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The SHORT WAVE Magazine

VOL. XXII MAY, 1964 NUMBER 3

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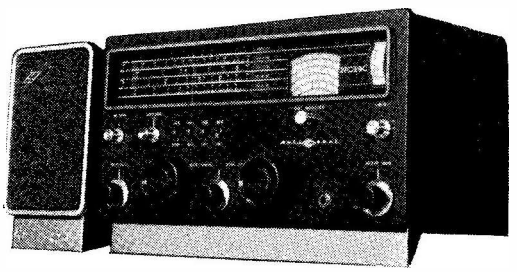

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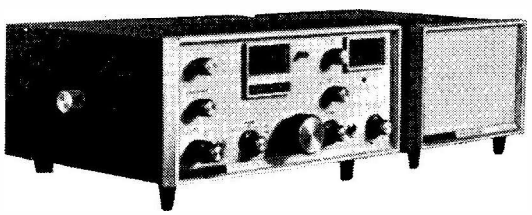

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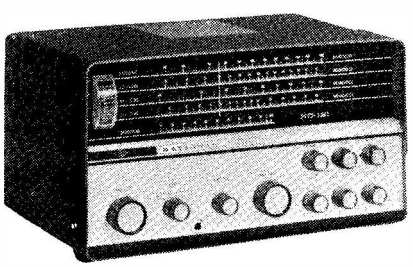

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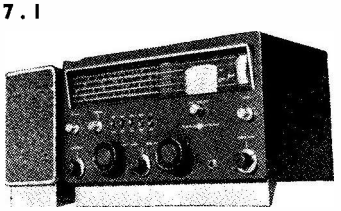

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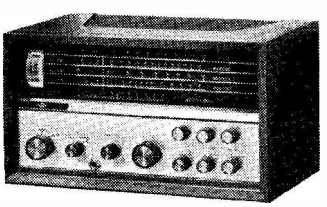

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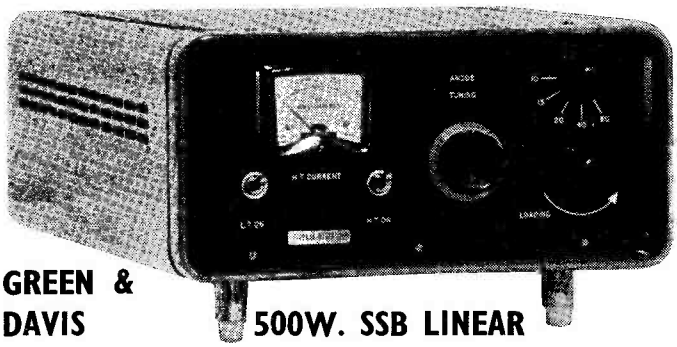

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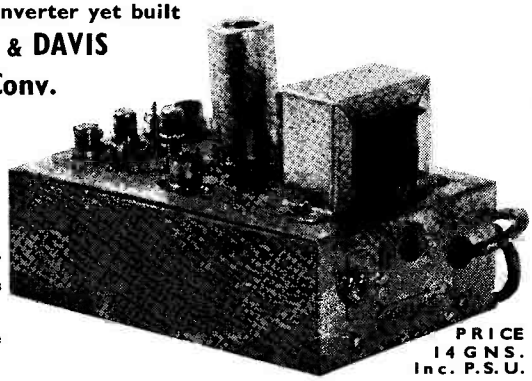

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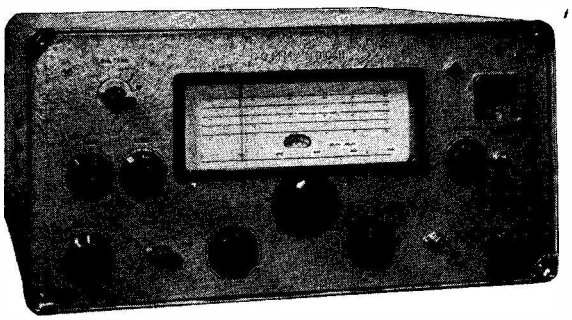

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(GB3SWM)

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E.&O.E.

FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT-WAVE Magazine

EDITORIAL

Problem *One of the great difficulties confronting those concerned for the future of Amateur Radio is that of "Catering for the Beginner." Where does a boy find the simple stuff to start him on the right road? Not in* SHORT WAVE MAGAZINE*—nor, we venture to say, in any other similar publication in the English language.*

Why is this? The answer lies in that simple but compelling phrase "Cost of Production." There are never enough beginners to justify, in the commercial sense, a publication intended specifically and entirely for them—yet that is what they need, and what is wanted. If a beginner-periodical is offered its cover price (by reason of the relatively small circulation, low advertising appeal and high production cost) immediately puts it beyond the reach of most beginners, who are mainly juniors in low-paid employment or schoolboys with limited pocket-money. Thus, a beginner-periodical (in any subject with a technical flavour, radio or whatever) must be heavily subsidised. Apart from this, anyone with practical experience of technical journalism knows that dealing with technicalities in simple language is a great deal more difficult than writing a technical article for informed readers. There are thousands of qualified technicians who can write a high-level technical article—but very few who can say the same thing in simple language. There has only been one Sir James Jeans. And as rare are those who can write like Fred Hoyle, FRS.

The correspondence we get bearing on this problem is illuminating to a degree, as the comments on pp.147-148 of this issue show. On the one hand, it is quite clear that many readers would not accept any lowering of our present technical standards to meet the needs of the beginner; on the other, there are the SWL's (who are really "advanced beginners") who say that we are already above their heads and beyond their reach in the technical sense.

Both these opposing view-points have equal justification. The problem has been with us for years. Its solution is as far off as ever!

Austin Forsyth, G6FO.

THE PRACTICAL APPLICATIONS OF SEMICONDUCTORS

IN THE AMATEUR STATION

Part II

TEST EQUIPMENT

M. I. DAVIS, B.Sc.

As explained on p.97 of our April issue, this is a series of articles to show how transistors and semiconductors generally can be used in amateur-station equipment. Though our contributor does not hold an AT-station licence, he is professionally engaged on semiconductor circuit and design work. All the circuits being described have been built and tested and this ensures that they are practical, reliable and can be repeated with confidence. The first article of the series, in the April issue, discussed power supply designs in detail.—Editor.

THE first and simplest application of semiconductors to be considered in conjunction with test equipment is that in which diodes may be used to protect moving-coil meters against overloads. Milliammeters and microammeters are prone to irreparable damage by overloading, such as may easily occur when experimental work is being carried out. Many multimeters have an electro-mechanical cut-out, and these are usually fairly safe. Further, it is possible to obtain fuses which will blow at currents as low as 10 mA, and these can be used to protect the more robust higher current meters. The main problem is how to ensure that a sensitive meter will not suffer damage, when the two systems mentioned above are not suitable.

The use of semiconductor diodes as shunts is frequently the answer. The April article in this series touched briefly on the non-linear voltage/current characteristic of junction diodes, and it is this property which is exploited to prevent excessive currents flowing through the meter. A typical diode characteristic is shown in Fig.1(A). As soon as the voltage across the diode becomes greater than a few hundred millivolts, the diode passes a high current and acts as a safe shunt, affording a good measure of protection. To give protection against reverse overloads as well, two diodes are connected back-to-back as in Fig.1(B).

There is (as usual!) a drawback. The diodes always take some current, and so the meter calibration suffers. However, since the welfare of the meter is the prime consideration, it is worth making the shunt optional by means of a switch, so that once an approximate value of the quantity to be measured has been safely determined, the meter can then be used without the shunt to get a more accurate reading. The choice of diodes is not critical. It should be determined what the voltage across the meter at FSD will be, knowing the coil resistance and the full-scale current, and suitable diodes chosen after consultation of manufacturer's data. As a guide, copper oxide rectifiers need a voltage of about three to four hundred millivolts across them to pass a reasonable current; germanium is next, with five hundred millivolts, and then silicon and selenium, which need about 800 mV.

Protection for meters used to measure high voltages is very easy, and does not suffer from the drawback of the last system. A typical circuit is shown in Fig.1(C). The usual series resistor is split into two, and a zener diode is connected from the junction to the other side of the meter. If the meter connections are accidentally reversed, the zener becomes forward-biased, and acts as a shunt as in the previous case. If, on the other hand, too large a voltage is applied in the correct polarity, the voltage drop across R2 and the meter is larger than the breakdown voltage of the diode, and it again shunts the meter. For voltages less than its breakdown voltage, the zener passes only the reverse-biased current of a silicon diode—a few milli-microamps, and hence the calibration of the meter is unaffected. By suitable choice of the ratio of R1 to R2, protection may be afforded at any percentage of full-scale voltage.

AC Measurements

At this point, some mention should be made of the familiar use of diodes to convert a moving-coil instrument to measure alternating voltages. RMS values are not indicated by any simple and reliable rectifier instrument, and, in general, scales are calibrated to read RMS on a meter which is in fact not measuring this, but either mean or peak values. A bridge arrangement such as in Fig. 2(A) measures the mean value of the applied AC waveform. The diodes are of the copper-oxide variety, with a low voltage drop, since a high voltage drop spoils the linearity of the scale. Due to this non-linearity, the scale is displaced by a few hundred millivolts. Copper-oxide rectifiers are only suitable up to a few tens of kilocycles, and for frequencies above this germanium diodes are used, in spite of their larger voltage drop. This is the type of instrument which is most frequently calibrated, by experiment or calculation, to read RMS values. The mean value of an AC quantity is $1/\pi$ times its peak value ($= 0{\cdot}318$ times). A meter which has been modified to read peak values is shown in Fig. 2(B), from which it will be seen that the current through the diode is used to charge the capacitor to the peak value of the applied waveform, and the high resistance provides a discharge path for a small current through the meter. Since (1) The diode has not infinite back resistance; (2) The capacitor has a leakage resistance; and (3) The meter does drain some current from the capacitor, this instrument does not read the true value of the peak voltage, but is sufficiently accurate for

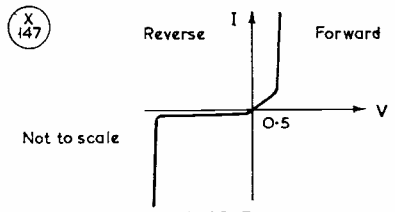


Fig. 1a: DIODE CHARACTERISTIC

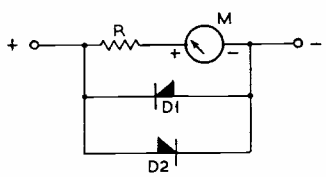


Fig. 1b: BACK TO BACK PROTECTION FOR METER

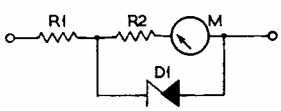


Fig. 1c: PROTECTION OF VOLTMETER USING ZENER DIODE

Fig. 1. How the diode characteristic, at A, can be used for meter protection, at B and C, as explained in the article. Typical values are: R1, 210K, h.s.; R2, 90K, h.s.; M, 500 μA f.s.d.; diodes, OAZ208. In Fig. 1C, these values would be suitable for an 0-100v. range on the meter.

most practical purposes. No values for the components are given since these must be chosen to suit the meter and the voltage it is required to measure, but the C-R time constant must be much longer than the period of the applied signal. Again, using germanium diodes, these types of meter can be used for RF measurements. Silicon devices are also used in this type of circuit, with their advantages of low leakage current and low temperature coefficient.

A meter to measure peak-to-peak voltages is shown in Fig. 2(C), and, for the same reasons, no values are given. Remember, however, the warning about diode p.i.v. ratings mentioned in the last article. (This is a capacitative load!)

Valve Voltmeter Circuit

The next piece of testgear to be described is one of those things which, once you've got it, you wonder how you ever did without it. As a look at Fig. 3 will show, it is a transistor version of that old faithful, the valve-voltmeter. It can, as they say, be knocked up in an evening, and may be built literally out of the junk-box, without the usual premise that your "junk" includes half the stock of Lisle St. The unit can be used to measure signals from low audio frequencies up to the normal HF band frequencies; it reads RMS values, and may be backed off from any reading to zero, a very useful feature when investigating the performance of resonant circuits, since a small voltage change in the face of a large standing voltage is not easy to detect by normal means, and thus the position of the true resonance may be missed.

S1 switches the frequency range from AF to RF by connecting C1 in parallel with C2. This is necessary because C2 on its own would present too high an impedance at audio frequencies, and C1 does make the input time constant rather long; however, at AF this is not usually important, although ten seconds or so should be allowed to elapse before reading the meter when C1 is switched in. It was felt that to overcome this slight snag would take the instrument out of the "simple, inexpensive, portable, self-contained" class in which it is supposed to be. Another fault which has not been rectified for the same reason is that the reading must be backed off to zero when changing scales, but surely the trouble involved in that is negligible. S2 is the range switch.

As is the author's habit, this design is intended purely as a specimen, and readers are left to modify and improve the circuit as required. Hence, only three ranges are shown, increasing in decades, although this may be unsuitable for some requirements, and a 1, 3, 10, 30 . . . range may be preferred. TR1 may be any LF transistor, but should have a fairly high current gain if the optimum sensitivity is to be realised. Biasing is done *via* R4, and the no-signal drain of the unit is very low. R6 is the backing-off

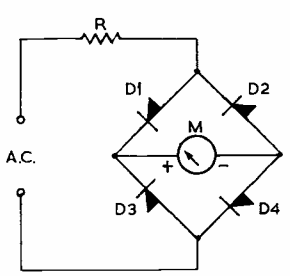


Fig. 2a: MEAN VALUE BRIDGE VOLTMETER.

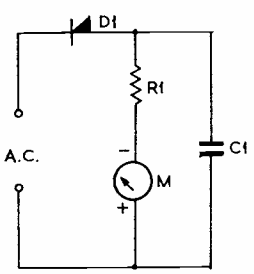


Fig. 2b: PEAK READING VOLTMETER

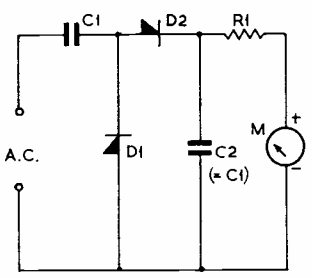


Fig. 2c: PEAK-TO-PEAK VOLTMETER X 148

Fig. 2. In sketches A, B and C are shown voltmeter circuits, explained in the text. In the case of Fig. 2A, all series resistance must be at position R, and no resistance put in series with the meter itself. Meter ranges can be considerably extended by the proper use of semiconductors, in that DC instruments can be adapted for AC measurements.

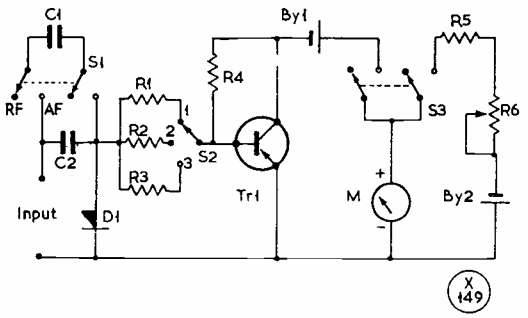


Fig. 3. Circuit for a sensitive Transistor Voltmeter, on the principle of the valve voltmeter, as described in the text, with values in the table below.

Table of Values

Fig. 3. Circuit for a Transistor Voltmeter

C1	= 10 μF	M	= 0-1 mA f.s.d., m/c
C2	= 0.1 μF	S1, S3	= DPDT toggle
R1	= 68,000 ohms*	S2	= SP 3-way, wafer
R2	= 680,000 ohms*	By1,	
R3	= 6.8 megohms*	By2	= 1.5v. (U2)
R4	= 270,000 ohms	D1	= SX644(*Mullard*)**
R5	= 1,000 ohms	TR1	= OC71, OC72, OC44, or any *p.n.p.* type
R6	= 10,000-ohm, log. potentiometer		

Notes: *Resistors R1, R2, R3 adjusted for correct values during calibration. **If Range 3 is omitted, any diode such as OA10, OA81 or OA91 may be substituted.

control described before, and offsets the standing current in TR1.

The construction of the unit is at the reader's discretion; the writer put his together in a *Lektrokit* cabinet (due to his incompetence at metalwork) and built the circuit on *Veroboard*, with the two batteries mounted in Terry tool clips. (If the cardboard is removed from the batteries, and the clips are bolted to the board, battery connection is simplified.) The meter used was a 0-1 mA, three-inch instrument, but a more sensitive type might be preferred.

Calibration is carried out using a mains transformer and a multimeter. Of course, if a calibrated oscilloscope or another valve voltmeter are available, then calibration at AF and RF becomes straightforward, but in general this happy state of affairs does not occur. In this case, calibration must be carried out at 50 c/s, and trust be placed in the fact that the instrument will also be OK at RF. By forming a low-resistance potential divider with close tolerance resistors across various windings of the transformer and using the multimeter to read the overall voltage, the instrument can be calibrated over all its ranges, and a calibration chart drawn. Alternatively, the perfectionist might rescale the meter.

Table of Values

Fig. 4. Fixed Frequency Wien Bridge Oscillator

C1	= 2 μF	R5	= 1,000-ohm potentiometer
C2	= 10 μF	R6	= 1,000 ohms
C3, C4	= .015 μF	R7	= 8,200 ohms
R1	= 27,000 ohms	R8	= 3,300 ohms
R2, R4, R9	= 4,700 ohms	TR1,	
R3	= 33,000 ohms	TR2	= OC71, or any equivalent

Signal Generator

We turn our attention now from methods of measuring signals to methods of generating them, and consider first the production of audio signals. The applications of audio oscillators include: Testing the response of amplifiers, modulators, and IF amplifiers; generation of standard tones, *e.g.* the RTTY "mark" and "space" signals; and use as bridge sources and Morse practice oscillators.

No mention will be made of L-C audio oscillators, since the accent in this series is on simplicity and availability, and it is felt that the transformers needed for L-C circuits present too much of a problem to warrant their inclusion. The first type of oscillator to be described is the Wien Bridge, a circuit which requires care in design when constructed using transistors, since the loading effects of the amplifier part of the circuit adversely affect performance. This can be overcome by careful design, and the inherently low input impedance of the amplifier can be increased to reduce its loading effect. A typical circuit is shown in Fig. 4.

This oscillator was in fact designed to generate the 2125 c/s signal for the author's RTTY system, and a similar circuit was used for the other standard frequency of 2975 c/s. The calculated frequency is given by the relationship:

$$f = \frac{1}{2\pi \sqrt{(C3.C4.R4.R9)}}$$

and the circuit does, in fact, oscillate at about this frequency. Since R4 = R9, and C3 = C4, this formula simplifies to:

$$f = \frac{1}{2\pi (C3.R4)}$$

The values of R3 and R4 have been chosen with the DC conditions in mind, and therefore, if it is required to vary the frequency of oscillation, the values of the two condensers should be changed to suit. The values of the other two capacitors should

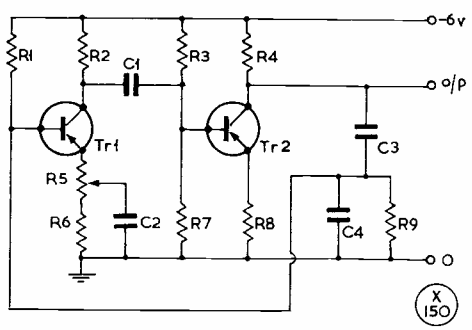


Fig. 4. Another useful item of test equipment for the amateur bench — a fixed-frequency Wien bridge oscillator.

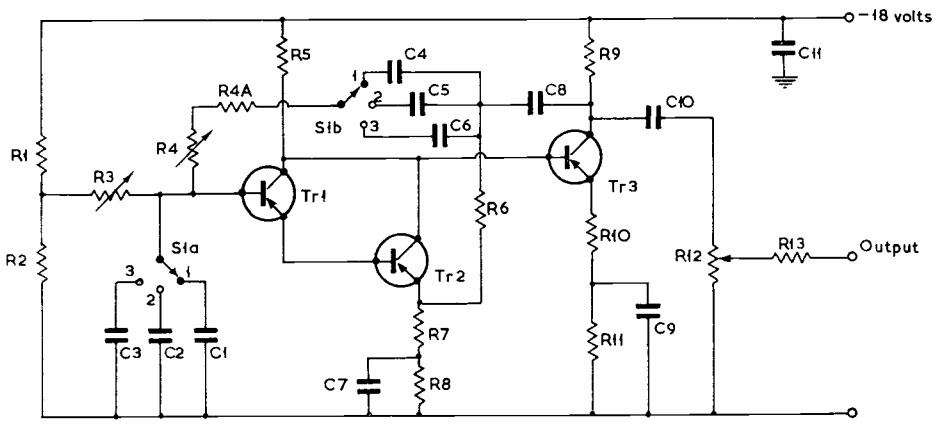


Fig. 5. A variable-frequency Wien bridge oscillator, some points about which are brought out in the text. A very useful frequency coverage is given by this circuit, all values for which appear in the table.

be adjusted at the same time, their values being inversely proportional to frequency, but these are not so critical as the values of C3 and C4—so the nearest preferred value may be taken. The circuit has been designed to have good DC stability, and AC feedback is provided by R8, which has been left un-decoupled, to give a more constant amplitude of oscillation. R5 also alters the level of AC negative feedback, and is used to adjust the conditions for maximum amplitude consistent with minimum distortion. The capacitors may be reduced to a much smaller value if RF operation is required, but it will be necessary to replace the transistors by high-frequency types such as OC45's.

A natural development of this circuit is to make the frequency of oscillation variable over a wide range, and this has been done in the circuit of Fig. 5. The spectrum 20 c/s to 20 kc is covered in three ranges, by switching condensers, with the two resistors which complete the frequency-determining network being made variable, to tune over each range.

The fact that the circuit is much more complex is unavoidable, since the DC conditions are varied by the two variable resistors R3, R4 when changing frequency, and the circuit is required to oscillate over a wide range. In order to overcome these difficulties, the input impedance of the amplifier must be made very high, and it will be seen that a compound emitter-follower is used to achieve this—an arrangement which presents a load as high as 500 kilohms to the tuned circuit. In order to get the required phase-shift of 360 degrees, the output must be taken from the collector of TR2, so this transistor is not, strictly speaking, a pure emitter-follower; however, when compounded with TR1, the combination does present the needed input impedance. R1 and R2 constitute a low-impedance potential-divider, and in the face of the high impedance seen into the base of TR1, changes in the resistance of R3 and R4 are negligible, DC-wise. R6 and R7 provide negative feedback to stabilise the output amplitude, as does R10 in the emitter of TR3. In a more professional

Table of Values

Fig. 5. Variable-Frequency Wien Bridge Oscillator

C1, C4	= .01 μF	R5	= 10,000 ohms
C2, C5	= 0.1 μF	R6	= 2,200 ohms
C3, C6	= 1 μF	R7	= 680 ohms
C7	= 25 μF, 25v.	R8	= 2,200 ohms
C8, C9,		R9	= 680 ohms
C10	= 50 μF, 25v.	R10	= 100 ohms
C11	= 100 μF, 25v.	R11,	
R1	= 6,800 ohms	R13	= 1,000 ohms
R2	= 510 ohms	R12	= 5,000-ohm potentiometer
R3	= 10,000-ohm lin. potentiometer, ganged R4	S1	= 2-pole 3-way, wafer
R4	= 10,000-ohm lin. potentiometer	TR1,	
R4A	= 470 ohms, as series limiter R4	TR2	= OC71, or similar
		TR3	= OC72, or similar

instrument, thermistors would be used to replace part of the resistance of some resistors in the circuit, to give stability against changes in temperature, but since these are components not usually found in junk-boxes, this measure has not been taken.

Note that the circuit is largely direct-coupled. This eliminates difficulties which might arise from phase-shifts in coupling condensers. The upper frequency limit of the circuit may be increased if required, with the proviso that higher-frequency devices may be necessary if the frequency is pushed up too much. The output across R12 is about one volt RMS, and loads of less than one kilohm should not be applied, or the output waveform will be distorted. If an oscilloscope is available the frequency can be checked by comparison with the 50 c/s mains, using Lissajous Figures. The circuit may also be used as a low-frequency crystal oscillator, by removing the two tuning capacitor sections (C1-C3 and C4-C6) and R6 and connecting the crystal between the junction of R8 and C7 and the base of TR1. The values given for R1, R2. and the fixed resistor R4A in series with R4 are indicative only and should be trimmed during initial trials for optimum waveform and performance at all frequencies.

[*over*

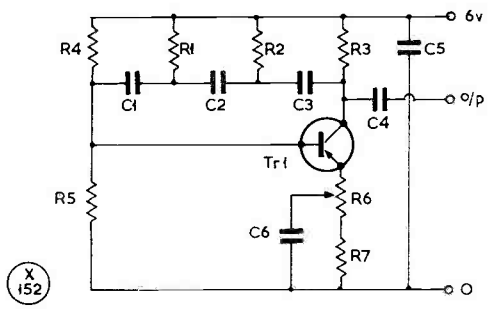


Fig. 6. A 1000-cycle phase shift oscillator, capable of a very pure sine-wave output — see oscilloscope trace.

Table of Values

Fig. 6. 1000-Cycle Phase Shift Oscillator

C1, C2, C3, C4	= 0.1 μF	R4	= 39,000 ohms
C5	= 100 μF, 12v.	R5	= 4,700 ohms
C6	= 50 μF, 12v.	R6	= 100 ohms, w/wound
R1, R2, R3	= 820 ohms	R7	= 200 ohms
		TR1	= OC71, or similar

Phase-Shift Oscillator Design

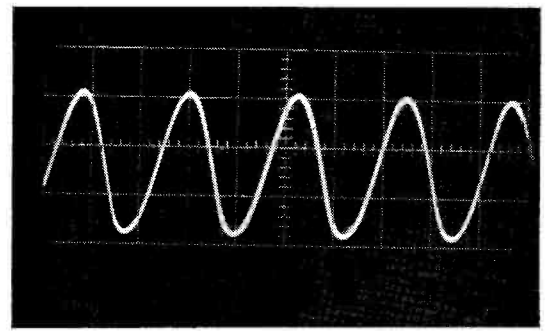
From Wien Bridges, we turn our attention to another circuit of the R-C type, the phase-shift oscillator, or, as it is sometimes called, the ladder oscillator. This latter name arises from the fact that the frequency of oscillation is determined by a ladder network of resistors and capacitors, as shown in Fig. 6, which is the circuit for an oscillator of this kind operating at a frequency of 1 kc—a useful standard.

If R1, R2, and R3 are all made equal, and this value is called R, and similarly if C1, C2, C3 are all equal to C, then it can be shown that, theoretically, the frequency of oscillation is given by:

$$f = \frac{1}{2\pi\sqrt{6.CR}}$$

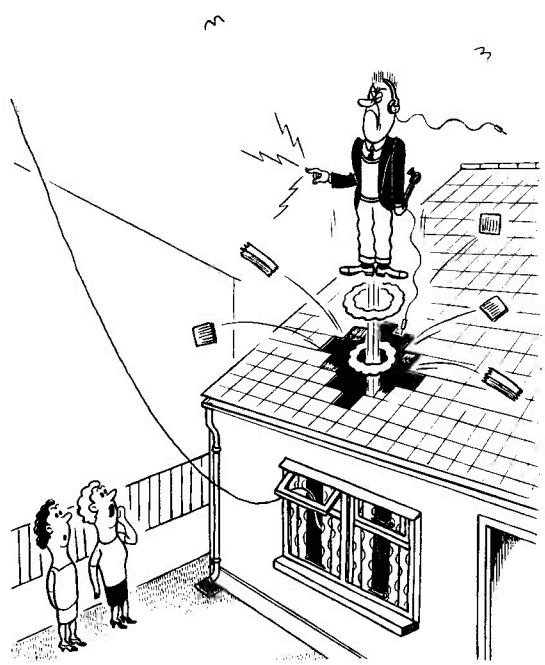
However, the input and output impedances of the amplifier used modify this value somewhat. It can also be shown that the amplifier must have an effective gain of at least 29 to sustain oscillation, so TR1 should have a current gain in common-emitter configuration of at least 50, to allow for losses in the matching of the frequency-determining network to the amplifier. As before, the values of the ladder components can be altered to give different frequencies, and transistors with a higher cut-off frequency may be needed to produce the necessary gain at higher frequencies. R6 is used to trim the waveform for optimum amplitude and minimum distortion; it also alters the frequency by about 10%.

The next article will conclude the treatment of test equipment using semiconductors, and will deal with the generation of RF signals (including a simple but efficient modulated signal generator), grid-dip oscillators (a misnomer in this case!), and simple UHF oscillator circuits using one tunnel diode. Wobbulators, absorption wavemeters and square-wave generators will also be discussed.



Output waveform of the 1 kc phase-shift oscillator shown in Fig. 6, as taken on a Tektronics 545 Oscilloscope with R6 (in Fig. 6) adjusted for the highest output frequency. The 'scope settings were for 1v./cm. in the vertical and 500 μSec./cm. in the horizontal.

Take Care — HT Can Kill



"... he will fiddle with the thing when it's on ..."

VERSATILE AERIAL TUNING UNIT

TO SUIT VARYING AERIAL/FEEDER CHARACTERISTICS

L. E. PROFAZE (G3KAB)

MANY components of Government surplus origin are retained in the hope that eventually they will be used—but so often this intention is frustrated because, having been designed for a specific function, they are not always entirely suitable for the task on hand, or they may be rejected in favour of a commercial product of more modern design. Transmitting variable condensers are typical of these "white elephants" and the object of this article is to suggest one way of employing them.

There is a constant need, both by the SWL and the transmitting amateur, for aerial tuning units (ATU) and it is often necessary to use different circuits to suit the aerial feed impedance; and when band-changing, or when, carrying out experiments, it is a matter of deciding whether to have a number of units, each designed for a particular set of conditions, or one with wide-range characteristics. The

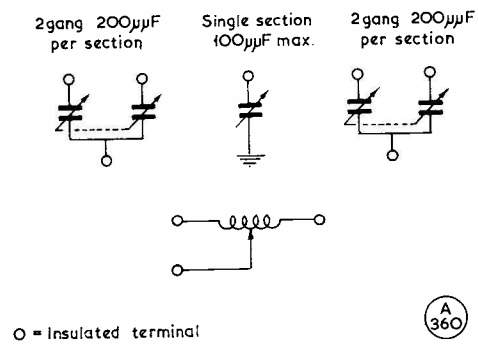


Fig. 1. As explained in the text, each component of the ATU is separately terminated, so that circuit arrangements as shown in Fig. 2 can be achieved.

Notes on ATU circuits, Fig.2

CIRCUITS A & B Series tuned for use with ¼ wave end-fed aerial. The inductance can be varied in (A) by using the sliding contact to short out part of the coil while the input is by way of the fixed tapping points. The sliding contact is used in (B) for the input.

CIRCUIT C Parallel-tuned for use with high impedance feed point, such as a half-wave end-fed wire. The sliding contact is used for the input connection.

