The SHORT WAVE Magazine

2/6

VOL. XVI MAY, 1958 NUMBER 3

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The SHORT-WAVE Magazine

EDITORIAL

Justification

In the last two comments in this space, "Allocations" and "Equity," some points have been made and conclusions drawn as to Amateur Radio licensing and the needs of the amateur when it comes to the working-out of frequency areas. With the next International Conference now in view, and the Bragg Committee sitting, these are matters which demand consideration.

Proceeding from the basic assumption that the ether is free for all to use subject to reasonable safeguards reached by mutual agreement — a principle which needs constantly re-emphasising — we should now look at the conditions under which amateurs are at present operating. Briefly, on virtually all bands except ten metres, they are "working in the cracks." That is to say, our rightful allocations are being trespassed upon by illegal commercial stations, to say nothing of noises emanating apparently from idling jammer transmitters. Though these encroachments have been increasing steadily and the whole situation gets progressively worse, it is nevertheless being met in the sense that more and more amateurs are coming on the air and a great deal of DX is being worked, world-wide, on both CW and phone.

What this means is that amateurs are quite capable of working under shared-band conditions, if they must. But it also implies that a shared band means sharing — in other words, commercials have no ground for complaint if they are being interfered with by amateurs. Nor does it necessarily follow, if a complaint is made, that in all circumstances a commercial station's operations are more important than the amateurs'. It could be shown that a great many commercials waste ether space and spend many hours transmitting merely to "hold the channel." In any case, the apparent threat of amateur interference on a shared band is more imaginary that real; the commercials competing with us (on our bands) are always much higher-powered and practically never use their own frequencies for reception.

In the same way that amateurs — as a body, the most experienced, capable and progressive communicators in the world — have long since ceased to expect their own frequencies to be clear of interference by other amateur stations, so the commercial use of the spectrum as a whole must be worked out, geographically and in time, to allow one channel to serve as many interests and services as possible.

The present level of amateur activity, with the high state of development of the art of Amateur Radio, has become its own justification for a proper share of the ether. This is not a matter of "privilege," or even a "right" (in the moral sense), but simply a requirement by virtue of sheer weight of numbers! Moreover, since radio amateurs are primarily concerned with and interested in Communication, they must have frequency areas available which are capable of carrying their DX traffic — that is to say, any suggestion that amateurs can be compensated for HF bands lost by further allocations in the deserts of the UHF or SHF is completely unacceptable.

Austin Forbes G6FO.

RF Front End Unit

LOW-NOISE DESIGN, FOR THE AMATEUR BANDS

A. C. EDWARDS (G3KGN)

In the September, 1957, issue, our contributor described a High-Selectivity IF/AF Amplifier Unit, suitable for use with an amateur-band converter. This article is the natural sequel, for here he discusses the construction of a tuning unit to go with the IF/AF strip. This RF section covers all bands 80-10 metres, with full band-spread over each range, thus comprising, with the IF/AF Amplifier already described, a complete home-built amateur band receiver of high efficiency.—Editor.

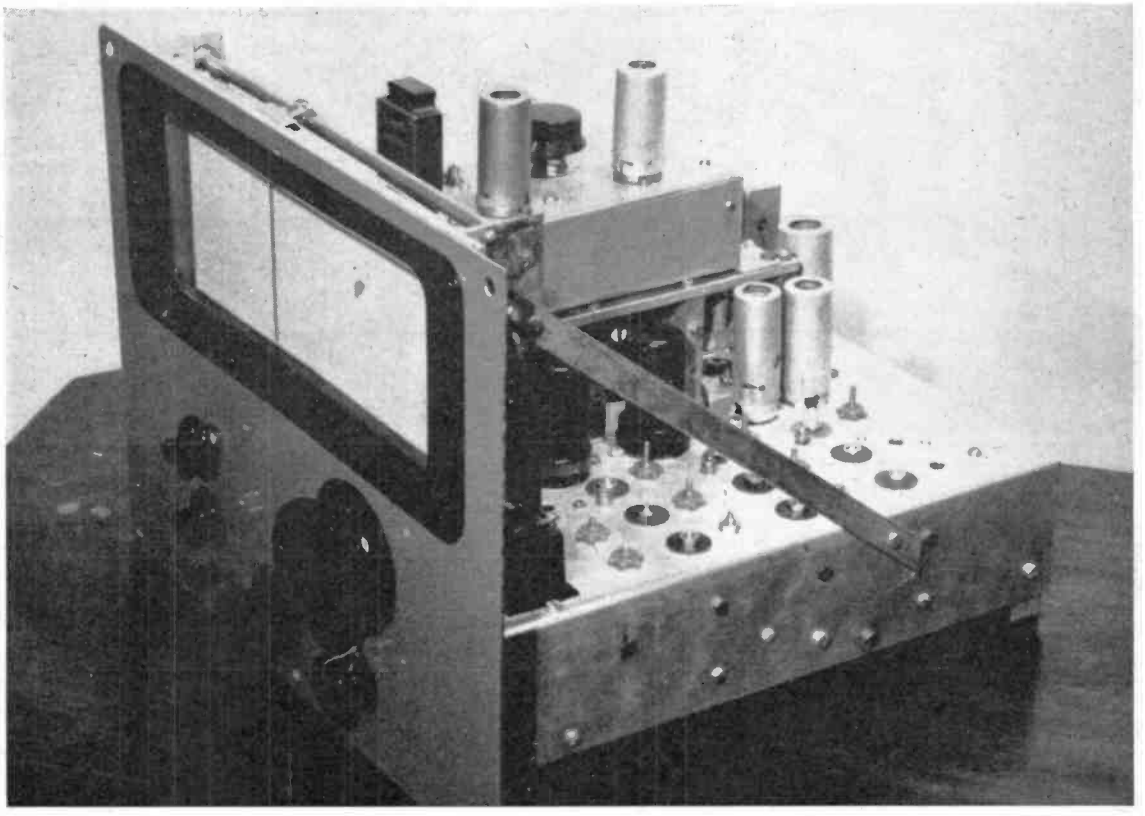
AT some time or other, most amateurs take steps to improve the efficiency of the receiving side of their stations, whether it be by building converters for the 21 or 28 mc bands to precede the receiver, or adding on selective devices to follow it. By comparison, however, few seem to attempt to *design* and *build* a complete new RF front-end to replace some by-now obsolete (sad, but true) pre-war or war-surplus receiver, or to go with a home-brewed IF unit. Possibly difficulties in connection with the design of the coils and the provision of a suitable dial deter many would-be constructors. The object of this article is to show that these difficulties are not insurmountable and to describe just such a front-end, as built by the writer, using no more elaborate test gear than a grid-dip oscillator and a roughly calibrated receiver.

The decision to construct this unit was actually the logical outcome of the construction of the IF/AF amplifier described in *Short Wave Magazine* of September, 1957. The combination of CR-100 and IF amplifier then described was good—certainly an improvement on the CR100 alone—but it was felt that it could be "bettered." In this connection, it may not be realised why the addition of selective devices at the tail-end of a receiver does not always give such good results in practice as is expected. In fact, while the selective units may function perfectly when tested on the bench with a signal generator and show up well on selectivity curves, their performance may be disappointing when receiving signals from the aerial. The trouble is that interfering signals have been superimposed on the wanted signal at some stage in the receiver *before* the selectivity has been introduced. This is because cross-modulation, caused by a strong signal adjacent to the weak wanted carrier, has taken place in one or more stages, giving rise to unwanted noises in the pass-band, after which no amount of filtering will remove them. This problem is particularly troublesome on the amateur bands, where just such conditions exist; part of the solution lies in ensuring that the first few stages in the receiver are as selective as they can be made. We are also, unfortunately, faced with two conflicting requirements in the design of these stages, namely: While maximum gain is required before the mixer valve to overcome noise caused by the latter, at the same time too much gain before the selective circuits in the IF amplifier will aggravate inter-modulation effects caused by strong signals. As a result, some compromise is usually necessary in the design.

We must also not overlook the importance of obtaining a good signal-to-noise ratio, and the valves to be used must be chosen with care, so that noise due to shot effect and thermal transit time is kept at a minimum.

Pentodes are more noisy than triodes in this respect, but for reception triodes (as normally used) are unsatisfactory because of the problem of preventing feedback *via* the grid/anode capacity.

The writer had been very interested in the circuit described on p.368 of the September 1956, issue of *Short Wave Magazine*, being the modification of one which had originally appeared in *QST* for March, 1955. Here we have low-noise VHF techniques as applied to an HF band receiver, and it was decided to make this the basis of the present design, with some minor modifications. With three tuned circuits before the mixer, without excessive gain, it should be possible by attention to circuit Q to obtain very good selectivity. While on this point, most amateurs are aware of the necessity for using low-loss components in their transmitter output circuits, but many tend to overlook this fact when building a converter, where often any type of coil and condenser that will tune the band will be pressed into service. This is just not good enough if we want to obtain the best results, particularly on 21 mc and 28 mc. Coil formers should be of low-loss material wound with the maximum gauge of wire the former will accommodate, and with turns slightly spaced to reduce the self-capacitance. The leads to switch and valves must be kept short so that as much as possible of the inductance is in the coil. The switch wafers should be of



The RF Front End unit designed by G3KGN, to go with his IF/AF Amplifier described in September 1957. The panel controls are RF gain, oscillator set frequency, switch S2, band-change switch S1, the main tuning capacity and aerial trimming condenser C5. Stages V7, V8 are on the sub-chassis above the tuning gang. The dia lhad not been calibrated when this photograph was taken.

ceramic, as also the insulation of the tuning condenser and trimmers. And to avoid instability earth returns should be of heavy gauge material, preferably copper, and earthed at *one* point only for each stage.

If anyone doubts the need for these exhortations, let him look at the coil pack of an AR88, and he will see what makes it such a highly sought-after receiver.

By attention to these points it should be possible, in the single unit, to equal the performance which would be obtained from separate converters for each band, without the inconvenience of changing over and the duplication of valves and components.

It was decided that amateur-band coverage only was required, to give plenty of bandspread and ease of resetting, and since any slight change in local oscillator frequency would be more noticeable under such conditions, a fine control of the oscillator would have to be provided on the front panel. And a built-in crystal calibrator was also highly desirable, to enable accurate dial calibration to be set up and maintained.

Circuit Details

Reference to the circuit diagram will show that the first valve is a cathode follower, giving no gain, but presenting a high impedance to the input circuit.

An EC91 is used for V1 having an equivalent noise resistance of 300 ohms (for a triode, $Rn = \frac{2 \cdot 5}{gm}$). Half a 6J6 might be used here at the expense of a slightly higher noise figure. The ideal would be a 6J4, but they are scarce and expensive. The output of this stage is of the right impedance for feeding V2 (a 6AC7), working as a grounded grid triode. V3 is another 6AC7 used as a high gain pentode amplifier with manual control of gain in the cathode circuit. The mixer V4 is an EF91 wired as a triode with consequent low noise output ; oscillator injection is into the

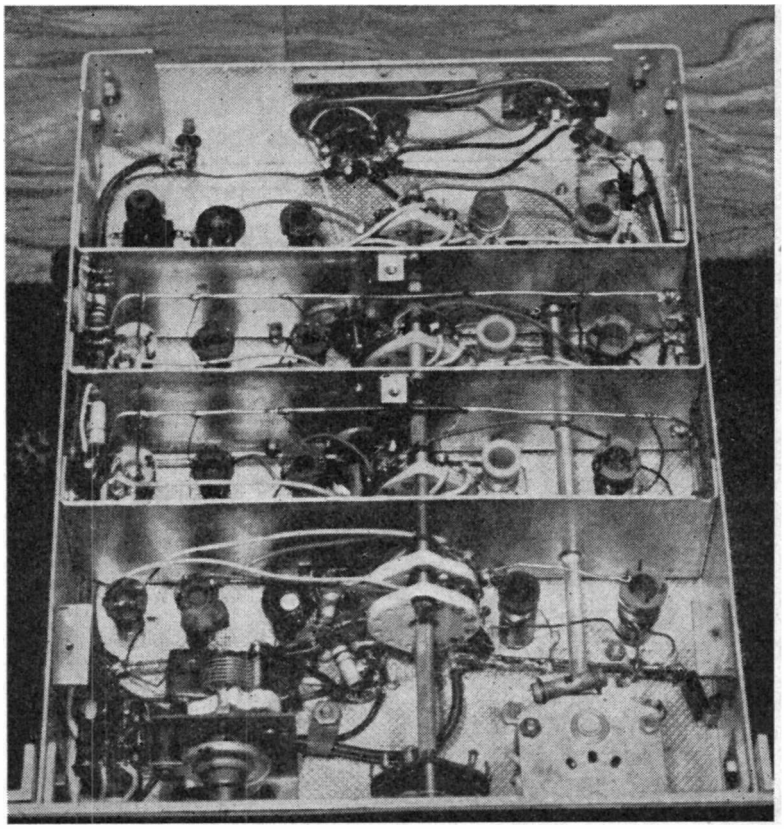
COIL TABLE

BAND	TUNING RANGE — mc	COIL	INDUCTANCE μH	FORMER	NUMBER OF TURNS	WIRE SIZE SWG	PRIMARY OR TAP	SPACING	T TRIMMER μμF	P FIXED SILVER MICA CONDENSER μμF
80	3.5 — 3.8	Aerial	}		*SEE*	*TEXT*				None
	3.5 — 3.8	RF, Mixer	}						3–30	25
	3.965 — 4.265	Osc.	25.9	½″	46 close wound	32	8		3–30	25
40	7.0 — 7.2	Aerial	3.3	⅜″	16 close wound	28	3	1/16″		100
	7.0 — 7.2	RF, Mixer	3.3	⅜″	16 close wound	28	3	⅛″	3–30	100
	7.465 — 7.665	Osc.	2.7	⅜″	15 close wound	28	6		3–30	125
20	14.0 — 14.4	Aerial	0.83	⅜″	8 close wound	20	2½	1/16″		100
	14.0 — 14.4	RF, Mixer	0.83	⅜″	8 close wound	20	2½	⅛″	3–30	100
	14.465 — 14.865	Osc.	0.75	⅜″	7 close wound	20	2¼		3–30	120
15	21.0 — 21.65	Aerial	0.4	½″	4 Spaced own dia.	18	2	⅛″		100
	21.0 — 21.65	RF, Mixer	0.4	½″	4 Spaced own dia.	18	2	⅛″	3–30	100
	21.465 — 22.115	Osc.	0.37	½″	4 Spaced own dia.	18	1½		3–30	120
10	27.0 — 30.0	Aerial	0.77	½″	5 Spaced own dia.	18	2	1/16″		None
	27.0 — 30.0	RF, Mixer	0.77	½″	5 Spaced own dia.	18	2	⅛″	3–30	None
	27.465 — 30.465	Osc.	0.73	½″	5 Spaced own dia.	18	2		3–30	None

cathode *via* C14 from the buffer valve V5, to prevent any pulling of the oscillator V6 (½ 12AT7). Using a Hartley type oscillator here with cathode-tap simplifies the construction of the oscillator coils.

V7 and V8 comprise the crystal calibrator—a 1 mc crystal was available so V8 operates as a multivibrator, giving 100 kc marker points. Operation of the calibrator is controlled by S2, giving three positions: off—1 mc—100 kc.

In the "off" position the calibrator is silenced by the high resistance in its HT supply lead (R 14). In the 1 mc position this resistance is shorted, while R5 comes into circuit and biases off V3; the 1 mc oscillator feeds into the grid V3 *via* C9, which consists actually of a turn of plastic-covered wire bent round the grid tag on the top of the tuning condenser. In the 100 kc position, V8 cathode circuit is completed in addition.



Underneath the G3KGN RF unit, showing general layout and construction. The central switch-line is the band-change, and the oscillator section is in the first compartment from the front.

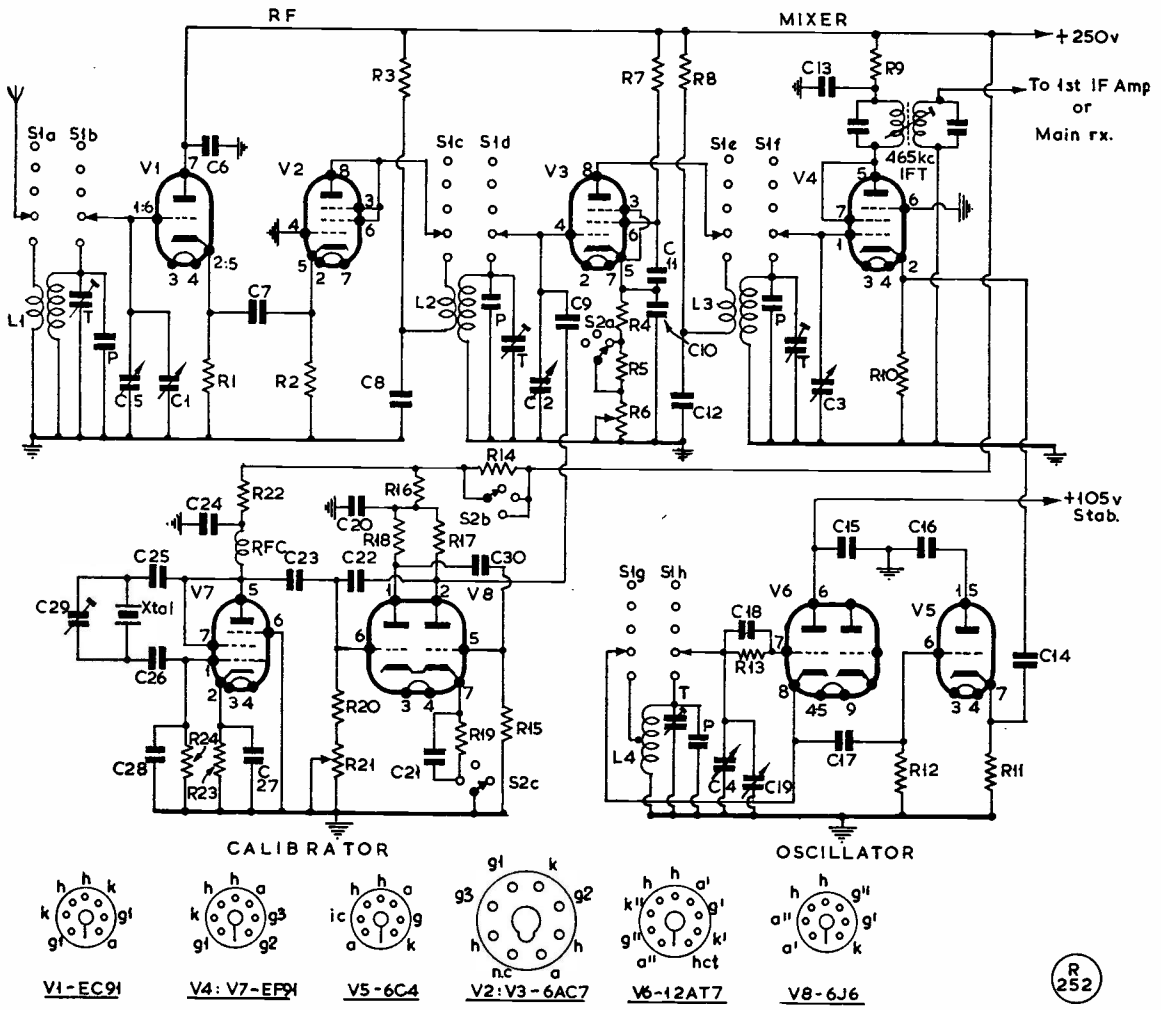
A search of the market failed to unearth a four-gang condenser of suitable size and capacity for C1-4, so two twin-gang units, each 7·5 to 17·5 $\mu\mu$F, were used instead. Unfortunately, these condensers were single-ended, and a ¼in. shaft coupler had to be sweated on to the "blunt" end of one of them. A length of cotton was first wound round over the ball-bearings to prevent solder running in, and the coupler was then sweated on using a very hot iron. The joint was made and broken several times before it was judged to be in alignment. Possibly two of the twin-gang condensers from an RF26 or RF27 unit could be used instead, if some of the plates were removed. It is important that the capacity swing of the tuning condenser is known reasonably accurately, for reasons to be shown later.

Construction

The chassis used was four-sided, of 16g. aluminium, and measured 12in. x 9in. x 2½in.; every effort was made to get this as rigid as possible. Three aluminium screens pass right across the chassis, centrally over V2, V3 and V4, with cut-outs to clear their bases, and are bolted to the chassis sides. They do not actually touch the chassis as they cross, but are bolted to it with 4 BA eye bolts. To these screens are fixed the switch wafers, using ½in. spacers. (Two single-pole wafers were actually used for S1A and S1B, as only three double-pole wafers were to hand.) Aluminium right angle strips 3in. long were bolted in the two rear corners so that the chassis stood a half-inch high. The front panel is of ⅛in. aluminium, to the rear sides of which are bolted two pieces of ⅛in. right-angle strip. These in turn are bolted to the chassis sides, and two further bolts, plus the nut on the wave-change switch, hold the panel to the chassis front edge.

Two lengths of mild steel strip run from the top of the ⅛in. angle strips to the rear of the chassis sides to ensure that the front panel is held rigid; this completes the metal-work, the general construction being as suggested by the photograph.

The front panel has a cut-out measuring



Circuit complete of the amateur-band RF/Mixer/Osc. Unit designed by G3KGN, and fully described in his article. It was produced to work with the IF/AF Amplifier discussed in our September 1957 issue — together, they make a very efficient receiving combination, as the Amplifier itself is designed for high selectivity, and incorporates a product detector for SSB reception. In this diagram, only one set of coils is shown for clarity, on the switch assembly S1A-S1H. *(Note: In this circuit, pin 6 of V4 and V7 should be connected to pin 5, and not as shown).*

9in. x 3½in., into which was fitted a bakelite escutcheon, salvaged from an old BC receiver. A piece of 1/16in. perspex is held at the back by 6 BA screws, into holes drilled and tapped in the bakelite. The well plate holding the celluloid dial is of 18g. aluminium sheet with the end turned outwards for a ¼in. and bolted to the ⅛in. angle strips.

The condenser drive mechanism is one of the AR88 gear reduction type now on offer on the " surplus " market, but instead of a round dial plate, a 2in. drum wheel is mounted on the appropriate spindle and this drives a pointer, *via* nylon cord, between pulleys mounted at the top rear off the well plate. To keep the pointer steady, the brass carriage to which it is soldered runs over and under a length of ¼in. brass rod. This can be seen in one of the photographs. Approximately 6½in. of pointer travel is available with the size of drum wheel used.

Flexible couplers are fitted between the gear mechanism and the tuning condenser and also between the two twin-gang condenser units. These condensers are mounted on four square brass pillars (believed to be from an old R.1132) which, with the addition of a washer on each, ensure alignment between condenser and gear mechanism; 2 BA solder tags are placed under the nuts holding the pillars beneath the chassis and serve as single earth return points for their respective stages. To

Table of Values

Circuit complete of the RF Front End Unit

C1, C2, C3, C4	= 7.5-17.5 $\mu\mu$F, *see text*	R17, R18	= 10,000 ohms
C5, C29	= 50 $\mu\mu$F, variable	R19	= 150 ohms
C6, C15, C16	= .005 μF, ceramic	R20	= 27,000 ohms
C7, C14, C25, C26	= .001 μF, mica	R21	= 50,000-ohm, pot'meter
C8, C10, C11, C12, C13	= .01 μF, ceramic	R24	= 150,000 ohms
C9	= Very small, *see text*	S1	= 4-wafer, each 2-pole 5-way, ceramic, band change switch
C17	= 10 $\mu\mu$F, silver mica	S2	= 3-pole, 3-way wafer, calibrator on-off
C18, C22, C30	= 100 $\mu\mu$F, silver mica	X	= 1 mc crystal bar
C19	= 1.5-3 $\mu\mu$F, variable	RFC	= 1.25 mH
C20, C21, C24, C27, C28	= .05 μF, paper	V1	= EC91
C23	= 2 $\mu\mu$F	V2, V3	= 6AC7
R1, R2, R10, R11	= 1,500 ohms	V4, V7	= EF91
R3, R8, R23	= 1,000 ohms	V5	= 6C4
R4	= 100 ohms	V6	= ½-12AT7
R5, R14	= 100,000 ohms	V8	= 6J6
R6	= 10,000-ohm pot'meter	T	= Trimming condensers, 3-30 $\mu\mu$F, *see text* and Coil Table
R7, R12, R13, R15	= 47,000 ohms	P	= Padding Condensers, *see text* and Coil Table
R9	= 170,000 ohms	L1, L2, L3	= For bands required, *see text* and Coil Table
R16, R22	= 22,000 ohms	L4	= Oscillator coil, *see text* and Coil Table

the top of the pillars, over the tuning condenser, a screened sub-chassis is bolted ; this contains the calibrator valves and components.

Details of Coils

The coils were designed to ensure that on each range the combination of L and added parallel capacitance C would just cover the amateur band with one swing of the main tuning condenser. The inductance required was calculated using the formula

$$L\mu H = \frac{50660 \times \delta F}{F^3 \times \delta C}$$

where F and δ F are in mc and δ C is in $\mu\mu$F. The term δ F is the width of the band, F is the mean frequency, and δ C is the change in tuning capacitance occurring with 85 to 90% rotation of the tuning condenser. The required total value of capacitance can then be ascertained using ABAC's, or worked out from the formula

$$C\mu\mu F = \frac{25{,}330}{L\mu H \times Fmc^2}$$

Deducting the mean values of the tuning condenser and trimmer and allowing, say, 12 $\mu\mu$F for circuit strays and valve input capacitance, the values of the fixed silver mica condensers can be calculated.

All coils are wound on polystyrene formers with dust-iron cores for maximum "Q" and ease of adjustment of the inductances when *in situ*.

Unfortunately, this more or less rules out using coil winding formula to give the number of turns required. In practice, the inductance required was first worked out from the formula, then the frequency at which this would resonate with a close-tolerance 100 $\mu\mu$F silver mica condenser was calculated. A coil was then wound up, the 100 $\mu\mu$F condenser soldered to the wire ends (which were approximately the length that would be required) and the iron core was set to half mesh. With a grid dip oscillator and a roughly calibrated receiver the resonant frequency was then noted, and cores and/or number of turns adjusted until the frequency was approximately the same as that calculated.

For the aerial, RF and mixer coils on the 80-metre band, Denco Range 3 coils were used owing to the difficulty of winding coils of reasonable Q of the inductance required, namely, 36·7 μH. The oscillator coil for this range can be wound up, however, from the details in the Coil Table. All coils when finalised should be given a coat of coil cement.

