volt, 0·3 ampere bulb, in series with a 50-ohm resistor, will serve the purpose, at the same time giving an indication that a good output is being obtained. C24 will be not quite at minimum for 28 mc output and the capacity needs to be progressively increased on 21 and 14 mc.

In actual operation, the optimum setting of C24 is shown by maximum grid current into the driven PA valve. It is assumed that, in the grid circuit of the PA, coils and links similar to L5, L6 and L7 in the exciter are used. As a matter of interest, the prototype exciter drives an 813 final to between 12 and 15 mA grid current on each band, against a standing fixed bias of 130 volts *plus* some additional resistor-derived bias; this is, of course, ample for 150 watts input on 'phone or CW, and is obtained without any critical adjustment of the coupling coils — possibly, such adjustment would produce even greater grid current.

If a positive tuning indicator is desired on the exciter panel, a small moving-coil meter could perhaps be squeezed in above the dial controlling C19, but it is suggested that a torch bulb, mounted so that the light could be seen through a hole in the panel, would serve the purpose equally well. The bulb would be wired in series with RFC2 and should be chosen to have a consumption of 100 or 150 mA, when

it will not light too brightly and variations in brightness as C24 is brought into resonance will be readily seen.

Keying

With the key in the screen grid circuit of V4 only, there is a small amount of residual output on 14 mc with the key up, which can at times cause a spacer wave to be radiated. With the key cutting off screen voltage to both V3 and V4, there is complete cut-off with the key up and a clean, crisp note is obtained. When using the exciter for telephony transmissions, the key is either short circuited by the switch usually fitted, or the plug can be withdrawn from the jack at the rear.

Final Comments

When the VFO frequency range covered has been adjusted satisfactorily, the scale can be directly calibrated using black ink.

Although in the photograph a round knob is shown attached to the spindle of the band-selector switch, this is a temporary measure and the knob finally fitted is the Cat. No. 846 bar type, which ensures a very firm grip and positive control.

The main thing to remember when changing bands is to see C19 is adjusted to the correct point. With C19 tuned to 14 mc and the final stage to 21 mc, there will be no output at all.

Better Results with the R.1155

From Notes by G8IX

AFTER reading numerous articles on improving the R.1155, the writer is prompted to give the findings on a modification as applied to his own model. In brief, this enables many stations to be brought up to S9+ under normal conditions, and for "kc's to be split" in terms of dial readings.

A small "rat-tailed" (long spindle) variable condenser of approximately 75 $\mu\mu$F—which had 10 fixed and 9 moving plates—was obtained, and the nearest plates pulled out to leave only three fixed and two moving plates at the far end of the spindle, remote from the dial. (A condenser with a maximum capacity of about 20 $\mu\mu$F would meet the requirement.) A second smaller condenser of approximately 5 $\mu\mu$F is also needed; in the writer's case, this was a 4/3-plate variable stripped down to leave two fixed plates and one moving.

The larger condenser is mounted on a brass or aluminium bracket bolted to the rim of the chassis, with a piece cut out of the lid to allow the receiver chassis to be pushed back into the container. The smaller condenser is secured to the bracket by its locking nut and is wired across the larger so that both rotors are common on the bracket to ground; a lead is taken from the fixed vanes of both condensers to the tab to be found on top of the rear main tuning capacity in the receiver itself.

With small dials on these band-spread condensers and off-setting the main dial on the R.1155 to allow for the additional capacity, full band-spread with vernier frequency setting can be obtained on all bands without further adjustment on the main tuning control. In the writer's case, the R.1155 main dial is set to 13·9 mc for the 20-metre band, and to 6750 kc for 40 metres. Two settings are necessary to cover the 'phone and CW sections of the 80-metre band.

If the R.1155 is being used in conjunction with a T.1154, as at G8IX, much improved reception is possible by inserting a relay in the PA link-line to the aerial tuning unit—an external ATU should always be used with the T.1154,—connected so that the aerial goes to the R.1155 *via* the tuning unit in the "receive" position. This amounts to an auxiliary "peak-up" aerial input circuit for the receiver, on the lines of the tuner described on p.31 of the March, 1956 issue of SHORT WAVE MAGAZINE.

MINIATURE SELENIUM RECTIFIERS

A range of miniature selenium rectifiers has been introduced by The General Electric Co., Ltd. In half-wave capacitive and voltage-doubler circuits, the output rating when operating at 35°C. ambient is 4 mA at mean output voltages between 16v. and 7,040v., according to the number of series elements and the method of connection. For resistive load circuits the ratings are 5 mA in half-wave connection and 10 mA in bridge connection at the same ambient temperature. Similar voltage and current ratings apply when the rectifiers are used with inductive loads, but the straightforward half-wave connection is unsatisfactory unless the inductance is only a small proportion of the load impedance.

The rectifiers are made in moulded polythene or resin-bonded paper tube types. All moulded polythene units have the same dimensions (14.5 mm. tube length by 9.5 mm. dia.), regardless of the number of series elements, which varies from one to nine according to the voltage. The resin-bonded paper tube units can be supplied with wire, screw or plain cap terminals and contain from ten to 440 elements in lengths between 51 mm. and 305 mm.

150 Watts of Audio

AN EXPERIMENTAL SET-UP

WHILE in the ordinary way audio power of the order of 100 watts is sufficient for amateur transmission in this country, it is often convenient, not to say desirable, to have audio watts in hand—just as it is to have the RF output potential of, say, a fully loaded 813 PA, even if it is never used as such. The fact that some operators actually run 150 watts of audio merely gives point to the argument, it being well known that on the VHF bands, for instance, much more than the usual 1: 2 ratio of audio power to DC carrier is necessary for full modulation. In any event, many administrations outside the U.K. licence their amateurs for more than 150 watts DC input.

Production of audio at the 150-watt level calls for a very good speech amplifier/sub-modulator driving a pair of large triodes, preferably at zero-bias in the Class-B mode. As regards power supply, two separate units are needed—one at low voltage (300v. 150 mA) for the speech amplifier/sub-modulator, and the other of 1,000v. 250-300 mA for the Class-B output stage.

An assembly of this kind calls for a good deal of constructional work and, in particular, a very carefully designed speech amplifier, capable of giving an absolutely hum-free output at full gain. For economy of equipment and to widen the application of the speech amplifier/sub-modulator, it is also desirable to regard it as a separate audio unit, and not only as a driver for the Class-B modulator proper. In other words, as a low-level modulator and audio amplifier capable of being used by itself with, say, a 25-watt transmitter; or with a record player, a tape recorder or as a local or FM station quality amplifier. If 10-12 watts of audio could be produced from such an amplifier, it would also be suitable for small PA work.

Searching round for an assembly for experimental audio work along these lines, the obvious choice appeared to be the Osram "912-Plus" as speech amplifier/sub-modulator driving, as an entirely separate piece of equipment, a pair of Osram DA42's in zero-bias Class-B, of course with separate power supplies for the two units. This would enable the Osram "912-Plus" to be used for a variety of purely audio functions apart from that of driving the Class-B modulator.

The Osram "912-Plus"

This is fully described in the G.E.C.'s booklet, *Osram Nine-One-Two Plus*, as a detailed, illustrated constructional design. The basic circuit is shown herewith, as it could be followed in constructing a similar amplifier using Osram valves. Miniature types are used throughout, the N709 pentodes in the output stage being capable of giving 12 watts of audio for an input of 50 mV at full gain. The general design of the amplifier is such that the frequency characteristic is flat, within ± 1 dB, from 30 to about 20,000 c/s. The input circuits are suitably arranged for either radio, crystal pick-up or crystal microphone, and the amplifier is self-powered.

The photograph shows one way in which the Osram "912-Plus" can be built up, from the G.E.C. manual describing its design and construction. Since this also discusses in detail the various applications of the amplifier other than that of using it as a modulator or sub-modulator, the latter is the function to be considered here.

Osram "912" as Modulator

With the Acos Type 22 microphone seen in the photograph, the output of the amplifier can be applied to any 25-watt transmitter for full modulation with excellent quality. The audio from the amplifier appears across the low-impedance secondary of the specified (Gilson) transformer. Considered strictly from the point of view of modulation, this has both advantages and disadvantages. An additional matching transformer must be provided for the transmitter itself, but on the other hand the transmitter (or the high-power modulator) can be fed through a low-impedance line of any convenient length, and it is a simple matter to arrange output switching so that the "912" can be used for its other audio functions.

Alternatively, if the "912" is to be operated solely as a modulator or sub-modulator, and not for any other audio purpose, the transformer T2 can be replaced by a Woden UM1, with taps suitably selected and inter-connected with the Class-B output stage in the usual way. However, this would rob the "912" of its versatility, since it would have to be parcelled with the main modulator if long high-impedance (or high voltage) leads are to be avoided.

On all counts, therefore, it is better to retain the low-impedance output feature of the "912," if only because it simplifies installation in the station layout. As an amplifier, it can be kept handy at the operating position, ready to un-

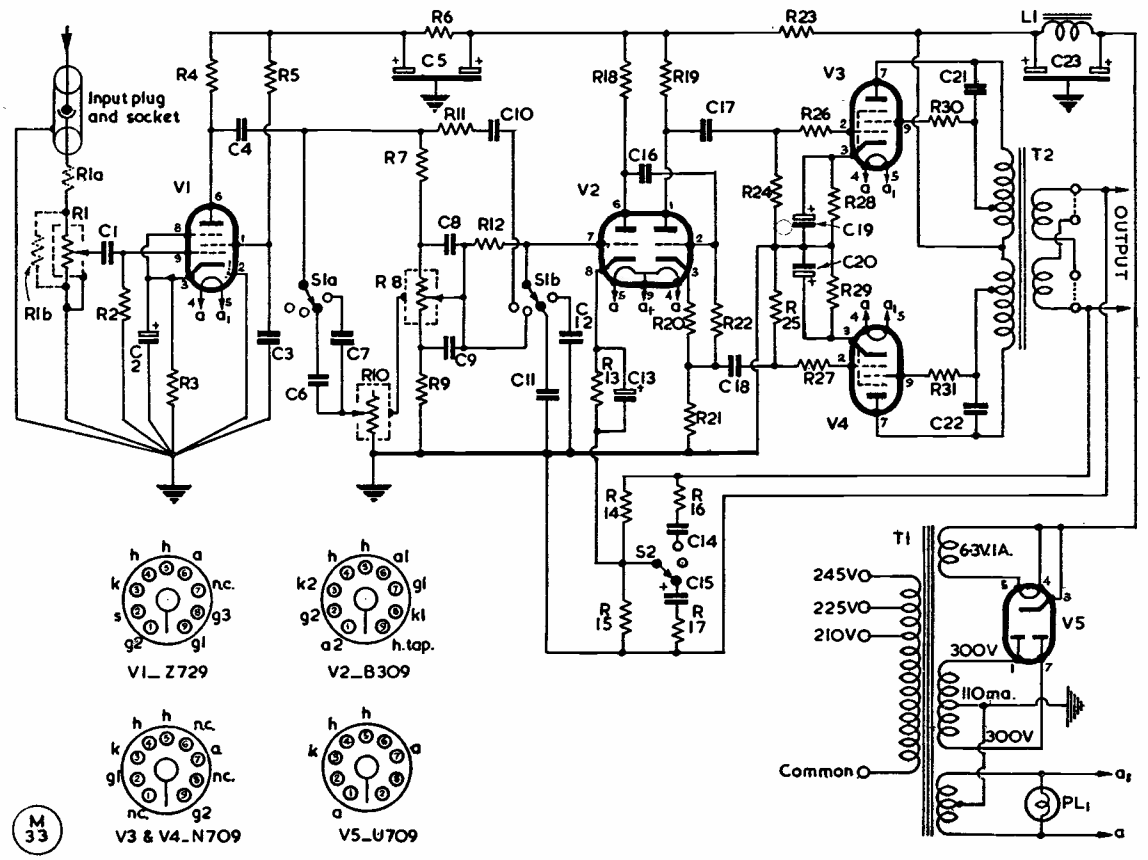


Fig. 1. Circuit of the Osram " 912-Plus " 12-watt amplifier. It can be used for a variety of audio purposes, including that of modulator for a 25-watt transmitter or sub-modulator for a high-power Class-B audio amplifier. The latter possibilities are those discussed in the article. This circuit can be built up as described in detail in the G.E.C. booklet on the Amplifier, or taken for guidance by those who wish to build something similar, to individual requirements ; for this purpose, all values are given in the table.

plug for some other audio purpose. As a sub-modulator, it is within reach for gain control adjustment while the main Class-B modulator it drives can be several yards away, coupled by low-impedance line. This facilitates installation of the Class-B unit, with its high-voltage HT supply, as an entirely separate entity, making for both safety and convenience.

These considerations prompted the experimental layout shown in the photograph, the essential point being the separation of the two units. In the test arrangement, lengths of up to ten yards of low-impedance line (ordinary lighting flex was tried, quite successfully) have been used with entirely satisfactory results.

The Class-B Modulator

The circuit of this, shown in Fig. 2, is designed for Osram DA42's in push-pull. The DA42 is a zero-bias triode modulator type, with a 7·5v 1·2 amp. heater, and, with 1,000v. on the plates, a pair in push-pull will give a maximum

Table of Values

Fig. 1. Circuit of the Osram " 912-Plus " 12-Watt Amplifier

C1	=	.005 μF
C2, C13	=	25 μF
C3, C14	=	0.1 μF
C4, C17, C18	=	.05 μF
C5, C23	=	16+8 μF, elect.
C6, C12	=	470 μμF
C7, C21, C22	=	.001 μF
C8	=	.002 μF
C9	=	.02 μF
C10	=	22 μμF
C11	=	220 μμF
C15	=	2 μF
C16	=	.01 μF
C19, C20	=	50 μF, elect.
R1	=	1 megohm, gain control
R1A, R1B	=	680,000 ohms— 330,000 ohms— potential divider, needer for xtal pick-up only
R2	=	2.2 megohms
R3	=	1,200 ohms
R4, R12	=	100,000 ohms
R5	=	330,000 ohms
R6, R9, R19, R22	=	22,000 ohms
R7, R24, R25		220,000 ohms
R8, R10, R22	=	1 megohm
R11	=	150,000 ohms
R13, R20	=	680 ohms
R14, R16	=	1,000 ohms
R15	=	68 ohms
R17, R30, R31	=	47 ohms
R18	=	47,000 ohms
R23, R26, R27	=	10,000 ohms
R28, R29		220 ohms
V1	=	Osram Z729
V2	=	Osram B309
V3, V4	=	Osram N709
V5	=	Osram U709
L1	=	Gilson 10 Hy. Choke
T1	=	Gilson 300-0-300 v. 150 mA, 6.3v. twice
T2	=	Gilson W0710

audio output of 175 watts for a drive of 5 watts at a peak voltage of 200v. grid-to-grid. The standing (no signal) plate current is 50 mA, and full audio output is attained if the HT supply will give 275 mA at around 1,000v.

These operating conditions are easy to achieve using the "912" as the audio drive unit with a Gilson WO710 transformer (the output type specified for the "912") as the driver transformer for the DA42's. The two WO710's are, in fact, operated "back-to-back," thus making possible the inter-connection by low-impedance line, *i.e.*, on the "912" the output side is the low-impedance secondary, while at the DA42 end, the secondary (low impedance) winding on the other WO710 becomes the primary. The whole thing works out perfectly because it happens that the high-impedance winding of the Gilson WO710 transformer is a perfect match into the grids of the DA42's.

It is fair to say here, however, that R. F. Gilson, Ltd., makers of these transformers, specify their Type 696 as being preferable to the WO710 in the driver position. The result is the same, but the effect is better ! Anyway, the driver transformer shown on the DA42 deck in the photograph is a WO710.

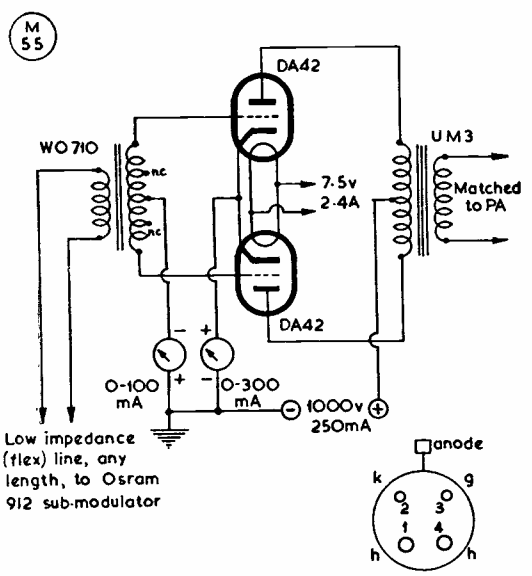


Fig. 2. Circuit for a 150-watt Class-B modulator, with Osram DA42's in zero-bias. By using a low primary impedance driver transformer of the same type as that specified for the output of the Osram "912-Plus" amplifier (used as sub-modulator), the two units can be inter-connected by low-impedance line of any convenient length, as explained in the text. On speech peaks, the DA42's draw 250 mA plate current, with grid current of about 60 mA; the standing no-signal plate current is 50 mA. In the DA42, the heater and cathode are not connected internally.

Modulator Power Supply

Though not shown in Fig. 2, the main power supply items for the DA42's are actually carried on the same chassis as the modulator itself, with an "out-rigger" HT power transformer. A pair of Osram GU50 mercury-vapour rectifiers are across this transformer, which gives 1000-0-1000v. at 250 mA. The only smoothing provided is an 8 μF condenser, the GU50's being protected against switch-on surge by a low-inductance input choke.

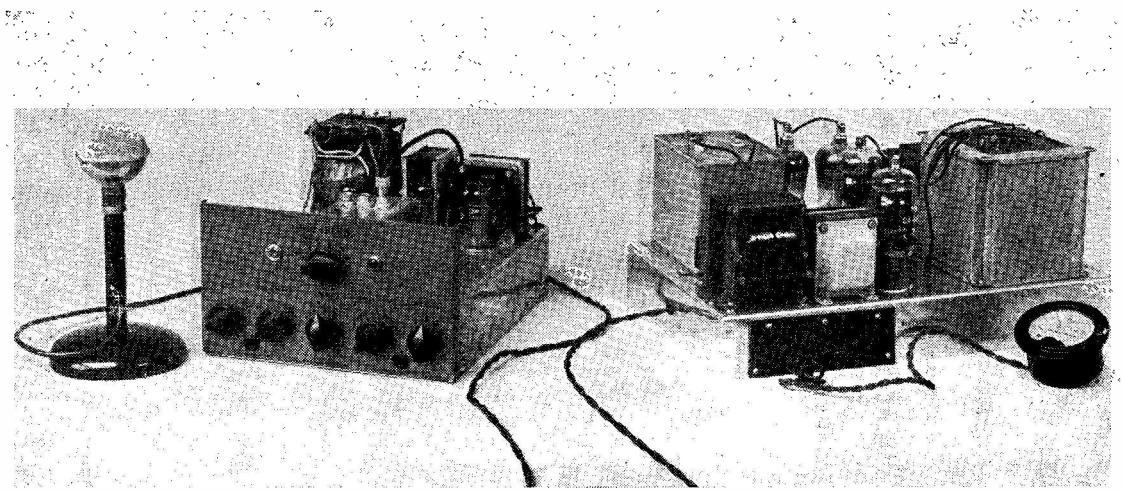
The small panel on the front chassis drop carries jacks for the meters in the grid and cathode returns. With GU50's, a relay must be fitted to cut the HT supply to the DA42's. An alternative is to use Osram U19's, which, at this sort of voltage, can be directly switched on the primary side. As this tends to slow down change-over, another alternative is to heat the GU50's from a separate, well insulated LT transformer, with stand-by switching, by relay, on the primary side of the HV transformer.

Operating Conditions

In action, using the Acos Type 22 crystal microphone, with the gain control (left-hand knob on the "912" panel) about $\frac{2}{3}$rds open and no HT on the DA42's, grid swings up to 70 mA from zero are shown on the meter in the DA42 grid return—*see* Fig. 2. This represents the driving power into the DA42's and in practice ample audio output fully to modulate a Labgear LG.300 is obtained with grid swings up to 50 mA only and plate current peaks of 250 mA.

As connected in the circuit, the meter in the cathode return of the DA42 stage will, of course, read grid and plate currents together; it is necessary either to fit a second meter to read grid drive, or to check peak grid current with HT off the DA42's in order to evuluate peak plate current, if reading only in the cathode. (The reason for putting the plate meter in the cathode return is because, in an experimental layout such as this, it is simpler constructionally and makes the equipment much safer to handle.)

The output of the modulator is matched into the LG.300 (or other load) by a Woden UM3 modulation transformer, which handles it without the slightest fuss. If the full 175 watts of audio of which this set-up is capable is required, then the output matching transformer should be a Woden UM4. Audio power on the output side of the modulation transformer was checked by connecting large 10,000 to



The 150-watt audio equipment discussed in the text. This is an experimental layout and shows, left to right, the Acos Type 22 crystal microphone, the Osram "912-Plus" amplifier (with built-in power pack) used as a driver unit and, on the right, the 150-watt modulator with DA42's in Class-B. Inter-connection between driver and modulator is possible by low-impedance line, considerably simplifying installation, because the output transformer of the "912," with a low-impedance secondary (7 ohms) connects into the same type of transformer with its low-impedance winding used as the primary; the high-impedance side becomes the secondary and is a good match into the grids of the DA42's. The HV power supply, with a pair of Osram GU50 mercury-vapour rectifiers, is built on to the modulator chassis. The Gilson low-to-high impedance driver transformer is between the input surge-limiting choke and the DA42 in the foreground, on the modulator deck. As pictured, this assembly will easily modulate a Labgear LG.300 transmitter fully on all amateur bands.

20,000 ohm vitreous resistors, rated at 100 watts, across the appropriate taps.

Results Obtained

The assembly complete — Acos Type 22 crystal microphone with a lead about 4 feet long, Osram "912-Plus" amplifier built exactly as specified in the G.E.C. manual, with a 15-foot low-impedance (flex) lead connecting into the DA42 Class-B modulator, and a Labgear LG.300 as RF unit—has been tested over a long period on various amateur bands with entirely satisfactory results.

Speech quality is consistently reported as "perfect," with no hum content whatever even at full gain, which is not in any case necessary; running a carrier input of 150 watts, the LG.300 can be fully modulated very easily—as, indeed, one might expect!

