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MV4 No compromise ground planes for 14, 21 and 28MHz. Each completely adjustable from 7 feet to maximum length.

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RA2 Four radials for MV14 in 18 SWG copper. Complete with tags and insulators...

RA3 Four radials for MV2 in 18 SWG copper. Complete with tags and insulators...

RA4 Four radials for MV3 in 18 SWG copper. Complete with tags and insulators...

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KW ELECTRONICS

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<tr>
<td>400 ohm, twin</td>
<td>yd. 23 feet</td>
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Mic 45 | £1 2 6 |
Mic 60 | £1 9 6 |
Mic 39 | £1 9 11 |

FOUR RADIALS

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SECOND-HAND

EDdystone 888A | £65 0 0 |
Heath HW12A | £42 0 0 |
KW Vanguard | £20 0 0 |
9R-59DE Immaculate with calibrator | £30 0 0 |
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We still have some items from previous adverts. S.A.E. please with inquiries.

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Once again, footsore, aching and dreadfully weary, we have arrived back home after the Show. With, needless to say, a truckload of bread which all you nice people just insisted I take from you. One of the snags of the Show is that I am so busy taking money I don’t have time to stop and chat! Sounds too stupid to laugh at, but it’s quite true. The stand was always thronged with chaps buying bits and pieces that all of us had a full time job keeping pace. This, unfortunately doesn’t allow time to shoot the breeze with old friends and makes us seem very rude. We don’t want to be, but have to be!! The light fingered gentlemen were fairly busy—odd bits and pieces missing. Ah well, part of the game I suppose. I did a roaring trade, and it certainly did me a power of good! Anyway, you could at least see the Sommerkamp and Inoue gear along with all sorts of goodies even if we didn’t have time to get you into a corner and give you the hard sell routine. I had the sense to order up bags of Sommerkamp and Inoue stuff so although the show pretty well cleaned us out, we are now back to normal and all is ex stock.

Another funny thing about the Show. A manufacturer comes out with something new and good—you order it in bags of time for the Show, allowing plenty to check it and give it a thrashing so that you have the pleasure of unveiling a new world beater to the expectant throngs at the Show. This is the theory, but it never seems to work—the new world beater arrives Friday night, too late to clear customs. Happens every year!! Anyway, for those of you who have managed to wade through the waffle thus far, let me just whisper in your expectant lug 'ole that I have a new Tx built to a very high standard which is as TVI-free as one can reasonably expect. The makers claim harmonics down 80 dB. Yes, eighty decibels, sir. That’s indeed going some. Mind you, nothing very clever really—any designer can do it given enough money. He just bangs in extra filtering and tuned circuits all over the place and knocks the harmonics out long before they ever get to the PA. Just like they do with commercial Tx’s. In this case the joke is that the price, although high, is still well within reason—just under a couple of hundred quid. O.K., O.K., O.K., I agree it’s a lot of bread—but if you want the harmonic suppression of a commercial rig, you’ve got to pay for it! Anyway, to those of you who’ve tried all TVI cures without success—here’s one more for you to try!!

The other bit of new gear is the Sommerkamp FL-50 and FR-50. Actually this has been on the Japanese market for years, but in the past I’ve always reckoned that although it was cheap, it wasn’t all that good and so haven’t imported it (NOW do you believe I’m fairly honest? No? Ah well, bash on!) However, over the years the factory have incorporated a mod. here and a mod. there, minor improvements and so on and the present FR/FL-50 is vastly different from the early ones—so much so in fact that I reckon it ain’t a bad buy at all, at all. Tx £90, Rx £85. If you want any gen, drop me a s.a.e. I won’t go overboard on advertising—if it’s any good (and it is!) I’ll let you find out for yourselves and start pushing the advertising when deliveries improve.

Well, that’s about it—but for those who didn’t get the following at the Show, we’ve completely sold out:—Teisco DM-501 mikes, Hansen S.W.R. Bridges, Katsumi keyers. More on order, but it’ll be a month or two before I get ‘em. Rest of the stuff still in stock. Incidentally, do you remember many moons ago I ran a competition for the best classical quotation applicable to Amateur Radio? The best of them are printed in my new catalogue of sundry amateur accessories. Yours if you send me a large s.a.e.

Cheers,

73, de Bill, G3UBO/VE8DP
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EDITORIAL

Result

While it is hardly for us to criticise the recent Exhibition—we were not there, of intention, for reasons explained in this space in the July issue, and in September—readers will nevertheless expect some comment from us now that it is all over. A short illustrated feature appears elsewhere in this issue—but that does not tell the whole story.

Concurrently with the Exhibition, we had arranged to keep our Office open till late every day. This was purely an experiment—but the result of it was that we had the pleasure of meeting a large number of readers at 55 Victoria Street and we were kept busy all the four days during the Exhibition. Almost without exception, discussion with those of our visitors who had already been to the Show elicited the opinion that it was "poor," "disappointing," "not worth the journey" or "the same as last year." Some opinions from the Trade point of view were: "Disastrous, a lot of talk but very few orders"—"We did well because the junk-boys were not in"—"Fortunately, we took much less stand space than last year"—"It was an opportunity to meet customers, but not a lot of business was done"—"You made the right decision, not to be here this year." There were also disparaging comments about the Hall itself, and the catering arrangements.

On the other hand, from our own observations it would be fair to say that any keen radio amateur who was a first-time-ever visitor would undoubtedly have found the Exhibition interesting and stimulating—simply because it was a new experience. But this is hardly good enough for the old hands, who hitherto have made the Exhibition a sort of annual pilgrimage.

What is to happen for the future is at the moment undecided—but apparently there is widespread support, on the part both of visitors who pay to come in and among trade exhibitors in the Amateur Radio field who pay to be there, for the ideas and opinions put forward here in the July issue.

So far as our own trading results were concerned, the experiment was entirely satisfactory, when compared with how we came out of the Exhibition last year and the year before.

We would like to thank all those readers who took the trouble to come round to see us, who between them made our experiment so successful. It was unfortunate that at times the pressure was such that it was not possible to talk to everybody—anyone who was with us on the Saturday (a day on which we are not normally open at the Office at all) will know why!

WORLD-WIDE COMMUNICATION
AFTER operating for a number of years with separate home-built transmitter and receiver in the car, the author came to realise the need for the simplicity of control and operation of mobile equipment. The transceiver described (block diagram Fig. 1) is the outcome of thought and planning in pursuit of this simplicity. The 19 Set circuit was used as the basis of the design, which was planned around valves and components available in the shack. Top Band AM is still used by the majority of mobileers and so other bands and also SSB were not considered.

Circuit Description

Receiver Section—see Block diagram and Fig. 2. The Rx side is quite orthodox, employing six valves in a single-conversion circuit having an IF of 460 kc. Electroniques 160m. amateur-band coils are used, giving excellent bandspread across the whole of Top Band. The three-gang condenser is a surplus unit, thought to be ex-38 Set. Vanes were removed to make each section about 20 µF. A similar three-gang, 7-20 µF condenser is available from Electroniques. Four 460 kc transformers are used—two together in a top capacity-coupled arrangement to give extra selectivity. This works out very well in practice. HT for the receiver is switched via the send/receive relay, with the exception of the anode of the mixer V2, ECH42. The reason for this will be explained later.

Transmitter Section. The heart of this circuit is the mixer type VFO—see Fig. 2. The 19 Set circuit was closely studied, and copied. The triode section of V7, ECH42, runs at a fixed frequency of 460 kc from an Electroniques HSO-460 unit. A signal is taken from the receiver oscillator V2, and fed into the signal grid of V7. The mixing process produces at the anode a frequency which is the same as the received frequency. This is amplified by V8, 6AM6 which drives the QV04-7 PA. The following example will make the mixing process clearer: Assuming the receiver is tuned to 1900 kc, the receiver oscillator will be at 1900 + 460 kc = 2360 kc. If this frequency is now mixed in V7 with 460 kc, the output is the difference between them, i.e. 2360-460 = 1900 kc.

Modulator. A 12AX7 is arranged in a high gain audio pre-amp circuit which easily drives the EL84 modulator valve. The modulation transformer is a home-wound
item which exactly matches the EL84 into the QV04-7, but any transformer with a ratio of approx. 1:1 would do. The author uses a small crystal insert mounted inside an old GPO breastset which hangs round the neck, leaving both hands free for the essential job of driving.