Referring to the under-chassis photograph, looking to the rear, the coils just to the right of the bandswitch are for 15 metres, and then further to the right the 10-metre coils. To the left of the switch wafers the coils are for 20, 40 and 80 metres in that order. Their respective trimmers are Philips 3-30 $\mu\mu$F beehive type, mounted on lengths of 2 BA screwed rod (as found in the RF24 or RF25 units). These provide a very rigid mounting. They are insulated from the chassis by means of an oversize hole and fibre washers top and bottom ; 2 BA soldering tags are placed on top of the fibre washer under the chassis and to these is soldered a ¼in. wide copper strip which extends the width of the chassis and is earthed at one point only, at the soldering tag under the brass pillar, as mentioned earlier.

All coil earth returns are soldered to these copper strips, as are the fixed silver mica padding condensers, the other ends of which are soldered to their respective trimmers.

Similarly, all anode and cathode by-pass condensers are soldered to these strips. The strip for the aerial stage is supported from insulated tags at the chassis sides and earthed at one point only, as before. The earth connection on the aerial trimmer (C5) is connected to this strip, and care taken to see that there is no other earth return by insulating it from the mounting bracket and epicyclic slow-motion drive ; a short piece of Tufnol rod is

used for the extension spindle passing through the front panel to the knob. The oscillator set condenser (C19) is mounted on the rear screening partition (between the 10 and 15 metre trimmers) and is earthed only to its appropriate earthing strip. It is adjustable from the front panel *via* a shaft coupler and a length of insulated rod (¼in. wood dowel will do) which passes between the 10 and 15 metre coils of each stage through holes drilled in the partitions. It is not advisable to use a metal rod in case unwanted coupling occurs between stages.

Alignment

The coils were wired, inserted and aligned one range at a time, commencing with those nearest the bandswitch. Provided your calculations have been reasonably accurate, no difficulties should be experienced.

With no aerial and no connection to the IF amplifier, commence by adjusting the oscillator to tune over the range required—either with the grid dip oscillator or by listening on the receiver. With the receiver set, say, on 14·865 mc and with the tuning condenser at the HF end of the band (minimum capacitance), adjust the oscillator trimmer until the signal is heard. Now swing the tuning condenser to the LF end of the band to see how much bandspread there is; if there is too much, reduce the inductance of the oscillator coil with the slug; if too little bandspread, increase it. With the oscillator set, connect up the output and adjust the aerial, RF and mixer circuits for maximum output, either using a local signal or connecting an aerial and finding a steady signal on the band.

Once again tracking over the band can be obtained by compensating adjustments of trimmer and iron-core. This part of the work is not easy and does take time—but if properly and carefully done, the results are well worth while.

An aluminium base plate should then be fitted, suitably drilled with holes over the trimmers, and a final touching-up made with the plate in position.

The calibrator can now be aligned, adjusting C29 so that zero beat with WWV is obtained when in the 1 mc position, and adjusting R21 so that nine beats are heard between 1 mc points, when in the 100 kc switch setting.

Without quite elaborate test equipment it is impossible to measure the signal-to-noise ratio of a receiver. Although any specification of the signal/noise ratio is meaningless unless we know the bandwidth for the noise and the strength of the signal, we could obtain some idea of the performance in *practice* by comparing the reception of the same signal on another receiver. Up to the time of writing this had not been done with this unit, but judging by ear alone there seems no doubt on this score. Perhaps the most rewarding features of this front end have been the knowledge that with good bandspread it is sometimes possible to find a quiet spot on the band, and also that when you say you will QSY 10 kc down, you will hit the frequency accurately.

Of course, it is not essential to use an IF output of 465 kc, and values of L and C for the oscillator section could soon be worked out from the formula for an IF of, say, around 1600 kc if desired.

"AMATEUR STATION OSCILLOSCOPE"

With reference to this article in the April issue of SHORT WAVE MAGAZINE, it should be noted that Point 5 in Fig. 6 goes to the grid of the CRT—that is, to a point "above" R40 in Fig. 7 on p.70. In this diagram, the two unidentified plates should, of course, be marked Y2 and Y1, and the connection to the X1 plate, through the tube, should be drawn solid, and not as given. A query that has been raised in connection with the article generally is the use of the term "volts per centimetre," it being held that deflection sensitivity is more usually expressed in "millimetres per volt"; if thus quoted, the deflection sensitivity will increase with decreasing EHT. Some American publications, however, do give V/cm as the expression for deflection sensitivity.

"KT88's IN A CLASS-B MODULATOR"

Further to this article by G3JZK in our March issue, we are asked by the M-O Valve Co., Ltd., to point out that the G.E.C. KT88, in pair, will give 100 watts of audio in Class-AB1, with only 560 volts on the anodes, in the ultra-linear circuit. Those who subscribe to the excellent G.E.C. Data Service will receive, in due course, full operating notes on the KT88 in the Class-B mode. Since writing his article, G3JZK has found that even better results are obtained by eliminating the 22,000-ohm resistors, taking the control grids straight to cathode, and driving on the screens only. Quality was noticeably improved, and there was no loss of gain. He suggests that this circuit modification would be worth trying on any tetrode type of zero-bias Class-B modulator, *e.g.* the 807 or 5B/254M when used in a circuit such as that on p.246 of the July 1957 issue of SHORT WAVE MAGAZINE.

BRITISH RADIONICS EXPORTS

It is announced that figures for the year 1957 show that the total value of British electronic component exports was no less than £10·1 millions; this compares with £8·7 millions for 1956. The figures are for components only, and they exclude valves, cathode-ray tubes and made-up equipment.

More about the El-Bug

CIRCUIT AND ADJUSTMENT OF AN ELECTRONIC KEY

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

IT is some six years since the writer produced an article called "Improving the El-Bug" (*Short Wave Magazine*, July, 1952, p. 272). The substance of this was a series of modifications to the excellent basic design associated with OZ7BO, together with a few hints on the care, maintenance and operation of the device.

The keyer described was in continuous use for a year or so, after which it was banished in favour of the old Vibroplex (now thirty years old), which still sent faultless dots . . . . the dashes were the concern of the operator.

At the time it was thought that automation was a bad thing after all, and that Freedom of Behaviour—in the form of the right to make dashes whatever length one wanted them—was preferable to the ability to send Perfect Morse.

Since then the Bug has been unearthed and tried again at various times—and it is always enjoyable to use it once more, and equally enjoyable to put it away and to resume acquaintance with old-faithful and his everlasting vibrator.

It seems that this is a fairly common attribute of El-Bugs—that their use palls after a while. Then, after a decent interval, there is a fascination in putting them to work again, unlearning the straight-bug technique, and blaming all mistakes on the key.

De-Modifications

The original modified OZ7BO affair had been sadly mauled during the last interval, and was devoid of both relays (Siemens Type H85C) and several other vital parts.

This time a new one was built, complete with power pack on the same chassis, and with several of the original modifications omitted. Ordinary GPO 2000-ohm relays were used, despite doubts about their speed capabilities. These doubts were soon banished when the relays started turning out both dots and dashes in excess of 50 w.p.m., but the disadvantage of noisiness remains. The "clackety-clack" they cause would only be tolerated in a remote shack, such as the one in which the writer's Bug is used.

The circuit of the unit (Fig. 1) remains basically the same as the original, using either the two halves of a 6SN7, or two 6J5 or 6C5 triodes.

The potentiometer R2 controls the ratio of dot to dash speed by determining the potential applied to the paddle blade (full HT for dashes). R4 is the speed control; R7 and R9 are both "shaping" controls, whose action is somewhat interdependent and can only really be appreciated by practical experience.

Originally the speed control was a 1-megohm potentiometer, but there is no need for this high resistance unless you are interested in sending at speeds below 2 w.p.m.! Similarly it had a fixed resistance in series with it, which has now been dispensed with. Its removal means that there is no limit to the top speed except the inertia of the relays. At the high-speed end the whole thing goes fast enough to become a blur before the relays finally give up.

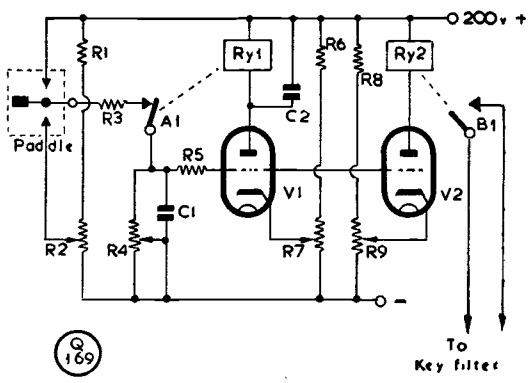
Relay Characteristics

One of the characteristics of this circuit is that Relay 1 can operate *too quickly;* with a high-speed type in this position, the action of the contacts A1, which *break* when the relay is energised, can be altogether too rapid. They then cut off the positive voltage applied to the grid within milliseconds of anode current flowing, and the dots are always too short and

Table of Values

Circuit of the Electronic Key

C1	= .05 μF	R6, R8	= 25,000 ohms, 5-w.
C2	= *See text*	V1, V2	= 6J5, 6C5, 6SN7, 6C4, 12AX7
R1	= 20,000 ohms, 5-w.	Ry1, Ry2	= Post Office 2,000-ohm relays
R2, R7, R9	= 10,000 ohms variable, wire-wound	A1	= Open when Ry1 energised
R3	= 1,000 ohms, 1-w.	B1	= Closed when Ry2 energised.
R4	= 500,000 ohms, variable		
R5	= 2 megohm, ½-w.		



The El-Bug described in the article.

erratic in speed. Originally, this was slowed down with a huge capacity across it (1 μF was the value quoted). The diagram still shows a condenser C2 in this position, but with the average G.P.O. relay it probably will not be necessary. There are mechanical methods of slowing such relays down, especially as only the two lower contacts will be in use—so the upper contact, if there is one, may be carefully bent downwards to press hard on the centre one. It is only the break between the two lower contacts that is used in this case. When mechanical slowing down is not feasible, and if the dots are erratic, try condensers of various sizes across the winding of this relay—but *not* as large as the original 1 μF.

The behaviour of Relay 2 is not nearly so critical, but its characteristics will change according to the nature of the keyed circuit. If there is the slightest tendency towards sparking at the contacts, a keying filter should be used—not forgetting the RF chokes directly in the key leads, and close to the key. Sparking or arcing at the contacts does peculiar things to the regularity with which they operate.

A milliammeter in the anode circuit of V2 (0-30 mA is suitable) gives a useful indication of the relative lengths of dots and dashes if it is slugged, so to speak, by a 25 μF condenser. A string of dashes should give just twice the reading as a string of dots sent at the same speed. (One dash is three units of time, one dot one ; hence, a dash plus a space is equal to twice the time duration of a dot plus a space.)

Setting Up

The control R2 has a certain effect on the length of the dots, but mostly governs their speed. Hence, the first thing to do on setting up is to adjust R4 for a suitable overall speed, and then to set R2 so that the dots match the dashes. If the mark-to-space ratio is all wrong (and it *can* be as wrong as all mark and no space, or *vice versa*), try to get it right with R7. Finally, R9 will be found to have one particular setting at which the R7 adjustment really does produce the correct results. R7 and R9 are always interlocking in their action, and it seems necessary at each final adjustment of R7 to move R9 a corresponding amount in the opposite direction.

V1 and its relay are sending " backwards " Morse, so to speak — the A1 contacts *open* when anode current flows. It would be very nice to be able to use another pair of contacts on the same relay to produce the final result, but the spaces are extremely minute compared with the marks—hence the necessity for using the second triode V2, with its facilities for separate control of its grid voltage by means of R9, the cathode potentiometer.

The HT voltage should be not less than 200v., and good regulation is helpful. Stability is also most desirable, since a relatively small fall in HT volts can necessitate re-setting at least three controls ! It might even be worth while, if you are a purist, to use a neon stabiliser in the power pack. As regards construction, the Key can be put together on a small chassis as a separate unit, in a box, with or without its own little power pack.

Operation

Two words of advice: Do carry out the adjustment and also your practice " off the air." Those strings of dashes drive other people round the bend when they are radiated on the DX bands—and how often one hears them ! And, secondly, remember that El-Bug Morse is invariably faster than it sounds. If you habitually send at 18 or 20 w.p.m. on a straight bug, you will find yourself doing 25 or more with the El-Bug, and it's not everyone who can copy that. We might even add that it's not everyone who can send it, perfectly, even with the help of an El-Bug! So fetch out that practice oscillator, or even a buzzer —and start at a slow speed, which is apt to be far more difficult than dashing off at 25-30 w.p.m.

If you have got all your constants right, and the relays are both working as they should, then the speed control should alter speed and nothing else. The mark-space ratio, and the relative speeds of dots and dashes, remain the same whether you are working at 8 w.p.m. or three times that speed.

Finally, and perhaps most important of all for those after perfection, remember this solemn truth: There is only *one* correct mark-space ratio, and there is only *one* correct dot-dash ratio. Any deviations, in either direction, and you are no longer sending Morse Code as first thought of by its inventor, the great Samuel.

INTERNATIONAL SHIPPING EXHIBITION

During September 11-17 next, Hull, the biggest fishing port in the U.K., will be the *venue* for a large Shipping Exhibition, which will include a marine radio communication and radar section, also covering navigation equipment and research progress in radionics. This should be an interesting exhibition to visit as, in addition to marine radio, it will embrace " all to do with ships."

Geloso VFO Unit and K. W. "Vanguard" on Top Band

MODIFICATIONS FOR 160 METRES

R. G. SHEARS, B.E.M., A.Brit.I.R.E. (G8KW)

(K.W. Electronics, Ltd.)

This article will be of great value to all who own a Geloso VFO Unit, whether or not it is incorporated in a Vanguard transmitter. For those who possess this Kit, as described in our March, 1958, issue, the notes here will be of particular interest; they show how the Vanguard can be modified for 160 metres, thus making it into a six-band CW/Phone Transmitter, matching into a wide range of output impedances. The modifications evolved by our contributor can, of course, be applied to any transmitter incorporating Geloso RF units. He also shows a much more efficient way of reducing PA input (for Top Band) than the methods commonly used.—Editor.

THE Geloso "Signal Shifter" (Models 4/101 and 4/102), now enjoying world-wide popularity, provides an excellent VFO and adequate drive for either a single or a pair of 807's, or 6146's, on 10, 15, 20, 40 and 80 metres.

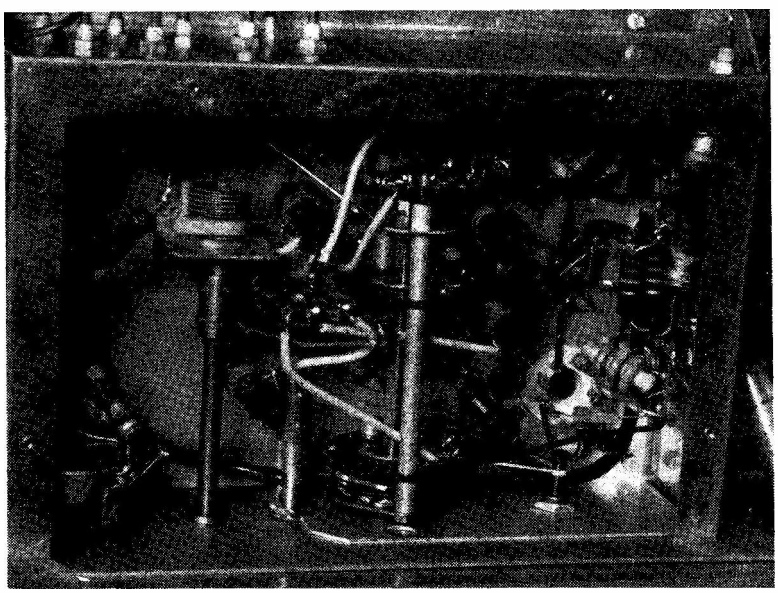
Many Top Band operators have, however, been compelled to build a separate transmitter for 160 metres when the Signal Shifter is included in their HF bands transmitter. As the Geloso Signal Shifter is incorporated in the K.W. "Vanguard," it was decided to investigate the possibility of a modification to make the Transmitter operable on Top Band without impairing efficiency on any of the other bands, and thus making the Vanguard a six-band job.

Three main problems had to be considered: The conversion of the VFO and driver stages in the Signal Shifter and the switching to return the circuitry back to normal; the modification of the PA tuned circuit; and the method of reducing power from 50 to 10 watts, while yet maintaining a satisfactory match between modulator and PA.

Modifying the Geloso Signal Shifter

It will be seen from the circuit diagram of the Geloso Signal Shifter, on p.22 of the March, 1957, *Short Wave Magazine*, that this unit employs a Clapp type VFO with three switchable grid inductances. Two of the inductances are on approximately 80 metres with different L/C ratios to provide satisfactory bandspread. One is for the 80-metre band and the other. when multiplied in frequency, gives good bandspread calibration on 20 and 15 metres. The third coil is operating on 40 metres and is proportioned for adequate bandspread on this band and also on 10 metres.

In order that sufficient bandspread for a 160-metre VFO could be obtained, it was decided to use the existing circuit arrangement for the 80-metre band and to pad out



The under-chassis modification for Top Band, applied to the Geloso Type 4/102 VFO Unit, and equally applicable to either mark of Geloso "Signal Shifter." The additional switch unit SA1/SA2 (see Fig. 1a/Fig. 1b) is fitted alongside the existing main band-change switch, with coils LA1 and LA2 adjacent; the actual positioning will immediately be clear on examination of the Geloso VFO with this photograph.

to 160 by switching in additional inductance in series with L1, as shown in Fig. 1a here. Details of this inductance and others used in the modification are shown in the Coil Table.

The same treatment was applied to the 80-metre inductance L7 in the anode circuit of the output stage (6V6G or 6L6G)—see Fig. 1b and full circuit p.22, March, 1957. No modification to the 6AU6 is required, as on 80 metres this is already operating as an aperiodic untuned amplifier stage and provides sufficient drive for the following valve. The method of switching in the additional band had to be considered and the writer suggests that the neatest and most compact way would be to replace switch wafers S1A and S1C (in the original Geloso Unit) with a 6-position wafer—but this would also require modification to, or replacement of, the 5-position selector. As these changes constitute a major undertaking, it was decided to incorporate an *additional* 2-position change-over switch of the wafer type to give 160 metres in its position 1 and normal (giving 80, 40, 20, 15 and 10 metres) in its posn. 2.

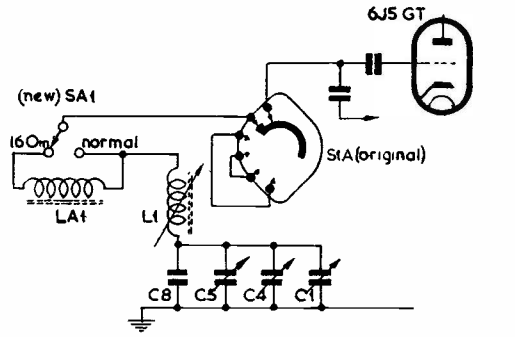


FIG 1a

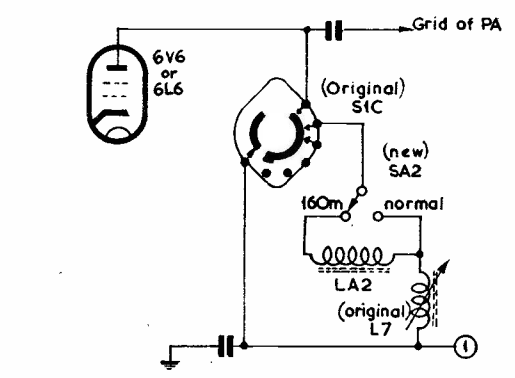


FIG 1b

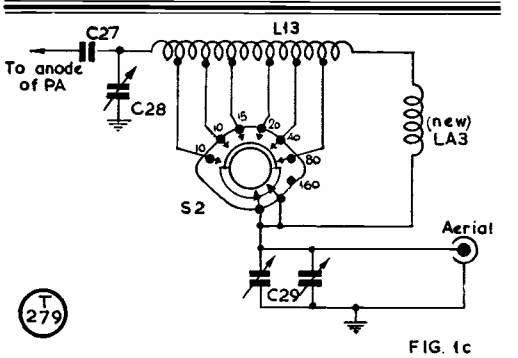


FIG. 1c

In this sketch, Fig. 1a shows the modification required to the frequency-generating side of the standard Geloso 4/101 or 4/102 unit for operation on 160 metres. The lead connecting the top end of L1 is taken off S1A and rewired with the additional items LA1 and SA1 to the circuit given here. In Fig. 1b is shown the modification to the output stage of the Geloso "Signal Shifter," applicable to Models 4/101 and 4/102 when they are to be used on the 160-metre band. Fig. 1c gives the alterations to the standard Geloso 50-watt PA pi-coil assembly for operation on Top Band. The coil LA3 is wired in as shown, and its position in the PA tank compartment of the Vanguard transmitter is illustrated in the photograph on the opposite page.

The fitting of this switch and coils can be seen in the under-chassis photograph; it should be noted that the metal mounting bracket for the additional switch (SA1 in Fig. 1a) permits sufficient screening between the two additional coils (LA1 and LA2). The position of the switch is not critical but it is convenient to locate it adjacent to the centre wafer of the main unit.

It should be noted from the Coil Table that two details are given for LA2—one is for use with a Signal Shifter Type 4/101 driving a single 807, 6146 or similar valve, the other is for a Model 4/102 driving a single valve with a grid resonating trimmer (such as in the Vanguard), or when the 4/102 is used with a pair of valves in parallel.

Wiring out for these modifications should be kept as short as possible, using 20g. tinned copper wire with sleeving.

For those who wish to carry out these modifications to their Vanguard transmitter as already constructed, it must be borne in mind that, due to the small amount of panel space available, the control spindle for the extra switching SA1/2 must be brought through the front panel exactly mid-way between the VFO switch and drive control knobs. (The writer does not use a knob for operating the switch but a flat key, or a screwdriver.)

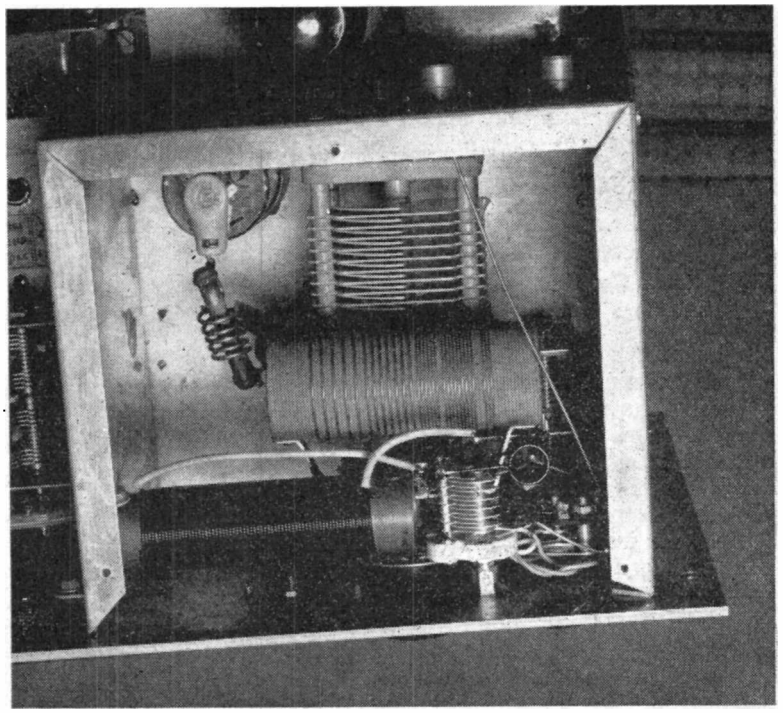
Modifying the Vanguard RF Amplifier

The Vanguard transmitter PA has a Geloso pi-coil assembly Type 4/110. This Coil Unit is fitted with a 7-position switch providing two positions each for 10 and 80 metres and one position each for 15, 20 and 40 metres. With the variable condensers specified, tuning over all bands 10-80 metres with a wide range of

output impedance (approx. 40-2,500 ohms) can be expected. If one is prepared to accept a low impedance output (say, 40-350 ohms) on 80 metres only, the second 80-metre switch position can be disconnected and utilised to bring in the 160-metre coil, as shown in Fig. 1c. The placing of the additional coil LA3 does not appear to be critical, but the writer found the most convenient place to be that as illustrated in the photograph (alongside) of the PA compartment.

The detail given for the PA inductance (LA3) is suitable for low-impedance aerial feed when operating *on low power only*. This provides an impedance range of about 60-500 ohms over the band. Should a lower impedance feed be required, a ceramic condenser of ·001 may be connected across C29 —that is, across the aerial socket. To obtain a higher impedance feed, LA3 should be made 80 turns of 22g. enamelled copper on the 1in. dia. former.

It is of interest to note that the inductance value of LA3 should be *reduced* for 50-watt operation; 40 turns of 20g. enamelled will give a feed impedance range of approximately 60-500 ohms. This is due to the PA anode load impedance being almost halved when running 50 watts compared with 10 watts.



Positioning of the additional 160-metre coil in the Vanguard RF power amplifier compartment, with the PA valve itself (a 6146) at upper left; the small winding close up to the top cap of the valve is an anti-parasitic choke, L17 in the original circuit diagram on p.34 of the March 1958 issue of "Short Wave Magazine." The 160-metre PA coil itself is the winding at lower front, and consists of 70 turns of 20g. on a 1-in. diameter former 4½ inches long — see text.

COIL TABLE

FOR GELOSO VFO/PA UNITS ON TOP BAND

(*Refer to Geloso and Vanguard Circuit Data*)

LA1	— 50 turns 38g. enamelled, close-wound on 3/8-in. diameter Aladdin former with iron-dust Core.
LA2	— (*For Type* 4/101): 64 turns 38g. enamelled, close-wound on former as for LA1. (*For Type* 4/102): 58 turns as above.
LA3	— 70 turns 20g. enamelled, close-wound on 1-in. diameter Paxolin former 4½-ins. long. (Or 40 turns for 50-watt operation — *see text*).
RA1	— Power dissipating resistor, 3500 ohms, wire-wound, rated 20 watts.
SA1/SA2	— Double-pole change-over wafer switch (*see text*)
SA3	— On-off toggle switch, insulated for 500v., for PA input reduction.

Reducing Power to 10 watts

The method of reducing power in the Vanguard transmitter from 50 watts is shown in Fig. 2. (It may also be considered for use with other transmitters.) Systems whereby power is lowered by increasing the value of the screen resistor to a PA stage using a pentode or tetrode, or by reducing the voltage output from the PA power supply, can cause a serious mismatch between modulator and PA. The value RA1 in Fig. 2 has been calculated to fulfil three main considerations. (1) Suitable working voltage for the PA valve; (2) Impedance match between modulator and PA; and (3) Dissipation of audio volts not required when on low power. It will be seen that, with switch SA3 open, the audio volts appear across the PA load of the modulation transformer secondary (4,000 ohms in the Vanguard) and the resistor RA1 in series, equalling 7,500 ohms together. This reduces the PA anode voltage to about 275 volts. The aerial loading should be adjusted to draw 36 mA anode current; this will give a power input

of 9.9 watts and an anode load of approximately 7,500 ohms, which is a good match to the modulator.