Conclusion

This article is offered, not so much as a finalised constructional design, but to suggest one way in which the problem of obtaining high audio power can be approached. The Osram "912-Plus" can either be put together from the very clear instructions in the excellent G.E.C. manual describing it, or is available ready built from several manufacturers. The DA42 Class-B section is easy to construct, involving no snags at all provided the working principles of apparatus of this kind are understood and proper attention is paid to the insulation factor.

"PRINCIPLES of RADIO" — WALL CHARTS

Those who teach radio subjects and appreciate the importance of visual aids will be interested in a set of wall charts showing in clear diagrammatic form the basic principles of radionics. The subjects explained are valve amplification and reception, the valve as a detector and oscillator, and the fundamentals of the superhet receiver. Very well printed, in several colours, they are available at the purely nominal cost of 3s. the set, from Educational Productions, Ltd., East Ardsley, Wakefield, Yorks., and are really outstanding value. The low cost at which these charts can be offered is because they have been produced in collaboration with E.M.I. Institutes, who have been very generous in the matter.

THE ARRL HANDBOOK

The 1956 edition of the *Radio Amateur's Handbook,* published by the American Radio Relay League, is selling faster than ever this year. It covers the subject of radio strictly from the amateur and home-constructor point of view, and is thus essentially practical. Sold throughout the world, it is recognised as the standard guide to the subject. The 1956 edition runs to nearly 600 text pages, not including a large catalogue section of American radio apparatus, which is in itself interesting reading. The whole book weighs about 2 lbs., and costs 31s. 6d. post free; it can be obtained, from stock, from the Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

DX COMMENTARY

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

GB2SM

THIS report covers one of the best periods ever experienced since we started to write this "Commentary," nearly ten years ago. So rapidly has the present sunspot cycle progressed that we might almost be approaching the maximum already. Conditions right now, in mid-April, roughly correspond with those anticipated for the spring of 1958. Where we go from here is another matter! Either this cycle will build up to an unprecedented maximum, or it will stay at a very high level for two years or so, or it will start declining and, presumably, do so very slowly over a very long period. Meanwhile, we have an almost unlimited choice of DX on the HF bands, and, judging by the QRM level, amateurs all over the world are by now well aware of that fact.

Those who have been licensed since 1948 or thereabouts are now living through one of these spells for the first time, and they are discovering (as prophesied) that it is harder to work DX when conditions are really good than when they are bad! What one might call routine DX is all right—there's more of it to choose from—but when a real rare one shows himself, the reaction is worldwide. Only the man with an outstanding signal, or unusual operating ability and cunning, or the one who was just born lucky, will get away with it.

As might be expected, this month the post-bag is much heavier than usual—which means that comments must be on the brief side. New entries for the various ladders are also numerous, and that also is most pleasing. For too long the Five-Band Table has been occupied by the same group, but now we have a nice bunch of G3J's climbing the lower rungs, and we should like to see many more.

CALLS HEARD, WORKED and QSL'd

The DX Bands

It is hard to give general impressions when conditions are so very good, but we have noted in particular the increased activity from the Pacific area. On 21 mc there have been numerous small panics centred round FU8AA, FK8AO, KX6's, VR2's and the like. On 14 mc, YJ1AA and VR1B have set up chain-reactions; VR3B has been called by many W's when he couldn't be heard at all over here. Many other interesting ones will be found under "DX Strays," towards the end of this Commentary. In the routine line, W6's and 7's have been workable on 14 mc nearly every morning as late as 1000 GMT, and on 21 and 28 mc all through the afternoons. VK and ZL have been around 14 and 21 mc at all sorts of times; South America has, as usual, occupied the late-night specialists. Anything else might crop up at any time, and the REF Contest brought out activity under such prefixes as FK8, FO8, FL8, FD8 and FU8—all being chased by stations from every part of the world.

Any general analysis of the situation is thus almost impossible, except to say that the DX is more or less where you find it, and that you will have to be more and more clever to winkle out the rare ones! Any DX-pedition which is publicised beforehand will invariably lead to a tough scramble, but that will not deter the real DX-happy characters who *must* have each new one as it arrives, or die in the attempt. And so to individual reports, band by band.

Ten Metres

Ten has naturally been the most variable of the bands, and has been "out" for longer periods than the others. But when it is good it is really good, and, as always, phone is more in evidence than CW. G3DO (Sutton Coldfield) worked FG7XB, YN1KK and ZD6RM (all phone). G3KHE (Birmingham) joins the Marathon Ladder, and reports contacts with

CX, PZ1 and ZP on phone.

New ones for G2CDI (Stokenchurch) were XE1FU, VR2CG, MP4QAL, VK9BW (New Guinea), VK9DB (Papua), ZD8SC, ZD7C, PJ1AA, SVØWE (Rhodes); a lot of other DX was worked, and a new two-element beam helped. G2CDI makes a comment on the method of scoring for the Marathon, which, we think, is answered by the fact that it is shifted round every month: In March, the order was decided by the total number of countries worked (both bands); in April, by the 21 mc figure; and this month it is in the order given by the 28 mc score. Next month it will again be decided by the totals. This should keep those interested on their toes on both bands.

G3FPQ (Bordon) has worked the following on 10-metre phone: CR7AF, EA9AZ, HH7W, HK3AB, ET2MZ, MP4B, K and Q, PJ2AA, TI2AFC, VR2KB, 3HAG, 5RR, 6PV, 7NF, VK9BW, XE1FU and ZD3BFC; so far this year, he has raised 56 countries on the band. G3FXB (Southwick) is plagued by the local Decca transmitter, but during certain periods he managed to get in with such DX as ET, HP, MP4, TG, VR2, VQ5, ZD3 and the like on phone, plus CR6AI, UC2KAB and ZD6RM on CW.

G5BZ (Croydon) reports CR7, CX, ZD3, ZP5 and EA8 on phone, with KZ5KA and crowds of W's and VE's on CW. G5FH (Oldbury) has worked all Canadian districts (VO to VE8), W7, LU, HK, KG4, ZD3, VP1 and VP9, as well as having a 30-minute QSO with ZL2AT at 1900 GMT! In a later letter he reports the skip as having moved more from East Coast U.S.A. to the West, and W6, W7 and VE7 have been worked in quantity and at terrific strength. All on phone, by the way!

G3CMH (Yeovil) is troubled by a radar beacon, but worked CX, PY, VP6 and W's; called unsuccessfully were CR5SP, VU2EJ and ZD8SC.

G3HCU (Chiddingfold) raised three new ones — SVØWX, YV5AB and FB8BP.

Fifteen Metres

There has been a little more bait for the CW man on *Fifteen* this month; we should say that on this band activity is just about equally divided between CW and phone. G8KU (Scarborough) has added several new ones to celebrate his return to the Five-Band ladder, including HE, OQ5, CR6, EA9, HZ, YV, VS6, MP4Q, ZB2 and such. G3DO tells us that he can be included in the "select list of G's who worked FS7RT" on the 21 mc band last month; a phone contact (S8 both ways) did it.

G3KHE collected VK9 (Papua), CR9, DU, KR6, KH6, MP4's, VU, VP4, ZB2, and, we note, another one for FS7RT! G2CDI's bag included FB8BZ, KX6ZB, DU6IV, ZD8SC, ZD3BFC, ZS7C, CR5SP, HR1LW, VK9DB, HB1OP/HE and some "scatterbacks." Among others worked (but not new) were VP8, KA, VR2, HP, KL7, CR9 and "all the usual."

G3JJZ (Compton Bassett) worked FQ8AG, OQ5CP, KL7, ZL and EL2FC/MM, who is ex-G3GPZ; he also spent quite a lot of time fruitlessly chasing FU8AA, who just then was only interested in F or FA stations.

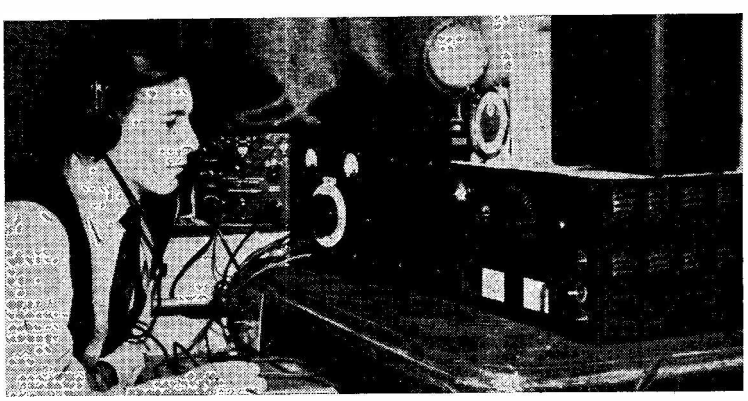
G3FPQ christened his new 813 PA, and the very first call on phone brought back ZD8SC for his first QSO on any band! Other phone contacts were CR5SP, HP3, KG1, KL7, FB8BZ, MP4's, VP2DA, 5EM and 8BP, VK9DB, VS2DB and ZD3BFC; CW fetched in a UB5 and a UC2.

G3FXB's phone got out to KA, KG1, KL7, KR6, KX6ZB, MP4QAL, OY2Z, ST, VP2DL, VK9BS, VP5RR, VQ6LQ and ZS7C; CW netted KR6SC and UC2KAB; gotaways here were VP1EK and VP3YG (phone) and FU8AA and ZD9AD (CW).

G5BZ raised VE8WN, all W districts, all VE except VE6, UC2, VK and ZS4, on CW. G6VC (Northfleet) put up his score with MP4B, MP4Q, OA, UB5, ST2 and others.

G3CMH spent most of his time on 15 metres, trying out a two-element rotary which obliged to the tune of CE, EA8 and 9, HC, HH, KG1, KL7, MP4K, OX, TF, UQ2, VP4 and 6, ZD4 and ZP5; among those missed were ET3GB, HR1LW, KH6's, VK9's, VP5 and 7, YN, SV6SP, ZD9AD and ZS9. Yeovil Club members heard VP8BP and 8BS, both operated from the Royal Society Base on the Weddell Sea. G2YS (Filey) has been working W6 and W7 regularly, and spent a lot of time chasing KX6AF.

G3HCU booked in a big batch of new ones, including CR5SP, EL2D, HR1LW, PJ2AO, SVØWE, VK9DB, VP5RR (Caicos) and ZS9G, all on phone. He also had a very good contact on April 13 with VP8BP at Halley Bay, Caird Coast (about 1000 miles south of Graham Land), who is, of course, with the expedition. This, presumably, counts as Antarctica, and G3HCU wonders whether it was a "first." A late note tells us that he also worked three ZL's and a ZP between 0100 and 0145



G3KDA, Bidford-on-Avon, Warks., was first on the air in December 1954, from N.W. London. He now runs a 150w. transmitter, on 20 metres with a ground-plane and on 80 with a 134-ft. doublet; 64 countries have been worked on the latter band, and one station, VE1ZZ, on no less than 32 occasions.

GMT, April 15 — the ZL's *via* the long path, of course.

DL7AA (Berlin), working hard for the 5-Band Table, put his score up with CX6CM, XE1PJ, VP3YG and VP8BL.

Twenty Metres

Good old *Twenty* has been full of worldwide DX practically all the time, and very nearly throughout the twenty-four hours. The familiar sound of W6's at fantastic strength between 0600 and 0900 is once more with us; KH6's and KL7's pop up at all times; VK's and ZL's mix it with the others. And when a real rare one shows up, he is often as strong as anything else on the band. Only the sleepless wonder can hope to catch up with it all.

G3DO raised FO8AB and ZM6AT on phone, as well as VR1B on CW. Heard but not worked were FU8AC, VR2CO and 2CZ, and ZK1BL. G3FPQ had phone QSO's with HK3, PJ2, TI8ECH, VP1JH, ZD4BT, HH's and YV's. Best on CW were OY1R, KB6BA and VQ1EQ.

G3FXB talks mostly of DX *not* worked, such as KC6AL, FU8AA, VR1B and VR3B, all driven off the air by wolf-pack tactics, or else buried under W's. Two hours spent on FS7RT were not rewarded, either, and G3FXB came to the conclusion that rare DX wasn't worth the trouble on this band.

G5BZ managed to work KH6, CE, JA, VQ3, KR6, MP4, CX, VQ5, VP5BE and VS2CP (the latter at 0830 GMT); gotaways, though, were FU8AA (CW), FU8AC (phone), FK8AH, VR1B and VR3B! G3JJZ collected JA's, VS6, DU, ZD9AD, VQ1EQ, VQ3FN, VK4SD, TF and ZS, many of which were new ones for him.

G3KMQ (Compton Bassett) worked ET's, VQ1EQ, TF, 4S, VQ5, JA and PI1LS/VP1LS. (We should like to know more about the status of this last one.) Magnificent gotaways were VR1B, FK8, FU8, VP2LH, FB8BR and, alas, many others. G3KOC (Barrow-on-Humber) put out 15 watts on the band and got back a 579 from a W2.

G2PS (Westbury) raised VR1B (0755 on April 13) with reports of 339 each way. As it happened, conditions were not good at that particular time, but G2PS says that other stations on the frequency were very co-operative, which was a pleasant experience.

FIVE BAND DX TABLE
(POST-WAR)

Station	Points	3.5 mc	7 mc	14 mc	21 mc	28 mc	Countries
DL7AA	719	102	160	220	125	112	225
G5BZ	640	64	115	236	132	93	237
W8KIA	617	61	145	255	51	105	225
G3FXB	576	67	124	190	133	62	201
G4ZU	534	12	45	215	138	124	222
W6AM	494	30	58	264	85	57	264
G3FPQ	456	52	64	145	124	71	169
G2YS	428	61	79	146	87	55	162
GM2DBX (Phone)	382	33	31	158	79	81	169
G3ABG	364	45	83	157	49	30	165
G8KU	364	23	52	161	53	75	170
W6AM (Phone)	323	13	32	218	39	21	218
G6VC	267	27	33	126	54	27	122
G3INR	252	43	51	101	38	19	112
G6TC	230	17	61	113	12	27	122
G3IGW	211	40	53	64	45	9	88
GM3EFS	209	25	39	97	27	21	107
G2DHV	175	19	25	112	7	12	113
MP4BBW (Phone)	153	1	4	45	56	47	81
G3JLB	151	30	25	46	28	22	71
G3HSM	129	14	43	44	25	3	63
ZB1HKO	110	18	21	45	15	11	49
G3JJZ	109	21	31	48	7	2	58
G3GZJ	104	17	27	31	23	6	47
G3JVJ	97	7	46	25	11	2	57
GM3DOD	71	10	15	36	9	1	40
G3HEV	47	8	19	16	3	1	28
G3IDG	44	11	10	6	1	16	26
G3JSN	29	13	8	5	2	1	17

21-28mc MARATHON, 1956

Station	28 mc.	21 mc.	Total
VQ4RF	80	74	113
G2CDI (Phone)	67	112	122
MP4BBW (Phone)	45	47	61
G5BZ	37	62	75
G2DC	28	47	56
G3HCU (Phone)	27	90	98
G3KHE (Phone)	12	47	51
G3GGS	11	18	24
ZB1HKO	8	15	20
G3GZJ	6	14	20
GM2DBX (Phone)	4	37	37
G3IGW	3	14	17
G3JVJ	2	11	11

Forty Metres

With all the attractions of the other bands, it isn't surprising that *Forty* should be deserted by the DX fraternity. However, there are a few reports.

G3JJZ raised all W districts except the 5th — best was W6GAL/7 in Arizona. G6VC worked CT2 and VQ2J. G5BZ made it a new one with ZD3BFC, by arrangement.

G3FXB worked VQ6LQ on the band for a new one, as well as VQ4, ZD2 and ZD4. G3FPQ thinks 40 metres suffers as much as anything from lack of activity, but his CW brought him in FP8AP, HH3DL, KV4AA, PJ2AK, VP4TM and 6LS, SVØWK and some PY's.

DL7AA reports that LB9PA/P is on Spitzbergen, and active around 7020 kc.

Eighty Metres

Brief notes include QSO's between G3FPQ and KP4, KZ5, W's and VE's. But he *heard* PJ2, PY, VP1 and KV4 also on the band. G5BZ, again by arrangement, raised ZD3BFC up here. Just before the sked (2300) ZD3BFC called CQ and not a soul replied!

G3JOM (Ripon) raised VQ2J with only 15 watts, just after midnight. G6VC got an EA for a

new one on 80 metres.

Until June 1, GM3GZA will be operating on this band from the Outer Hebrides (Mangersta Radio Station, Isle of Lewis). At present he is on 3510, 3520, 3550, 3580 and 3725 kc. He will also be on harmonically related spots on 40 and 20, but unfortunately can't work Top Band owing to 150-kW Loran interference from next door!

Top Band Topics

On the subject of real Top-Band DX, W1BB's final report on the Trans-Atlantics shows that this season's poor conditions prevailed right to the end. On February 26, G5JU, G8IL and HB9CM worked their way through from Europe ; on March 4 and 11 no Europeans were heard on the other side ; and on March 18 no DX whatever could be received, partly owing to the static noise caused by a heavy blizzard. March 25 was plagued by another blizzard, but W1BB managed to make contact with G3FPQ.

Other items of news and some statistics concerning these tests: Several DL's obtained special permits for them, and hope to repeat it next year. DL1DA was using 10 watts and an abandoned power line for an aerial. Taking part on the other side were 16 WI's, 24 W2's, 16 W3's, 17 W4's, 6 W5's, 3 W6's, 2 W7's, 23 W8's, 17 W9's and 8 WØ's. Other countries involved in various ways included G, GD, GC, GM, VP, KZ5, KP4, TI, EI, GI, LU, OA, DL, XE, YN, OK, KV4, SP, HR, HB, HE and KH6.

In short, the Tests were very well backed up, but conditions were as bad as they have ever been known on the band. The Loran which troubled the East Coast Americans on 1850 kc has been proved to be a temporary gimmick in use by the U.S. Navy, which may not be there again, although the area 1800-2000 kc is strictly a U.S. Government Loran band, shared with amateurs.

Once more we pass on our sincere thanks to W1BB for keeping the pot boiling so efficiently on the other side, and our regrets that conditions were against U.K. stations. For that our 10-watt limit is partly to blame, with a certain amount of responsibility also laid on the phenomenally cold weather we had at the beginning of the year.

W1AHX at West Falmouth, Mass., has a rhomic, a Sterba curtain and a Vee-beam, and is keen to cross-band with G's on 11-metre phone. As W1AHX says, it is too often forgotten by G stations that the W's have a narrow and relatively QRM-free phone band at 26.9-27.23 mc (" 11 metres ") from which they listen for replies (which they seldom get!) in the U.K. 10-metre phone band, 28.2-28.5 mc. W1AHX is operational on all bands 160 to two metres, CW and phone, and runs 150w. to a BC-375, or 120w. with a Collins 32V1. His receiver is a National 183.

Coming back to the more normal uses of the band, we all have to thank GM3IGW/A and GW3BHT/A for successful expeditions at Easter. The former also turned into GW3IGW/A (Denbigh) for his " mystery trip," after giving the customers Wigtown and Peebles. The latter was on from the county of Montgomery.

G3IXA (Leamington Spa) raised them all, as well as several nice GM's. But he thinks calling CQ has turned into a disease, and numerous aimless CQ's blotted out weak GM stations. Do the culprits forget to switch on their receiver before calling, or do they all need hearing aids? G3IXA, by the

way, is a recent WABC claimant.

So is G3KOG (Ulceby), with a transmitter copied from the Beginner's CW Tx design, as described in our September 1955 issue; on this he has worked 16 OK's and HB9CM. G3JHH (Hounslow) raised the expedition stations and improved his score accordingly; he has his card from HB1CM/HE, too.

G3BRL (London, W.5) added Wigtown and Peebles to his list.

TOP BAND COUNTIES LADDER

(Starting Jan. 1, 1952)

Station	Confirmed	Worked
G2NJ	97	97
G5JM	97	97
GM3EFS	96	96
G3JEQ	93	94
G6VC	92	94
G3EUK	91	93
G2AYG	86	87
G3JHH	83	85
G3BRL	81	83
G3HEK	79	88
G3GGS	79	83
G3KEP	76	76
G3ABG	75	79
G3FTV	74	82
G3DO	74	74
G3AKX	72	73
G3IXA	71	83
G3JJZ	71	76
G3FNV	65	74
G2CZU	63	67
G8KU	63	65
G3KOG	61	65
G3FTV/A	60	69
G3KKZ	60	64
GW3HZZ	60	63
G3JNX	60	61
G3EJF	57	64
G8CO	56	67
G3KLP	48	52
GM3JZK	46	55
G3HQT	39	44
G3ICH	32	51
G2HDR	28	48
G3KMQ	24	54
G3JZP	20	42
G3JME	16	25
G3JSN	13	27

GM3EFS (Alexandria) tells us that GM3KBZ, although we referred to him last month as Glasgow (his postal address), is well and truly in Dunbartonshire. He adds that there is no lack of GM activity, at least a score of stations in 14 counties being regularly on the air.

G3KOC (Barrow-on-Humber) had HB9DB back to a CQ and thanks G3IGW for the three new ones. G2CZU (Bath) does likewise, and his Easter DX made him very happy; he worked G3IGW/A in Peebles on phone, bringing his phone total to 38 counties. A phone WABC does not seem out of reach, as he says.

G3EJF/3JZP (Tottington) had a glorious last fling at Easter before taking the long wire down for the summer (cows now graze where the half-wav used to be). They both worked G3IGW in all three counties, and G3JZP nailed six other new ones in addition.

G3KMQ (Compton Bassett) worked from his home QTH in Berwick-on-Tweed during his Easter leave, and raised G3GIO, who lent him the crystal, on the first QSO! He also operated as GM3KMQ/Midlothian, but did not have a single contact.

Last month we inadvertently referred to G3ICH (Leighton Buzzard) as ex-DL2CH instead of DL2SU, for which we apologise. He, too, collected the points from the Easter expeditions, as well as Cumberland, Inverness and Aberdeen and GM3GZA in the Hebrides; he says the QSL situation is very poor, but *not* from GM counties, which have responded 100 per cent.

G6VC puts his score up to 94 with Wigtown and Peebles, and now needs only Perth and Sutherland to complete the GM's.

G3GSZ (Birkenhead) is on the band with a handful of milliwatts from an all-transistor outfit—home-made transistors, too—on which he recently received a listener report (349) from Prague; at the time he was working a station in Staffs. He wonders whether this is a DX record for transistor operation? (Yes!—*Ed.*).

The only home report of distant DX on 160 metres this time comes from G3FPQ, who confirms that he worked W2PP on March 18, also W1BB and ZB1BJ on March 25, when he was called by W2EQS. On April 8, G3FPQ was being called by KZ5FA, but this was a sked and no actual QSO resulted.