**Power Supply.** This is not described here in detail since it is assumed that individuals will have their own arrangements for this. It suffices to say that the author uses a home-built transistorised power supply made as arrangements for this.

Connections between power supply and transceiver are made with multi-way screened cable.

**Construction**

The equipment is built into a Philpott's cabinet measuring 12in. long, 5¾in. high and 6½in. deep. The chassis is 11½in. x 6½in. x 1½in. Layout will be determined by the size and shape of the components and Figs. 3, 4 and 5 will help readers to determine their own layouts. Since it is assumed that individuals will have their own chassis is 11 in. x 6½ in. x 1½ in. Layout will be determined by the size and shape of the components and Figs. 3, 4 and 5 will help readers to determine their own layouts.

A lot has to be got into a small space and so the use of physically small components is essential. The loudspeaker is essentially a miniature RF transformer. A little of the volume is taken up with the oscillator coil must be silver mica if maximum stability is to be achieved. HT for the receiver is applied through a 1K, 5w. wire-wound resistor.

**Table of Values**

| C1 | 365 µµF, var. | C61 = 50 µµF, elect. | R46 = 200 ohms |
| C2 | 850 µµF, see text | R47 = 2·2 megohms |
| C3 | 1·846 | R57 = 5,000 ohms |
| C5 | 7·20 µµF, 3-section, ganged | R58 = 65 ohms |
| C6 | 470 µµF | R59 = 40 ohms |
| C7 | 120 µµF | Rs = Meter shunt (see text) |
| C8 | 400 µµF | VR1 = RF gain, 2·5K |
| C9 | 630 µµF | VR2 = Audio gain, 500K |
| C10 | 630 µµF | VR3 = Mod. gain, 1 meg-ohm |
| C11 | 630 µµF | R3 = R. F. check, see text |
| C12 | 630 µµF | R5 = RF check, see text |
| C13 | 630 µµF | R6 = 4,000 ohms |
| C14 | 630 µµF | R7 = 7,500 ohms |
| C15 | 630 µµF | R8 = 47,000 ohms |
| C16 | 630 µµF | R9 = 10,000 ohms |
| C17 | 630 µµF | R10 = 8,200 ohms |
| C18 | 630 µµF | R11, R14, |
| C19 | 630 µµF | R20, R23, |
| C20 | 630 µµF | R3, R4, |
| C21 | 630 µµF | R5, R9, |
| C22 | 630 µµF | R6, R10, |
| C23 | 630 µµF | R7, R11, |
| C24 | 630 µµF | R8, R12, |
| C25 | 630 µµF | R9, R13, |
| C26 | 630 µµF | R10, R14, |
| C27 | 630 µµF | R11, R15, |
| C28 | 630 µµF | R12, R16, |
| C29 | 630 µµF | R13, R17, |
| C30 | 630 µµF | R14, R18, |
| C31 | 630 µµF | R15, R20, |
| C32 | 630 µµF | R16, R21, |
| C33 | 630 µµF | R17, R22, |
| C34 | 630 µµF | R18, R23, |
| C35 | 630 µµF | R19, R24, |
| C36 | 630 µµF | R20, R25, |
| C37 | 630 µµF | R21, R26, |
| C38 | 630 µµF | R22, R27, |
| C39 | 630 µµF | R23, R28, |
| C40 | 630 µµF | R24, R29, |
| C41 | 630 µµF | R25, R30, |
| C42 | 630 µµF | R26, R31, |
| C43 | 630 µµF | R27, R32, |
| C44 | 630 µµF | R28, R33, |
| C45 | 630 µµF | R29, R34, |
| C46 | 630 µµF | R30, R35, |
| C47 | 630 µµF | R31, R36, |
| C48 | 630 µµF | R32, R37, |
| C49 | 630 µµF | R33, R38, |
| C50 | 630 µµF | R34, R39, |
| C51 | 630 µµF | R35, R40, |
| C52 | 630 µµF | R36, R41, |
| C53 | 630 µµF | R37, R42, |
| C54 | 630 µµF | R38, R43, |
| C55 | 630 µµF | R39, R44, |
| C56 | 630 µµF | R40, R45, |
| C57 | 630 µµF | R41, R46, |
| C58 | 630 µµF | R42, R47, |
| C59 | 630 µµF | R43, R48, |
| C60 | 630 µµF | R44, R49, |

**NOTES:** All 01 condensers are disc ceramic, except C29, C33 (paper), C59, C60 are 350v. paper. Mica types C30, C51, C52, C53, aluminium foil, C27, C28, C62. Following are silver mica: C2, C30, C31, C32, C34, C36, C38, C40, C43, C45, C46, C49, C54. Resistors R16, R25, R27 are 3-watt, wire-wound; R27, R35, R38, R39 are 2-watt wire-wound; and R43, R45, R46 2-watt carbon. All other resistors rated 1-watt. Coil connections are: L1, white lead, Ae; brown, earth; green, grid; black, earth. L2, red lead, HT; blue, anode; green, grid; black, earth. L3, blue lead, anode; black, earth; green, grid; yellow, padder.

**The Short Wave Magazine**
radiating and resonance indication.

The 32 μF condensers, C57 and C58 must not be reduced in value otherwise V10 will become unstable. Being a single-ended valve the QV04-7 tends to "take off" and the 33-ohm grid stopper is essential.

The voltage stabiliser, QS 150/15 could be replaced by an OA2 with suitable alterations to the base connections. (To be continued)
Fig. 2. Circuit diagram complete of the G3EGC Mobile Transceiver—read from left of facing page.

(Table of Values on p.541)
AN AC BRIDGE FOR MEASUREMENT OF R, L AND C

USEFUL BENCH TEST-INSTRUMENT FOR RESISTANCE, INDUCTANCE, CAPACITY CHECKS TO A HIGH ORDER OF ACCURACY

D. J. RAVEN, M.Sc., Ph.D (G3TKR)

RECENT constructional projects undertaken by the writer, on filters and phase-shift networks, required the measurement of resistors, inductors and capacitors to an accuracy of 1 per cent or better. Fortunately, access was available to a Marconi Universal Bridge, but it soon became apparent that it would be much more convenient to have a test instrument of this accuracy readily to hand on the bench during experimental work.

Such an instrument, of simplified design to suit requirements, has been constructed at a fraction of the cost of a commercial instrument, and proves most valuable.

Besides checking and accurately measuring the values of resistors and capacitors, the values of inductors, from RF tuning coils upwards, can also be measured accurately, and this alone has taken much of the hit-or-miss out of the writer’s constructional work. Tuned circuits can now be constructed with confidence, knowing that they will be right first time.

The Bridge Circuit

The bridge circuit used is shown in Fig. 1. For simplicity, the ranges of resistance, inductance and capacitance are restricted to 10 ohm to 1 megohm, 10 µµF to 1 µF and 10 µH to 1 Hy. respectively, as these are probably the ranges of values in which accurate measurements are most likely to be required. A table of ranges is shown, but other ranges could be accommo-
dated by using additional range resistors. The aforementioned minimum values of 10 ohm, 10 µF and 10 µH are indicated to 3 significant figures (i.e., using all 3 sections of the balance arm) but measurements down to 1 ohm, 1 µF and 1 µH are measurable to 2 figures, with proportionately decreased accuracy. In fact, the instrument has proved useful for measuring inductances of less than 1 µH, utilising the fine balance control VR1 alone, the 300° scale of which indicates 0-1 pH on Range 1.

For resistance measurements, the circuit is a conventional Wheatstone bridge, but because the bridge is energised by an AC supply, it is generally not suitable for measuring the resistance of wirewound iron-cored components such as transformer windings, LF chokes, etc., which have a high reactance. The addition of a DC supply and switching of the meter to put it directly across the bridge could be arranged if desired. However, for the ordinary wirewound resistor, the error is found to be negligible.

The unbalance-signal from the bridge is amplified, rectified and the resulting DC indicated by the meter M1. The decade switches SR1 and SR2 and the variable resistor VR1 are adjusted to obtain a zero or minimum reading of the meter. The settings of the two decade switches give the first two figures of the component value under test and VR1 provides still further resolution. A 10-division scale incorporated in the latter allows for easy reading of the third figure, which, without further subdivision, is sufficient to give a direct reading accuracy of 0.1-1%.

For the measurement of inductance, the capacitor C1 with VR2 in parallel, or C2 with VR3 in series, is incorporated to give a Maxwell or Hay AC bridge configuration respectively.