CIRCUIT D The same circuit as C but with the aerial connected to the sliding contact and the input *via* the fixed tapping points.

CIRCUIT E The aerial tapping point is selected here by means of two independently adjusted variable condensers.

CIRCUIT F A quarter-wave section, often known as the L-match. This is very useful for matching a low-impedance source to a high-impedance load, such as a half-wave end-fed wire. The continuous tapping is made to vary inductance by shorting out part of the coil. For frequencies including and above 7 mc it may be necessary to use quite a small value of capacity, or at least a condenser having a very small residual capacity — hence the third, single-section, condenser seen in the photograph overleaf.

CIRCUIT G The *pi*-coupler.

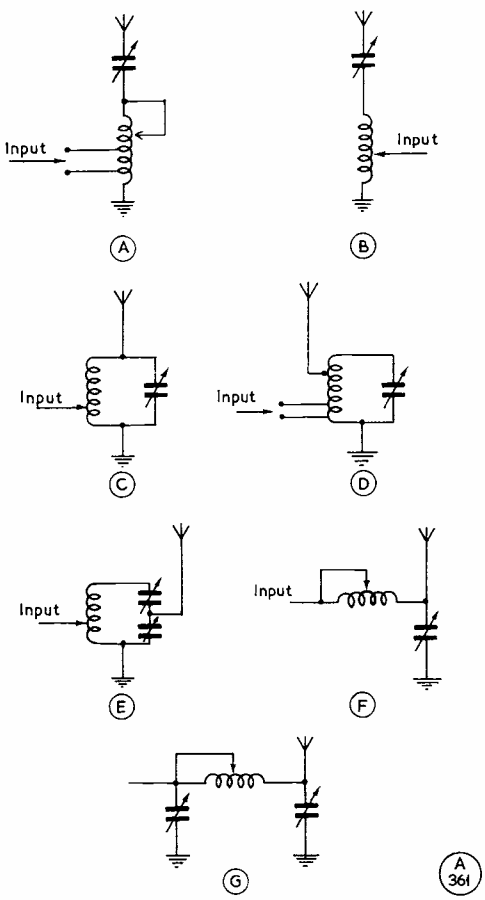
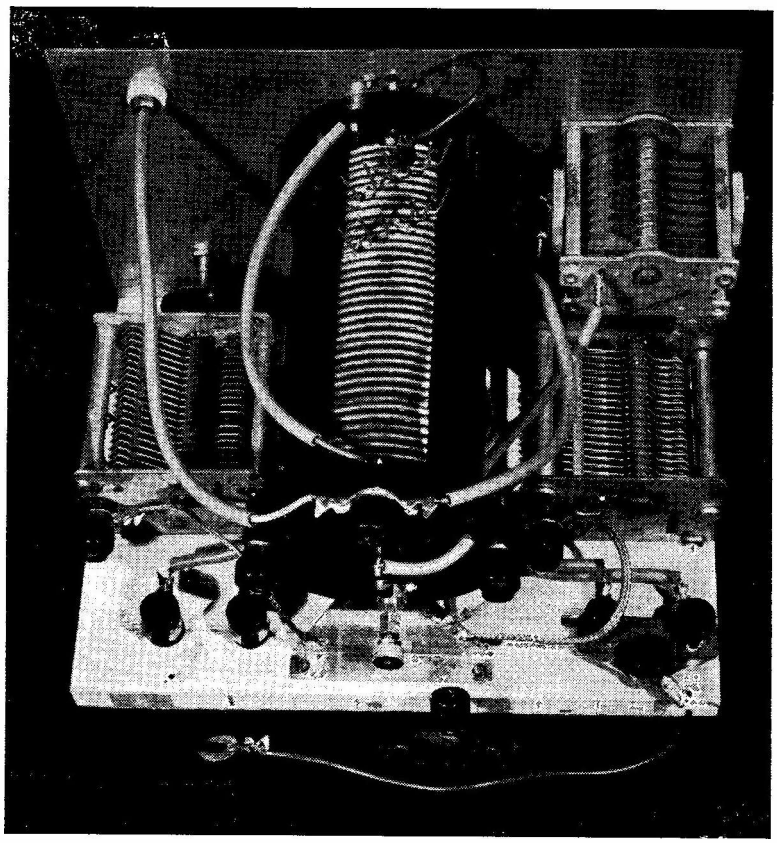


Fig. 2. With the ATU as described and illustrated, these aerial tuning circuits can be used with either transmitter or receiver.

piece of equipment described here is a compromise in that it is merely a collection of components conveniently mounted, and each furnished with a simple means of inter-connection so that circuits can be set up as required.

In the arrangement shown in the photograph a plywood base with a duralumin front panel supports three surplus-type variable condensers and a continuously tapped coil. Each is provided with insulated terminals to serve all connecting points—for instance, a two-ganged condenser has a terminal for each set of fixed plates and one for the moving plates, while each end of the coil and its sliding contact are similarly terminated.



The aerial tuning unit described by G3KAB, using surplus condensers and a tapped coil. Each of these components is separately terminated (see Fig. 1) and with this ATU the circuit configurations shown in Fig. 2 on p.143 are possible, taking care of many aerial feed situations.

Component Arrangement

The terminals of the condenser fixed plates are placed in pairs on the baseboard so that a copper shorting strap, carrying a terminal and seen in the foreground, can be used to connect the sections in parallel. They can be used individually or with both in series in which case the working voltage will be equal to twice that of a single section at half the capacity.

The first set of diagrams on p.143 shows the theoretical symbols of the individual components with terminals indicated, while the second set of diagrams suggests possible ATU circuits.

There are two input sockets on the front panel. One is furnished with a short flexible lead so that connection can be made to the coil by means of a screwed brass sleeve (extracted from a moulded plastic terminal block) to one of several tapping points composed of short lengths of thick copper wire soldered to selected turns at one end of the coil—*see* photograph. The other flexible lead permits connection elsewhere according to the demands of the particular circuit to be used.

All leads, including those exclusively for earthing purposes (which are formed from lengths of coax outer braiding) have spade ends to facilitate connection to the terminals. The bracket which supports the end of the coil is a convenient point for a heavy duty terminal with large knurled knob for the main earth lead.

The equipment, as shown, was originally designed for use with a portable station hence its rather rudimentary appearance, but it could equally well be made up in more elegant form for the permanent station. It is doubtful whether any reproduction of this unit will follow exactly the pattern shown as its composition depends entirely upon the components available. It might be an idea if several operators in a club co-operated with the supply of parts so that for field day activities several such units are available to be drawn upon as required.

SINGLE-COPY ORDERS

Readers in outlying parts, where there may be difficulty in getting SHORT WAVE MAGAZINE regularly, are reminded that if they send us a postal order for 3s. 6d. on the Tuesday before the Friday of publication (always the first Friday of the month) a copy can be posted to arrive by that day.

REPORT FROM A READER

"I have taken SHORT WAVE MAGAZINE for very many years and have built quite a number of circuits from various articles, which have worked very well. I enclose my callsign for the New QTH page, and might mention that my licence was issued on my 34th birthday — a good reminder date for the renewal, I would say."—GW3SUH, Ynyshir, Rhondda, Glam.

ONE-MAN CRANK-OVER MAST

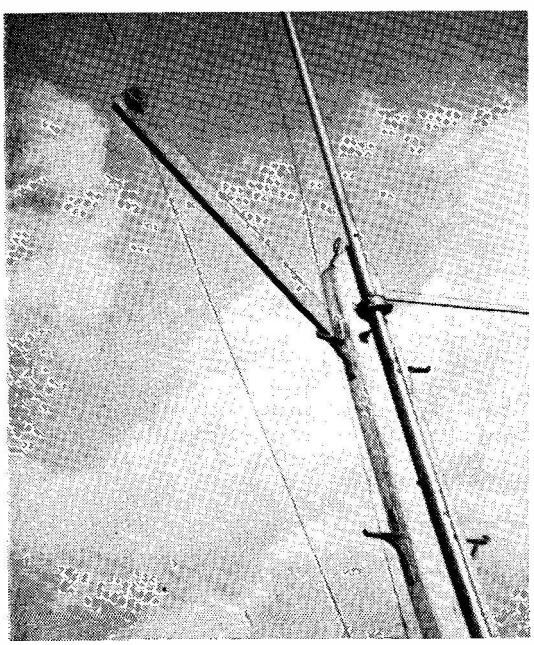
FOR HEIGHTS UP TO 40 FEET— DESIGN AND CONSTRUCTION— SIMPLE MATERIALS

B. TAYLOR (G3HWO)

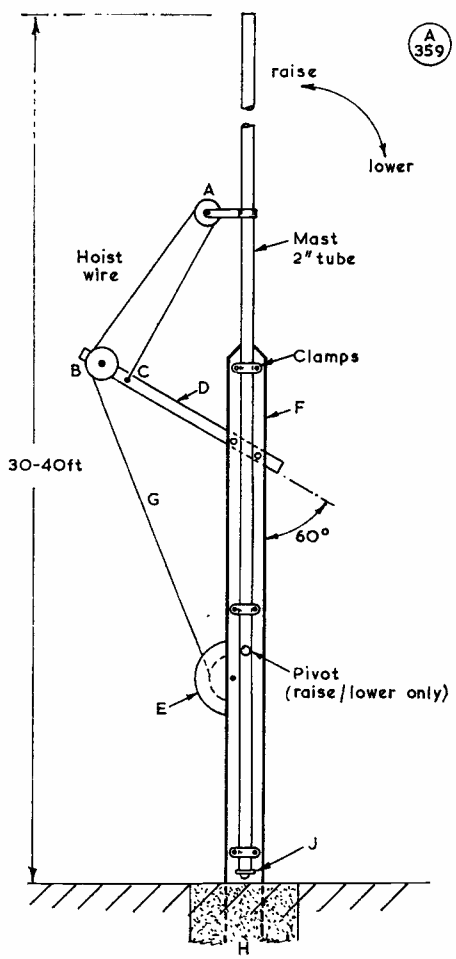
EVERY amateur who uses a beam or Quad, finds it rather disconcerting that one cannot lower, or raise, the mast without assistance if any alterations are needed to the system. During the period when ten and fifteen metres were open, the writer found himself having to depend on outside help to assist with the mast in order to work on the beam.

The set-up described in this article is in use at the writer's QTH, raising and lowering a 33ft. x 2in. alloy mast carrying a TA-33Jr. beam. Also, a similar mast design is used at another amateur's QTH, with a 35ft. mast and a Tri-band Quad.

All the parts can be obtained from the local metal-scrap and timber yards. The piece of main timber at G3HWO is 15ft. long, 10in. wide and 3in. thick. Of course, heavier timber can be used if necessary, and the dimensions given are about the minimum for a 30ft. to 40ft. mast. The timber post was put into the ground to the depth of 2ft. 6in., bedded in a concrete base, the mix being about 3 parts ballast to one of cement. Some kind of wood preservative should be used on the part of the timber which goes into the ground—the writer creosoted his and the post has been in for seven years.



The crank arm is of steel and is bolted to the main post at an angle of 60°. The dimensions given in the diagram may be varied — a higher post or a longer crank arm — but are about the minimum for raising a 2-in. mast 30ft. long carrying a Quad. The load can, of course, be started well on the way by using a step-ladder at the rest position.



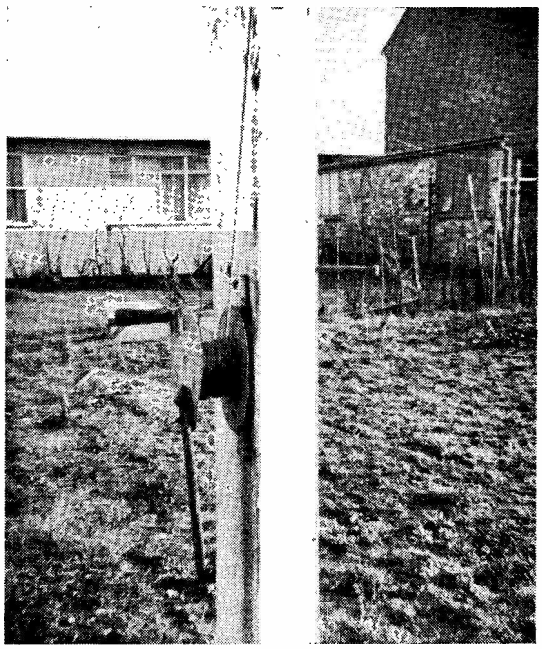
Diagrammatic layout of the crank-over mast. A, 2-in. pulley, about 8 ft. from top in 30 ft., on swivelling flange to allow for mast rotation; B, 3-in. pulley; C, hoist wire anchorage; D, crank arm, about 3-in. by 3-in. by ⅜-in. steel, 4½ ft. long; E, 8-in. diam. winch with wide flanges; F, timber stand or main post, 15 ft. long by 5 ins. square; G, ⅜-in. stranded galvanised hoisting wire; H, foot of timber stand, 2½-3 ft. into concrete base; J, footing for mast rotation.

Crank Arm

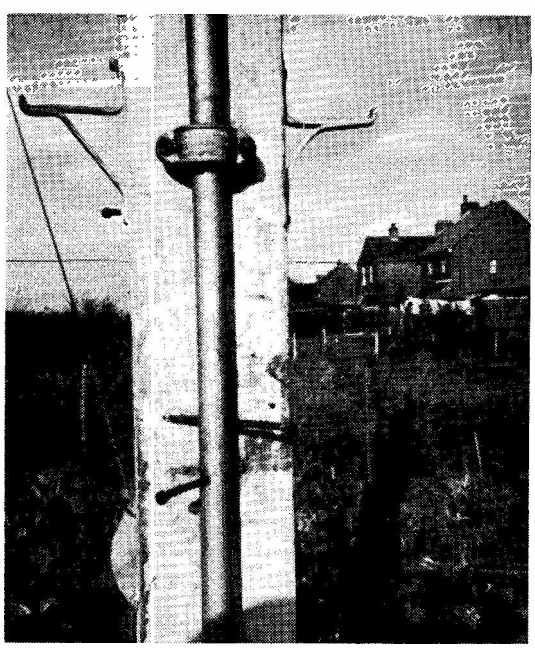
The metal arm for leverage is steel and should not be less than 4ft. 6in. long, 3in. wide, and ⅜in. thick—again, these are the minimum dimensions.

At one end of the arm, about 3in. from the end, a pulley is fixed, this being not less than 3in. in diameter, and having a centre spindle not smaller than ½in. dia., with a deep groove.

The fixing of this pulley is by having a bolt



The winch for hoisting the mast in the G3HWO crank-over design. The lever opposite the handle is to give additional purchase. The winch was picked up in a scrap yard and has a ratchet for locking against the load.



Base arrangement of the G3HWO crank-over mast. The bolts lock the mast against windmilling of the beam head and by changing their position the mast, and hence the beam, can be rotated.

through arm and pulley, the bolt extending half an inch beyond the pulley. A hole should be bored through the bolt to take a strong split pin, to keep the pulley on the bolt; and include some washers. Another hole is drilled in the arm about one inch from the outer edge of the pulley, this serving as an anchor point for the hauling wire. Two holes can be bored at the opposite end to secure the arm to the wood post. The arm is fixed to the post at an angle of about 60°.

Split-type clamps, having a ball centre of 2in. inside diameter, allow the mast to rotate. The reader may have his own ideas on the type of clamp he should use.

The winch was also picked up at the local metal scrap yard. The flanges of the winch are 8in. diameter, and the gap between flanges is 3in. A ratchet system is attached to the particular winch obtained, so that the mast can be held in any position during the operation of raising or lowering. The reader could no doubt design his own winch to suit his requirements, even if something suitable cannot be found. The wire used for hauling up the mast is the type sold by hardware dealers as XYL clothes-line. It is usually 6 strand galvanised, and is flexible and very strong. The pulley on the mast should be positioned about a quarter of the length down from the top. This pulley is the sheath type, made of galvanised iron, and is as obtainable from hardware stores, or Woolworths.

Operation

The mast during the operation of raising and lowering is pivoted on a loose bolt, inserted through a hole in the mast and the post, with a nut on to prevent it from coming out. The position for the pivoting hole is a matter of choice, the writer's being 5ft. from the ground level.

Lowering is quite simple: The clamps are dismantled, and if any guy wires are used, those which would restrict the mast from being lowered are released, and any which will fall with the mast are left in position, so that when the mast is raised again these guys will already be there.

During the operation, the pivot bolt keeps the mast from swaying about, also at the same time the lifting wire keeps it steady. When the operation is completed, and the mast is vertical, it can be locked with the pivot bolt to prevent high winds from windmilling the beam. Time of operation is usually about 15 minutes, as against a couple of hours when using extending ladders and depending on outside help.

INTERESTING MERGER

The firms of Mullard Equipment, Ltd. and Research & Control Instruments, Ltd., have joined forces to form one company, to be known as the M.E.L. Equipment Co., Ltd. All existing customer links and the products of both companies will be preserved. The new Company will operate from the existing Mullard Equipment headquarters at Manor Royal, Crawley, Sussex.

WHAT SOME READERS THINK

OF "SHORT WAVE MAGAZINE"

From time to time we circulate a questionnaire to direct subscribers. They are simply asked to say, under various headings, what their interests are, what they think about the Magazine, and whether they are agreeable to having their views published. The selection of replies given here, from the questionnaire sent out during the last four months, is strictly in proportion to all the answers received — about ten times the number of comments we can print in the space available.—Editor.

"I am an SWL just interested in radio and find most of the articles are too technical for the average beginner. The *Magazine* is in general very good but most articles are of more interest to the licensed amateur than to the man able only to follow practical circuits and layouts."

W. Owens, Crewe, Ches.

"As a licensed amateur and a professional radio engineer I would like to see the SWL items cut. The *Magazine* is not technical enough. I have seriously thought of discontinuing my subscription but I have decided to try another six months before making a final decision."

J. S. T. Ruddock, G8TS, London, S.W.10.

"I am a pre-war SWL and a post-war licensed amateur. I approve of the general style of *Short Wave Magazine*. The SWL articles are not of great interest to me but they are necessary for beginners. I have no preference for articles on particular subjects and I am satisfied with the present topics."

C. J. Morris, G3ABG, Cannock, Staffs.

"As a Merchant Marine professional radio operator and a post-war licensed amateur I like *Short Wave Magazine*. I consider you have struck a happy medium and I look forward to the *Magazine*. Anyway, the XYL finds it difficult to talk to me when I return after a six- or seven-month trip to a backlog of SWM!"

D. Aird, GM3MFE, Alloa.

"I am a post-war callsign and was a professional radio engineer until 1954. I approve of *Short Wave Magazine*, though I consider the features 'VHF Bands' and 'SWL' to be of limited value. The general technical level is satisfactory. But I speak for many when I say you have given comparatively little coverage to the subject of transistors. There is much scope for experimental work in this field—one must not be die-hard nor old-fashioned."

K. H. Varney, G3DMV, Hon. Sec., Sutton Coldfield Radio Society.

"I am a licensed transmitter, post-war, and I do approve of the general style of *Short Wave Magazine*. There are no articles I want to see cut or eliminated, and the general technical standard is about right. What I like are constructional articles and gimmicks."

J. C. Bird, G3GIH, Thetford, Norfolk.

"I would like to comment that the standard of *Short Wave Magazine* is not technical enough. Perhaps you could reduce the space on VHF, Mobile and Clubs."

Ahmed Ebrahim, AP2AD, Lahore.

"As a post-war amateur, I think far too much space is given over to SWL activities and not enough to Clubs. My subscription for the current year is not being renewed due to the fact that I find insufficient articles to interest me alone."

J. E. Alban, G3JEA, London, W.10.

"Speaking as a professional radio engineer and a licensed amateur I approve of the general style of *Short Wave Magazine*, and I find the technical standard OK. The *Magazine* is generally well balanced, with items of good interest."

R. H. Dowsett, DL2DO/G3RSV, B.F.P.O.17.

"As a beginner just interested in radio, I find your articles OK but I would prefer more about antennas, receivers and converters."

C. Wagner, OZ9CW, Copenhagen.

"Whether you like it or not, Amateur Radio is becoming more technical. Your *Magazine* should follow suit and aim to raise the standards of design, equipment and operation."

P. W. Fenwick, G3PWF, Gateshead, Co. Durham.

"Though I like the style of *Short Wave Magazine*, I think the Editorial should be eliminated! Otherwise, the articles are just right, though the bits about DX worked could be severely axed, with less moans-and-groans in 'DX Commentary.' How is G9BF doing these days—let's hear from *him*!"

P. A. Schoral, GW3PFF, Cardiff.

"I like your Editorials—some are very thought-provoking."

D. G. Snell, Aldridge, Staffs.

"Although I have not been subjected to the experience of interference from Europeans at close proximity, I find your oft-repeated attacks on some practices of other Continental countries rather distasteful. This is not quite in the amateur spirit."

K. B. Pounsett, VK2AQJ, Queanbeyan, N.S.W.

"I am sick to death of reading in 'DX Commentary' about the exploits of Gus and the big-boys. This rat-race does nothing for Amateur Radio. And how about a real honest look into a Citizens' Band, all-same U.S.A. If a man wants to

use radio to talk to his friends and relations, why shouldn't he ? "

K. C. Kates, G3PHS, Sutton, Surrey.

" Are the majority of AT-station operators interested in DX ? I read the 'Commentary,' but the length could be cut. On the whole your standard is good, but all the meat seems to come at once. Give the mixture a better stir ! "

B. E. Dean, G3OIX, Harrogate, Yorks.

" As an SWL and a professional radio engineer, I think *Short Wave Magazine* is just right."

N. Smith, Stratford-on-Avon.

" I have decided to stop taking *Short Wave Magazine* because I find that in trying to get on with my Radio Course I just haven't the time to read it. Thank you for all you have done for me in the past."

G. Curran, Glasgow.

" In my opinion, your *Short Wave Magazine* is one of the few periodicals that give good value for everybody, with a wide range of technical as well as non-technical information."

J. L. Green, G3PYF, Trowbridge, Wilts.

" I find the S.W.M. is tending to become more of a news magazine instead of the much more preferable balanced semi-technical publication of previous years."

J. R. Poole, G3MJC, Malvern, Worcs.

" A good magazine—I've been reading it for years."

W. H. Brown, G3NQX, Hoghton, Lancs.

" As a professional radio engineer and a licensed amateur since 1924, I would like to see all band reports eliminated—they are a waste of valuable space. Who cares if G3XYZ works John o' Groats, except G3XYZ. Keep the general style as it is, but make the *Magazine* more technical. I have no preference for articles on particular subjects."

N. E. Read, G6US, Oswestry, Salop.

" I very much appreciate your efforts to make the *Magazine* so entertaining topically and technically. I still have my first copies from 1938 and haven't missed a month since early 1946. Can we have some more G9BF soon, please ! "

W. G. Johnson, G2BJY, Walsall, Staffs.

" I suggest that 'DX Commentary' be cut by half and that we have 'SWL' every month. The articles are often too technical for me and I think that space could be given to more important matters by cutting out uninteresting details about readers and their thoughts. Notwithstanding that comment, the *Magazine* is excellent ! "

J. Irvine, Whitstable, Kent.

" As a professional radio engineer, I think the technical standard is just OK. What I am interested in is VHF and the transistorisation of VHF gear."

J. Wright, GW3OXU, Brynmawr, Brec.

" Though I approve of the general style of *Short Wave Magazine*, I think you should cut 'Month with the Clubs' and 'VHF Bands.' There is far too much accent on VHF, and I consider that the number of articles on this subject is excessive."

V. A. Davis, GW3OCD, Aberdare, Glam.

" Truly, a very well-orientated magazine. It appears to me that all interests in the short-wave spectrum should be well satisfied."

S. C. Chapman, PJ2AE/W1HTE, Aruba, Antilles.

" I think the general content of the *Magazine* would be hard to improve upon. There are so many partitions of interest in Amateur Radio that it must be difficult to do justice to them all. I find the tone of *Short Wave Magazine* friendly and the general style very readable. There is a place, I think, for the occasional humorous article."

E. G. Harrison, G3NWT, Sandiacre, Notts.

" Though I like the *Magazine*, the RTTY feature should be cut. The technical articles are OK but I would like to see more new-equipment reviews and a series giving a complete description, the circuit diagram and full information on modifying, aligning and repairing the more common surplus receivers, *e.g.* AR88, R.107, SX-28, the 18 Set, TCS-12 and the rest."

D. Ryan, ex-VS6CO/5A3CR, Banbury, Oxon.

" The *Magazine* is not technical enough—I prefer articles which are educational."

A. Mothersole, R.A.F., Cyprus.

" You have my blessing for the raising of the sub—I still think we get remarkably good value for money ; keep the old flag flying."

J. G. Barnes, G3AOS, Hale Barns, Ches.

" A feature I would like to see cut is 'SWL,' because it is a waste of good space which could be devoted to the improvement and instruction of all SWL's. Though I have been a devoted listener for 16 years and have amassed about 4,600 QSL cards, the art of SWL'ing is not just logging prefixes but in self-training in communication procedure and the design and construction of equipment."

J. E. Agar, Scarborough, Yorks.

" I have been an SWL for over 40 years and, as a post-war licensed amateur, I have no fault to find with *Short Wave Magazine*."

J. W. Bickmore, G3RHO, Witham, Essex.

" Very good reading all through, but not enough pages—hi ! "

A. R. Vickers, G3HFM, Knutsford, Ches.

" No adverse comment to make because I think that at present *Short Wave Magazine* does cater pretty fully up and down the scale."

R. Miles, G3HPU, Chippenham, Wilts.

We will continue trying to please as many readers as possible as much as we can!
—Editor

THE POSSIBILITY OF A TWO-METRE TRANSPOSER

SOME OF THE FACTORS

B. BOWER (G3COJ)

THE writer was interested in the comment on this topic in "VHF Bands" in the March issue of SHORT WAVE MAGAZINE. Originally, about 1957, it was thought that for BC a simple mixer, or perhaps two mixers, plus a linear amplifier giving a watt or so would be sufficient.

Experiment soon showed this to be unsatisfactory. Linearity was not good enough for sound and vision to be put through the same amplifier, and it was necessary to convert to IF and put in filters, sound traps, and so on. Similarly with VHF/FM, the idea of putting Home, Light and Third programmes through one amplifier did not last long.

For amateur working on VHF, it would undoubtedly be technically possible to design a two-metre translator (or "transposer," the term recommended by the E.B.U.) to accept, say, a 50 kc band centred on 145·9 mc and re-transmit any signals in this band over a 50 kc range centred on 145·4 mc. However, the filtering problem would be considerable and high-Q coaxial filters would be needed. Though difficult, they would be quite possible for someone with a well-equipped workshop which included a lathe. (Any competent model-maker could produce exactly what would be wanted).

Some idea of the extent of the design problem is given by the description of *Oscar III* in the February, 1963, issue of *QST*. However, an earth-bound transposer for our purpose would be far easier because: (1) Separate Rx and Tx aerials could be used, and (2) The power supply and heat dissipation problems would not arise.

The main difficulties in a practical installation are: (i) Overloading of input front end by output signal; and (ii) Spurious mixer products and noise in the output appearing at the input frequency.

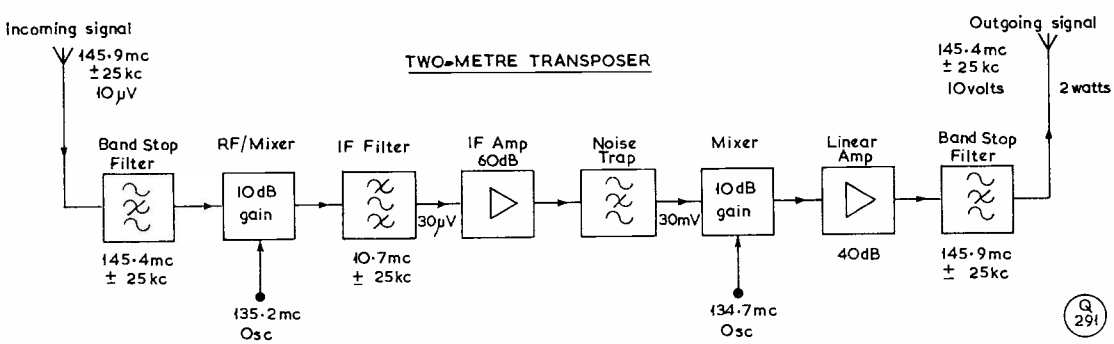
Design for A Transposer

A practicable arrangement is shown in the diagram hereunder. For convenience, aerial and circuit impedances are assumed to be 50 ohms. A reasonable objective would be to take a 10 μV input signal and transpose/amplify it to 10 volts, a gain of 120 dB and a power output of 2 watts. Of course, the RF output on re-transmit could easily be made greater, but this would mean that valves would have to be used, at least in the last stage. Since stations working through the transposer would be able to accept a received signal of much less than 10 μV, a 2-watt output would be satisfactory.

Though at first sight it might appear that for a London-Manchester link (with the transposer located, perhaps, in the neighbourhood of Rugby) the aerial system could consist of two Yagis placed back-to-back with a wire-mesh reflector between them, giving very good isolation, this has one big disadvantage: Two complete sets of gear would be needed, one for each direction. Probably something like a set of stacked dipoles, one for receiving and the other for transmitting, would be a simpler answer and an attenuation of about 40 dB between these sets of aerials might be obtainable.

Experience shows that a transistor RF amplifier (in the Rx) will stand about 10 mV of unwanted signal—above this level, cross-modulation gradually becomes appreciable. This means that we must attenuate the 10v. at the transmitting aerial by 60 dB; since 40 dB of this would be given by the aerial separation, we must find a filter which, while attenuating 20 dB at 145·4 mc, will pass 145·9 mc with negligible loss—a fairly tall order!

For this, a half-wave open-wire line short circuited at one end is a possibility, though actually it must be several ½-waves long to get a sufficiently rapid change of reactance with frequency. A length



Block schematic of the two-metre receive/retransmit unit as suggested by G3COJ, and discussed in his article. The main design problems revolve round the system of filters and traps required to separate two channels in close frequency proximity — however, it can be done, and the whole transposer, as a ground-borne device, would be a good deal simpler than the "Oscar III" project. The design by G3COJ proposes 50 kc bands, with an incoming signal of 10 microvolts at 145.9 mc re-radiated as a 2-watt signal on 145.4 mc. Operation could be automatic unattended.

of coax, however good, is not good enough because of dielectric losses. The right answer is a high-Q copper-pipe structure, and is quite practicable.

Another design factor would be some form of AGC, to prevent the transposer being overloaded by strong signals, *e.g.* a mobile parked underneath it.

Conclusion—

From this study it is evident that a two-metre transposer is technically feasible. The biggest problem might well be in finding a suitable site, and arranging for regular maintenance.