Miscellany

E. Elsley (S.T.S. *San Florentino)* writes from Australia for this month, and reports that conditions south of the Equator were not good when he was last listening. However, on Fifteen he heard sundry Europeans, with G3FXB as the only G up to March 10, after which he logged G3HCU, G3DO and G3KFT. He also mentions that SM8CSH/MM is on the tanker *Petro Emperor,* and he was heard working G's from the Persian Gulf.

G3FXB passes on the news that ZD8SC is on both Fifteen and Ten; he will not answer on his own frequency and cannot possibly respond to SWL reports. Also that ZE3JO and two VQ4's are taking a B2 to VQ1 in the near future; that KC4USA is active from the South Pole (?) on Fifteen; and that W4NQM has worked 143 countries on Fifteen phone. W4NVM has worked 11 on Fifteen phone in less than a year's operation and with only 30 watts—no mean achievement amid the W QRM.

VK1RR (Antarctica) complained of not raising enough DX with that call, and was subsequently heard signing VR1RR, South Seas! Rather a long way from the real VR1 territory . . . and why do it, anyway?

The Overseas Mail

VQ4AA (Nairobi) is probably the only station in the world located on a train; he works with a portable rig running 35 (battery) watts to an 807, and always a whip radiator. The railway coach shack, also used as his home and office, moves around covering about 500 miles a week behind freight trains, and the 24-volt battery is kept well charged by a generator, belt-driven from one of the axles.

Mobile working is never attempted, since severe static is caused by the air brake and by friction when the train is in motion. Stationary operation with the little rig keeps phone going on 14, 21 and 28 mc, and in three weeks before writing VQ4AA had worked 47 countries, the best being KH6ZA, ZD9AD and CE3MJ, all on 21 mc phone; as well as this, a regular sked is kept with G3HXQ and G3HXN in the "home town."

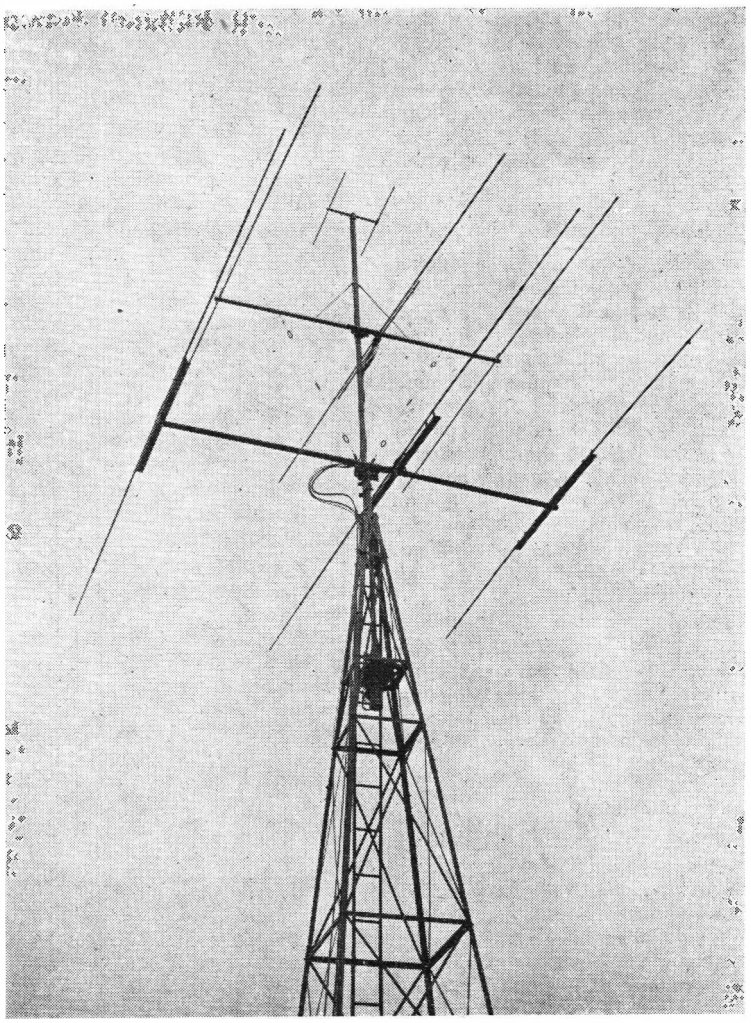
VQ4ERR, 4AQ and 4RF continue to keep Kenya on the map by winkling out most of the rarer countries. It is said that if VQ4AQ ever decides to start collecting certificates, some of the cards he can produce will cause quite a stir . . .

W8KIA (Defiance, Ohio) pushes further up the Five-Band ladder and says he hopes to get really moving on 21 mc now. He has been raising a few new ones on 28 mc, too—heard MP4KAC there on phone the other day, but he got away.

VQ5GC has been on 3.5 and 7 mc, but hasn't raised any G's as yet; he would really like to work one on 80 metres before the rainy season starts up the QRN; so listen for him, 3515 kc, during the small hours GMT. As soon as Neville gets some portable equipment together, he will be making trips by car into OQ5 and OQØ, his XYL driving so that he can operate while on the move; he will also take the QRO rig and operate from the hotel on arrival. Finally, he has tried to get permission to use 1.8 mc, but has had no luck as yet.

ZB2Q (RAF New Camp, Gibraltar) is without a transmitter at present, but has done a little listening with an R.1475 and has logged G's and Europeans on 14 mc. He hopes to be on with 35 watts before long.

W6AM (Long Beach) still manages to find time to get his logs up-to-date, and the result of his latest effort is to increase his Five-Band score by roughtly 80 points! Don has now reached the incredible figure of 264 countries on 14 mc, and has nothing further to look for except DX-peditions in new, uncharted ones!



All set for the DX. G3BG (Breaston, nr. Derby) has recently completed this fine assembly. The tower is built of 1½-in. mild steel angle, and is fitted with an access ladder. The beams are 3-element for 10 and 20 metres. G3BG remarks that "DX is no problem now"—we can well believe it!

From the "Malayan Radio Amateur" we quote the following: Only eight of the 77 amateurs in Ceylon are authorised to use 100 watts, the rest being restricted to 20 watts . . . VS6BE hopes to be on shortly with his Collins KWS1 . . . VS6AE was first licensed in 1929 . . . VS6CG was VE5DN in 1929, XU1DN in 1931 and XU6F in 1932 . . . XW8AB has been ill, but hopes to be active again on 14 and 7 mc shortly.

VQ8CB is radiating from Diego-Garcia Island on 14 mc phone . . . VS4NW, ex-ST2NW, is active on 14 mc phone from Kuching . . . ZC5CA is at present in Edinburgh on leave.

From "South Coast QRM" (ZS5-land) we extract the following: Old Timer ZS5U has just received two certificates—the WAA and the award for the leading station in the Union in the 1955 ARRL DX Contest (CW) . . . A special station, ZS5MHF, was on the air during the Hibiscus Festival (March 24 to April 2) and contacts were rewarded with a very attractive QSL.

MP4BBK (Bahrein) continues active on the HF bands, and mentions raising ZD9AD on Ten,

and KV4BB on Fifteen for two new ones. Most of his time is spent on Ten, phone, where he finds the South Americans showing up in increasing numbers. Out there in Bahrein both Fifteen and Twenty are very lively at 0200-0300 GMT.

Five-Band Centuries

In the March issue we quoted DL7AA's scores and pointed out that he had DXCC on all five DX bands, and was possibly the first station in the world to achieve this. In so doing we innocently stuck the neck out, and we now have to retract it! G6ZO (Edgware) needs no introduction to the DX chasers, but we didn't realise that he had completed the century on all five bands way back in 1954; he can claim 108 on 3.5 mc, 150 on 7 mc and 253 on 14 mc, the other two bands both being well over the hundred mark. And he adds that he thinks W4BRB, EI9J, DL1FF and possibly W2QHH have all done it, too, some of them possibly before G6ZO. We praise these famous men, and keep the neck well tucked in!

New Certificate

VQ4RF passes on the following details of the new certificate offered by the Radio Society of East Africa, and known as the WAVQA Award. It will be available to amateurs who can produce the following QSL's: 1 from VQ1; 10 from VQ2; 5 from VQ3; 20 from VQ4; 5 from VQ5; 1 from VQ6; 1 from VQ8 (Mauritius); 1 from VQ8 (Chagos); 1 from VQ9. For any missing card from the above series, five extra confirmations from *any VQ call areas* may be substituted.

QSL's are to go to VQ4RF, Box 264, Nakuru, Kenya, with six shillings sterling or the equivalent in foreign currency (U.S.A. one dollar), or 20 IRC's. QSL's must be accompanied by a check list; all contacts must be after November 1, 1945; a minimum readability report of R3 and a minimum tone report of T8 are required. Phone-to-phone or CW-to-CW.

Members of a radio club need not send QSL's but may submit a list, certified by the secretary of the club concerned, as a true copy from the log.

DX Strays

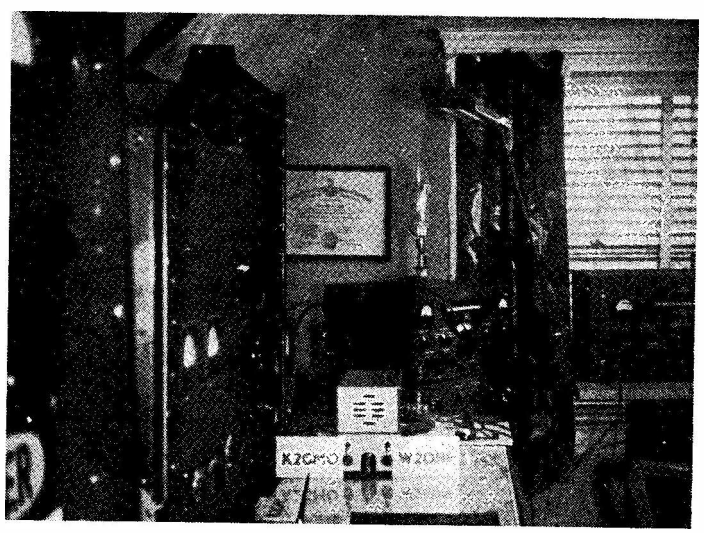
From "The DX-er" (Northern Calif. DX Club) we quote the following concerning FS7RT: W6ITH left New York on a Monday, with his KWS1, 75A4 and a 1.5 kW "putt-putt" power pack aboard a DC7 heading for St. Martin; on the following Wednesday he was sending his first "CQ de FS7RT." Reg says you can *read* all about the thrills of the first CQ from a DX spot, but having it happen to you personally is beyond all description. "From the instant the first call went out, it was like being in the middle of a huge beehive, and it stayed like this the entire time."

He worked 3012 stations, about 1000 of them on CW and the rest on phone, mostly SSB. As a matter of courtesy and reciprocity, he tried to work all the French possessions and French stations possible, and thereby collected FL8, FD, FR7, CN8, FO8, FA and so on. Other good DX included such rare stuff as CR8, all the MP4's, VU5, UC, UF, UH, UP, UQ, UR, ZA, ZD1, ZD3, SV (Crete), SV (Rhodes) and what-have-you. DXCC was made very easily, both on phone and CW.

Back at home, Reg finds his place stacked up with a huge mail, including direct air mail QSL's from behind the Iron Curtain, and many long overdue ones for QSO's with W6ITH! He intends to QSL to all, card for card, so sit tight and don't worry—you lucky ones who worked FS7RT. And his cards will be reproductions in full colour of an oil painting of a typical scene on St. Martin, done by his XYL, Louise, who was with him on this epic trip.

Other news from "The DX-er," somewhat truncated: FS7AA was W2BBK . . . KJ6BJ is active (Box 65, APO 105, San Francisco . . . W6MHB and W6HNX have a Caribbean assignment and may show up from HH, HI, VP2 or somewhere . . .

It is well-known by now that Danny Weill and his *Yasme* duly arrived in the British Phoenix Islands, whence he has been active as VR1B. Several dog-fights have been logged around 14080; at 1000 GMT one day he was working strings of SM's, OH's and DL's but we in Southern England couldn't hear a squeak from him.



W2OHF/K2GMO is a partnership station in East Orange, New Jersey, and runs a kilowatt on the 7 and 14 mc bands, using 4-125A's in push-pull. One of the transmitters in this picture is a Collins KWS1, which covers 3-30 mc, running 1 kW on CW and 600 watts on AM phone or SSB. The receiver is a Collins 75A3, and aerials a 3-ele beam for 14 mc and dipoles for the other bands. K2GMO and W2OHF operate the same station but have different interests; the former is the DX man, with 167C worked and 123 confirmed in a year on CW, while W2OHF is keen simply on operating and taking what comes.

although the others were giving him 569; his next spot for the propogation of dog-fights will be Nauru, signing VK9TW.

SWL I. E. Hawes (Aldershot) reports that SVØWN is now to be legally operated from Crete, using 500 w. He heard this reported by SVØWO on 14 mc.

YA1AM requests that all QSL's shall be sent *via* bureaux only—if sent direct they will put him off the air for good.

FB8BR/FB was the first station ever to operate from the Comoro Islands (February 23 to March 1); he hopes to return from time to time . . . Another rare one is Aves Island, Caribbean (YVØ) and there is a buzz of a possible expedition during the first week in July . . . Tromelin Island now qualifies as a separate country, and activity may be expected from FB8BK and possibly others.

YJ1AA and YJ1RF have both been active on 14 mc CW (we heard a pile-up around YJ1AA, 0930 GMT, 14090 kc) . . . VP5SC is now on Ascension Island and operating as ZD8SC . . . W7FNK/FO8AI plans a South Pacific trip and may get to ZM7 or Nauru, or somewhere . . .

VQ8CB is due to return to Port Louis, Mauritius, in August, leaving the Chagos Islands unpopulated (from the radio amateur point of view); he may finally go to New Zealand . . . VR2CS is active on ten-metre phone (28300 kc) . . .

G2RO, on his travels again, has been signing VS9RO; he hints at the possibility of operation from VQ7 and VQ9 . . . FG7XB has been heard and worked on Ten (28300 kc, phone) . . . K2HGU/KW6 (14030 kc) has been putting this rare spot on the air again.

Norwegian stations no longer use LB as a prefix when they are working portable. Instead, they sign LA../M when on ships, LA../G for possessions in Antarctica, LA../P for Arctic territories (Svalbard, Jan Mayen and so on), and LA../.. with a letter for portable stations in the different regions of Norway.

Thanks, for many of the above items, to the West Gulf DX Club, W6YY and KV4AA.

Dead-Line

And that runs us dry on this offering—we look forward to next month's mail being even heavier. Dead-line for this feature in the June issue will be **Friday, May 18,** with all your DX notes, news and claims addressed: "DX Commentary," *Short Wave Magazine,* 55 Victoria Street, London, S.W.1. For the July issue, the "due date" will be *June 15,* which should give our overseas correspondents time to get their airmails in. For the nonce, 73 and GL with the rare ones.

AMENDMENTS and CORRECTIONS

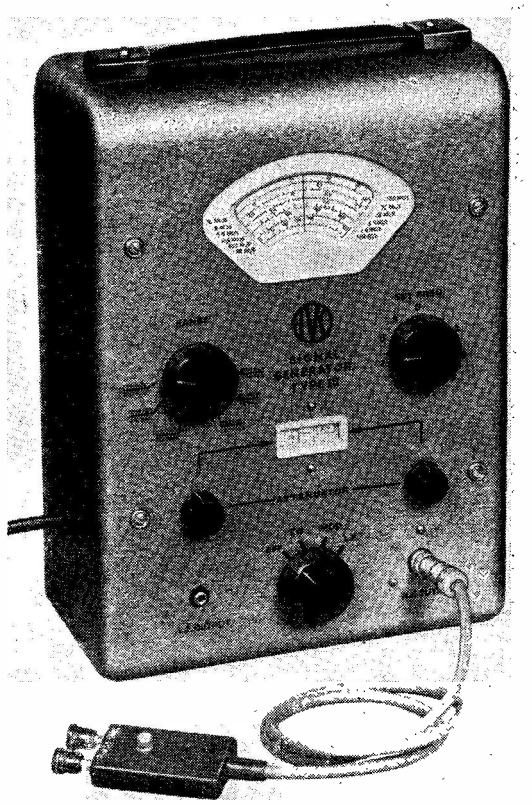
In the circuit on p.65 of our April issue ("Self-Contained VFO Unit"), there should, of course, be a connection from the junction of C17, RFC into the grids of V3.

On p.96 of the same issue, in the circuit of Fig. 5, the upper + SHT line should be shown connected to the junction of the upper of the two voltage stabilisers with the resistor immediately above it.

With reference to the article on p.98, April ("On Learning Morse"), we are informed that the Columbia Morse records DB1995—DB1998 are not easily obtainable, as they have been "out of print" for some time. We are looking into the possibility of a further, or alternative, source of supply for such records, and a note will appear in due course.

REGULAR FEATURE on SSB

We hope to commence, with the June issue, a feature under the title of "SSB Topics." It will appear every other month and will cover not only SSB activities and operation, but also the technical aspects of single-sideband working. We feel sure that "SSB Topics" will capture the interest and have the support of all SSB operators. It will be in charge of R. L. Glaisher, G6LX, who is himself an active exponent of the art of SSB.



The new AVO Signal Generator, Type III, covers the very wide frequency range of 150 kc to 220 mc, in six directly calibrated bands. The outputs provided are unmodulated RF ("CW"), modulated RF (1,000 c.p.s. note superimposed), and an LF output also at 1,000 cycles. The RF output, into an entirely new design of attenuator, is variable over a wide range, and the calibration accuracy is ±1%, with a very low RF leakage factor.

THE SPRING MOBILE RALLY

NORTHAMPTON—
SUNDAY, APRIL 8, 1956

Forty-Five /M's on The Park!

ENTHUSIASM for the art and practice of mobile working, and a high level of collective know-how in its application from the technical point of view, were the key-notes of the very successful Mobile Rally held at Overstone Park, near Northampton, on Sunday, April 8. A large attendance was recorded—probably, by tea-time, including visitors and friends, not less than 200 people were present.

The *venue*, centrally situated, was ideal for the purpose and the arrangements, made by the Northampton Short Wave Club, excellent in every way. The only factor over which they had no control was the weather—it was a dull, cold afternoon, threatening rain, with a biting wind. The attendance of fitted cars—that is, vehicles equipped for two-way working while on the move, on either the 160, 80, 10 or 2-metre bands—totalled no less than 45, many from considerable distances. Among these, one might mention G3HCK/M from Hurst Green, Sussex; G2ADR/M and G3HSZ/M, from York; G5BM/M, from Gloucester; G3JMY/M, from Bristol; G3IVP/M, from Salisbury; and a contingent from the London area, including G2LW/M, G3DOX/M, G3FZL/M, G3HSE/M, G3IES/M, G3IIR/M and G3JTQ/M. For some of them, it meant a round trip of over 200 miles.

Talk-In Procedure

The Northampton Group had organised this for 160, 80 and 2 metres, with G3GWB/A (the Club's own station) on the LF bands, and G2HCG/A on VHF. Eleven mobiles were worked on two metres and 34 on LF, mainly the 160-metre band, which remains by far the most popular channel for amateur mobile operation.

Procedure was for all mobiles, as they came within range, to make one call from a stated point (the "World's End" public-house) on the main road about 1½ miles from Overstone Park. The field strength given by the signal, in terms of microvolts, was then logged, and this was the basis for deciding the winner of the measured field strength contest, on Top Band and Two Metres. These trophies went to G2CVD/M (Birmingham) for the 144 mc band, and to G3GGK/M (Eastwood, Notts.) for 160 metres.

Two well-known VHF mobiles at the Rally — G2ATK/M (left) and G2CVD/M. The latter won the two-metre field strength contest with the neat little assembly seen here.

After lunch, for which about 80 people had arrived, the cars were toured and the various installations, in particular their aerial systems, inspected and discussed—and, of course, many personal QSO's were made by those who had been working one another on the run to the Rally. Long and deep were the discussions about capacity hats, loading coils and resonating whips, the best methods of mounting, and the problems of power supply. From what your correspondent was able to see in the time available (there were so many /M's present that we could not get round them all!) one of the most interesting installations was that of G3GVF/M (Hartley Wintney, Hants.); this is band-switched transmit-receive on two and ten metres, using home-built gear throughout, receiver control and change-over being on the steering column, with built-in speaker and the microphone on an adjustable mounting arm. A neat installation on a smart car was that of G2ADR/M (York), who can resonate his whip by remote control while in motion. G3DOX-G3KGC/M have a very well-fitted aerial system, consisting of a loaded whip fitted with a capacity hat. The fully-metered Top Band transmitter-receiver assembly built by G3BK/M (March, Cambs.) is small enough to slip between the front seats; his aerial is a resonated whip with a very lightly-built loading coil. On G2AK's car, the two-metre mobile transmitter-receiver complete fits under the facia board, and is a particularly neat piece of work.

Discussing the loading coil on G2ADR/M's 160-metre whip: G3IUF/M (light coat), G2MF and, at near right, G3BK/M. The G2ADR aerial can be resonated by remote control while on the move.

An effective PA system had been installed for the control of events and announcements over the ground, so that everyone was kept in touch with what was going on. In the middle of the afternoon, the treasure hunts were called.

Treasure Hunts

These were amusing, and a most original idea. QRP transmitters, one on two metres and the other on 160 metres, were concealed in the grounds, radiating a tone-modulated signal. The problem was to find the transmitter by driving about until the signal was loud enough for the source to be located, any D/F trickery *not* being permitted. The two-metre transmitter was found fairly quickly by G2AK/M (Aldridge, Staffs.) in a field of about eight competitors. The 160-metre transmitter was run to earth by G3GXZ/M (Wigston, Leics.) against some 20 other entrants, and took rather longer to locate.

During the afternoon, a small committee of three went round all the /M cars to decide the winner of the *concours d'elegance* — the best-looking car with the most effective and tidily fitted mobile equipment. It is no exaggeration to say that this was a hard task for the committee ; there were some extremely smart and well-maintained cars, with excellent installations. The winner of this event was adjudged to be G3ATL/M (Hugglescote, Leics.), with an 80-metre rig in a very well turned out Ford Consul.

It was overcoat weather for the Mobile Rally on April 8 last, organised by the Northampton Short Wave Club at Overstone Park, near Northampton. This is a view of part of the car park at mid-afternoon.