The variable resistor VR2 or VR3, as the case may be, is the phase balance control and produces a phase shift in this arm of the bridge to balance that produced by resistance or loss in the component under test.

It will be appreciated that to obtain a balance in an AC bridge circuit, the potentials across the bridge must not only be equal but also in phase. A pure inductance or capacitance will each produce opposite phase shifts of exactly 90°, but resistive components in either give rise to phase shifts which depart from this ideal condition. This is much more apparent in inductors than in capacitors because good quality capacitors have negligible losses.

Fig. 1. Diagram of the Bridge circuit—values as shown.
The basic Maxwell and Hay bridge circuits are shown in Fig. 2. For the Maxwell bridge with parallel phasing control, the balance equation is:

\[ L = R_1 R_2 C_1 \]

and the setting of the phasing control R3 is determined by the Q (or quality) factor of the coil under test. The Q-factor of the coil is given by:

\[ Q = \frac{2\pi f R_3 C_1}{1 + (2\pi f R_4 C_2)^2} \]

It is seen that the equation for L is independent of both frequency f and the value of R3, but for high values of Q, the value of R3 becomes impractically high. For coils of high Q-factor, the Hay bridge arrangement is used. The balance equation is:

\[ L = \frac{R_1 R_2 C_2}{1 + (2\pi f R_4 C_2)^2} \]

and

\[ Q = \frac{1}{2\pi f R_4 C_2} \]

It is seen that the balance equation is more complicated in that the evaluation of L is dependent on frequency and on the value of R4. However, for values of Q greater than 10, \(2\pi f R_4 C_2\) is much less than unity, and \(L = R_1 R_2 C_2\).

A bridge source of about 1-6 kc was chosen, so that \(2\pi f\) is approximately 10,000, making for ease of calibration of the phasing controls in terms of Q-factors, if so desired. The exact frequency, for the above relationship to hold, is 1592 c.p.s. The nearest note to this, on a piano tuned to concert pitch, is the third G above middle C and is 1568 c.p.s.

Fig. 2. Basic circuitry of the Hay and Maxwell AC bridges—see text.

Bridge Source Oscillator

The circuit is shown in Fig. 3, p.547. It makes use of an EF50 valve V1 (which still occurs in large numbers in the writer’s junk box!). It operates as a phase-shift oscillator which gives a good sine-wave output. The values in the three-element phase shift network are the nearest preferred values for the frequency of 1-6 kc mentioned previously. The actual frequency is not too important, but can be adjusted over small limits by varying R3. (Fig. 3). The one tricky point is to ensure that the output from the transformer T1 is capacitively balanced to earth. The screening method used by the writer, to ensure this, seemed to be satisfactory, because reversing the connections between transformer and bridge did not alter the measured value of components under test.

Amplifier and Detector

Again EF50 valves, V2 and V3, are used, in two stages of AF amplification, to boost the output from the bridge. Low values of coupling capacitor are used in order to attenuate mains hum, which would give a standing signal and mask the null point. For the same reason, relatively low values of cathode bias decoupling capacitors are used to give a greater measure of negative feed-back at the lower mains frequency. The output from V3 is rectified by diode D1 and the resulting DC is indicated by the meter M1. A power supply is not described because requirements are straightforward and the unit can be operated from an auxiliary supply, as in the writer’s case.

Construction

Layout is not critical, provided that the leads to the
bridge components are kept short and direct. The below-chassis circuitry of the oscillator section is screened from the amplifier to minimise stray pick-up. The output transformer with electrostatic shield calls for comment, and is made from a Radiospares midget output transformer after removing the original secondary winding. A sheet of copper foil is then wrapped round the insulated primary and a connection made from it to earth. The ends of the foil are insulated where they overlap in order to avoid forming a short-circuited turn. This is followed by several layers of cellulose tape and then the new secondary is added in two sections, each of 100 turns of 36g. enameled copper wire, wound in opposite directions. The inner ends of each are connected together and the output is taken from the two outer ends, as shown in Fig. 4. This gives an output which is capacitively balanced to earth—See p.548.

The resistors used for the range and decade switches should be of high stability and of 1 % tolerance or better, as of course the overall accuracy of the instrument depends on these. In the writer's case, they were selected from batches of Radiospares 2 % tolerance metal-oxide resistors, most of which, as purchased, were found to be well within 1 % tolerance and the ones selected were within about 0.1 %. The range resistors are conveniently mounted across the range switch S1.

The capacitors C1 and C2 (Fig. 1) are 1 % tolerance silver mica types, also selected if possible. If an additional pole is added to the function switch S2, one capacitor C2 can be made to serve both of the phasing circuits. This modification saves a close tolerance capacitor, but is not shown in the circuit diagram for the sake of simplicity.

The decade balance switches SR1 and SR2 are of the edge type (Radiospares) with positions numbered 0 to 9 for digital readout and incorporating a printed panel on which the nine resistors (100 ohm or 10 ohm respectively) are mounted. Alternatively, a rotary 10-position switch could be used.

The fine-balance control VR1 is a wirewound linear potentiometer. A wirewound component is quite suitable here because its reactance at the operating frequency is negligible compared with the resistance of the arm. Similarly a wirewound component is suitable for VR3. A scale divided into 10 equal parts and numbered 0 to 10 is used with the fine-balance control VR1.

The component to be measured is connected across the test terminals, with the function switch at the appropriate setting and the sensitivity control at minimum. The sensitivity control is then turned up to give a reading on the meter and the range and decade switches adjusted

### Table of Values

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1, C2, C3, C7</td>
<td>0.001 µF</td>
</tr>
<tr>
<td>C11, C12</td>
<td>= 0.001 µF</td>
</tr>
<tr>
<td>C4, C8, C13</td>
<td>8 µF, 450v., elect.</td>
</tr>
<tr>
<td>C5</td>
<td>25 µF, 25v. elect.</td>
</tr>
<tr>
<td>C6, C9, C14</td>
<td>1 µF, 500v., elect.</td>
</tr>
<tr>
<td>C10, C15</td>
<td>1 µF, 25v., elect.</td>
</tr>
<tr>
<td>C16</td>
<td>0.01 µF</td>
</tr>
<tr>
<td>R1, R2, R3</td>
<td>27,000 ohms, 1w.</td>
</tr>
<tr>
<td>R4, R5, R9, R14</td>
<td>10,000 ohms, 1w.</td>
</tr>
<tr>
<td>R6, R11, R16</td>
<td>470 ohms, 1w.</td>
</tr>
<tr>
<td>R7</td>
<td>2.2 megohms, 1w.</td>
</tr>
<tr>
<td>R8, R13</td>
<td>= 220,000 ohms, 1w.</td>
</tr>
<tr>
<td>R10, R15, R17</td>
<td>47,000 ohms, 1w.</td>
</tr>
<tr>
<td>R12</td>
<td>1 megohm, 1w.</td>
</tr>
<tr>
<td>VR1</td>
<td>= 500,000 ohms</td>
</tr>
<tr>
<td>D1</td>
<td>= 220,000 ohms</td>
</tr>
<tr>
<td>T1</td>
<td>= See text OA202</td>
</tr>
<tr>
<td>V1, V2, V3</td>
<td>= EF50</td>
</tr>
</tbody>
</table>

![Fig 3. Circuit of the Oscillator-Amplifier-Detector](image.png)

**Fig. 3. Circuit of the Oscillator-Amplifier-Detector for the AC Bridge.**
Showing the general construction of the AC Bridge, with the EF50's neatly mounted on a chassis which fits into the containing cabinet. Full details of the design and operation of the Bridge are given in the text.

Output to bridge

Fig. 4. The transformer modification for electrostatic shielding.

to reduce this reading to a minimum. As the bridge is gradually brought into balance, the sensitivity can be increased further. If L or C is being measured, the appropriate phase-balance control is simultaneously adjusted to produce a minimum reading. It is necessary to go back and forth a few times between the phasing and balance arm controls to obtain an optimum null point. It is usually possible to find a position of these controls which gives a practically zero reading at maximum sensitivity. The value of the component is then read off the decade switches and the fine balance control settings, in conjunction with the range in use. For example, if the balance arm reads 1-2-3 (123 ohm) on range 5, the value would be 123K, 123mH or 12.3 µF for resistance, inductance or capacitance respectively.

When put through its paces, the results obtained for the various functions of the bridge agreed very closely (± 0.1%) with those obtained using a commercial instrument. Perhaps this is not surprising, in view of the careful selection of bridge components, but is very reassuring. Using standard 1% tolerance components, which are usually well within their stated tolerance, an accuracy of 1% or better should be achieved.