The resistor RA1 and Switch SA3 can be placed at the rear and under the chassis in the Vanguard. A good quality switch should be used for SA3 as this must withstand DC volts in addition to the modulator voltage swing. To return the transmitter ready for 50-watt operation, it is only necessary to close SA3.

Adjusting the Vanguard for Top Band

The switch SA1/2 and PA pi-coil switch should be put in their 160-metre positions.

First, it is necessary to align the VFO. In the Vanguard this can be done by putting the netting switch to "Tune." Set a receiver, with BFO switched on, to 1900 kc and set the Geloso dial pointer to 50° on the outer scale. Adjust the iron-dust core in LA1 until a beat note is heard in the receiver. This will allow the 160-metre band to be spread in an almost linear manner from about 1800 kc at 5° to 2000 kc at 94°. This calibration will be slightly affected by the tuning of L1 and C1 in the "Signal Shifter." but these should be made correct for 80-metre calibration and not touched thereafter. Next, put the switch SA3 to the low-power position, return the netting switch to "Normal" and turn Send/Receive Switch to "Send." Adjust the iron-dust core in LA2 for maximum grid current with the VFO about the middle of the 160-metre band and the grid tuning condenser (C20A in the circuit on p.54, March, 1958, issue) about half-way in. Drive will then remain constant over almost all the band. The level of drive should be adjusted, by means of the drive control, for a PA grid current of 2·5-2·8 mA. Adjust the "Aerial Coupling" and "PA Tuning" controls in the normal manner, so that the PA is loaded to 36 mA plate current. The modulation gain control should be turned down lower than the position used for 50 watts input. The speech peaks on the modulation percentage meter should not be allowed to go higher than the "50% modulation" mark *when operating 160 metres.*

Keying is not affected by this 160-metre modification and may be used in the manner prescribed for 50-watt operation.

Conclusion

Many users of the Geloso "Signal Shifter" will find this a very simple way with which to obtain excellent results on Top Band. It may help those who have a separate transmitter for 160 metres to dispose of it and make room for something else! It may also help others to give Top Band a try and thus to meet a new circle of very good friends.

The writer wishes to thank all those in the London area, Kent and Essex, who so willingly stood by for tests and gave useful reports on the 160-metre test transmissions from G8KW while this modification was being evolved.

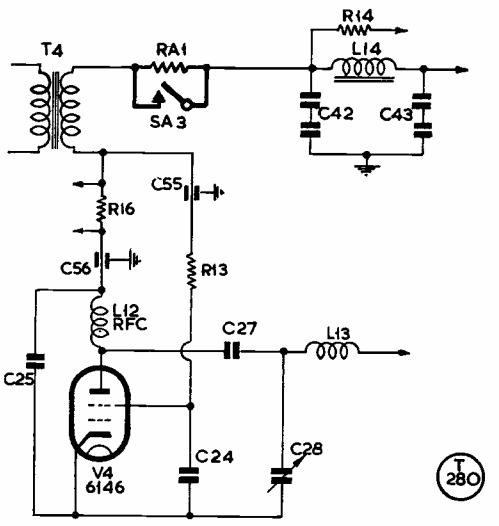


Fig. 2. The method of reducing PA input when the Vanguard is operated on 160 metres. The resistor RA1 is so proportioned that, with the modulation transformer secondary, it produces the correct modulator/PA load when the RF stage is run at 10 watts input. It should be noted that C25 in the original circuit (p. 34 March) is now connected between L12 (the RF choke) and the 6146 cathode. Switch SA3 has to carry full DC plus the modulating voltage, so should be selected accordingly; the resistor RA1 should be mounted clear, as it also carries the voltages across the switch.

EI QSL BUREAU — NEW QTH

We are asked to announce that the QSL Bureau of the Irish Radio Transmitters Society (EI stations) is now operated from 39 Booterstown Avenue, Blackrock, Co. Dublin. the manager being EI4Q.

CALL BOOK — SPRING EDITION

The latest (Spring) edition of the *Radio Amateur Call Book* is now being delivered as fast as the orders come in—at the present rate, there will not be many left by the time that this appears. The 29-page U.K. section runs to 85 columns of G call-signs, and all QTH's and changes of address, as published in the "New QTH" feature up to and including our January 1958 issue, have been taken into the Spring *Call Book.* This edition runs to more than 600 pages, weighs over 2¼ lbs., and costs us 1s. 9d. to post. The price is 41s. 6d., post free. Orders, with remittance, should be addressed to: Publications Department, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

Noise Limiter Circuit

FOR COMMUNICATION RECEIVERS

SHOWN here is an effective noise-limiter arrangement of the type which can be applied to almost any communications receiver —provided one can get at the connections to the secondary side of the last IF transformer and the grid of the first audio amplifier, and there is room somewhere on the chassis to mount the double-diode. As this can be of the miniature type, a 6AL5 or G.E.C. D77, there should be no difficulty about that, while the additional 0·3 amp. LT required will normally be well within the capacity of the existing heater supply.

What this limiter does is to reduce the effect of impulse-noise, and a good test of its effectiveness is to see how much it will smooth out the Loran signal (Top Band) or the noise caused by heavy ignition interference. It should be noted, however, that switching in the limiter will also reduce the audio level; at first sight, this seems a serious disadvantage, but the point to remember is that most receivers are nearly always operated with a lot of audio gain in hand. Hence, apart from any consideration of improved signal-to-noise ratio by the use of the limiter much of the audio can be restored merely by turning up the AF gain control when the limiter is switched in.

Action of the Circuit

The way the circuit works can be explained as follows: The negative rectified carrier voltage produced on the (1) side of the double diode is applied through the action of C1, R4 and R5 to the cathode of the (2) side, making this conducting. Part of the audio element on the (1) side is thus passed through the (2) side to the normal volume control potentiometer R6.

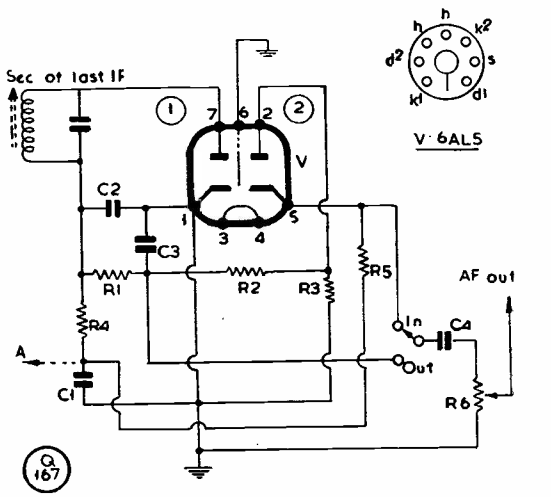
A "peaky" noise impulse drives the (2) anode negative with respect to its cathode because the duration of the impulse is so short that the cathode cannot change at the same instant as the anode voltage, due to the delaying action of R5, C1. Therefore, the (2) side of the double diode is (or should be) completely cut off for the duration of the impulse, which thus does not appear in the audio output of the receiver.

The immediate query now is "What happens to speech peaks, with the limiter in circuit?" In fact, no more than a change in the *timbre* of the speech will be detectable, because the periods during which the audio amplifier is inoperative are so short that the transmission sounds quite smooth.

Another interesting feature of the circuit and its values (as shown here) is that if these values are chosen so that good speech quality is obtained from a heavily modulated carrier the performance of the Noise Limiter, as a *limiter*, is degraded. Hence, with the values given, which are for optimum limiting action on impulse noise, the audio output from heavily modulated transmissions will be noticeably down.

The fact is, of course, that noise limiters always do affect the audio output of the receiver in some way—the nature of the problem is such that this is unavoidable, if anything like effective limiting action is to be obtained. A noise limiter which does not produce some change in audio output when it is switched in is just not capable of performing satisfactorily *as* a noise limiter. As it stands, this circuit will also provide non-delayed AVC, which can be taken from the point A.

It follows from what has been said that, unless the existing receiver circuitry is thoroughly understood and a test has shown that this particular Limiter would be worth while under normal receiving conditions at the location, it should *not* be applied to a receiver which already has an N-L of some sort, with



Circuit of the Noise Limiter, the action of which is explained in the text. It is of the type which gives a marked cut-off, but with most receivers any serious loss of audio can be made up by advancing the volume control. The circuit is particularly effective against any sort of peaky noise.

delayed AVC In other words, it is the sort of modification which is best applied to a receiver which does not incorporate noise limiting at all.

Construction

There is not much to be said about this, since the wiring is quite straightforward. The resistors and condensers could be mounted on a small tag-board to fit in near the valve holder, with the switch S brought out to the front panel of the receiver, or the side of the case, if that is more convenient. Slight re-trimming of the secondary side of the last IF transformer will probably be necessary after the Limiter is fitted.

The values to use are as follows : C1, 0·1 μF ; C2, C3, 100 $\mu\mu$F ; C4, ·02 μF ; R1, 100,000 ohms; R2, R3, 250,000 ohms; R4, 1 megohm; R5, 0·5 megohm ; R6, existing receiver audio gain control, probably 1 megohm. These values may be varied for experiment.

BBC's STEREOPHONIC EXPERIMENTS

During " Radio Record Week," May 11-17, the BBC will carry out some further experiments in stereophonic sound broadcasting. To hear the transmissions, two receivers will be necessary, feeding separate speakers, and the listener should be about equidistant from them—left ear towards one, and right ear towards the other. The left-hand receiver is tuned to the " left-hand channel," and the other receiver to the right, with the speakers from 6 to 12 feet apart, and the receivers are adjusted to give the same volume level ; this is done by setting the gain controls till the test speech transmission appears to be coming from a point mid-way between them.

The first test will be on Sunday, May 11, 10.30-11.00 a.m., when all Home Service transmitters (including VHF/FM) will be radiating " left-hand," and all Third Programme (including VHF/FM and TV sound) will be transmitting " right-hand." The test will be repeated on Saturday, May 17, 11.00-11.30 a.m., when the left-hand channel will be radiated by all *Light Programme* transmitters (including long-wave and VHF/FM), the right-hand transmission system being as before.

As the BBC explains, to obtain a really good stereophonic effect, the two speakers must operate in phase ; that is, their diaphragms must move together. Since there can only be a 50/50 chance of this happening at random, the BBC will reverse the phase of one channel half-way through the experiment, so that all listeners should get the right result for at least half the time. In the case of receivers having reversible speaker connections, this should be tried, remembering that a reversal will again be necessary when the phase is changed on the transmitting channel.

This should be a very interesting experiment and, as can be seen, the BBC engineering people are going to great trouble to lay it on. The programme material will be limited to commercial recordings, and will be the same on each of the two days. For 15 minutes before the start of each test period, there will be warming-up announcements and explanation, on the right-hand channel only.

AVO ACROSS ANTARCTICA

It is very interesting to note that in the equipment taken by Sir Vivian Fuchs on his great journey across the Antarctic Continent on Avometer and three Avominors were included ; according to a message from David Pratt, radio man with the Expedition, the Avo instruments were " much used with great success " ; Avometers were also supplied for the Base stations at Scott and Shackleton. Except that their calibration was checked for the very low temperatures to be encountered, all these instruments were standard Avo models from the normal production line.

TAYLOR PRICE REDUCTIONS

Some substantial price reductions are announced by Taylor Electrical Instruments, Ltd., who market an interesting and comprehensive range of test meters. Their Model 71A is reduced by 25s. to £12 10s.; the 77A by £1 to £16 0s.; and the Models 120A and 122A by 10s. to £9 5s. each, list. Full information about these instruments can be obtained from: Taylor Electrical Instruments, Ltd., Montrose Avenue, Slough, Bucks.

PERSONAL SIGN

With the current vogue for everybody to be addressed by a Christian name, if at all possible, what is being forgotten is that the one appellation that does make you different and distinctive is your call-sign, which identifies you immediately because it is yours and nobody else's. There are clouds of Bob's, squads of Al's, Bill's, Bert's and Joe's—but only one G3XYZ. Before the war, licensed amateurs were *always* known by their call-signs, Christian names being used but rarely, and then only among operators who were known to one another personally. On the DX bands, the trend now is for people even to adopt some short name which is easy to send, either phonetically or on the key, merely to satisfy the demand to " give your name." At least one cynic (about this name business) that we know uses a different one on each band! In due course, the wheel will turn full circle, and once again people will respect the call-sign for what it is—a personal sign which it is a distinction to hold and a privilege to use.

NATIONAL RADIO EXHIBITION

The 25th Exhibition organised by the Radio Industry Council—the Radio Show—will be held at Earls Court, London, during August 27-September 6 next, with a pre-view on August 26. The scope of the Exhibition is broadly the same as in previous years, and once again H.M. The Queen has graciously consented to be its Patron.

DX COMMENTARY

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

VK2AMB

CALLS HEARD, WORKED and QSL'd

HAVING gathered from many correspondents that they do not altogether approve of our recent innovation—that of segregating the DX Worked from the General Gossip—we have reverted this month to the old band-by-band system of reporting. It is evident that our DX fraternity prefer reading in straightforward sentences what their friends and rivals have been up to, but when the same information becomes a tabulated string of call-signs in small type, they can't even bother to look at it! As it happens, this is all for the best, for DX has been so *fantastic* this month that the Gossip and the DX Worked have really been one and the same thing.

One appeal we must make. We have made it before and shall doubtless have to repeat it in future, but here it is again—*please* separate out the bands in your letters. It's a big job going through numerous five-page letters, with call-signs sticking out like prickles all over the paper but only the vaguest clues as to which was worked where. So, please, sectionalise your letters under the headings of Ten, Fifteen, Twenty and so on; make it clear whether it was phone or CW; and by all means continue to list your best DX worked on the last page. Leave the rest to us and we will do our best to produce something readable which contains all the meat.

No particular comments on this month's activity, except that there was a phenomenal short-duration fade-out on Sunday, March 23, at 1000 GMT. All bands except One-Sixty were affected, and many stations thought their receivers had gone u/s or become disconnected from their aerials. Yet, later in the day, conditions were back to normal, even on Ten Metres.

In view of the very heavy post-bag this month, we carry straight on with the DX bands, taken one at a time.

Ten Metres

Probably not so good as last month, with the approach of typical summer conditions. Even this band will give way to short-skip in time! G3JCQ (Barrow) enjoyed himself, with ten phone contacts producing ten new countries—including VK9 (Papua) in the shape of VK9DB. VS6DJ, VQ6ST and MP4BCI were also raised on phone.

G3FPQ (Bordon) worked PZ1AE, ZD1EO and ZD3E on phone; on CW he caught FE8AH and KC4AF (the Navassa expedition). G3WL (Plymouth) winkled out VP6AG and 4S7NG.

G3CSE (Hull), running 30 watts to a Minibeam, raised VK9BS, KC4AF, KG6AGO, KR6SO, PZ1AQ, VP1, VP5, VP6, VP8CV, HH, KZ5, VU and VS6—so the band hasn't been *too* bad!

G3GQK (London, S.E.23) has been operating on Ten for four weeks only, and his list, all phone, looks like this: VK9DB (1400), ZP5JP (1300), CX1AK (1900), CR6AU (1800), VP6JK (1450), VP5BL (1150), MP4BCI (1300), VS6DL (1245), 9G1CP (1550) and a host of smaller fry. He runs a maximum of 40 watts to a Bi-Square beam 24 feet high.

EI6X (Limerick) raised VS6AE, VS6DJ, UQ2AB, VP2LB, EL1D and VE3BQL/SU—all on phone. His main aerial is a Lazy-H, 33 ft. long, with 16½-ft. spacing, with the bottom wire 15 ft. above ground. It works on all bands from Ten to Forty!

G2DC (Ringwood) only worked one new one on the band—TI2LA—and says Ten continues to be patchy, although stuff from the Middle and Far East is beginning to come in well.

G3FXB (Southwick) pulled in CR9AK, FE8AK, FB8ZZ, VK9LE/Cocos, VS9AD and 9AP, and ZS8I—all phone. G3JAF (Lymington) kept on CW and collected 4S7NG, YV5HL and

ZE7JY. GW3AHN (Cardiff) used both modes; the key fetched in FL8AC, KC4AF and ZD7SA, while the mike was good for KG6AGO, TI2JA, VK9DB, VP8CV, VS6's, VS9AD and ZD3E.

G5BZ (Croydon) thinks the band has passed its seasonal peak, but raised KC4AF and ZD7SA on CW, with 9K2AX on phone. New for G3DNR (Broadstairs) were OD5BN, MP4BCI, VU2EJ and HL2AM — all phone. G3DO (Sutton Coldfield) added ZS7C—also phone.

G3ABG (Cannock) collected VU2CQ and 2EJ, 9K2AP, OD5BN, OQ5RS and VE3BQL/SU on phone, with VS9AD. FE8AH, KC4AF and a CO on CW.

G3BHJ (Norwich) worked phone with CT2AH, DU6IV, FF8AP, VK9DB, VS1AF, ZB1, ZE and ZS, with ZS8I a regrettable gotaway. G3BHW (Margate) raised EL1D and 1K, FB8ZZ, HH2Z, HL2AM, OA4V, PZ1AE and ZS7C on phone, with FE8AH on CW. G3BHJ and G3BHW have encountered a little mutual confusion when both are on CW at once—there's only a dash between them!

Fifteen Metres

G3JZK (Cambridge) has returned again from GM, whence the most notable DX was VP8CR and JT1YL, both with 70 watts CW to a Windom. G3LET (Westcliff), also on CW, raised CR7DQ, FE8AH, KC4AF and VS6EC. G3ABG, likewise on the key, worked CR6AI, OY7ML, VP8CR, YV5HL and ZD3G; he is still chasing JT1AA and KW6CM. G3DO, on phone, raised FL8AB and FB8ZZ the same afternoon — both all-time new ones. Others were ZS8I, 9G1CH, VR3P and VKØKT (Macquarie).

G3LCI (Wallasey) has got JT1AA at last, also KC4AF, DU7SV, KP4 and VK7. G3FPK (London, E.10) stuck to CW and emerged with F2CA/FC, HP1LO, JT1YL, KG1CK, and some /MM's. He has found the band open very late at night, and even around 0230 he has had W9's queueing up to work him!

G5BZ was surprised to get DU7SV (0730) over the long path —*via* the South Pole. Must be quite a distance that way! Others were KC4AF, FQ8AG, JT1AA and 1YL, VS6's, JA's, FE8AH and VP8CI.

G3FXB has been amazed at the strength of JT1AA on this band—blocks his receiver day after day! On phone he raised Ludvik and also PY1CK/Ø, while CW accounted for FK8AS, JT1YL, KC4AF and VK9RH. G6TC (Wolverhampton) added JT1AA, JA's, VK7JB and VE7AAD. KC4AF and JT1AA were new ones for G3GGS (Preston).

GW3AHN's phone stirred up DU7SV, FM7WQ, HH2FB, HK's, JT1AA, KP6AL, VKØKT, VP2DC, VP8CC and 8CQ, three VR2's, VR3Q, ZK2AB and ZS8I—a nice little list if ever we saw one—and CW added CR9AH, the JT1's, KC4AF, KC4USB, KG6, LA1VC/G, VP8CI and 8CR, XE1PJ, XQ8AG and ZD3G. The 21-mc band must have found something quite resonant around Cardiff way! G3JAF, on CW, quotes DU7SV, JT1YL, UAØOM, VS1 and VS6. G2YS (Filey) says he worked nothing of import, but heard FK8AS, KC4USK, KW6CM and VKØAT.

G3BHJ raised both the JT1's on CW, and phone brought him OD5BZ, SV1AG, VP6's, VQ3DQ and VS1BB. G3BHW's CW was good for CR9AH, FK8AS, the JT1's, LA1VC/G, VP2DC and YN1AA.

G3CSE got his 30 watts out to VP3AG, VP2GE, VS1FJ and VS2CL on phone, while CW brought in HI8BE, JT1AA and JT1YL. He thinks the standard of operating on the DX bands has improved, while on the lower frequency bands it has fallen off. (If you now include *Twenty* as one of the "lower frequency bands" we would be inclined to agree with him.)

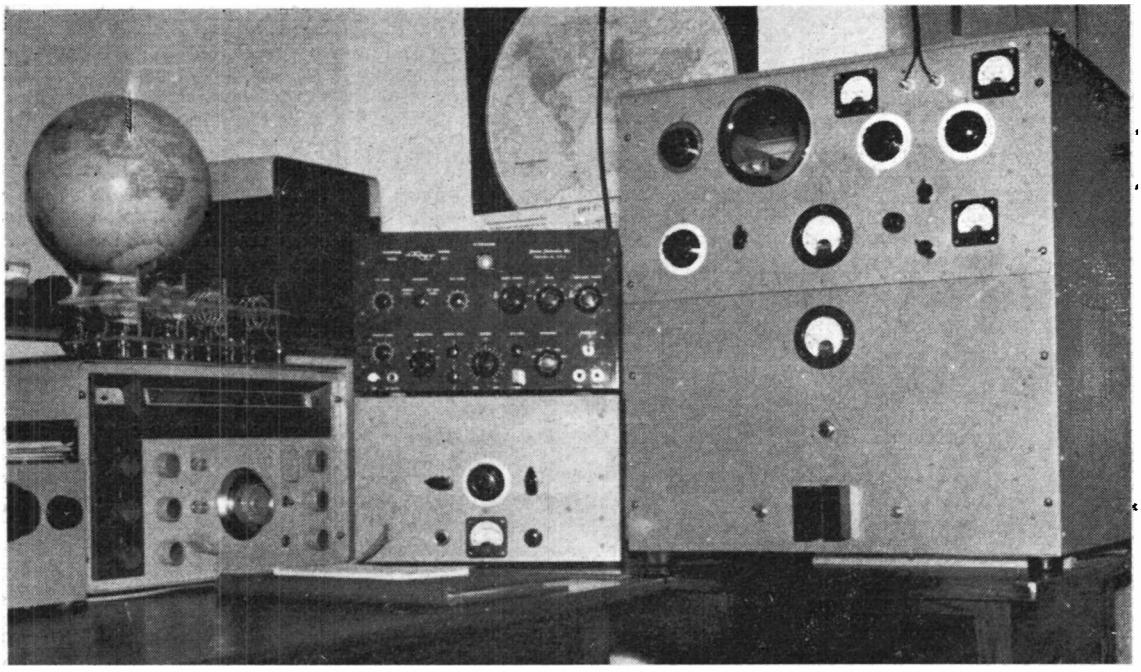
G3JSN (Harrow) logged VS5JL roaring in on Fifteen phone—he apparently has a Minibeam now, out there in Brunei. G3WL worked CO3YP, JT1YL, KL7PI, VE7AAD, VE8MX, VP7NB and ZL4MK.

G6VC (Northfleet) has been busy building a Cubical Quad for Fifteen, and it works like a bomb, giving him 589 from the States

FIVE BAND DX TABLE
(POST-WAR)

Station	Points	3.5 mc	7 mc	14 mc	21 mc	28 mc	Countries
DL7AA	872	113	170	235	185	169	249
W8KIA	784	68	145	269	164	135	269
G3FXB	748	73	130	212	188	145	238
G5BZ	731	64	118	251	177	121	258
G3FPQ	683	70	99	199	183	132	220
G2DC	665	74	101	205	147	138	223
G3DO	634	24	46	235	162	167	252
W1VG	604	25	120	204	139	116	209
W2EQS	577	79	118	177	114	89	193
W6AM	509	30	58	278	86	57	278
G3WL	502	40	82	167	122	91	195
G2YS	483	67	86	159	109	62	177
G3ABG	480	45	84	170	96	85	187
G3BHW	468	15	32	171	136	114	203
G6VC	384	34	49	146	87	68	155
W6AM (Phone)	355	13	32	250	39	21	250
G3GZJ	332	29	60	102	96	45	136
G3IGW	309	44	65	86	66	48	121
G3FPK	292	30	64	110	60	28	133
G6TC	290	17	66	125	51	31	140
G3JZK	286	15	54	61	97	59	140
G2BLA	256	27	45	65	65	54	107
G3JJG	250	37	43	92	48	30	109
G8DI	248	25	56	67	58	42	104
G2YV (Phone)	240	12	24	76	84	44	125
G3LET	238	11	45	121	45	16	129
G2DHV	225	20	27	124	40	14	133
G3DNR	216	10	21	83	45	57	101
VO2NA	154	13	17	80	33	11	85
G3IDG	104	11	15	24	23	31	45
W3HQO	61	3	5	12	32	9	?

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



This is another view of the station of ZE5JJ, Salisbury, Southern Rhodesia, featured in the heading to "DX Commentary" in the April issue. Operating on SSB, the transmitter side consists of a home-built VFO into a commercial SSB exciter unit, driving an 805 as PA in the Class-B zero-bias linear arrangement. The receiver is a National NC300, and the station is fully voice-controlled. The aerials at ZE5JJ include a 3-element beam for 20 metres, with dipoles for the 15- and 10-metre bands.

under bad conditions. He is now thinking of squeezing a ten-metre one inside it! Also on the farm are a 132-ft. wire for Eighty and Forty, a 66-footer and a vertical dipole for Twenty, and a 300-ft. wire with 90-ft. counterpoise for Top Band.

G3FPQ raised KB6BH on phone, and was delighted to work ZK2AB (also phone) and to be his first G contact on Fifteen. On CW he collected KW6CB and XW8AJ; and a ZL friend tells him that VR3P and VR3Q are both active on Fifteen phone — so there is a further chase afoot. G3FPQ had a KM6 come back to him on phone, but he promptly faded out — and he *still* needs KM6!

G3JCQ worked VK4DL and 4RW on phone, but adds that "hearing and hearsay" suggests that the following are "available": ZK2AD, VKØKT (Macquarie), FK8AU, VR2BU, KA2BE and 5MK, and VK5NE (Darwin) —all phone.

G2DC has found the band excellent between 0700 and 0800 GMT, with lots of VK, ZL, JA, KH6 and the like coming in. During the early evenings, it has been worth turning the beam on South Africa for ZS, OQ and VQ signals. OQ5CP has been putting in an S8 signal with 10 watts and a Minibeam. G2DC remarks that Fifteen is still the only band on which DX can be enjoyed at reasonable hours *in comfort*. His list for the month includes FE8AH, DU7SV, KH6, KR6, OQ5, PZ1AQ, YV5FH, XQ8AG, all W, VK1-6 and VE8.

EI6X's bag included CR5SP, VS2DW, EL1P, KG1EE, PJ5CA, VP9IVM, VQ and VK.

Twenty Metres

G3JCQ says conditions are so good on both Twenty and Fifteen around 0600 that it's hard to make the choice. However, Twenty gave him HK7LX, KH6PM, VK7TR and 7UW, VK9AD (Norfolk Is.) and some W7's — all phone. On this band he uses his 275-footer; on the other HF bands the Cubical Quad.

G3ATH (Coningsby), running 150 watts to a dipole, raised CR6AI, CT2BO, HP9FC, KC4AF, KV4AA, OQ5IG, VO1EK and 2NA, XW8AI, ZB2X and 4S7RD —plus strings of W's and the like.