By tea-time, the number of cars in the Rally park had increased considerably. During tea, the prizes for the various events were presented, and tickets drawn for the raffle, for which several firms and organisations had made suitable donations. By six p.m., most cars had started homeward, carrying with them the recollection of a very enjoyable and interesting event ; the 160-metre ether around 1900 kc was rent by calls of "CQ Mobile," and many QSO's mobile-to-mobile were being made as the cars dispersed on their various ways. On two metres, the /M's were also working each other, as well as those fixed stations which happened to be on that Sunday evening.

Freddy Miles, G5ML/M, was at the Rally, with a two-metre Slot assembly on his car. It seemed to sway rather perilously . . . . !

The Roll-Call

The number of call-signs in the Club visitors' book totals 81, but this does not include all who could have signed in. The operators present with /M fitted cars, worked by the Rally control stations on the run in were, on two metres: G2AK, G2ATK, G2CVD, G2HCG, G3EHK, G3GVF, G3JTQ, G3XC, G5BM, G5ML and G6SN. On the LF bands, mainly 160 metres, the mobiles recording field strengths were: G2ADR, G2FVX, G2LW, G3ATI, G3ATL, G3AWM, G3BK, G3DOX, G3FUR, G3FZB, G3FZL, G3GGK, G3GGR, G3GWR, G3GXZ, G3HCK, G3HEE, G3HSE, G3HSZ, G3HYZ, G3HZF, G3ICK, G3IEF, G3IES, G3IIR, G3IUF, G3IVP, G3JMY, G3JOL, G3JWQ, G3WW, G4FO, G4JW and G8GI.

It is interesting to note that, of all these /M's, twelve were present at the first Mobile Rally at Oxford in October last year. Thus, we see that the

total of known mobile operators is about 60, with probably half as many again, at least, who are active but unrecorded. If they could all turn up at the next Rally, we would have something like 100 stroke M's on the park, which would be *quite* an event in the history of British Amateur Radio!

It would be fair to say that the organisation for this Mobile Rally sets the pattern and the standard for future events of the kind. The whole credit for its success is due to the Northampton Short Wave Club; members concerned can be content that, by their initiative and enterprise, they put on a very good show.

For our part, we would be interested to hear from local groups able to offer facilities for a Mobile Rally to be held in the early autumn.

The Top Band transmitter-receiver run by G3BK/M is in one small box and fits between the front seats. The aerial is a loaded whip, the coil being protected by a tight-fitting plastic bottle with the bottom cut out. On mobile excursions, the XYL drives while G3BK does the operating.

DISCUSSION ON ETHICS

Or, DOES AMATEUR RADIO STILL EXIST?

Scene: **The living-room at DL2TH/2YL. The rig is u/s again and OM-DL2TH is reading "Short Wave Magazine" while XYL-DL2YL writes out QSL cards. He starts the ball rolling:**

DL2TH: "Rather like the look of this new 3-ele beam advertised here; only £25—cheap, isn't it?"

DL2YL: "Huh! Why not buy the lot and have done with it; then you'll be like the rest of them."

'TH: "What's that? Buy the lot? How do you mean, luv?"

'YL: "Well, buy that transmitter you fancied a couple of months ago with the 813 at £150, the beam you've just mentioned, and you have the receiver—then sit back and work all the DX you like."

'TH: "Ah! that wouldn't be Ham Radio."

'YL: "Well, it would appear to fit the bill for a lot of so-called Hams."

'TH: "I don't really think so; it just depends what one wants."

'YL: "Be honest; how many people do we natter with who say 'The rig here is a Super . . . , the Receiver is an XYZ . . . , and the antenna is a 4-ele . . . '?"

'TH: "Quite true, but I like to think that they are in the minority."

'YL: "Even if they are, do you really think that they should get themselves a ticket and use up band space?"

'TH: "Why not? If these types have the necessary qualifications, why can't they buy all this equipment and use it as they like?"

'YL: "I thought Amateur Radio was for the types who wanted to experiment, exchange ideas and get the best out of a few valves, and so on."

'TH: "Yes, but equipment isn't *everything*; a certain amount of operating know-how is necessary to work that rare DX station on phone, for example."

'YL: "Surely that's acquired and most, eventually, get it; anyway, is DX the beginning and end of Ham Radio?"

'TH: "Well, it isn't the beginning and end of Ham Radio, and lots of chaps don't worry if they never work a W. It's nice to work DX, though, in my opinion."

'YL: "OK. Then take the extreme opposite, the type who natters to Joe down the road every evening. Why don't they use the landline?"

'TH: "Yes, but these types have all paid their licence fee and are all qualified and, in my opinion, can use the bands as they like."

'YL: "Is that enough? How many people really *do* experiment with equipment, aerials and so on?"

'TH: "Well, I like to think for every one of the types we've mentioned there are dozens with home-made equipment who *do* experiment."

'YL: "You may be right, but my idea is that nobody should be allowed on the amateur bands with commercial equipment. *They aren't amateurs.*"

'TH: "That closes DL2TH and DL2YL down, then."

'YL: "Why?"

DL2TH: "We use a commercial receiver!"

DL2YL: "OK, sell it; we'll buy a car!"

QUESTION IS: *Who was right?*

VHF BANDS

A. J. DEVON

Report on The Contest—

G5YV "Victor Ludorum"—

Nearly 200 Stations On—

Well-Supported Event, but Conditions Fair Only—

Rules, All-European VHF Contest, July—

THE "U.K. Two-Band VHF Contest," the first VHF event of the season, took place over the week-end March 10-11. As so often happens when we lay on a Contest, conditions were no better than fair, and for most of the time they could only be described as poor.

Nevertheless, there was a good turn-out, and the total of logs received was 42, including the five SWL's. This was rather better than had been expected, because it was quite evident that most people were having difficulty in finding stations at D-distances, while E-contacts were few and far between. In other words, except for a short time on the Saturday evening, conditions never really opened up.

As is always the case when there is a good assortment of entries on which to work, much useful and interesting data can be derived from the logs. Here let it also be said that, with one or two exceptions, the entries were very well prepared, all the detail asked for was given, and the business of checking took very little longer than had been anticipated. There were the usual comic mistakes in arithmetic, and in two cases scores as claimed were too small!

Critical Comment

Before dealing with the results in detail, let us get this out of the way. The general opinion was that the Contest was too long, that it started too early, that it was a bad thing to try and run both bands together, and that the scoring system should have been heavily loaded in favour of the 70-centimetre operators. Other suggestions were that there ought to have been some sort of premium or bonus for CW contacts, that short-distance (local) QSO's should not score at all, and one proposal that a handicapping system should have been devised "to give everyone an equal chance"!

With the exception of the last suggestion, in the main we are in agreement with these criticisms—though it should also be remembered that this Contest was laid on to get things moving and to obtain working data for the staging of future events. Furthermore, had conditions been better, more GDX would have been coming through, so that there would not have been those dull periods during Sunday, when there seemed to be no new stations to work. As regards the two-band feature, this would certainly have been more interesting and effective under (*a*) Better conditions, and (*b*) A scoring system designed to favour the 70-cm operator; the difficulties of two-band working on VHF are unquestioned, but they seem to us to be difficulties to be overcome. As Table II shows, six operators did try two-band, though none of them found much to work on 430 mc.

The phone *v.* CW situation will always be with us; in the old days, the bonus was given for telephony contacts! In the comments on this Contest, the one complaint made more frequently than any other is that of the number of weak and unresolvable phone carriers which would have been workable signals on CW. On the other hand, a number of stations were working both, and which to use will always depend upon conditions, the general level of activity, the direction in which points are wanted, and whether the scoring system favours DX contacts (with weak and difficult signals) or short-haul QSO's (which can be knocked off quickly and for which phone is more convenient).

Favourable Opinion

For the other side of this picture, it is true to say that the majority were pleased with the scoring system and expressed themselves as very well satisfied with their own results, the activity, and the interest and enjoyment that they got from the Contest. Without exception, all who wrote in this vein said they were looking forward to the next Contest occasion.

Out of this whole boiling, what do we get? That the rules (except for 430 mc) were satisfactory; that we are really not yet ready for two-band contest working on VHF; that long sessions are not favoured; and that CW should be used much more than it is.

To your A.J.D., these seem to be very valuable conclusions, and useful guidance for the future.

The Main Results

The tabular matter herewith is a digest of all logs received, excluding "check logs," of which there were ten, with strict injunctions that they were not to be taken into the results. This was a great pity (and a disappointment to us), as in every case they would have made creditable entries!

Harold of G5YV (Leeds) emerges as the outright winner and, since he heads Table II and Table III, is accorded the title of "Victor Ludorum"—he will also get a Certificate of Merit, as will G3KEQ (Sanderstead, Sy.) in recognition of his outstanding performance as a comparative newcomer to VHF activity.

From Table III on p.150 one can extract a most interesting and illuminating statistic—the relative

TABLE 1

TWO-METRE PLACINGS — Rule 2 (a)

Place	Station and Location	Points	Best Distance Contacts	Input	Aerial
1	G6TA, London, S.W.16	252	6 (D)	20w.	4/4
2	G6CW, Nottingham	218	6 (D)	90w.	5-ele
3	G2DVD, Slinfold, Sussex	194	2 (E)	72w.	3/3/3/3
4	G3JWQ, Ripley, Derbyshire	176	3 (D)	10w.	6-ele
5	G4JJ/A, Chesterfield, Derbyshire ...	156	5 (D)	10w.	Slots
6	G5DS, Surbiton, Surrey	155	3 (D)	50w.	12-ele
7	G3WW, Wimblington, Cambs. ...	151	12 (C)	100w.	Slots
8	G3GPT, Nr. Preston, Lancs. ...	146	2 (E)	?	?
9	G3DKF, Coventry	140	11 (C)	22w.	Slots
10	G3GBO, Denham, Bucks.	131	1 (D)	30w.	4/4
11	G3CGQ, Luton, Beds.	121	9 (C)	10w.	4/4
12	G3FIH, Nr. Bath, Somerset	119	12 (C)	75w.	4 d'pls
13	G3IRA, Swindon, Wilts.	112	2 (D)	150w.	Slots
14	G3XC, Slough, Bucks.	104	4 (C)	150w.	Slots
15	G2FJR, Sutton Bridge, Lincs. ...	102	1 (D)	60w.	Stack
16	G3WS, Chelmsford, Essex	78	2 (D)	75w.	Slots
17	G5LK, Reigate, Surrey	71	1 (C)	60w.	4-ele
18	G3HHY, Bristol	64	9 (C)	45w.	4/4
19	G3IEX, Felixstowe	63	1 (D)	70w.	4/4
	G3KHA, Bristol	63	5 (C)	70w.	4-ele
21	G3IUL, Bedfont, Middlesex	50	4 (B)	25w.	3/3
22	G3EEO, Derby	41	7 (B)	15w.	5-ele
23	G2AHP, Perivale, Middlesex ...	39	2 (B)	?	?
24	G5MR, Hythe, Kent	38	2 (D)	100w.	Slots
	G8LN, London, S.E.18	38	3 (B)	20w.	4-ele
26	G3BII, Beaconsfield, Bucks.	36	5 (B)	22w.	4-ele
27	G3HII, Liverpool	35	1 (C)	25w.	4-ele
28	G3JXN, London, N.6	30	1 (B)	10w.	4-ele
29	G2WS, Todworth, Surrey	24	2 (B)	12w.	3-ele
30	G5AM Nr. Ipswich, Suffolk ...	18	1 (D)	20w.	6-ele
31	G2BRR, Wootton Bassett, Wilts. ...	11	2 (B)	10w.	Slots

grading of stations in terms of points-per-QSO. The higher this figure, the better the station did irrespective of location, points scored and number of contacts.

Get out the slide-rule, and let us look at some of them: G5YV makes 3.24, but G6TA, though he is in 2nd place, only 1.94 points per contact; G3KEQ does better than G6TA, for his figure is 2.16. Going much further down Table III we find G4JJ/A with 3.06, G2FJR not far behind with 3.00, and G3GPT with 2.60; among the lower placings (in terms of points) we find G3IEX making 2.33, G3HHY with 2.13 and G3WS with 2.05.

An outstanding result is G5MR, who on this basis makes 2.92 points per QSO, putting him well up in front and compensating nicely for the known difficulty of his location (right on the South Coast, completely screened to the north). Another good figure from the bottom of Table III is G5AM, whose rating is 2.57—again this checks with his sort of location (nr. Ipswich, with no locals to work) and his log, which shows one D-distance and two C contacts, even though he only made seven QSO's in all.

Of course, this method of computation cannot be taken too far. For one thing, with a top total number of contacts of 130 (G6TA), a calculation on less than about 10 contacts for stations at the other end of the Table is not really significant; for another, if this were to be adopted as the method of scoring, it would mean that everyone would wait for DX all the time and (taking this to its logical conclusion) the leading station could come out with a figure of 10 if he sat tight all through and made only one QSO at the 200-mile distance! This would hardly be in keeping with the spirit of the Contest, the main idea of which must always be to encourage activity, with high scoring a secondary consideration. Indeed, had points-per-contact-distance been the official method of scoring in this particular Contest, it would have paid G6TA, for instance, to avoid working London stations at all; a check on his log shows that this would have improved his figure from 1.94 to 2.19.

Just for the fun of it, from the Table III figures as on p.150, we have worked out who, in fact, the first 10 stations would have been on this points-per-QSO basis of computation. The placing is as follows, with figures calculated as before but multiplied by 100 to get rid of the decimals: G5YV (324), G4JJ/A (306), G2FJR (300), G6CW (299), G3IOO (294), G5MR (292), G3GPT (260), G3IEX (233), G3JWQ (231) and G3KEQ (216).

On the face of it, this system does appear to balance out the inequalities of geography, though it cannot take into account power used nor time spent on the Contest. To make it really effective, the value of short-range contacts would have to be increased, and it would also have to be stipulated beforehand that no entrant making less than, say, 20% of the highest number of contacts obtained would be taken into the final cal-

culation—this to maintain activity and keep short-haul QSO's going, since nobody would know what "20% of the highest number" was going to be. Anyway, it's another line of thought on VHF contest scoring systems.

And it will not have escaped the notice of those who have followed us thus far that, whatever way one juggles the figures, Harold of G5YV still comes out on top! It is a great pity that Bill of G6NB was not able, after all, to put in an entry this time, as it would have been a most interesting encounter between those two for top place.

Analysis of Activity

Still on the subject of data extracted from the entry, we have also done an analysis of ten logs selected strictly on a geographical basis, to find out who came on and the total of stations available during the period of the Contest.

Of the old-timer brigade, there were 20 G5's, 13 elderly gentlemen signing G6, and 16 with G8 calls; there was also a sprinkling of G2's and G4's. But the great majority signed G3+3, and, of these, eleven were G3K's; with respect to G3KEQ (who has made himself one of the outstanding operators on the VHF bands), it is good to know that the newcomers are giving the VHF's a fair share of attention.

The total of stations on for the Contest comes out at 191 (by analysis of the logs selected). In terms of different stations identified, SWL Blandford (Mitcham, Sy.) has the greatest number—he records 99 of the 191. In the SWL list in Table IV, his figures put him well ahead; he will be remembered as one of the most efficient SWL's on the VHF bands.

As Table III shows quite clearly, there were more stations on to be worked during the 2nd Period (the Sunday) than on the Saturday evening, when conditions were actually better. From Table I, it is also evident that power had little to do with the result, and here an interesting note is that, with only 10 watts, G3JWQ and G4JJ/A not only do well on points scored, but also on points-per-QSO, as they get a place in the first ten under both systems.

The A, B and C distances (0-150 miles) were within the reach of most entrants; though half the stations listed in Table I did get out to the D-distance, this represents less than 40 contacts of up to 200 miles. Conditions certainly were not good!

For 70 centimetres, there is not much to analyse! Conditions on that band were apparently no better and the Contest activity was never focussed on it. But the six operators who, in the spirit of the rules, entered on a two-band basis are to be congratulated on their enterprise and they have our thanks for their support. It was their efforts which established that a two-band event is not practicable just yet.

Gear Used

At G5YV, the two-metre transmitter runs a QQV06-40 PA, at 75w., and the converter is a crystal-controlled job, on G2IQ lines, into an Eddystone S.740; his 4/4 beam is at a height of 65 ft. G6TA puts his 20w. through an 832, and the receiver is a 12AT7 in cascode with a 6J6 mixer-oscillator, into an HRO at 12 mc; the beam at G6TA, similar to G5YV's, is at a height of 42 ft.

G3KEQ has a two-band transmitter, the 832 PA on two metres, run at 28w., also being the driver for the QQV03-20/QQV03-20 tripler-PA for 70 cm, with 25w. input. Receivers are a G2IQ-type converter for two metres (IF 8 mc), and a G3BKQ (IF tuned 23-27 mc) for 70 cm, the main Rx being an HRO; both these converter types have been described in SHORT WAVE MAGAZINE; his aerials are two stacked slots at 35 ft. for the 144 mc band, and four of the same at 20 ft. for 70 centimetres.

The 95w. transmitter at G6CW is 829 PA, the receiver is a 6J6-6J6-6J6 CC converter into an HRO tuning 26-28 mc, and the beam a 5-element Yagi. G6CW adds into his log summary some interesting statistics of his own: Av. miles per contact, 94; total mileage covered, 6863; No. of counties worked, 29; best DX worked, G5MR; best heard,

TABLE II

TWO-BAND PLACINGS — Rule 2 (c)

Place	Station and Location	Points			Best Distances	
		144 mc	70 cm	Total	144 mc	70 cm
1	G5YV, Leeds	272	6	278	23 (D)	1 (D)
2	G3KEQ, Sanderstead, Surrey ...	229	16	245	1 (E)	1 (D)
3	G3HBW, Bushey, Herts.	185½	16	201½	2 (D)	1 (D)
4	G2XV, Cambridge	173	4	177	2 (D)	1 (B)
5	G3IOO, Oswestry	138	15	153	1 (D)	1 (D)
6	G2CIW, Cambridge	53	4	57	3 (C)	1 (B)

Equipment Used:

Station	Two Metres		70 Cm.	
	Input	Aerial	Input	Aerial
G5YV	75w.	4/4	?	?
G3KEQ	28w.	Slots	25w.	Slots
G3HBW	110w.	3/3	100w.	16-ele
G2XV	80w.	3/3/3	12w.o	20 x 20
G3IOO	*no details given*			
G2CIW	75w.	6-ele	25w.	8-ele

GC3EBK ; total time on, 13 hrs. 13 mins., giving 10m. 50s. per QSO. Thanks, John!

For 70 cm, G3HBW's transmitter is a QQV06-40 driving an ACT-22 in a coaxial PA, taking 100w. input on 434.66 ; his receiver is RF DET-24 into 446A RF, with a push-pull crystal mixer and a CC oscillator, giving an IF of 25-31 mc tuned on an AR77. Beam for 430 mc is a 16-ele stack at 25 ft., stub-matched into semi-air spaced coax.

Jerry of G2XV has quite a different layout for 70 cm: Transmitter is a QQV06-40 PA giving 12w. output into a stack consisting of 20 driven elements backed up by 20 reflectors, at a mid-point height of 40 ft. His receiver is a diode crystal mixer, CC injection, with an SX-28.

It is not possible to detail the equipment factor in every case, but here are some receiver arrangements selected from the logs: G2DVD has an RME-152A, which is a 6AK5 RF-6J6 mixer/oscillator arrangement, into an HRO at 6.95 mc. G3JWQ runs a *Magazine* G6UH converter into an HRO. At G3GBO, the converter is a CC Cascode into an S.640. The main receiver at G3CGQ is a home-built superhet, and with this he uses a 12AT7 SEO converter with IF at 9 mc. G3IRA has a 6J6 RF job with a crystal mixer and EF-91 head amplifier into an S.640. At G5LK, the converter is a Cascode into an S.680. G3HHY has a home-built receiver, 22 valves in all, the 2-metre front end being 6AK5-Z77-VR136-12AX7. The converter at G2CIW is 6BQ7A-12AT7 CC into an AR77. G3IUL describes his receiver simply as a " 10-valve home-built superhet." G3EEO is another user of the *Magazine* G6UH converter, into a BC-348. G8LN has a largely home-made Rx, with a modified 624B as front end. G3HII uses a Canadian VRL as main receiver, with a three-stage CC converter. G2WS runs a G2UJ converter with an S.640 receiver.

Contest Side-Tones

G3EEO was the Derby Club entry . . . G3JWQ had G3JWU as 2nd operator for the Contest

SHORT WAVE MAGAZINE

ALL-EUROPEAN VHF CONTEST

RULES

(1) The Contest will be in two separate Sections, over two consecutive week-ends in July, either or both of which may be entered.

(2) The duration of the Contest, **1st Section,** will be 1900 hrs. July 14 to 2000 hrs. July 15 ; and **2nd Section,** 1900 hrs. July 21 to 2000 hrs. July 22. There will, however, be a break-period between 0100 and 1000 hrs. on July 15 and July 22, during which no Contest activity may take place. (*All times GMT.*)

(3) The band used will be 144-146 mc, CW and/or phone, and the Contest will be open to participants in either of three divisions :

(a) 1st Section only (July 14-15)
(b) 2nd Section only (July 21-22)
(c) Both Sections combined.

(4) Place lists will be compiled for each of these three divisions ; thus, there will be a winner for each division. If the volume of entries warrants it, additional lists will be prepared by country prefixes.

(5) *Scoring System.* Distances will be reckoned in miles or kilometres, using the conversion factor 5/3 to convert miles to kms., *e.g.* 60 miles = 100 kms.

(a) 1 point for each station worked within a radius of 30 miles (50 km)—A.
(b) 2 points, 30-60 miles (50-100 km)—B.
(c) 4 points, 60-120 miles (100-200 km)—C.
(d) 6 points, 120-180 miles (200-300 km)—D.
(e) 12 points, 180-240 miles (300-400 km)—E.
(f) 20 points, 240-300 miles (400-500 km)—F.
(g) Any distance over 300 miles (500 km), 25 points—G.

Multipliers : Scores obtained as above will be multiplied by the prefixes worked, own excluded, *e.g.* a PAØ working G, DL, PA and HB would multiply his points-score by three to give the grand total. Each G prefix will count as a separate multiplier.

(6) The time of 0100 GMT on July 15 (*1st Section*) and July 22 (*2nd Section*) will be the " change-hour." All stations worked before this time can be worked again to score after 1000 GMT in that Section. Prefixes worked a second time will *not*, however, count for the multiplier, *e.g.* an F station working F, G, DL and PA before the change-hour and F, DL, ON and PA after it would have a multiplier of four (own prefix is excluded).