RANGE TABLE

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>RANGE (S1a and S1b)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>R</td>
<td>0-100ohm</td>
</tr>
<tr>
<td>L1 Low Q</td>
<td>0-100µH</td>
</tr>
<tr>
<td>L2 High Q</td>
<td>0-1µF</td>
</tr>
</tbody>
</table>

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TWO-METRE RECEIVER WITH TUNABLE FIRST OSCILLATOR

ELIMINATING
FREQUENCY-MULTIPLIER STAGES
—DOUBLE-CONVERSION,
CRYSTAL-CONTROLLED
SECOND OSCILLATOR—
DESIGN FROM AERIAL INPUT TO
AUDIO OUTPUT

C. J. DAVIS (G3VMU)

The receiver described here is double-conversion with a tunable first oscillator giving a first IF in the region of 10-7 mc, the second IF being 455 mc. A crystal-controlled oscillator appears at the second conversion.

FET's are used in the VHF circuits, the remaining transistors being germanium except the first IF amplifier, regulator and crystal oscillator, which are silicon. A negative earth line is used; no trouble was encountered with the admixture of transistor types and their earthing requirements. A block diagram is shown in Fig. 1.

VHF Oscillator and Buffer

In both these positions FET's are used to provide simplicity of circuitry and high impedances. The oscillator is a Hartley, directly transferred from its valve equivalent with little change of values. It operates at 130 mc and is very stable. No special precautions were taken with the lay-out except to Araldite-down condensers and other movable parts to give maximum rigidity. The supply voltage is regulated at 6.8v. by a simple series regulator, this also feeding the BFO and detector stages. No noticeable pulling occurs due to the demands on the main supply of the audio output stage, which operates in Class-B.

The buffer, a source follower, does not provide complete isolation between the oscillator and mixer. During alignment the signal has to be followed by the VFO, but once this has been completed the VFO can be set and left. A small shift is still evident when changing from one aerial to another but this is of no real consequence.

The oscillator is built in an L-shaped piece of printed circuit board made by soldering two pieces together, with soldered-on copper angles for extra rigidity; this was then bolted to the main chassis board. The main tuning condenser is a wide spaced 15 µF, one which has been cut down to one fixed and one moving plate. A 20 µF capacitor in series reduces the frequency coverage so that two metres can be spread over the whole dial. By adjustment of this condenser the coverage can be set to whatever is required. With an ex-Govt. Muirhead dial—one of the best rotary types ever made—no trouble is found at all with tuning in a weak signal; a flexible coupler is used between the dial and tuning condenser to reduce movement to a minimum. All other condensers are silver mica with an air trimmer for bandsetting. These are Araldite-bound to a stand-off insulator which acts as the main support for the oscillator components where these are not soldered to the board. Injection is via a 1-5 µF ceramic capacitor in the source of the buffer amplifier. The value quoted gives more than enough injection to the mixer, the drain current just rising when the oscillator is coupled to it.

On the bench with the oscillator open to the atmosphere only about 6 kc of drift can occur, due to draughts, etc., but it soon returns to normal.

RF Amplifier and Mixer

This is a standard grounded-source FET circuit with

---

**Fig. 1. Block diagram of the Two-Metre Receiver.**
neutralisation and provides plenty of gain. The source resistor should be varied for best gain and noise; if this is adjusted to let the FET pass 4 mA it should be about right. Gain and noise factor are dependent on drain current, as juggling with this resistance will soon show.

The mixer is also straightforward. The drain tuned circuit can be either home-wound of a commercial 10-7 mc transistor IF transformer. A home-wound one will give better selectivity, not being damped to provide a wide FM passband. This means that there is greater suppression of the inband image at (Signal frequency—twice IF) i.e., approximately 900 kc from the wanted signal. If the mixer is found to be unstable a resistor of 10 to 75 ohms in the drain lead should stabilise it.

**First IF Amplifier**

This provides selectivity and gain at 10.7 mc. Gain of this stage is made variable but no AGC is applied to it. Sufficient control of the signal strength is available here without reducing the gain of the second IF amplifier, and no overload of the second mixer is evident even on strong local signals. The screening cans are on the plain side of the board and as they are not earthed, they can be live to RF, as was found out after much trouble. The following action cured this, but if commercial coils are used there is no need to do this as they are soldered in: When all the holes have been drilled and the cans are being bolted into place, a solder tag should be placed between the board and the can over one of the fixing screws. When the screws are tightened this will give a good contact with the can, the tag is turned out side ways and a small

### Table of Values

#### Fig. 2. RF Amplifier, First Mixer and IF Amplifier, Oscillator Buffer and Voltage Regulator

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cn</td>
<td>-001 µF</td>
</tr>
<tr>
<td>C1, C3</td>
<td>20 µµF, s/m</td>
</tr>
<tr>
<td>C2</td>
<td>11 µµF, s/m</td>
</tr>
<tr>
<td>C4, C9</td>
<td>-001 µF</td>
</tr>
<tr>
<td>C5</td>
<td>2.2 µµF, s/m</td>
</tr>
<tr>
<td>C6, C8</td>
<td>001 µF</td>
</tr>
<tr>
<td>C10</td>
<td>47 µµF</td>
</tr>
<tr>
<td>C11</td>
<td>2.2 µµF</td>
</tr>
<tr>
<td>C12</td>
<td>2.2 µµF</td>
</tr>
<tr>
<td>C14, C19</td>
<td>33 µµF, s/m</td>
</tr>
<tr>
<td>C16</td>
<td>220 µµF, s/m</td>
</tr>
<tr>
<td>Vc1</td>
<td>see text</td>
</tr>
<tr>
<td>Vc2</td>
<td>2.8 µµF, trimmer</td>
</tr>
<tr>
<td>R1</td>
<td>47,000 ohms</td>
</tr>
<tr>
<td>R2</td>
<td>1 meigohm</td>
</tr>
<tr>
<td>R3</td>
<td>470 ohms</td>
</tr>
<tr>
<td>R4</td>
<td>see text</td>
</tr>
<tr>
<td>R5</td>
<td>1,000 ohms</td>
</tr>
<tr>
<td>R6</td>
<td>1,500 ohms</td>
</tr>
<tr>
<td>R7</td>
<td>10,000 ohms</td>
</tr>
<tr>
<td>R8</td>
<td>3,300 ohms</td>
</tr>
<tr>
<td>R9</td>
<td>560 ohms</td>
</tr>
<tr>
<td>R10</td>
<td>330 ohms</td>
</tr>
<tr>
<td>R11</td>
<td>50K ohm</td>
</tr>
<tr>
<td>Vr1</td>
<td>50K linear potentiometer</td>
</tr>
<tr>
<td>RRF1</td>
<td>2 µH, or any small RF choke</td>
</tr>
</tbody>
</table>

**Notes:** All resistors carbon rated 1-watt, and condensers ceramic except those marked s/m, which are silver mica.

#### TABLE OF COIL DATA

<table>
<thead>
<tr>
<th>Coil</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>4 turns 16g. tinned copper, i.d., 3½in. long, tap quarter to half-turn from earthy end</td>
</tr>
<tr>
<td>L2</td>
<td>4 turns 20g. tinned copper, 5/16th dia., 3½in. long, aerial tap at one turn</td>
</tr>
<tr>
<td>L3</td>
<td>4 turns 18g. tinned copper, 3½in. long on 1½in. Radiospares former, with slug</td>
</tr>
<tr>
<td>L4</td>
<td>Six turns as L3</td>
</tr>
<tr>
<td>Ln</td>
<td>8 turns 22g. enam. close-wound on 1½in. former with slug</td>
</tr>
<tr>
<td>T1, T2</td>
<td>32 turns 32g. enam., on 1½in. former with slug and can, with 4-turn link at centre</td>
</tr>
</tbody>
</table>
drill run through the normal connecting hole and the board beneath. A piece of 18g. wire is then pushed through the hole and soldered to the tag and the board. No further trouble was encountered after this.

The circuitry of the front end is shown in Fig. 2. This could by itself be used as a converter ahead of a general-coverage receiver.

**Second Mixer and Crystal Oscillator**

The oscillator is built into a small can salvaged from a TV IF strip; this was done to minimise the possibility of harmonics appearing in the tunable range. Injection to the mixer is by condenser coupling from an over-wind on the coil to the emitter of the mixer. The 10.7 mc signal is applied similarly to the base from the collector of the first IF amplifier. Instability was encountered when using the oscillator overwind as part of the emitter circuit, as is normally done. This mixer works very well and no further trouble was found.