G3FPQ's bag included ZK1BS on phone, with KP6AL and KR6GF on CW. G6VC collected UN1KAA, UO5, UAØ, UJ8, UI8, UL7 and KC4AF.

G3WL totted up CE3DZ, CX1BO, FG7XC, KC4AF, KL7, KV4, TI2PZ, VE8, VK, VP5BL, VS1HU, YV4AU and ZD3G.

G3JSN found ZC3AC coming in, *in the clear*, around 1745 GMT on 14110 kc. Everyone's looking for this chap and no one seems to work him!

EI6X raised SVØWN (Crete) on phone, also SM8AQT/LA/P in Spitzbergen; other nice ones for him were FP8AP, FM7WS, OX3DL and BV1US.

G2DC has found 20 metres quite pleasant between 0700 and 0830, and at 2230-2330 GMT, when quite a lot of good DX is around without short - skip troubles. During the morning stretches he has raised ZK1AK and KM6EVK for new ones, along with CT2AI, FL8AA, UAØKCA and all W districts. Funny Types were HV1L and ZA1B. The latter, as usual, said

he was in Tirana, but we feel that St. Trinian's might be nearer the mark. . . .

G2YS worked FY7YE, HV1CN (phone), 9K2AQ, KP6AL, UAØKAR and CR9AH. Heard were ZK1AK, FL8AC, KC4USB, VKØDA and VQ8AJC (Chagos). G3JAF collected ZK1AK, 4S7's, VS1JF, VK6SM, ZD3G, VK5WC (Woomera) and FL8AC—all CW. GW3AHN, also on CW, managed KG4AF, KW6CM, LA1VC/G, OA7I, UM8AD, VKØRO and VR3A. He has heard ZM6AS at S8, but no QSO as yet.

G3GGS pounced on CR9AH, KC4AF, LU1ZE, LU7ZS, OR4VN, UPOL7 and VQ5GJ; a sad gotaway was YS1O. G6TC raised JA1AG, HK3JC, VS6DV and UAØKAR.

G3FXB's phone fetched in W4IHW/KS4, and CW accounted for KC4AF, KP6AL, UAØKSA and XV5A; he heard KC6JC (Truk), but no luck. Al has had MP4BBL staying with him and sharing the operating for nearly a month.

G5BZ still prefers this band, and his long list includes FB8BP, HE9LAC, HS1JN, KC4AF, KM6EVK, LA2JE/P, VKØDA and ØRO, VR3A, ZK1AK and ZM6AS, to quote only the rarer ones. On one deadish morning he risked a CQ and both KP6AL *and* ZM6AS came back to it! (Reminds us of a CQ we made about eleven years ago, when VR2AR and ZM6AF both replied—both new countries. And as they hadn't worked each other we had to steer them together...)

New for G3DNR were VK4SS and OQ5NG. G3LCI raised HE9LAC, KC4AF, KH6KD, VP7NB, 4S7NG and 9K2AN. G3LET pulled in CR6AI, CT2AI, FQ8AP, HH2LD, VP7NB, VQ8AM, VU2NW, ZC5AL, ZD2CKH and 4S7RD.

G3DO found an all-time new one with PY1CK/Ø on phone, and also worked BV1US. Six new ones came to G3FPK, including FB8BD, HE, VP7, 9K and UA1KAE/6 in Antarctica; SM8AQT/LA/P was another welcome one.

G3BHW finds short skip persists very late, but as ever the lower layers are always rewarding —witness VR3A (0915), KC4AF (2315), CP3CD, CR9AH, FL8AC, JT1AA and VKØRO.

Forty Metres

G3FPQ was one of the fortunate ones who found KC4AF on this band; he also worked 9K2AQ. G2DC raised all W districts, and a really nice catch was VP8CY (ex-G3LWY at Halley Bay), who said it was his first G contact.

G3FPK found plenty of activity, especially in the REF Contest, during which he polished off his DPF and scored 9990 points. PY's have been in evidence from 2200 onwards, and G3FPK worked nine of them, together with UA9FZ, UAØAA, UF6, UL7, UO5 and a bunch of W's. Meanwhile the Parasitic Pests continue to make their "V6T" and "777 VVV" noises just below 7000 kc, but spreading well into the band. A solitary new one for G3ABG on this band was OY7ML.

Eighty Metres

G3FPQ also worked KC4AF up here — his "rarest one yet" on the band. G2DC put in some time and worked all W districts except 6 and 7.

Miscellany

G3HJF (Enfield) notifies us that anyone working a station with that call during the past two years has been taken in by a pirate. He is getting QSL's for contacts on Forty phone, whereas he is a CW man except for Top Band, and in any case has been inactive for a long time; any helpful information would be appreciated on the spurious "G3HJF."

G2YV (Cannock) reports a W1 telling an F3: "Don't worry about your English, Pierre; as a matter of fact you speak it real good!" (No comment.) This very morning we heard an SM telling a JA to "sleep good" and a PA saying "Sorry, I didn't quite got you" — but these fellows don't claim to speak perfect English anyway—although most of them *do* speak it real good. . . .

G3JUB (Liverpool) reports a nice bit of QRP on the part of CE3CU, whom he worked on Twenty, giving him a 459 report; the CE's card duly arrived, and shows that he uses but 4 watts, with which he has worked 78 countries.

VO2NA (Goose Bay) is a bit embarrassed at the number of people who seem to think Labrador is a rarity and don't realise that it counts along with VE as part of Canada. It should make his DX-ing a bit easier, but, as he says, certain types call him furiously about thirty times and sign twice in their excitement, making other QSO's rather difficult.

G2AWT (Parbold, Lancs.) writes that he has received a batch of LU3ZS QSL cards, for U.K. contacts made when the latter was /P in the South Shetlands during the winter of 1956/7. These cards had been refused for delivery and returned to LU3ZS, and included one for G2AWT himself! However, they have all been sent on to the G's concerned by G2AWT, by direct post at his own expense. LU3ZS is now OA4W and, if you are short of a card from him, he can be reached *via* E.V.O., Box 538, Lima, Peru. *Thanks, G2AWT.*

Expedition

G3AAE, G3BQR, G3IFB and G3JUL will be on the air from Alderney between May 16 and 30, using the call GC3AAE. They will operate CW on 14, 21 and 28 mc, also SSB, working shifts so that the station can be kept on the air for 24 hours a day. Their equipment is a Collins KWM-1, sent specially from the States for the purpose.

Since the SSB operation will be the first of its kind from the Channel Islands, they expect a pretty busy time with the W-K gang. They do *not* propose any Top-Band operation.

Yasme II, VP2VB/P

Danny Weil finally got away on April 12, although he had to put into Torquay for the righting of small technical hitches. But he should by now be bound for the Azores or thereabouts, *en route* for KV4. The only regular skeds will be between 2230 and 2330 GMT, and he will operate CW on 14080 kc, AM phone on 14150 kc, SSB on 14305 kc, and both AM

and SSB on 21150 kc. He is keeping in touch with the UK *via* 7 mc, at least for the early part of the trip.

Sheepskin Department

The P-16 Certificate (Picardy 16 Diploma) will be awarded by the 16th Section of the REF to amateurs who, if they reside in Zones 14 or 15, can prove contacts with 16 Picardy stations since January 1, 1956, including 4 in Aisne, 4 in Oise and 4 in Somme. For amateurs outside these Zones the requirement is 6 Picardy stations with 2 in each of those departments. Full details from F8BO, to whom applications should also be sent, with five IRC's.

Top Band Topics

First, the DX. W1BB's bulletin tells us that W6KIP, from his new location, worked through to the East Coast for 2½ hours on March 9. No Europeans were heard that day, although SWL's over here logged W1BB and W8GDQ weakly. W6KIP also figured in the news for his first QSO with KP6AL. W6KIP told us over the air (*not* on Top Band !) that he has been running skeds with ZL3RB, who has heard him every time, but no luck in the other direction.

W2EQS has been back on One-Sixty and VE2AZI is a new one who has been taking part in the tests. The ARRL DX Contest brought them out in force, and points were being handed round by KH6IJ and VP7NG, with CN8GU being heard out there. On March 30 W9PNE heard W5SOT and worked VE5DT; also W6KIP heard VE5DT. Tests for the season are now over, and although the North Atlantic path was never kind to us, at least it was proved that even the year of maximum sunspot activity was not a complete washout for Top Band DX.

G2DC reports working W1BB on a very dead band, but doesn't give the date; he also raised HB, DL and OK. GM3COV (Caithness) claimed his WABC during the month, and now scores 68/70 from his new QTH. He works a bit of phone as well, and thinks he could make a phone WABC, but it would be hard work.

G3FPQ was delighted to raise ZC4BL on One-Sixty, which removed the main barrier to the *Magazine DX Award*. Recent new ones for G3JSN were G3GQS (Cornwall), GM3JDR (Sutherland), GI3KVD/A (Fermanagh), GW3AJZ (Montgomery), GW6HH/A (Merioneth) and the above-named GM3COV.

Incidentally, the Hastings Mobile Tour did a good job from at least four Welsh counties, and we worked them on consecutive nights from Merioneth, Montgomery, Radnor and Brecon. Before this they had a night's activity from Rutland.

Keep Off !

G2NS (Southbourne) has gone to enormous trouble to prepare a list of all known coastal stations sharing the Top Band with amateurs. It makes very depressing reading, since they occur at 7-kc intervals throughout the band, with quite a few extra ones in between. He summarises the whole thing by saying that the following frequencies are possible ones for launching CQ calls: 1802.5, 1809.5, 1816.5, 1823.5, 1830.5, 1837.5, 1844.5, 1851.5, 1858.5, 1865.5, 1876.0, 1886.5, 1897.0, 1907.5, 1914.5, 1921.5, 1929.5 and 1936.5 kc. Operators of phone nets at the HF end should note that the Danish ship-to-shore service (to whom a recent complaint about interference was attributed) operates on 1988 and 1995 kc. There are no Coastal stations operating between 1950 and 1988 kc, but that space is occupied by the Loran chain, with the Master station in the Faerðes and Slaves in Iceland and the Hebrides. Other spots to be watched are 1827 and 1855 kc, where British Railways operate their stations at Folkestone and Newhaven with only 20 watts and are supposedly more prone to interference from us than the higher-powered Coastal stations. Many thanks, G2NS, for all this information.

GI2DZG (Belfast) tells us that he and GI3FJA hope to put Tyrone and Fermanagh on the band on the evenings of May 16 and 17; also that GI6YM will be operating from the Model Engineers' Society Exhibition in the Wellington Hall, Belfast, from May 29-31. All contacts welcomed.

SWL Corner

Only space for the very best of the loggings, so please keep the run-of-the-mill stuff out of your letters while the band conditions are so good. P. R. Smith (Crewe) logged phone from HC1FG, HK7LX and three XE's on Twenty; HK3FV, FB8BX, ZB5HZ and VP8DK on Fifteen; and HC1HL, VK9DB, lots of CX's and VP8CV on Ten.

V. Porter (Loughton) mentions HS1SN, YS3IF, VK9LE (Cocos), all Ten phone; HC1MD, OA4IGY, OHØNB, VR2BC, ZS3AJ and a curious "VS3R" on Fifteen phone. The latter was seemingly a VS2 operating away from his home at Kuala Lumpur, and was located on the island of Langawi, near the north-west tip of the province of Kedah; VS2EY was apparently his second op. The

TOP BAND COUNTIES LADDER

(Starting Jan. 1, 1952)

Station	Confirmed	Worked
G2NJ	98	98
G6VC	96	96
G3ELZ	96	96
G3FNV	91	92
G3JHH	90	90
G3AKX	89	89
G2AYG	88	88
G2CZU	78	78
G3DO	75	75
GM3COV	68	70
GW3HFG	66	80
G2AO	60	60
G2CZU (Phone)	60	60
G5JM (Phone)	59	60
G3JMJ	51	55
G3JSN	49	62
G3LBQ	42	57
G3LEV (Phone)	39	47
GW3HFG (Phone)	30	40
G3LNR	26	40
G3LNO	23	41

DARC Contest (Phone leg) provided plenty of good listening for V. P., who feels it wasn't sufficiently publicised.

L. D. Strange (Sutton Coldfield) say that as the SP's are obviously not licensed for the Top Band, it would be kind to avoid mentioning their call-signs. His own best listening included TI2OE and ZD6JL (Ten phone), FB8BQ, PZ1AP, VKØKT and ZS8I (Fifteen phone), JT1AA, JT1YL and KC4AF (Fifteen CW), FY7YF and PJ2ME (Twenty CW) and UN1KAB and ZB2M on Forty CW.

B. Griffiths (Ventnor) took up SWL-ing a year ago, and now scores 228 countries in 40 Zones—pretty good going. Among the DX he mentions are VK9DB, KM6SO, VR6TC and ZS7C on Ten; FW8BZ (?), FB8BX, KX6SO, VP8CJ, VP5FH, DU7SV and OA4IGY on Fifteen; lots of W's, including 5 and 6 districts, on Forty; and ZC4BL on CW, Top Band.

M. Marment (Birmingham) found ZK2AB and SVØWN (Crete) on Twenty phone; Ten gave him only KP4ANS, OQ5RS and an OD5.

P. Day (Sheffield) says the most consistent Fifteen-metre signal has been JT1AA, audible nearly every day. W's have been missing, but replaced by VS1, VS2, KG6 and the like. F9BG and ZE2JV run regular 50/70 mc skeds; F9BG has heard ZE2JV many times, and has logged ZS6UR on 50 mc. Best of the month for P.D. were VK9DB, FB8ZZ and KG6AGO on Ten; KX6AF, OR4VN (Antarctica) and VK9JF on Fifteen phone; JT1AA and VR2AS on Fifteen CW; KM6EVK, UAØOM and VP8AX on Twenty CW; many W's on Forty phone, with MP4KKN and UN1AE on CW; and W1, 2 and 3 on 80-metre SSB. Several interesting "gossip" items forwarded by P.D., one of our most experienced SWL's, appear under that heading.

The Israel Marathon

The 4X4's are celebrating the Tenth Anniversary of Independence by running a Marathon Contest from April 28 until October 31. All bands, Eighty to Ten; all contacts, any type of transmission. Three points for Eighty, two for Forty, and one for the other bands. Each 4X4 station may be contacted once on every band during 24 hours of the period!

First prize for the winner on each Continent will be a cup offered by the State of Israel, and duly engraved; the three highest scorers from each country will receive a Diploma; everyone taking part will receive a Participation Certificate. Full details from Israel Amateur Radio Club, P.O. Box 4099, Tel Aviv.

DX Gossip

Another San Marino trip is promised for the summer, I1ADW having the urge to sign M1 again. He promises longer hours of activity (more operators!) and a better rig. Details later . . . PX1FC will be on the air for two weeks in July, with 300 watts under the control of ON4AU and F8FC, with round-the-clock operation . . . VPØRT was due to have been on during April — no trace at the time of writing.

PY1CK/Ø should likewise have been on towards the end of April, working AM and SSB. We hope you found him . . . Yet another promised one was an HKØ, operated by VE3MR, TI2RC and TI2HP, all of whom planned to go on to YN, then to VP1 and finally to VP5 (Caymans).

ZD8JD is running 100 watts on Ascension Island. Meanwhile, ZD7SA on St. Helena causes pile-ups on Ten. We heard someone ask him how long he was going to be there, and he sounded quite indignant when he replied, "I *live* here"! He is the first national to be licensed, we gather.

Various proposed expeditions to CR10 having come to nought, people are stinging up CR10AA to ask why he isn't more active. Since the trouble seems to be shortage of electricity, it is possible, we hear, that some sort of generator is being shipped out to him.

YK1AT is QRT, doubtless for some political reason or other . . . SVØWN, already on Crete, says he will be there until July, 1959, so take it easy . . . A W7 has worked a station signing C1A and claiming to be in Peiping (14 mc) . . . ZS6IF plans a sortie to ZS7, and possibly ZS8 and 9, during July. ZS6AJ expects to be on from ZS8K with SSB . . . VK9LE has been running SSB from Cocos-Keeling.

ZE3JO plans an expedition between June 7 and July 14, but this one is for his pleasure rather than ours, and no rarities will be available. He will be on a photographic *safari* in the Big Game Reserves, and will sign ZE3JO/P from ZD6, then VQ5JO, VQ4JO and VQ3JO. About 20 watts of CW and phone will be used, with as much wire as it is possible to erect in the various spots visited. All on 14 mc.

ZK1BS on SSB, 14 mc . . . VS5JL CW, same band . . . OR4VN very active on 21120 kc . . . ZD7SA on 28020 kc, 1800-2000 . . . VP2KM will be on from St. Kitts . . . 4S7RD (ex-G3KUD) looking for G's on 14020 kc . . . ZC5AL looking for GI's and GC's on 14 and 21 mc.

The OVARA's much-hoped-for trip to Socorra having been laid low by the occupation of the Island by the Mexican Navy (!!) and hence the refusal of licence facilities, the whole thing was switched to Navassa, and very successfully, too, judging by the performance of KC4AF. Several G's worked him on four bands. Activity was continuous and pretty rapid during his short stay there.

VQ4EO is trying to get a licence for operation from FD8-land . . . AC4AX is said to be genuinely in Tibet—if you get the right one! There are liable to be several on the band at the same time . . . We recently worked a very shady character purporting to be AC5PN, but we shan't believe it until a card arrives. AC5PN's name is Chhawna, and this one said "name is Chawan" . . . VR3A has shown up on 14 mc with a much better signal than ever before.

VS1FJ (G3IDC) gives the following news: VS1BB was due to leave for R.A.F. Gan (Maldive Islands) on April 15, and would be staying there for about three weeks. He would have with him a DX-35 rig borrowed from

VS6AZ, and expected to have his permit to operate by the time he arrived. Crystals for 14050, 14200 and 14300 kc were available, with others to follow. Another item is that VS1JF has the chance of a job in the Maldive Islands for six months . . .

From the *Malayan Radio Amateur* we gather that ZC3AC has 40 watts, a dipole and one crystal—somewhere around 14110 kc—but keep off that frequency if you want to work him . . . that VS2CP is toying with the idea of SSB . . . that VS6DJ, who is a Malayan, runs a DX-100 and a 75-A4 receiver. He likes working the VS2 boys, and his favourite topic is Chinese food!

The Malayan Prime Minister, Tunku Abdul Rahman, spoke to the VS2 amateurs over their local net, from the shack of VS2DQ, on two occasions. During the two evenings he spoke to amateurs of all the different races in Malaya—Malay, Chinese, Indian and European—and was, we gather, very impressed by the spirit of friendship existing between them, which must have made quite a change from politics . . .

News from Overseas

From VS1HU (G3JFF) we glean the news from Kranji, where they have had visits from VK3DU and VR2AP. VK3DU is a representative of the W.I.A. and is making a world tour—he should be in England by the time this appears. VR2AP was in VS1 awaiting his passage home to Fiji, in the course of which he will be calling at ZC5, CR10, VR4, FU8 and VR1, operating mainly on 14340 kc phone. VS1HU has supplied crystals for 14020 and 14080 kc, however, so some CW may emerge as well.

KP4BI was another visitor to Kranji, and a large gang of VS1's turned out to meet him; he is a QRO man himself, and was amazed at the "5 plus 9" QSO's that he could make with VS1FJ's 25-watt rig.

DX from VS1HU included FB8YY, KC6JC (East Carolines), KW6CM, VS4BA, VS5JL, W3PZW/KB6, ZS3B and 3A2CD on 14 mc CW; there is a VR5AZ around, but rumour has it that he is Ungood. VS1HU now chalks up a score of 163 worked, in all Zones.

ZD2CKH (Ibadan) made his first entry in the log on December 9 last, and works almost entirely on 14 mc CW, except for the local 7 mc phone net. He has accounted for about 60 countries with his veteran Canadian 52-Set and a Windom. On his next tour he hopes to dabble with SSB—meanwhile he is on his way home and hopes to acquire a G call..

W6AM (Long Beach) now makes it 251C worked on phone with ZL1ABZ, UQ2AG and FD8DZ/P; his CW score stands at a phenomenal 278C, thanks to cards from ZL1ABZ and AC3SQ. There's nothing much left for W6AM but an XE4, and it doesn't seem likely that that one will crop up again for a long time.

OK1JX tells us that JT1AA and JT1YL are doing quite a bit with phone these days, and they now have frequencies around 14345, 14178 and 14156 kc. As far as total QSO's go, Ludvik is nearly on 5000 and Mila about 400. Mila's QSL's, by the way, are to be of the photographic variety, and she is, as OK1JX puts it, "a pretty lass."

ZE5JU (Umniati) writes that he is now running the Cubical Quad as designed and described by GM3BQA in the December 1957 issue of SHORT WAVE MAGAZINE. To quote ZE5JU: "It is working fine here, and going great guns! It's the best I've yet put up, and gives DX without tears."

The "CQ" Phone Contest

The Phone half of the *CQ* DX Contest produced some of the highest scores on record, as well as a very large entry. Dealing first with *Single-Operator* stations, the "World High" and Trophy Winner was F8CH (All Bands) with a score of 436,974. Other high scores in Europe were DL1BZ (369,900), F8PI (324,870), I1BWN (305,172) and OH5PE (254,567). All these were on an "All-Bands" basis. The top-scoring G station in this category was G2DYV with 110,397, although G3DO, working 28 mc only, beat him to it with 121,862 on that band alone.

Italy showed five scores higher than 180,000, Germany three. Leaders under other prefixes were GI3IVJ (27,336 on 28 mc only), GC6FQ (62,218 on 21 mc only), GM8SQ (36,900), GW3AHN (104,000), SM3BIZ (116,128), OE5CK (224,008). Outside Europe we find W6YY (265,630), VE3AIU (269,533), CO2BL (401,800), 4X4GB (372,736), CX3BH (226,504), VK6RU (197,098) and KH6IJ (409,962).

Dealing with the *Multi-Operator* Section, we find K2GL established as "World High" and Trophy-

When W3HQO was in the U.K. recently, one of the "sights of London" he was able to visit was — Scotland Yard! Left to right in this photograph are: W3HQO, his XYL, G3ANW (seated), G3IDG and G3IDF.

Winner with 866,250 (All Bands). Following him up are ON4SZ (582,798), 5A5TH (544,635) and SM6QH (204,864). Highest in the U.K. were G2AHC (62,676) and GI2HML (104,204). GB2SM operated from the Science Museum in the heart of London, scored 59,414 on 28 mc only.

Interesting points were the relatively small total entry from the U.K., which was numerically smaller than that from Germany and roughly equal to those from Finland, Sweden, Denmark, Netherlands and Italy.

The CW Contest

We hope to have some preliminary information on the CW Section in time for next month. Meanwhile, we understand that some fabulous scores have been sent in, the probable winner being a W with over 800,000! In the Multi-Operator category, the group signing W6RW went to over one million . . . No clues yet concerning high scorers in Europe.

Late Flash

G3LZM (R.A.F. Locking) reports that he will be on Top Band from Hereford during the Whitsun weekend, after TV hours. This county is still one of the rarer ones among the WABC-chasers, and we feel sure he will not lack customers.

G3WW (Wimblington) having heard, at the recent Mobile Rallies, that Cambridgeshire is now regarded as a "rare county" for WABC on Top Band, says he will be glad to arrange schedules to remedy the deficiency for anyone who cares to write him—*QTHR*.

And so we sign off once more, in the hope of equally good DX to come during the next month. The deadline for reporting it is **first post on Friday, May 16.** (For the July issue it will be *June 13.*) Address everything to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1—and please separate those letters out into the various bands! Meanwhile, we wish you Good Hunting and 73. BCNU.

THE MOBILE RALLY REPORT

HAREWOOD, APRIL 13— SOUTHGATE, APRIL 13— TRENTHAM GARDENS, APRIL 20— AND FORTHCOMING EVENTS

IF one thing is certain, it is that mobile operation, combined with Rally events and activity, has caught on in a big way among U.K. amateurs. This, and a marked improvement in the weather, ensured a level of support beyond the organisers' expectations for the first two big Mobile Rallies of the season. They both brought in over 200 cars, most of which were equipped for /M operation. Though all bands are covered, much of the mobile working is still on 160 metres, followed probably by two metres as the second favourite, and then 80 metres and the DX bands. The general popularity of mobile operation, and rallying, is undoubtedly due to the combination of the radio side with the motoring interest, the fact that one can get out with the family with some definite objective (instead of merely teetering about the side roads, as so many drivers find themselves doing on week-end outings), and the pleasure of meeting fellow-enthusiasts for Amateur Radio (and cars) under congenial conditions.

The first event of its kind to be held in the North was the Mobile Rally at Harewood House, Yorkshire, on April 13. Organised jointly by the Spen Valley Amateur Radio Society, the Leeds University Union Radio Society, the Bradford Radio Society and the Leeds Radio Society, more than 200 vehicles drove into Harewood along the A.61, about half of them with what the local residents regarded as "weird excresences," gazed at with astonishment. Of the callsigns mentioned, we have G8SB/M who is on the DX bands and has worked 89 countries while under way; he took the *concours d'elegance* prize. The two-metre mobiles included G3GJV/M with a *three-element beam*, and G3ATM/M, with a 50-milliwatt outfit (6J6-6AK5) on a motor-cycle; his receiver is a 2-valve super-regen, and the aerial a vertical dipole. G2BDQ/M displayed an impressive collection of DX QSL cards, his 35 watts having got him WAC on 15 metres; with the assistance of a second operator, G2BDQ/M works CW as well as phone. A particularly interesting mobile installation was that of

The two-metre talk-in station, G3BA/A, for the Trentham Gardens Rally with, left to right: G2AK, G3HAZ, SWL Kingston and G3KLJ (standing). The three stations installed for the event (on 160, 80 and 2 metres) were kept busy from 11.00 a.m. to 3.00 p.m. Their control procedure and operating efficiency generally have been very favourably commented upon by many of the visiting mobiles who were talked in.

G2AUC/M, who built the whole of the equipment himself, including the vibrator unit for the power supply! While most mobiles showed home-built transmitters and aerials, if not receivers, there were two American commercial outfits, complete, on view, some Type 42 Sets, seven ZC1's and two 19 Sets.

It is hoped to make the Northern Mobile Rally an annual event—and certainly the organisers, of whom SWL N. Pride of Spen Valley was the prime mover, can take heart for the future from the success of their first venture.

* * *

The Southgate (North London) Club group also held their first Rally and get-together of mobiles on April 13, with a registered attendance of 47. Talk-in stations on Top Band were operated by G3KDF/P, G3LXP/P, and G3MBL/P, with G3IUQ/P looking after 40 and 80 metres. Among the visitors were G3CIM/M (whose entirely home-built installation was described in the March 1958 issue of SHORT WAVE MAGAZINE) and G3HRH/M, who also have very fine equipment.

It should be noted that the Southgate Club are holding these Sunday morning get-togethers regularly through the season, the next being on May 11—*see* panel p.161 for details of routeing—and that they will take place irrespective of weather conditions; the Top Band talk-in station opens at about 10.00 a.m., and the meeting will disperse at 6.00 p.m.