(7) Portable, mobile or multi-operator working (two or more operators manning one station) will be permitted, provided only that the same callsign is used throughout the Contest for the section entered.

(8) A completed contact to score must include signal reports, QTH and operator's name as given in any ordinary QSO. Reports shall be given simply as RST for CW and RS for phone. The general call " CQ DX Contest " should be used.

(9) Logs must be set out *strictly* in the following form :

Callsign		Location			Name	Section Entered		
Date	Time	Station Worked	Report Given	Report Rec'ved	His Name	QTH	Distance Letter	Points Claimed

(***Note:*** *The " Distance Letter " in Col. 8 will be either A, B, C, D, E, F or G, as given in Rule 5).*

A bold line should be drawn right across the log sheet at the " change hour " of 0100 GMT. The log must be summarised as follows :

(*See facing page*)

(i) Total of stations worked under A, B, C, D, E, F and G distance heads, before the change-hour,

(ii) Totals under these heads after the change-hour,

(iii) Total un-multiplied score claimed for the Section entered,

(iv) Prefixes worked, own excluded, and multiplier claimed for Section,

(v) Grand total of points claimed, by multiplying figures under (iii) and (iv),

(vi) Operators entering both Sections will obtain their grand total by *adding* the two figures given in (v).

A brief description of equipment used should be included, with any comments on the Contest the entrant may care to make.

(10) Logs, addressed only A. J. Devon, "VHF Bands," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1., England, should be posted to reach us by the closing date, **August 13, 1956.**
A brief preliminary survey of the Contest will appear in the September issue of SHORT WAVE MAGAZINE. Results in detail, with a full report, will be published as soon as possible after this, depending on the volume of entries ; an announcement will be made in the September issue. Results will also be circulated to all European Amateur Radio journals printing these rules.

(11) It is a condition of entry that the decision of the Managing Editor of SHORT WAVE MAGAZINE on the results of the Contest will be accepted as final. At his discretion, Certificates of Merit will be awarded to the leading operators in each division. If the volume of entries justifies it, Certificates will also be awarded under prefix headings.

. . . G5LK was operated by G3BBR, G3JDN, and G3KAX, as well as by G5LK himself . . . G3GPT heard no GI's, though normally he can work them, and a call from GI3GXP was missed . . . For the Sunday evening, G8UG/A was operated from the QTH of SWL Blandford at Mitcham, and a check log put in . . . The QRM in the London area was severe at times . . . Fading during the Sunday mid-day hours was very bad on the more distant stations . . . Several entrants ask "Where were the Midland stations?" . . . G3IEX says he called "numerous stations in the Midlands" . . . Many logs include lists of "heard but not worked" stations . . . G3CGQ says he filled three pages of his log in 9 hours ; the previous three pages had taken four months to fill . . . Very little was heard from the West Country, though several stations were on and trying . . . G3WS remarks that he was left "pulsating under his headphones" when a vacuum cleaner came on just as a D-distance station signed over . . . A gink calling himself "UA6RK" appeared in the Midlands on Sunday, calling CQ on 145.2 mc . . . With G2BRR in Wootton Bassett, the outstanding signals were G3KEQ and G6TA, consistent throughout the Contest.

Taking it all in all, it can be said that the Contest was a success, was well supported and seemed to be thoroughly enjoyed by all those who sent in an entry. From our end, your A.J.D. would like to say that the response generally was most gratifying and that it was a pleasure working over the entries ; all those who sent in logs are thanked most sincerely for their support.

European VHF Contest — July

From one contest, on to another! In this space you will find, as promised, the rules for our European Contest, to take place over two week-ends in July.

Main points are that it is Two Metres only, and that entrants have the choice of either or both week-ends, since there will be three place lists. Scoring is designed to encourage DX operation as well as activity. The experience of the recent Contest has been drawn on heavily in framing the rules and the timing, and, once again, the "office work" has been made as easy as possible.

Since it is hoped that this Contest will attract a European entry, it is necessary to think in terms of kilometres as well as miles for the distance limits ; fortunately, this is easy if one takes the near-enough figure of 60 miles to 100 km, as shown in Rule (5), where it is all worked out for you, whether you think in miles or the metric system! The system of scoring is such that while large totals can result if conditions are good and DX working is possible, the bias is still on getting prefixes, which means EDX. If we get big openings, it should be found that working numerous short-haul contacts for a few points will not give any great advantage. On the other hand, if conditions are poor, then the Contest will still be worth

TABLE IV

SWL ENTRY — Two Metres

Place	Name and Location	Points	Best Distances Heard	Aerial
1	A. W. Blandford, Mitcham, Surrey	202	1 (D), 12 (C)	4/4 Slot
2	W. Tomlin, Malvern, Worcs.	151	22 (C)	4-ele
3	P. Fidgeon, London, S.W.14	53	2 (B)	3-ele
4	P. Ball, Hutton, Essex	51	1 (D)	4/4 Slot
5	W. Lee, Bridgend, Glam.	50	6 (C)	12-ele

while in that all workable stations score.

For the information of all concerned, copies of these rules, in translation, have been sent to all European radio amateur periodicals, from Norway to Spain. The success of the whole affair will turn upon conditions. It is for this reason that July has been selected, because from our records and the surveys conducted by G3EGB—*see* p.750, February 1954 SHORT WAVE MAGAZINE—it is the most likely month for an EDX break.

TABLE III

COMBINED TWO-METRE PLACINGS

(Full Entry excluding all 70 cm Scores)

Place	Station and Location	Points	No. of QSO's		
			1st Period	2nd Period	Total
1	G5YV, Leeds	272	34	50	84
2	G6TA, London, S.W.16	252	53	77	130
3	G3KEQ, Sanderstead, Surrey	229	32	74	106
4	G6CW, Nottingham	218	39	34	73
5	G2DVD, Slinfold, Sussex	194	51	53	104
6	G3HBW, Bushey, Herts.	185½	41	68	109
7	G3JWQ, Ripley, Derbyshire	176	32	44	76
8	G2XV, Cambridge	173	39	52	91
9	G4JJ/A, Chesterfield	156	26	25	51
10	G5DS, Surbiton, Surrey	155	43	51	94
11	G3WW, Wimblington, Cambs.	151	33	38	71
12	G3GPT, Nr. Preston, Lancs.	146	23	33	56
13	G3KDF, Coventry	140	31	46	77
14	G3IOO, Oswestry	138	17	30	47
15	G3GBO, Denham, Bucks.	131	39	52	91
16	G3CGQ, Luton, Beds.	121	32	43	75
17	G3FIH, Nr. Bath, Somerset	119	25	34	59
18	G3IRA, Swindon, Wilts.	112	25	30	55
19	G3XC, Slough, Bucks.	104	28	47	75
20	G2FJR, Sutton Bridge, Lincs.	102	12	32	34
21	G3WS, Chelmsford, Essex	78	17	21	38
22	G5LK, Reigate, Surrey	71	28	34	62
23	G3HHY, Bristol	64	12	18	30
24	G3IEX, Felixstowe	63	9	18	27
	G3KHA, Bristol	63	14	22	36
26	G2CIW, Cambridge	53	15	16	31
27	G3IUL, Bedfont, Middlesex	50	26	20	46
28	G3EEO, Derby	41	14	20	34
29	G2AHP, Perivale, Middlesex	39	13	24	37
30	G5MR, Hythe, Kent	38	11	2	13
	G8LN, London, S.E.18	38	14	21	35
32	G3BII, Beaconsfield, Bucks.	36	9	22	31
33	G3HII, Liverpool	35	10	14	24
34	G3JXN, London, N.6	30	7	22	29
35	G2WS, Todworth, Surrey	24	10	12	22
36	G5AM, Nr. Ipswich, Suffolk	18	5	2	7
37	G2BRR, Wootton Bassett, Wilts.	11	3	6	9

VHFCC Elections

New members this month are: T. Kendrick, ZL2HP, Palmerston Nth, VHFCC Certificate No. 196, who, among many interesting Australasian contacts, has worked VK9XK (Papua), VR2CG (Fiji) and ZK2AA (Niue) on six metres (50 mc). To G. Schrick, DL9MZ, Braunschweig, all whose contacts were Europeans on 144 mc—but no G's at all!—goes Certificate No. 197. VHFCC Certificate No. 198 is awarded to G. Blauw, PAØBP, Heemstede, who, for his 100, has worked 38 G's in addition to DL, ON, OZ and SM.

R. Sachs, G2CZS, Chelmsford, gains Certificate No. 199, and H. Rodman, G3GJZ, Newmarket, No. 200.

UHF/VHF Convention

We are asked to announce that a one-day convention, devoted to UHF/VHF, will be held on Saturday, May 26, at the Bonnington Hotel, Southampton Way, London, W.C.1, commencing at 10.0 a.m. and concluding with a dinner in the evening. The inclusive charge for the day is 22s., and tickets can be obtained from P. A. Thorogood, G4KD, 35 Gibbs Green, Edgware, Middlesex.

Normal Next Month

Your A.J.D. wishes to apologise for the non-appearance of "VHF Bands" last month, the reasons for which were given on p.89 of that issue. One member of his breathless public wrote to complain and several "questions were asked." Well, being right up to the collar nearly all the time, it has to be loosened sometimes!

The dead-line for everything VHF for the June issue will be **Tuesday, May 22,** addressed: A. J. Devon, "VHF Bands," *Short Wave Magazine,* 55 Victoria Street, London, S.W.1. Till then, watch for openings, and be ready on both bands. Have a good Whitsun.

FIRST NOTES ON 25-CENTIMETRE WORKING

RESULTS ON 1250 mc OVER A PERIOD

F. W. Tyler (G3CGQ)

DURING a spell of six months some intensive daily tests have been carried out on the reliability of signals on the 25-centimetre band, over a short distance under varying weather conditions.

At the receiving end the G3CGQ receiver, as described in the August 1955 issue of SHORT WAVE MAGAZINE, was used. In order to allow for operation in all weathers, the parabolic aerial was removed from the receiver assembly and a Pye plug connector fitted to allow coax feeder to be run between receiver and test aerial.

The aerials actually used at both ends were 4-over-4 Yagis, and at G3FUL (who was collaborating in these tests) two were available; one was connected through about 30 feet of air-spaced coaxial feeder, and the other through a shorter length of 12 feet; both aerials were kept in their mounted positions during the tests, irrespective of which was being used.

At G3CGQ, a similar aerial was installed at the end of 4 feet of coax. In the early days of the test, the receiver aerial was indoors, and this was maintained during the autumn and early winter; with the onset of winter, signals began to attenuate, and eventually it became necessary to put the receiving aerial outside in order to maintain contact. In February 1956, when the very severe winter conditions set in, with continuous snow and ice over a period of weeks, the signals declined still further, and difficulty was experienced in keeping the schedule going. The tests finally ceased at the beginning of March last, when improvement in the weather was restoring the signal level to a noticeable extent.

Effect of Weather

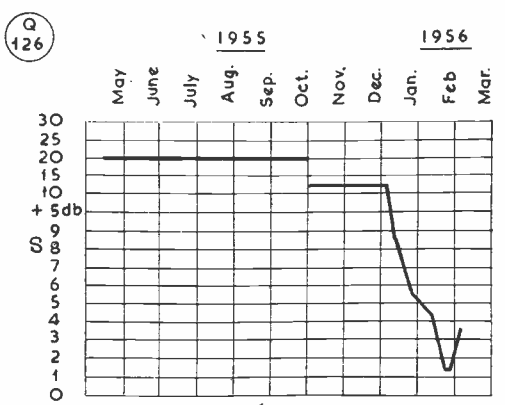
From these first tests, there is no doubt that weather conditions—both those obtaining at the time of contact and in the cumulative action on aerials and feeders by corrosion—play an essential part at this higher frequency. In one sense, propagation is directly affected and, in the other, aerial efficiency. The graph herewith plots the actual results obtained, and is self-explanatory.

One feature of particular interest noticed during the bad weather was the distortion of the field of polarity, apparently caused by snow. With up to 6ins. of snow on the roof-tops, and the aerials frozen solid, polarisation of the signals across the town of Luton changed considerably; both the direct wave and reflections were between 45° and 90° out of the horizontal plane under these conditions.

First conclusions reached were obvious and as expected: That the use of normal air-spaced coaxial cable of any great length is out of the question at this frequency. This is because it is most difficult to exclude moisture from the cable, with consequent serious loss of RF in the aerial. This possibility was considered when the receiver, as originally described in the *Magazine*, was designed. The use of feeder line was kept to a minimum, by mounting receiver and paraboloid as one; it must be admitted, however, that such an assembly is cumbersome, and is not easy to handle within the station. One has a bulky aerial connected physically to a heavy receiver, all of which must be so placed, outside and in a high position, that it is accessible for tuning.

Avoiding Feeder Loss

From these first conclusions, it therefore appears to the writer that 1250 mc is the "demarcation point" where the principles and techniques as normally used on the lower VHF bands cease to apply. From this point, the idea is introduced of placing the RF portion of the receiver up with the aerial itself



Signal level between G3CGQ and G3FUL, across Luton, on the 1250 mc band, as recorded by G3CGQ over the period shown. During the severe winter weather, there was a very big drop in signal strength, the significance of which is discussed in the text. The S9 + 20 dB consistency was obtained with the transmitter and receiver outside and the paraboloid fitted right on to the receiver, as illustrated on p. 309 of our August 1955 issue. For the winter-months test, the equipment layout was changed, and at first the drop in strength, to S9 + 12 dB, was not as great as expected. As all but the transmitting aerial was under cover during the winter, the progressive reduction in signals is assumed to be due to weather effects along the path and on the transmitting aerials.

and bringing the IF down the feeder for tuning; similarly, for transmission, the doubler-PA stages should be with the aerial, DC power and drive RF at some lower frequency being sent up the feeder for amplification and radiation—in short, to avoid heavy feeder losses by putting the RF sections right "in the eye of the beam."

Enough has probably been said to show that there is much useful experimental work to be done on the 1250 mc band. Indeed, the writer can assure those interested that, from his own experience, a great deal of pleasure can be derived from these pursuits when working from first principles in what, to the radio amateur, is unknown territory.

EXERCISE FLOP

FRED'S EMERGENCY NETWORK

By G3COI

THE chatter on Fred's Top Band net had come around to the possibility of disaster striking their town, and the members were becoming fired with the idea of their own Commando group formed for the express purpose of springing into action at the drop, as it were, of a blown 807.

Fred smiled inwardly at the thought of some of them "springing into action" — old Charlie, for instance; his was a bedside rig which would fetch a handsome price from the Hiram Maxim Amateur Radio Museum at any time, and its owner would only come on the air after considerable priming at the "Dog and Partridge."

Anyway, it was decided to make a start, and build outfits which would work from batteries and such-like; then, at a later date, there was to be a full-scale exercise in which each and every member of the net would be away from his own shack and working "emergency portable."

Standrick, an old-timer with money, quickly bought himself a mobile two-metre rig and became the butt of the net because nobody else could work two metres.

Marshall, the net's chief constructor, launched himself into the making of a Magnificent Job, built with the utmost precision, capable of working 'phone and CW on 160, complete with integral electronic key and mike, the whole thing the size of a packet of cigarettes. The trouble with Marshall, though, is that he is so slow . . . he is still working on a ten-metre beam originally intended for the *last* spell of good conditions in 1947.

Birklough, the "baby" of the net and worst off financially, was at his wit's end to build a suitable rig, as he could not afford a solder tag (if he had had some solder), so the rest voted him to carry the batteries on the great day.

Stymie, the dark horse, as usual said nothing of his constructional intentions. During the nightly ragchews he would give all the others their report and pass it on quickly; then, when at last it came round to him again, he would say "Roger, well nothing much here, over to . . ." and relapse into intriguing silence. It was later discovered that he was, to quote Mr. Pickles, "courting strongly" and was in the habit of sitting out the net activities with his YL, an extremely attractive girl with large eyes which glistened like VR150's, long wavy hair the colour of over-run 807's, a figure like a ball and biscuit mike, and a voice like rare DX. In short, some tomato, as our W and K friends would have it. (How Stymie could spare any time at all for the boredom of the net beats us.)

Fred—well, we left him to the last because he was already fixed up with a portable rig that he had made long ago from a portable rig; having nothing better to do, he was forever urging the others to get a move on, as disaster was liable to strike at any moment.

Came the day, a Saturday afternoon during the Cup-Tie season, when activity on all bands was at a high level between 1300 and 1400 hours, thereafter succumbing to the icy grip of TV. It had been arranged to call on 1900 kc, establish contact with each other, and reveal QTH's; then, after a final-of-finals, activity would cease until the nightly net, when the whole thing would be chewed over.

As you may have assumed from the title, nobody contacted anybody. The reasons are brief: Charlie, seeking inspiration at the "Dog and Partridge," found himself accidentally locked in at closing time, so passed the afternoon asleep until opening time. Standrick became involved with a serious fault in his

". . . . near the rails, Block F, on the stand side . . . ."

new trawler transmitter—its coverage was 2.1 to 4 mc. Marshall, the perfectionist, hadn't more than ten per cent. of the *parts* of his proposed miniature rig, let alone finished it. Young Birklough waited for two hours at a bus stop for Marshall, to help carry a non-existent car battery. Stymie thought he wouldn't be missed and took his YL for a short walk into a long wood. Yes, it was left to Fred (although he did not know it) to uphold the honour of the net. Our hero remained at his post for two hours, shouting his head off. He was "near the rails, Block F, on the stand side at the Cup-Tie," his portable rig concealed in the folds of his coat and the trailing aerial tangled in the feet of the adjoining mob.

Emergency operation has ceased for the time being, but the idea remains. And that is about all, for without a molecule of doubt, there is not the slightest chance of *this* net becoming a potent factor in the field of Amateur Radio disaster communications.

Are Your Power Circuits Safe ?

Design for a Communications Receiver

AMATEUR-BAND DOUBLE-CONVERSION SUPERHET USING CC CONVERTER SYSTEM

PART I

B. A. M. HERBERT (G2WI)

This is not a set-piece constructional article, but an account of how, in one particular case, the requirements were met for a home-built communications receiver capable of really good performance on all amateur bands, 160 to 10 metres. It is offered as an approach to the problem, rather than as a finalised design to be followed exactly. The ideas put forward by our contributor, and successfully carried into practice in his own model, will be of great interest to readers—in particular, the notion of using a tuned IF/AF amplifier section preceded by a crystal-controlled converter for each frequency range, band selection being by crystal switching. Circuitry for the essential refinements, such as noise limiter and crystal filter, is also covered.—Editor.

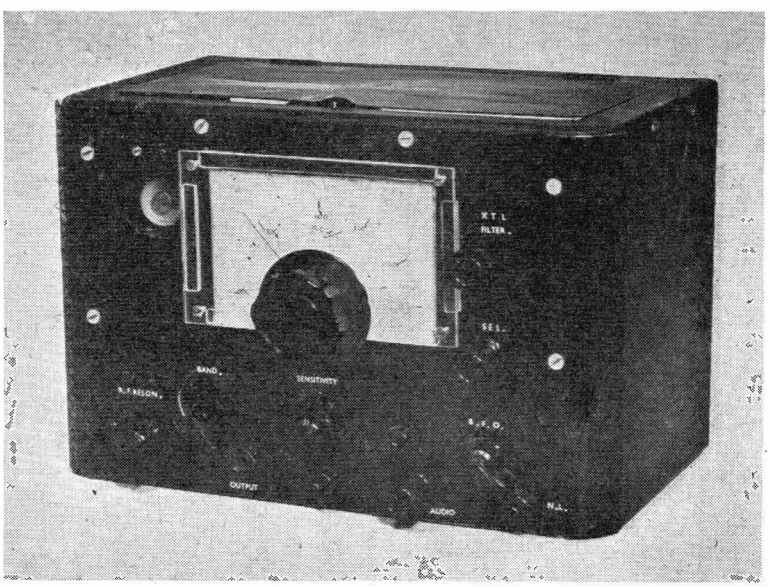
IT seems a fairly well-established fact that anyone with whom Amateur Radio persists as an enduring passion passes through several phases, among which that of constructional work looms large. In the writer's case the first flush of enthusiasm, long ago, for building receivers, gave place to other more complicated items. However, with the passage of time, and experience of many commercial receivers, the old urge reasserted itself. All those tried had some good features, but no particular specimen combined these into one.

The inevitable result was, of course, the idea of a "home - brewed" special which would combine all the good features ; once this seed had been sown it was only a question of time before it germinated !

The essential points to be covered were listed as sensitivity, selectivity, stability, size, and last but far from least, ease of construction, alignment and cost.

With all these factors in mind it was decided to use a double-conversion circuit except on 160 metres, where normal single conversion was felt to be adequate. Having settled this point, the question was how to approach the other bands. Nearly all the current ideas seem to run to plug-in coils which are cumbersome, or else to commercial coil-packs which are inclined to be greedy of space and are somewhat costly. In any case, to use a tunable first oscillator was felt to be undesirable since at the higher frequencies it is a potential source of drift. It was therefore decided to use a tunable first IF which would include the 160-metre band in its coverage and for the other bands to feed this from a fixed-tune front end consisting of RF - Mixer - Oscillator, using crystals in the Osc. section, these to beat with the incoming signal to produce the tunable IF.

In short, the idea was to have a series of



Appearance of the Tuned IF double-conversion receiver as designed and described by G2WI. Entirely home-built, it incorporates all desirable features such as noise-limiter and crystal filter. The originality of the design lies in the fact that the IF is tuned, the front end being an RF-mixer-CC oscillator arrangement, with switched crystals. This ensures very high stability with all bands well spread over the tuning dial, which is scaled to cover 500 kc.