**Second IF Amplifier and AGC**

The circuit used has appeared before in other receivers, and it does its job very well; the AVC performance is good and alignment simple. The unit actually used in the receiver was a commercial unit purchased some time ago for another project; this was modified to the circuit given in Fig. 3. The circuit shown has single-tuned IF transformers whereas the original board uses double tuned ones. R5 and R7 may need some adjustment to give the voltages quoted in the section on alignment—

### Table of Values

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1, C3, C4, C5, C6, C7, C9, C11, C13, C17</td>
<td>–</td>
</tr>
<tr>
<td>C19, C21</td>
<td>0.01 µF</td>
</tr>
<tr>
<td>C2, C16</td>
<td>100 µµF, s/m</td>
</tr>
<tr>
<td>C5</td>
<td>390 µµF, s/m</td>
</tr>
<tr>
<td>C10</td>
<td>10 µµF, elect.</td>
</tr>
<tr>
<td>C12</td>
<td>56 µµF, s/m</td>
</tr>
<tr>
<td>C14</td>
<td>120 µµF, s/m</td>
</tr>
<tr>
<td>C15</td>
<td>0.001 µF</td>
</tr>
<tr>
<td>C20</td>
<td>0.05 µF</td>
</tr>
<tr>
<td>C23</td>
<td>33 µµF, s/m</td>
</tr>
<tr>
<td>C24</td>
<td>220 µµF, s/m</td>
</tr>
<tr>
<td>R1</td>
<td>15,000 ohms</td>
</tr>
<tr>
<td>R2</td>
<td>4,700 ohms</td>
</tr>
<tr>
<td>R3, R8, R10</td>
<td>1,000 ohms</td>
</tr>
<tr>
<td>R4, R15</td>
<td>2,200 ohms</td>
</tr>
<tr>
<td>R5, R7</td>
<td>150,000 ohms</td>
</tr>
<tr>
<td>R6</td>
<td>680 ohms</td>
</tr>
<tr>
<td>R9</td>
<td>390,000 ohms</td>
</tr>
<tr>
<td>R11, R14</td>
<td>–</td>
</tr>
<tr>
<td>R19, R21</td>
<td>5,600 ohms</td>
</tr>
<tr>
<td>R12, R13</td>
<td>10,000 ohms</td>
</tr>
<tr>
<td>R22, R26</td>
<td>39,000 ohms</td>
</tr>
<tr>
<td>R23</td>
<td>830 ohms</td>
</tr>
<tr>
<td>R25</td>
<td>3,900 ohms</td>
</tr>
<tr>
<td>R26</td>
<td>2.5 mH choke</td>
</tr>
<tr>
<td>SW1</td>
<td>SPST, AM/CW</td>
</tr>
<tr>
<td>X1</td>
<td>11-155 mc xtal</td>
</tr>
<tr>
<td>Tr1</td>
<td>–</td>
</tr>
<tr>
<td>Tr2</td>
<td>–</td>
</tr>
<tr>
<td>Tr3</td>
<td>–</td>
</tr>
<tr>
<td>Tr4</td>
<td>–</td>
</tr>
<tr>
<td>Tr5, Tr7</td>
<td>–</td>
</tr>
<tr>
<td>Tr6</td>
<td>–</td>
</tr>
<tr>
<td>Tr8</td>
<td>–</td>
</tr>
<tr>
<td>R11, R14</td>
<td>–</td>
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<tr>
<td>R19, R21</td>
<td>–</td>
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<td>R12, R13</td>
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<td>R22, R26</td>
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<tr>
<td>R23</td>
<td>–</td>
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<tr>
<td>R25</td>
<td>–</td>
</tr>
<tr>
<td>SW1</td>
<td>–</td>
</tr>
<tr>
<td>X1</td>
<td>–</td>
</tr>
<tr>
<td>Tr1</td>
<td>–</td>
</tr>
<tr>
<td>Tr2</td>
<td>–</td>
</tr>
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<td>Tr3</td>
<td>–</td>
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<td>Tr4</td>
<td>–</td>
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<td>Tr5</td>
<td>–</td>
</tr>
<tr>
<td>Tr6</td>
<td>–</td>
</tr>
<tr>
<td>Tr7</td>
<td>–</td>
</tr>
<tr>
<td>Tr8</td>
<td>–</td>
</tr>
</tbody>
</table>

Notes: IFT's 1, 2, 3, 4, 5 all single-tuned 455 kc transistor transformers. All resistors carbon rated 1-watt, and condensers ceramic except those marked s/m, which are silver mica. L1 is 32 turns 32g. enam. on 1 in. former with can and core, 4-turn link for injection into mixer.
Detector and Audio

The transistor detector provides plenty of output, there being more than enough to drive the amplifier to full audio. For CW reception the BFO signal is coupled into the emitter from the base winding of an ordinary 455 kc IF transformer, the BFO and amplifier giving more than enough injection. The BFO and amplifier are also part of the detector unit. (As yet no SSB signals have been heard so its use in that mode has not been checked.) The 144 mc harmonic from a 9 mc crystal gives a T9 note so the only limiting factor would appear to be the VHF oscillator. This whole unit is really more complicated than it need be, but a BFO is useful in setting up the receiver and for resolving beacons whose signals are a most reassuring sign of life when the band appears dead.

A pre-built audio output stage is used; this came with the IF strip but any similar small amplifier will do. A circuit suitable for it is included at Fig. 4, or a pre-built unit may be used.

Construction

The receiver main chassis is a piece of printed circuit board cut to fit inside an upside-down chassis; shielding is by pieces of material soldered to the base board. Corner brackets and angle bent from aluminium sheet hold this rigid. A front and back panel of 1/16-inch aluminium are bolted to the chassis. The bottom, much abused, was cut out and a new full size piece cut to provide a new base. A sheet of 22g. was bent round the outside to form a wrap-round cabinet, and all given a coat of hammer-finish paint.

The batteries and speaker are external and connected to the receiver by a strip connector block on the back plate. This was done to stop any vibration from the speaker causing frequency modulation of the VHF oscillator.

The detector and first conversion oscillator were made as units, which are mounted on the chassis with stand-offs. The audio and second IF strips should be built in the same way, either on Veroboard or a printed circuit. Suitable commercial units could be used and modified to suit.

Having all the units as modules allows shuffling them about to get the best lay out. The RF, mixer and first IF stages are built straight on to the board, following normal practice.

Alignment

After checking for obvious faults the 9-volt supply is connected and the 6.8 v. regulated line checked. The voltages at the emitters of the second IF transistors should be, first transistor 0.85 volts and second 1.3 volts above the IF amplifier positive line with the second conversion oscillator disabled. The crystal is then plugged in and the core adjusted for best starting when switching on; this can be checked by the rise in the emitter voltage of the mixer. A voltmeter should then be connected between the collector of the AVC transistor and the positive line. A signal at the crystal frequency minus the second IF is applied to the mixer base and the IF transformers tuned for a voltage minimum. The same signal is then applied to the drain of the first mixer and the 10.7 mc IF tuned for the minimum voltage, as above.

The signal generator is then moved to the aerial socket and set for 145 mc and the signal found by varying the oscillator. L2, L3 and L4 can then be tuned for maximum signal and the neutralising coil adjusted for the best stability and noise figure. All that remains to be done then is to set the oscillator to cover two metres. In this receiver it is covered by a 140° rotation of the tuning condenser. The BFO is then tuned to the centre of the passband and its amplifier transformer touched up for maximum voltage drop across the detector load resistor.
Results and Observations

The receiver performs very well indeed but it could do with a noise limiter. As yet, however, a suitable one has not been found, but experimentation continues. Sensitivity is good, aerial noise can be heard, and GB3VHF at 70 miles received on a very poor aerial (a four-element beam resting on a roof about six feet above ground level). The drift is small and the receiver becomes quite stable after 10 minutes.

All-in-all, this Rx is better than it was thought it would be, though more listening will no doubt uncover some snags—but as it stands the receiver does much more than was originally required of it.

The version by G3MJW—who also has a similar Rx—uses a VHF Hartley oscillator directly taken from its valve equivalent, as shown in the VHF/UHF receiver section of the Radio Amateur Handbook. The values shown for the Colpitts, in the same section, should give approximately the correct coverage. The BFO is crystal controlled, and a different IF circuit is used, though the block diagram is the same; SSB can be copied on this receiver, also Continental stations have been heard on it from the Midlands.