One of the "DX" visitors to the Northern Mobile Rally at Harewood House, Yorkshire, on April 13 was G3FXG/M, who came up from London, a distance of over 200 miles. Seen here with his Italian-born XYL, G3FXG/M has worked more than 50 countries mobile, including a car-to-car contact with an HB/M. While static at Harewood they raised an I station in Milan.

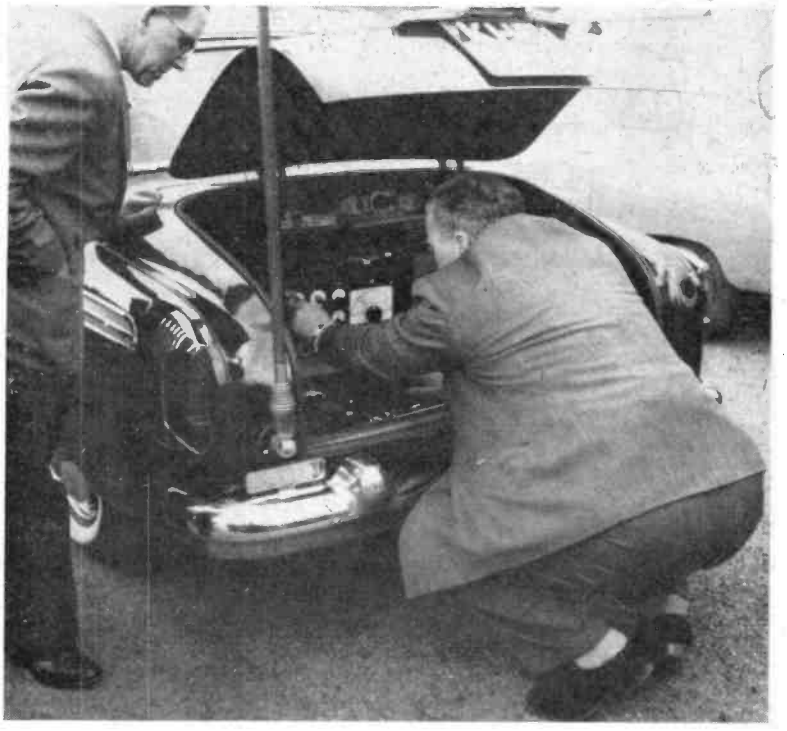
The weather was set-fair for the Trentham Gardens (Stoke-on-Trent) Mobile Rally on April 20, which was attended by some 500 people in 200 cars, more than half of them fitted for /M working. Mobiles were talked in on 160, 80 and 2 metres, some contacts being started from as far away as GW; the local control stations were kept hard at it all the morning and until mid-afternoon. The event was organised jointly by the Midlands Amateur Radio Society, the Stoke-on-Trent Amateur Radio Society and the British Amateur Television Club, with their enterprising and effective roving-eye demonstration. Very high quality pictures were piped round on closed-circuit to a number of receivers, and the B.A.T.C. team (G3KBA/T, G3LGJ/T and G3LNN) not only "roved" the grounds, but also interviewed some of the well-known amateurs who were present.

In order to keep people interested and occupied, several of the events were run in parallel, among the most important being the judging for the eight prizes in the equipment classes. Winner of the *concours d'elegance* was G3KHE (Birmingham); the prize for the best Top Band installation went to G3IJC (Leeds);

A view of a section of the car park at Trentham Gardens on April 20. XRB-781 is owned by G5CP/M, and 491-ATU, to its left, by G3HZ/M.

for the best in the 80-metre group to G3CLG (Stourbridge); for the outstanding two-metre equipment to G3JGY (Malvern); for an all-band mobile to G3ATL (Huggles-cote); for his 10-15 metre equipment G8SB (Prestwich) gained a special certificate, as did G3GXZ (Leicester) for his outstanding portable gear, while G3LDY (Wolverhampton) took the prize for motor-cycle installations on two metres. There was also a raffle and prize draw open to everybody.

The talk-in stations—G3GBU/A, G3MAR/A and G3BA/A—worked in an "operations room," while the television interviews were conducted in an adjoining room. Short lectures were given by G2ATK, G3APY and G3ENY on various aspects of modern mobile equipment construction; these also were televised, which resulted in extra audience coverage without any over-crowding. An efficient sign-in procedure had been evolved, so that everybody got a recognition badge, and a system of QSL-card display enabled one to find out who was present. The catering arrangements were very good—and as the weather was warm and sunny into the bargain, all things combined to make this Rally a very memorable, enjoyable and successful affair, on which the organisers from the three Clubs mentioned are to be congratulated. They themselves could have had no doubt that their efforts were appreciated: the home-going mobiles made that quite clear.



G3KLJ looks on while G3KHE/M (from Sparkhill, Birmingham) makes some adjustments to the equipment, carried in the boot of his car, the registration number of which is KHE-599. G3KHE took away the prize for the "concours d'elegance," which was one of the features of the North Midlands Mobile Rally.

* * *

Forthcoming events in the Mobile Rally calendar are now the **Cheltenham Mobile Rally,** to be held in the Montpelier Gardens on Sunday, May 11, for which the Top Band talk-in station will be G3GPW/P on 1810 kc, with the assistance of a home-based station, G3CWV/A, on 1995 kc. The two-metre control station will be G3YZ/P on 145.3 mc. Visitors are specially asked to sign in and to bring one of their own QSL cards with the car registration number on it; these cards will then be displayed, to make recognition easier. Light refreshments will be obtainable on the ground.

For Sunday, May 18, we have the **Lincolnshire Mobile Rally** (*see* p.101, April issue, for full details), the **Manchester Mobile Rally** (*see* p.45, March) and the **Bournemouth Mobile Rally.** The latter will be held in Kings Park Boscombe, Bournemouth, and two talk-in stations will be in

A general impression of the car park and surroundings at Trentham Gardens, the site for the very successful North Midlands Mobile Rally on April 20. Some 200 cars were checked in, overflowing the private car park arranged for the occasion. The total of visitors to the Rally is estimated at about 500.

operation from 10.30 a.m. onwards: G3HLW/P on 1880 kc, and G2HIF/P on 145 mc. Mobiles are asked to raise their talk-in stations as early as they can on the approach, and to report their progress periodically. As the event is not intended to be anything more than a social get-together, no programme nor competitions have been arranged. Those attending can either bring a picnic, or go to one of the restaurants within a mile of the site for lunch or tea. This Rally is being laid on by the Bournemouth Amateur Radio Society, and there is time to get any further details about it from their honorary secretary: C. R. Davies, G3JAU, 107 Talbot Road, Winton, Bournemouth (*Tel.: Winton 4078*).

THE GREAT CIRCLE DX ZONE MAP

The stock of our 3s. 9d. *DX Zone Map* having become exhausted, it is now under revision prior to reprinting. Since first being offered, this map has run through four printings, and several thousand have been sold. The new *DX Zone Map* will be a complete revise and, as before, will be printed in several colours. It will not, however, be possible to price it as low as 3s. 9d. (the original price, some years ago, was 6s. 6d.). Readers who have orders outstanding for the Map will be notified as soon as it is ready, and an announcement will also appear in the *Magazine*. We would assure those who are waiting that it will be produced as quickly as possible.

"YASME II" ON PASSAGE

On Saturday, April 12, Danny Weil (VP2VB) cleared Poole in *Yasme II*, bound for KV4AA in the Virgin Is. He was seen off by a large crowd, including the Mayor of Poole, and was featured in the BBC's "Radio News Reel" that evening. He said he had "three amateur-band transmitters and receivers on board, with more equipment to be fitted at Miami, Florida." Unfortunately, *Yasme II* started a leak shortly after departure, and had to go into Torquay for repairs. She is a 51-ft. ketch, a very fast sailer, and is fitted with a new set of light sails of great strength and durability. A regular U.K. schedule is being maintained with him, and it is hoped that we shall be able to report progress every month.

THE QSL BUREAU

For the convenience of readers requiring QSL Bureau facilities, we operate our own Bureau, *both*-way use of which is open only to direct subscribers, *i.e.* those who obtain SHORT WAVE MAGAZINE direct from us by subscription paid in advance (33s., or 16s. 6d. for six months). While we cannot make the both-way facility available to bookstall or casual readers, we do accept cards received *for* all or any G operators, even if they are not readers of the *Magazine*. The main function of our Bureau is, and always has been, the distribution of cards outwards, which it has been doing to the general satisfaction of all its users for many years now. Recently, the throughput cards has nearly doubled.

INTERESTING BEAM-POWER TYPE

An addition to the RCA range of receiving valves is the 25C5, a 7-pin miniature capable of giving no less than 2·3 watts audio output with voltages of only 120v. on the plate and 110v. on the screen; this is for one valve in Class-A1.

SORAD'S CATALOGUE COMPETITION

In connection with the Catalogue Competition, announced in recent issues by Southern Radio & Electrical Supplies, of Redlynch, Salisbury, Wilts., some 40 prizes were distributed among a large number of competitors. The full list appeared on p.59 of our April issue. The 56 pp. catalogue, price 9d., post free (overseas 1s. 3d.), now being issued shows some 2,000 new and guaranteed radio items by the leading manufacturers, no "surplus" of any sort being included. Over the years, Sorad have built up a large by-return mail order business, and can be relied upon for service.

LICENCE FIGURES

The total of combined TV/Sound licences in the U.K. is now 7,900,000, but there are still over 6,600,000 licences in issue for Sound only; the figure for car radio licences has gone up to 330,238. We must ask the G.P.O. to include, in their monthly return, the number of U.K. amateur transmitting licences in issue!

"....And carefully tuning the band...."

Better Absorption Wavemeter

SHARP TUNING AND SENSITIVE INDICATION

THE absorption wavemeter discussed here is something a good deal better than the usual type. This is because valve-and-meter indication is used, with a tuned circuit arrangement which gives much improved sensitivity and, because of the inherently high Q, the tune point is sharp on all bands.

This is achieved by tapping the grid of the valve down the coil. Furthermore, by using the bandspread arrangement shown inset in the diagram, good coverage can be obtained on all amateur bands with the same main tuning capacity C4. Both these are old circuit dodges, well known in the days of straight receivers, when by careful selection of the L2, C1, C2 values, it was possible to get equal spreading of all bands with a single tuning capacity giving full spread on the lowest-frequency band.

Resonance tune is indicated by the microammeter in the plate of the first valve, the series resistor R3 being used for "zero-setting" the meter; actually, R3 is adjusted for full-scale reading in the no-signal condition, the meter needle flicking downwards when a signal is tuned in, after the manner of a grid dipper. Because of the sensitivity of the device, much less coupling can be used than is necessary with the ordinary "brute-force" type of absorption wavemeter. This in turn means that it is well worth using a good slow-motion condenser and dial for C4, and putting a calibration on the scale.

Fully to exploit the possibilities really involves two separate sets of coils which, as indicated by the circuit, are made plug-in. The L1 series of coils are for general coverage, the data given being for 3-50 mc continuous, using three coils: 3·0-7·5 mc, 7·5-20·0 mc and 20-50 mc. The L2 series incorporates the C1, C2 capacities, for giving good spread over the 3·5, 7, 14, 21 and 28 mc bands. This may be thought to be unnecessarily luxurious, but in fact one always needs the general-coverage coils for quick checking, and the bandspread set for accurate investigation or setting up within a band. All necessary detail for the construction of the coils is given in the tables herewith.

The second valve is connected as a phone monitor, the circuit arrangement being such that plugging phones in at J produces the monitor signal *without* upsetting the tuning or, what is more important, the setting of R3 for zero'ing the meter; if J is made single-circuit, V2 draws no current until monitoring is required.

So much for the circuit itself. The next consideration is what type of valves to use, which in turn determines the general layout and construction. An elaborate arrangement would be miniature valves with a small power supply incorporated — but this would involve quite unnecessary complication, expense and inconvenience. An obvious requirement in an instrument of this kind is that it should be "handleable" — without trailing leads, nor too heavy to use conveniently.

Hence the use of battery valves, and of the miniature type; by adopting battery miniatures, a small battery element for power can be incorporated in the construction, making the whole instrument light, compact and easy to use about the bench. The valves in the model are Brimar IL4 battery pentodes, powered by a single 1½ volt cell element for LT, and a deaf-aid battery for HT. Alternatively, a small HT/LT battery pack of standard type can be used.

Construction

There are so many different ways in which this version of an absorption wavemeter could be put together that there is no point in laying down a hard-and-fast form of construction. Broadly speaking, the right way is that which suits the constructor best.

As a guide, however, the whole assembly, including the battery, can be accommodated in a small box 6in. by 4in. wide by 2in. deep, with a detachable lid, the valves and their associated wiring being put together on a separate chassis which is bolted into the box. The coil mount can be fitted at one end; the variable condenser C4, with its miniature slow-motion drive, on a small bracket placed along the box so that the connections are kept short, is positioned so that its drive shaft protrudes at the opposite end, taking a small calibrated dial.

With the 0-500 microamp. meter let into the face of the box, the only other items protruding are the control for R3, which can be a standard one-watt potentiometer, and the on-off switch.

Making the Coils

Working from the data given in the tables, the coils can be wound on standard 1¼-in. diameter plug-in formers. Those for the band-

spread series L2 take in the capacities C1 and C2 as part of their construction; this means the use of physically small condensers mounted inside the coil former itself; there is no difficulty about this, though it should be noted that to obtain the required coverage (in the bandspread series), a certain amount of adjustment of the turns will probably be necessary—either in the spacing or the number of turns. The wire used for the model was 20g. enamelled.

Having established the values correctly, band by band and range for range, the coils should be doped up so that they are solid. Apart from rough checking, there is no point in attempting calibration until the coils are finalised.

Table of Values

Circuit of the Absorption Wavemeter

C1, C2 = *See table*
C3, C6 = 100 $\mu\mu$F
C4 = 75 $\mu\mu$F, tuning
C5, C8 = 500 $\mu\mu$F
C7 = .002 μF
R1, R2 = 1 megohm
R3 = 10,000 ohms, variable
R4 = 5 megohms
L1, L2 = *See tables*
M = 0-500 μA meter
J = Open circuit jack
V1, V2 = Brimar IL4

GENERAL COVERAGE COILS

(*L1 Series*)

Range	Turns	Winding
3.0-7.5 mc	45	*close wound*
7.5-20.0 mc	15	*spaced wire diameter*
20.0-50 mc	5	*spaced out to half-inch*

Coils are wound on 1½-in. diameter formers, using 20g. enamelled, and all windings are centre tapped.

BAND SPREAD COILS

(*L2 Series*)

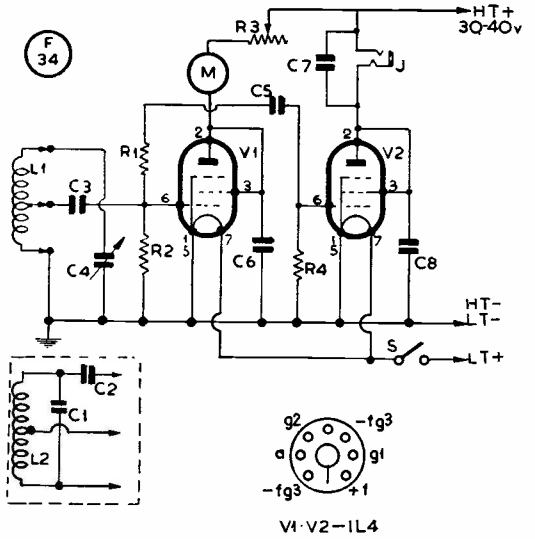
Range	Turns	Winding
3.5-4.0 mc	35	*close wound*
7.0-7.5 mc	16	*spaced wire diameter*
14.0-15.0 mc	9½	*spaced out to one inch*
20.5-22.0 mc	6	*spaced out to one inch*
28.0-30.0 mc	4½	*spaced out to ¾ in.*

Coils are wound on 1½-in. diameter formers, using 20g. enamelled, and all windings are centre tapped.

BAND SPREAD CONDENSERS

(*L2 Series*)

Range	Parallel, C1	Series, C2
3.5-4.0 mc	50 $\mu\mu$F	50 $\mu\mu$F
7.0-7.5 mc	50 $\mu\mu$F	50 $\mu\mu$F
14.0-15.0 mc	30 $\mu\mu$F	15 $\mu\mu$F
20.5-22.0 mc	30 $\mu\mu$F	15 $\mu\mu$F
28.0-30.0 mc	30 $\mu\mu$F	15 $\mu\mu$F



The circuit discussed in the text. The coil arrangement provides for general coverage over a wide range, with bandspread over all amateur bands. The sensitivity of this wavemeter is such that, if the tuned circuits are made sufficiently stable, a reasonable degree of calibration accuracy is assured. By using low-consumption battery miniature valves, very compact construction can be attained, and with ordinary use the power supply should last nearly as long as the normal shelf-life of the batteries.

Calibration

The bandspread series can be calibrated against a VFO, which should itself be set up against some reliable frequency standard; it ought to be possible to get a very accurate and stable calibration on to the dial for the bandspread coils, the resonance point being indicated by the meter deflection.

For the general-coverage coils, however, a highly accurate calibration cannot be expected, and it would be a waste of time to attempt it; this is because the frequency coverage is so wide, and also because the only simple way to calibrate these coils is by "receiver absorption." The method is to take a couple of turns of the loose aerial lead to the receiver round the end of the coil in the wavemeter; tune in a not-too-strong signal on the receiver with the RF gain backed off; then swing the wavemeter variable condenser; when the wavemeter resonates with the signal on tune on the receiver, a "suck" effect will be noted—the signal will go down in strength, or will disappear. The degree to which the effect is obtained will depend upon the coupling into the wavemeter coil and the receiver settings; it may be necessary to do a little experimentation with both before a noticeable change takes place in the signal on tune — which, of course,

is the calibration point for the wavemeter, read off the receiver dial setting.

The best accuracy is obtained when the coupling into the wavemeter coil is kept so loose as to make the "suck" effect only just discernible. The tighter the coupling, the greater the error will be due to pulling between the circuits. No deflection will be shown on the microammeter during this process of calibrating the general-coverage coils, but the meter must be correctly "zero'ed" for maximum deflection while it is being done. A few main points in each tuning range should be put on as accurately as possible, and graphs drawn for the three coils.

Application

This instrument is used in the same way as any other absorption wavemeter — except that it will be found a good deal more sensitive, and the coupling to transmitter circuits can be made quite light for a sharp deflection on the indicating meter. Of course, it is this that makes the wavemeter an accurate indicating device.

BBC UHF TRANSMISSIONS ON 650 Mc

Early in November the BBC began a series of test transmissions on 654.25 mc (46 centimetres) to collect propagation data relating to the UHF regions (Bands IV and V) which were allocated to television at the International Radio Conference at Atlantic City, 1947—but are not so far used for this purpose by any authority.

Following earlier laboratory work, the BBC embarked on its first series of UHF propagation measurements in 1955. These were directed towards the investigation of propagation on frequencies between 470 and 960 mc over distances representing a normal service area, and over longer distances to obtain data necessary for the evaluation of co-channel interference. The initial tests were for the latter purpose and employed transmitters, modulated by square waves, manufactured for the BBC by Mullard Electronic Products, Ltd. The transmitters were installed at various television transmitting stations, the aerials being erected high up on the television masts. Regular field-strength measurements were made over long periods at various locations, some as far away as the Shetland Islands.

The long-distance tests were followed in 1956 by a series to determine propagation conditions within a typical service area using a transmitter at the Crystal Palace, working into a Yagi aerial and radiating a peak power of 1 kW over a fairly narrow beam when modulated with square waves; pulse modulation was also used for some of the tests. The bearing of the aerial, which was at a height of 440ft. was changed from time to time so that field-strengths could be measured over the whole circle from Crystal Palace. These measurements have been completed and the resulting information concerning field-strength contours and an assessment of shadow and echo effects are now being studied. The information collected in this way was, however, insufficient to determine fully the suitability or otherwise of Bands IV and V for television broadcasting, and at the request of the Television Advisory Committee the BBC decided earlier this year to embark on a more ambitious series of experiments, using a high power transmitter and radiating full television signals, initially on 405 lines and later on 625 lines (C.C.I.R. standards). These tests have been planned by the BBC in co-operation with the Committee and the radio industry.

UHF Equipment

The BBC has installed at the Crystal Palace a 10 kW peak-white UHF vision transmitter and a 2½ kW carrier power sound transmitter (manufactured by E.M.I. Electronics, Ltd.), the frequency being 654.25 mc. The equipment is low-power modulated on both sound and vision channels and employs (Eimac) klystrons in both audio and video final stages. These klystrons use three external cavity resonators and operate as linear amplifiers with a power gain of approximately 100. They are driven by a modulated amplifier stage operating with a cathode modulated circuit. The output of the transmitters is combined in a circuit of the filter bridge type constructed in rectangular section waveguide. The combined output is then conveyed to the aerial by an elliptical waveguide having dimensions of 12in. x 6in. The elliptical waveguide is made of 99.5 per cent. aluminium in 12ft. lengths. At the top of the mast the waveguide is transformed into a 5in. concentric feeder to take power to the four driving points of the helical aerial, the pole supporting the aerial being arranged to form the outer of the concentric feeder.

The helical aerial, made of ½in. diameter copper rod, comprises four bays, mounted one above the other on the same vertical axis, each having a linear height of five wavelengths. Each bay is fed at the centre, the helix being wound from the centre point of the bay in opposing directions to cancel the vertical component of radiation. In the four bays there is a total of 48 turns, each turn being approximately two wavelengths long. The aerial is mounted at the summit of the Crystal Palace Tower, the top of the 6½in. diameter pole supporting the aerial, being 707 feet above the ground, while the centre line of the aerial is 691 feet above the ground. The aerial has a power gain of 20; after allowing for losses in the feeder and waveguide system, the effective radiated power of the vision signal is of the order of 125 kW peak-white in the horizontal plane. Provision is made for de-icing the aerial by electrical heating.

Starting early in November, the transmitter is now in use for several hours a day radiating pictures on the 625-line standard.

From the experimental point of view, these BBC transmissions on 654.25 mc are of extreme interest to those engaged on UHF propagation research and investigation, irrespective of the TV angle.

VHF BANDS

A. J. DEVON

Improving VHF Conditions—Mobile and Portable Activity—News and Station Reports—London VHF/UHF Convention, May 17—

AS this issue went down, the signs were that the VHF bands should be breaking open. After about a fortnight of relatively steady pressure conditions, the barometer started moving up on Saturday, April 26, the weather changed from cold to warm and then very warm, and on two metres the "feel" of the band was that it was lively. The weather commentaries were talking of early-morning fog and, in general, all the indications were that an opening was on its way.

If these surmises are correct, we should know about it, and what happened, in time for next month. What is certain is that it is only by regular evening listening that one can expect to find the openings—and not so much just by listening, either; it is worth risking a CQ every now and then, just to see what might happen! If everybody did this, as often as possible, two metres would sound a great deal livelier, and perhaps we should not get so many reports of "not much activity."

For that has been the feeling for the recent period, though there have been one or two bright spots. Yet the odd thing is that the regular long-distance schedule keepers consistently report their paths workable, even up to 200 miles. It is, in fact, probable that 100 miles is nearly always workable between stations at "average" locations (provided enough trouble is taken at both ends) and that the better-placed stations, with good receivers, can rely on 200-mile distances for a great part of the time. Yet so many people seem to take it the band is dead, or there is not much activity, if they cannot hear loud signals from all parts of the country. The results being obtained on the regular schedules is pretty well known—and to PE1PL's party can now be added G3JWQ (Ripley, Derbys.), who has been getting across to The Hague at lunch-time almost daily. PE1PL says that this is not a "regular" schedule with them, but remarks that it is rapidly becoming one! And G3KQF, not far from G3JWQ, might be interested to know that PE1PL heard him, on a CQ, at the lunch hour on April 23.

As it happens, April 23 was one of the few really good days in this last period. Others were April 21, when there was much QSB on long-range G contacts, but the east-west path was well open; April 14 gave good signals from the north, with deep QSB; and over the Easter week-end conditions were fair, but apparent activity low.

An interesting log summary by G8VZ (Princes Risboro') suggests that, comparing the first fortnight in April in each year 1957/58, conditions were better last year than this. The findings are based upon the results of his daily 100-mile schedule with G3JWQ—which has been running so long now that such comparisons are possible. With transmitting and receiving equipment unaltered at either end, the 1957 contacts during April 1-14 show rather better signal levels than those over the same period this last month. And this, incidentally, proves the value of regular schedules, and what can be derived from them.

On this same point, one fact that seems to be emerging from the daily G6FO-PE1PL exchange is that if either pressure or temperature are about the same at both ends, signals are good, irrespective (almost) of whether they are high or low; in other words, a low glass is not of great significance; what does affect signals (or seems to) is a difference between them of more than about ·04 of an inch in the pressure reading. No explanation is offered for this phenomenon, which has been mentioned in this space before as a point worth watching by those able to make the necessary observations. They can be carried out by any pair of stations, not less (it is suggested) than about 150 miles apart, both equipped with barometers corrected to sea level, able to work a daily schedule, and to exchange the information with accurate readings of signal strength. Then, keep the schedule for about twelve months, and analyse the results.

GW5MA/P Again!

Newer readers of this feature may not realise that one of our most experienced /P operators, with an activity record covering a

TWO METRES

COUNTIES WORKED SINCE SEPTEMBER 1, 1957

Starting Figure, 14

From Home QTH Only

Worked	Station
50	G3KEQ
48	G5MA
43	G3HBW
41	G3GHO
36	G8VZ
35	G2CIW
30	G3JWQ
27	GM3DIQ
25	G3KHA
24	G2AHY, G3GSO
22	G3KQF
21	G3KUH
17	G3DLU
15	G2HDR, G3CKQ

This Annual Counties Worked Table opened on September 1st, 1957, and will run till August 31st, 1958. All operators who work 14 or more Counties on Two Metres in the year are eligible for entry in the Table. The first claim should show a list of counties, with stations worked for them, as soon as 14C have been achieved. Thereafter, the list can be added to as more counties accrue.