Editorial Note: As the foregoing is an authoritative comment proving the point made in the March issue of the *Magazine*, the next step would appear to be to invite the co-operation of a group of readers able and willing to design and construct the equipment. While we would be happy to give assistance, the work would by its nature be largely a labour of love in the public interest. If this co-operation is forthcoming, a survey could be started for a site and a guardian.

TRANSMITTER FOR SEVENTY CENTIMETRES

PRACTICAL DESIGN FOR UP TO TEN WATTS RF OUTPUT

THE circuit here is of a 70-centimetre transmitter designed by G3NNG and shown in the February issue of *QAV*, of the Harwell (A.E.R.E.) club group. Capable of an output of 8-10 watts on 432 mc, the DET-24 is in a resonant cavity, details of which are given in Fig. 2.

In some notes on the circuit, G3NNG makes the following points: All earthy pins should be soldered direct to chassis, and the wiring kept short and direct. The first A.2521 could be replaced by an E180F with only a slight reduction in output. A good screen should be soldered across V3 and V4 sockets to isolate inputs from outputs. In the case of V4, the screen forms part of the trough for L5.

RF chokes must be used as specified, and both heater leads of V3 and V4 need to have chokes wound to the dimensions given for RFC1; similarly, the heater side of V5 has chokes as specified for RFC4.

Grid drive is controlled by R11, and is set for maximum output at anode currents up to 12 mA; about ¾-watt of drive should be available for the PA.

The DET-24 grid is mounted in a brass ring which is insulated from chassis by mica or melinex sheet to form the decoupling capacity C21. Care must be taken to ensure that no excessive mechanical strain is placed on the valve in its mounting, or the glass-metal seals may break. The key to the construction of the cavity is given with Fig. 2.

G3NNG reports that this neat design has been in use for about 18 months with reliable and most satisfactory results — indeed, all who may have

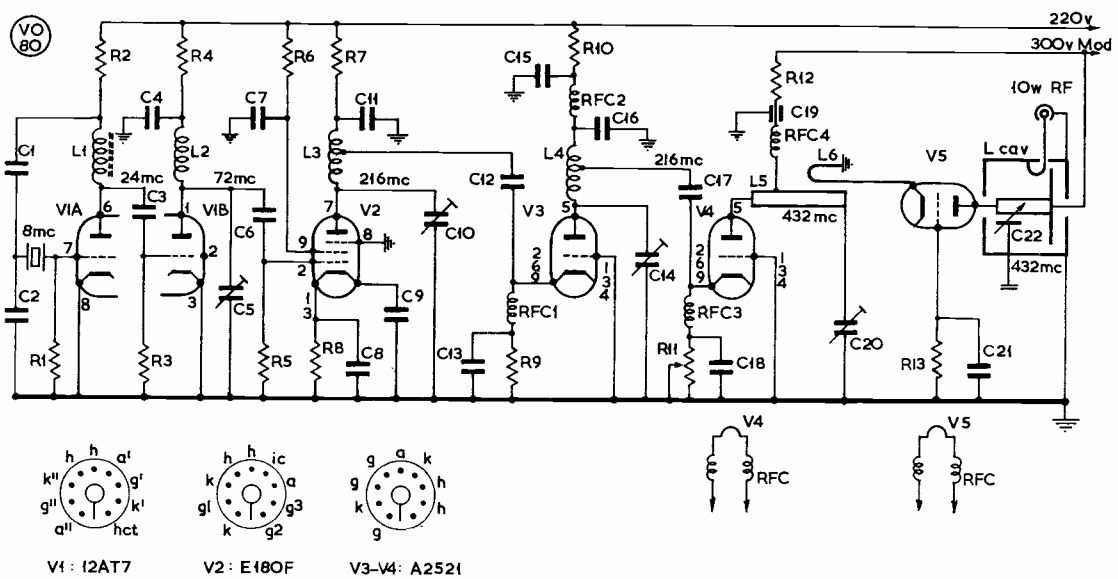


Fig. 1. Circuit of the 430 mc transmitter design by G3NNG, with a DET-24 in a cavity resonator (see Fig. 2) as the straight-driven PA, V5, capable of up to 10 watts RF output. Note that modulation is applied simultaneously to the anodes of driver and amplifier. This has been a particularly successful 70-centimetre Tx design for the Harwell club group, having won them three 430 mc contests during 1963. Note that in this circuit V3 should also be shown as taking heater chokes.

worked the Harwell group on 70 cm. field day occasions will have heard this particular transmitter, which won the A.E.R.E. boys three 430 mc contests during 1963. So it does work !

Table of Values

Fig. 1. Circuit of the G3NNG 70 cm Transmitter

C1, C19	= .001 μF	R1	= 12,000 ohms
C2, C3	= 47 μμF	R2, R7	= 4,700 ohms
C4, C7,		R3, R5	= 33,000 ohms
C8, C9,		R4	= 1,000 ohms
C11, C13,		R6	= 22,000 ohms
C15, C16,		R8, R13	= 100 ohms
C18	= .005 μF	R9	= 120 ohms
C5, C10,		R10	= 2,200 ohms
C14, C20	= 2-8 μμF, tuning trimmers	R11	= 5,000-ohm drive potentiometer
C6	= 22 μμF	R12	= 8,200 ohms
C12	= 220 μμF	V1A-	
C17	= 100 μμF	V1B	= 12AT7
C21	= *see* Fig. 2	V2	= E180F
C22	= tank tune, *see* Fig. 2	V3, V4	= A.2521
		V5	= DET-24

TABLE OF COIL DATA

L1 — 24 mc: 18 turns 26g., ⅜-in. diameter, slug-tuned.

L2 — 72 mc: 4 turns 20g., ½-in. dia. by ½-in. long.

L3 — 216 mc: 1½ turns 20g., ⅜-in. dia., tap ¼-in. up from cold end.

L4 — 216 mc: One turn 20g., ½-in. dia., with ½-in. anode lead. Tap ⅛-in. from cold end.

L5 —432 mc: 5½-in. length of ⅛-in. dia. copper rod in one-inch square trough; HT tap 2 ins. from anode.

L6 — Link, L5: Hairpin 1½-ins. long by ½-in. wide, 20g., placed ¼-in. above centre L5.

Lcav — 432 mc Cavity: See sketch Fig. 2.

RFC1, RFC2, RFC3— 20-in. length of 24g. enamelled, wound to ⅜-in. dia. to be self-supporting.

RFC4 — As RFC1, but 10in. length 24g.

Note: RF chokes as RFC1 also in heaters V3, V4; as RFC4 in heater V5.

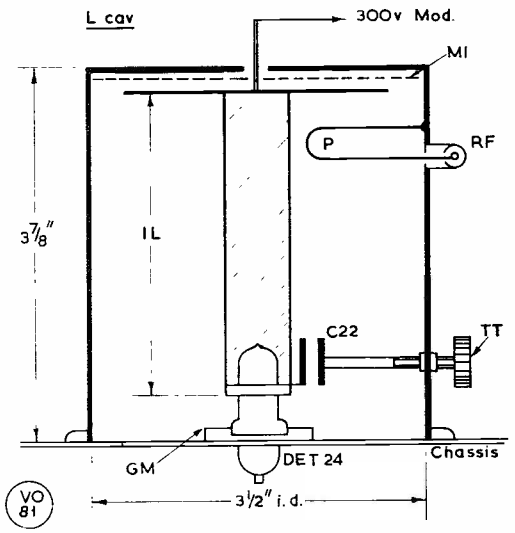


Fig. 2. *Cavity Resonator*

IL = Inner Line, 1-in. o.d., with 1/16th-in. wall, brass or copper.

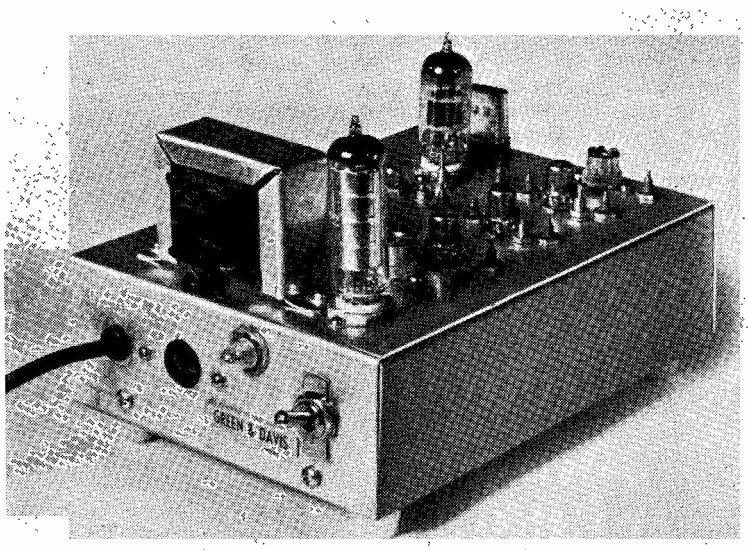
GM = Grid Mounting, 1½-in. diameter brass ring insulated by one-thou melinex or mica from chassis, forming C21.

TT = Tank Tuning, discs of ⅞-in. dia. brass on 4 BA rod, forming C22.

MI = Mica/Melinex Insulator, 1½-2 thou.

P = Probe, for taking off RF.

Notes: Construction can be in brass or copper. Anode of DET-24 clamped by disc to line to keep seal cool. Outer cavity 3½ ins. inside diameter by 3⅞ ins. long. PA HT fed to rod fixed to inner line.



The new Green & Davis 70-centimetre converter has two 6CW4 RF stages and a 6CW4 mixer ; the oscillator is a 6J6 into a 1N82A multiplier, and the tunable IF is 14-18 mc (or to order). Based on a proven " ARRL Handbook " design, there is extensive decoupling in the heater line, this being a prime requirement at these frequencies. The converter is self-contained for power and the price is 16 gns.

Miscellany

CONTROVERSY—VIEWPOINTS—NEW IDEAS, AND GOSSIP

All is not quiet on the western front . . . the ARRL's backing of a scheme for incentive licensing is regarded either as the best thing that ever happened, or as a national disaster, according to which papers you read. *QST*, the official organ of ARRL, has carried hundreds of letters in the last few issues; some back the scheme to the hilt, while others lambast the League and accuse it of trying to ruin Amateur Radio in the U.S. *CQ*, the lively independent, is in favour of the *principle* of an Advanced Class licence, but differs on matters of detail. *73*, the rebel, fairly screams blue murder against the whole idea.

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Unfortunately Wayne Green, the Editor of *73*, has published what the ARRL alludes to as "several items of particularly flagrant misinformation," thereby weakening, if not ruining, any case he might have had. First he confused the Plenipotentiary Conference, Geneva, 1965, with a high-frequency allocations conference; then he stated that the FCC would announce its decision in March this year (which it did not plan to do); and thirdly he suggested that Herbert Hoover Jr., the League's President, intended to resign this year (which he doesn't). Even if one has a strong case, it doesn't help to present it in a hysterical and abusive manner . . . when one has an extremely dubious one, even more care is needed. The "debate" continues . . .

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A correspondent who wishes to remain unidentified (and we don't blame him) writes as follows: "If this Radio Caroline thing can get away with it, what's to stop an amateur rowing or sailing out beyond the three-mile limit with a boat full of high-powered gear?" We don't know "what's to stop it," but we do not, on the whole, advise anyone to try. A small boat with a big generator, a lot of gear and a reasonable aerial system aboard might prove a bit of a handful . . . and unless the amateur in question contemplated running something over a kilowatt, he would probably do better from the comfort of his own home.

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A GM3 is thinking of taking advantage of the Beeching axe by making an offer for a redundant lattice signal tower on which to mount his beams. The base lever could no doubt be arranged to change from vertical to horizontal polarisation!

(*"GM Magazine," Radio Club of Scotland*)

— • • • —

"In addition to the boys who can never remember your name and QTH, we now have the characters who insist on giving you theirs, when you already know them." (*Letter from G3IDG*)

"To Choose a Ham:—Run a small sharp knife or skewer into it, close to the bone. If the skewer comes out clean and has no unpleasant smell, the ham is good." (*Housewife's Cookery Book*)

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"Whilst complacency, smugness and self-satisfaction have no place in one's make-up as an amateur, a little self-flattery is not a bad thing, because if we think well of ourselves we are likely to do our best to live up to our expectations. Don't forget the saying 'If you think yourself a worm, don't blame people for treading on you!'"

(*"4S7 Bulletin," Radio Society of Ceylon*)

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"No good, I'm afraid—the Continentals got a smell of the DX and now we've *all* had it. That chap who said that the British were the only nation in the world who would form a queue had something after all." (*G3-- on 80-metre SSB*)

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If you want to be "with-it" these days you have to know a tremendous amount about radio that is not technical at all. For instance, a few thousand valve and transistor designations; innumerable abbreviations and manufacturers' labels for equipment (such as TA-33, KW-77, HX-50, DX-40 and so on); and then you run into the fanciful regions of Marauders, Apaches, Valiants, Vikings, Topbanders, Joysticks, Mohicans, Couriers, and so on *ad lib*. All these you have to memorise to keep up to date, with new ones arriving every month. It is quite a feat of memory, judged by any standard.

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Now a greater menace is with us—the cryptic labelling, chiefly by American manufacturers—of all sorts of ancillaries and *parts* of transmitters and receivers. By the time you have caught up with "Nuvistaplug," you are assailed by "Channelator," "EVT," "Compreamp" (all to be seen on one page of February *CQ*). Try your hand at these, all genuine and up-to-the-minute:— Cliff-dweller, Aermotor, Power Inverter, Signal Saver, Instantune, Scotch-Master, Re-Setability, Code-O-Matic, Miniverter, Mobiltrans, Transtenna, Ni-Key, Can-Key, Mor-Gain. And then there's the other kind of advertisement, of which one of our favourites is for "Hermetically Sealed, Precision Ground, Custom Made, Non-Oven Crystals." But at least you do know, instantly, what it means.

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Strangest reason yet heard (but at least an honest one) for operating almost entirely on CW: "Every time I go on phone I feel that I'm exposing my

ignorance to all and sundry. On the key I don't have time to talk so much, and I also have the feeling that no one is really listening to what I say except the fellow I'm actually working." After a bad patch of listening on the phone bands, one somehow wishes that many, many more would stay on CW for part of the time.

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Dr. Robert Fenwick (Stanford University Research Laboratories) has propounded a theory that signals may be able to travel right round the world along the underside of the ionosphere. He asserts that "tilts" occur in the ionosphere and can be located on the maps issued by propagation investigators; and that these "tilts" can be used to give a signal a kind of double bounce into the round-the-world path. Higher frequencies than those predicted may be used; transmission is less vulnerable to interference; and transmission time over long-distance paths can be lengthened. The reflections are available over a given path for a limited time—perhaps five or six hours each day. (*"The DX-er," Northern California*)

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During 1964 the ARRL celebrates its 50th Anniversary, and the January issue of *QST* includes an absorbing section dealing with the events of 1914 leading to the formation of the League. The Hartford Radio Club was born on January 14, 1914, chiefly with the object of resolving the conflict between amateurs who used a rotary spark-gap and tuned helix ("narrow" signals!) and those who connected a Ford coil across an aerial and earth (an "all-wave" sending device and undoubtedly the original prototype jammer). In the chair at that first meeting was Hiram Percy Maxim, a famous name even then, but destined to become one of the principal architects of ARRL and, later, the I.A.R.U. He was also the original holder of the call 1AW, now immortalised by the ARRL Headquarters station W1AW.

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Something new (to amateurs, at least) in the way of broad-band amplifiers is described in January *QST*. This is described as "an inexpensive high-quality amplifier which is reasonably flat over the range 3·5 to 14 mc and is usable, but with decreasing output, up to 30 mc." High-impedance tuned circuits are eliminated by using twelve 6GJ5 tetrodes in parallel, operating at an input of 600 volts, 1·6 amps. to give the statutory kilowatt input, and an overall anode impedance of about 400 ohms. An efficiency of 60 per cent is described as normal on 3·5 and 7 mc; roughly 45 per cent at 14 mc.

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An engineer at Stanford University has developed an electronic pen recorder with a principle of operation analogous to that of the CRT. The deflection is applied to the "ink stream" by electrostatically charged plates, and the ink emerges from a finely drawn glass tube which is vibrated at 100 kc to break up the stream into droplets of ·002-in. diameter. The system is said to be capable of recording signals at frequencies up to 10 kc, and may even have amateur applications among the more enterprising.

SWITCHING THE KEY POSITION

OSCILLATOR OR BUFFER CATHODE

A. J. LLOYD (G3AKY)

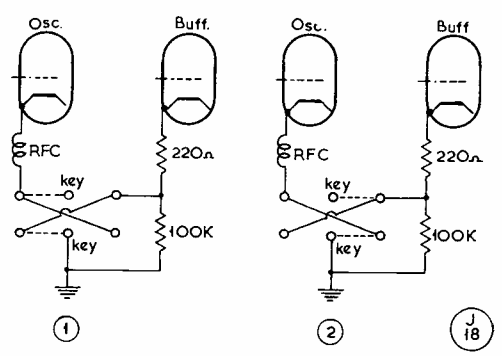
DO you prefer to key the oscillator, or the buffer, or sometimes wish you could have the option of either ? With this simple switching method you can have the choice, by the flick of a switch. It also offers the advantage that you can switch to the buffer for netting on the VFO.

As this article is meant only to describe the wiring of the switch, no other than the essential circuitry is shown; either a DPDT toggle, or a wafer type switch will do. With the wafer type, a four-way two-pole can either be used singly, or duplicated to ensure a good contact.

Figs. 1 and 2 show a double-pole changeover toggle, in the oscillator and buffer cathodes, the pecked lines indicating the switch interior connections. In the first case the RFC to cathode is left open for keying, with the switch shorting out the 100K loading resistance of the buffer, leaving the normal bias resistor (shown at 220 ohm, but varied to suit requirements) connected to earth.

Fig. 2 shows the oscillator connected through the switch to earth, leaving the 100K resistance in circuit to be keyed out.

The only difference from normal single-valve wiring is that the oscillator cathode is taken *via* the RFC to the contact on the switch, and the junction of the buffer to the opposite switch contact, with the two arm contacts taken to the key socket, making sure that the earthy side is as shown.



A simple circuit to change the keying position between the cathodes of the oscillator or buffer.

S W L • • • • • •

NEW READERS, AND OLD READERS LEAVING WITH A CALLSIGN—QSL's AND THE BROADCAST LISTENER—DX CONDITIONS—THE MAY R.A.E.

READERS of this feature come and go; we first meet them as raw novices who don't know what "HPX" stands for, and who imagine that the fact that they have heard a DL on Twenty will interest the great big world outside! After quite a brief period, it seems, many of them write to say that they have just become G3---, and will we please remove them from the tables as they are going to Another Place. It all rather confirms the feeling that this feature is worth while, especially as so many of these "birds of passage" turn out to be very good amateurs who set themselves high standards.

To deal first with the newcomers this month:—*R. S. Finley (Kenton)* is now thirteen, but started last year with a Japanese RX-60 receiver. He added an RF stage, made the wiring more rigid, and now writes to say that he has heard 153 prefixes on it in *less than three weeks!* So he's on the Ladder already. A two-metre cascode converter (as described in the September, 1963 issue) is also on the way.

J. W. Smith (Tunbridge Wells) became interested only six months ago, and now claims 223 prefixes and 95 countries—pretty fast going; his main interest is 15 metres. *R. J. Smith (Littlehampton)* also started about six months ago, but in a rather big way, with an AR88D; much of his DX has been on the same band.

J. E. Hart (Leeds) is fourteen, and his first efforts have been with a Philips transistor set covering Forty and Twenty, and, later, a Codar Mini-Clipper for Eighty; he, too, joins the ladder with 154.

V. Lear (Wallasey) might be described as both a joiner and a potential leaver. Although only fourteen, he takes the R.A.E. in May, and can already copy 15 w.p.m. on CW.

Graduates

In contrast to the foregoing "joiners," two regular supporters report that they are "leavers." *Roger Western (Torquay),* who occupies the top position on the CW Ladder, is now licensed as G3SXW. (His late father was G3LFL and his mother is G3NQD, so there is a fine tradition to carry on.) Roger writes: "I found SWL'ing exciting, interesting, in fact absorbing; but I now find that operating has all these qualities to a greater extent, and more besides." He congratulates *R. Hunter (Kenton)* who now takes over the top place on the CW list, and advises him to watch out for Barry Curnow, a close friend of Roger's who is determined to get to the top!

Ron Smith (Manchester) "retires" with a CW score of 225, being now licensed as G3SVW and operating on CW only. In his last report to us, he queries an XC3 and an OB1, both heard on Twenty CW, and asks whether they are pirate or commercial. We don't know!

Old-Stagers

J. E. S. Paterson (Hatch End) is an old timer amongst SWL's, now using a Philco "Tropic" 3741, six years old and going strong with a Joystick and Joymatch ATU Mk. III. He joins the HPX Ladder with 385, and suggests that "VPX" might be a better idea, for *verified* prefixes only—in which case his score would be 250. And he adds "Good to read that our SWL's seem to have adopted a saner attitude to the QSL situation . . . it is an honour to receive a QSL from an amateur, and a *duty* to send a sensible report, if you intend to send one at all." (But more on this QSL business later.)

H. G. Shaw (Heswall) who has headed the Phone-only Ladder for a very long time, now makes his total up to 700 and says that it is time for him to pull out. "Lots of the boys now competing have no chance of adding scores and scores of prefixes no longer in existence—also the search for new prefixes is making me ignore much of the best in Amateur Radio, such as listening to old friends." Too true—just as chasing only the "super-DX" becomes an obsession among certain transmitting operators, so the frantic search for "new ones" can deprive an SWL of much more leisurely enjoyment. Congratulations, then, to SWL Shaw, whose 700 will stand unbeaten for quite a time, we imagine. He intends to start again, probably with SSB only.

We could hardly have an older old timer than *F. W. Hattemore,* a reader of SHORT WAVE MAGAZINE since No. 1, who now writes from Jamaica. Since arriving there six months ago he has been living in hotels, with no gear available. However, he shipped a "complete station" on departure from the U.K. and this has now arrived. By now he should be an active SWL once more, and he will be applying for a 6Y5 call shortly (yes, those 6YA monstrosities have been put right at last, and 6Y5 is now official). He will be listening for the Top Band DX, if not taking part in it, next season.

This QSL Business

K. C. Staddon (Stroud) says that he used to send out QSL's "willy-nilly," and as a result he got no replies; but having learned the hard way he is now beginning to see the fruits of good reporting, with cards coming in.

J. A. Cawkwell (Newark) writes "As a newcomer I don't know which stations might be glad of a report—I might receive a station who had complete knowledge of his range and capabilities who wouldn't want a report, or send a card back." Too true—a lot of reasoning and common sense is needed. Reports are of no real interest to, say, a DX station who is working strings of G's; the knowledge that a British SWL also heard him would mean

absolutely *nothing*. The weak station continually sending CQ's and apparently getting nowhere is far more likely to appreciate an SWL's efforts. But this has all been said before.

G8ON (Worksop) writes "Almost every SWL report I get is completely valueless, often inaccurate, and always Q5, S9 and *please* QSL." He suggests that SWL's who are really listening to a station should check that the gear he describes to others does not make the result remarkable. Presumably if he "comes in like the BBC" he no more needs a report than the BBC do ! G8ON continues "My hobby is an escape from fairly onerous office work, and no one is a friend who sends me back to the treadmill of paper work even for a few minutes. For this reason I object even when an s.a.e. is enclosed." Well, that's plain enough speaking, and obviously you will make a friend of G8ON by *not* reporting on his signals.

J. E. Paterson had a card back from one G station worded "Thanks report, but suggest 2,000 miles is minimum distance for SWL reports on 15-metre sigs." But another one says "Nice to get a card that is not usual run-of-the-mill stuff I receive from every SWL."

The only way we can see of summing it all up is this: Before writing out that card, ask yourself "If *I* had that particular station and had just made that transmission, should *I* be glad if a lot of cards informed me that SWL's had heard me ?"

Broadcast SWL's

A recent paragraph about non-QSL'ing broadcast stations has fairly infuriated a section of our readers, who accuse us of writing off broadcast SWL's as a useless lot of clots ! Not at all—listeners to broadcast live in a very different world from amateur-band listeners and have their own problems. To be very proficient in that field you have got to be something of a linguist, to start with —foreign broadcasters, unlike many foreign amateurs, don't speak pidgin English !

Chris Mitchell (Ewell) says that it is more difficult to log BC stations in 150 countries than an equivalent number of amateurs. He listens to both and thinks that broadcast provides "a far harder and often more exciting DX medium than amateur-band listening." *T. E. Sloan (Enniskillen)* expounds on the greater difficulty of getting return QSL's from broadcast stations, and suggests that such a QSL often involves one or two hours' listening and perhaps 45 minutes spent writing the report in any language from Spanish and Brazilian Portuguese to French or Arabic (whereas an amateur-band SWL tears off a dozen cards an hour by quickly filling in some blank spaces).

J. Fitzgerald (Great Missenden) makes a point when he says that broadcast SWL's who deluge the high-powered stations with QSL requests are regarded in the same way as amateur-band types who behave in similar fashion. And this is what it all boils down to—that SWL's, whether broadcast or amateur, come in all sizes and shapes, both physical and mental. And the good ones are better than the bad ones ! So let's leave it at that.

Fifteen Metres

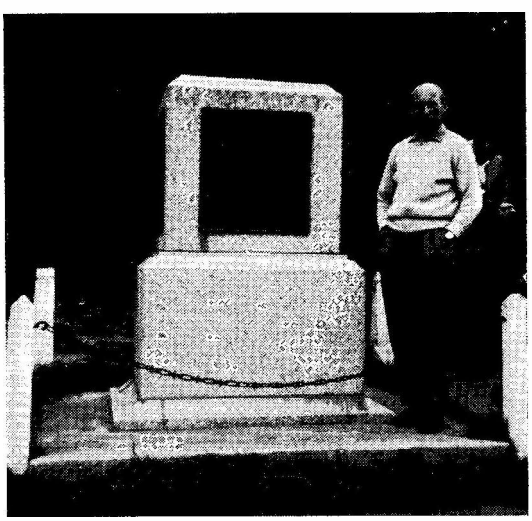
Several comments come in to the effect that *Fifteen* is now a most intriguing band. On one level it appeals to those whose SSB technique is not so hot, since it still carries a lot of AM phone ; on another it is a good band because you can hear the DX, whether CW or phone, without having to plough through masses of Central and Eastern Europeans to get at it.

J. W. Smith (Tunbridge Wells) says "May I plead with all 15-metre amateurs who read this to put out two or three CQ calls at an appropraite time, for I know many who spurn this band without realising that all continents can be worked with comparative ease at some time, most days." He heard such good ones as CR5SP, AP2NQ, 9Q5HF, 6W8DD, 6YAUC and many others at times when the band could have been assumed dead. *R. J. Smith (Littlehampton)* is another who heard some good stuff on Fifteen, although he is dissatisfied with his results on other bands.

Club Influence

It's good to see sundry references to local clubs by some of the keen listeners, and even better to note that we have not yet come across a disparaging one. *C. R. Garnham (Stevenage)* says that his "local" has a large number of SWL members, and that the help and encouragement they have received from the transmitting members leaves nothing to be desired.

G. S. Bunting (Birmingham) tells us that he is developing an interest in VHF portable operation, mainly because of that kind of activity in his local



When G2BP was near the Needles, in the Isle of Wight, he found this memorial plaque commemorating the wireless station established on the site by Marconi for his original tests across to Poole and Bournemouth in the 1898-1900 period. It was these results which first proved the feasibility of reliable radio communication.

club (Dudley).

Those who read this and *don't* belong to a club in their area should start investigating at once. It's generally safe to say that nothing but good will come of joining.

Generalities

Terry Popham (Exeter) queries the prefix AJ—he heard AJ6AG working a W. It is one of those allocated to the MARS network (Military Amateur Radio Service) at U.S.A. stations spread around the world, all of whose prefixes begin with "A."

Stewart Foster (Lincoln) points out that UY5's may now be heard from the Ukraine; and that F5 calls are being issued for the first time in France. He was very pleased to log XW8AW/BY (China) and JT1CA during the month. Unusual prefixes mentioned by *Dave Whitaker (Waddington)* are SM/ZC6 and AL9—the latter was used in Algeria, in between FA and 7X2.

Terry Bucknell (Chesterfield) asks whether /MM's count at all? Yes, they do, providing their *prefixes* are all different. *J. R. Eveson (Bromsgrove)* has notched up 192 prefixes with an R.107 (unmodified) borrowed from his School Signals Platoon—although he's on the look out for something better.

Terry Popham added 77 prefixes to his total and thinks Twenty is "in terrific shape for DX." But he dislikes the phone-patch traffic and suggests "the tripe that is emitted from some of these offenders is a bad example to the amateur radio fraternity."

Gil Bunting (Birmingham) is glad to find Twenty open until 2300 again and has heard lots of good stuff thereon—but "A" levels are slowing him down now . . . *J. D. Williams (Winchester)* is surprised at the ups and downs of the same band—sometimes very little, sometimes cram-full of W stations. He heard TA4HA and asks whether Turkey is active. Well, perhaps "active" is not quite the word, but this station appears to be OK, and might be described as legitimate but under cover.

S. N. Gall (Old Coulsdon) harks back to that little discussion on home-brew in the March issue, and says he has always built his own receivers, the latest being a double superhet. He gets more satisfaction from hearing good DX on his very own receiver, and in any case couldn't afford "£100 plus" for a job which he could build at home for £20. Just a word to infuriate the phone enthusiasts: "I listen on CW because phone signals are often too restricted in frequency response, and because of the absolute drivel some of them put out." And a final thought: "What do non-constructor SWL's do when their receiver breaks down—send it to the local radio and TV repairer?"

R. J. C. Coats (Cowie) is right up near the top of the Phone ladder, but says he hopes to make an entry in the CW section soon. The reason why he is learning Morse is not far to seek, and he might well show up as a GM3 - - - one of these days.

Malcolm Healey (Horsham) is another who has been busy at CW and also constructing some gear for the great day. He has built a "device" giving check points on 100 kc, 1 mc and 2 mc, and it stays on tune with Rugby (MSF) on 5 mc for a whole day, starting ten minutes after switching on. He hopes to add 10 kc and 1 kc markers, a VFO and 400-cycle modulation. (It will be quite a gadget by then.) Meanwhile, he listens on all bands from 70 cm to Eighty, and even likes Forty!