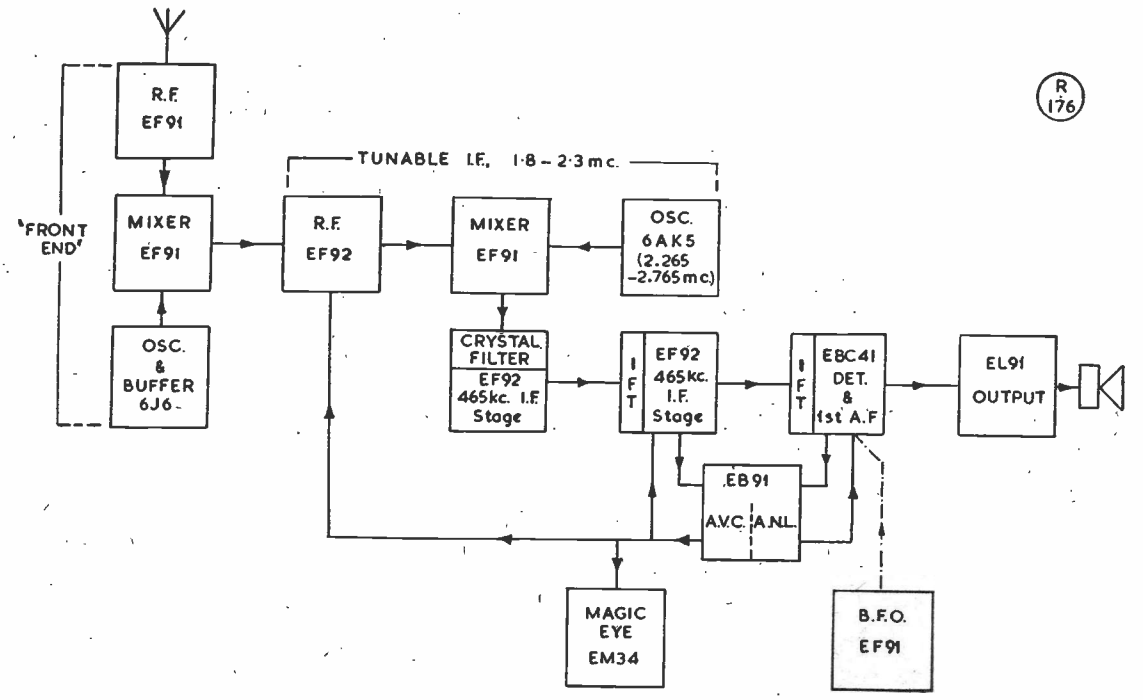


Fig. 1. Block schematic of the arrangement of the Amateur Band receiver described by G2WI. Selection of the crystal frequencies for the front-end CC oscillator is as follows: For 80 metres, 1.7 mc; for 40 metres, 5.2 mc; for 20 metres, 12.2 mc; for 15 metres, 6.4 mc x 3; and to cover the 10-metre band, 8.733 mc x 3 and 8.900 mc x 3. The theme of this design is double-conversion, with the IF side tuned, and the first oscillator crystal controlled.

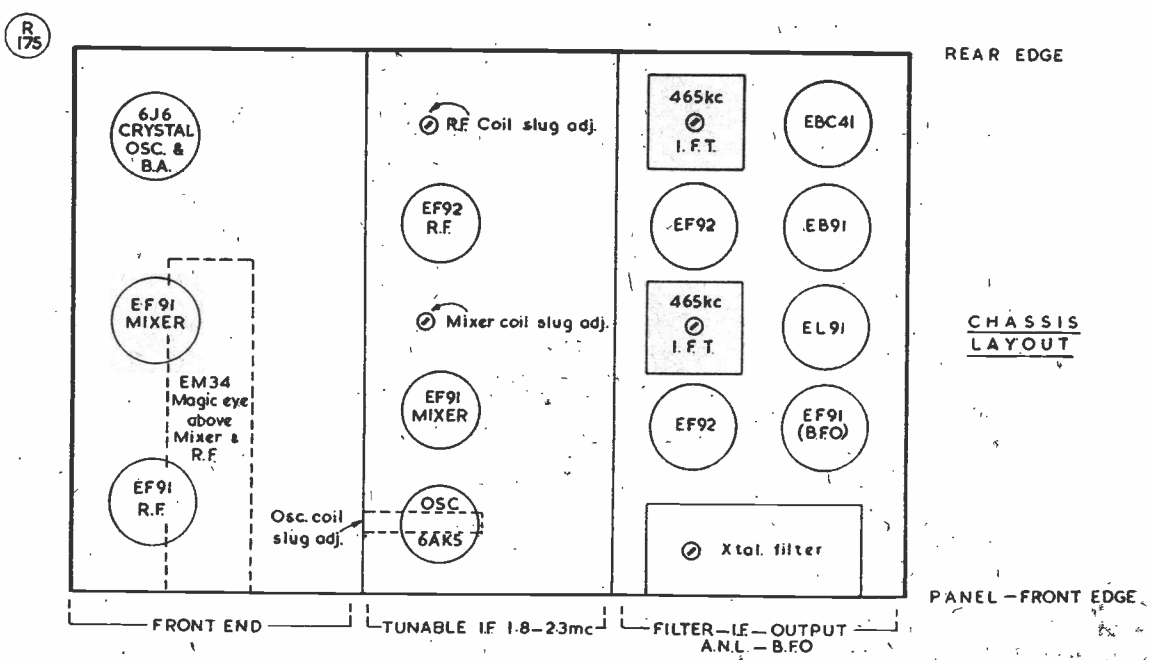


Fig. 2. Plan view of the layout adopted by G2WI, which facilitates the building of the receiver by sections, while bringing the main tuning control centrally on the panel. See photographs for general construction.

crystal-controlled converters feeding into the tunable IF section. Reference to the block schematic (Fig. 1) will make the intention clear. The layout plan is shown in Fig. 2.

Construction

This fell into a series of well-defined operations, each of which will be treated separately.

(1) *Output Stage, AVC, ANL, Two Stages*

Table of Values

Fig. 3. The 465 kc IF, Crystal Filter, Noise Limiter, AVC and Output Section

C30, 37, 38, 44, 45 = 100 μμF silver mica 350v. wkg.
C31, 32 = 200 μμF silver mica, 350v. wkg.
C33 = 5 μμF airspaced variable, also Xtal switch, *see text*
C34 = 15 μμF silver mica, 350v. wkg.
C35, 36, 39, 40, 41, 42, 43, 48, 49, 50, 51, 52, 54 = .01 μF tubular, 350v. wkg.
C46 = 250 μμF silver mica, 350v. wkg.
C47, 53 = 12 μF 12v. wkg.
C55 = 100 μμF
C56 = 35 μμF midget variable
C57 = 200 μμF silver mica
R19 = 50,000 ohms composition pot'meter
R20, 22 = 150 ohms ½ watt
R21, 21A = 47,000 ohms ½ watt
R23 = 680 ohms, ½ watt
R24 = 75,000 ohms ½ watt
R25, 26 = 470,000 ohms ½ watt
R27 = 100,000 ohms ½ watt
R28, 29, 31 = 1 megohm ½ watt
R30 = 1 megohm pot'meter (*Composition*)
R32 = ½ megohm, ½ watt
R33 = 470,000 ohms, ½ watt
R34 = 250 ohms, ½ watt
R35 = 5,000 ohms, ½ watt
R36 = 50,000 ohms, ½ watt
R37 = 100,000 ohms, ½ watt
L19-20 = Miniature 465kc IFT No. 1. (In Xtal Filter)
L22-23 = Miniature 465kc IFT No. 2.
L24-25 = Miniature 465kc IFT No. 3.
L26 = BFO coil (*see text*)
L21 = 465kc IF inductance (*see text*)
S7, S8, S9 = Miniature push-on push-off switches
T1 = Suitable output xformer
V7, V8, V12 = EF92 Mullard
V9 = EBC41 Mullard
V10 = EB91 Mullard
V11 = EL91 Mullard

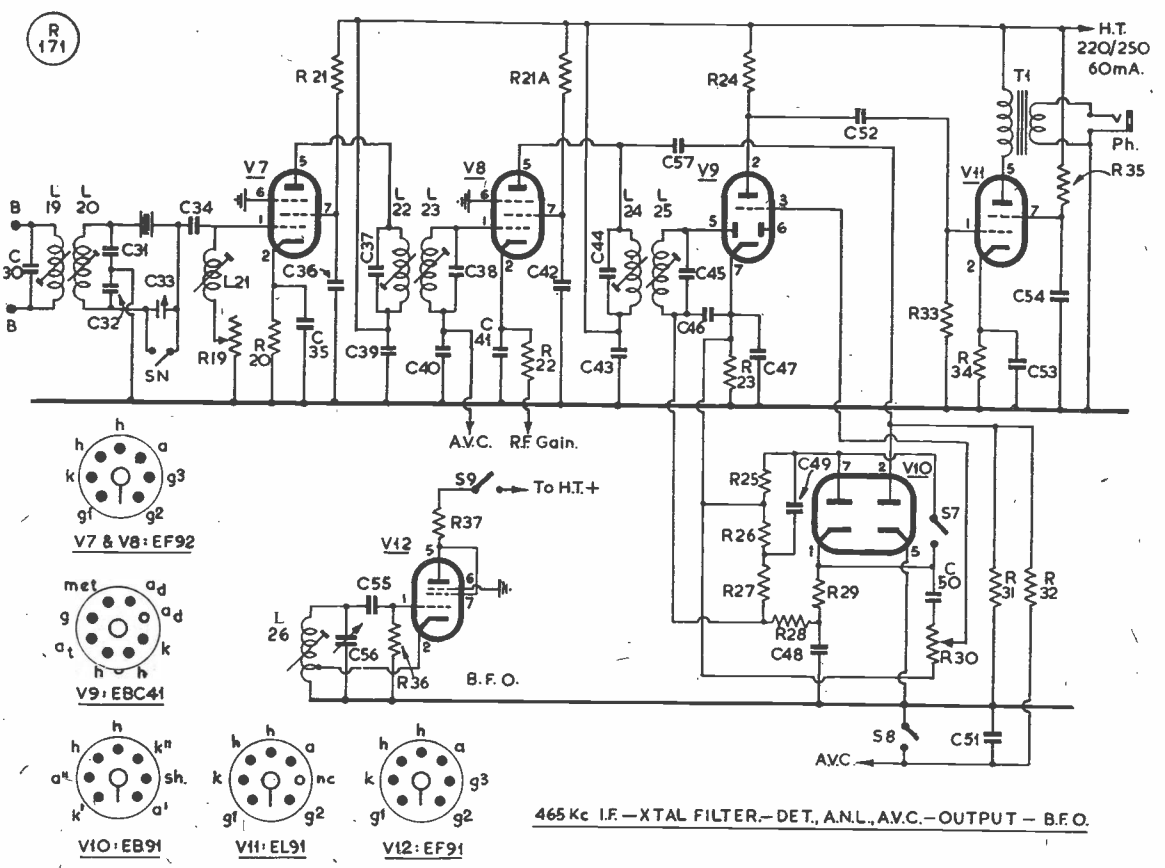


Fig. 3. The 465 kc IF, crystal filter, noise limiter, AVC and output section of the G2WI receiver. This end can be built first, and tested through, before the next section is attempted. This makes construction easier underneath, as there is no need to worry about masking the LF end components.

of 465 kc IF. A diecast chassis, 8ins. x 5½ins., was acquired—previous use had rather "moth-eaten" the top, so this was removed and replaced by a sheet of 16 ga. aluminium held in place by 6 BA bolts through remnants of the old deck.

The small size of the chassis dictated miniature valves and IFT's and the layout shown in Fig. 2 having been decided upon, work began. Since the tunable IF constituted a unit in itself, it was decided to mount this on a sheet of aluminium structure standing on the main chassis deck (clearly seen in the illustrations). This added considerably to the available space on the main chassis, gave a measure of additional screening to this section, and brought the main tuning control nicely central on the panel (naturally, a secondary consideration in planning had been a certain measure of symmetry in the outward appearance).

As it was intended that everything should be made to work as built (as far as possible) the actual construction started at the output stage; for this an EL91 was selected, the output transformer being mounted sub-chassis and a plug and socket connection made for the 2½in. speaker which was mounted on the cabinet wall. Once this stage was wired, checked, and operational, a move was made to the stage ahead. For this an EBC41 was used as it was to hand (a B7G-based type would be equally acceptable here). Only one of the diodes is used (as detector) and the triode section as first audio. This part of the circuit was then wired and checked.

Since a noise limiter is highly desirable an EB91 was next installed; one diode is used in the "series" type circuit, for which the values were taken from the *Radio Handbook* (13th Edition). This has previously been found most effective and does not seriously upset 'phone quality. There *is* a small insertion loss, but the overall gain available makes it of little consequence.

The other diode in the EB91 is used for AVC, being fed *via* a small capacity from the anode of the second 465 kc IF valve. The resultant AVC is taken to the RF stage of the tunable IF and to the second valve in the 465 kc IF.

Operation of these two sections of the EB91 could not easily be checked as things stood, so work was carried on by fitting and wiring the two 465 kc IF stages. For these two EF92 valves were scheduled, together with suitable miniature IFT's. In passing it might be mentioned that considerable time will be saved if a metal template of the base of these IFT's is first cut and then used in setting out.

When the IF strip was complete a signal generator was brought into use and the circuitry aligned. The AVC action seemed quite adequate and the reduction in odd crackles and scratches which was apparent when the ANL was switched in seemed to indicate that this portion of the receiver was working!

(2) *Tunable IF.* The construction of this section was now undertaken. The aluminium structure to house it was first of all made, a small three-gang condenser — actually a "surplus" item—of 50 $\mu\mu$F + 50 $\mu\mu$F + 30 $\mu\mu$F was employed and mounted on the side wall, together with a simple epicyclic slow-motion drive.

The line-up for this section was to be EF92 RF, EF91 Mixer, 6AK5 Osc. The necessary circuitry for these valves was installed and work started on the oscillator. It had been decided to make the tunable IF cover 500 kc, starting at 1·8 mc. This would give a fair spread of the various bands over the major portion of the dial; in order to cover the more populated parts of 10 metres two crystals were selected, one giving coverage 28·0-28·5 mc, the other 28·5-29·0 mc. Apart from these points, the dial once calibrated reads directly in frequency for all bands except 160 metres, and the upper half of Ten.

This oscillator was intended to work on the high side of the signal and hence with an IF of 465 kc had to cover the range 2·265 to 2·765 mc.

A coil of some 250 turns of 38 SWG enamelled wire was layer wound on to a dust-cored ¼in. former, with a tapping about 40 turns from the earthy end; this coil was to be tuned by the 30 $\mu\mu$F section of the 3-gang condenser with a 30 $\mu\mu$F trimmer in parallel. This arrangement was wired up to the 6AK5 in a normal ECO circuit and worked nicely straight away! As expected, it was not on frequency but the removal of a few turns of wire *plus* a little juggling with core and trimmer, soon rectified this and produced the desired result. It should be mentioned here that the oscillator anode load resistor is also the screen dropper for the mixer—the arrangement works well and gives satisfactory injection.

Attention was now directed to the mixer grid coil. This circuit has to tune 1·8 to 2·3 mc; it has a larger section of the 3-gang to tune it so it was felt that possibly a coil similar to that employed for the oscillator might be about right. One was made (without tap) and a

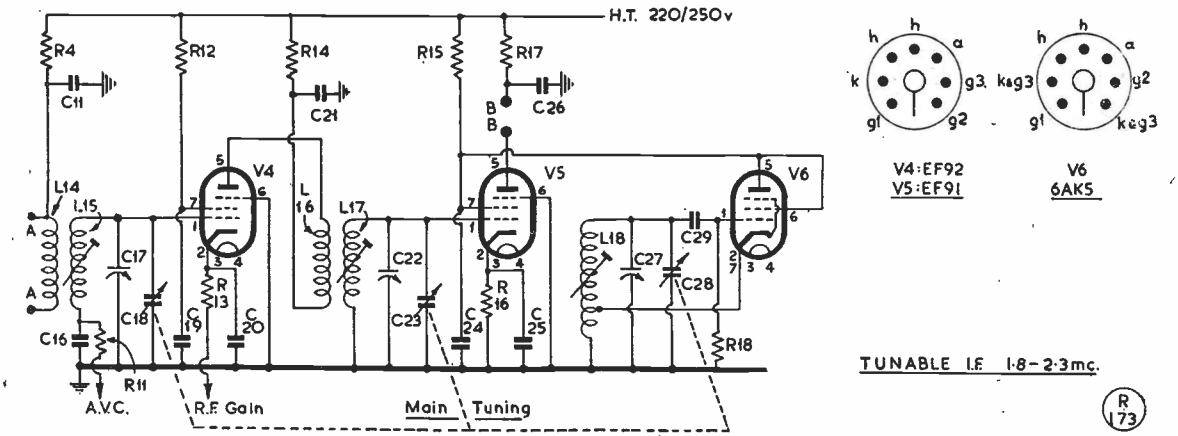


Fig. 4. The tuning heart, or Tuned IF section, of the receiver designed by G2WI. The frequency coverage is 1.8 to 2.3 mc, the 500 kc tuning range being spread over the whole 180-degree scale of the main dial.

coupling winding of some 30 turns of 38 SWG enamelled wire scramble-wound at the upper end of the former as a coupling winding. This coil was wired into circuit. To align the unit the tunable IF was now mated up with the main chassis, a signal generator fed into the coupling winding and the power applied. The familiar signal was immediately apparent, and with very little adjustment the whole was tracking nicely over the 500 kc.

The desire to see how it performed on an aerial could not be resisted, and one was connected in lieu of the signal generator. Top Band signals rolled in well and the ANL was checked on Loran ; it did a first-class job.

The two sections were now separated again and work begun on the RF stage — this presented no difficulties, the coil being a duplicate of that wound for the mixer.

As a precaution a screen was placed across the valve holder, entirely shutting off the grid side from the plate and mixer circuitry. Once again the two sections were united, and after alignment as before an aerial was put on. Results were now excellent indeed, and as no adjustments produced any improvement the assembly was deemed complete. This brought the end of Phase Two.

(3) *Front-End.* Whilst doing the routine work for other stages much thought had been expended on this section of the receiver.

It had been resolved that the oscillator here should work on the low side of the signal. The main factor in this decision was the question of crystals. Had wiser preparation been made these could all have been acquired through amateur channels or from the "surplus" market ; as it was, no great thought was given to the matter until they were actually required, with the result that they were not so cheap ! However, low frequency specimens seemed to be less costly than those getting on the higher side, so were chosen accordingly.

Before starting the RF wiring of the front end, all the normal circuitry (heaters, screen droppers, decouplers and so on) was installed, leaving only the signal circuits to be dealt with.

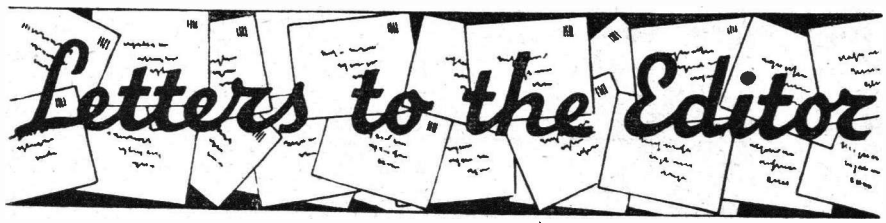
The wave-change switch, which of course figures large here, is a miniature seven-wafer affair, each wafer being one-pole seven-way. It subsequently proved that this assembly could have been reduced by one wafer (the reason for this will be clear later). This switch brings all the coils and crystals into circuit as required. In the 160-metre position it switches the aerial *via* a small capacity to the grid of the mixer and also places a coil resonant on 160 metres in that grid circuit ; since the HF oscillator is inoperative on this band the mixer acts as a broadly-tuned RF stage, contributes some gain, and effectively makes the line-up for Top Band into two RF.

(To be continued)

Table of Values

Fig. 4. The Tunable IF Section of the Receiver

C16, 21, 26	= .01 μF tubular, 350v. wkg.	C29	= 100 μμF silver mica, 350v. wkg.
C17, 22, 27	= 3-30 μμF Philips trimmer	L14-18	= *(See text)*
C18, 23, 28	= 50 + 50 + 30 μμF 3-gang miniature variable	V4	= Mullard EF92
		V5	= Mullard EF91
		V6	= 6AK5
C19, 20, 24, 25	= .005 μF silver mica, 350v. wkg.	RF	Gain Control (labelled "Sensitivity") = 5,000 ohm wirewound resistor



Letters published are those which seem to us to be of general interest, but should not be read as necessarily being in accordance with our own views on the subject. We welcome readers' comments.

ANOTHER TTX SUCCESS

SIR,—*I am writing to report what may be a new TTX record for Top Band; following a contact with G3JRL at 2028 GMT on 5 Feb. 56, I had an SWL card from OK1-00642 in Prague reporting my signals as having been RST-349 with him. The rig is still the CO with five home-made transistors in parallel, with an input of 250 mW, into a 270-ft. aerial of the type described by G8PG in the May issue last year.*

My Top Band score is now 23/28 for the Counties ladder, with all the U.K. covered except GC, and I have had a total of 106 QSO's on TTX alone, with GM3JFG and G2JF as best DX; indeed, a valve transmitter has never yet been used from this station.

C. Hubbard, G3CSZ/TTX, 104 Highfield South, Rock Ferry, Birkenhead, Cheshire.

The distance Birkenhead-Prague is 790 miles, making a new world TTX record (for reception); best two-way contact remains the 500-mile QSO between GC2CNC and HB9T. We congratulate G3CSZ/TTX on his very interesting and encouraging results, particularly in view of the fact that his transistors are home-made, from the data given by G3HMO in the April 1954 issue of SHORT WAVE MAGAZINE. —*Editor.*

NOTE OF THANKS

SIR,—*I am very grateful to you and your staff for sending me the VHFCC certificate, which arrived in good order. Also, I wish to tell you that I am proud to be a member. VHF has given me much pleasure and satisfaction, but also hard work. However, it has proved itself very rewarding!*

It is hoped in future to have many opportunities of making G-PA contacts. For G's, I can say that during the right conditions they will be able to make many more PA QSO's than last year, because the activity and number of stations on two metres has increased considerably over here.

G. Blauw, PAØBP, Josef Israelsplein 4, Heemstede, Netherlands.

ON SURPLUS RELAYS

SIR,—*In the March and April issues there were comprehensive articles on relays, and in December the T.1154 was fully discussed. But in none of them was there any mention of the aerial relay fitted in the T.1154. Practically all writers dismiss this relay with the words "wedge it firmly in the send position," though it is fair to say that in the April issue A. A. Mawse does at least give it favourable mention, and it is appreciated that any detailed treatment would have been outside the scope of his excellent series of articles.*

Actually, there could hardly be a better aerial relay than this; it follows keying easily up to 25 w.p.m., and so allows one to work full BK; having in the past used the T.1154/R.1155 combination, I would not wish for anything else. It would be helpful to many people were you to publish details on how it can be used.