TWO METRES

ALL-TIME COUNTIES WORKED LIST

Starting Figure, 14
From Fixed QTH Only

Worked	Station
78	G5YV (787)
73	G6NB
71	G3CCH
70	G6XM
68	G3BW, G3GHO
66	EI2W (286), G3IUD (302), G5BD
65	G5MA
64	G3BLP
63	G2FJR (542)
62	G3KEQ
61	G3HBW
60	G2OI (402), G3DMU
59	G3EHY, G4SA
58	G3FAN (637), G3IOO, G8OU
57	G8SB
56	G3WW (770), G5DS (654)
55	G2HDZ (495), G2HIF, G5BM, GW5MQ
53	G2AJ (519), G4CI, GM3EGW (196)
52	G2NH, G6RH, G6XX, G8VZ, GW2ADZ
50	G3ABA, G3GSE (518)
49	G3HAZ (358)
48	G3FIH, G5ML, G6TA (487)
47	G2CIW (264), G3DKF, G3JWQ (357), G5WP
46	G3LHA, G4HT (476), G5BY, G6YU (205)
45	G2AHP (647)*, G2DVD (362), G2XC, G3BJQ, G5JU
44	G3BK, G8DA
43	G2DDD, G3BA, G3COJ, G3DLU,* G3HWJ, G3KHA (262), G4RO, G5DF
42	G2HOP, G3BNC, G3IER, G6CI (220)
41	G2CZS (282), G2FQP, G3DO, G3WS (255)
40	G3CGQ, G8KL
39	G2IQ, G3DVK (208), G3GBO (434), G3VM, G8IL (325)
38	G2FCL (234), G3APY, G3CKQ, G3HTY, G5MR (343), G8VN (190)
37	G2FNW, G2FZU (180), G3DLU, G3KUH, GC3EBK (260)
36	G2DCI(155), G3CXD, G3DLU* G3IIT, G6CB (312), G8IP
35	G3FZL, G3FYY (235), G3HCU (224)

long list of rare counties visited during the early 1950's, is Bob, G5MA, of Great Bookham, Sy. After an interval of 3½ years, the /P bug suddenly bit him again, and over Easter he was away to Breconshire, operating as GW5MA/P from sites near Brynmawr; on the Saturday evening, conditions were poor, activity low and only three stations were heard — G3EGG, G3IRA and GB3IGY—with nothing worked; on the Sunday, from another of his old DX sites, the going was very much better, 15 stations being worked, including several in the London area—*see* Activity Report. We hope that Bob will now feel inclined to start touring again, through the Welsh counties, few of which have been worked by the many stations new on the two-metre air since 1955.

Worked	Station
34	G3AEP, G3CKQ (162), G8IC
33	G3FUR, G3GFD, G3HHY(125)
32	G3HIL, G8QY, G8VR, GC2FZC
31	G3GSO (209), G3HXO, G3KPT (108), G3KQF, G5RP, GM3DIQ
30	G2AHY, G3FRY, G3GOP (208), G3GVF (129), G3IRA, G3KEF (110), G5NF, GW8UH
29	G3AGS, G3AKU, G3FIJ (194)
28	G3ITF, G3KUH, G8DL, GM3BDA
27	G3CVO (231), G3DAH, G3ISA (160), G6GR, GI3GQB, GW3GWA
26	G2BRR, G3CFR (125), G3SM (211), G3YH, G4LX, G4MR (189)
25	G3JMA, G3JXN (220), G5SK, G6PJ
24	G3FD, G3FXG, G3FXR, G3JHM
23	G3CWW (260), G3HSD, G4JJ/A G5PY
22	G2DRA. G3AGR (135), G3ASG (150), G3BPM, G5AM, G8NM
21	G2AOL (110), G3DVQ, G3IOE, G3IWJ, G6XY
20	G3EYV
19	G3FEX (118), G3GCX, G5LQ (176)
18	G3DBP, G3JGY, GC2CNC
17	G3EGG
16	G3FRE
15	G2HDR, G3IWA
14	G2DHV, G3CYY

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

* New QTH

News and Gossip

With the improvement in the weather, the portables (and mobiles) are getting out and about again. G5YV/M has been heard, an old VHF hand not previously reported on mobile, and G3IRS/P is said to be testing a 150-watt portable transmitter on two metres. GW8UH/P has been giving Monmouthshire in the course of trying out his /P equipment.

An impressive list of fixed stations is now reported active in the Rotherham - Sheffield area: G2CG, G2HQ, G3EHK, G3ELG, G3GCV, G3KUH and G3LLE. From the same neighbourhood, G3DLU recommends that all who want a really nice piece of VHF "surplus" at the right sort of price should look out for a thing called (Admiralty) Unit Type 7AM; this is a CC 95 mc transmitter, full of good parts, which looks a possibility for conversion to 144 mc. Up his way, the as-new price is only 21s. each, with all valves. G3DLU will shortly be trying a modification on one of these units, and will report the results in due course.

G3DA (Liverpool) will be remembered as an active VHF operator, with several expedition successes in the GDX field; he has recently been appointed Station Telecommunications Officer at Manchester Airport, which now ranks as an international air terminal and is to be equipped with the most modern VHF communications system and radar apparatus. We congratulate G3DA, who did so well as G3DA/P on several occasions, on this important appointment.

There is now a keen group of ZC4's active on two metres—ZC4CH, ZC4DT and ZC4WR. The latter runs an auto-sender and beams round 4X4, I1 and VQ2/4 almost daily, starting at 1630

GMT. Then at 1700 GMT, on 144.064 mc, he heads on the U.K., and calls CQ at intervals for about 20 minutes.

The ZC4's are planning to operate from near the top of Mt. Olympus (6,400 ft.) during the summer, when a determined attempt will be made to hear, if not raise, some real DX. They can work one another all right, and get very good results over most difficult *terrain*, but at the moment of writing nothing had been heard or worked outside Cyprus.

Some 50/70 mc Items

Down in Kenya, our old friend ex-G3GBO, now VQ4EV, reports that there are VQ4's active on 6 metres around Nairobi—including, of course, himself on 50.25 mc—and that they have 70·2-70·4 mc as well, though at his time of writing nobody had started on four metres. VQ4EV has been hearing plenty of Band I TV sound, including the BBC's 41·5 mc Crystal Palance channel, so hopes it may be possible to make it with U.K. stations on our 52.5 mc band. In fact, the north-south path should be open quite often—remember the ZS1's about this time eleven years ago?

VQ4EV himself is very hopeful of results, because he is moving to a new and much better QTH outside Nairobi, with a particularly good take-off to the north-west, and plans to go in for 50 mc operation in a big way. He is running 90w. to a QQVO6-40, phone and CW, and is also on Ten (28,300 kc) mid-mornings BST on Saturdays and Sundays, looking for U.K. stations to arrange 50 mc tests. So you now have all the information to give him some co-operation, starting the week-end this appears.

Talking of 70 mc again, it is interesting to see from *Radio REF* that F3GX has worked no less than 31 French stations on that band—which proves that the F's

Some of the photographs taken at the Scottish VHF Convention, held at Paisley on March 15. The total attendance was 36, including eight G's. Some well-known personalities can be identified, and below we see GM3DIQ presenting one of his several prizes to GM3FYB. On Clarke's immediate right is old-timer GM6ZV.

TWO-METRE ACTIVITY REPORT

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

G2HDR, Bristol, 9.

WORKED: G2FQP, 3FKO, 3FKO/P, 3HXN, 3IER, 3IRS, 3KHA, 3KPT, 5BM, 5DW GW3MFY, 8UH/P.
HEARD: G2JM, 3BA, 3HAZ, 3IRS/P, 5YV, 6NB, 8VZ, GW8SU. (*March* 15 *to April* 21).

G3KUH, Rotherham, Yorks.

WORKED: G2HQ, 2LG, 3APY/M, 3BA, 3CCH, 3DVK, 3EHK/M, 3ELG, 3GFD, 3GJV, 3GSO, 3HA, 3HBW, 3HWC, 3IWJ, 3JWQ, 3JWQ/M, 3JZG, 3JZN, 3JZN/P, 3KQF, 3LLE, 5KG, 5YV, 5YV/M, 6BX, 6NB, 6XM.
HEARD: G3GHI, 3HAZ, 3IRS/P, 8VZ, GI3GXP. (*March* 23 *to April* 22).

G8VZ, Princes Risborough, Bucks.

WORKED: G3ENY, 3FKO/M, 3GSO, 3IOO, 3JWQ, 3JWQ/P, 3KHA, 3LHA/M, 6XM, GW5, MA/P (Brecknock).
HEARD: G2FNW, 2NY, 3FAN, 3FIH, 3IKV, 3IRS, 3JZG, 5YV. (*March* 17 *to April* 16).

GW5MA/P, 4 miles N.W. of Brynmawr, Brecknock.

WORKED: G2HDY, 2UJ, 3EYV, 3FCQ, 3FP, 3GNR, 3HXN, 3IER, 3IRA, 3JR, 3KHA, 3MA, 6NB, 6NF, 8VZ.
HEARD: G3ANB, 3EGG, GB3IGY. (*April* 5 *to* 6 *only*).

SWL Tomlin, Malvern, Worcs.

HEARD: G2ATK, 2DCI, 2FNW, 2NV, 3BA, 3CKQ, 3EJO, 3ENY, 3FGT, 3FTN, 3FUW, 3GKZ, 3GSO, 3GTN, 3GZM, 3HAZ, 3HXN, 3IER, 3IOO, 3JGY, 3JMA, 3JZG, 3JZN, 3KEQ, 3KFD, 3KMT, 3KPT, 3LAY, 3LDW, 3LGI, 3LGJ 3LHA 3LTF, 3MGR, 3NL, 4DC, 5MA, 5ML, 5YV, 6NB, 6SN, 8VZ. (*March* 1 *to* 31, *week-ends*).

G3KQF, Derby.

WORKED: G2AHL/M, 2CDB, 2CRL, 2FNW, 2NY, 2XV, 3APY/M, 3BA, 3DJJ, 3DKF, 3EKX, 3FAN, 3FUJ/P, 3GFD, 3GSO, 3GUX, 3HBW, 3IKV, 3ILX, 3JZN, 3KAG, 3KUH, 3LCV, 3LHW, 3LOK.
HEARD: G2BVW, 2DCI, 2FMO, 3CRH, 3EJO, 3FZL, 3HA, 3HXN, 3HZK, 3IRS, 3JGY, 3JWQ, 3JXN, 3KEQ, 3KPT, 3LHA/M, 4MK, 5KG, 5MA, 5YV, 6NB, 6XM, 6YU, GB3IGY. (*March* 20 *to April* 21).

SWL Winters, Melton Mowbray, Leics.

PHONE: G2AHL/M, 2FMO, 2FNW 3APY/M, 3BA, 3CKQ, 3EEO, 3EHK/M, 3FUW, 3GFD, 3GHI, 3GSO, 3JWQ, 3JXN, 3KUH, 3LHA, 4MK, 5CP/A, 5KG, 5YV, 6NB, 6XM, 8CZ, 8VZ, GB2RS.
CW: G2FMO, 3GSO, 3JWQ, 3NAT, 6XM, GB3IGY. (*March* 16 *to April* 21).

are using it a good deal more actively than we are. F8OH has worked 15, some of them different from F3GX's lot; and these are recent lists. F3GX (Bry-sur-Marne) is on 72·15 mc, and F8OH, on 72·38 mc, is at Rethel, in the Ardennes. Another active F on 4 metres is F3NE (Metz), 72·45 mc.

Going much further east, we have a note from OHØNC (Mariehamn) that the OH's are being released on 50-54 mc until the end of this year, and OHØNC himself will be operating around 50·1 mc very shortly.

It really is high time we had more U.K. activity on the 50/70 mc bands. The equipment is easy for both, and through this feature it can be widely publicised. There are eight EU countries now licensed in the range 70·2-72·8 mc.

Some Station Reports

G2HDR (Bristol) has done enough to get a foot on both Counties ladders, but remarks that "the month brought nothing startling into the receiver." G3MLS (Harrow) is a new station, on 144.95 mc, running 8 mc CO Z77, 24 mc Z77, 72 mc N78, 144 mc 5763, into a PA consisting of a pair of TT11's running 25-30w. His converter is a Cascode with a tunable Kallitron oscillator, giving 14·5 mc IF into an R.1475; the beam is an 8-ele bi-directional stack, and he is on most evenings from 7.30 p.m.

G3KQF (Derby) says he has been "guilty of a lot of listening," but having got things ship-shape, is now ready for more regular on-the-air activity. The QSL situation is improving, too. G3KUH (Rotherham) says the same thing about his VHFCC prospects. G3DLU (Sheffield) is still off the air but ready to resume as soon as a new shack can be organised; his version of the improved G2IQ Rx is working well. G2CIW (Cambridge) reports for the tables, and mentions G3IRS/P, G3KHA, G5BM and GW8UH/P as more distant stations to the west raised during the April 20 week-end. The schedules being worked from G8VZ (Princes Risboro') now include G3ENY and G3KHA as well as G3JWQ; all are being kept very successfully, and Jack is to be congratulated on his enterprise.

Those on 70 centimetres will be interested to hear that a new one on that band is G3HKD (Norwich), who is on 434·7 mc, CW only; his corner reflector looks south and south-east every Monday evening from 8.00 p.m.

London VHF/UHF Convention

We are asked to announce that in the programme for this event—to take place on Saturday, May 17, all day—are what should be three very interesting talks, by well-known authorities: Dr. Kayser will discuss "Auroral Propagation at VHF"; Dr. Saxton, "Problems of UHF Broadcasting"; and Mr. C. de Leeuw, one of the PE1PL team, will talk about "VHF/UHF RF Amplifiers." The proceedings will terminate, as usual, with a dinner, at which Dr. Smith-Rose, of the Radio Research Board, will be present.

The cost of all this is but 22s. 6d. (or 3s. 6d. for the meeting only), and immediate application for tickets should be made to: F. G. Lambeth, G2AIW, 21 Bridge Way, Whitton, Twickenham, Middx. The place is the Prince of Wales Hotel, De Vere Gardens, W.8, within an easy walk of the High Street - Kensington Tube; De Vere Gardens is a turn off Kensington Road.

Radio Astronomy

We have news of a very interesting sidelight on the VHF scene: G3HMO (Stowe School) has a radio telescope in operation. It consists of a 32-element array (designed by J-Beams, Ltd.) for 200 mc, with a converter tuning 200-210 mc, into a Pye 45 mc IF strip. On the sun, very good indications are being obtained on a Cossor Valve Voltmeter, with well-defined directional effects in both azimuth and elevation. Other noise-sources in the heavens have also been traced.

In Conclusion

The tabular matter herewith is up-to-date, but there must still be many claims outstanding. And with what looks like the opening of the VHF season, we hope to see many more calls h/w lists; our regular SWL correspondents are particularly to be thanked for the way they are supporting the Activity Report.

So now it only remains for your A.J.D. to give you **May 21** as the June dead-line, and the address for all VHF reports as: A. J. Devon, "VHF Bands," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1 Watch for EU openings, and Go Carefully if you are out over Whitsun.

Some Useful Adaptations

BREAST MICROPHONE FITTING—77A AERIAL RELAY MODIFICATION—DC SUPPLY UNIT

N. P. SPOONER (G2NS)

IN the interests of road safety, many mobile enthusiasts would undoubtedly find a third hand invaluable. A simple solution is to purchase one of the breast-microphones advertised in *Short Wave Magazine*, and adapt it to serve a dual purpose. The original carbon insert provides that extra "kick" sought by mobileers to reduce the number of AF stages, and thereby weight and current drain, while a very simple adaptation will result in an alternative speech output of much better quality.

These breast units, now being sold at a very low price, somewhat resemble those still to be seen at manual telephone switchboards where an operator requires both hands perfectly free for testing and entering circuits and for making out tickets concerning the calls connected during a spell of duty. Fixed-station radio operators will quickly discover that the "two-handed freedom" bestowed by a supporting plate at once overcomes the awkwardness that arises while attempting to hold a microphone in a talking position, and, at the same time, make slight tuning adjustments or write in the log.

Fitting the Microphone

Also advertised in these pages is a crystal microphone insert with an exceptionally high output; this can be completely shielded merely by enclosing it in the front portion of a bicycle lamp, from which the battery compartment has been severed. When plugged with a rubber grommet, the hole occupied by the bulb makes an exit for the shielded cable for the insert; when filled with some soft material, the hollow occupied by the polished reflector provides a bed for the insert if its tags are kept from touching surrounding metal; by using it as a template, the glass front (of the lamp) will assist in the cutting of a similar disc of perforated zinc or other metal mesh, to form the *grille*. This completes the shielding when it is wedged into the screw-on front cap instead of the original glass.

Before soldering a coax plug to the far end, the shielded cable is threaded through the grommet, the inner conductor and outer braiding are quickly and lightly soldered to the tags of the crystal insert, and the braiding is also connected to the surrounding metal of the lamp-front, in the sides of which two small holes are then drilled. These take two bolts and hold two thin stand-off metal straps, the bottom ends of which are in turn bolted to the curved mouthpiece of the breast unit, in the sides of which and near to the open end two more holes have been drilled.

After attaching the lamp-front to the carbon mouthpiece, as shown in Fig. 1, the crystal insert is bedded and the assembly is completed by screwing on the front cap with its metal mesh. It will now be found that the cup-and-ball swivelling device of the carbon unit not only permits close-up talking *across* the crystal insert, when desired, but that the entire mouthpiece and both microphones can be angled well out of the way while still being worn but not in use. Freedom of movement about the station, while actually speaking, is limited only by the length chosen for the

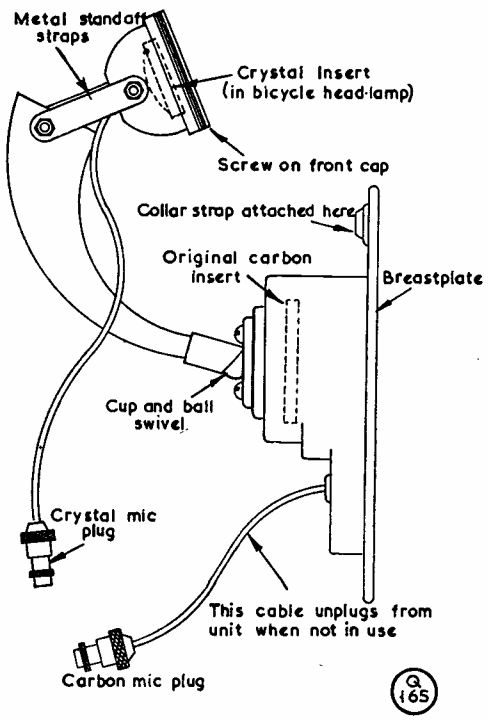


Fig. 1. Adapting a breast-microphone assembly — of the type frequently advertised as "surplus"— to make a mounting for a crystal microphone insert. This arrangement, which retains the original carbon microphone for use if required, makes a convenient and flexible microphone set for general use, either for mobile operation or about the station.

shielded microphone cables.

Aerial Relay

The once copious supply of ex-Air Ministry coax relays known as "Switch Type 78A" has now practically dried up, but a recent release of a similar Type 77A has by now probably revived interest in these items. The 77A has, however, unfamiliar and awkward input and output sockets, calling for special plugs and cables, and this in itself may seem to make them unusable.

However, a very simple adaptation will overcome this drawback, as follows: Where Pye-type coax plugs and sockets are in use throughout the station, a slot just wide and deep enough to accept a socket of this type is cut in each of the three large threaded circular sockets seen standing out from the sides of the 77A relay casing. After inserting the Pye sockets and tightening up, the Pye tags are soldered to the appropriate pins, as shown in Fig. 2. By staggering *six* such Pye sockets, together in pairs, two separate aerials may be simultaneously swung between two different receivers and transmitters (as was originally intended with this particular relay).

Alternative treatment is shown in the sketch Fig. 2, where Belling-Lee plugs and sockets are used; only one to each original relay socket is needed if only one aerial is to be changed over.

DC Supply

It would appear from the large number of queries heard over the air that the conjuring-up of a separate 24 (or more) volts of DC often deters amateurs from adopting full relay control of their equipment. While only a transformer and a metal rectifier are needed, the difficulty lies in knowing just where to obtain these two items, even if their full retail price is acceptable. It may therefore interest readers to learn that a Brinklow, Rugby, firm named Douglas Electronic Industries, Ltd., offer a rugged transformer with AC inputs of 200, 230 and 250 volts; two specified output taps, chosen from a total of five, give 3, 4, 5, 6, 8, 9, 10, 12, 15, 18, 20, 24 and 30 volts at 2½ amperes. A firm named Electrix markets a full wave, bridge-connected selenium rectifier giving a DC output of 24 volts at 2½ amperes. Both these items were obtained by the writer through a local radio retail shop and have given excellent service for a number of years. While "surplus" metal rectifiers present little difficulty, an LT transformer giving the useful variety of outputs mentioned would probably be hard to find.

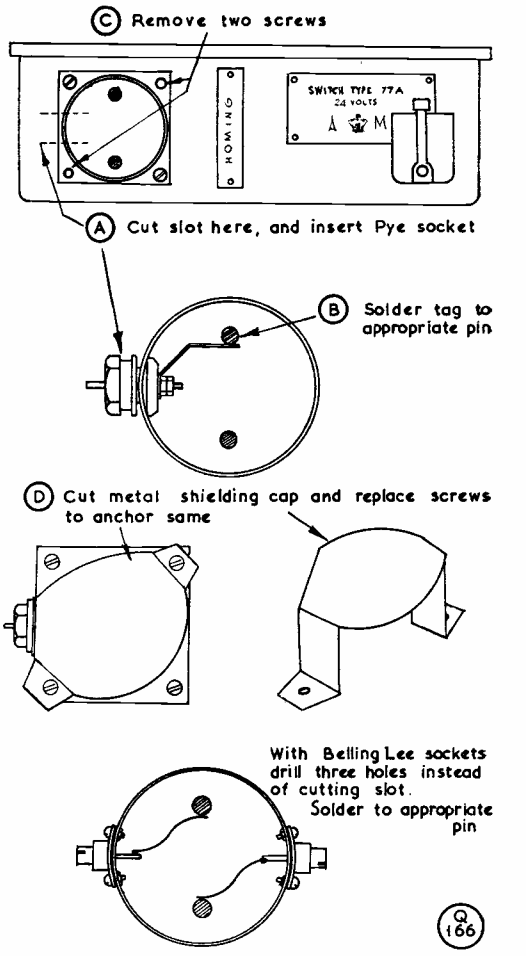


Fig. 2. The switch Type 77A is a useful item for aerial control and change-over in the amateur station. Designed for 24v. operation, it can be adapted as shown here and explained in the text.

When using the 24-volt output for a Type 77A or 78A relay, this can be dropped by a suitable series resistor for G.P.O. Type 3000 or 600 relays in use at the same time.

VISITING AMATEURS ABROAD

The coming season will, no doubt, see many readers going abroad on holiday, with or without their own transport, possibly with the idea of making some "personal QSO's." In the old days, you could walk round the town you happened to be in, find what looked like an amateur aerial system, beat on the door — and be welcomed with open arms. Nowadays, however, it is advisable (and only fair) to let your prospective contact know you are coming, and arrange with him some convenient time, or place, for meeting. To make a call "off the cuff" can often be a great disappointment, to both sides.

GIVE THAT ACC. A CHANCE!

BATTERY MAINTENANCE FOR PORTABLE/MOBILE WORKING

A. D. Taylor (G8PG)

WITH the approach of the summer, portable and mobile work will once again be coming to the fore. In this sort of work it is essential for the operator to carry his own source of power with him, and one of the most commonly used is the accumulator. Twenty or 30 years ago any amateur had, by the nature of his equipment, to have some knowledge of accumulator charging and maintenance. Today the position is vastly different and many of those embarking upon portable and mobile work are having their very first experience of the problems involved. While the maintenance of accumulators is not difficult, it is essential that it be properly carried out, otherwise the battery can be quickly ruined, causing a great deal of unnecessary expense—and disappointment. In this article the basic rules of battery maintenance are discussed in detail, and some additional hints on dealing with neglected batteries are given.

Definitions

An accumulator is a secondary cell which delivers approximately 2 volts during the major portion of its discharge time. It can be recharged by passing a correctly polarised current through it for a certain period. When higher voltages are required, a number of such cells are connected in series to form a battery. In this case the cells are normally built into the same container and permanently connected together during manufacture. Maintenance should always be on the individual cell basis, as one bad or neglected cell can seriously impair the performance of the whole battery. An accumulator can be maintained in good condition with the aid of the following equipment: A battery charger, a hydrometer, a supply of distilled water, a tin of Vaseline and an old knife. The station voltmeter is also of use, but is not essential.

The charger is a simple transformer-rectifier arrangement used to deliver the charging current, and a suitable circuit is shown in Fig. 1. The metal rectifier can be of either half-wave or bridge type, the latter being more efficient. The ammeter can be made by suitably shunting any available spare milliameter, or by using one of the ex-Service high range thermo-couple meters which are generally obtainable. The resistance should be a good, solid high current job, and once again the "surplus" market is a cheap source of supply.

The hydrometer is used to measure the specific gravity of the electrolite in the cells. It consists of a glass syringe containing a float, inside which is pasted a calibrated scale. The syringe is used to suck up some electrolite from the cell and the point at which the mark inside the float is level with this scaling is read off and indicates the specific gravity of the electrolite. This instrument is essential for proper accumulator maintenance and can be purchased for a few shillings. The knife and vaseline are used for cleaning and protecting the battery terminals respectively.

The voltmeter is useful as an adjunct to the hydrometer, but, as stated, is by no means essential. The reason for this will be obvious if the graphs in Fig. 2 are studied. While the output voltage from the cell only changes over very small limits during the full period of discharge, the specific gravity changes steadily, thus providing a much more reliable picture of the condition of the cell.

Practical Maintenance

(1) *Never charge or discharge an accumulator at a rate greater than that specified by the makers.*

Any accumulator has a certain maximum output current capability. If this is exceeded for any length of time permanent damage is most likely. The only commonplace exception to this rule is when a car starter-motor or a dynamotor, or similar machine with no starter resistance, is used. The current drain for the first second or so of running the machine is many times above normal in these cases, but it rapidly drops to normal as the machine gathers speed. For this reason it is less damaging to a car battery to let it turn the engine over several times when attempting to start rather than making a number of jabs at the starter button and hoping that the engine will fire on the first couple of revolutions. As far as dynamotors are concerned, too much stopping and starting should also be avoided if possible, unless a suitable starting resistance can be switched in to limit the starting current surge. Overcharging can be equally dangerous. It produces heat, damage to the surface of the plates and, in bad cases, actual buckling of the plates. In the latter case the performance will be seriously impaired. The golden rule is never to

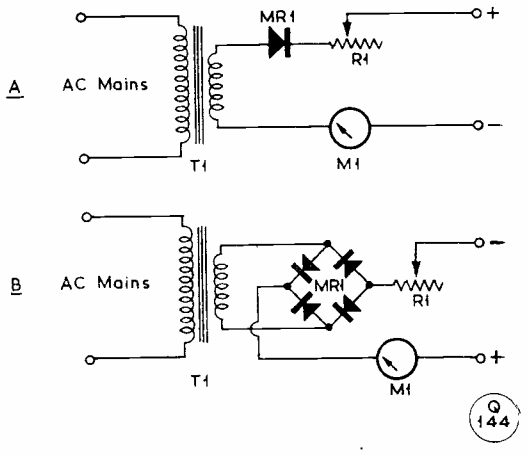


Fig. 1. Alternative circuits for charging 2 to 12 volt accumulators at up to 5 amps. T1 should have a 15v. 5 amp secondary. MR1 is a 5 amp metal rectifier (charging type), R1 is 8 ohms rated 30 watts, and M1 can be an 0-5 amp moving-iron meter for adjusting the charge rate.

exceed the maximum charging current specified by the makers.