HPX LADDER

(Starting January 1, 1960)

Qualifying Score—150

SWL	PREFIXES
PHONE ONLY	
H. G. Shaw (Heswall)	700
A. W. Nielson (Glasgow)	631
R. J. C. Coats (Cowie)	624
D. Douglas (Dundee)	619
R. Hunter (Kenton)	578
D. S. Smith (Stanmore)	514
R. R. Loe (Colchester)	502
S. Foster (Lincoln)	482
B. Curnow (Plymouth)	480
F. Bourne (Plymouth)	450
C. N. Rafarel (Poole)	448
D. A. Whitaker (Waddington)	447
D. A. Pickup (Preston)	428
K. C. Staddon Stroud)	424
M. Vicent (Cheltenham)	406
P. J. Lennard (Wartling)	398
P. Baxter (Winchester)	394
M. Healey (Horsham)	384
A. F. Huggett (Lamberhurst)	360
B. Cushing (Whyteleafe)	340
N. J. Summers (Market Harborough)	319
M. Woollin (Leeds)	315
F. B. Blake (Beaconsfield)	309
T. R. Popham (Exeter)	302
D. Cree (Newark)	284
R. Garnham (Stevenage)	268
A. Stone (Kidderminster)	267
A. F. Roberts (Kidderminster)	255
P. Etheridge (Hull)	251
J. R. Daws (Leeds)	251
M. A. French (Highbridge)	250
G. S. Bunting (Birmingham)	242
I. Buffham (Spalding)	240
D. C. Parker (Redditch)	233
P. R. Doughty (Loughborough)	226

SWL	PREFIXES
PHONE ONLY	
G. C. Fermor (Exeter)	226
J. W. Smith (Tunbridge Wells)	223
P. A. Cayless (Exeter)	221
C. Whaley (Cambidge)	220
C. G. Ivermee (Reading)	219
D. H. Doff (Wallington)	214
J. P. Fitzgerald (Gt. Missenden)	213
M. J. Gilding (Kenton)	212
T. Bucknell (Chesterfield)	208
P. R. Ball (Sligo)	201
J. L. Pearce (Basingstoke)	196
P. H. Moncaster (Goole)	196
J. N. Eveson (Bromsgrove)	192
C. Cummings (Manchester)	191
A. E. Beales (Clacton)	186
B. J. Turner (Westcliff)	186
H. Wolton-Carr (Cambridge)	182
K. M. Duggan (York)	173
C. Read (Hatch End)	167
N. C. Butler (Liverpool, 16)	163
J. E. Hart (Leeds)	154
R. S. Finley (Harrow)	153
CW ONLY	
R. Hunter (Kenton)	512
B. Curnow (Plymouth)	461
P. J. Lennard (Wartling)	449
C. Thomas (Salford)	368
J. D. Williams (Winchester)	346
K. M. Duggan (York)	320
M. Vincent (Cheltenham)	311
R. P. Smith (Manchester)	225
M. Healey (Horsham)	223
D. Douglas (Dundee)	157
I. Buffham (Spalding)	151

(NOTE: *Listings include only recent claims. Failure to report for two consecutive issues of "SWL" will entail removal from the table. Next list, July 1964 issue—deadline, May 29).*

Eighty Metres SSB

Quite a few of the listeners who prefer their DX on the more difficult bands have been getting lots of pleasure from the DX SSB on Eighty, but the season for that has just about closed. However, some of the less usual ones heard include K7EUA, W5MYM and HC8FNN (by *B. F. Hughes, Worcester*); YA5A, VP7NS and XE1IL (by *M. Woollin, Leeds*); TI2JUC and HK4AB (by *Chris Cummings, Manchester);* and many long lists of W's and run-of-the-mill stations by others.

Barry Curnow (Plymouth) mentions that Roger Western, G3SXW, already alluded to in an earlier paragraph, has lost no time in working his first W station (with ten watts, and ten days after getting his licence). Barry was glad to be able to send G3SXW his very first SWL report! Other highlights of the month were the logging of three new countries on *Top Band*—CO2CY, VP7NS and HK4EB, and some

very nice DX, including XW8AW/BY, on Forty.

J. R. Eveson (Bromsgrove) says he would like to see a "Top Band Counties Heard" list in this feature; and we might well start something like that towards the end of the summer. John says it was the local Top Band net which first introduced him to Amateur Radio—when playing around with an old commercial receiver he "heard odd people talking." Just how odd, he's since found out!

John Woodham (Bristol) passes on a message from 9Q5RK, who wants the word spread around that he is not interested *at all* in receiving SWL reports from countries that he is actually working, and that he will not reply to them. He adds "I will go to the trouble of sending one of my cards direct to an SWL if he reports that he heard a CQ of mine which was not answered, or if he is in a country that I have not contacted yet."

Chris Whaley (Cambridge) sends a "potted history" of his gear:— 1960, home-built TRF receiver (5 valves) and a 70-ft. wire; 1961, an R.1155 (an improvement); 1962, a Bendix RA-1B and a new aerial; 1963, a CX-300/1, and dipoles for Fifteen and Twenty; later, a Codar PR.30 preselector; 1964, a K.W. Geloso converter. Future projects, a ten-metre beam, a Q-multiplier, S-meter and product detector . . . also a climb up the HPX Ladder, on which Chris makes a start with 220.

Dennis Boniface (Ripon) says there's been nothing to report in the DX/TV line during the past few weeks, but he is all ready to go—with several new aerials, two TV receivers and a sound-only receiver for Band I.

M. Vincent (Cheltenham) agrees with the statement that most of the CW QRM on the phone sections of the bands comes from commercials, not amateurs. He has not done much DX listening of late, being involved in the building of a two-metre converter with a 10·7 mc IF.

R. G. Hunter (Kenton) — now at the top of the CW ladder — thinks the HF-band conditions have really started looking up. He notes that W6's have been heard of Fifteen at 2000 GMT — both CW and phone — to say nothing of shoals of South and North American stations up to a much later hour. One-sixty has also been investigated (eight countries heard in one evening) but SWL Hunter says "the night-life on this band is not for me."

R.A.E. Coming Up!

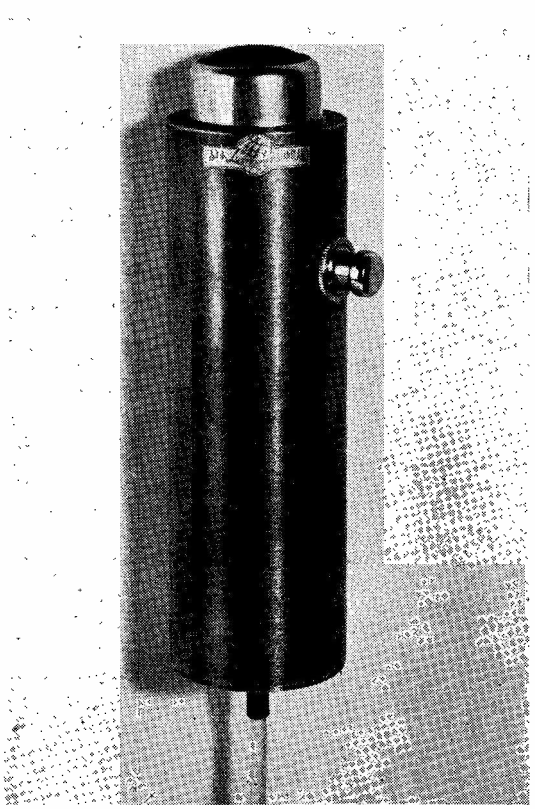
Entrants for the May sitting for the Radio Amateurs' Examination should take due notice of the paragraph on p.87 of the April issue, concerning the December results. The pass rate was high (76 per cent) but some of the questions were surprisingly badly done. The two compulsory questions in Part 1 brought forth interesting comments; Question 1, about licensing conditions (as always) was far better answered than the corresponding question in the previous examination—showing that candidates had done their homework rather better. But Question 2, concerning the suppression of spurious emissions in a PA stage, showed some confusion.

As always, the questions impressed us as being excellently chosen and completely representative of what a would-be transmitting amateur should be expected to know. Those who failed, it is felt, did so entirely through lack of study and preparation, and would probably *not* have been a credit to the amateur fraternity until they had covered the ground more thoroughly.

And, need we add it, good luck to all SWL readers who are taking R.A.E. this month.

Correspondence for the next appearance of this feature, in the July issue, should reach us not later than May 29, addressed: "SWL," c/o The Editor, Short Wave Magazine, 55 Victoria Street, London, S.W.1. Good photographs of SWL interest are always wanted for illustration, and are paid for on publication.

SWL • • • • • • *continued*



This is the Lustraphone D59/RT miniature microphone/transmitter, designed to work into the Lustraphone short-range communication system. It is an exceedingly interesting piece of apparatus, fully transistorised with the battery in the housing; all you do is to hold it, and speak; it has an automatic voice-operated gain control. The D59/RT is designed to work on the 175 mc band reserved for commercial services, and conforms to the G.P.O. specification for such apparatus.

RTTY Topics

INCREASING T/P ACTIVITY — FIRST RTTY /M CONTACT! — OPERATING NEWS — NOTES ON KEYER TYPE FSK.2

W. M. BRENNAN (G3CQE)

The March contribution in this series dealt with Polarised Relays in some detail, and this month our contributor discusses a new Keyer Unit. Correspondence from readers interested in RTTY is invited, and may be addressed c/o The Editor.

RTTY activity has never been higher than the level it has reached during the last few weeks. Even 15 metres has provided some QSO's between Europe and North America. In the U.S.A., there has always been a reasonable level of T/P working on 40m. and these days the American amateurs are putting the 7040 kc spot to good use for working DX such as FG7, YV, KP4, XE and so on. There are also signs that some of the European stations are beginning to dust off this section of their receiver dials, too. Twenty metres has certainly been the most active band of the lot, and during one Saturday afternoon and evening of monitoring recently there was hardly a five-minute period in which there was no RTTY signal audible in the 14090—14110 kc section of this band. G2HIO, G3NAE and G8DD seem to be the chief representatives of the U.K. on Twenty and G2HIO reports some excellent QSO's, including a three way with FG7XT and YV5AWV during which the signals were stronger than the usual inter-G signals on 80m. Some of the 20m. stations reported this month are: ZL1WB, KW6DS, HL9KP, FG7XT, ZS1FD, ZS6UR, W8BZB/HC2, YV1EM, YV5AWV, LU1AA, XE1YJ, KP4GN, SVØWN, 5A5TR, 5A3TX, VE2, VE3, VE4, and all W call areas. Nearer home we have: OY7ML, SM6CSC, I1RIF, LA6VC, OZ8US, DL1VR, DL1LK, DL3IR, DJ4KW, DL4IA, DL4VR, DL9EX, F8KI and others. EP2RW (Iran) is also testing some newly-arrived RTTY gear and should stir up the dust a little from Asia by the time you read this. The recent release of surplus T/P's by the Danish Government to their amateurs has resulted in an overnight increase in the numbers of OZ stations on this band, and according to OZ8US there are still more printers to come. On the other hand, the T/P with which SM6CSC has put Sweden on the RTTY map had to be sent from the U.S.A. by W6BZL.

Business has also been brisk on 80m. with some newcomers helping to swell the numbers. Some T/P's offered for sale in SHORT WAVE MAGAZINE were quickly snapped up and should result in several new RTTY operators shortly. Sunday is the high-activity day and most operation takes place between 3550 and 3590 kc. The test transmissions between G6CW and G2HIO have proved to be a meeting point for most of the gang. The tests are intended to help those who are setting up their equipment and they are transmitted at both the 50 and the 45·5 baud speeds with a standard 850 c/s shift. From time to time a further test is run using the narrower 170 c/s shift. These tests commence at 1100 BST. Those present on this band include: G2CVV, G2DSF, G2FUD, G2HIO, G2UK, G3CQE, G3HVB, G3KOS, G3LLV, G3NAE, G3NRM, G3OBZ, G6CW and G8DD. On the DX side, FG7XT and YV5AVW have arranged skeds with DL and G stations for some trial runs on 3620 kc.

Two metres has not been particularly good as far as propagation is concerned. Nevertheless, G6CW (Nottingham) was able to report some very good QSO's with stations in London, Kent and Southampton. He is active every evening on RTTY and SSB around 1900 to 2200 BST on a frequency of 145·35 mc. Others wielding keyboards on two metres include G2AFD, G2DZH, G3BPT, G3CRH, G3GGR, G3LAY and G3MDH. Gradually the 2m. RTTY stations are changing over to the use of FSK these days and finding it a big improvement over AFSK. As one correspondent puts it "The difference is rather like adding another stack to the beam—at both ends."

It Was Bound To Happen

It has always been a pretty safe bet that one day someone would come up with a mobile RTTY QSO and here we have it! WØICS/M has been working several other W/RTTY stations on 20m., using a Tx with an input of 12 watts. These contacts have actually taken place whilst the car was in motion. Perhaps it is superfluous to add that the operator was not driving the car as well as the keyboard. WØICS is on the lookout for some DX QSO's. What next? Well a mobile-to-mobile contact, of course! Joking apart, anyone who has ever casually thought of the problems involved in using RTTY from a car (the printer motor supply, the keying supply, the T.U. and its power supply—in addition to the normal Tx and Rx set up) will readily admit that this is no mean feat. This particular "first" has been well earned.

Under the same heading comes another piece of news from nearer home. For some time now it has been obvious that as far as RTTY is concerned in the U.K. something has been lacking—activity from GW. It therefore comes as no surprise to learn that plans are afoot to produce some on a "Do-It-Yourself" basis! The Nottingham Amateur Radio Club are planning a domestic DX-pedition to Montgomeryshire during the week September 12th to 19th this year. Using the call-sign GW2HIO, they propose to operate RTTY on all the HF bands and 2m. Again this venture will

require a lot of organisation and hard work—the sort that makes a field day look like something of a rest cure. Nevertheless, if there is one group in this country with a great deal of RTTY and NFD experience it is certainly the Nottingham lads.

Don't Hide That RTTY Gear

Most of the older hands on RTTY can recall just how difficult it was to find T/P's and other associated gear three or four years ago and how some machines were then made up from parts collected from several different sources. In some cases it took months to get hold of one missing part even with the full co-operation of other enthusiasts. In actual fact, these early difficulties had their compensations because it almost became a point of honour to help get another T/P on the air and this fostered a spirit of mutual help that is now almost taken for granted in RTTY circles. These days, the supply situation may appear to be much easier to those who are fully set up with a printer and tape equipment. Whilst there are certainly more machines and T.U.'s about, in actual fact, a little research has shown that the demand for this gear is such that it appears that for every such item there are something like three or four would-be buyers in this country. Many T/P operators own more than one printer and in the main the second machine is hardly (if ever) used. If therefore you have any such items lying idle, why not find them a good home and help to get someone else on the air ?

Frequency Shift Keyer Type FSK.2

Some U.K. stations have recently been able to purchase a commercial frequency shift keyer unit, namely the A.T.M. Type FSK.2 and also its associated power supply unit the FSK.2.2. These are in fact the companion units (on the transmitting side) to the now well-known terminal units and associated gear in the FSR and FSY series. The FSK.2 is a complete FSK exciter which gives an output of 4 watts in the frequency range 2 to 6 mc. The amount of frequency shift is variable from 0 to 1,000 c/s and the degree of the shift in use is indicated directly on a meter. With the companion unit, the equipment is completely self-contained and requires only a 230v. AC supply and a keying signal in the 50 to 150v. range. This equipment is quite complex and employs some 18 valves plus a voltage stabiliser, a barretter and a neon. In the unit itself, the latter are labelled as "valves" and so the valve numbering runs from V1 to V21. On the face of it, this may seem rather a large number of valves to achieve something which most amateurs attain with either a double diode or a single triode. This is, of course, a gross over-simplification and it is worth looking a little more closely to see what all these valves are doing.

Basically, the unit consists of a high stability 400 kc self-excited oscillator (V7) using an ECC35. This stage is frequency-modulated at the keying freq. by a reactance valve V5 (an EF37A). The output from the oscillator is passed to a balanced modulator which consists of two ECH35 valves (V8 and V9). The other input to the balanced modulator comes from a xtal oscillator *via* a buffer stage (V12 and V10) an L63 and an EF50 respectively. Any one of four xtals or an external oscillator can be selected by means of a switch. The xtals are housed in a thermally stabilised oven. The actual xtal freqs. are the required output freq. plus 400 kc. The output from the balanced modulator is tuned to the difference between the two input freqs. Further discrimination against the unwanted products in the output of the balanced modulator is provided by other tuned circuits in the anode of the following buffer stage (V15) an EF50, and also in the PA stage V19 (807). The PA stage gets both cathode and drive bias, and the bias voltage on this stage is used to control the deflection on the target of an EM34 magic-eye tuning indicator. The unit also provides facilities for phase modulating the FSK signal at a frequency of 200 c/s. This was intended to combat the effect of selective fading on radio T/P circuits and in the companion terminal unit there is a low-pass filter which removes this phase modulation component at the output of the discriminator stage. V3, an L63, is employed as a 200 c/s oscillator and its output is fed to V5 (the reactance modulator). A switch is provided to disable the 200 c/s oscillator when the PM facility is not required. Both V21 and V22 are diode limiters which restrict the amplitude of the keying signal before it is passed to the grid of the reactance modulator.

An interesting feature of this unit is the provision of a meter which indicates the amount of frequency shift being employed. An ECH35 triode-hexode (V1) functions as a xtal controlled mixer with the xtal frequency of 397 kc. The 400 kc signal from V7 is mixed with this frequency to provide a 3 kc output. This audio freq. is amplified by V4 (EF37A) and then limited by a limiting amplifier V6 (ECC35) before passing to a pair of diodes in a simple counting circuit. The output from these diodes is proportional to the input frequency and produces a deflection on the meter. The deflection due to the 3 kc difference between the xtal and the self-excited oscillator is normally offset by a backing-off voltage which reduces the meter deflection to zero ; thus, any further change in frequency due to the FSK can then be read directly from the meter and so enables the operator to set up the required freq. shift.

V11 is a 5U4G used as a normal rectifier in the power supply and V14, V16 and V17 (KT66, EF37A and 85A1 respectively) are in a typical series valve voltage stabiliser circuit to provide 225v. regulated HT. V18 is a barretter which provides stabilisation of the heater current to the two main oscillator and the reactance modulator stages.

The tuning controls of the xtal oscillator, the balanced modulator, the PA buffer and the PA stage itself are all ganged so that only the correct (difference) frequency can be selected when tuning. Provision is made for an external oscillator input

and when used, such an oscillator should have an output voltage of approximately 10v. RMS.

Such a complex unit clearly illustrates the importance which commercial stations attach to frequency stability and accurate shift adjustment. That must be all for the present, *73 and Figs ? : , 7, de G3CQE.*

Do You Know That ——

—— Very good semiconductor mounts can be made from those brass inserts, with two pinching screws, found in electrical connectors. As they do not need soldering, there can be no damage to diode or transistor, besides the convenience of making circuit changes in an experimental layout. *(GM3MCH).*

—— The flat-twin plastic-covered lighting flex, sold in Woolworth's at 5d. a yard, measures 75 ohms near-enough in the RF application, and may be used as balanced feeder. It has a good loss characteristic and the only slight disadvantage is that when using full power into a feeder line having a bad SWR, there is a tendency for the plastic to melt and fuse the wires together at the nodal points ! But you shouldn't be using a lot of power with such a high SWR that the phenomenon becomes a visible effect...

—— In an RF meter that is burnt out, it is possible to wire direct to the basic movement and, with a suitable shunt, make it into a perfectly good milliammeter. *(G3JEQ).*

—— Brake static in a mobile installation can be partially suppressed, if not completely cured, by drilling a hole in each brake-lining, to the face of the shoe, and fitting a piece of carbon rod in the hole, fixed in with an adhesive. The carbon rod can be as from a used dry battery, and the brake-lining drilled accordingly. *(G3MQY).*

—— Bamboos up to 12ft. long are sometimes obtainable as give-away from carpet shops and furnishing stores ; they are used to carry carpets, and the diameter varies from 1in. to 2in., making ideal spreaders for Quads and similar light beam systems. Some branches of Woolworth's also sell similar bamboo poles at 5s. each. *(G3SJX).*

—— A good way to cure noisy carbon-type potentiometers is to remove the back cover and coat the track with *Vaseline.* The spindle should be rotated across the track a few times before fitting the pot. back into circuit. *(G2BP).*

—— Quite adequate meter shunts can be made from the wire off a burnt-out tubular electric fire-bar. *(SWL Rogers, Wrexham).*

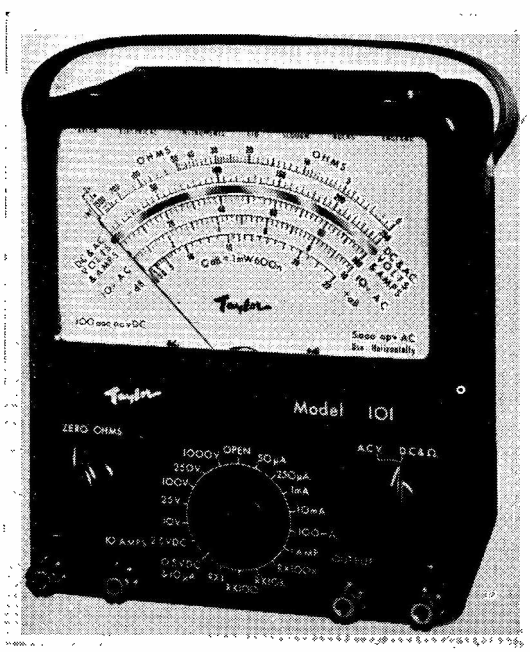
—— By removing one or two panes of glass from a window of the shack, and replacing with perspex (the high-grade clear window variety, obtainable from the handyman's stores) you have an easy way of bringing in feeders and aerial leads. To make a new hole, just run a slow drill through the perspex. It will be a fully insulated hole, too.

(Readers with half-guinea ideas are invited to send them in for the attention of the Editor, on a separate slip, with name, call-sign and address. No circuitry or drawings. Those used here are paid for immediately on publication).

EXHIBITION DATE

The very important I.E.A. (Instruments, Electronics and Automation) Exhibition—now one of the world's most interesting and best supported of international scientific fairs—takes place this year at Olympia, London, during May 25-30.

For Readers' Small Advertisements see pp.183-191



The new Taylor Multimeter Model 101 has a sensitivity of 100,000 ohms per volt, making it suitable for use, in many applications, in place of a valve voltmeter. It is a beautifully-made instrument of high quality, yet it is sufficiently robust for normal bench work. In addition to the AC/DC ranges usually expected in high grade multimeters, the Taylor 101 has an 0-10 microamp. range and can measure resistance up to 200 megohms, self-contained.

DX COMMENTARY

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

ACCORDING to readers' letters, we have just been through a pretty lean month for DX, as might have been expected. Towards the end of the period, though, things started to improve, and at the time of writing it seems that spring conditions are with us, and a more cheerful outlook prevails on all bands. The sunspot number can hardly fall much lower than the figure it has now reached, and although a definite upgrade may not occur until early next year, the future *is* more cheerful.

The newcomers who have just experienced their first "trough" seem to be pretty relieved about it —they expected something much worse. As things are, it is obvious that DX of some kind is never lacking; in fact, it is a safe bet that during 1963 more new countries were worked by more newcomers than ever before. And that leaves very little room for complaint.

"DX" is such a relative term that the long-period conditions hardly affect it. As the next cycle gets under way and the HF bands really open up, we shall all raise our sights accordingly, and what has been regarded as DX during the past two years will be passed over in favour of even more exotic stuff. The QRM will be heavier, but the DX signals will be stronger. There may even be times when someone yearns for "the good old conditions of 1963," when the bands were reasonably quiet!

By the tail end of 1965 it is pretty certain that 21 mc will be as tightly packed as 14 mc is at present; and the 28 mc band should be improving rapidly, thus relieving the others of a lot of congestion. The principal mourners (or moaners) will be the DX'ing types on 3·5 and 1·8 mc, who will find things getting harder and harder.

This whole business of DX working depends upon so many factors; the power used, the aerial system, the efficiency of the gear, especially the receiver; the skill of the operator counts enormously, as does the QTH. The latter can even be the deciding factor.

A specific case concerns a keen young G3--, who lived at a good QTH in open country. With low power and a dipole he was working the world, including the exotics; DX came quite easily, since he knew how to listen and was a good operator. Then force of circumstances resulted in a move to a very poor QTH, in the centre of a town and badly screened. TVI and BCI came into the picture for the first time. What had been DX before was now just about unattainable; very little except Europeans could be raised on 14 mc. But W's on 7 mc had now become "real DX"; the whole yardstick had changed.

Imagine such a case in reverse, with some of the legendary DX being heard for the first time—and worked, too. One might even become bored by DX if it came too easily, after years of fighting for it.

All of which proves just how relative DX'ing really is; and it also proves that a novice, with simple gear, should derive no less pleasure from the bands than the dyed-in-the-wool, disillusioned old timer who has to winkle out a brand new one from somewhere before he gets any kind of thrill at all.

Sometimes we are quite sorry for those types who never seem to make an ordinary routine QSO, because they are skulking around in the hope of hearing that tyrannical "new one" which is essential as an ego-bolsterer. Is their pleasure any greater than that of the plodder who is really pleased to work the odd W, and to whom a W5, 6 or 7 is an unexpected gift?

Alter the focus again, and look at the diffident types one meets who think they could never aspire to real DX . . . and so they never even try for it, but continue to derive their pleasure from working the same old stations and are occasionally thrilled to the marrow by a QSO with someone a little

TEN METRE ACTIVITY SUNDAYS

To try out once again the possibilities of the Ten-Metre Band under the present propagation conditions, a special Test Period is being arranged for Sunday, May 10. To make this Test worth while, it is hoped that as many operators as possible will come up on 28·0-28·5 mc during the period 0900-1700 clock time on the 10th. No formalities—just come on Ten and see what you can work—local or DX, Phone or CW. SWL's, too, are asked to co-operate, with reports of what they hear. Please notify all results by May 15, preferably earlier, as it is intended that this Test should be the subject of a separate report. Another 10-metre Activity Period is proposed for Sunday, July 12, also 0900-1700. Overseas readers are asked to note this date, and join the party then; there will be reminders in the June/July issues. Wherever you are, overseas or in the U.K., note May 10 and July 12 as Activity Sundays on the 10-metre band. Even if you cannot hear anything, call CQ, on CW or Phone. A report on the May Test will appear in this space in the June issue, and on the July Test in the August "Short Wave Magazine."

further off than they ever expected to reach. The moral of all this: Don't look on "DX" as just a hit-and-run QSO with some exotic spot. Take it as you find it.

News from Overseas

F2MO and F2QX, both of Bordeaux, will be running another expedition to Andorra, June 12-21. They will be at the same site (8,000 feet a.s.l.) as last year, and will sign PX1MO and PX1QX on SSB, all bands 3·5 to 28 mc. (PX1QX will also be on 144 mc at times.) QSL to the home stations.

ZE1AW (Mazoe) sends notes about local conditions in Southern Rhodesia. He is a one-band man (14 mc) and runs 40 watts to an inverted-V dipole; and he wonders why so few G's appear to hear him. By contrast, he gets good reports from all districts of the U.S.A., and says that the "Iron-Curtain fraternity" are no longer heard in quantity. (Perhaps that's why so few G's—conditions to Europe are not good?) Frank has found the band rather peculiar, with skip changing very rapidly, making a DX signal readable for about two minutes, and then—out like a light. Good DX worked during March included FR7ZI, KC4USK, AP2AR, VP8HJ, KH6KS, 4S7RN, JA7ACM/MM and PZ1BH.

5B4JF is the personal call of SAC J. Farrar (R.A.F. Episcopi), one of the former operators of 5B4TJ. He likes 21 mc, on which he has recently worked CW with VS6FC, KR6AH, VS1LX, UAØLL, YV's, W's and JA's. On AM phone he has raised 4S7BR, YA1AQ, VS1LY and VU2TX. This is with a Heathkit DX-40U, Quad and AR88, and he confirms the impression that the dead state of 21 mc is mostly caused by inactivity.

VE3BWY (Toronto) will be arriving in London this month, and hopes to meet "all the old gang." He added VP7NY to his Top-Band list, and is now up to 303 countries worked, all bands. Ham says he feels rather badly about Gus's exploits from China not being recognised by ARRL. They accepted his Tibet sortie (AC5A/AC4) so why not China (XW8AW/BY)? Licences for both places (if you can imagine that) would presumably have come from Peking!

The VS1LP affair . . . both G6LX and Bob Snyder himself now confirm that the only G's worked on 80-metre SSB from VS1LP were G2PU, 5BJ, 5UG and 6LX; others were worked, however, on 80m. CW. On occasions Bob worked several Europeans, and he heard other G stations (sometimes very strongly) but was unable to raise them. However, his pet pirate brought (temporary) joy to many hearts by putting out a very creditable imitation of VS1LP and making a lot of people think they had worked the genuine article. It's a very puzzling business, because the pirate gave Bob's correct address for QSL's, so he didn't get anything out of the whole business except his little bit of twisted fun.

VS1LP says he only worked "a handful of stations" on Top Band. But they were G3GRL, G3RBP, KR6ML, KR6BQ, W1BB/L and four W6's. The strongest of the bunch was W6UOV, received at S9 plus 10. Main trouble in VS1—tropical storms. "There is always a storm in the vicinity, and the QRN is usually S9, S7 being considered very favourable."

Bob spends three weeks out of every month in Indonesia, but has little hope of getting a licence, and grave doubts about any so-called Indonesian activity that there has been so far. Likewise the ZC5 boys are finding it almost impossible to get licences for VS5, which is very sticky.

9G1CC (Accra) reports that there is now a "9G1 Award" for contacts with five different 9G1 amateurs on at least two bands, phone, CW, or both. To claim, send duplicates of the QSL cards which have been sent (or are being sent) to the stations worked, plus 7 IRC's. Ghana A.R.S., P.O. Box 3773, Accra.

VP8HF/MM (H.M.S. *Protector*) writes that his South Sandwich foray was enjoyable but rather disappointing because of the poor conditions that prevailed most of the time. At one stage he was so "frustrated and miserable" that he thought of packing it in. However, he has since heard that he made a lot of people very happy, and has even had pile-ups of stations thanking him for the QSO from the rare spot.

Ken has since been circling round Bouvet Island (no chance whatever of a landing) and will, by the time you read this, have been around Gough Is. and Tristan. Up to May 15 he will be

ZONE-BAND TABLE

Station	Zones Worked						Total Zones
	28 mc	21 mc	14 mc	7 mc	3.5 mc	1.8 mc	
G2DC	40	40	40	36	25	5	186
G6QB	38	40	40	34	20	7	179
G3DO	39	40	40	25	24	2	170
G3IGW	36	37	37	31	17	11	169
OH3NY	32	30	40	25	10	7	144
G3NOF	34	38	39	6	8	1	126
G3PEK	2	21	35	30	17	4	109
G3OLN	2	7	11	16	3	4	42
G3RDC	3	14	38	11	3	1	71
G3PLQ	1	7	4	3	3	5	23

(Entries for this new table are invited; scores are post-war, *i.e.* starting from any time back to January 1946.)

on *Ten* all the time (28040 kc CW and 28500 kc Phone) as the ship will be on the way home; after that he will be signing G3RFH from Poole, Dorset.