C. F. Thomas, G3EKU (OT 1913), 38 Colney Heath Lane, St. Albans, Herts.

SIR,—*With reference to the article on surplus aerial relays in the April issue, readers may be interested in the following data concerning the aerial current indicator incorporated in the American "Antenna Relay Unit, Type CCT-29125."*

This is a Weston meter, model 507, and has a non-linear movement due to the angled pole-pieces; this has the effect of opening out the bottom end of the scale so that a linear calibration can be put on the dial for RF current measurement with the thermo-couple. The pointer movement is logarithmic from scale readings of 2 to 10, so the instrument would be particularly useful as an S-meter. The DC resistance is about 3 ohms, and the calibration can be taken as varying between 0.2 mA for a scale reading of 1, to 5 mA for a reading of 10, thus: 1, 0.2; 2, 0.4; 3, 0.5; 4, 0.7; 5, 1.0; 6, 1.3; 7, 1.8; 8, 2.5; 9, 3.5; 10, 5.0 mA.

R. A. Bastow, G3BAC, 17 Leahurst Gardens, West Bridgford, Nottingham.

G3BAC and G3EKU are thanked for these ideas and useful suggestions, which will be of interest to many readers.—*Editor.*

LOOK ON 11 METRES!

SIR,—*As a subscriber to the Magazine, I thought readers might be interested to know of W efforts to attract the attention of G's to the 11-metre (26.960-27.230 mc). band. Since its reawakening about six months ago, a group of VE's and W's (calling themselves the "National Association of Diathermic Amateurs"!) have been yakking away in this QRM-free paradise, especially during week-ends when the commercial and medical deep-ray therapy apparatus is normally off.*

This is the only DX band in which we W's are permitted to use duplex phone, and nothing has given more pleasure than a cross-band, 10/11-metre Trans-Atlantic contact with those few G's who have thought to rescue us from our isolation. But in the main, even with 10 metres wide open, our "CQ, please answer below 28.5 mc" goes unanswered. In despair, we tune the G portion of the 10-metre phone band, hoping to hear the "CQ Eleven" that never comes; we have to be content with a stray Central or South-

American who, in an idle moment, may be curious to know whether his 10-metre beam will give on 11 metres.

With 120 watts into a 6-bay Sterba Curtain, beamed on Manchester, England, my tape recorder grinds out the following, sometimes for hours on end: "CQ DX. This is W1AHX. Please interrupt this CQ by answering between 28.2 and 28.5 mc. I am tuning that segment now for any calls." And the results so far? As our Latin-American friends would say, "Absaloutamente nada"!

J. Fraser Austin, W1AHX, Frazar Road, West Falmouth, Barnstaple County, Massachusetts, U.S.A.

We are quite sure that after the appearance of this letter, W1AHX and all the other members of his group will not lack calls from the 28.2-28.5 mc area of the 10-metre band, if the level of Gee (navigational aid) interference allows them to be heard at all!—*Editor.*

WHERE is MONMOUTHSHIRE?

SIR,—*Since I reside in the county of Monmouthshire, I understand that I can choose either a G or a GW prefix. However, I have been told that, even though I may have a GW call, my station would still be considered as being in England. But, because a GW is rarer than a G call-sign, I would naturally choose the former. To be fair to the other station, who may think he is working a new country (Wales), I would be glad if you could clear up this matter for me.*

B. R. Davies, 19 Coronation Road, Blackwood, Mon., S. Wales.

We are being asked to solve a geographical problem, involving ethnological factors of deep significance to those concerned, which has been a matter of learned controversy for generations! When it comes to amateur licences, even the GPO refuses, wisely, to adjudicate on this one. That part of Monmouthshire from which our correspondent writes is certainly more Welsh than the Usk-Abergavenny-Chepstow-Monmouth area, and for this reason he would be right to choose a GW call. For the purposes of our WBC Certificate we have, quite arbitrarily, put Monmouthshire in Wales, and to that extent his GW call would be accepted as Welsh. But beyond that we cannot go! At the same time, it should be remembered that Wales is no longer a "rare country" in the Amateur Radio sense, there now being many GW's active on all amateur bands. For those who might be interested in knowing how this issue has been evaded officially, it is because the district has always been described as "South Wales and Monmouthshire." People of the county, keen on local history, like to refer to it as Gwent, the border country between England and South Wales. This confuses the issue a little further!—*Editor.*

OPERATION ON SINGLE-SIDEBAND

SIR,—*The article by G3GEN in the October 1955 issue of the Magazine is basically very good, but I feel that he has missed warning the unwary that the RF phase-shift networks described are somewhat frequency-conscious, and that a change in frequency of only a very few kc will spoil the sideband suppression; this cannot, in any event, be very good when the exciter is working on the frequency for which the values were calculated, because of the simple RC network used. But in the present state of the art, the exciter as described by G3GEN is capable of putting out a reasonable sideband signal.*

An SSB transmitter of good design, correctly adjusted, can radiate a signal which faithfully reproduces the voice frequencies, with the supreme advantage that it only takes up half the bandwidth necessary for an AM signal of equivalent quality characteristics. Receiver tuning is not nearly as difficult as many people seem to think; any trouble in that respect can usually be traced to excessive RF gain, causing blocking.

I am myself using an SSB exciter of home construction, somewhat similar to that described by G3GEN, but incorporating rather more elaborate RF and audio phasing circuits, with the sideband generated at a fixed frequency of 9 mc. This allows mixing with a VFO on 5 mc to give output in the 80 and 20 metre bands; by doubling in the VFO, I can get on Top Band and 15 metres, and by tripling, on to 40 metres; for 10 metres, the VFO is quadrupled.

Up to last October 1 had worked more than 200 SSB stations, over 70 of which were G's on the 80-metre band. Totals to date are nearly 400 SSB stations worked in 52 countries, and it is obvious that the number of active stations is increasing daily; the latest figures suggest that there must be over 300 G/SSB's now operating on a regular basis. In the Croydon area alone we have four SSB stations active on the HF bands, and seven more who can use it on 3.5 and 14 mc. It would seem reasonable to suppose that other areas of amateur activity also have a large proportion of SSB population.

R. L. Glaisher, G6LX, 279 Addiscombe Road, East Croydon, Surrey.

These are interesting statistics, and will surprise some readers. G/SSB's may like to know that we hope shortly to start a regular feature devoted to Single-Sideband activity and interests.—*Editor.*

CW PROCEDURE SIGNALS ON TELEPHONY

SIR,—*With reference to the article entitled "Restrictive Practices on the Air," by G2NS, which appeared in the March issue of the Magazine, I feel that I cannot allow some of his remarks, under the heading of Go-Slow-Telephony, to pass without comment.*

It appears to me that the art of radio-telephony lies in conveying one's meaning to the other station as concisely and as clearly as possible. In order to achieve that object, I am prepared to borrow from code procedure, from Army procedure or from any other procedure, and am little concerned whether the various users of those systems are flattered or not! The Q-code was specially designed to convey lengthy meanings by a three-letter group; if it can be adapted for phone use then, I say, by all means let's employ it.

G2NS maintains that it is

Letters to the Editor

simpler and more business-like for an operator to say "Fading" rather than "QSB Quebec Santiago Baltimore"—but is it? If the station you are working has QSB, then the chances are that you are fading also. G2NS would perhaps say "Your signals are fading"; I would prefer to say "You have QS Boston." There is no need to expand further, as "Boston" is the effective word. I maintain that QS Boston conveys my exact meaning to the other station, is concise and, what is more, the word Boston (or Baltimore, if G2NS prefers it) will get through to the other end very much better than will the word "Fading," under the conditions we are considering.

Let us take two further examples, QRN and QRM. As G2NS has deprived himself of the use of the Q-code, he would have to come out with "Your signals are suffering from interference by passing cars," or some such sentence—but he won't get it much shorter. If he allowed himself the use of the Q-code, he would say, simply, "You have car QR Mexico." More concise and, I venture to say, more business-like! And my second example, "You have QR Norway," is surely much clearer and more concise than "You have interference from static"—especially when trying to get one's meaning across to a foreign operator who hasn't very much English. I would say that very often a judicious use of the Q-code is the only *way of getting one's meaning over under such circumstances.*

I have one final bone to pick, and then I am done! G2NS says that, when calling, we should say "Calling any station, this is . . . etc." Surely this is cumbersome? How does he call if he wants a reply from a distant station, but not from a local? I suppose he would have to say "Calling any station outside Europe . . ." I would prefer to say "CQ, this is . . . etc," if I don't mind who comes back to the call, or "CQ DX, this is . . etc." if I am looking for a call from a distance, or from a station difficult to work. Anyway, I am sure that, whatever he may write or I may think, phone operators will still be calling "CQ DX" long after G2NS and I are silent phones!

I would like to conclude by saying that, in spite of all this, I immensely enjoyed reading the article by G2NS, that I always do enjoy his articles, and that, apart from these criticisms, I am fully in agreement with everything else he has to say.

R. F. B. Featherstone, VQ4RF, Box 264, Nakuru, Kenya Colony.

VQ4RF is a well-known DX phone operator of great experience, and his views will therefore be respected by all who have opinions on this matter. It is fair to explain that G2NS, who takes these criticisms in good part, was discussing G phone behaviour on our "local" 80-metre band rather than in the DX sphere. Thus, the view-points as between VQ4RF and G2NS are rather different. However, we shall be interested to hear what other readers have to say on the subject.—*Editor.*

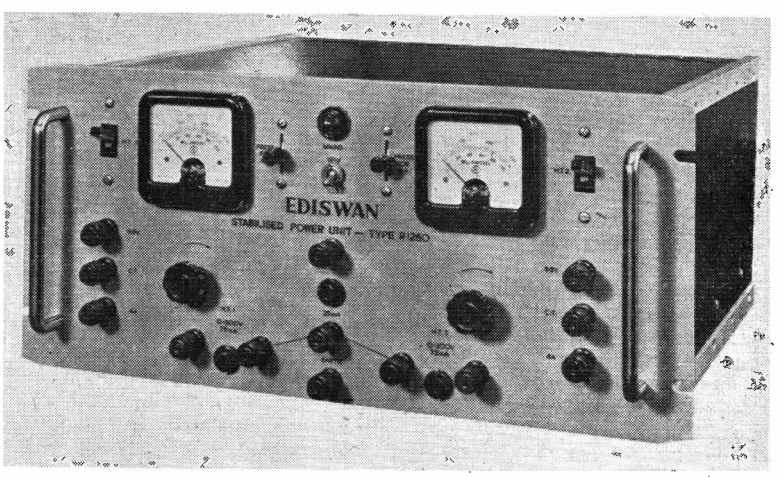
SUCCESS FOR A BEGINNER

SIR,—*I would like you to know that I read the Magazine from cover to cover, and that all my DX results have been obtained purely by following the recent "Going After DX" series. I obey them word for word!*

My station runs about 25 watts to a 132-ft. aerial, and the QTH is on the top of the North Downs—which may account for some of my results. These include several W's on Forty, and the whole of the States, with FM7, KP4, PY, VP3 and VP9, on Twenty. This DX would not thrill the old hand as much as it does me, but anyway it has convinced me that I am on the right lines. As I am only 20 years old, I hope to be at it for some time yet, as I should have a good few years of DX before me!

D. G. Quarrington, G3KSL, 69 Pennant Road, Rochester, Kent.

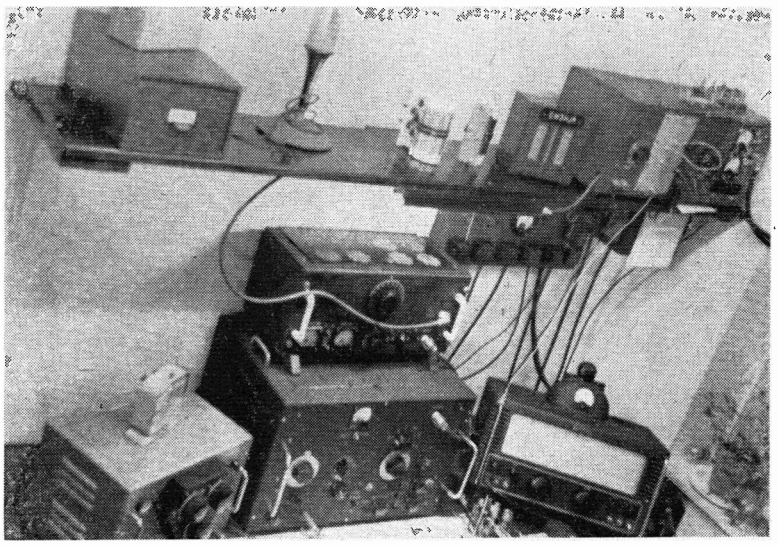
The series on DX operating to which G3KSL refers appeared in the December, January and February issues of SHORT WAVE MAGAZINE.—*Editor.*



The Ediswan Type R.1280 stabilised power supply unit, giving outputs of 75 mA and 300 mA at any voltage up to 300v., as well as — 200v. at 25 mA.

THE OTHER MAN'S STATION

GW3HJR



THE location of GW3HJR—owned by R. Morris, The Shack, St. Cenydd Road, Caerphilly, Glam.—is 500 ft. a.s.l. and well in the clear; the station is accommodated in a small back room of a bungalow. On the extreme right of the desk is the Eddystone S.750 receiver with an S-meter; on the right of the 750 is a twin-section audio filter. The knob above the S-meter is a separate monitoring control so arranged that the receiver does not have to be touched during transmission.

In the centre, to the immediate left of the S.750, is the table-top transmitter, entirely self-contained, for Phone/CW operation on all bands 160 to 10 metres; the arrangement is VFO-BA 6AB7-6AB7 into a Labgear wide-band multiplier using a pair of 12BH7's into a single 807. The built-in modulator is 6AM6-6C4-6SN7-p/p-6L6's in AB for plate-and-screen modulation of the 807 PA, which runs 35w. on phone and about 50w. on CW. Power packs for this transmitter are built-in, and control is by a net-send-receive switch on the front panel.

On the table-topper is a high-power PA unit for CW operation only, consisting of a single TZ40 with band-switching on the grid side but plug-in tank coils; this PA runs 120-130w. on all DX bands, with the 807 transmitter below it as driver.

A VFO of rather more ambitious design than the one in the transmitter itself is on the extreme left; it is a Clapp EF50-BA EF50-6V6 with output on 160 metres, and is arranged for 100° dial coverage of the 1.8, 3.5 and 14 mc bands. Included in this unit is a 100 kc oscillator and a 10 kc multi-vibrator; part of the VFO and crystal oscillator outputs are fed to a mixer, the output of which is rectified and passed to a magic-eye tuning indicator, thus giving visual spot checks of high accuracy.

Under the shelf on the wall is the mains distribution panel, with fuses, voltmeter and power outlets, and connected to a main breaker known to and convenient to operate by any member of the family. Also on the underside of the shelf is the low voltage DC supply for the relays which control the whole station on a single switch. To the right on the shelf is the aerial tuning unit, designed for plug-in coils or straight-through operation depending on the aerial in use. Those at present available are: (1) A 67-ft. top between two 35-ft. masts, fed with 60 ft. of open-wire line and constructed of 14 SWG hard-drawn aluminium, a great saving in weight in an exposed location; (2) A 20-metre ground-plane; and (3) a miniature beam, also for 14 mc.

Main interests at GW3HJR are DX on CW, constructional work and contest operating when time permits—well, he has a very nice station from which to pursue these activities.

"IN TOWN TONIGHT"

During this BBC Saturday evening feature on April 14, a W2 was introduced as an interesting visitor. He was apparently on a world tour, and fitted mobile. No doubt many readers saw, or heard, the item.

NEW MULLARD APPOINTMENT

We are informed that R. W. Addie has been appointed assistant commercial manager of the Television & Radio Division of Philips Electrical, Ltd. He will be well known to many readers as G8LT, of Richmond, Surrey.

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Dead-line for June Issue: MAY 18)

IT seems to us that Clubs who are in need of a rejuvenator might well turn to mobile work this summer. It has much to recommend it, for the production of two good mobile outfits entails enough work to keep ten or twelve members going, and their operation is not a one-man affair, but a team job.

Most Clubs will have members with cars but no rig, and others with rigs but no car; and when one of those cars is mobile-equipped, it will be able to transport a team of three or four members, thus absorbing a few of those who otherwise would not be actively in on the party.

In the case of the average small Club it will be found that two or three mobile teams, out in the country on a Sunday morning, with the remaining members at their home stations, either transmitting or listening, will provide activity for the entire membership—and activity of a kind that brings them all together into one operation.

Yes— if *your* Club needs a "shot in the arm," this might well be it.

ACTIVITY REPORTS

Aldershot, a Club which was in existence in pre-war days, has now staged a revival, with a preliminary gathering and the first business meeting for the election of officers. Fortnightly meetings will be held from now on, at "The Cannon," Aldershot—at the bottom of Victoria Road and near the local Football Club.

Forthcoming events at **Coventry** include "Summer DX," by G2LU, on May 14; an Open Night on May 28; and a lecture by Mr. Dryburgh, an SWL very active on VHF, on June 11.

Nottingham (Amateur Radio Club) held its AGM in the Sherwood Community Centre at the end of March, and elected C. W. Hage as chairman, with G3KTQ and G3IQM as joint secretaries. The 1956/57 programme was discussed at length, and it is hoped that suitable equipment can be found to keep the Club station, G3EKW, on the air all round the year.

Slade meet on May 11 for a lecture on Industrial Control by Mr. C. H. Banks of C.J.R. Electrical and Electronic Development Ltd. On May 25 Mr. N. B. Simmonds, a member, will talk on Rectifier Circuits, and on June 8 Mr. D. W. Morris takes up the subject of Industrial Electronics.

Swindon recently held their first AGM and elected G3AYL chairman, Mr. C. Vance treasurer and G3JOT secretary. Recent activities included a talk on Capacitors and the demonstration of a transmitter and receiver with the help of G8PX and G4AP/Mobile. In May, there will be a demonstration of Hi-Fi Reproduction, and in June a comparison of VHF and medium-wave broadcast reception.

West Lancs have also had their AGM and elected Mr. T. Searle chairman, G3JUA treasurer and G3KVE secretary. Morse classes are under way again with G3KKU's guidance, and the club now boasts 50 per cent licensed membership, with two new calls added this year. Meetings are every Tuesday, 8 p.m., at the clubroom (over Gordon's Sweetshop, St. John's Road, Waterloo, Liverpool 22).

Wirral held their Fifth Annual Dinner on April 5; it was well attended and the "draw" was a popular feature, as usual. Meetings continue on the first and third Wednesdays, 7.30 p.m., at the YMCA, Whetstone Lane, Birkenhead.

Surrey (Croydon) re-elected their Committee at the AGM, and for their first meeting of the new season (on May 8) will hear a lecture by G4ZU on his Minibeam. A rota of members of the Club have begun to act as Morse instructors to the Croydon Sea Cadets.

Salisbury will be taking part, with the local model engineers' society, in an exhibition at the Market House during the Whitsun week-end. They will be operating on all bands with the club call G3FKF/A. They still meet every Tuesday, 7.30 p.m., at the Clubhouse, The Sawmills, South Street, Wilton.

Plymouth will meet on May 19 and June 16 at the Tothill Community Centre, St. Judes, when visitors will be welcome. Members will be taking part in the

NAMES AND ADDRESSES OF CLUB SECRETARIES REPORTING IN THIS ISSUE:

ALDERSHOT: J. St. C. T. Ruddock, G8TS, 44 Hazell Road, Farnham, Surrey.
BRITISH AMATEUR TELEVISION CLUB: D. W. E. Wheele, G3AKJ, 56 Burlington Gardens, Chadwell Heath, Romford.
COVENTRY: J. H. Whitby, G3HDB, 24 Thornby Avenue, Kenilworth.
GRAFTON: A. W. H. Wennell, G2CJN, 145 Uxendon Hill, Wembley Park, Middx.
LOTHIANS: J. Good, GM3EWL, 24 Mansionhouse Road, Edinburgh 9.
NOTTINGHAM: J. Rayner, G3KTQ, Woodthorpe House, Sherwood, Nottingham.
PLYMOUTH: C. Teale, G3JYB, 3 Berrow Park Road, Peverell, Plymouth.
SALISBURY: V. G. Page, G3IVP, 32 Feversham Road, Salisbury.
SLADE: C. N. Smart, 110 Woolmore Road, Birmingham 23.
SOUTH MANCHESTER: M. Barnsley, G3HZM, 17 Score Street, Bradford, Manchester 11.
STOCKPORT: G. R. Phillips, G3FYE, 7 Germans Buildings, Buxton Road, Stockport.
SURREY (CROYDON): S. A. Morley, G3FWR, 22 Old Farleigh Road, Selsdon, South Croydon.
SWINDON: F. G. Whatley, 6 Crombey Street, Swindon.
WELLINGBOROUGH: K. R. Fulbrook, G3KRF, 2 Kent Road, Wellingborough.
WIRRAL: L. I. Powell, 549 Woodchurch Road, Prenton, Birkenhead.

field day on June 2 and 3, at Buckland Monachoram. It is hoped to run a junk sale during May or June.

Grafton continue to meet thrice weekly (Monday and Wednesday, RAE, and Fridays, Club). Recent events included a junk sale, a talk by G3AFC (Labgear LG. 300), by G2CJN (Phone and CW Monitors) and G5GQ (Ideas on Simple Phone Rigs). Next big event is Grafton's Field Day, June 9 and 10.

Wellingborough took part in a hobbies and careers exhibition organised by the local Rotary Club from April 4 to April 6. The Club station G3KSX was working full time, and a local mobile transmitter was "talked in" to the exhibition hall. A home-made tape recorder was also a big draw, and many ingenious exhibits were on show, including a burglar alarm made by a member of the local police force.

Members and friends at the annual dinner of the Bradford Amateur Radio Society, which is a well-supported organisation.

The **British Amateur Television Club** (Chelmsford Group) meet on May 10, 7.30 p.m., in Marconi College, Arbour Lane, Chelmsford, to hear a talk on Recent Development in Camera Tubes. On June 14 the subject will be 70-cm TV Transmitters, and the speaker G3VI.

South Manchester have a talk on the Clapp Oscillator (G2HW, on May 4), one on Electrical Measuring Instruments (G3HZM, on May 18) and a discourse called "Transportable" (G3IXC, on June 1). **Lothians** meet on May 17 to hear about The Beginners' Transmitter, Part II, by The Brains Trust, and meet again on May 31 for their field day briefing. On June 10 they have organised a bus tour (details from secretary) and they hold their AGM on June 14. All meetings at 25 Charlotte Square, Edinburgh.

Stockport elected their officers at the recent AGM, and heard a report of a successful year and good financial status. A social and dance was held on April 13, with about 75 people present. Early in May they are collaborating with a local TV dealer and are exhibiting equipment.