(2) *Never let an accumulator stand in a discharged state for any length of time.*

The chemical action taking place during the discharge of an accumulator is such that the specific gravity gradually falls and at the same time lead sulphate is formed on the surface of the plates. This causes the terminal voltage of the cell to fall, due to an increase in internal resistance. At the end of the discharge the lead sulphate is still soft and the cell can be restored to its original chemical condition and terminal voltage by passing a correctly polarised charging current through it. If the cell is left standing about for a period, however, the sulphate has time to harden and it may be impossible to remove it all by charging. When this happens, the internal resistance of the cell is increased and its discharge capacity is permanently reduced. The cell should thus always be recharged as soon as possible.

(3) *Always charge with the correct polarity.*

The cell must be connected in opposition to the charging voltage, *i.e.*, charger + to battery + and charger − to battery −. If this is not done, the battery voltage appears *in series* with the charger voltage and the battery will do its best to discharge rapidly through the charger circuit. Serious damage can be done in this way.

(4) *Never let the on-load voltage drop below 1·8 volts per cell, or the specific gravity drop below 1·175.*

This rule should be regarded as hard-and-fast and the cell should be taken out of service whenever either the voltage or SG drops to the figure stated.

(5) *Always keep the level of the electrolite at least ¼-inch above the top of the plates.*

This is important for two reasons. First, current between the plates flows through the electrolite; therefore, for maximum capacity, the whole surface of the plates must be immersed. Secondly, any exposed area of plate tends to deteriorate, due to the action of the atmosphere. If electrolite is lost, due to evaporation, it should be replaced by pure distilled water. Should any electrolite be spilt, it should be replaced by sulphuric acid diluted to a specific gravity equal to that of the battery when fully charged. The acid can be diluted by pouring it, a few drops at a time, into a container of distilled water. *Never pour water into acid*—a violent reaction will result. Top the battery up before charge, not after.

(6) Except in a vehicle which charges on the move, *always remove the vent plugs from the battery before charging* and replace them when the charge is completed.

A considerable amount of hydrogen is given off during charge and should be allowed to escape.

(7) A fully-charged cell should give a *voltage of 2·2 volts* and a specific gravity reading of *between 1·220 and 1·275,* depending upon the make.

The voltage reading specified is that to be expected on load immediately after the conclusion of charge. It will drop rapidly to 2 volts. The exact SG reading for a given cell is specified by the makers.

(8) *Keep the top of the cell free from dirt and acid splash; keep the terminals clean and thinly coated with Vaseline.*

Acid and dirt provide a leakage path between the terminals and, if allowed to persist, can partially discharge the battery. Keeping the terminals greased prevents them becoming corroded. This precaution is particularly important as far as the positive terminal is concerned.

(9) *Never bring naked lights near to a battery on charge and see that the terminal connections are tight to prevent accidental sparking.*

As pointed out already in rule (6), hydrogen is given off during charge, and this combines with the atmospheric oxygen to produce a highly-explosive mixture which can easily be set off.

(10) *Do not physically bump the battery about any more than can be helped.*

Heavy bumps can dislodge material from the surface of the plates. Besides impairing performance, this can cause a sediment to build up in the bottom of the battery container, which may eventually touch two or more of the plates, causing an internal short-circuit.

Finally, though not a maintenance rule, remember that the electrolite is highly corrosive and must be kept away from one's clothes—and eyes. Hands should invariably be washed in plenty of soapy water after working on a battery.

More Advanced Maintenance

Where a battery has been left standing in a discharged condition and has become sulphated, the best treatment is to give it a long, slow charge at about a third of the normal maximum rate. This will get rid of most of the sulphate, though some deterioration in performance is virtually certain.

Where a cell is to be stored for up to about three months, it should be fully charged, then cleaned and stored in a cool, dry place. If time allows, it should be discharged through a dummy load then recharged

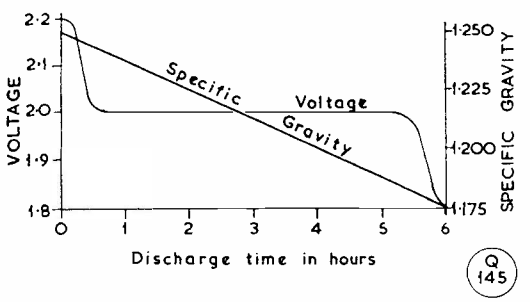


Fig. 2. Typical curves showing how voltage and specific gravity of an accumulator vary during discharge. The article discusses correct charging procedures and general maintenance.

before being put back into service at the end of the period. Where a cell is to be kept in storage for longer periods, the best method is to store it fully charged then, every two to three months, discharge it through a dummy load and recharge. Properly maintained accumulators thrive best on regular work and this can be simulated by the artificial discharge method suggested.

Should the sediment in the bottom of a battery rise to a dangerous level, it must be removed. This is done by cutting around the pitch seal on the top of the battery with a hot knife blade, then very carefully lifting out the plates and placing them in a container of pure distilled water. Non-metallic supports must be arranged so that the plates do not touch the container itself. With the plates removed, the old electrolite and the sediment can be poured out of the battery container, which can then be thoroughly washed out. The plates are then carefully replaced and sealed back in position with pitch and the battery immediately refilled with sulphuric acid of the correct specific gravity. The battery can then be recharged.

Conclusion

While accumulators involve a certain amount of initial expense, they are a thoroughly reliable and long-lasting source of power *if properly maintained* as outlined above. It is hoped that this article will prove of value to the user and help him to get years of useful service from his batteries. If they are neglected, they will be a constant source of annoyance and expense.

BBC'S TV ON TAPE

The engineering research department of the BBC has succeeded in producing a practical method of recording television on tape; the great advantage of this over film is that immediate play-back is possible. The equipment is named Vision Electronic Recording Apparatus—and so, inevitably, is called VERA. She is a technical achievement of great magnitude and importance, and though the pictures shown on her first public appearance were not too good, it is certain that in due time they will be cleaned-up sufficiently to make their full impact on the BBC TV service. One can also envisage a considerable overseas market for this equipment, as it is said that the American apparatus is not nearly so effective as VERA.

MARINE RADIO INSTALLATION

The radio equipment fitted to the m.v. *North Devon,* recently launched at Sunderland, is an interesting example of a modern installation for a deep-sea cargo vessel. Supplied by Siemens Edison Swan, Ltd., the gear consists of a 100-watt transmitter for operation on six spot frequencies in the 405-525 kc band, built as a single unit, with provision for phone working; a separate 250-watt HF transmitter which can be band-switched for the 4, 6, 8, 12, 16 and 22 mc ship channels, and capable of world-wide communication; a two-section receiver covering 15-20 kc and 100-2600 kc in five bands for the MF range, and 2·6-30·0 mc, also in five bands, for the HF channels; and an emergency battery-operated automatic transmitter spotted on 500 kc (the international distress frequency) with an output power of about 75 watts. Additional equipment includes a 500 kc receiver giving permanent watch on speaker, and another receiver which operates off batteries alone; an auto-alarm is provided, which accepts emergency signals only and rings bells in various parts of the ship when a call comes in. D/F equipment, with a separate nine-valve receiver, is also fitted. Normally, the radio gear is operated off the ship's main power supply, but battery power is provided for emergency and stand-by. The m.v. *North Devon* is a 10,000-ton ship, built for Newcastle owners.

ELECTRICAL ENGINEERS' EXHIBITION

It is reported that the total attendance at this Exhibition, supported by more than 400 firms showing the latest British electrical equipment, exceeded 70,000, with a record number of overseas buyers from many countries.

G.P.O. EDUCATION SCHEMES

The G.P.O. announces that, in the interests of its technical staff, it will award up to ten University bursaries each year, by competitive selection; the duration of each award will be three years, successful applicants being given leave for that period, with a maintenance grant and all dues paid. It is also intended to award up to ten "sandwich course" places every year, selection being mainly by report, the course consisting of six months at college and six months' practical work, tenable for four years and working up to a degree qualification. These arrangements are in addition to those already operating for junior staff taking technical courses with official assistance.

GETTING THE MAGAZINE

There should be no difficulty in obtaining SHORT WAVE MAGAZINE, to order, through any newsagent or bookseller; he can obtain his supplies either from us or through his usual wholesaler. In the ordinary way, bookstall copies should be available by not later than the day after publication, which is the Friday after the first Wednesday of the month—that is, by the Saturday in the week of publication. Bookstall readers who experience difficulty or delay should complain to their newsagent, and not to us! If the order is received, it is despatched in time for publication day, or Saturday at the latest (in the U.K.). In any event, we can always supply the *Magazine* by post monthly, on publication day, the cost being 33s. for a year of twelve issues, starting next month. The price overseas is based on the same rate, or $4.75 U.S. currency. Orders, with remittance, should be sent to: Circulation Department, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1. For the U.K., we also accept half-yearly subscriptions, at 16s. 6d.

NEW QTH's

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

G2FRG, K. D. Ayers, 190 Ratby Road, Groby, Leics. *(Tel.: Anstey 2310).*

G3BJS, C. B. Seys, 144 Other Road, Redditch, Worcs.

GM3GHJ, C. W. Wallace, 121 Navitie Park, Ballingry, Lochgelly, Fife.

G3KKC, A. R. Rumbelow *(ex-VP8CE),* 30 Pott Hall Road, West Row, Nr. Bury St. Edmunds, Suffolk.

G3LXU/A, 1927158 SAC Wallis, G., "A" Watch (Met. W/T), A.T.C.U. Signals, R.A.F. Station, Hillingdon, Middlesex.

G3MAO, L. Pradier, 21 Churchill Road, Tufnell Park, London, N.W.5.

G3MBN, B. C. Gibbs, 4 Yew Terrace, Claverton Down, Bath, Somerset.

G3MDE, T. F. Burrows, 385 Whitmore Way West, Basildon, Essex.

G3MDO, D. N. T. Williams, Llandogo, Bridge, Nr. Canterbury, Kent. *(Tel: Bridge 245.)*

G3MEG, D. F. Brunton, 226 Dunkery Road, Mottingham, London, S.E.9.

G3MEH, R. E. Piper, 65 Sherwood Park Road, Sutton, Surrey.

G3MEK, N. Gaunt, 351 Grimshaw Lane, Middleton Junction, Manchester, Lancs.

G3MEO, J. Cronk, 93 Thurlow Street, Walworth, London, S.E.17.

G3MEQ, F. G. Pack, 94 Erdington Road, Blackpool, Lancs.

G3MEZ, D. J. Earnshaw, 74 Lower Clapton Road, London, E.5.

G3MFP, Club Station of Gospel Broadcasting System, Ltd., A. C. Mitchell Memorial Hall, Liverpool, 11. *Sec.:* H. Ralfs, 67 Meadow Lane, Liverpool, 12.

G3MHM, S. F. Wheeler, 47 Bordesley Green Road, Small Heath, Birmingham, 9.

G3MHO, H. Moulden, 247 Ratcliffe Road, Sileby, Loughborough, Leics.

G3MIJ, D. T. Campbell, 24 Ashbury Road, Shrivenham, Swindon, Wilts.

G3MJN, L. A. Harvey, 56 Devonshire Road, Laindon, Basildon, Essex.

GI3MKG, D. T. Grafham, c/o Sgts. Mess, R.A.F. Aldergrove, Crumlin, Co. Antrim, N.I.

G3MKK, G. V. Gadd, 42 Park Avenue, Oswestry, Shropshire.

G3MKO, A. J. Long, Hyde Farm, Wareham, Dorset. *(Tel.: Bere Regis 284).*

G3MKU, A. F. Bower, 17 Lower Street, Dartmouth, Devon.

G3MLA, J. C. Woodhouse, 22 Darbishire Road, Fleetwood, Lancs.

G3MLG, Dr. R. Francis Jones, M.B. (Cantab.), The Manor House, Tamworth Staffs.

G3MLS, D. Nappin, 20 Balmoral Road, South Harrow, Middlesex.

G3MMJ, R. Browne, The Vicarage Flat, Flamstead, St. Albans, Herts.

G3MMM, S. T. Marriott, The Cottage, The Street, Kennington (Ashford), Kent.

G3MMN, B. J. Newman, Meadowlead, Clap-Hill, Aldington, Nr. Ashford, Kent.

G3MMP, R. J. Arthy, 28 Rosecroft Walk, Pinner, Middlesex.

G3MMS, G. A. Whiting, 5 Spilsby Road, New Leake, Boston, Lincs.

G3MNF, G. H. Salter, 74 Moss Lane, Litherland, Liverpool, 21.

CHANGE OF ADDRESS

G2BPF, P. F. Ballard, Whitehaven, Sycamore Road, Farnborough, Hants.

G3BEX, J. Short, 98 Hundred Acres Lane, Amersham, Bucks. *(Tel.: Amersham 2085.)*

G3BLG, E. J. Chatfield, 54 Moorlands Road, Gt. Malvern, Worcs.

G3CYS, J. B. Walker, 3 Gifford Drive, Warmsworth, Doncaster, Yorkshire.

G3DA, A. B. Boswell, Station Telecommunications Officer, Manchester Airport, Wythenshawe, Manchester, 22.

GW3DIX, G. Moorfield, Bryn Hyfryd, Amlwch Port, Anglesey.

G3DQO, A. L. Cawley, 32 Torbay Road, Urmston, Nr. Manchester, Lancs.

G3EKE, L. A. F. Stockley, 123 Harbour Road, Wibsey, Bradford, Yorkshire.

G3FWA, J. Bennett, 47 Ibbett Close, Kempston, Bedford.

G3GNR, R. E. Short, 98 Hundred Acres Lane, Amersham, Bucks. *(Tel.: Amersham 2085.)*

G3HGX, F. L. Rogers, Birchetts Court, Stockland Green, Speldhurst, Kent. *(Tel.: Speldhurst 87.)*

G3HRU, G. T. Senior, 59 Buck Stone Grove, Alwoodley, Leeds, 17, Yorkshire.

G3HSV, D. E. Alesbury, 154 Victoria Road, Swindon, Wilts.

G3IBT, W. B. Pratt, 11 Ridge Street, Primrose Hill, Huddersfield, Yorkshire.

G3JGJ, J. R. Wordsworth, Lincombe View, Five Lanes, Paignton, S. Devon.

G3JGR, Dr. G. S. Rockwood, Shorelands Hospital, Shoreham-by-Sea, Sussex.

G3JPI, P. E. Hale, 74 Cedar Road, Romford, Essex.

G3JSV, D. A. S. Holmes, The Gables, Highfield Road, Southgreen, Billericay, Essex.

G3KAJ, D. K. Jagger, 69 Oxford Street, Daventry, Northants.

GI3KYP, A. D. Patterson, 284 Antrim Road, Belfast, N.I.

G3LPB/T, J. Brown, Marlborough Farm, Falmouth, Cornwall.

G3LST, P. F. L. Clarke *(ex-DL2AK),* 3d Meadows Estate, Brentwood Road, Ingrave, Essex.

THE OTHER MAN'S STATION

G4OV

THE station of G4OV is owned and operated by A. R. Osborne at Windcroft, Mount Joy, Bridport, Dorset, the full licence having been obtained in 1938; prior to that an AA ("artificial aerial") licence was held for some three years. But the experience of G4OV goes back much further than that—right back to the days of Writtle, 2MT, in fact, and G4OV himself is still with one of the leading manufacturers in the radio industry.

A Labgear LG.300 is now in use as transmitter, with a CR-100 receiver, which is the centre-piece in the photograph. To the right of this is the home-built modulator, running 807's in Class-AB2, the whole of the speech equipment being enclosed in the one cabinet. Separate bias and screen supplies are provided for the modulator, and there are two main power packs—one supplying the 813 PA in the LG.300 at 1,500v., and the other the anodes of the modulator valves; these packs are under the bench, and incorporate heavy-duty power transformers with mercury-vapour rectifiers.

Complete TVI-proofing has been achieved by very elaborate filter arrangements and a fully screened aerial tuning unit, and the whole station is relay-controlled. The radiating system at G4OV includes an "8KW" multi-band aerial, a three-element rotary beam for 28 mc. and a Cubical Quad for 21 mc, this latter also being usable on 10 metres. The station is well sited, being right on the coast 350 ft. a.s.l., so that phone contacts with DX areas like VK, ZL and ZS are regularly possible. Though CW is also worked, the main interest at G4OV is in phone operation and the audio side generally. It is worth mentioning, too, that before installing the equipment shown here, the gear was completely home-brewed, as one of his earlier QSL cards shows—so G4OV has been through the mill and knows his stuff on the constructional side. And it is also interesting that, as a side-line, he has played chess by Amateur Radio.

DEMISE OF SATELLITE II

The Russian S.II, the one with the dog in it, finally spun-in on April 14, in the Caribbean area; the Russians said that "pieces were scattered over the Atlantic, the West Indies and Brazil." It will be remembered that S.II had a very short radio life (barely a week), but since its launching on November 3, 1957, it had completed some 2,500 revolutions of the earth, equivalent to a distance of about 62 million miles. A very good visual on S.II was obtained from all over the U.K. on the evening of April 12; it was visible, as a bright star, for a full minute as it crossed the night sky from north-west to south-east. The Americans now report that their satellite S.V., known as "1958 Beta" in the I.G.Y. calendar, should remain in orbit for a *hundred years* or more; as its 108.3 mc transmitter is powered by solar batteries, it is also expected that "1958 Beta" will continue to radiate indefinitely.

INVITATION TO MOBILES

All operators who are actually equipped for mobile working are asked just to send in their QSL card, endorsed "Mobile" and with the registration number of their car; from this data, a Mobile Register will be prepared for publication, and a record maintained of the number of /M's active. This information will be very useful for statistical purposes, and will also enable operators to be identified on the road and at Mobile Rallies. QSL cards with the details requested should be addressed "Mobile," attention Editor, *Short Wave Magazine*, 55 Victoria Street, London, S.W.1.

THE MONTH WITH THE CLUBS

By *"Club Secretary"*

(Deadline for June Issue : MAY 16)

CLUB members who are just dipping their toes in the mobile pool will probably be interested to hear the results of the **Hastings** Club's recent mobile tour, which took them *via* Rutland and the Midlands into North Wales, thence down to Cardiff and home again. They carried a Top-Band mobile outfit and an all-band station, complete with power supply, for /A operation wherever the opportunity presented itself.

Results, briefly, were that in less than a week G6HH (under GW and with /A, /M, /P suffixes) worked 142 stations from the all-band rig, and 49 Top-Banders from the mobile, of which ten were other mobiles. Fifteen countries were worked, the best piece of DX being W6DOJ on Forty. Thirty counties were accounted for on One-Sixty, DX being OK1HI and an unidentified UA1 who called them. The Hastings operators put Rutland, Merioneth, Montgomery, Radnor and Brecon on the air late at nights on Top Band, and never lacked customers.

Co-operation from other Clubs was wonderful, and they send their warmest thanks to the various Groups and Clubs in Welwyn, Stamford, Leicester, Coventry, the amalgamated Midland Clubs at Sutton Park, and Cardiff. Many Clubs turned out in force to welcome them, and numerous individuals did all they could to make life easy, including the provision of shacks, meals and sleeping accommodation—truly a fine example of co-operation in the real amateur spirit.

This, it seems to us, is a forerunner of many such tours, and Clubs who can seize this opportunity of meeting up personally with others will do well to consider the scheme. Requirements—six or eight members on holiday at the same time, two or three cars and some effective gear. Details to us in advance will ensure the publicity and oil the wheels. Who is next on the list?

NAMES AND ADDRESSES OF CLUB SECRETARIES REPORTING IN THIS ISSUE:

ABERDEEN: W. K. Heggie, 6 Blenheim Lane, Aberdeen.
BARNET: E. W. Brett, G3LUY, 28 Edward House, Edward Road, New Barnet.
BASILDON: R. A. Mewse, 28 Collingwood Road, Basildon.
BRADFORD: D. M. Pratt, G3KEP, 27 Woodlands Grove, Cottingley, Bingley.
BRIGHTON: R. Purdy, 37 Bond Street, Brighton 1.
BURY: L. Robinson, 56 Avondale Avenue, Bury.
CAERNARVONSHIRE: J. Howard, 40 Rhuddlan Avenue, Llandudno.
CLIFTON: C. H. Bullivant, G3DIC, 25 St. Fillans Road, London, S.E.6.
CORNISH: J. Brown, G3LPB, Marlborough Farm, Falmouth.
CRYSTAL PALACE: G. M. C. Stone, G3FZL, 10 Liphook Crescent, London, S.E.23.
EDGWARE: E. W. Taylor, G3GRT, 99 Portland Crescent, Stanmore.
GRAVESEND: L. C. Bodycombe, 21 Grives Road, Northfleet.
LEICESTER: P. G. Goadby, G3MCP, 535 Welford Road, Leicester.
MITCHAM: D. Johnston, 23 Woodland Way, Mitcham.
NEWBURY: J. A. Gale, Wild Hedges, Crookham Common, near Newbury, Berks.
NORTH KENT: D. W. Wooderson, G3HKX, 39 Woolwich Road, Bexleyheath.
RINGWOOD: K. Cutler, 19 Pardys Hill, Hurn, Christchurch, Hants.
SLADE: C. N. Smart, 110 Woolmore Road, Birmingham 23.
SOUTHGATE: D. E. Bootman, 18 Worcester Crescent, London, N.W.7.
SOUTH SHIELDS: K. Sketheway, 51 Baret Road, Walkergate, Newcastle on Tyne 6.
SURREY (CROYDON): S. A. Morley, G3FWR, 22 Old Farleigh Road, Selsdon, South Croydon.
SUTTON COLDFIELD: A. C. Phillips, G3JFZ, 23 Plantsbrook Road, Walmley, Sutton Coldfield.
WANSTEAD & WOODFORD: K. Smith, G3JIX, 82 Granville Road, London, E.17.
WIRRAL: H. V. Young, G3LCI, 9 Eastcroft Road, Wallasey.
WORTHING: J. R. Toothill, 113 Kings Road, Lancing, Sussex.

Barnet inaugurated themselves on March 25, with 19 members, 16 of whom are licensed. G3AAE is chairman, and G3LUY secretary, from whom the future programme may be obtained. It will include talks on Aerials, Tape Recording, Hi-Fi, Modulators and many other subjects. The second meeting was on April 29, with a talk on Transistors by G3DGN; next is on May 27, and will be held at the HQ No. 1374 Sqdn. Air Training Corps, Gloucester Road, New Barnet.

Basildon, after "lying dormant" for some time, has awakened and now meets every Friday at Nevendon Rectory, Basildon, for a "general evening." On Wednesdays there are lectures, at the moment mostly for beginners. A duplicated news-sheet is published, and DX contests are held every other month.

Bradford are meeting only once in May (on the 13th) to discuss Field Day arrangements. On June 3 they have a lecture by Mr. H. D. Kithin, on Colour Television.

Brighton will be together on May 13 for a talk by Mr. H. R. Henly; on the 20th Mr. J. P. Clement takes as his subject The C.R.O.; and on the 27th final arrangements for Field Day will be discussed. Morse and "Fundamentals" classes are held at various times to fit in with the main programme.

Bury meet at the George Hotel, Kay Gardens, on May 13 for a Technical Forum on Aerials; at the following meeting (June 10) there is to be a Junk Sale.

Cornish held their AGM on April 2 and elected new officers for the season. G3GGX gave a talk on his new SSB rig at the same meeting. Future topics will include Aerials, Licence Conditions and Regulations, and an Introduction to SSB. All meetings are held at the YMCA, Falmouth, on the first Wednesday.

After G6HH/A at the Hastings Carnival Week Hobbies Exhibition worked DLØRR at a similar exhibition at Recklinghausen in W. Germany, the operator on DLØRR sent the Hastings & District Amateur Radio Club a trophy to mark the occasion. This consists of a miniature miner's lamp, representing the major industry of the Ruhr district, suspended from a plaque bearing emblems of the miner's tools. The gift has been named the Horst Jens Trophy, after DJ3OD who sent it, and will be added to the Club challenge trophies, competed for annually. Left to right in this photograph, by courtesy of the "Hastings & St. Leonards Observer," are: G3LMG, G3IKE, G3KNI, SWL Bennett, G3BDQ, G3HRI, SWL Thompson (hon. secretary, H.D.A.R.C.). G3KMP, and SWL Page.

Edgware continue their Wednesday gatherings (8 p.m.) at the Community Centre, Stanmore, with a Junk Sale on the last Wednesday of each month. Recent lectures have covered The El-Bug, Measuring Instruments, and Two-Metre subjects.

Gravesend recently heard their chairman, G3DCV, on the subjects of Oscillators and Standing Waves. G3FST is preparing a number of members for the next R.A.E., and new recruits are joining. Club night is Thursday, 7.30 p.m. at 4 Cobham Street, Gravesend.

SOUTHGATE CLUB'S SUNDAY-MORNING MOBILE MEETINGS

On May 11 Southgate will be holding their next informal "get-together" for mobiles at Colney Heath, from 10 a.m. onwards. Talking-in stations will be operated on Top Band. All are welcomed, particularly those with mobile or portable gear.

The QTH is reached by forking left on to A6 just north of Barnet, proceeding on this road for 5½ miles and turning right on to B556 at "The Bell." Carry on along B556 for about two miles and turn sharp left just before the small bridge.

Full particulars from D. E. Bootman, 18 Worcester Crescent, Mill Hill, London N.W.7 (*Tel.: MIL* 5156).

Mitcham held their AGM and elected a new secretary and committee. They meet on alternate Fridays (next dates May 9 and 23) at The Cannons, almost opposite the Police Station.

North Kent forward their *News Sheet*, from which we learn that they held a Special Meeting of some importance on March 27; on April 10 G3ISX talked on Aerials for the Beginner; and April 24 was booked for a Film Show.

Ringwood is a newly-formed Club, which intends to meet every Wednesday, with a general get-together every last Friday of the month, at 23 Merryweather Estate, Ringwood. Roughly a dozen members have been recruited up to date, and a permanent clubroom-*cum*-shack is being sought.

Slade will be hearing a talk on Transmission Lines and Aerial Coupling systems (G3HHD) on May 9; on May 23 the subject will be Portable Receivers, and on June 6 IGY Research.

Worthing still meet regularly on the second Monday, 8 p.m., at the Adult Education Centre, Union Place. Their now-famous annual "Bucket and Spade Party" is arranged for Sunday, June 22, and will follow the usual informal pattern, but with additional attractions.