CORRECTIONS AND AMENDMENTS

Reference his article "Discussing Phased Vertical Antennae" in our September issue, G3DDN points out that in Fig. 2 (p.419), the tops of Sw3A, Sw3B should be connected, likewise Sw3C, Sw3D—these interconnections are essential for the proper working of the system. Also, in Fig. 3 (p.420) Sw2 should be seen as a two-way switch only, without a centre position.

Again in the September issue, in the circuit diagram on p.422, G3EEZ says that there should be an 001 µF by-pass condenser from the junction of R3, L1 to earth; “C18” on the lines L5, L6 should have been marked as C20—same applying to the reference in the second paragraph on p.424. Diode D1 is a GEX-66, and D2 must be a mixer type, such a 1N21C.

Regarding the item “Beginner Licensing in Eire,” on p.420, September, we are informed that all EI amateur Licences are “Experimental Permits,” and that new licensees are confined for one year to the use of CW only on the 20-40m. bands—what a sensible provision! After the expiration of this probationary period, they have to re-apply for full-bore operation on all bands. Calls as issued are not dated by the figure, but any single-letter suffix, e.g., EI9F, pre-date those having two or three letter suffixes. And we can remember the time, 'way back in 1927, when Irish amateurs had callsigns like GW12B, in that case the Wireless Society of Ireland, now EIORTS, for today's Irish Radio Transmitters Society.

NOMINATED FOR COUNCIL

We were interested to see that Eric Dowdeswell, G4AR, of Ashtead, Sy., until recently general manager of the RSGB, has been nominated for the council of the Society. The election takes place shortly, by ballot, on forms delivered to members. G4AR has had considerable experience in the fields of amateur and commercial radio, as well as of administration. A keen and active DX operator, CW and SSB, he was well known as ST2AR when chief radio officer with Sudan Airways in Khartoum, before retirement to the U.K., to take up his job with the RSGB—a position now held by Ron Vaughan, G3FRV. We commend the nomination of Eric Dowdeswell, G4AR, to readers who may be RSGB members.

TO WHOM IT MAY CONCERN

We are informed that the firm of Globe Scientific, Leeds, is in voluntary liquidation, with a deficiency at present estimated at about £15,000. Their affairs are in the hands of Mr. R. W. Hellyer, of Armitage & Co., chartered accountants, City House, Leeds 1—and it is to him that all claims and correspondence respecting Globe Scientific should be addressed, without delay.

On the same dolorous theme, it was only on October 13 that we received information that the affairs of Swanco Products, Ltd., Coventry, are now being handled by H. L. Barnes & Sons, chartered accountants, 22 Queens Road, Coventry, preparatory to a meeting of creditors, which has been called for November 4 and is to be held at the Accountants' offices. Any reader having a claim against Swanco should write immediately to H. L. Barnes, with full details.
HIGH-GAIN VHF/UHF AERIAL ARRAY

ERECTION, EXPERIENCES AND RESULTS

M. HEARSEY (G8ATK)

The writer having spent three years in a mediocre VHF/UHF location in the middle of a saucer-shaped area, decided to move to a QTH which was 600 feet a.s.l., in the nearby town of Farnham. This was in fact the old home of G5NF, now GW5NF, from whence several records were made.

From contacts with G5NF in the past and early tests by the writer, it became apparent that from the NW around to NE the take-off was slightly obscured by rising ground and a heavily wooded area of high pine trees, so an aerial height of at least 40-50 feet was required to attempt clearance of the obstructions.

Factors Involved

All sorts of problems had to be considered, the most important being windage on a large array at the top of a hill. It became apparent that a rigid structure would be necessary. All the various suppliers' products were scrutinised, and the Heathkit 32-feet galvanised tower was selected.

Next, what aerials should be used? At first two Parabeams for 70 cm, and another pair on two metres were considered, but it was felt that two 14-element 2m. Parabeams would present a serious windage problem; so a compromise was made—two at 70 cm and one for two metres. Following a telephone QSO with G3JHM it was decided that a monitor on ZB2VHF on 4m. would be extremely helpful, to indicate when sporadic-E conditions were prevalent, so a 3-element Yagi was added for four metres.

With a high-gain highly directional array, it became apparent that one would only be able to search the bands in the directions that the aerial was aimed, so a form of wide-angle aerial would be required. As it happened the author had a two-metre 4-element Yagi, and an 8-over-8 wide-angle aerial would be required. As it happened the two 70 cm Parabeams were assembled on the top of the tower and inserted in the 2in. dural tube, the 9ft. steel section on the ground and hoisted up to the top of the tower and inserted in the 2in. dural tube, the feeder was connected into the converter—but only weak signals could be detected. This was traced to a short-circuit joint in the phasing harness. However, to rectify meant taking the antennae down again. Whilst the harness was away with the rotator re-erected. When the harness was returned it was fitted inside the tower where it could be reached, should a fault re-occur in the future.

Problem (2) was solved by removing the bottoms out of scaffolding feet, and mounting on 1/8 in. aluminium plates. The load-taking bearing was fabricated using a brass bush, turning on a SRBF plate, with a 1/8 in. p.t.f.e. washer between. The object of this disc was to take up any tolerance discrepancy and provide a self lubricating bearing. An AR22R rotator was purchased from K.W. Electronics.

Getting It Up

All various parts began arriving and assembly started by laying the base for the tower; this was 5ft. square, 4ft. deep with, 18in. x 12in. feet on each corner for stability. The ragbolts were mounted in a simple jig. An inspection of the tower components yielded some sub-standard pieces. After discussion with Heathkit these were replaced.

At last construction of the tower started. It was easy enough to build on one's own, with the exception of joining the second set of verticals to the first. With the aid of G8BEJ, this was accomplished, but without some difficulty, as extra holes had to be drilled.

When the rotator was inserted the control box appeared to malfunction, jumping several divisions. A replacement was despatched immediately by K.W. Electronics, free of charge without question.

Following discussion with G8COB of J-Beams, the problem of watertight jointing on coaxial cables was overcome. An hitherto unknown service provided by J-Beams came to light, which was that phasing harnesses can be ordered with feeder attached, or alternatively if one's own feeder is despatched to the firm, it can be bonded to the harness for you.

The two 70 cm Parabeams were assembled on the 9ft. steel section on the ground and hoisted up to the top of the tower and inserted in the 2in. dural tube, the feeder was connected into the converter—but only weak signals could be detected. This was traced to a short-circuit joint in the phasing harness. However, to rectify meant taking the antennae down again. Whilst the harness was away with J-Beams, two identical lengths of cable were connected to the Parabeams, and the aerial re-erected. When the harness was returned it was fitted inside the tower where it could be reached, should a fault re-occur in the future.

The two-metre Parabeam is of course nearly 20 feet long and it was felt that assistance would be required to mount it—here G8BEJ and G8AXZ obliged. Having fitted it, no signals could be heard. Subsequent investigation revealed open-circuit coaxial feeder. Down it too came, and had new feeder connected. (Moral: Never use second-hand coaxial cable that has been used on a rotary system before.) The remainder of the aerials went up without a hitch.

For securing cables to the structure, insulating tape was tried and found to be useless, as it came off with weather; p.v.c. tape also came undone. The remedy in this case was to put a tie of lacing cord over the top.
The aerial assembly for VHF/UHF as described in the article by G8ATK (Parnham, Sy.). The two upper elements are a pair of J-Beam "Para-beams" for 70 centimetres. Below is a two-metre "Parabeam", and the Yagi assembly for monitoring ZB2VHF on four metres (see text) is beneath. The 32ft. tower is a standard Heathkit, and the AR22 rotator is mounted about 20ft. up in the tower, where it can easily be got at when necessary. The tubing above the tower is unguyed.

If subsequent work had to be carried out, Hellerman strapping and studs would be used.

In the future it is intended checking the gains, and it is hoped to publish the results. However, since May 1969 G8ATK has worked 400 different stations on two metres in 8 countries, and 40 counties, 150 of these stations being Continentals; on 70 cm 5 countries and 20 counties have been raised. The 4-metre ZB2VHF beacon has been discernible above the noise for quite long periods.