DX Gossip

Pacific activity is on the upgrade; KC6AA (Western Carolines) has been heard on 14290 kc SSB, 1300 . . . KJ6CC is a club station, and others from Johnston Is. are K5YHI/KJ6, K6RKT/KJ6 and W5HJ/KJ6, all on 14 mc SSB and some also on 7 and 21 mc. CW operation a bit scarce, but W9ZQA/K16 appeared on April 15 (14070 kc CW).

VR1B promises operation shortly . . . ZL4JF (Campbell Is.) still on, in the hands of ZL4LY . . . VK9DR (Christmas Is.) is on 14110 kc SSB, listening usually 14260-300 kc.

VK2AGH/VK2 (Lord Howe Is.) should have been and gone by now . . . VK4JQ (Willis Is.) was QRT for awhile, but should now be back with new batteries . . . KB6EPN has been heard on 14270 kc SSB, 0900 . . . K7VAX/KS6 is expected to be on regularly . . . FU8AA is said to be on 21040 kc CW (0900-1100) and FU8AG has been worked on 14 mc CW.

So much for the Pacific delicacies, and anyone who has worked them all is entitled to be pretty pleased with himself. Now for some of the others:

ZC5AJ was very active on 14110 kc SSB, listening 14310 daily at 1200 . . . VS1LV is on 14005 or 14095 kc every day at 1400 (CW) . . . 8A3AA, 8A3SK, 8A6AC and 8F2ER, all claiming to be in Indonesia, must be treated as highly suspect until firm news arrives . . . CR4AD has been active on 14110 kc SSB . . . VE1DC is on Prince Edward Is., which counts for the WAVE award . . . HL9 stations may now use 3500-3550 kc between sunset and sunrise . . . ZS3EW is on 21 mc CW, 1530-1730, from Pelican Point Lighthouse.

Around the Bands

Since there has been no outstanding DX peculiar to one band, it is perhaps more convenient to lump the HF bands together this month. At least it will save quoting a particular correspondent in several different places, and, as always, some of the comments are more interesting than the lists of callsigns worked. Sufficient to say, therefore, that *Twenty* has carried most of the DX, as always; that *Fifteen* is far from dead, but nice and peaceful by comparison; that *Ten is* open more often than you think; and that *Forty* and *Eighty* are perhaps suffering a little from the change of season, but still carry the stuff when you can find it. That leaves only *One-Sixty*, which will be treated, as always, as a special case.

Station of VS1LP (the genuine one), in Singapore, operated by Robert Snyder. He has made himself famous on the LF bands in the DX context, and has worked hard for European QSO's on 80m. and Top Band. Because of having to spend some time each month in Indonesia (where amateur operation is prohibited) his activities as VS1LP are somewhat limited. *A G6LX print*

Top Band Doings

G3GGS has at last made the "98-98" position in the Counties Worked table, and congratulations to him. He didn't think, when he embarked on the ladder, that scaling it would take him ten years! This season he was very disappointed at not being able to raise any W's and VE's—not from lack of calling them—but was delighted to make a surprise QSO with VP8GQ, raised first call.

G3REA now wants only Kirkcudbright and East Lothian to score the 98—can anyone oblige? On CW he worked ZB2AF, and on phone three DL's, Sark, Alderney and Guernsey. He would now like to see a Top Band Ladder that counts CW and Phone separately, giving a total of 196—it might encourage the Phone men to try CW, and *vice versa*. This seems like a Bright Idea . . . we will brood over it!

G3PLQ continued his DX'ing as an SWL/MM, and during a spell at home he managed to work W1BB, VE1ZZ, OE1KU and ZB2AF. He confirms that the boys signing with the OL prefix are only allowed to work OK's and other OL's—as mentioned on p.83, April. And it's his opinion that some of the new boys on the band must have pretty poor receivers, "judging by their incessant CQ's."

Now for a few points of outstanding interest from the latest bulletin from Stew Perry (W1BB). The Trans-Atlantic Tests of February 2 and 16 were not so hot

—very disappointing after the marvellous results in January . . . W/VE "sunset DX'ing" very interesting this year. During the period 2200-0100 GMT many G's made it who had never got across before . . . VK and ZL stations being heard in the States, 1000-1200 GMT.

HP1IE and HC1DC were both on the air during the *CQ* Top-Band Contest, trying hard for contacts but unlucky . . . DL7AA started DX'ing on the band in January, using an 80ft. vertical; best DX so far is VE3BWY . . . W1BB himself was able to hear so many stations, and copy them solid, when other W's couldn't detect them at all, that he has evolved a theory about his 260ft. high inverted Vee. He thinks that man-made interference produces a kind of "electronic smog" at the low levels, and that it takes an aerial of this kind to get above it. Certainly Stew's phenomenal results suggest that something of the kind might be occurring.

TOP BAND COUNTIES LADDER

Station	Confirmed	Worked
CW and Phone		
G3GGS	98	98
G6VC	98	98
G2NJ	98	98
G3REA	96	96
GM3KLA	95	96
G3LWQ	94	95
G3PLQ	92	92
G3OLN	86	92
GM3PPJ	86	88
G3PHO	76	92
G3NTI	76	79
G3RJH	76	83
G3RHM	72	75
G3REP	65	77
G3NOW	62	68
G2BP	57	64
G3IDG	50	54
GW3ITZ	29	50
G3SNU	17	57
Phone only		
G3FS	88	89
G3NPB	85	86
G3RHM	64	67
G2NJ	51	51
G3REA	41	57
G3RJH	33	54

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

Eighty and Forty

G2DC thinks DX on Eighty is "quite plentiful," with W's workable as early as 2100 and as late as 0830. His best were KC4USK, KC4CI, UL7HA, VU2GC, ZL1AMV and all W districts except 7th. On Forty, no new ones, but KC4USK, ST2AR, VK3XB, ZL4JF, 5Z4IV and 4AQ, and all W districts. All on CW, as ever.

G3PIT didn't think so much of Eighty, but found Forty very interesting. During the ARRL Contest the band opened to the West Coast around 0200 and again, very strongly, at 0700 on both mornings. Conditions to VK were good, and on six mornings he made a dozen VK or ZL contacts between 0630 and 0900, averaging one contact for every two calls. He has the impression that the QRM on the LF bands is actually getting *less*, but admits that this may be a subjective phenomenon and a matter of getting used to copying through non-stop interference.

G3PLQ deserted Top Band for a while and tried Eighty with QRP. He was pleased to work W1TX for his first W on the band. Some AM phone contacts, he reports, were "spoilt by SSB stations who wallow in splatter from one end of the band to the other."

Reverting to Forty — some wonderful SSB DX is still going on, despite the lack of space, the QRM and the general chaos. But those who are making the contacts (probably wisely) keep mighty quiet about their results, it would seem. Only by "reading the mail" on Forty or Twenty can one hear all about it.

Recent DX worked from this country, but not reported directly, is recorded as a matter of interest: *Eighty CW*: CE1AD (0700), KP4's (0545), UA9's, UH8, UJ8 and UL7 (0030). *Eighty SSB*: HC2JT (0600), VP9FE (2200), YS1JJG (0600), ZL 1-4 (0700). *Forty CW*: CM's (2315), VR2BK (1900), VS1LP (0020), W7DOS (0720), XE1OK (0700), ZD3A (0645), FS7AA (2220), FY7YK (0130), HI8NPI (2355), VP2KJ (2250), CP5EZ (0130), HP1IE (0745).

The HF Bands

"Fifteen is still playing up trumps," writes G2DC, "especially at week-ends; the only band where one can work DX in comfort without having to put up with a background of muck." Jack had several QSO's with VP8HF on this band, and also worked CR4AD, CR5SP, CR8AD, FB8XX, HK3LX, JA 1-7, KC4USK, TU2AW, TL8SW, W 1-Ø, VE1-8, VP8GQ and 8HJ, 9Q5HD and 5LY; all on CW.

On Twenty he found the ZC5 expedition (ZC5AJ) going great guns, and also worked FB8ZZ, JT1JY, KC4USK, VP8GQ, 8HF, 8HJ, 4W1B, 5T5AD and 9L1NH—also entirely CW.

GM3JDR finds conditions on Twenty improving steadily, and sends his usual two long lists, from which we pick the following: SSB, AP2AD, DU1AN and 1AP, TU2AU and 2AW, VP2KJ, VP7NG, VP8HJ, VQ9HJB, VS1LX, YS1O and 1MAO, ZC5AJ. To balance this lot, on CW he raised CP5EZ, DU1FM, FU8AG, JA's, KC4USK, PJ2AA, TU2AN, UAØ's, a stack of VP8's, VU2GWZ and 2TH, ZC5AJ, 4S7NE, 9L1TL and 9Q5PS.

G3NOF used SSB to some purpose on both Fifteen and Twenty. On the former band he worked most U.S. districts and 9Q5AB; on Twenty, FG7XV, FM7WQ, HC2JT, HR1SO, HS1S, M1AC, TI's, VP2KJ and 3HAG, VP8's, VQ9HJB, VS1's, XW8AL, YA1BW, ZC5AJ, YS2SA, 6W8AE, 9G1DV, 9M2FR and many others.

G3NWT comments on ZC5AJ's "superb operating." While working the States, Bob was heard to say "I am trying to sort out some of the weaker signals. The boys with the home-brew 50-watt rigs are the ones I am looking for." Twenty SSB, from G3NWT, fetched in KX6AE, CR9AI, BV1USG, KC4USX, HS1I, VP9XI, ZC5AJ, AP2MI, VP2KJ,

YS1JJG, 4S7IW and many others that would be good DX at any time, let alone this "year of the trough." On fifteen SSB he collected FR7ZD, ZD6PBD, TU2AW, 9Q5AB, 5H3JJ and HK3AT.

There is almost a complete absence of news about *Ten* this month, but G3MQD, operating at week-ends only, worked SSB with LU1DAB, 4X4DK and VQ2BC; the latter replied on CW. G3GGS is very interested in the proposed Ten-Metre Activity Sunday, and appeals for more CW activity—last time he heard many a phone carrier, very QRJ, which might have been readable on CW. (For details of the Activity Sunday, see the box on p.161.)

DX News from Readers

EP2RW is Roy Worthington, ex-VP3RW and other calls. He was in OD5 and TA, but couldn't get licences. He will be visiting AP2 and hopes for better luck there—SSB is projected . . . CEØZI changes to KC4AAA when south of the Antarctic Circle. *(G3NWT.)*

VP8CY is on SSB most week-ends, looking especially for QSO's with Gravesend, his home QTH. *(SWL T. Roberts, Gravesend.)*

ZC5AJ also holds the calls VS1LX, VS5LX, GM3OEV, VS9MG and is ex-ZB2N, and also one of the ops. at ZB2A . . . *QSL's*: HS1S to Box 2008, Bangkok, ET3AV to W3AAZ, PZ1CE to W1NTH and DU1JC to W6ZJY. *(G3NOF.)*

QSL's for all European QSO's with ZC5AJ to VS1LX, either direct or *via* the bureaux; same applies to any who worked VS5LX. *(G2DC.)*

VU2NR plans a sortie in October to the Andamans, Nicobar and the Laccadive Is. with SSB gear . . . CP1BH, 1BJ and 5AD are all causing pile-ups on 14100 kc SSB, around 1900-2100 . . . VQ2DT puts in a paralysing signal at times on 21 mc AM, thanks to a nine-wavelength rhombic! . . . VQ9HJB on 14 mc SSB almost daily, often S9 at 1530-1700. He expects a posting soon, which might be to a DX-otic spot. *(SWL Dave Gray, Croydon.)*

CQ Contest Results

The 1963 Worldwide DX Contest, organised by *CQ*, fetched in a total of more than 700 logs for the Phone section—a record. British stations did better than in the past, and special congratulations are due to G3FXB, who was the Continental Leader for Europe in the 14 mc category, with a score of 270,692. (Highest score in this slot came from HL9KH with 318,960.)

In the All-Band category the highest G's were G8FC (150,781), G5ZT (121,342) and G6RJ (93,170). G3FXB's score in the 14 mc section was followed up by G4CP (185,640) and G3LSF (108,019), with all the others well behind.

G13CDF achieved the position of Continental Leader for 3·5 mc only, with a total of 16,092. Highest scorer in this category was 4X4DK with 20,416.

So much for the U.K. stations; many others did well, but were not within jumping distance of the leaders mentioned. As regards the broader picture, the World Leader (all-band, single-operator) was 5A1TW (662,546), closely followed by ZD7BW (598,647) and 5N2JKO (543,415). The remainder of the Top Ten were CX3BH, 4X4AS, K2HLB, I1BAF, ZE1JE, WA2SFP and JA1BRK.

Highest score in the whole world came, as one would expect, in the Multi-Operator, Multi-Transmitter class, in which CX2CO

We might have said — " two guesses for working out this one." With the QSL cards is none other than Gus Browning, W4BPD, who has spent the last two years travelling through the rarer parts of the world to put them on the amateur map — the cards tell you some of the 66 places he visited. It is estimated that during his operations under these many callsigns, W4BPD made about 200,000 QSO's — an extraordinary feat for a one-man station, when all the travelling is taken into account. Stuart Meyer, W2GHK, on right, is president of Hammarlund's, and is actively concerned with the " DX-pedition of the Month " operations.

scored just over one million (1,026,086)! They were closely followed by K2GL and W6VSS, and the fourth and fifth were DJ3VM and DLØWW.

Interesting to note, too, that LU1DAB managed to score the surprising total of 95,353 on *28 mc only*—roughly forty times the next highest score on that band!

Record entries are also expected for the CW Half of the contest, of which we hope to have news next month.

DX-Peditions

The Hammarlund "DX-Pedition of the Month," planned for early summer (no dates yet) will be known as the African Islands Campaign. Al Silva, CR5SP, will operate SSB from Sao Thomé (he is now on AM, "on a limited basis"). He will also operate periodically from the Principe Is., which have the same DXCC status as Sao Thomé. An absolutely new DXCC country is promised, however, when he goes to the *Annobon Islands*, whence he will use an EAØ prefix, and further operation is promised from Fernando Po, also probably with an EAØ call. CW and SSB is promised from all parts; the two latter sorties may be spread over six visits of about three days each.

Hammarlund also promise "the surprise of the year"—a limited-time operation from a new country in Southern Europe; and Stuart Meyer, W2GHK, plans a surprise operation from "Deep Dark Africa."

We can only promise to let you know of any plans as soon as they reach us. Meanwhile, keep those dials spinning!

Incidentally, Hammarlund are tackling a tremendous chore by handling all the QSL's for so many of their past expeditions, and also for all kinds of smaller operations sponsored by them. The volume of mail must at times be tremendous.

Fair Comment

G3NWT writes "About the noise made by the DX'ers in print . . . one needn't listen around the bands for long to realise that only a small proportion of the DX worked does actually get reported . . . and some of the undisclosed DX is pretty impressive. Certainly I hear quite a few around, with DX scores definitely ex-directory but suspected to be stratospheric, to whom anything I could report this or any month would be chicken-feed.

"But it is a human part of the enjoyment of DX to send one's list in, and to read the other fellow's, and possibly to derive that harmless feeling of one-upmanship along with the interest (*ah*! so he didn't work *that* one), or perhaps of one-downmanship (*hmm*—so he worked that one, did he? Shows what freak conditions can do for you)."

G3PIT says "There are frequent grouses about the menace of EU's answering G's DX calls. This is really a minor worry, and the real obstacle to working DX is distance . . . and, of course, propagation and the competition from other stations. I took time off to tell a UT5 what calling CQ DX really means. The technique I use is to send very slowly, giving his call-sign many times, so that he knows I am talking to him, then in very simple jargon to explain. This produces one of three effects: (*a*) dead silence; (*b*) CQ DX from the offender, or even CQ G; (*c*) very occasionally, profuse apologies, which make one feel a selfish DX hog!"

G3PIT also says "Don't start to give endless details of operating awards—anyone who wants to paper his shack can get it all elsewhere." We don't, and we don't intend to . . .

A G3—who asks to remain anonymous, writes "Would you ask the persons running excess power on Top Band at least to reduce their key-clicks, to give the rest of us a chance to try for the DX?"!

G2HKU passes on the word that PAØPN, that popular Top-Band man, is becoming financially embarrassed by the very large number of G's asking for a direct QSL. If you *must* have a direct QSL, despite the excellent work of the bureaux, send him an IRC. It's only fair!

G3REA comments "I wonder how much Liddery (so-called) is caused by the inability to read CW? When DL9KRA was recently working SSB on Top Band, his instructions were obeyed to the letter. Could it be because we all understood them?" Food for thought there—but there is also the fact that there's little or no language problem on Top Band.

Finally, back to G3NWT again: "I get the impression that the vital thing with ARRL/DXCC is a change of *name*. ZS is now a foreign country — formerly it wasn't. Would someone explain why *that* isn't an admissible change of status? Zanzibar isn't a new one, either, although its change of status caused the 'Project Mercury' boys to be issued with a full list of steamship departures. But if some property owner there had rented the top floor of a block of flats to the UN Commission on Brussels Sprouts, then you would have a new country.

"Transkei, in ZS, and Barotseland, in VQ2, are both self governing and would seem to qualify for attention. ZD6 is due to change to Malawi and will presumably become a new one. VQ2 is to become Zambia, or something like that."

Yes, DXCC has got itself into a sad mess with all the do's and don'ts. There are so many glaring anomalies in the various rules and conditions that one just can't keep pace. How simple the WPX scheme appears by comparison—no politics, no change of status unless the callsigns themselves are changed. All very clean and simple.

Late Flashes

G3SKM has departed for Singapore, and asks it to be stated that his home station will be closed for three years; he hopes to be in touch from VS1 shortly.

G3MWZ will be on Top Band, /P and /M, on CW and Phone as follows: May 4, *Anglesey;* 5th, *Montgomery;* 6th, *Radnor;* 7th, *Cardigan;* 8th, *Merioneth.* CW on 1827 kc, phone on 1880, signing GW3MWZ/P or /M. Please look out for him.

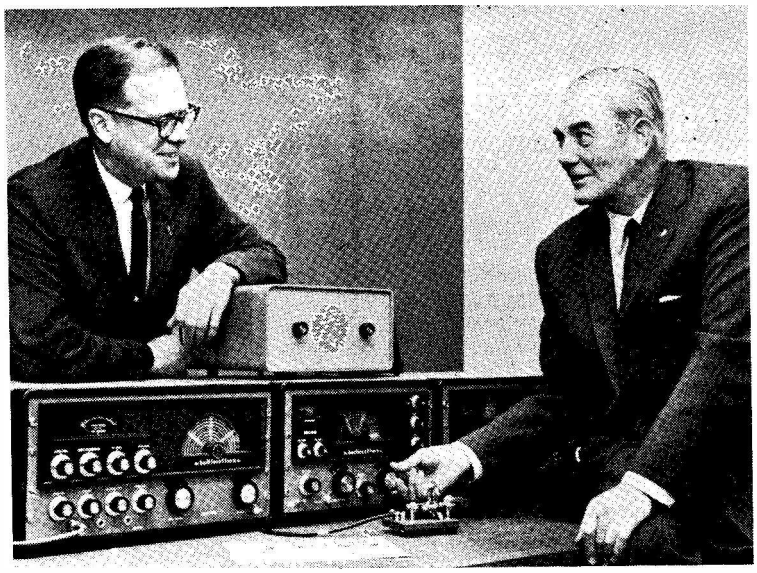
Harvey Brain, VQ8BFC, was nearing Chagos on April 16; all being well, you should have worked him by now . . . Likewise

Angus, HZ2AMS, was due on as 8Z4AMS from the Neutral Zone, roughly April 18-28. 8Z4 is now the prefix for the Iraqi Neutral Zone; Saudi Arabia is to be divided into 8Z1 (Red Sea area), 8Z2 (Riyadh), 8Z3 (East Region) and 8Z5 (Kuwait Neutral Zone). Prefix-hunters will be happy.

VR1B should be operating from British Phoenix Is. for seven days from May 2, followed by seven days' operation from Christmas Is. (VR3) . . . VS1LX's operation from Brunei (VS5) now timed for May 1-14.

Sign-Off

So much, then, for another month. Thanks and acknowledgments to the WGDXC *Bulletins*, the *DX News-Sheet*, W1BB and his bulletins, and to all our correspondents. Also to numerous stations who regularly pass the latest DX news over the air. For next issue, the deadline (which would have fallen on Whit Monday) has been extended to **first post on Tuesday, May 19.** But please, if possible, send everything to catch *first post on Friday, May 15*, treating the later date as "Stop Press" for hot news only. Address everything to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Until then, 73, as always; Good Hunting and—BCNU.



From the Amateur Radio point of view, one of the attractions at the New York World's Fair is the station installed in the Coca-Cola pavilion. Hallicrafters equipment is provided and here we see Herbert Hoover, Jr. (right) with John Huntoon, W1LVQ, Editor of "QST" and general manager of the ARRL.

THE "NEW QTH" PAGE

Readers who obtain an AT-station licence, or who have a change of QTH if already licensed, should let us have a note of the new callsign/address immediately, for appearance in "New QTH's" and the *Radio Amateur Call Book* (DX Listings section) which is the directory to the amateur stations of the world. Please write your callsign, name and address clearly on a separate slip—and make sure all the information is there. We have recently had several QTH slips either without (*a*) the callsign, or (*b*) the name, or (*c*) a full address!

• • • The Mobile Scene • • •

AT BEDFORD, APRIL 5, AND TRENTHAM GARDENS, APRIL 19—1,500 U.K. AMATEURS LICENSED MOBILE—THE SEASON'S PROGRAMME

THE Mobile Rally Season got off to a very good start with the event held at **Bedford** on April 5, by courtesy of Texas Instruments, Ltd., who made available their excellent parking and canteen facilities to the RSGB Mobile Committee (under the chairmanship of G3ABB). There were also conducted tours of the Texas plant—where the prime interest is semiconductors and their applications—which were greatly appreciated, particularly as many of the Texas staff had given up their Sunday to help in making the Rally a success.

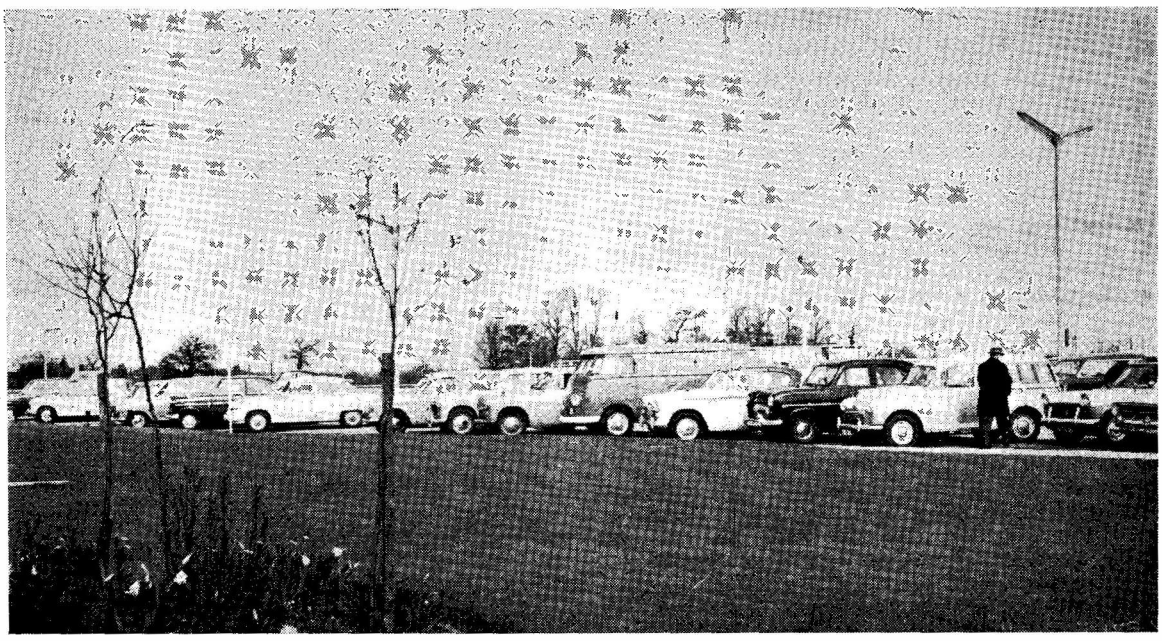
With some 150 cars in the park by 3.15 p.m., of which probably 100 were fitted mobile; a dry and sunny afternoon; a cheerful crowd in the canteen hall, which gave plenty of seating accommodation; background music provided by Aveley Electric, Ltd. on their latest hi-fi apparatus; a small equipment exhibition; and the usual prize draw—there was no doubt of the success of the event, which was largely contributed to by the generous hospitality and co-operation of Texas Instruments, Ltd. as the hosts.

Outside exhibitors included J-Beams, Green & Davis, K.W. Electronics, Strattons, and Aveley Electric, and there was also a small exhibit by the local police. Efficient sign-posting had been arranged by the AA from all round Bedford, in addition to which there were the talk-in stations on two metres and 160m. These were kept busy, an interesting fact being that some 40 mobiles were worked on the 144 mc band, with G2DUS operating; this compared with about 60 worked on Top Band during the same period. This in itself is a most significant result, in that it shows the rapid increase in mobile activity on VHF relative to Top Band.

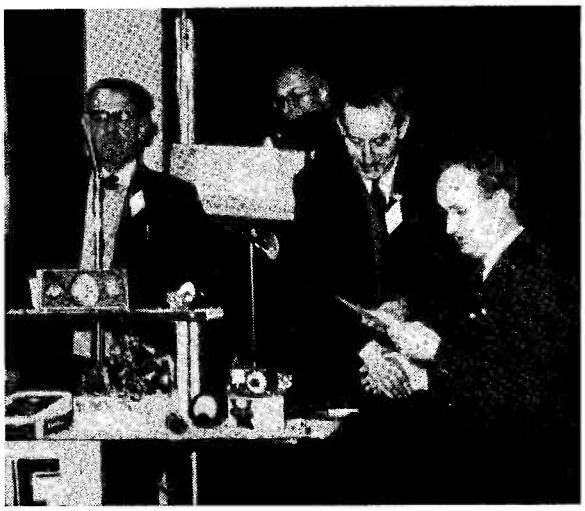
* * *

We have time and space only for a brief preliminary report on the **Trentham Rally** on April 19, but it was again a great success, in very bad weather! With an attendance in the strictly amateur interest running into several hundreds, and a public interest measured in thousands—for the *locale* up there is such that ordinary visitors to Trentham find them-

[*cont'd. p.170*



An impression of part of the car park, Texas Instruments, Ltd., Bedford, on the occasion of the first Mobile Rally of the season, held there on Sunday, April 5. About 100 cars were fitted mobile and the meeting — organised by the RSGB Mobile Committee — was a great success, with generous hospitality from Texas Instruments.
A G3GMN print

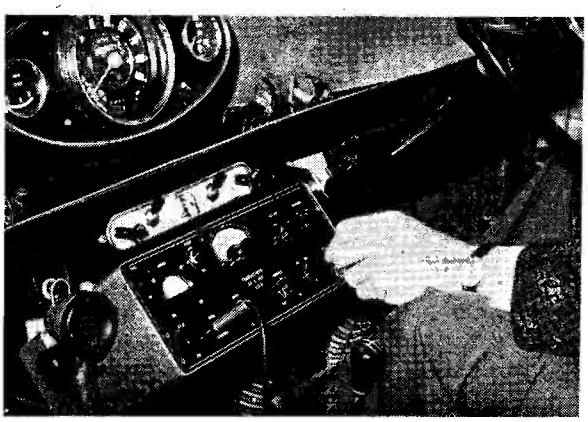


At the Bedford Mobile Rally, left to right, G3ABB, G3IIR (of the RSGB organising committee) and G3JFH/M from Cheltenham, stepping up to receive the prize for the best home-constructed mobile rig. *A G3GMN print*

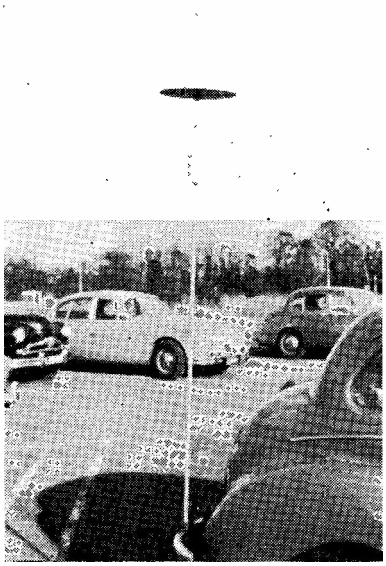
At the Bedford Mobile Rally the local police were demonstrating their Doppler phase-shift unit for measuring car speed. It can easily be jammed — but that is against the law, even if you do have a mobile licence!

During the conducted tour of the Texas Instruments factory, where semiconductor and solid-state devices are manufactured. This picture shows members of the party viewing, through a microscope, a photo-etched unit which, though only $\frac{1}{2}$-in. long by $\frac{1}{4}$-in. wide, incorporates 27 separate circuits. *A G3GMN print*

The 160m. control station for the Bedford Mobile Rally, with G3RPL (left) and G3DPQ operating. By 3.15 p.m. they had worked about 60 mobiles. *A G3GMN print*



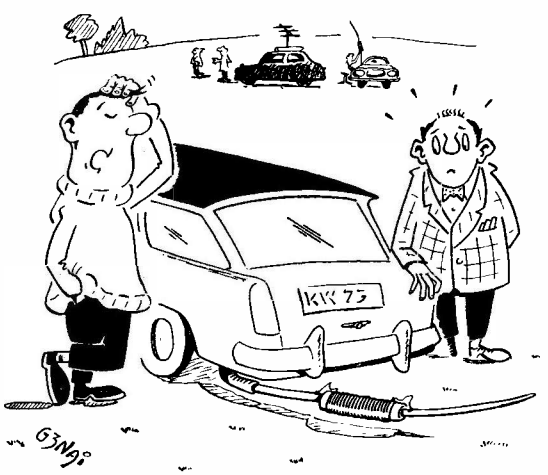
This picture is of more than usual interest — the 80/160m. SSB transceiver, designed by G6VX, and built into a Mini-Minor by G3JFH, who operates the rig /M. It gives 40w. p.e.p. with a 5B254M in the PA, has a 455 kc mechanical filter for receive and transmit, and involves 12 valves, 7 silicon diodes and one crystal. Seen at the Bedford Mobile Rally, it won G3JFH the prize for the best home-built /M installation. *A G3GMN print*



Neat /M aerial seen at Bedford — a loaded whip with a capacity hat, the coil standing above the roof level of the car. This is a very sound configuration, both in theory and practice, and should give good results. Except that the car number was KLO-298 and it carried the badge of the South London Mobile Club, we were unable to identify the owner.

At the Bedford Mobile Rally. The canteen hall, Texas Instruments, during the raffle and prize draw, with which the Rally concluded. A bright and fairly warm day contributed much to the success of the event.