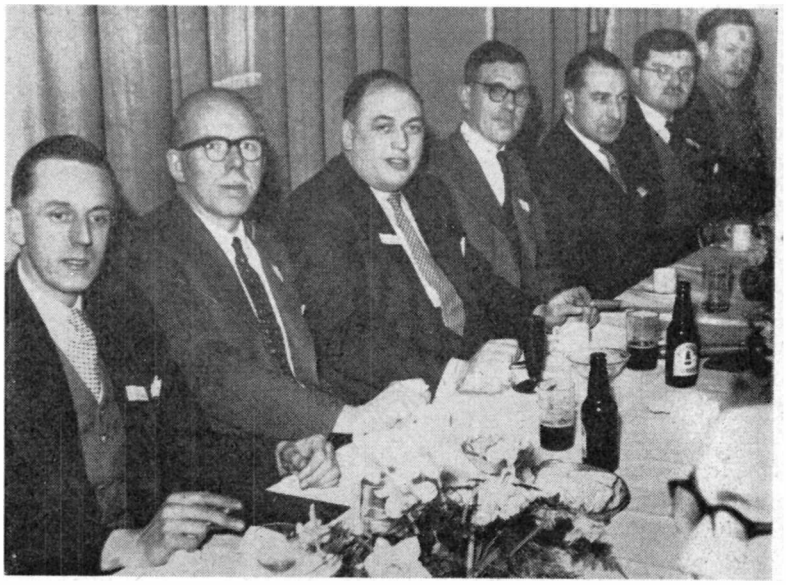
Clifton hold their first D-F Contest of the season on May 18, starting from the Larches Café, Green Street Green, Farnborough. May 14 and 30 are Constructional Nights and Ragchews; May 9 a Junk

Sale ; and on May 23 there will be a talk on Measuring Instruments. All meetings at 7.30 p.m., 225 New Cross Road, London, S.E.14.

Crystal Palace will be hearing G3BCM on International Amateur Radio on May 10 ; at the meeting on June 3 there will be another talk in the series supplementary to the R.A.E.

South Shields heard about FM Tuners from G3LKZ at their April meeting. On May 28 they will hold the final discussion on Field Day matters. Theoretical classes are now running on Friday evenings, and G3JDO will be making Slow-Morse transmissions at 11.30 GMT every Sunday.

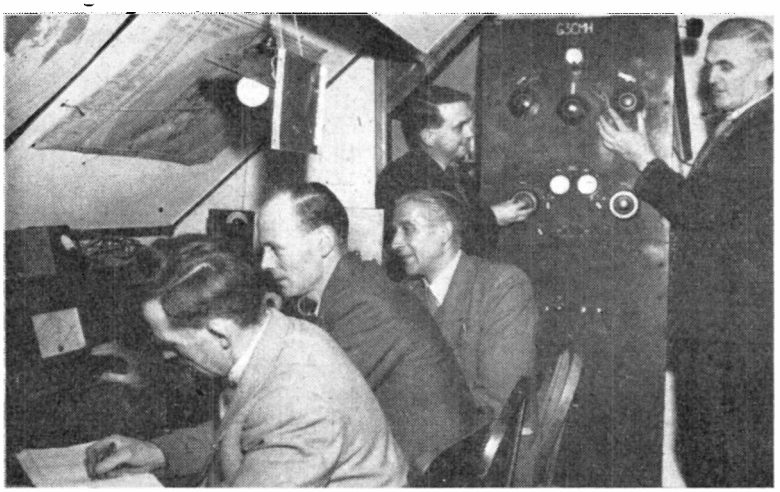
Wanstead and Woodford report steady progress and they will be opening their new shack shortly. They have been very busy organising the equipment for the Gilwell Park "Jamboree-on-the-Air," and hope to have many contacts from there on One-Sixty and Eighty. Anyone interested should drop a line to the secretary *(see* panel).



During the last year or two, Liverpool & District Amateur Radio Society have had a lot of trouble with local pirates. They are much happier now that strong official action has been taken. This is the top table at their recent Hamfest, showing, left to right: G3EWZ, hon. secretary; G3ELL, vice-president ; G3LIU, chairman ; G5KS, president ; G2AMV, G3BHT and G3HII. More than 80 members and friends were present for the occasion, with representatives from the Wirral and West Lancs. Societies.

Southgate will be holding their next Sunday Mobile Meeting at Colney Heath on May 11, and they extend a welcome to all who may wish to join them there. Full particulars of the QTH appear in the panel herewith. The first of these events, on April 13, turned out a great success—*see* separate report.

Aberdeen have made a number of changes, and their secretary/treasurer has had to resign after serving the Club for six years. See panel for name and address of his successor. On May 16 they are holding a talk on Field Day and a Film Show ; on the 23rd a discussion of the Club project to build a number of two-metre converters and thus to increase VHF activity in the north-east of Scotland—a *very* praise-worthy move, this ; on the 30th a Junk Sale ; and on June 6 a final discussion on Field Day arrangements.



One of the more active and old-established West Country groups is the Yeovil Amateur Radio Club, operating G3CMH. As far back as we can remember, the honorary secretary has been SWL D. L. McLean, seen standing on the left of the transmitter rack, which is Club built, runs 150 watts, and is designed for CW/Phone operation on all bands 3.5 to 28 mc. The operating console was also fabricated by members, of whom in this photograph we can see : G3BEC, logging it all down ; G3CFV tuning it in on the Eddystone 640 receiver ; SWL Parkhurst, who is honorary treasurer and, standing on the right of the transmitter, SWL Ricketts, chairman of Yeovil. Y.A.R.C. have regularly appeared in our annual Club Contest (MCC) and have always made a good showing.

Caernarvonshire met on April 10 for a talk by GW2BMN, which was well attended. Next meeting is on May 8 at the Liverpool Arms, Bangor. Meanwhile a committee has been formed to seek out a new club-room.

Newbury held their AGM recently, and elected G3JNQ chairman and G3IG vice-chairman ; G3LLK continues as secretary. At a recent meeting they heard an interesting lecture on Radio Astronomy and Cosmology. We understand that they hope to be "well represented at the various Mobile Rallies this season." Good show !

Sutton Coldfield, founded last

November, now boasts a membership of 42 and is still growing. They meet on alternate Thursdays at the YMCA, Sutton Coldfield (next meetings May 8 and 22) and try to cover as many branches of radio as possible, with the transmitting side predominant. Meanwhile the "Jamboree-on-the-Air" has been keeping them pretty busy. The May 22 meeting takes the form of a lecture and demonstration at the Sutton Coldfield TV Station of the BBC, by Mr. T. Douglas, G3BA, the well-known VHF operator, who is in charge at Sutton Coldfield.

Surrey (Croydon) re-elected G8TB as chairman, and G3FWR as hon. secretary. They also put G4ZU on the committee as vice-chairman. At their next meeting, on May 13, the Constructional Contest will be judged by the members attending. Blacksmiths Arms, South End, Croydon, at 7.30 p.m.

Leicester will be at work on the new clubroom on May 12, and will hold a Field Day practice on May 18. The following day a *post-mortem* will be held on the results! Then on June 2 they will return to the fray on the clubroom (no meeting on May 26).

Wirral will be putting in quite a few candidates for the R.A.E. We wish them success. Their interest in mobile working is growing, and G2AMV/M and G3ERB/M will soon be joining their "veteran," G3EGX/M. On May 9 G3CSG will describe and demonstrate his latest transmitter, and on May 21 the Mullard transistor film will be shown.

All Clubs and local groups are invited to use this space for publicity and the reporting of their activities. We sometimes get complaints that "Our Club is never mentioned." The reason always is that no report has been sent in! Reports should be addressed to The Club Secretary, "Short Wave Magazine," 55 Victoria Street, London, S.W.1, and be posted to arrive on or before the date given every month at the head of this article. Reports received late cannot be taken into this feature. Photographs suitable for reproduction are always welcome, and a small fee is paid for those used, immediately on appearance.

The new AVO Universal Measuring Bridge, Type 1. It measures inductance and capacity at 1,000 c/s, and resistance using DC. This instrument sets a new standard by virtue of its clear and simple presentation of measurements.

Among licensed British amateurs, Short Wave Magazine has a circulation larger than any similar periodical

SMALL ADVERTISEMENTS

("SITUATIONS" AND "TRADE")

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SITUATIONS VACANT

THE UNIVERSITY OF MANCHESTER

Radio Telescope — Duty Controller

A VACANCY exists for a post of Duty Controller in connection with the 250ft. steerable radio telescope at the Jodrell Bank Experimental Station of the University of Manchester. The commencing salary, which will depend on qualifications and experience, will not exceed £650 per annum, but will be subject to review later.

The radio telescope is driven by remote control, and the person appointed will be required to work on a shift basis in the control room of the telescope. Under normal conditions, the duties will include the simple following of operating instructions as determined by the research programmes, but quick judgment may be necessary when emergencies arise. The duties include the routine maintenance of the electronic control equipment and instrumentation in the control room. Candidates must be physically fit, with good eyesight, and be capable and willing to work on a shift basis to cover the 24 hours. They must be capable of keeping full, accurate and tidy records relating to the duties entrusted to them. Candidates must hold a Higher National Certificate in Electrical Engineering, or a senior City and Guilds Certificate in some branch of light current electrical engineering or similar qualifications. Previous experience of the control of plant or apparatus containing both electrical and mechanical parts is desirable.

Applications, giving full details of qualifications and experience, as well as the names and addresses of two referees, should be sent to Professor A. C. B. Lovell, Director, Jodrell Bank Experimental Station, Lower Withington, Macclesfield, Cheshire.

TRADE

NOW IS THE TIME TO PUT UP A TRIPLE-QUAD ROTARY BEAM FOR MAXIMUM EFFICIENCY ON 10-15 AND 20 METRES. £17, DELIVERED. — DETAILS FROM GM3BQA, FORTH MOTOR CO., EDINBURGH ROAD, COCKENZIE, SCOTLAND.

GELOSO G210-TR Transmitter, £45 complete; also G255 miniature Tape Recorder with mike, tape and magnetic pick-up device, £33. Demonstration models, as new.—K. W. Electronics, Ltd., 136 Birchwood Road, Wilmington, Dartford, Kent.

BEGINNERS' MORSE COURSE up to 14 w.p.m. on 4-speed L.P. record. Especially designed to pass student through G.P.O. test the easiest way. Send 42/-, Course with book by return. Panadaptor, new condition, with manual. Input 450/475 kc, 230v. Bargain, £28. Spare 2BP1 tubes, 30/-. WANTED: 5IJ or R388 Receiver; good price paid.—Further details, s.a.e., G3HSC, 45 Green Lane, Purley, Surrey. *(Uplands 2896.)*

SMALL ADVERTISEMENTS, TRADE—*continued*

CRYSTAL MICROPHONE INSERTS with exceptionally high output (Cosmocord Mic. 6); guaranteed newly-made and boxed; 15/6, post free.—Radio-Aids, Ltd., 29 Market Street, Watford, Herts.

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

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

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

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

15/10-METRE CONVERTERS from £2 2s. 0d.; high performance guaranteed; s.a.e. details. S.A.S. 72-ohm coax, 8d. yd.; post extra.—G3FXB, 86 Cross Road, Southwick, Sussex.

READERS' ADVERTISEMENTS

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

SALE: Manuals AR88D, WS53, WS12, TCS6, £1 each. Suitcase Tx/Rx, ECC Tele-Commander Tx, £5, and B2 Tx, Power Pack, Coils, £10. Unused Valves, guaranteed: QQVO6-40 (6), £4 each; QQVO3-20A (6), £3 each; QQVO2-6 (12), £3 each; QVO6-20 (6), £2 each; QVO3-12 (12), 30/- each.—G3MHD, 68, Doods Road, Reigate, Surrey.

PANDA CUB in perfect order, unmodified, press-to-net facility, nine months old, little used; gone QRO; nearest £40 secures.—Box No. 1991, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

AR88D, £20 or near; requires some minor attention; rough, but works extremely well; carriage extra.—Box No. 1992, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: 530-0-530v. at 880 VA, normal primary; also 0-1000v. at ½ amp., plus 2 x 2.5-0-2.5v. at 3 amps. and 2.5-0-2.5v. at 6 amps. Normal primary and oil-filled. SSB xtal filters, 100 kc; commercial job in nitrogen-sealed cases; USB and LSB models available. These have a bandwidth of 5 kc with a perfect response. At least 60 dB attenuation. R107 receiver with handbook.—Offers or inquiries for any of the above to G3JTW, c/o A. R. Williams, 24 Queen's Road, Chelmsford, Essex.

WANTED: QRO commercial table-top Tx, Minimitter or similar; not more than 12 months old.—Box No. 1993, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SMALL ADVERTISEMENTS, READERS—*continued*

TOP-BAND GELOSO: Coils supplied with simple conversion data, 36/6; Pi-tank Coils conversion, 26/6.—G3ATL, Hugglescote, Leicester.

HRO, complete with mains power supply, speaker and ten coils, including ten-, fifteen-, twenty-, forty- and eighty-metre bandspread; excellent working order; £25. Crystal Calibrator No. 7, Mk. 1; ten, hundred, thousand kc, complete with mains power supply, £4.—Box No. 1989, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SWL requires used Morse training course; complete records and booklet; beginner.—Details and price to A. H. Kightley, 28 Castlandhill Road, Rosyth, Fife.

SALE: BC348R, internal power supply, manual, excellent condition, £15 (o.n.o.); BC453 Mod. Q5'er for BC-348, £2 10s. 0d.; Class-D, internal power supply, AC, £4; 150-watt Tx, Geloso VFO-813 PA and power supply, etc., £35; OZ7BO El-Bug, £2 10s. 0d. Prefer buyer collects. — G3KKZ, 7 Leonard Road, Streatham Vale, S.W.16 *(Pollards 4508).*

WILL EXCHANGE Super DX 250w. Tx for Tape Recorder, or anything interesting. Offers?—F. Barnett, 65 Woodstock Gardens, Blackpool.

WANTED: PA Valve for Army 12 Set, PVI.35 (ATP.35).—Welsh, 18 Lichfield Drive, Bury, Lancs.

SALE: RME70 Rx, 550 kc - 33 mc, in six ranges, bandspread, ten valves, S-meter, xtal filter, matched speaker, £25 (o.n.o.). Acos Mic. 22, £1; 1143 Tx on 144 mc, £1. Valves: 6L6G, 6/-; 6X5/GT, 5/-; pair TZ40's, 25/-; pair PT15's, 10/-; KT66, 10/-.—G3KAG, 714a Harvey Road, Derby.

EXCHANGE brand-new and unused Sobell T.21 table 21in. Television Receiver for Labgear LG.300, Panda PR-120-V, or similar. Merseyside area.—Box No. 1996, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: Hallicrafters S2OR with manual; must be mechanically and electrically sound. Please state price.—S. L. Yeo, 22 Elm Row, Edinburgh 6.

WANTED: SCR-522 modulation transformer, B2 Tx/Rx handbook; also power unit for same.—V. Totten, 29 Unwin Avenue, E. Bedfont, Feltham, Middlesex.

MODULATOR TRANSFORMER, similar to UM4, 50/-. Hallicrafter spares. CR100 Transformers (mains), 21/6. All goods brand-new, plus carriage. Receivers: B47, £5; 358X, £5; HRO Senior. S.a.e. for list.—R. Wright, 17 Kent Road, Atherton, Manchester.

EXCHANGE: Have Hunter 35, 35mm. Camera, f.3.5, 1/100 sec, new, with leather ever-ready case. Will exchange for B2 Transmitter/Receiver with power supply. — G8UA, 406 Higher Brunshaw, Burnley, Lancs.

WANTED: Three-key Wheatstone Morse Perforator. State price and condition.—Box No. 1997, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SMALL ADVERTISEMENTS, READERS—*continued*

FOR SALE: Eddystone 640, £20; Guthman Silver Super Rx, £10; BC-221-AK, with AC power supply and calibration manual, £30; Windsor Sig. Gen., 100 kc to 80 mc, to £20; Mullard 10-watt amplifier, £8; Amos & Johnson FM Rx, £10; Wilcox Gay VFO, 30/-; BC-453 mod. Q5'er, £2. Also for disposal: Valves, Condensers, Chokes, Transformers, Meters and the rest. Offers considered for all above equipment. Details and list. — G2HMG, Central Hotel, Thetford, Norfolk.

FOR SALE: Rx, Type P104, new and complete, 95-150 mc, £4; or would exchange for equally good R.1132. List of Valves, Relays, Components, etc., on request. — Button, 7 Upper Flowerfield, Nunney, Nr. Frome, Somerset.

SALE: BC-454, 230v. P.U. fitted, FB 80m., £4; R.1224, 2v. LT, 1132-type dial, £4; RF25, Mod. for 21 mc, £1; RF26, new, £1; RF24, new, plus two rough, £1; Rx Unit 159, motor-tuned, 4 freq's., 10/-; R.1132 OP Stage, £3; SCR-522, front-end as converter, needs completion, £1. Various other chassis, etc.; s.a.e., please.—A. T. Hunt-Duke, 18 Hawkins Road, Folkestone, Kent.

SALE: National 1-10, all coils, calibration chart, good condition, £6 10s. 0d. (carriage paid).—Baker, Oakwood, Hillside, Montrose, Scot.

FOR SALE: R.1155 with power/pack, 6V6 output stage, spare valves, handbook, £8; Bendix RA10DA, complete with remote-control box, cables and plugs, power/pack for mains operation, £10; BC-455, brand-new, complete with dynamotor, mounting rack, remote-control box, all plugs and flexible drive, £5; RF24, brand-new, 10/-; RF25, RF26, 10/-. WANTED: Good AR88D, preferably fitted with S-meter. Buy or borrow: November 1956 issue of *QST*.—Box No. 1990, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: *Short Wave Magazine*, March 1952-Feb. 1958, £4 (or offers?) Two brand-new R.C.A. 813's, guaranteed, £3 each; four 6CL6 (miniature 6AG7), 10/- each; five 6BQ6GTA, 15/- each; three GZ34, 7/6 each; EF91, EB91, ECC91, 6CB6, 6BA6, 6AQ5, 12AT7, 12AU7, 12AX7, ECC85, 6AK5, QS150/15, OB2, 6Y6, GZ32, all 5/- each. All valves fully guaranteed; please add post and packing.—G3GQK, 21 Vancouver Road, Forest Hill, S.E.23. *(FOR: 4449.)*

MOBILE/PORTABLE with Austin Taxi 1956, new heavy-duty batteries, £25; AVO, sealed, reconditioned 1958, £10; new 4X150A, £2; field telephone, £1; working 70 cm G2DD converter, £2; 45ft. mast, 10m. beam, rotary head and control system, £10. Other items.—G. I. Turner, Deegeen, Clifford Road, New Barnet, Herts. *(BARnet 9035.)*

VFO, Type 145 (1.9 - 15 mc) with associate p/pack, £5. CC/CW Transmitter, 40w. (provision for VFO and modulator), £7 10s. 0d. TU5B, 10/-. Pair TZ40's, 15/-. Many other spares. Collection preferred.—G3MEM, 76 Culver Lane, Earley, Reading.

BARGAIN: All components for 150-watt transmitter. Separate VFO, wideband multiplier, zero-bias modulator, UM3. All valves, plus spare 813 and rectifiers, four power/packs, rack and panels, £25 (o.n.o.). Eddystone 358X, modified RF, internal power supply, all coils, £12 10s. 0d.—G3AFC, 109 Fortress Road, London, N.W.5.

SMALL ADVERTISEMENTS, READERS—*continued*

EDDYSTONE 888 Receiver; condition as new, unscratched; just overhauled by the manufacturers; may be air-tested. Birmingham area. £75 (o.n.o.).—S. A. Faulkner, Kantara Hotel, Ramore Avenue, Portrush, Northern Ireland.

FOR SALE: No. 12 Tx, £8; ET4336, less 813's, 866's, £20 (o.n.o.). WANTED: Modern Table-top Tx, amateur or commercial.—Box No. 1994, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1, or *Phone BAR: 3238.*

WANTED: Handbooks, G.E.C., Miniscope, RA-1B. *CQ* Jan. '55. SALE: 837, 12/6; 6AC7, 6AG5, 6AG7, 4/6. RF 0-1 amp., USN, 12/6 (all new).—Box No. 1995, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: AR88, handbook, new speaker, spare wavechange switch, wobulator for lining-up, £55.—R. Machin, 20 New Road, Barlborough, Chesterfield, Derbyshire.

RECEIVER, Type R1294, 500 to 3000 mc; spare oscillator, valves; £10 (or exchange BC348, etc.). Transformers (open construction), 1100-0-1100v. at 500 mA, 5v. at 3A, £1. Transformer and rectifier unit, 1200v. and 700v. DC at 600 mA, £2. Choke 10 Hy. at 500 mA, 15/-. Enclosed transformers, 4v. at 1A, 2v. at 1.5A, 2000v. at 5 mA, 15/-. U.S.A. Mod. transformer pri., 6700 ohms, CT sec., 4500-5000-5500 ohms, 50w., £2. U.S.A. Choke, 10 Hy. at 500 mA, £1. Other transformers available; s.a.e., please. Valves (guaranteed): SP61 (6), VT52 (2), 1/6; EF50 (12), CV6 (2), CV88 (1), 2/-; 12A6 (4), 2/6; CV9 (3), 3/-; 8012 (1), 5/-; 2A3 (2), 7/6; 808 (2), 10/-; 803 (1), 15/-. Prefer buyer collect heavy items. — G3FOQ, Capella's Way, Haverhill Road, Stapleford, Cambs.

RF26, 18/-; RF15, 9/-; RF24, 11/-. Brand-new in original cartons. Postage 3/6. — Jay, 69 Church Road, Moseley, Birmingham, 13.

RECEIVER P58, 250 mc - 700 mc, £8 10s. 0d.; 2½in. speaker, 7/6; 420 mc Tx/Rx, 60/-; voltmeter 0-400 AC, Ampmeter, 8/6 each. All new, plus carriage; s.a.e. list.—Wright, 42 Malvern Crescent, Ince, Wigan, Lancs.

SUPER Pro SP-200-S, 1250 kc - 40 mc, complete with P/Pack and matched speaker, £40 (or would exchange for Hallicrafter S36 or S27. — G2DC, Morseden, Hightown Hill, Ringwood, Hants.

TX P/S Mod/CW, 5 bands, 25 watts input, with power supplies, £12 (o.n.o.); bargain. — John Murray, 23 Grieve Street, Methilhill, Methil, Fife.

WANTED: Hallicrafter S27 Receiver, good working order; state price.—Waller, 18 Leaside, Delves Lane, Consett, Co. Durham.

RCA AR77E, perfect; overhauled by Webbs; performance figures given; circuit data, spare valves; price £28. Buyer collects. — G3LGN, 9 Montgomery Drive, Unsworth, Bury, Lancs. *(Tel.: WHI. 2942.)*

HRO, 9 coils, p/pack, speaker; good condition; as new; £25 (o.n.o.). Must sell, going abroad. —Lim, 62 Queen's Park Rise, Brighton, Sussex.

SMALL ADVERTISEMENTS, READERS—*continued*

WANTED: 24v. DC cowl gill motor; also BC-453, valve-type 717.—Box No. 1984, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Ex-German Rx, 22-62 mc, with instructions, £5, plus postage. WANTED: SCR-522 mod. and driver transformers (London).—Box No. 1998, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

20 METRES: 3-element Rotary Beam, with folded dipole radiator, 2 Selsyns and Prop Pitch motor; all fixing brackets, clamps, nuts and bolts; £19 (o.n.o.). — G. Newton, Murieston House, Midcalder, Midlothian, Scotland.

HALLICRAFTERS Radiophones, Model H.T.11, 1.5 - 3 mc, complete with 12-volt power/packs, less crystals, £20. Cossor Double Beam 'Scopes, Model 339, £17 10s.; Model 3339, £14. Mullard 'Scope, Model G.M.3186, sens. 1mv/cm, time-base 0.1 - 40,000 c/s, perfect, £22. B.S.R. LF Sig. Gen., 20-16,000 c/s, £10. G73 Wavemeter Sig. Gen., with crystal cal., 100 kc - 25 mc, perfect, £10 10s. 0d. Collins TCS/12, complete 24-volt p/pack, manual, remote control, aerial coupler, etc., £20. ABOs, Model 47A, £8 10s. 0d. Power Packs, fully smoothed, 2 chokes, paper cond., output 250v. at 125 mA, 6.3v. at 6A., rack mounting, £2 10s. 0d. WANTED: Manuals for Hallicrafters H.T.11.—L. Riches, 110 Luton Road, Chatham, Kent.

FOR SALE: 1155 Rx, built-in power/pack, o/p stage, speaker and S-meter, £10 (o.n.o.). Also Model 40 Avometer, £6.—R. H. Titcombe, Fullersmoor, Argoed View, New Brighton, Nr. Mold, Flints.

SALE: Brand-new Panda ATU 150, £13 (o.n.o.).—G3LNK, J. Boume, 777 Lightwood Road, Longton, Stoke-on-Trent, Staffs. *(Tel.: 39426).*

SALE: Minimitter, excellent condition; can be seen working; £65 (or nearest offer).—Spencer, 34 Harrison Road, Erdington, Birmingham, 24.

HALLICRAFTER H.T. 11B PU, 12v. DC in, 350v. 170 mA out, 250v. 60 mA out; new sealed carton; £5. Two Rotarys, 6v. DC in, 355v. 175 mA out, £1 each. One Woden 500-0-500v. 120 mA, 5v. 2A, 6.3v. 4A, £1. One QQVO6-40A, unused, guaranteed, £5. Ten RL12P35, 7/6 each. One LS50, 2 sockets, 15/-. One 832, 12/-. Twenty-four TZ40. 24 DA41, 1 pair BTH heavy-duty 50v. Selsyns. One ASB8, modified to 430 mc. Offers? S.a.e. All plus post/carriage.—R. Rothery, 293 Dudley Road, Birmingham, 18.

G3MCY requires FB-type BUG KEY (no comments). — Details and threatening letters to: G. C. Moore, Officers' Mess, R.A.F. Tangmere, Sussex.

S.W.L., moving QTH, has Eddystone 740 for sale, excellent condition. Best offer over £20.—L. Fish, School Lane, Northwold, Thetford, Norfolk.

WANTED: H.R.O. cabinet and panel.—Offers to Robinson, 50 Burland Avenue, Tettenhall, Wolverhampton.

QUAD-BEAM 2-Band, solid home-built; can be viewed in position. Owner now building 3-Band. £5. Buyer collects.—G3BDH. *(Wanstead 4139).*

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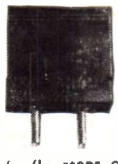

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1550.62	1680.5	2087.5	3630	10,534	11,751
1554.4	1700	2089	3850	10,545	11,788
1561.1	1727	2118.25	3920	10,557	11,814
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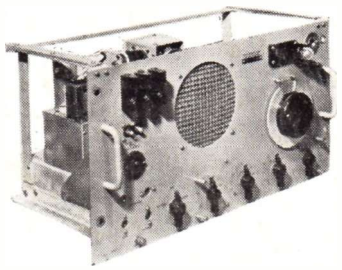

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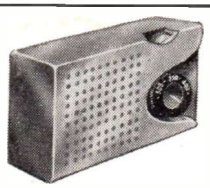

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