In conclusion, if the aerial could be raised another 20 feet, stations in the North would be more workable than at present, although fair success has been had in that direction.
THERE is no doubt whatever that the improvements in the technological state-of-the-art as far as communication is concerned have, and will increasingly, change the face of Amateur Radio as we know it. Already this situation is beginning to develop. In the days when your J.C. was a young reader of this piece—well, a bit younger!—the usual path into the SWL aspect of A.R. was the building of a simple TRF receiver, or accidental reception of AM amateur transmissions on the short-wave range of the domestic BC receiver. Of late years the almost complete adoption of SSB as the normal mode for telephony working has resulted not only in the TRF but the BC set becoming very rarely the sparkling-point for interest. Similarly, receivers which a few years ago were highly-regarded by transmitting amateurs and aspired to by SWL’s have more and more been replaced by the latest chromium wonder-worker. Coincidentally, the trend has been to regard the present-day range of commercial equipments as black boxes securely labelled “do not touch” (for fear of invalidating the guarantee), to be put down tidily, and connected to an aerial and earth system of terrifying inefficiency, and used solely to listen to the S9 signals that appear from time to time from all parts of the world.

However, many operators of these SWL outfits wonder why, when the band appears to be dead, old Joe Blow down the way is busily knocking off strings of VK or JA stations at S9 which are just not audible to the listener, the said Joe Blow being known to use an old HRO or R.1155 as his main station receiver, and a transmitter that resembles a bit of a bird’s nest.

How can it happen? Usually by carelessness or lack of application. An expensive receiver is no guarantee of an infinity of DX, even when new, if sufficient of the DX signal radiation is not presented to its input terminals—and in this context the single-valve receiver well made and operated need lack little in sensitivity in comparison with the more modern receiver. In the final analysis, the aerial is The Thing, plus the earth system, and the ATU which will ensure best transfer of signal from the aerial to the receiver. The “big boys” who are so often accused, quite wrongly, of using excessive power, are in fact those who have spent more time, thought, and energy, on the system outside the shack than on anything else, to ensure that the receiver gets the best possible chance to work, within its limitations—and the biggest limitation the receiver has is invariably the bit between the headphones!

Talking about that between the ears reminds us that experience is a great aid in winking out the weaker ones from under the QRM, and it is very nice to note, among the new correspondents this time, several who have been at it for quite a long time.

R. Iball (Worksop), although this is his first letter to “SWL,” has been at it since ‘way back in 1936, first with an O-V-O, which could be used as converter, adaptor or straight receiver. Progress then was to a 1-V-1 running from batteries, with which both BC and amateur bands were monitored. After Hitler’s War, Bob had to content himself with BC listening until 1951, when another one-valver enabled him to hear W/VE on Top Band; this was followed successively by R.1224, R.1155, and SX-28 receivers, until the present AR88D. And it is an interesting thought that when your J.C. was a budding SWL, marvelling at the distant stations some of the top-dogs used to report hearing, one of the names that can be recalled through the years is none other than that of Bob Iball of Worksop, in the early fifties!

Another old-timer is M. Newsome (Sutton-on-the-Forest) who has an answer to the plea of S. Palmer last time round for suggestions on a good, cheap-and-cheerful two-metre converter for use with an HRO. Malcolm uses a conversion of an old HRO coil-pack, which plugs into the receiver in the normal way, no modifications to the main body of the receiver being needed, and says that many other enthusiasts have been astounded to hear 144 mc signals coming so well out of an HRO.

Both an HRO and an RA-1 are used by B. McCombe (Peterborough) who combines Amateur Radio with many other interests, not least of which is his work as a general practitioner. However, Brian even turns the “night calls” into use, by taking a quick turn round the bands when he gets home from the inevitable baby-case!

Points of Technical Interest

Interference from TV sets was mentioned last time, and touched off a letter from G3LHR, who has spent quite a lot of time battling with it. Martin says the first thing to do is to disconnect the mains earth from the receiver, and to rely entirely on the station earth both for the aerial and for safety—which in itself means doing some work to get the station earth resistance down
to a low value. Any remaining traces of noise from the Lantern can usually be removed by 0.001 μF mica capacitors wired between live and neutral in the mains plug, first in the shack, and then in each TV set in turn. (J.C. would add a rider that the rating of the capacitors should be not less than 1000 volts). By this means it should be possible to reduce the interference caused by line time-base harmonics down to negligible proportions.

Changing tack a little, frequency measurement would appear to be something that most SWL’s do not consider very important, if the frequencies quoted on reports received by J.C. are anything to go by; and it is a view confirmed by the correspondence, which very rarely mentions any method of confirming frequency. There are various forms of wavemeter, the simplest one being nothing more than a tuned circuit roughly calibrated in bands, called the “absorption wavemeter” and used by transmitters for confirming that they are somewhere near the right hand. Having done this, the next step is to use some sort of heterodyne wavemeter to tell exactly where in the band one has settled, the point being that the heterodyne device cannot tell you for certain which band you are in, but can tell you the exact spot once you have confirmed you are in the right parish.

To make it easier to zero-beat the wavemeter with the received signal, visual display by way of the oscilloscope is possible. For oscillator frequency measurement, one can apply the signal to a receiver and beat it against the wavemeter, or, a possibility becoming more intriguing with the arrival of integrated circuit chips on the surplus market, actually to count the number of cycles in a given time. A 1 mc “rock” in a suitably designed oscillator can be made to generate a one-second “gate” by using, for example, seven J-K flip-flops. The gate so produced is used to “enable” a counting chain using another seven J-Ks, which can count up to ten million. Having done the count, there are various ways of displaying the answer, probably the simplest being to use lamps to put up each digit of the answer in binary form. Other methods, such as the use of digital indicating tubes, Nixies, or whatever, are nicer but need lots of transistors or valves to convert the output of the counting chain into a suitable form for driving them. However, it is nice to be able to give a chap a really accurate report on his frequency or perhaps more important, drift. Such a home-brew counter could be made to be accurate to a cycle or so at room temperature and knocked up in a weekend.

From The Letters

M. Fatherley (Wokingham) dabbled in radio as a lad during the early years of the war but did not have a great deal of success, so gave it all up until the bug bit again a couple of years ago. A home-brew Rx was used for a while, until the present B.40C receiver was acquired and courage is now being plucked up to delve into it and bring it up to date.

S. Lowe (Exmouth) wants to know the licensing conditions for G/MM stations. Broadly, they are crystal-controlled as to transmitting frequencies on the VHF and HF bands, and the transmitting licence is to an operator in a particular ship, it being necessary for the installation to be inspected before the rig is used, and again cleared before it can be set up on a different vessel.

Still talking around the HRO receiver, M. Stokes (Wakefield) has a 21 mc bandspread coil which flatly refuses to “give” although the receiver goes well on the other bands. Coils for this band are usually made by modifying other ranges, and it would not be at all a bad idea to start off by giving the pins on the coil-box a good clean, followed by a thorough check of the innards for broken or dry joints.

New Entries

J. Haig hails from Hitchin, and started listening in February with the domestic set, which later was replaced by a Trio receiver, Joystick, and various odd aerials which John had been putting up and taking down during the month prior to writing.

Although he has been a reader for several years, C. S. Foster (Ferryhill) had his first contact with Amateur Radio back in 1952, when a visiting Flight-Sergeant tuned in G31OW on the mess radio set, and later took him on a visit to the G3IOW shack. SW/BC listening was the main interest for some years after that until a couple of years ago a CR-100 was picked up, and extensively altered, making a tremendous difference, and bringing the amateur bands to the fore. Incidentally, Sammy is wondering about tackle for use when he gets his ticket and wants to know whether the Heathkit DX-100U plus SB-10 combination can only put out ten watts of SSB RF. No, indeed, the SB-10 in itself gives ten watts of Sideband, which is then passed back into the DX-100 and used to drive a pair of 6146’s in the PA.

Another new starter is G. R. Ridgway (Upminster) who has a PCR2 and a 52 Set, operated to a 110-foot wire at about twenty feet. Graham does not have set listening times, but just fires up as the mood takes him, and sometimes this results in him getting some DX band is well and truly open.

The next letter in the clip comes from the HRO receiver, M. Stokes (Stratford), who has a PCR2 and a 52 Set, operated to a 110-foot wire at about twenty feet. Graham does not have set listening times, but just fires up as the mood takes him, and sometimes this results in him getting some DX band is well and truly open.

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Department of Congratulations

As ever at this time of year, there are quite a few letters mentioning either passes in the exams, or a nice new call. J. E. Jenkinson (Oxford) has taken out GSCVS; John took the R.A.E. at Oxford College of Technology, but did not follow any course, simply setting out to read up his subject carefully and make sure he was well grounded in examination technique.