A G3GMN print



". . . as a matter of fact, I do put out a very strong ground wave . . ."

selves caught up in the Rally goings-on—the car parks started filling from mid-morning. Indeed, the Trentham Gardens management admits that the annual Mobile Rally organised jointly by the Midland and Stoke-on-Trent amateur groups each year is one of the most profitable events in their season. At Trentham, the mobiles are, as far as possible, segregated by types, *i.e.* Top Band /M's and the VHF lot have separate parking spaces; this tends to draw together those with similar interests. The committee (from the organising societies) usually contrive to put on a great many side-show attractions, radio and non-radio, and it can truly be said that all interests are covered, indoors and outside. This year's radio equipment exhibition was the biggest yet—in fact, the event itself has become so big that it is hardly possible to get round to see it all, and find everyone one wants to meet, in the time available. We hope to have pictures and some further notes covering Trentham for this space next month.

MOBILE RALLY CALENDAR

Arrangments and the booked dates known to us at the time of writing are now as follows, with some adjustments in the programme as previously published:

May 3: Organised by the Medway Group, at the works of British Uralite, Ltd., Higham, near Rochester, Kent. Talk-in by G2FJA/A on Top Band and G3OHP/A on two metres. This is in a rural area, with picnic facilities, but there will be ample covered accommodation if the weather is wet.

May 10: Mobile Rally organised by the Thanet Radio Society, at the Viking Ship, Pegwell Bay, Ramsgate, with G3DOE/P talking-in on 160m., and G3BAC/P available on two metres.

May 24: Seventh Mobile Rally organised by the Northern Amateur Radio Mobile Society, at Harewood Park, near Leeds. Opening at 12 noon,

talk-in will be by G3OGV/A on Top Band. There will be a number of competitions, trade stands and a surplus equipment sale (bring-and-buy). Further information from: D. Binns, G3MGI, N.A.R.M.S., 80 Gipton Wood Road, Leeds, 8.

June 7: A.R.M.S. annual mobile meeting at R.A.F. Station, Barford St. John, near Deddington, Oxon. There will be a tombola, a comprehensive trade show, and a military band concert. The talk-in will be on 160m. and two metres, under call-signs G3NMS and G3NMR, with an additional SSB station working the DX bands. Details from: N. A. S. Fitch, G3FPK, hon. sec., A.R.M.S., 79 Murchison Road, Leyton, London, E.10.

June 14: Hunstanton Mobile Rally, meeting in the car park at the pier, with talk-in by G3ANM on 1980 kc and G3RED on 145·2 mc. This is an all-day affair, with amateur TV as one of the attractions (look out for the ATV camera on the approach to Hunstanton). Charge 2s. 6d. for admission and parking, and any further information from G3KPO, *QTHR*.

June 21: Seventh Mobile Rally at Longleat House, near Warminster, Wilts., with many attractions based on the experience of the previous six events, held at one of the loveliest sites in the southern part of the country. The talk-in stations—G3JMY/A on about 1885 kc, and G3SJI/A on a Zone 2 frequency—will open at 10.0 a.m. and there is a charge for admission, since Longleat is one of the show places of England. The Rally Organiser is E. C. Halliday, G3JMY, 4 Parkside Avenue, Winterbourne, Bristol, who can supply a leaflet on request with an s.a.e.

also, Mobile Picnic, South Shields, Co. Durham.

June 28: RSGB Mobile Rally at U.S.A.F. Station, Wethersfield, Essex.

July 5: Mobile Rally, R.A.F. Amateur Radio Society, Weston-s-Mare, preceded by a dinner on the Saturday evening; apply G3GNS *(QTHR)* for details.

also, Mobile Rally at South Shields, organised by the local S.S. & D.A.R.S., hon. sec., G3KZZ, *QTHR*.

July 26: Mobile Rally to be organised by the Cornish Radio & TV Club, at Pentire Headland, Newquay, Cornwall. *Further information to come.*

August 9: Mobile Rally at the Royal Naval College, Dartmouth, Devon, arranged by the local Amateur Radio groups. *Full details later.*

August 16: The annual Derby Mobile Rally, at Rykneld Schools, Bedford Street, Derby, with all the usual facilities and attractions. *Further details later.*

August 30: The U.B.A. (Belgian) Rally, near Namur, in the Ardennes. *Details later.*

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

With no less than 14 major Rally events now dated, the season is well covered for the /M enthusiast. It would be hard to avoid clashing if any other big event, of which we have not yet been informed, is being planned.

It is our hope and intention that, as in previous years, most if not all these Rallies will be reported in "The Mobile Scene." As it is hardly possible for the *Magazine* to be represented at them all, organisers are specially asked to deal promptly with our report forms and also to arrange for us to be given, in good time, all necessary information for advance publicity. This is going to be a very big Rally season, and a great deal of work will be involved in getting it fully covered.

THE RESONOMETER

TEST INSTRUMENT FOR TUNED CIRCUIT MEASUREMENTS

R. V. MOORE, B.Sc. (G3LWB)

A RESONOMETER is a useful device for measuring the resonant frequency of a tuned RF circuit when a grid dip oscillator cannot conveniently be used. The most obvious example is the case of an IF transformer *in situ*. It is possible to apply a GDO in such cases by removing the screening can and coupling directly to the GDO or, for greater accuracy, link coupling and replacement of the can before checking the resonant frequency. However, this is a tedious business, and use of the instrument described in these notes is to be preferred.

Circuit and Principle

The resonometer is used in conjunction with a signal generator. RF from the signal generator is fed into the input socket of the instrument. The transistorised circuit is essentially an amplifier. When a tuned RF assembly is connected to terminals A and B the circuit will give its greatest response (as shown on the meter) when the RF injection is at the *same* frequency as the *resonant* frequency of the assembly.

After thinking out the circuit and selecting arbitrary values for the components from those available, it was built up using MAT 120 transistors —but other transistors such as the OC169, OC170, OC171 or OC44 would be suitable. The components were mounted on a paxolin panel about 8in. by 4in. with the meter, potentiometer knob, VR1, on/off switch and terminals A and B on the upper side and the wiring and other parts on the lower side. The panel was than fitted into a plywood box, 2½in. deep, having a loose bottom, with a coaxial input

Table of Values

Circuit of The Resonometer

C1, C3	= .01 μF	VR1	= 1,000-ohm pre-set var.
C2	= 0.1 μF	D1	= OA70, or similar
C4, C5	= 50 μμF (*see text*)	M	= 0.5 or 1.0 mA m/c meter
C6	= .005 μF	TR1, TR2	= MAT-120, OC44, OC170
R1, R6	= 47,000 ohms		
R2, R7	= 15,000 ohms		
R3	= 3,900 ohms		
R4, R5	= 1,000 ohms		
R8	= 2,700 ohms		

Note: All resistors rated ¼-watt.

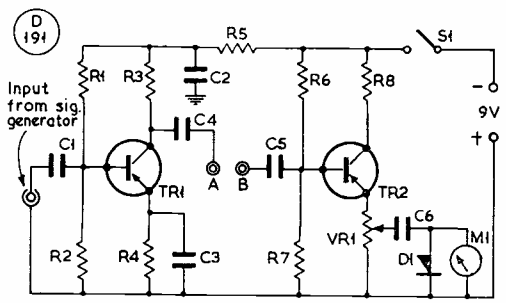
socket at the side. (It has since been found that the size of the instrument could have been reduced considerably with advantage.)

Wiring should be as short as possible to reduce circuit capacities. For the same reason leads taken from terminals A and B to the circuit to be checked must be kept short; it was found convenient to have solder tags on A and B. Condensers C4 and C5 (50 μμF) affect the accuracy of the instrument and may be reduced to 25 μμF or lower if frequencies higher than about 2 mc are to be checked, or greater accuracy is required. However, the instrument is most useful at low frequencies, 100 kc to 2 mc. Between these frequencies the accuracy seems to be approximately 3 per cent. The writer is unaware of the accuracy that might be expected at frequencies higher than 2,000 kc as no further work has been carried out. The circuit as wired fulfilled a need that had arisen at the time. There is little doubt that the circuit could be improved by further experiment and development.

Use of the Instrument

Let us suppose that it is desired to check the resonant frequency of an unknown IF transformer in a receiver. Proceed as follows: Unsolder one side of the IF transformer (say primary) and connect to terminals A and B with the shortest possible leads. Feed in RF from a calibrated signal generator and go through the ranges of the generator and through the full frequency coverage of each range. A range and then a particular frequency will be found which gives the highest reading on the meter. Then back off VR1 and, if necessary, the signal generator gain so that the meter reads only about 1/5th of full scale deflection. Now set the frequency accurately on the signal generator for the greatest deflection on the meter and read off the resonant frequency of the IF transformer. To be certain you are not working on a harmonic go to the next higher range and check—the meter reading should be considerably less. Although in many cases the circuit capacity of the instrument affects its accuracy it is not of great consequence. When checking an IF transformer *in situ*, for instance, the transformer has been disconnected from its own circuit capacities so the capacitance of the instrument is only replacing this, either wholly or in part.

In a similar way the resonometer can be used to check tuned RF coils in a receiver or transmitter. It will also permit the determination of the proper



Circuit of the Resonometer, as devised by G3LWB, and described in the article. It is used with a signal generator and if any tuned RF circuit is connected across A-B, the condition of resonance is indicated on the meter as the sig. gen. is swept through the frequency of the circuit on test — see text.

combination of coil-and-condenser to give a particular range of tuning.

The instrument should also be useful for the checking of the comparative activity of quartz crystals on fundamentals, or harmonics, by injecting the RF from a crystal oscillator and connecting to A and B a tuned circuit resonant at the correct frequency (fundamental or harmonic). The instrument would be useful for indicating the relative *Q* of a coil/capacitance combination. A coil with a high *Q* would give a higher reading on the meter than one having a lower *Q*.

THE NEW "ARRL HANDBOOK"

With 592 pages of text, 34 pages of valve and semi-conductor data, a 14-page index, and 80 pages of interesting advertising, the 1964 *Radio Amateur's Handbook* is well worth getting if you have not had an "ARRL Handbook" (as it is usually called) during the last three years or so. As always, it is full of practical data on the design, construction and operation of amateur-band equipment of every conceivable kind—from HF to VHF and UHF; AM phone, CW and SSB: mobile, portable and fixed; aerials and beam systems; power supply units for every purpose; test gear of all sorts; and constructional ideas and methods.

The fact is that the "ARRL Handbook," constantly revised and kept up-to-date, continues to be—as it always has been—the bible of Amateur Radio for the English-speaking world. It is, as its cover proclaims, the standard manual of Amateur Radio communication. That it is American in origin—the *Handbook* is produced and published by the American Radio Relay League, the national radio amateur organisation for the U.S.A.—in no way lessens its usefulness for radio amateurs outside America. It is, in fact, sold throughout the world. The present edition is the 41st; it is nearly 1½ins. thick, weighs over 2lbs., and costs us 2s. 3d. to post to you. We can supply from stock at 37s. 6d. post free (library binding, hard covers, *de luxe*, at 47s. 6d.). Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

VHF BANDS

A. J. DEVON

WELL, your A.J.D. is on his marks again—though not yet pumping quite at full bore—with profuse and sincere apologies for the non-appearance of this feature last month, and a slight glow of satisfaction that a few readers at least did notice the absence of "VHF Bands" in the April issue. Those who really did miss it can be assured that it was not due just to idleness on the part of A.J.D. (as contended by old-man Editor) but because the press of events under a malarial temperature of 103° made it a little difficult for A.J.D. to sort his papers.

Anyway, as things fell out, there would not have been a great deal to report last month in the way of operating results—indeed, after a very good start in the early part of the year, VHF has been in the doldrums for the last couple of months. Plenty of local activity, and many new stations coming on, but nobody working much in the way of DX. Of course, for a lot of people on the VHF bands, the working of EDX/GDX is not their *raison d'etre* at all—there are a great many experimenters in our midst, and much of the real constructional urge and interest of Amateur Radio has been transferred from the HF to the VHF bands. And what a vast field of interest there is, from aerials to receivers and transmitters in several modes, to say nothing of UHF possibilities and developments.

The weather during the last few weeks has effectively dictated the trend of conditions, and there is not much to say about that. The March contest was played off in very cold Wx and though the glass was fairly well up, at 30·4 in. this was not significant in the circumstances, and conditions for the event were poor, and the apparent activity low—though this did not mean that there were not a lot of stations trying, as proved by the fact that some of the London-area protagonists were showing stations-worked totals of well over 100; G3GHI had 140S by the close.

Scottish VHF Convention

This is reported as having been the most successful yet, with about 70 people at the afternoon meeting, and 62 at table for the dinner with which the convention concluded at the Mill Hotel, Rutherglen, on Saturday, April 18. There were talks and demonstrations by Tom Withers, G3HGE, and Ed. Murphy, GM3SBC, and the exhibitors included equipment displays by the firms of Withers, Green & Davis, J-Beams, Cathodeon Crystals, M-O Valve Co., Partridge, Strattons and the local Glasgow Electronic Services. With G3FZL in the chair, the speeches were by GM3EGW, G3HRH, GM5VG and G5JU, and the Kyle Trophy was presented to GM6XW in recognition of his untiring efforts on VHF for Scotland. There was a very good attendance of GM's in addition to the visitors from London way—and until GM3GZA showed up at the meeting, very few knew that he is on 145·8 mc from Campbeltown in Argyllshire, is very well sited for GDX and, though he hears many distant stations, gets few contacts because nobody tunes that high in the band!

London VHF/UHF Convention

Note that this popular and well-attended VHF meeting is to take place on Saturday, May 16, at the Kingsley Hotel, Bloomsbury Way, London, W.C.1; that the tickets, for convention and dinner, are 27s. 6d., obtainable from F. E. A. Green, G3GMY, 48 Borough Way, Potters Bar, Middlesex; that early booking is advisable, as the dinner

TWO METRES

COUNTIES WORKED SINCE SEPTEMBER 1, 1963

Starting Figure, 14

From Home QTH only

Worked	Station
57	G3BA
55	G3LRP
54	G3GWL
52	G3NUE
49	G3CO
44	G4LU
42	G3PTM, G3SAR
40	G3HRH
38	G2AXI
37	G3LAS
34	G3DVQ, GM3LDU
33	G2BJY, G2CDX, G3PSL
32	G3AHB, G5JU
30	G3CKQ
29	G3CCA
28	G3PKT, G5UM
26	G3GSO, GW3PWH
25	G3KQF
24	G2BDX, G3ONB
22	G3IOE
21	G3SML, G8VN
20	G3EKP
19	G3KPT
17	GW3CBY
16	G3HWR, G3OJY
14	G3OZF, G5ZT

This annual Counties Worked Table will run till August 31, 1964. All two-metre operators who work 14 or more Counties on the band are eligible for entry. QSL cards or other proofs are not required. After the first 14 worked, simply claim from time to time with counties as they accrue, giving callsign and date for the county worked. To keep the Table up-to-date, claims should be made at intervals of not more than two months.

seating is always a sell-out; that there will be a very interesting programme of technical talks, and an equipment display; that the convention opens in the morning, with the lectures in the afternoon; and that tickets for this part of the programme only (exclusive dinner) are 3s. 6d., also from G3GMY.

This is the tenth in the series of these important VHF conventions, always drawing an enthusiastic gathering from all parts of the country. Out-of-town visitors take care to arrive early on the Saturday, so that there is time for improving and productive tours round those well-known radio establishments in the Lisle St. and Tottenham Court Road areas.

Andorra on Two Metres!

There will be a very good chance of working a new country during June 12-21, when that experienced expedition team, F2MO and F2QX, will be in Andorra. They have been there before, and know the form, but this is the first time that two metres is to be tried. Signing PX1QX, from a location 8,000 ft. a.s.l. and with a clear take-off in most directions, operation will be daily from 1800z on a frequency near 144·0 mc, running 100w. AM/SSB, with an 8-ele beam and a nuvistor converter into an NC-300. Though the HF bands are also to be worked (as on their previous occasions), a special effort is being made this time "to put Andorra on two metres in the right way," as F2QX expresses it. VHF transmission will not start until the evening, but he will be QRX on two metres most of every day, so that a blind call might activate PX1QX. The HF-band activity is being looked after by F2MO, signing PX1MO, so it may be possible to raise him on, say, 80 metres, for a 2m. sked.

From a site like that, we would think that PX1QX will not have much difficulty in making a great many EU contacts on two metres, under almost any conditions, as they will command an enormous "local area," well populated in the VHF sense. However, for working the U.K., conditions will undoubtedly be a factor—indeed, we could be in the position of being able to hear PX1QX quite well, without being able to raise him through the semi-local EU barrage. The QSL address is: Bernard Achard, F2QX, 117 Rue de la Course, Bordeaux (Gironde). Though Bernard does not mention it, sked arrangements might be possible—but remember, he will be in demand from all over Europe!

And now, looking no further than our own boundaries, we are asked to announce that the Liverpool boys will be taking their club station into Caernarvonshire for May 23-24, signing GW3AHD/P on two *and* four metres. QSL to G3MCN (*QTHR*).

And on Four Metres

We are glad to be able to report new ground being broken by GC3OBM/G5ZT, who have made the first-ever G-GC contact on 70 mc; GC3OBM, on Guernsey, runs 45w. on 70·35 mc, with a QV06-20 in the PA, a CC converter into an HRO, and a 4-ele flat-top. His normal operating period is from noon-time on Sundays, and skeds are offered. Bill, G6NB, reports hearing him at 579 on Easter Sunday and calling many times without response—however, during the same session GC3ROP on Sark was worked from Brill, for a new one on four metres. G5ZT (Plymouth), the other half of the GC3OBM "first," is on 70·2 mc, but says it is hard going down there.

Notes on 23 Centimetres

G3GWL (Bletchley) reports that his 23 cm Tx is nearing completion, with the exciter section to 70 cm in operation and driving a DET-22 tripler giving an RF output of about one watt on 23 centimetres; this in turn is to drive a DET-24 in a cavity resonator, as a straight PA taking (it is being hoped) about 20w. input. This will give Colin a pretty potent RF source on the 1290 mc band, to be fed into a corner reflector for plenty of gain. He will then be in the business, as the Rx is already working.

Up in Birmingham, G2CIW reports two-way QSO's with G3NBQ (Coventry); the 23 cm signal averages S7 over their 19-mile path. Other stations in the area collaborating on 1290 mc are G3KFD and G3KPT, and work is going on all the time to improve the gear and get better signals over what are strictly non-visual paths.

Reflections—on Reflection

In the March issue, in this piece, some passing reference was made to the possibility of GDX being heard by *Echo II* reflection. G3EDD, in a very interesting comment, suggests that this is most unlikely, and that a much more probable cause of the sudden appearance of a DX signal on VHF is aircraft reflection. He cites several instances from his own experience, of GDX being heard for the sort of period and in the direction from which it

FOUR METRES

ALL-TIME COUNTIES WORKED LIST

Starting Figure, 8

From Home QTH Only

Worked	Station
41	G3EHY
37	G3IUD, G3PJK
35	G3OHH
34	EI2W
33	G5JU
30	G2OI, G3JHM/A
29	G3NUE
26	G3PMJ, G5FK
21	G3AYT
20	G3LZN
19	G3BNL
16	G3BJR, G3FDW, G3OWA
15	GI3HXV
14	G3OKJ
12	G2AXI, G3LQR, G5DS
11	G3HWR, G3SNA
10	G2BDX
8	G3PRQ

This Table records Counties Worked on Four Metres, on an all-time basis. Claims can be made as for the other Tables, e.g. a list of counties with the stations worked for them, added to from time to time as more counties accrue. QSL cards or other confirmations are not required.

would be expected if a large aeroplane were on a steady course relative to both fixed points. On several occasions, listening to G2XV on 70 cm and knowing his beam heading, G3EDD was able to deduce a Doppler-shift effect of about 50 c/s, consistent with aircraft reflection.

A few days before seeing G3EDD's letter, your A.J.D. was having a listen round the two-metre band and came upon a London station discussing this very matter of aircraft reflection, on two metres. Being on the edge of London Airport, said operator is apparently in the habit of using the Boeing flight coming in at 8.55 p.m. to hear all sorts of things, including G3OCB down in Truro! The Boeing's approach being from the westerly direction this would give time for a QSO—and, in fact G3SHK has worked G3OCB, but whether it was by Boeing reflection or some more conventional propagation mechanism, we would not know. (G3SHK is the station within the fall-out area of London Airport.)

What all this comes to is that aircraft reflection can be a factor in GDX working on VHF—it can even have an effect on 10 metres in those parts of the U.K. where aircraft density is high—and so it follows that if you get the brochures (*not* from us, and A.J.D. cannot be involved in any correspondence about this) covering BEA/BOAC/KLM/PAA/TWA timings and routes over the U.K., you may be able to work out something useful for your own district, remembering that Daventry is a turning point for aircraft being stacked over London Airport. The airlines mentioned are those flying large aircraft on regular services into and out of U.K. airports. The smaller ones are not worth bothering with in this context.

Two Metre Notes and News

One of our keenest VHF operators, with good gear for the 144/430 mc bands and an excellent location, is G5QA (Exeter). But for the last few months Herbert has been having a bad time under surgery and both he and his XYL were in the same nursing home for different troubles. However, he writes to say that things are now straightening out and that he will be on the VHF ball again before long.

G6NB (Brill) is finishing off a new two-metre Tx—and from where he is, it is anybody's guess what Bill will be able to do with it. He is also /M on two metres, and is able to find the local spots from which he can put out a good signal.

Johnny, G3BLP (Woldingham), who has now worked no less than 1,311 different stations on two metres, remarks that the only reaction to his comments about the Zone Plan (*see* p.41, March) seems to be "the steady erosion of other zones by London-area stations who are already getting out very well and have no need to operate out of zone." This only makes it more difficult for those in poor QTH's, already having a struggle to get out.

A comment on the same theme comes from G3RMB (Coventry)—who himself gets out very well, incidentally—saying that he hopes the Band Plan is maintained and that all VHF operators adhere to it. He goes on to say "there are very few who do not wish to work DX on the VHF bands; it is of great assistance to them to know where to look when wanting GDX." It is nearly a year since G3RMB last wrote in, and since then he has improved the receiving side—with a 6CW4/12AT7 into an AR88—and the beam is now a 10-ele long Yagi; the Tx still runs 25w. Having been on a DX-pedition into Scotland and Northumberland with G3KXA, he knows what it is to have a band-full of signals calling—"an almost frightening experience."

Bob at G5MA (Great Bookham, Sy.) says he is on the look-out for GM3GZA, as already mentioned, but that conditions will have to improve quite a lot to make him workable. At G5MA, the only thing out of the ordinary during the last few weeks was a CW contact with G3IOE (Newcastle), on April 8.

At G3CO (Hartley, Kent) activity has been low, and he is one of those who confirm that for the last few weeks VHF has been somewhat in a slough of despond. He had a rather dreary Easter holiday in Holland, *en famille*, with the Wx even worse than it was over here, but he managed to make personal contact with PAØDEF, who confirmed that VHF conditions were as bad there; another interesting meeting was with PAØLQ, who is second operator of PAØAA, the official VERON station, on the air every Friday evening and looking for QSO's after their Dutch, English and RTTY transmissions, when they always expect to be able to

TWO METRES

COUNTRIES WORKED

Starting Figure, 8

22	G3LTF (DL, EI, F, G, GC, GD, GI, GM, GW, HB, HG, LA, LX, OE, OH, OK, ON, OZ, PA, SM, SP, UR)
22	ON4FG (DL, EI, F, G, GI, GM, GW, HB, HG, LA, LX, OE, OH, OK, ON, OZ, PA, SM, SP, UA, UR, YU)
21	G3HBW, G5YV (DL, EI, F, G, GC, GD, GI, GM, GW, HB, HG, LA, LX, OE, OH, OK, ON, OZ, PA, SM, SP)
19	G3CCH
18	G6NB, ON4BZ, OK2WCG
16	G3BA, G3BLP, G3CO, G3GHO, G3KEQ, G5MA, G6RH, G6XM, PAØFB
15	G2CIW, G2XV, G3AYC, G3DKF, G3FZL, G3RMB, G4MW, GM3EGW
14	G2FJR, G2HDZ, G3AQX, G3FAN, G3HAZ, G3HRH, G3IOO, G3JWQ, G3KPT, G3PBV, G3WS, *G5BD*, G5DS, G6LI, G8OU
13	G2HIF, G2HOP, G3AOS, G3DMU, G3DVK, G3EHY, *G3GPT*, G3IIT, G3NNG, G3NUE, G3OHD, G4LU, G6XX, G8VZ
12	EI2A, EI2W, F8MX, G2BJY, G2CDX, G3BNC, G3GFD, G3GHI, G3GWL, G3JAM, G3JLA, G3JXN, G3LAS, G3OBD, G3WW, G5CP, G5JU, G5ML, G8DR, GW2HIY
11	G2AJ, G2CZS, G3ABA, G3BDQ, G3BOC, G3GSO, G3IUD, G3JYP, G3JZN, *G3KUH*, G3LHA, G4RO, G4SA, G5UD, G6XA, GC2FZC, OK1VR, PAØVDZ
10	G2AHP, G2AXI, G2FQP, G3BK, G3DLU, G3GSE, G3JHM/A, G3KQF, G3LAR, G3LRP, G3LTN, G3MED, G3OSA, G3OXD/A, G5MR, G5TN, G5UM, G8IC, GW3ATM, GW3MFY, GW5MQ
9	G2BHN, G2DHV, G2DVD, G2FCL, G3BOC, G3BYY, G3FIJ, G3FUR, G3OJY, G3PSL, G3PTM, G4LX, G8GP, GC3EBK, GI3ONF, GM3DIQ
8	G2BDX, G2DDD, G2XC, G3AEP, G3AGS, G3AHB, G3CCA, G3EKX, *G3GBO*, G3HCU, G3HWJ, G3KHA, G3PKT, G3MPS, G3VM, G5BM, G5BY, G8SB, GM3JFG, GM3LDU

work the better-placed southerly G stations. PAØAA is situated near Leiden, on what is high ground for Holland—a tower a few feet above sea level, and said by the locals to be an advantageous site.

The Tabular Matter

That shown here has been brought up to date so far as your A.J.D. has been notified. As always, there is a large clutch of claims in hand for the Two-Metre All-Time, the master table, which tells the VHF story literally from the dawn of time, meaning that it shows what everyone had done on two metres since the band was opened, sixteen years ago. If you are in the All-Time, with a good total of stations worked—and some of them bob around the 1,000-mark—you are among the founder members as regards VHF in the U.K. Few of the professionals have so long a practical experience of communication on VHF as those who lead our tables. In fact, much of the current commercial VHF practice is based on amateur understanding and know-how, and the results and technical data which for years have been explained, discussed and argued out in these pages.

We are now at that interesting stage where the radio amateur application—the backyard beam and 50 watts or so in the PA—is matched up by large commercial installations designed, thought out and controlled mainly by "professional amateurs" who would be glad to have those facilities in their own backyards. In other words, if you are a real radio man, it's in your blood, and all you are interested in is working DX on whatever happens to be the most difficult band of all at the time of thinking. (Where *did* he get these ideas from?—*Editor.*)

Some of The Gleanings

Scratching round the VHF bands and through the A.J.D. correspondence, we find the following: "This has been the best winter for conditions on Two in all the 12 years I've been on; good DX has always been workable" (G3IOE) . . . "Activity locally is now quite high, and the most popular times are around 1930-2100, clock time" (G3OCB) . . . "I can usually manage a five-minute lunch-time banter with Colin, G3GWL, when we are at home" (G4LU) . . . "GW2HQ in Aberdovey, Merioneth, is on 145·42 and is very strong here; he hears many Cornish and South Wales stations but they do not respond to his calls; are their beams ever turned to his direction?" (G3EHY) . . . "When LX1AL came back to my CQ it was a birthday treat for me; everyone else was after LX1SI; presumably this proves that if nobody calls 'CQ' no QSO's will result" (G3OHD) . . . "I have improved my 4-metre mobile gear and have had some very good contacts over a distance of 29 miles, using a ¼-wave vertical whip and a Tx input of 4 watts" (G8VN) . . . "Since starting on two metres in December, about 70 different stations have been worked, using a modified SCR-522 running 22w. input" (G3SML) . . . "As a newcomer to two metres I am perhaps not qualified to comment on the Zone Plan, but I feel bound to say that it seems to have worked well over the years; the thought of swooping VFO's on to pieces of rare DX is horrifying" (G3COI) . . . "I have a new 20-ele stack under construction and that should help to push up my score on 70 centimetres" (G3EKP) . . . "Persistence during the March two-metre contest produced contacts with 97 different stations, despite poor conditions" (G3PTM) . . . "I was very sorry to read that you had been ill but relieved to know that you are now out of the wood" (G2BDX) . . . "I have now got up to 15C in the 4-metre all-time counties worked, the new one being G3FDW for Cumberland" (GI3HXV). . . .

New UHF Licences

It is under G.P.O. consideration to issue AT-station licences for the amateur bands from 70 centimetres up without the Morse Test formality—in other words, to legalise the present /T licence situation. While the effect of this new dispensation might be (or could be) to concentrate some new brain-power on our UHF bands, most readers would probably agree that, whatever the bands to be used, the CW requirement sorts out the serious amateurs from those who just want to play. Without going into all the background arguments, there is good reason why every holder of an amateur licence should be coherent in Morse. This has nothing to do with being able to know how to "read the signal about closing down in an emergency;" or being able to copy CW on the amateur bands; or realising that all the real DX is still worked on CW, as being by far the most efficient, accurate and easiest radio communication system known—what the Morse requirement does establish is that if you are to be a fully competent operator in the Amateur Radio sense, you should be able to work a QSO as easily on CW as you can on phone. The interesting fact is that the people who really matter and who lead the field on the VHF bands can do just that. They are as coherent on the key as they are with the microphone.

With Thanks

Your A.J.D. would like to offer his particular thanks to the following, who were good enough to take the trouble to keep him informed of the VHF situation during his period of absence: G2CIW, G3BA, G3BLP, G3CO, G3EHY, G3GWL, G4LU, G5MA, G6NB and G8VN. Much of what you have read is based on their reports.

And in Conclusion

Thanks be to Allah, we have a little more time this month, during which a lot could happen—there could even be a big EU opening. Indeed, as this went down, there were signs of an improvement in conditions. To get your reports, comments, ideas, claims, suggestions, opinions and criticisms into "VHF Bands" for the June issue, send them all to: A. J. Devon, VHF Bands, *Short Wave Magazine,* 55 Victoria Street, London, S.W.1, to be with us not later than **Friday, May 22.** With you again on June 5, a.b.w. *73 de A.J.D.*

NEW QTH's

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

G3LRO, J. H. Tinker, 68 Caulfield Road, East Ham, London, E.6.

G3SKK, W. D. James, 36 Poplar Road, Rayleigh, Essex.