Reports for this feature are welcomed from all active Clubs. For the June issue, they should reach us by **May 18,** addressed "Club Secretary, *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Closing date for **July** will be *June 15.*

THE "BEGINNER" SERIES

In response to enquiries, we can say that it is the intention to resume in due course the series of articles by A. A. Mawse, who is at present resting from his recent labours. His series ran for the year up to the last issue, and covered a great deal of ground. A certain number of back copies of these issues, April 1955 to April 1956 inclusive, is being held in stock; the price is 2s. 2d. per copy, post free, for issues dated April 1955 to February 1956, and 2s. 9d. for the March and April 1956 issues.

THE R.E.C.M.F. EXHIBITION

As usual, this was a great success from the business point of view, while on what might be described as the personality side, it was very interesting to your correspondent to find holders of amateur call-signs officiating at so many of the stands. There can now be very few radionic concerns of any consequence in this country which do not number licensed radio amateurs on their staffs.

QSL BUREAU FACILITIES

Readers are reminded that we offer a full QSL Bureau service to direct subscribers—that is, those who take out a subscription to SHORT WAVE MAGAZINE with us; this costs 30s. for a full year of twelve issues, delivered by mail, or 15s. for the half-year. We accept cards *for* G's, irrespective of whether they are subscribers or even readers of the *Magazine*, from all overseas agencies. Only those readers in the U.K. who are in direct subscription with us can, however, send us their own cards for distribution outwards. The sole address of our bureau for QSL cards is: BCM/QSL, London, W.C.1, which is sufficient from any part of the world.

HELD OVER for NEXT ISSUE

We regret that pressure on space has prevented the appearance this month of our "New QTH" feature. This does not, however, in any way delay the G listings prepared for the quarterly issues of the *Radio Amateur Call Book*, for which we are sole agents for Europe and the U.K.

Readers are reminded that we accept call-signs and changes of address from all British amateurs, irrespective of whether they are subscribers to SHORT WAVE MAGAZINE. Appearance of the call-sign/address in "New QTH's" guarantees publication in the *Radio Amateur Call Book*, which is the only directory to the radio amateurs of the world.

OBITUARY

We very much regret to have to report the death of Victor Patterson, EI4X, of Mount Merrion, Co. Dublin, who passed over on March 16 after a short illness. His call was well known on the DX bands.

* * * *

It is with sorrow that we also record the death, on March 19, of John Piper, GM3COE, of Gateside, Fife; he leaves a widow and daughter, who will have the deep sympathy of all his friends of the air.

* * * *

Richard Barry, G3HBK (ex-MP4HBK), of Cowley, near Uxbridge, Middx., was the victim of a sudden heart attack on April 14. He leaves a widow and daughter, to whom we offer our condolences; they will also have the sincere sympathy of all who knew G3HBK.

SMALL ADVERTISEMENTS

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 AND LOG BOOKS. APPROVED G.P.O. SAMPLES FREE. — ATKINSON BROS., PRINTERS, ELLAND, YORKS.

WANTED: BC-610 Hallicrafters, ET-4336 Transmitters and spare parts for same. Best prices.—P.C.A. Radio, Beavor Lane, Hammersmith, W.6.

TELEVISION INTERFERENCE: Receiver Filters —High-pass E.5037, 30s.; Low-Pass E.5031, 30s.; Composite Band I/III, 49s. 6d. Transmitter Filter E.5034, 80 dB, 1 kW., £6.—Labgear (Cambridge) Ltd., Willow Place, Cambridge.

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

QSL's and **LOGS** by **MINERVA.** The best there are.—Samples from Minerva Press, 46 Queen's Road. Brentwood, Essex.

EDDYSTONE 640 Communication Receiver, with Speaker; perfect; £23.—*Phone: THO. 4627.*

READERS' ADVERTISEMENTS

3d. per word, min. charge 5/-, payable with order. Box Numbers 1/6 extra. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, S.W.1.

RCA AR88D, good order and condition, £48; 10in. Golden Wharfedale speaker, £5.—G2FSR, 2 Parkhill Road. Chingford, E.4. *(SIL. 2451).*

WANTED: Set of 85 kc IF coils for BC-946 or BC-453, or complete BC-946.—H. Bullers, 14 St. Helens Crescent, Swansea.

FOR SALE: Connoisseur xtal pick-up, new, 10/-. 5RV 5-band Tx, 65-watt, VFO Labgear W.B. couplers and Labgear 5-band PA turret, built on brass chassis, standard rack mounting, Eddystone full-vision dial on VFO, fully metered, with power pack, £11. Modulator, 100-watt: Line up 6SJ7-6J5-12AU7 (Clipper)-6V6 into pair 807's in AB2; driver tran. is Woden DT1; mod. tran. is UM3; fully metered, with power pack, rack mounting as Tx; £18. Panda low-pass filters (two), 35/- each; Meters, 0-10 mA, 2½in. F, 6/-; 0-5 mA, 2in. F (three), 5/- each; 0-150 mA, 2in. F (three), 5/- each; 10-0-10 mA, 2½in. F, 6/-. Valves: 6AG7 (two), 5/- each; 6SH7 (eight), 12/- lot; 6SK7 (five), 12/- lot; 6L6M (three), 12/- lot; 6F6M (two), 3/- each; 6J7M (three), 3/- each; 6SQ7, 3/-; 12SR7, 3/-; DET20 (eight), 10/- lot; 955 (six), 12/- lot; 12A6, 3/-; 12SK7, 3/-; 954 (six), 12/- lot.—Sephton, 16 Bloemfontein Avenue. Shepherds Bush, London, W.12.

SMALL ADVERTISEMENTS. READERS—*continued*

WANTED: October 1946 and December 1953 copies of *Short Wave Magazine.*—Bond, 118 Gartcraig Road, Glasgow, E.3.

FOR SALE: Little-used Eddystone 640, with manual; £17 (or nearest offer). — Turner, Edale, Colborne Avenue, Romiley, Stockport.

HALLICRAFTERS S20R, good order, manual, £13; Wilcox-Gay VFO, £5. Valves (mostly new): 24G, 15/-; TZ08-20, 866A/866, APP4G, 7/6; 816, GU1, 5B/502A, PT15, 89, 59, 6SG7, 6SQ7, 6SK7, 6Y6G, 5/-; VT501, 6AB7, 6SH7, 2/6; 7193, CV6, 1/6. WANTED: 105 Unit.—Breese, Cuckoo Hill Farm, Pinner, Middx. *(Phone: 7722).*

EDDYSTONE 840, excellent condition, just factory re-aligned, manual and spare valves; Eddystone bug key; S640, partially stripped; TU5B, QRP Tx and Rx, many valves and components. List on request. Going QRT. — G3JXK, 159 Hampstead Way, N.W.11. *(Speedwell 3965,* after 6.30 p.m.).

FOR SALE: 8-watt Modulator, p/p, EL36's with mod. transformer, £6; VFO for standard rack, xtal calibrator, 3.5 - 3.8 mc, £12; aerial tuning unit, relay and RF meter, 19in. panel, £4; 813 with base, 35/-; D104 xtal mike on stand, £5.—G2ASL, 68 Middle Park Road, Birmingham, 29.

FOR SALE: CR100, mint condition; recently was professionally overhauled; with speaker, phones, spare valves, manual; £25 (or offers).—Box 1675, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: Commercial Tx/Rx, completely self-contained with p/pack; size, 12" x 8" x 3"; an ideal holiday portable, or mobile equipment, 1954 manufacture. Brand-new Type 48 Tx/Rx with two generators; AVO wide-range signal generator; various feeder cables; chassis, panel, gang, dial for small communications receiver; all components, chassis, etc., for 465 kc; IF/AF amplifier with xtal filter, BFO, etc. Xtals 110, 6401, 6440, 6550, 7065, 8000 kc. *QST* 1953/54; *CQ* 1955. Cash offers; part exchange or swap for complete B2 equipment, National 1-10 Receiver, Commercial GDO, 2-metre converter, beam, good camera, radio books, or W.H.Y.?—J. A. Bratby, The Caravan Site, Goatacre, Calne, Wilts.

SALE: 20-metre Tx, complete; 7 mc VFO 6C4, 6AK5, doubler, QVO312 buffer amplifier, PA QVO620, 50-watt input. Modulator, fully metered, line up: 6SJ7, 6J5, 12AU7 speech clipper 6K6 into DT1 driver transformer, two 1625, UM2 modulation transformer; power supplies for modulator 650v.-0-650v., 250 mA and 350-0-350v. and LT. Power supplies for Transmitter 450-0-450v., 200 mA, and 350-0-350v. and LT; also Panda low-pass aerial filter. List price £20; might separate. SX24 in fair condition, price £8. Battery Rx, Type R1224B, range from 1 mc to 9 mc in 3 bands, price £3. VALVES: At 10/-, EM37 (one); at 8/6, 8012 (four); at 7/6, VR136 (two), VR137 (one); at 6/6, 6AG7 (one); at 5/-, 1625 (twelve), 6L6M (two), 1622M (one), KT66 (one), 6K8 (one); at 2/-, 954 (two), 955 (one), 956 (one).—P. Carter, 51 Sundew Avenue, London, W.12.

SMALL ADVERTISEMENTS. READERS—*continued*

WANTED: Bandspread Coil for 14 mc for HRO Rx. State condition and price.—G2FMP, 10 Chesterton Road, Eton Road Estate, Burton-on-Trent, Staffs.

THREE-MONTH-OLD Eddystone Model 750 Communications Receiver; head-phones, S-meter, loudspeaker. All in perfect order. No reasonable offer refused.—Write or call: G. D. Shigwell, 90 Blenheim Chase, Leigh-on-Sea, Essex.

WANTED: Master Oscillator Unit, Type 123; any condition; any reasonable price paid.—H. Hinde, 97 Burton Road, Withington, Manchester.

SALE or EXCHANGE, B2 Transmitter/Receiver with coils, but less power pack. Best offer, but would prefer swap for receiver suitable for club station.—c/o G3EJF, 24 Beryl Avenue, Tottington, Bury, Lancashire.

WAVEMETER wanted. SALE: Hambander with separate speaker, £12 10s.; Hallicrafter. S38B, £15; Marconi B36, £15.—GC3KPO, 3 St. Saviours Road, Jersey.

URGENTLY REQUIRED: 12 Set Tx Manual, to buy or borrow; one ATP35 valve.—Thyer, 12 Spotland Tops, Cutgate, Rochdale, Lancs.

CHEAP GEAR: Valves, meters, resistors, condensers, transformers, chokes. Lowest prices; s.a.e. for list.—John Morris, G3ABG, 24 Walhouse Street, Cannock, Staffs.

WANTED: SWL requires SX28, SX71, AR88D or NC183 Rx; good condition.—Blane, 62 Hewlett Road, Bow, London, E.3.

MORECAMBE HOLIDAY: Overlooking Bay and Lake District mountains. Ham Shack.—Write brochure: G3AEP, Ferncliffe Guest House, Drewton Avenue, Sandylands, Morecambe.

PHILIPS Crystal Microphone (cost £12); 100 kc crystal, 0-1 mA 3½in. meter. WANTED: 3.5 mc crystal; radio *Call Book*; W.H.Y. — J. Brown, Waterworks, Penryn, Cornwall.

HRO SENIOR with power supply, 4 coils including 14 and 21 mc bandspread coils with handbook; £22. Other gear; s.a.e.—J. P. King, 33 Abbey Road, Great Malvern, Worcs.

40 METRES? Two Canadian 58 Walkie-Talkies, complete with vibrator and battery pack, aerials, mike, headsets.—G3JOL, Saracens Head Hotel, Daventry.

AR77E, speaker, manual, £28; R1155E, modified with 21 mc, £4 10s.; power pack, rack mounting, 275v., 300 mA DC, 6.3v. 7A, £4 (or best offers). Also valves, plugs, relays, mikes, etc. Emigrating, must sell; s.a.e. for list.—Box 1676, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

AR88D Instructions Manual (new) in exchange for CR100 manual.—Maddox, 4 Pitt Crescent, Wimbledon Park, London, S.W.19.

SMALL ADVERTISEMENTS. READERS—*continued*

HALLICRAFTER SX17, excellent condition, £20; a Mk. III, complete all spares, new, £10; American all-dry Rx's, 2-6 mc, 5-13 mc, takes standard batteries, £8 the pair.—Write L. Grout, 68 The Drive, Worthing.

SELL or exchange for your gear: AVO7, £8; 2-metre gear, receiver, £11; transmitter, £8; aerial, two-stack, £3 10s.; double conversion IF unit, £6; HK257B/4E27, £2; 1952 *ARRL Handbook*, 10/-; low-pass filter, 35/-; 35mm. camera, f2.8, CRF, ERC, £21.—Box 1678, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: Complete phone Tx, up to 75 watts, preferably with separate VFO and power pack, to cover 80, 40, 20, 10 metres.—Jenner, Abbacot, Loudwater Lane, Rickmansworth.

AR88LF with manual, excellent condition, £42 (o.n.o.). Buyer collects.—Rooke, 57 High Street, Wootton Bassett, Wilts. (*Tel. 487*, evenings).

SENDER 12, mint, tunes 21 mc, spare ATP35, official handbook, all plugs; nearest £20. Eddystone Speaker, mint, 25/-. All carriage extra.—Box 1679, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

HRO COILS, 1.7-4 mc, 30/- each; Class-D Wavemeter, 130/-; National Receiver, type NC120, £35.—Gade, 45 Belvedere Avenue, Barkingside, Ilford, Essex.

12 VALVES required, type RV2P800 Telefunken, or similar make, stating price and quantity; also circuits for Tx/Rx F.U.H.e.d.—Kirby, Bailiffs Cottage, Langley Park Farm, Langley, Maidstone, Kent.

WANTED: 150-watt Table-top Tx, Labgear or Panda, etc.; state age and price. HK257B's for sale, 45/-, or swap 813. — Box 1674, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

HRO SENIOR, 4 bandspread coils, 3.5, 7, 14, 21 mc, manual, spare valves, £20; AR77E, revalved, £20. Both good condition.—Chamberlain, 26 Middleton Crescent, Costessey, Norwich.

MEDIUM-POWER TRANSMITTER, T1509; comprising Transmitter, Type 59; speech amplifier, Type 367; power unit, Type 381; covering 1.5-20 mc, Crystal/VFO, CW/Phone. Complete, valved and metered, in welded steel cabinet, with cooling fan; unused.—Write for details: Box 1677, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: Johnson's 200A Communications Receiver, phones, 10-170 metres; guaranteed; nearest 9 guineas.—Moore, Castle House, King's School, Worcester.

Short Wave Magazine Advertising gives World-Wide Coverage.

HENRY'S

(RADIO LTD.)

MINIATURE TRANSMITTER UNIT 'TYPE 81'
Containing 6 valves: CV415, CV309, 2–6AM6, 2–CV136, 4860 kc/s Xtal. Tuning Condensers, Res. V/C., etc. In absolute new condition. Chassis size, 9in. x 8in. x 3½in. Bargain **£4/10/–**, with Valves, and Xtal. Miniature I.F. Strip for above. **'Type 373.'** 9.72 Mc/s. Band width 180 kc/s. Ideal for F.M. Valve line: 2-EF92, 3-EF91, EB91. Size, 10¾in. x 2½in. x 3in. (with circuit). Less valves, **7/6**, p.p. 1/6.

"RF 26" F.M. CONVERTER UNIT 88/100 Mc/s
This well-known RF 26 Unit is now adaptable for F.M. reception using 2 IF. stages and separate local Oscillator and tuned by a Muirhead graduated Vernier drive. Can be converted at low cost of **92/6.** Send **1/6** for 8-page Descriptive booklet containing full wiring instructions, circuits and layout diagrams.

PYE 45 Mc/s STRIP TYPE 3583 UNITS
Size 15in. x 8in. x 2in. Complete with 45 Mc/s Pye Strip, 12 valves, 10 EF40, EB34 and EA50, volume controls and hosts of Resistors and Condensers. Sound and vision can be incorporated on this chassis with minimum space. New condition. Modification data supplied. **Price 69/6.** Carriage paid.

U.S.A. INDICATOR UNIT Type BC929A
These Units are in absolutely new condition. In black crackle cabinet 14½in. x 9in. x 9in. Complete with 3 BP1C/R Tube, Shield and Holder, 2-6SN7GT; 2 6H6GT; 1 6X5GT; 1 2X2; 1 6G6, V/controls, condensers, etc. Ideal for 'scope. **65/-**, Carr. Pd.

CATHODE RAY TUBES (Brand New)

VCR97 (slight cut-off) ...	15/-
VCR97 guaranteed full T/V Picture	40/-
VCR517C, guaranteed full T/V Picture	35/-
VCR139A, guaranteed T/V Picture	35/-
3BP1, guaranteed full T/V Picture	30/-

Carr. & packing on all tubes, 2/-

QUARTZ CRYSTALS
Type FT 243 Fundamental Frequencies
2-Pin ½-in. Spacing
200 TYPES in Following Frequencies:
5675 kc/s to 8650 kc/s (in steps of 25 kc/s).
5706 kc/s to 8340 kc/s (in steps of 33.333 kc/s).
BRAND NEW. 10/- EACH
Special Price for Complete Sets of 80 or 120

Type FT 241A. 54th Harmonic 2-Pin ½-in. Spacing

21.1 Mc/s.	23.2 Mc/s.	23.2 Mc/s.	26.1 Mc/s.
21.2 ,,	23.0 ,,	23.4 ,,	26.4 ,,
21.4 ,,	22.8 ,,	24.4 ,,	27.0 ,,
	22.9 ,,	26.0 ,,	

Brand New & Guaranteed, 7/6 ea.

FT241A 200 kc/s. 10/-
HOLDERS FOR CRYSTALS 1/3

SPECIAL PRICE FOR QUANTITIES.

VALVES — VALVES — VALVES
We have over 50,000 American and English valves in stock at very low prices. Send 3d. for 28-page Illustrated Catalogue.

CRYSTAL MICROPHONE INSERTS

5/- POST FREE  5/- POST FREE

Ideal for tape recording and amplifiers. No matching transformer required

62A INDICATOR UNIT
Containing VCR97 with Mu-Metal Screen 21 valves:—12-EF50, 4-SP61, 8-EA50, 2-EB34, Plus Pots., Switches, H.V. Cond., Resistors, Muirhead S/M. Dial, Xtal, Double Deck Chassis. BRAND NEW, ORIGINAL CASES, **67/6.** Carr. 7/6.

INDICATOR UNIT TYPE 182A
Unit contains VCR517, Cathode Ray 6in. tube complete with Mu-Metal screen, 3 EF50, 4 SP61, and 1 5U4G valves, 9 wire-wound volume controls and quantity of resistors and condensers. Suitable either for basis of television (full picture guaranteed) or Oscilloscope. Offered BRAND NEW (less relay) at **67/6.** Plus 7/6 carr. "Radio-Constructor" 'scope circuit included.

5, HARROW ROAD, PADDINGTON LONDON, W.2. **TEL.: PADDINGTON 1008/9, 0401**

G2AK QUALITY AND SERVICE G2AK

THERE IS NO EXCUSE *NOW* for not being on phone or for not having a nice clear signal.

★

CRYSTAL HAND MICROPHONES

As illustrated, in silver hammer case with polished grille, handle and 4-feet of screened lead.

ONLY **21/-**

Post paid.

COPPER WIRE. 14G, H/D 140ft., **15/-**; 70ft., **7/6.** Post and packing 2/-. Other lengths pro rata.

RACK MOUNTING PANELS. 19" x 5¼", 7", 8¾" or 10½". black crackle finish, **5/9, 6/6, 7/6, 9/-** respectively, postage and packing 2/-.

ABSORPTION WAVEMETERS. 3.00 to 35.00 Mc/s in 3 Switched Bands. 3.5, 7, 14, 21 and 28 Mc/s Ham Bands marked on scale. Complete with indicator bulb. A MUST for any Ham shack. Only **15/-** each. Post and packing 1/-.

CERAMIC FORMERS. 2¾" x 1¼". Ideal for VFO or Turrets, **1/9** each or **17/6** doz.

CERAMIC SWITCHES. 2 bank, 2 pole, 4-way each bank, **5/-**. Post and packing 9d.

HEAVY DUTY POTS. 500 ohms only. Torrodial type by: P.X. Fox, worth **15/-**, OUR PRICE **3/6** each. Post and packing 1/-.

HEAVY DUTY POWER TRANSFORMER. 0-240 tapped primary. Sec. 350/350 250mA., 5V. 2.5A, 6.3V. 3A, 15V. 5A (tapped 6.3 and 12.6V.), **39/6,** p. and p. 2/6.

CONDENSERS. 8μF 600v. trop. 750v. normal. New ex-W.D. stock, **5/6** each, P/P 2/-.

SHADED POLE MOTORS. Heavy duty type. Totally enclosed, made for professional tape deck. *Very limited quantity.* Only **35/-**, P/P 2/-.

PARMEKO H/D Transformer, 230v. pri. 620/620v. 200 mA. Tapped 550v. and 375v. 250 mA 5v. 3A., 5v. 3A. **£3,** carriage paid.

STREAMLINED BUG KEYS by famous maker. Brand new in cartons. Usually over **£4.** Our price, **45/-** only.

More Special Bargains

MINIATURE I.F. TRANSFORMERS
450/470 kc/s. Size: 2⅜" high x 1 3/16" square. Litz wound. Slug tuned, ONLY **7/6** per pair, P/P 9d.

FREE OFFER

AMERICAN. New boxed **807's, 7/6** each or 4 for **25/-**.

CERAMIC 5-pin. holders for above, **1/-** each **4 HOLDERS FREE** with each 4 valves.

EDDYSTONE, WODEN, RAYMART, AVO, etc., COMPONENTS AND A GOOD RANGE OF COMMUNICATION RECEIVERS ALWAYS AVAILABLE.

No C.O.D. on Orders under £1

PLEASE PRINT YOUR NAME AND ADDRESS

CHAS. H. YOUNG Ltd., G2AK

MAIL ORDERS TO:—Dept. "S"
102 Holloway Head, Birmingham *MIDLAND 3254*
ALL CALLERS TO:— **110 Dale End, Birmingham** *CENTRAL 1635*

Printed by The Courier Printing Co. Ltd., Tunbridge Wells, for the Proprietors and Publishers, The Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1. The *Short Wave Magazine* is obtainable abroad through the following: Continental Publishers & Distributors, Ltd., William Dawson & Son, Ltd.; AUSTRALIA AND NEW ZEALAND—Gordon & Gotch, Ltd.; AMERICA—International News Company, 131 Varick Street, NEW YORK. Registered for transmission to Canada by Magazine Post. *May*, 1956.