G3SMZ, R. T. A. Hill, 12 Hurst Street, Reddish, Stockport, Cheshire.

G3SNN, A. B. Woolford *(ex-ZC4CN),* 7 Wayside Cottages, Staplehay, Taunton, Somerset.

GW3SON, L. A. France, 5 Heol-y-Garth, Penparcau, Aberystwyth, Cards.

G3SPU, R. C. Moore, 15 Waverley Gardens, Melksham, Wiltshire.

G3STS, T. Edwards, 65 Connaught Street, London, W.2.

GW3SUH, K. Hughes, 2 Ynys Street, Ynyshir, Rhondda, Glam.

G3SUI, J. W. Burrows, 15 Ainscow Avenue, Lostock, Bolton, Lancs.

G3SUX, D. J. Bradshaw, 9 Howarth Road, Abbey Wood, London, S.E.2.

G3SVD, A. P. Hewitt, 24 Romany Lane, Tilehurst, Reading, Berks. *(Tel. Reading 28897).*

G3SVH, D. H. Perks, 87 Long Lane, Newtown, Nr. Walsall, Staffs.

G3SVJ, Luton and District Amateur Radio Society, c/o A.T.C. Headquarters, Crescent Road, Luton, Beds.

G3SVN, J. Fowler, Axholme Lodge, Woolsthorpe-by-Colsterworth, Nr. Grantham, Lincs.

G3SVW, R. P. Smith, 226 Greenbrow Road, Newall Green, Wythenshawe, Manchester 23, Lancs.

G3SWG, B. Tinton, Pineclose, 10 Glynville Road, Colehill, Wimborne, Dorset.

G3SWH, P. A. Whitchurch, 66 Pettigrove Road, Kingswood, Nr. Bristol, Glos.

G3SXW, R. K. Western, 118 Salisbury Avenue, Barton, Torquay, S. Devon.

G3SXX/T, G. True, Police House, Eythorne, Nr. Dover, Kent. *(Tel. Shepherdswell 311).*

GW3SYE, W. J. Davis, 30 Maindy Road, Cathays, Cardiff, Glam.

GM3SYO, D. J. Mackay, 28A Louisburgh Street, Wick, Caithness.

G3SYQ, I. Wicks, 16 Cedars Close, Swindon, Wilts.

G3SZC, I. G. West *(ex-VS9MA),* 17 Wife of Bath Hill, Canterbury, Kent.

G3SZC/A, I. G. West, 7 Station Road, Whitstable, Kent.

G3SZQ, V. G. Porter, 346 Kings Road, Ashton-under-Lyne, Lancs.

G3TAI, C. F. J. Ward, 39 Chestnut Avenue, R.A.F. Station, Topcliffe, Thirsk, Yorkshire.

G3TAM, T. A. Moore, 20 Samuel Richardson House, West Kensington, London, W.14.

CHANGE OF ADDRESS

EI2W, H. L. Wilson, 23 Rathgar Road, Dublin, 6. *(Tel. Dublin 977879).*

G2DT, F. L. Nunn, 62 Orford Street, Ipswich, Suffolk.

G3CMI, J. A. Scott, 85 Fountains Avenue, Bilton, Nr. Harrogate, Yorkshire.

G3DJQ, B. H. T. Olver, Little Orchard, St. Lawrence, Isle of Wight. *(Tel. Niton 204).*

G3DOQ, C. P. Pirnie, The Pines, Hepscott, Morpeth, Northumberland.

G3IDW, R. Reynolds, Orchard Cottage, Hook, Swindon, Wilts.

GI3IEX, D. J. Roper, Erinagh House, Erinagh, Nr. Downpatrick, Co. Down.

GM3IGY, W. A. P. Dellar *(ex-VK5DK),* R.A. Guided Weapons Range, Benbecula, Hebrides.

G3JAZ, B. M. Poole, Charnwood, 57 Annefield Park, Gresford, Denbighshire.

G3JGO, B. Priestley, 43 Raymond Road, Langley, Slough, Bucks.

G3JHM, D. T. Hayter, 16 A'Becket Gardens, Worthing, Sussex.

G3JTL, A. Fennell, Garden Cottage, Haytor, Newton Abbot, Devon.

G3LWH, G. Twist, L.L.M., 80 Bell Barn Road, Stoke Bishop, Bristol, 1.

G3LYT, W. Fennell, Garden Cottage, Haytor, Newton Abbot, Devon.

G3LZE, M. J. Henry, 17 Oakwood Avenue, Southgate, London, N.14.

G3LZQ, J. Dunnington, 122 Flinton Street, Hessle Road, Hull, E. Yorkshire.

G3MWV, D. G. Blake, Clare House, Clare Road, Cromer, Norfolk. *(Tel. Cromer 2872).*

GW3OCD, V. A. Davies, Ffriddoedd, 7 Cae Cotton, Llanelly, Carms.

G3OJV, P. W. Waters, 6 The Sheilings, Hornchurch, Essex.

G3OXO, P. E. Morrison, 16 Broadview Avenue, Rainham, Gillingham, Kent.

G3POQ, P. D. Hayes, Coppers, 98 Hawthylands Road, Hailsham, Sussex.

G3RBR, F. B. S. Rogerson, 12 Croft Road, Thame, Oxfordshire.

G3RDC, A. Wood, 30 Baldslow Road, Hastings, Sussex.

G5HB, H. Biltcliffe, Longlands, Station Road, Steeple Morden, Nr. Royston, Herts. *(Station in Cambs.).*

G5KC, G. W. Kelley, 9 Cornwall Drive, Fulford, York.

G8RY, F. E. Wyer, Four Winds, New Works Lane, Wellington, Salop. *(Tel. Wellington 4025).*

For anything radio you may want to buy, sell or exchange — use the Readers' Small Advertisement section in "Short Wave Magazine" — See pp.183-191

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for June Issue: May 15)

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

IS there such a thing as a formula for a successful Amateur Radio Club ? Many a harassed committee would like to know, particularly as things begin to fall off in that depressing way that many of them know so well.

Well, maybe there's no such thing as a formula, but there are certain ingredients that are most certainly necessary. The first (and probably the most important) is youthful enthusiasm. There's nothing like a bunch of young, keen SWL's, intent on getting their tickets, to keep a club alive. Enthusiasm is infectious, remember.

The second stage, often arising from the first, is a group of members between whom a keen but friendly rivalry exists—whether in the field of DX, or of home-construction, or whatever it may be. Four or five DX-minded members, each determined not to be outshone by the others, can offer a wonderful tonic, since they all have bright ideas now and then, and will certainly put them into practice. Hence "A" has a better aerial system ; "B" a better receiver ; "C" a higher-powered transmitter . . . but not for long, since each of them will profit from the experience of the others.

The secretary, if he does his stuff, will induce all of them to tell the club about these goings-on, and there is part of the lecture programme solved from within the membership.

Nothing is so certainly doomed to failure as a disillusioned group of old-timers, who have worked it all, built it all and done it all, wallowing in the nostalgic past. Without the young blood and the enthusiasm for new ideas, a club soon becomes moribund, and eventually defunct. Think it over.

Point to Watch

How's your insurance position ? **Derby** recently discovered, to their cost, that a loss of stationery and news-sheet material damaged by fire cannot be recovered from their Insurance Company because the stock was not in the clubroom, but at a member's private address. Check your policy—and read the small print !

ACTIVITY REPORTS

On May 26, **Barnet** will be hearing about the A.R.M.S. all-band SSB/CW transmitter—8 p.m. at the Red Lion Hotel, High Barnet. The June meeting (on the 30th) will be a Junk Sale.

Meeting, as always, at the Science Museum, **Civil Service** will hear a lecture by G2AOX on Satellite Tracking and Prediction, on May 4 ; on the 25th there will be an informal meeting (one week later than usual because of the Whitsun holiday).

Mitcham, who recently pulled themselves out of a deep depression, elected new officers at their AGM (*see* panel for new secretary's QTH), and halved the membership fee. It is even less for members under 21. They report "Club now going well," and we are very glad to hear it.

A Junk Sale will be held at **Northern Heights** on May 13 ; on the 27th there will be a talk on Transistors, by G3UI. Quite a few new licences among the members are expected, and there is a lot of activity in connection with special stations and outside visits during the summer season.

Southgate will be hearing a talk on Green & Davis equipment on May 14, with particular reference to Two Metres, by request of the club members. May 28 is the date for an informal meeting, following the pattern of the successful ones held in March and April as the second meetings of the month. Note new secretary's QTH.

The future programme at **Spen Valley,** who held their annual dinner on April 25, includes a visit to the Bradford club on May 12 ; a talk on "Missilemen, 1964" on May 14 ; a visit to the firm of Research Electronics, at Cleckheaton, on the 21st ; and a talk on RTTY, by G3KEP, on the 27th. On June 3 they will visit the Met. Office at Church Fenton. Altogether a pretty busy month.

Torbay, at a recent meeting, heard a talk on TVI by G3LKJ, their P.R.O. Roger Western, son of their secretary, G3NQD, now has his own callsign, G3SXW.

There will be a Film Show by G3ERB at **Wirral,** on May 6, and a talk on the 20th. A mobile week-end, organised by G2AMV, will be held on May 9-10, when it is hoped that a large turnout of members will rendezvous "somewhere in Wales."

Cray Valley held their AGM in April, and the review of the year's activity gave an encouraging picture, including an increased membership. Their officers were all re-elected.

West Kent continue to meet on the second and fourth Fridays at Culverden House, Tunbridge Wells, and report that recent gatherings have been well attended. The full programme at **Derby** includes a Surplus Sale on May 6, a talk on "Our Society—Its Past and Future," on the 13th ; a D/F Practice Run on the 20th and an Open Evening on the 27th. June 3

is booked for a Junk Sale.

Lothians report that they were " royally entertained by the Kingdom of Fife " when they recently visited Dunfermline, who laid on an excellent programme of talks, films, demonstrations and food ! At their May meeting they are to hear about " Small Vessel Communications " from Mr. W. R. Cook, of Coastal Radio.

Stratford-upon-Avon will by now be recovering from their efforts in connection with the opening of the new Shakespeare Centre on April 22, when GB2WS was due to take the air for four days, on four bands.

Oxford continue to gather at the Cherwell Hotel, Water Eaton Road, on the second and fourth Wednesdays ; they are looking forward to their visit from Heathkit (Daystrom Ltd.) on May 13, and on June 10 they will have a lecture/demonstration by Cathodeon Crystals Ltd. Also lined up for the future is a visit from Racal Electronics Ltd. R.A.E. classes are still run at every meeting, 7.15 p.m.

The May meeting at **Midland** will comprise a lecture by speakers from Birmingham University, on Lasers and Masers. This will be on the 26th at the Midland Institute, Paradise Street, Birmingham 1. On June 16 they will have a visit from Mr. H. V. Sims (BBC Training School), who will give a lecture/demonstration on Aerials.

Melton Mowbray will hold their monthly meeting on May 21 (St. John Ambulance Hall, Asfordby Hill), and the talk will be on " 70 cms.," by G2FNW.

Acton, Brentford & Chiswick will meet on May 12 for an NFD briefing—AEU Club, 66 High Road, Chiswick, 7.30 p.m. **Reading,** having devoted their April meeting to the SWL's, will be holding a Junk Sale on May 30, and the June event (on the 27th) will be devoted to the testing and checking of receivers—the speaker will be G3OLA. Three cups have been donated to the club, and contests will be run for them this year.

There has been a change of secretary at **Nottingham** (*see* panel), and we are notified that meetings are now held every Tuesday evening, and also on occasional Thursdays, 7.15 p.m. at Sherwood Community Centre, Woodthorpe House, Mansfield Road.

Wessex have stepped up their meetings to two a month, held on the first Monday, and the Friday of the third whole week, at the Cricketers Arms Hotel, Windham Road, Bournemouth. A more active programme has been drawn up, and a 20-metre SSB transceiver has been bought. Pending its arrival, a two-metre station will be put on the air.

Mansfield ask us to note that they now meet at the ATC Headquarters, Sutton Road, on Fridays at 7 p.m. —visitors always welcome. The March and April lectures at **Preston** were given by G2BQ—on Aerials and Transmission Lines. On May 12 they have arranged a visit to the Ribble Generating Station—7 p.m. May 26 is the next date for an ordinary meeting.

Evidence of fine work at **Crawley**—two new G3S - - callsigns on the roll, and no fewer than 18 sitters for R.A.E. A recent lecture, by GPO Engineers, covered Radio Interference ; and a visit from DL1ZQ was celebrated by the customary " tour of shacks and liquid refreshment."

Meetings on the second and fourth Tuesdays continue for **Bradford ;** on May 12 they will be discussing Field Day arrangements, and on the 26th the subject will be VHF Operating (G2HHV). On May 14 they visit the Spen Valley club.

Grafton have come out with a " prototype publication "—an excellent five-page newsletter. We are especially pleased to note the diary feature on the first page, although it unfortunately does not give us any gen. on meetings *after* publication date. We gather that Islington Public Library have offered to display a poster, and that Stoke Newington Public Library have asked for details of the club—an excellent publicity channel that might be followed up by more clubs.

A full programme for **Luton** (now owners of the call G3SVJ) includes a visit to a neighbouring club (May 5), a talk on Wartime Operating, by G2DPQ (May 12), and a tape lecture, " Radio Over the Years " (May 26). **South Hants** will hold the Southampton Area Group meeting on May 9, when it is hoped that G3CCA will be able to talk about his parametric amplifier for Two Metres. Failing

Photograph taken at the annual dinner of the Thanet Radio Society, at which the total attendance was 94. In the picture G3RAD is being presented with the Club's senior construction cup, by Mrs. Chapman, wife of Thanet's president, G2IC.

this, there will be a Junk Sale.

Things are flourishing for **Salop**, a fairly recently-formed club. They report steadily increasing membership and good attendance at meetings. The April lecture, by G3BA, was the last of the 1963-64 session, but visits to Shrewsbury Telephone Exchange and the GPO station at Criggion are arranged for May and June. Fortnightly meetings, at Chatwood Tennis Club, Harlescott Crescent, Shrewsbury.

Purley have decided to cater for Morse-learners, at the beginning of some of their meetings; May 1 will be the opening session; May 15 is the date for the AGM. All meetings start at 8 p.m. in the Railwaymen's Hall, Whytecliffe Road, Purley.

Medway will get together on May 4 to hold an inquest on the previous day's Mobile Rally at Higham; on May 18 they will have a discussion and talks on Aerial and Earthing Systems. Both meetings at the Brasenose Club, Nelson Road, Gillingham, 8 p.m.

Yeovil met three times during April, but give no details of May meetings. Similarly with **Worcester**—they gather on Saturday evenings at Perdiswell Park, Droitwich Road, but no further details are given except that there will be a Junk Sale in May.

Clifton have a nice crop of new licences, and hope to be active again on Two, very shortly. At their recent Quiz, versus Crystal Palace, members were a bit bowled over to find a three-minute Morse test included in place of the usual memory game—good idea!

The AGM recently held at **Cambridge** was a successful meeting, at which the secretary reported membership standing at 50. (*See* panel for new secretary.) On June 21 the club will be joining others from the district in a combined picnic at Houghton Mill, a delightful spot near Huntingdon.

The four May meetings at **Chester** are as follows: May 5, Net Night (160 and Two); 12th, Lecture (no details); 19th, G3EWZ will demonstrate his valve tester, and members may make use of it; 26th, Pre-NFD discussion.

Hounslow announce a change of secretary (*see* panel), G3NHH having left to become a VE3. They report good progress and regular attendance, and will hold their AGM on May 4. June 1 will be devoted to "launching the club callsign."

Loughton will meet on May 8, probably for a Film Show; on the 22nd the meeting will be devoted to setting up GB3LOU for its special operation on the following day, when it is hoped to work all bands, One-Sixty to Two. The venue will be Loughton Hall, Debden Community Centre, Rectory Lane.

Roding Boys' Society announce that one of their members has now become G3TAJ, and is a licensed operator of the club station, G3SRE. They are trying

Names and Addresses of Club Secretaries reporting in this issue:

ABERDEEN: J. McCall, GM3HGA, 1 Pinewood Place, Aberdeen.
ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, London, W.3.
A.R.M.S.: N. A. S. Fitch, G3FPK, 79 Murchison Road, London, E.10.
BARNET: F. Green, G3GMY, 48 Borough Way, Potters Bar.
BRADFORD: E. G. Barker, G3OTO, 63 Woodcot Avenue, Baildon, Shipley.
CAMBRIDGE: S. Clarke, 47 Hurst Park Avenue, Cambridge.
CHESTER: R. Trickey, G3DRB, 31 Penzby Avenue, Chester.
CIVIL SERVICE: G. Lloyd-Dalton, 2 Honister Heights, Purley, Surrey.
CLIFTON: J. Rose, G3OGE, 63 Broomfield Road, Beckenham, Kent.
CORNISH: W. J. Gilbert, 7 Poltair Road, Penryn.
CRAWLEY: R. G. B. Vaughan, G3FRV, 9 Hawkins Road, Tilgate, Crawley.
CRAY VALLEY: S. W. Coursey, G3JJC, 49 Dulverton Road, London, S.E.9.
CRYSTAL PALACE: G. M. C. Stone, G3FZL, 10 Liphook Crescent, London, S.E.20.
DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby.
EAST WORCS.: M. J. Nicholas, 12 Crabtree Close, Lodge Park Estate, Redditch.
GRAFTON: A. E. Bristow, 37 Tyndale Mansions, Upper Street, London, N.1.
HOUNSLOW: D. F. J. Walmsley, G3HZL, 153 Worple Road, Isleworth.
LEYTON: R. W. Firmin, 9 Raglan Road, Walthamstow, London, E.17.
LOTHIANS: L. R. Richardson, GM3AKM, 39 Silverknowes Grove, Edinburgh 4.
LOUGHTON: A. W. Sheppard, G3JBS, 11 Barfields, Loughton, Essex.
LUTON: D. J. Pinnock, G3HVA, 265 Chesford Road, Luton.
MANSFIELD: F. N. F. Bewley, G8HX, 116 Westfield Lane, Mansfield.
MEDWAY: P. J. Pickering, G3ORP, 101 Chatham Road, Maidstone.
MELTON MOWBRAY: D. W. Lilley, G3FDF, 23 Melton Road, Asfordby Hill, Melton Mowbray.
MIDLAND: C. J. Haycock, G3JDJ, 360 Portland Road, Birmingham 17.
M.R.C.C.: J. Lockyer, G3OVA, 23 Beechwood Road, Birmingham 14.
MITCHAM: M. E. Carter, 31 Trewint Street, London, S.W.18.
NORTHERN HEIGHTS: A. Robinson, G3MDW, Candy Cabin, Ogden, Halifax.
NORTH KENT: B. J. Reynolds, G3ONR, 49 Station Road, Crayford.
NOTTINGHAM: R. W. Attenborough, G3RDJ, Beech House, Chapel Lane, Epperstone, Nottingham.
OXFORD: B. Green, G3PMI, 3 Barnet Street, Iffley Road, Oxford.
PETERBOROUGH: D. Byrne, G3KPO, Jersey House, Eye, Peterborough.
PLYMOUTH: R. Hooper, G3SCW, 2 Chestnut Road, Peverell, Plymouth.
PRESTON: W. K. Beazley, G3RTX, 9 Thorngate, Penwortham, Preston.
PURLEY: E. R. Honeywood, G3GKF, 105 Whytecliffe Road, Purley.
READING: R. G. Nash, G3EJA, 9 Holybrook Road, Reading.
REIGATE: F. D. Thom, G3NKT, 12 Willow Road, Redhill.
RODING BOYS': R. J. Phipps, 51 James Lane, London, E.11.
SALOP: D. K. E. Jones, G3RRN, Greystones, Shrewsbury Road, Church Stretton, Salop.
SCOTLAND: A. Barnes, GM3LTB, 7 South Park Terrace, Glasgow.
SILVERTHORN: B. A. Lea, G3ICY, 9 Balgonie Road, London, E.4.
SOUTH BIRMINGHAM: A. E. Bishop Jr., 40 Cecil Road, Birmingham 29 (Acting).
SOUTHGATE: Q. Wilkinson, 33 Amberley Road, London, N.13.
SOUTH HANTS: G. J. Meikle, G3NIM, 34 Victoria Road, Netley Abbey.
SPEN VALLEY: N. Pride, 100 Raikes Lane, Birstall, Leeds.
STRATFORD-UPON-AVON: H. W. Gannicott, 17 Highfield Road, Stratford-upon-Avon.
TORBAY: Mrs. G. Western, G3NQD, 118 Salisbury Avenue, Barton, Torquay.
WAMRAC: Rev. A. Shepherd, G3NGF, 121 Main Street, Asfordby, Melton Mowbray.
WESSEX: P. Cutler, G3MXF, 43 Langside Avenue, Wallisdown, Poole.
WEST KENT: H. F. Richards, 17 Reynolds Lane, Tunbridge Wells.
WIRRAL: A. Seed, G3FOO, 31 Withert Avenue, Bebington, Wirral.
WORCESTER: G. W. Tibbetts, G3NUE, 108 Old Hills, Callow End, Worcester.
YEOVIL: D. L. McLean, G3NOF, 9 Cedar Grove, Yeovil.

to raise £20 or so to buy a tent for their camps and field days; one project towards this is a Jumble Sale, which may be repeated if the target is not reached. An old trek cart is also being sought for transport purposes.

Silverthorn will be operating G3SRA on May 29-31, when Friday Hill Community Centre holds its open week-end. Normal meetings are on every Friday except the first, 8 p.m. at the Community Centre.

North Kent will be holding their AGM on May 14, and making field day preparations on the 28th. **South Birmingham** will be having a Junk Sale, followed by an exhibition of Early Wireless Equipment, on May 21. They run a net every Sunday, 1100 on 1·9 mc, signing G3OHM/A, and would welcome SWL reports, especially from over 25 miles.

Members of the Melton Mowbray Amateur Radio Society showing, back row, left to right: G3FDF (hon. secretary, M.M.A.R.S.); G3FXP; SWL Bradley; G3NVK; and SWL Fisher (who has his R.A.E. pass slip). Front row, left to right: G4MK, G3NGF and G8CZ.

WAMRAC have now issued a printed register of members—a publication running to 20 pages, and the third (and largest) of the series. They are getting ready for their third "Wamfest," which will be held on May 30.

The five meetings at **Aberdeen** during May consist of a talk on Practical Receiver Alignment (GM3ALZ) on the 1st; Junk Sale on the 8th; Aerial Tuning Units (GM5YK) on the 15th; a visit to Stonehaven Radio, GND, on the 22nd; and NFD Preparations on the 29th.

Cornish changed their name at the recent AGM—they are now the Cornish Radio Amateur Club. G3NKE is president, G3OCB chairman and Mr. W. Gilbert continues as secretary.

G3JKY, of Clifton, will be talking to **Reigate** on D/F Working, May 23 at the George and Dragon, Redhill. Mobile activity is on the increase, and visits to quite a few rallies are anticipated.

East Worcestershire will meet on May 14 at the Old People's Centre, Redditch; NFD will be the main topic. The same applies to the **Midland Radio Contest Club,** whose meeting on May 4 will be devoted to it, as will the working week-ends which follow. They will hold no June meeting, but on July 3 G2RO will be talking about his Middle East experiences.

At **Leyton** in London, E.10, they have the use of the Senior Evening Institute, Essex Road, for meetings on alternate Tuesdays at 7.0 p.m., the next being on May 12, when there will be a film show. A programme is being drawn up and the group hopes that potential members will get in touch with the hon. secretary (*see* panel). For their April meeting in the local Tech. College, **Peterborough** had a lecture/demonstration on amateur TV, by G3REH/T, and Mr. J. Bransom showed the possibilities of 625-line closed-circuit television.

Crystal Palace have a site problem for their field-day effort—the landowner has by mistake given two clubs the same piece of territory, but it is hoped that the "situation will be resolved amicably." Though they lost their annual quiz-battle with Clifton this year, it turned out to be a most enjoyable event, the final scores being: Clifton, 238; Crystal Palace, 214—near enough for the latter to feel that they lost with honour.

Plymouth report a most able and interesting lecture on DX, given by SWL Barry Curnow at one of their March meetings—apparently, the audience sat without a murmur through a talk given in fine style and all who heard it learnt something, even if not particularly interested in DX. What impressed his hearers is that Barry Curnow is an expert at the age of 15, and a master not only of his subject but also of the art of public speaking—well done! Summer activities in hand include a joint club outing to Dartmoor and, to plan such events and avoid any

NOTICE TO ALL HONORARY SECRETARIES

Appearance in this space is free to those Clubs who care to make use of it for publicity and the reporting of their activities. Hon. secretaries are asked to ensure that their reports—addressed only "Club Secretary," Short Wave Magazine, 55 Victoria Street, London, S.W.1—reach us by the date given each month at the head of the feature. We can give no undertaking to write in late reports, received after the closing date. All reports must always include the name and address of the hon. secretary, for publication in the address panel.

clashing of dates, an inter-club committee has been formed (consisting of the Exeter, Kingsbridge, Torbay and Plymouth groups).

CLUB PUBLICATIONS RECEIVED

We acknowledge with thanks the receipt of the following Club Publications:

Medway (*MARTS Newsletter*, April); **Scotland** (*GM Magazine*, March); **South Hants** (*QUA*, April); **Southgate** (*Newsletter*, April); **Grafton** (*Newsletter*, March); **ARMS** (*Mobile News*, March); **Cray Valley** (*Newsletter*, April); **West Kent** (*QLF*, March); **Midland** (*News Letter*, March); **Reigate** (*Feedback*, March); **WAMRAC** (*Circular Letter*, April); **South Birmingham** (*QSP*, April); **North Kent** (*Newsletter*, March); **Wireless Institute of Australia** (*Amateur Radio*, March); **First Class Operators' Club** (*Circular Letter*, No. 192, April); **Radio Society of Great Britain** (*Bulletin*, April); **South African Radio League** (*Radio ZS*, February); and **Reseau des Emetteurs Francais** (*Radio REF*, March).

SCUNTHORPE

It is intended to form an Amateur Radio Club in Scunthorpe, Lincs. All interested persons are asked to get in touch, as soon as possible, with Harry Holmes, G3MSB, 69 Crosby Avenue, Scunthorpe.

CORRECTIONS AND AMENDMENTS

On p.79 of the April issue, the items for the PSU were not specified in detail. The diodes D1-D4 should be at least 400 p.i.v. for 300v. DC output, and the toroid referred to is a Type 10C HCR core with nylon former, obtainable from Telcon Metals, Ltd., Manor Royal, Crawley, Sussex. And on p.82, the use of the noise generator is not clearly explained. The adjustments using the NG should be carried out as laid down in the handbooks.

In the circuit on p.87, April, the + sides of C1, C2 should go to base in each case, and not as shown.

BBC ENGINEERING PROMOTION

In 1937, R. J. Keir joined the BBC as a student apprentice, under the Corporation's engineering training scheme for new entries. Having become a maintenance engineer at the Burghead transmitting station in 1939, he served in the R.A.F. during Hitler's War, and then on demobilisation re-joined the BBC. After various engineering appointments, R. J. Keir, O.B.E., B.Sc., M.I.E.E. has now been posted as resident engineer to the BBC's Far Eastern station, at Tebrau, Malaya.

BOOK ABOUT BEAM AERIALS

"Inverted Vee DX Arrays"

EFFECTIVE directional radiation at low angles, using a controllable beam system, has always been understood and recognised as being the requirement for reliable working over long distances—whether on commercial point-to-point systems or on the amateur bands.

The fact brought out in *Inverted Vee DX Arrays* is that the professional aerial designer works for low-angle radiation first, with gain as a secondary consideration—whereas in the amateur field the tendency is to look first at gain figures and only secondly, if at all, at the radiation angle of a system when assessing its merits as a DX array.

In this handbook, the author—Neville Jackson, G3IAD, ex-5H3GC, VQ3GC, VQ5GC and VS6CE, and until recently in the Government service as an aeronautical telecommunications engineer—shows that the inverted-Vee aerial configuration is particularly effective as a low-angle radiator, and all his designs are based on this concept. He deals with single and multi-element Vee arrays and discusses practical layouts for the amateur DX bands, as well as some very interesting fixed directional systems for 40m. and 80m. Design and constructional details are given for a variety of HF-band arrays, all to take advantage of the inverted-Vee principle. Some of these designs are claimed to give up to 15 dB effective gain over a horizontal dipole—and from the arguments put forward by G3IAD, it seems reasonable to suppose that such gains can be achieved, with sharpened beam widths and a lower radiation angle in comparison with conventional beam arrays having a greater overhang. It is shown that a full-size two-element inverted-Vee for 20 metres requires only a slightly larger turning circle than a horizontal 2-ele 15-metre beam of the conventional pattern. This is one of the advantages of the Jackson design principle—reduced size in the sky with no compromise on dimensions. This factor of size is of great importance where amateur installations are concerned, as well as the requirement of being able to work at least two DX bands using a single array in the mechanical sense.

Even if the treatment in print is a little confused as regards presentation and arrangement of material, what *Inverted Vee DX Arrays* does make abundantly clear is that its author has done a great deal of practical work in order to establish the principles and prove his arguments. And if the plumbing and mechanical work looks too formidable, his firm can supply Vee and VeeVee arrays to these designs. *Inverted Vee DX Arrays*, pp.40 in covers, by Neville Jackson, G3IAD, published by Vee Beams (Communications), Ltd., 22 Brooke Road, Morecambe, Lancs., price 8s. 6d. post free.

SMALL ADVERTISEMENTS

(" SITUATIONS " AND " TRADE ")

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SITUATIONS

LABGEAR LIMITED have a few vacancies for Electronic Technicians in their Laboratories and Test departments. Skilled prototype wireman also required.—Apply, giving full details of previous experience, to: The Personnel Director, Labgear Ltd., Cromwell Road, Cambridge.

TRADE

WEBB'S LOG BOOK for recording signals heard and worked; 112 pages 9¾ in. x 8 in. approved format, semi-stiff covers. Excellent value; 6s. 0d. post free, or callers, 5s. 4d.—Webb's Radio, 14 Soho Street, London, W.1.

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

CATALOGUE No. 15 Government Surplus Electrical and Radio Equipment. Hundreds of items at bargain prices for the experimenter and research engineer, 2s. 6d. post free; catalogue cost refunded on purchase of 50s.—Arthur Sallis Radio Control Ltd., 93 North Road, Brighton.

CASES, chassis, panels. ANYTHING in metal; send your drawings for quote. Stove enamelled, hammertone, or plain, in any colour.—Moss Watson, 40 Mount Pleasant Street, Oldham, Lancs. *(Main 9400.)*

QSL CARDS: Buff, blue, pink, green, 100, 15s.; 250, 25s.; 500, 40s.; 1,000, 75s.—Samples (s.a.e.); Reilly, Panxworth, Norwich, 56.Z.

READERS' ADVERTISEMENTS

3d. per word, min. charge 5/-, payable with order. Add 25% for Bold Face (Heavy Type). 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, London, S.W.1

52 Receiver, 13 valves plus power pack; good condition, £9 (postage extra). Jemco 30,000 o.p.v. meter, practically new, £6.—S. Benda, 59 New End, London, N.W.3.

WANTED: General purpose oscilloscope. Immaculate two-metre QRP transceiver offered (built Dec. 1963 G3NXD), on exchange basis with cash difference. All letters answered.—R. C. Shuck, Tregarrow, Lowe Lane, Wolverley, Kidderminster, Worcs.

LG.300 H/B P/Pack and Mod. UM3, spare 813. 5R4, 6146, small rack, immaculate condx, £35. Buyer collects.—GM3NIO, 10 Burdiehouse Drive, Edinburgh, 9.

SALE: Polar relay tester 299AN, £2. RF Unit TN-17, part AN/APR-4, £4 10s.—Bloom, 4 Langsett Ave., Sheffield.

SMALL ADVERTISEMENTS, READERS—*continued*

WANTED: Manuals for 19 Set and CR-300.—Philpott, Russell House, Rye.

WANTED: VHF receiver, also midget transmitter-receivers. Reward leading to information for gear or circuits that pick up speech sound from a distance; also buying gear.—Thomas, 13 Sydney Road, Marton, Middlesbrough. *(Ph. 56115.)*

SHACK CLEARANCE: SSB W2EWL PHASING Tx, nearly completed, genuine American transformers; B & W phase-shift network and coils; VFO and 2/1625 in o/p, as per *QST*, £15. *Below.*

CENTRAL ELECTRONICS 10B, all-band SSB kit. Genuine American main components, etc., all drawings and photo's, £18. *Below.*

COMMANDO SSB Tx, 80m. to 10m., as new, 6146 o/p, £80. *Below.*

SSB Table-Top Tx, using 813 linear, 2 x ½-lattice filter and G3AOO units; quite small; separate 1400 volt PSU, uses big Eddystone dial, £80. *Below.*

TCS-12, COLLINS Tx and Rx, as original, no mod. done, with genuine plugs and 12/24v. genny, etc., £25. *Below.*

CHOREHORSE petrol electric lighting set, 250v. 250 watts 50 c.p.s. and low voltage o/p, £25. 420 mc converter, ex G5BD, in Philpotts case. £10. *Below.*

G4ZU Mini-Beam, 20, 15, 10m., twin boom, hardly used, £10. *Below.*

INTERPHONE, from house to shack, with handsets, works off 2/4½ volt flat cells, not home constructed, £5. *Below.*

AVO signal genny, mains i/p, 500 kc to 80 mc, flat model with built-in die-cast box and turret; calibrated attenuator checked and correct, as new, £12. *Below.*

WANTED: 75A4 Rx; s.a.e. with all enquiries.—*Reference above.*—Box No. 2999, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: 2nd and 3rd IF Amplifiers for R.278/GR receiver. FOR SALE: P.116 UHF Rx, £30; R.322/ARN-18 Rx, £7; AN/USM-24B 'Scope, £40; CT-53 Signal Generator, £15; R.28/ARC-5 Rx, £5; APX-6 RF Cavities, £5; R.2A/ARR-3 Rx, £5. Ferranti No. 7 Rx, 1000-1100 mc, £10. AM-913/TRC VHF Tuner, 100-220 mc, £15. Offers considered. Carriage Extra.—E. K. Laskaris, 53 Hayes Hill, Hayes, Bromley, Kent.

FOR SALE: Cossor 339 'scope with spare tube, pots. and handbook, £13 10s. Heath 5in. 'scope and probe, £26. Sig. Gen. and matching field strength meter, 90-156 mc, £3. AVO Sig. Gen., 100 kc to 80 mc, £7 10s. SCR-522 Tx, complete, 40s. Hunts Resistance/Capacity Analyser, £7 10s. W/S No. 19, variometer, with internal mains power, £3 10s. FL8 filter, £1. AVO Valve Tester, £6. Woden DTM-17 (750v./250 mA), £5. 0-250 mA Meters, 2½ in. flush, 12s. 6d. Aerial spreaders, 4 in., 100 for 6s. BC-453 Q5'er, £5 10s. Heavy "A.M." brass keys, (back contacts), 12s. 6d. BC-454, £3. BC-221, £15. All carriage paid. Many other items, s.a.e. your requirements.—G3MOE, 11 Westbury Road, Cheltenham, Glos.

CENTRAL Electronics 10B Exciter, VFO and Xtals, mint condition, £40. Geloso 209R Rx mint, £48. G8KW multiband dipole, £3 10s. Class-D Wavemeter, £3. Field strength meter, £1. Heathkit mobile power meter, new, £2 10s. Wayrad signal generator, £2. Hallicrafters loudspeaker R7, £2. *Short Wave Magazines*, 1960-'63, £2. *Bulletins*, 1962-'63, 25s. No reasonable offers for above refused.—DL2AI, E. Bright, 25 Fd. Sqn. R.E., BFPO 16.

SMALL ADVERTISEMENTS, READERS—*continued*

2/RT159/URC4 VHF/UHF Transceivers, xtal, £20. Bendix RA1B, 150-15 mc, new, £10. 6/BC-1206A Beacon Rx's, 200-500 kc, 24v. wkng., £1 each. BC-906C Freq. Meter, UHF, £4. Murphy, Pye, Hudson 50 kc R/T Equipt.—Box No. 3000, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

GELOSO G299 Audio Oscillator; AR88D Handbook, bound volumes *Bulletin* and *Short Wave Magazine* from 1955; *Basic Electronics* and other student text books; J38 key; other items, s.a.e. list.—Crabtree, 138 Hawley Road, Dartford, Kent.

FOR SALE: Owing to local QRN and my Bad QTH, TW (6DS4) Nuvistor 2m. converter, excellent condition, £13. TW (6CW6) preamp., £4; both have PSU, IF's 28-30 mc; also 2m. 6-over-6 beam, £4. £20 LOT.—Write Fisher, 64 Caldene Avenue, Mytholmroyd, Halifax, Yorks, or phone (evenings) *Calder Valley 3166.*

R.S.C. power pack, 250v. 60 mA, 6·3v. 2A, 25s. R.S.G.B. *Bulletins*, Vol. 37: 2, 4, 6, 7, 8, 10, 12. Vol. 38: 1, 3, 4, 7, 8, 9, 11, 12. 1s. each. EXCHANGE: Singer Portable Sewing Machine, value £15, for good communications Rx, HRO or similar. All inc. p/p.—K. Livermore, 30 Johnson Road, Barrow, Bury St. Edmunds, Suffolk.

FOR SALE: R.B.150 Recording Bridges, comprising two-deck chassis, panel, cabinet, mains xformer, sec. 265-230 volts CT, 150 mA, 125 volts CT, 30 mA, 5 volts 3 amps, twice, 6·3 volts 11 amps. Various other xformers, chokes, valves, capacitors, etc., £2 5s. each, or will dismantle; s.a.e. full details.—Tynan, 29 Elm Walk, Stevenage, Herts. *Phone Stevenage 1297.*

SALE: AR88LF. Professionally re-aligned, cabinet re-sprayed, excellent performance, £32 10s.—Box No. 3001, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

HRO Senior, 7 coils, crystal calibrator 100 and 10 kc, power supply, £15. Minimitter mobile transmitter, control box, power supply, whips 160, 80 and 40 metres, £20; s.a.e. for details.—Benson, 10 Westcliffe Terrace, Harrogate, Yorks.

WANTED: DX-100U Transmitter, must be in perfect condition, not more than £60.—H. L. Clarke, Westaway, School Lane, Newton-with-Scales, Nr. Kirkham, Lancs.

FOR SALE: Collins TCS transmitter and receiver, 1·5 to 12 mc, complete with aerial loading coil, crystal mike, phones, key, speaker, heavy-duty AC mains power unit, 80w. CW, 60w. phone (10w. 160), TVI-proof, excellent performance and condition, £32, o.n.o.?—G3SPJ, 31 Holmes Lacey Road, London, S.E.12.

FOR SALE: Z-Match by Tiger, 600-72 ohm output, £5 10s. PCR Rx, Long/Med/Short wave, with matching PSU, £4 10s. 234A PSU, 300/6 Volt, £3. 2½ in. dia. Oscilloscope, Type H, £2 10s. Tea chest of miscellaneous 3A Teleprinter Spares, £3.—W. A. Clapham, 239 Cambridge Road, Ellesmere Port, Wirral, Cheshire.

WANTED: Manual for Eddystone 680/2 Rx. Your price.—W. S. Sives, 125 Sunderland Road, Gateshead, 8, Co. Durham.

WANTED: By licensed amateur, modern SSB transmitter and double or triple conversion receiver, also bandspread HRO coils.—J. H. Gorman, 7 St. Anthony Road, Cardiff.

SALE: Heathkit SB-10U, £30. As-new ZC1 Mk. II, modified, £5. Angle-Iron Tower, 8 in. square, £3. —Ginder, 222 Whetstone Lane, Aldridge, Staffs.

SMALL ADVERTISEMENTS, READERS—*continued*

WANTED: VHF receiver, from approx. 100 to minimum 146 mc, must be in perfect working order, reasonable condition and price. Required for Flying Club. All replies answered.—G3DUV, 28 Kempson Ave., Sutton Coldfield, Warwickshire.

COMPACT FB 600 kc-31 mc Rx, Electroniques GC166 front end, IFT's, etc., S-meter, Eddystone 898 dial, £20. Mains BC-221, £12.—Collins, 32 Albany Road, Skegness, Lincs.

FOR SALE: Marconi Canadian 52 Rx, good condition, 1·75-16·0 mc; price, including power supplies, £7 10s. o.n.o.? Carriage extra. Most suitable for SWL.—D. Hicks, 51 Church Walk, Worthing, Sussex.

AVELEY 12 volt transistor mobile p/pack, 300v. 200 mA, latest 18 gn. model, brand new, £12 10s. KW-160 Mk. II Top Band Tx, mint condition, with manual, £22 10s. TW 2-metre converter, 6DS4, IF 4-6 mc, as new, £10. TS148, 400-460 mc wavemeter/Sig. Gen., brand new in transit case, with manual, leads, etc., £6. HRO table model p/pack, brand new, 45s. HRO S-meter, new, in original carton, 38s. 6d. AR88D spares, brand new: Mains trans., 55s.; complete set of IF's in sealed cartons, 65s.; crystal load IF, 8s. 6d.; crystal filter, latest type, 12s. 6d.; main tuning dial, 10s.; manual, 20s.; full set control knobs, 35s.; o/p trans., 22s. 6d. Comprehensive BC-348 Manual, U.S. Army, covers every model, 45s. U.S. Air Force luxury L/weight H/res. H/Phones, brand new, 21s. BC-221 phones, miniatures, 25s. S-meter (U.S.A.) R/H zero, suitable AR88, new, 27s. 6d. 12-volt Command Rx dynamotor, brand new, 22s. 6d. Command Rx, 3-6 mc, new, usual mods. professionally done, 85s. Suitable p/pack, Eddystone louvred case, 40s. WANTED: AVO-8 Mk. II, in new condition. All items plus carriage.—Box No. 3002, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

MULTIBAND Antenna traps, 80-10m. high efficiency, superbly finished, only 45s. pair. Silicon diodes 1000 p.i.v. at 500 mA, 9s. OC44, 45, 81, 81D, 3s. 6d. OC170, 4s. OC171, 4s. 6d. BM3 xtal Mic., 37s. HE30 and HE40 communication Rx. All plus p. & p.—Wakeley, 70 Arnold Road, Binstead, I.o.W. *(Ryde 3231.)*

GELOSO G209 receiver, cost 89 gns., 2½ years old, little used, mint condition, modified Top Band, £60. Gonset 2-metre Communicator, £32 10s. Various Japanese receivers and equipment.—G3IDW, Orchard Cottage, Hook, Swindon.

SALE: Modified G209 Tx, 45w. phone, in good condition with circuit diagram, £11 o.n.o.? (carriage paid).—GI3SOO, 79 Prehen Park, Londonderry, N. Ireland.

FB SX-28A with handbook, £25. Immaculate Geloso converter (6-band version) with PSU and handbook, £15. WANTED: Good Rx. s.a.e.—Box No. 3007, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

TWO-METRE tranceiver, 12-volt, ECC88 cascode, double super, transistorised audio, built-in transistor power supply, silicon rectifier, transistor modulator, QQV03-10 PA, size 12ins. by 8ins. by 4½ins., £50 or near.—GW3KYT *QTHR.*

SALE: K.W. Vanguard, 10-160m., £35. CR-100, £15. Both in mint condition.—G3LSC, 4 Norman Avenue, Branksome, Poole, Dorset.

MORSE Record by G3HSC, excellent condition, 30s. or nearest secures.—Denis Downing, The Square, Kenmare, Co. Kerry, Ireland.

SMALL ADVERTISEMENTS, READERS—*continued*

FOR SALE: Labgear Wideband multiplier, professionally assembled for four 5763's to drive 150-watt PA, all bands from 80m., VFO, £5. E.M.I. R.A.E. course, £1. CR-100 handbook, 15s. R.114 2m. converter, unmodified, £1. RF-24, 12s. 6d. Large steel instrument case with built-in PSU (callers only), £2. WANTED: Case for BC-221; 455 kc mechanical filter; Londex coax relay plugs (urgent).—McCagherty, 299 Whitewell Road, Newtownabbey, Co. Antrim.

3X Teleprinter with silence cover, TVI suppressed, £9; delivery 50 miles. WANTED: ATM CRM unit, your price paid.—G3MEW, 17 Testcombe Road, Alverstone, Gosport, Hants.

HALLICRAFTERS SX-140 receiver, 80 to 10 metres, plus 6 metre band; full amateur band coverage, xtal calibrator, ANL, silicon power supply, etc. Immaculate, original carton, manual, few hours' use, £35 o.n.o.?—Box No. 3008, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

EDDYSTONE 740 with S-meter, £25. Panda Cub with ATU, £30; both items (unmodified), £50. Buyer collects.—G3JUZ, 13 Carnegie Road, Wittering, Peterborough, Northants.

SALE: AR88LF, professionally aligned and completely re-sprayed July, 1963, p.v.c. wiring, £42. Seen after 5.30 p.m.—Bray, 4 Ledway Drive, Wembley, Middx.

VICEROY Mk. II, above average spec., exceptional condition, unmarked; can be examined and tried, £98. Drake 2B, Q-Multiplier, speaker and complete with 100 kc calibrator as supplied by makers, manual, etc., in original transit boxes; immaculate, unmarked, £95.—Box No. 3009, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

888A for sale, with blocks, £68. WANTED: KW-2000 or NCX3.—G3ITH, *Kingswinford 3879*, 2 Berkeley Drive, Kingswinford, Staffs.

TCS-13 Rx, unmodified, good electrical and physical condition, with mains p/pack, loudspeaker, control unit, connector. Any offers? Buyer collects.—Write R. Bunney, Trelawne, Cupernham Lane, Romsey, Hants.

SALE: Heathkit RA-1 amateur bands Rx, £40. R.206 with power pack and speaker, 550 kc-30 mc, working FB, £13. Marconi FM deviation meter TF.934, 2·5-100 mc, deviation 0·25-50-75 kc, 100/250v. AC, £14. Geloso amateur band converter, with dial, no case, £7. Home-brew Tx, Geloso VFO, 160-10 metres, 50-watt, plate-and screen mod 807's, working FB, £12. PCR Vib. power supply, £1. Power supply and LF amplifier Unit No. 2, £1. Best offers accepted. Delivery 10 miles, otherwise buyer collects. —E. Workman, 121 Norton Road, Coleshill, Birmingham.

BC-348, mains, speaker, S-meter, good working condition, £7 (£6 collected).—Brooks, 5 Police Houses, Westburn, Cambuslang, Lanarkshire. *(Tel. Cambuslang 2225.)*

HALLICRAFTERS S.38E, £4. Also R.220, mint condition, £2 10s. Buyer collects.—Hogan, 4 Park Villas, Halsnead Park, Whiston, Prescott, Lancs.

WANTED: Communication receiver (AR88, CR-100, etc.) in scrap and wrecked condition. Will arrange collection.—G3SJX, 42 Gravel Hill, Addington, Croydon, Surrey.

JUNE 1962 issue of *Short Wave Magazine* urgently required by R. H. Williams, 35 Ave. de Lavaux, Pully, Lausanne, Switzerland.

SMALL ADVERTISEMENTS, READERS—*continued*

LICENSED amateur needs room or flat with permission to operate and construct in London Area from early June.—Box No. 3004, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

HRO Junior, 160-10 metres, 6BA6 RF's, good order, £10. Also PSU 600v. 200 mA, 6·3v. 3A, £2 10s. No offer. Buyer collects.—GW3LSB, Holmcombe, Vicarage Avenue, Llandudno, Caerns.

MOVING to Mars for Dx-pedition. Gear to be sold. BC-221, L.M. type,, with original p/pack, metered, voltage compensating switching, £18 o.n.o.? KW-500 fitted with cooling blower, £72 o.n.o.? 20m. full-size 2-ele Hy-Gain beam, £22 10s. o.n.o.? Brand new from USA, two Eimac 3-400Z valves with cooling anode caps, one base, one cooling chimney, £25 o.n.o.?—J. A. Steele (G3KZI), 12 Broadwalk, London, E.18. *(WAN 2321.)*

AR88D in original and excellent condition, S-meter fitted, manual, trimming tools, complete set of spare valves, mains trans., smoothing condenser, all in original containers, £45 complete; reluctant to sell, but space required; Lancs area. Emerson FM/AM 3WB transistor portable Model 110, list 22 gns., brand new and unused, complete in carton with guarantee, £14. WANTED: Heathkit, Griffin or Grundig GDO.—Box No. 3006, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: Marconi 52 Set and PSU, working OK, £5. P.104 VHF Rx with PSU, 100 to 150 mc, requires slight attention, £5. Also CR-45 TRF, £3. R.1155A, no valves or PSU, £2. Buyer collects, evenings.—S. Seears, 60 Holywell Road, Watford, Herts.

WANTED: HRO chassis with tuning condensers, drive and IF cans. State price.—R. Barker, 82 Main Street, Balderton, Newark, Notts.

WANTED: RTTY terminal unit AP66862 in good condition, with or without matching PSU AP66863. Collection in London area if desired.—Box No. 3005, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

150-WATT Tx, Elizabethan copy, fully metered, £9 10s. Hallicrafters R.19 Rx's, 16-valve, crystal controlled, 70 to 100 mc, 115v., £3 10s. each. Sig. Gen. CT53, brand new, £14 10s. Two brand new HRO Seniors, £14 each. 19 Set variometers Mark II, 8s. 6d. each.—Sharratt, 12 Clocks Close, Eddlesborough, Dunstable, Beds. *(Tel. Eaton Bray 297.)*

CR150/3A, £20. Hammarlund Super-Pro 794, rack mounting, EF183, 6BE6 front end, £23; suitable PSU available, £2. BC-342, £8. Command Rx, 3-6 mc less valves, 15s. BC-342 chassis, coils, 3-gang condenser, £1 10s. Spy Receiver chassis, less valves, £1 10s. B-28 less valves, £2. Pair of Hallicrafters Marine HT/8 trans-receivers, less PSU, £10 each. Command Tx covering 1·8-2·0 mc, £3 10s. Command Modulator, £1 10s. Marconi TF-390 Sig. Gen. 4-100 mc, £4. TS Pulse Gen., £2. Morse high-speed undulator, with matching RB-150 converter, 600-ohm or 5-ohm audio, suit Club, £15. TA-24J transmitter with motorised coil turret, 803 final, 150w. modulated output, £5. Marconi amplifier Type C, 100 kc USB and LSB amps., product detector, carrier amp. limiter, xtal auto freq. correction, £7. BC-221Q, perfect, less charts, £8. Waveguide, 10,000 mc rotary unit, £1 10s. TCS Tx and 12/24v. PSU, £12. RB-150, £3. 24v. gyro and repeater, £5. Tape Teleprinter 110v., works on loop, £3. AR88D, £32. AR88LF, scale awaiting recalibration, silver grey crackle, £25. Buyer collects.—Box No. 3010, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SMALL ADVERTISEMENTS, READERS—*continued*

WANTED: Ex-Army Wireless Sets, Burndept BE-201 or CN-348 in reasonable condition, including manual, if possible.—G3DNK, K. Turffrey, Hazlecroft, Scatterdell Lane, Chipperfield, Kings Langley, Herts.

SCANDINAVIAN amateurs still require (working or not) AR88D, CR-100, BRT400, HRO, BC-348, PCR3, BC221, LF-14; manual for 358X; amateur bands crystals; second-hand Eddystone and Hammarlund receivers, etc. Collection within 200 miles London.—B. J. Ayres, 21 Grange Road, Chessington, Surrey. *(Lower Hook 2000.)*

TRIX Tannoy console (130 watt) comprising 5 units: two-50w. amplifiers; one-30w. amplifier; VHF tuner unit 88-108 mc; control and monitor unit; complete and perfect, cost over £200. Exchange for best transmitter offered, or offers? E.N. Bradley Oscilloscope complete, only to be checked and set up, £7. Variable power pack 0-350v. AC or DC, with LT taps, fully metered, £5. VHF variable receiver unit similar to Responsor, brand new and pre-tuned at 178 mc. £3. IM-81/UB standing-wave indicator, brand new unit with handbook, £4. R.S.G.B. 2m. converter, 28-30 mc IF, never used, needs tuning to freq.; xtal 7733·0 kc, £4. Vols. 13 to 17 bound *Bulletins*, £1. AVO Valve Tester, complete with book and leads, £5. Set *Newnes Radio/TV Servicing*, 8 Vols., new condition, 1953/1960, £6. 84 *Wireless World;* 96 *Practical Wireless;* 72 *Radio Constructor;* 32 *Hi-Fi News;* 24 *Tape Record;* various radio books and Amateur Course; all in clean condition. Offers, W.H.Y.? Buyers collect.—Willetts, 11 Milton Street, Tantany, West Bromwich, Staffs. *(West 0409 after six.)*

NEW TESTED valves 6SN7/GT, 3s.; 3B24, 3s. 6d.; 6SH7, 2s.; 30FL1, 6s.; 6/30L2, 4s.; 6L12, 4s.; 30P12, 5s.; U26, 6s.; 6C12, 5s.; 30F5, 4s.; 6C9, 8s. 6d.; 25L6, 4s. P/P, 6d.—Austin, 24 Clarkes Road, Hatfield, Herts.

WANTED: Good modern receiver suitable for SSB. Also decent SSB transmitter and a general coverage receiver. Full details and price required in first instance.—Box No. 3011, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

BEST OFFER for new K.W. Mark II Vanguard, 10-160 metres, 8 weeks old. Also K.W. Geloso converter, 10-80 six band, mint condition.—Taylor, 156 Clarendon Road, Broadstone, Dorset.

£65 or near for the lot: K.W. Vanguard 160-10 metres. SX-28 ZC1 Mark II, less PSU. Large quantity components, including transformers, meters, valves, McElroy bug key. Purpose-made oak finish cabinet. Several years *Short Wave Magazine* and *Bulletins*. Buyer arranges collection.—G5WZ, 67 Severus Avenue, Acomb, York.

SURPLUS to Scandinavian amateurs requirements, large number of receivers, etc., now at Chessington. All thoroughly checked/overhauled and in perfect working order in anticipation of shipment to Scandinavia. These are now available for resale individually in this country. Delivered within 200 miles London. Write/phone your requirements to: B. J. Ayres, 21 Grange Road, Chessington, Surrey. *(Lower Hook 2000.)*

COMPLETE Set of HRO coils including band-spread types, £10 10s. Stripped HRO with new drive, £3. BC-453, £1. 2-metre 6 + 6 slot-fed J-Beam, with balun, £5. Labgear 10-metre Cubical Quad, £5. AR77 cabinet, £1 10s.—Box No. 3012, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SMALL ADVERTISEMENTS, READERS—*continued*

FOR SALE: CR-100, £12; good condition, S-meter, manual. Buyer Collects.—Holder, 10 Glenlyon Road, Eltham Park, London, S.E.9.

SALE: 358 Receiver with PSU and 10 coils, £14 o.n.o.? Prefer buyer collects (Essex).—Box No. 3013, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

7IN. LP tapes, used once, 12s. 6d. TR.1986's. Masses other bargains, transformers, crystals; large s.a.e. list.—G3ERB, 56 Kings Lane, Bebington, Cheshire.

HRO-MX with power pack, spare valves, coils for all LF/HF bands and bandspread on 40-20-15 metres. Offers?—D. Harding, 18 Park Road, Birstall, Leicester.

WANTED: 14 mc transmitter, about 75 watts, TVI proof.—Box No. 3014, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

HI-FI FM tuner, brand new, cost £16, sell £10. Laboratory PSU, stabilised to 500v. (variable), with LT taps, £15 o.n.o.? Sundays only.—Gorrill, 4A Southgate Parade, Crawley, Sussex.

FOR SALE: R.107, four new valves, good condition, manual, £10. Two 38's with junction boxes, aerial rods, 30s. each. 19 Set Variometer, 10s. 14ft. copper aerial rod, unjoined sections, 10s.; all good working order. *Short Wave Magazines,* Oct. '62-March '64; *Practical Wireless,* Dec. '57-March '64; s.a.e. any details; post/packing extra.—N. Stickells, 27 New Town, Uckfield, Sussex.

SHACK CLEARANCE: CT53 Signal Generator 8-9 to 300 mc, brand new, crated, £12 10s. Murphy TPG11 Television Pattern and Signal Generator, £7 10s. (cost £110). Two Marconi 12v. transceivers aligned to 144 mc, with crystals, and complete TR.1520 modified to 144 mc, £15 the lot. Lustraphone LFV59 stand microphone and S/2B base, £5 15s. (cost £10). Vitavox B50 hand mike, unused, boxed, £3 (cost £6). Mullard UHF tuner, brand new valved, 45s. FT-243 crystals, valves, transistors and resistors, large amounts, all brand new; s.a.e. for list. Post extra.—V. Cedar, 2A Convent Hill, London, S.E.19.

FOR SALE: Command Receiver 3-6 mc, brand new, £4. Command Receiver output transformer, 10s. Set of 3 IF transformers 2830 kc, 15s. S27/36 output transformer, 15s. Taylor 45A Valve Tester, £7 10s. HRO-Mx/5T manual, 25s. HRO 110-volt rack mounting power pack, 45s. Spares available for AR88D/LF, HRO, S.27, S.36 and S.36A. Send s.a.e. for list. Postage extra on all items.—A. J. Reynolds, 139 Waller Road, New Cross, London, S.E.14. Telephone *New Cross 1443* (after 7.30 p.m.)

MOBILE? **PIERSON KE93** miniature receiver 6/12 volts; additional mains PSU, speaker; spare valves; handbook; crystal controlled 12-valve double-superhet with 14 razor-sharp tuned circuits, 3 kc bandwidth; sensitivity better than 1 microvolt; variable squelch, ANL, AM/CW/SSB; turret tuner, electrically bandspread, 10/15/20/40/80/160 metres, plus 1650 to 3500 kc, plus full broadcast band. Size only 5 x 6 x 9 inches. The ultimate in receivers; best offer over £60. H.P. possible. **DUAL PSU** input 12v. DC/250v. AC, output 225v. DC at 125 mA, plus 12 volts AC/DC 6 amps, £3 (postage 7s. 6d.). **MOBILE LOG** transistorised tape recorder, 14-minute tape, push-to-operate on mike, £4 5s. G3IES, *QTHR (Edgware 0937.)*

FOR SALE: DX40U + VFO, £25. KW-160 Tx, £20. HRO-MX Rx, GC coils + PU, £18; or £60 the lot. Carriage extra.—GW3OSV, Park East, Clarbeston Road, Pembs.

SMALL ADVERTISEMENTS, READERS—*continued*

DRAKE 2B RECEIVER, with Top Band, Q-Multiplier, speaker, crystal calibrator, absolutely mint, cost £145, best offer over £90 accepted. Specified HC6U crystals for additional bands available at £1 each.—G2HCV, 34 Grasmere Avenue, London, W.3. *(Acorn 1564.)*

CR-100/2 with ANL, £16 o.n.o.? MR44/2, modified, with matching speaker, £35 o.n.o.? MW Command Rx with 12v. dynamotor, £6; less dyn., £5. 4-5·3 mc Tx, v.g.c., £2 10s. 5·3-7·1 mc Tx, £1 15s. BC-454, £2 10s.—P. J. Davies, 25 Pembroke Road, London, E.17. *(COPpermill 4364* after 6 p.m.)

OSCILLOSCOPE Model OS-1, *mu* screen, factory assembled, little used, £22 (save £7). Transformer 250-0-250v. 80 mA, 12·6v. 1·7A, 6·3v. ·65A, new, £1. *Conversion Manual* No. 2, 15s. *ARRL Handbook,* 38th Edition, 15s. Carriage extra.—Thompson, 134 Royal Oak Road, Manchester, 23. *(Wythenshaw 2897.)*

COLLINS 75S RECEIVER with accessory CW filter and extra crystals. Collins 30L-1 Linear amplifier. Heathkit HO-10 Monitor 'Scope, £30. Withers Twomobile with speaker, £23. Hammarlund HK1-B electronic keyer, £12. EL-Key paddle and straight key, £5. Aveley 12-volt 60 watt transistor pack, £10. Jennings vacuum variable capacitor 5-100 pF with dial, £10. Lots more gear, also complete Leica outfit. Details from—G5RP, Old Gaol House, Abingdon, Berks. (Telephone *Abingdon 380* evenings) after May 9th.

EDDYSTONE 740 RECEIVER, good condition, complete loudspeaker and output meter, also manual, £25.—GM3MUQ, 17 Brunstane Road, Edinburgh, 15.

WANTED: To buy or borrow, handbook, circuit, modification details for No. 22 Set Tx/Rx.—Watts, 30 Steyne Road, Seaford, Sussex.

WANTED: Vanguard 160-10m. SELL: All-band QRO Panda ATU, Eddystone Bug Key.—G3KNA, 5 Manor Street, Hartshead Moor, Cleckheaton, Yorks.

SALE: HQ-180, brand new condition, £110 o.n.o.? Apache Tx, as new, £75. SB-10U, perfect, £25.—Menzies, 60 Beech Avenue, Newton Mearns, Glasgow.

EDDYSTONE S.640 Receiver for sale, £15, in good condition. Radar TV Pattern generator (Midland), £5.—R. J. Newey, 23 Lea-House Road, Causeway Green, Oldbury, Birmingham.

HAMMARLUND HQ-145X with crystal calibrator, cost £145 when purchased, 48 hours' use only, £89.—Ewert, 41 Hayes Chase, West Wickham, Kent. *(Spring Park 5989,* week-ends only.)

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