* * *

Another one with a call, this time G3YRU, is P. Wilby (Rothwell) who is on 80-10 metres with a home-built CW rig running 60 watts to the PA.

Robert Ellis (Llandaff), has his R.A.E. and the Morse in the bag, and an Amateur Radio Certificate; the next step is to get the gear together for Top Band and take out a call.

Young Tony Cobb (Hull) spent most of his holidays waiting for the postman to bring in the slip, and now he has got it—a pass, incidentally—he feels, looking back, that all the traipsing to evening-classes and back through the winter weather was certainly worthwhile. Tony has now to pass the Morse, rattle together the gear to get him going, and, last but by no means least, to find ways and means of putting a decent aerial up where little or no room exists.

M. Bass (Nottingham) has passed the R.A.E., but is taking a rather more leisurely approach to things than most of the others in that he has targeted Morse and the call as "sometime in 1970." Meantime, he keeps his score going, with the help of a Trio 9R-59 recently introduced to the shack.

Last but not least, C. Ekberg (Grimsby) who, J.C. recalls, came back to radio at a time when the demands on his time were very heavy, and so has had to stick to a careful programme, even cutting out listening to a great extent, in order to do the necessary work involved in getting the R.A.E. and Morse passed. Now Charles is in for a ticket, and hopes, all being well, to be on by Christmas—and J.C. will be looking for a QSO, to fill a hole in his county score on Top Band!

John Struthers (Hawick) hopes to be operational on 144 mc, erelong, having gained the call GM8CVN since Christmas and J.C. will be looking for a QSO, to fill a room exists.

Turning now to the rest of the clip, we have quite an assortment of letters, so that once again we will have to select those with major points to be discussed. In the line of HPX queries, the 3Z wallahs have startled quite a few readers, notably J. Marchant (Sharnbrook), although a glance at the back sheet of the Prefix List would have settled the problem immediately.

Another one which worried quite a few people is mentioned in the letter from R. Bence (Cardiff) who was puzzled by hearing the C31CL station banging away on Twenty Sideband. The C31 prefix is the correct one for Andorra, and supersedes the PX1 previously used.
Volume XXVII
THE SHORT WAVE MAGAZINE

R. Berkolds has this outfit at 73 Barberry Avenue, Davis Estate, Chatham, Kent. the Rx on the right being a CR-100 (which he has been modifying recently) and below the TV set is an R.71, of which he would like to know more from anyone who knows anything about it.

with a wet towel round his aching head, he would surely know! Seriously, though, there is quite a lot of checking and researching to be done before the copy goes off to the Editor, who casts a distinctly beady eye over it before clearing it for press—and your conductor still has his daily bread to work for, let alone a little time for operating and domestic chores. Going on a little Maurice is quite interested in aerials and wants to know about the Joystick and what are the best ones to use if one has the choice. There is only one real answer to this—you pays your money and takes your pick! The Joystick, properly used, has certainly given extremely good results, but if one had all the space and funds to run the best possible aerial system it would not be far off the aerial farm at W6AM, where there are rhombics pointing in all the major directions, switched at the shack in order to select whichever one is needed at any time to give Don S9 from any part of the world.

Up in Hull, J. Singleton has popped out of silence again, with another entry for the Table. He seems to be working soundly along the lines of that old theory of Confucius which suggests that the more sunlight the aerials shut out the better the DX; in fact there is a quite astonishing collection decorating his garden, operation being contemplated on all bands up to Seventy-cems. XYL Shelagh also has an entry, and remarks that she now has her own receiver, an HRO-500. She had a trip to the maternity home up in Ferriby due during October, and reckons it would be a lovely site for an aerial farm.

P. N. Butterfield (Wakefield) had the bad luck to lose the copy of his last letter before deadline this time; which entailed a certain amount of mild cursing by old J.C. until the copy of the list held here could be dug up and things sorted out—but it all came out right in the end.

September 2 was quite a day for A. J. Harmsworth (Lymington) who fell neatly into a ten-metre opening, which gave him ZE1BS, G4RS, W3BMS, W1NSH, G3IAP, KG4AA, ET3RLL, G3UML and G3BR all around 1800 and 28-5 mc, give or take a little. Quite an unusual opening, with DX and also true short-skip conditions.

I. Poole (Leeds) hit the jackpot with his GCE results, eight in all, but has thus landed in the Sixth Form where it will be " nose to the grindstone " to the detriment of his SWL activities—but it will all be worth while in the end, and after all SWL is a hobby and not a means of livelihood.

A somewhat similar situation follows with D. Whalley (Corsham), who has finished the school examination grind, but is now occupied job-hunting. David has hopes of having a stab at R.A.E. sometime next year, before the examination techniques are completely forgotten. On a rather different tack, David recalls mention of the AC4RF book in this piece some time ago, and wonders if there are any more non-technical works which highlight Amateur Radio? Perhaps readers would care to offer suggestions; and J.C. would kick off by mentioning a yarn called Race for Life which is largely based on the theme of international communication by Amateur Radio. While it is none too accurate in depicting detail, it is nonetheless a good read for its own sake.

D. Randles (Sale) listens to the 80-metre DX Net quite often, but bewails the fact that the stations in it are often giving the DX reports of S6 or better when he just can't hear them—sounds like a good case for some careful working on the aerial system and coupler to get the very best out of it. David, on August 23, heard a genuine case of short skip on Twenty at the same time that W's were booming in; not so common—most of what is called " short-skip " is nothing more nor less than normal propagation at first-hop distance, which takes in a range of up to a couple of thousand miles or so, and so results in loud signals from all Europe. All the real DX is achieved by more than one hop, the number being a function of the aerial and the propagation conditions.

Talking of DX, A. Wood (York) rather amused J.C. with his comment that either conditions have been good
or there are a lot of JA pirates about! Good conditions it is, Alan, plus the numbers of JA's on the air, most of who seem to operate on the DX bands.

Headphones are the main topic with C. Burrows (Gidea Park) who has treated himself to a pair of light-weight padded ones, which are more comfortable than the old set. A good point this, as a comfortable pair of "cans" can make or mar one's pleasure in operating. For spectacle-wearers, there is a lot to be said for the stethoscope type, quite apart from the fact that one can change the insert in a moment for one of a different impedance.

Poor old J.C. has been scratching around in his files again, because someone forgot to sign their letter—this time it seems likely to have been N. Peacock (Tonbridge) who signed with just his Christian name. (It would help a lot if all correspondents would use block letters for name and address!)

A. Watson (Dartford) has, by the sound of things, been hearing rumours—anyway, he put inverted commas over your conductor's name in his letter and Table entry. Perhaps he thinks J.C. doesn't exist—must get the Editor to prove the J.C. identity, even if he does have to suffer it every couple of months when he gets the script!

B. K. Middleton (Welton) has recently become G8CRI, and comments thankfully on the quality of the R.A.E. course run by 9H1R at Paola Technical Institute, Malta. G8CRI was, in Malta, located, as far as aerials were, about ten feet from the 9H1BL skywires, which must have given the front of his receiver something to think about at times!

SWL support at stations Specially on the Air is a point raised by S. W. Dean (High Wycombe), who found that once the SWL types who were standing around looking interested realised he was himself "only an SWL" as he puts it, then they were much more keen to talk and to be roped in to the Club—which is, after all, the basic reason for most of these affairs.

Surprisingly, none of the letters, other than the Top Dog—S. Foster (Lincoln), and G3UML—noted the slip in deleting OF as a good prefix last time from the list of D.J. Reynolds of Dudley. Thanks, both, for correcting your conductor. On a different point, Stew mentions his conductor, for the encouragement of the others—he has one 560 of the original 9R-59 receivers from Trio, with which he has one for is as a comparative device, when checking aerials or the differences in signal levels from stations in the same area. Given a quiet band and a noise-free background, it would be quite proper to report a station R5 and S2—and an RS-52 signal can be quite hefty on the audio side when the gain is turned up a bit!

**Also Received**

And there, once again, space seems to have run out on us. So we acknowledge chatty letters and entries for the Tabular Matter from the following: A. W. Nielson, Glasgow; P. Levitt, Worksp; J. Pullen, Barton-on-Humber; C. G. Pearson, Northfleet; I. Porter, Harrow; S. Culnane, Harrow; J. Dunnett, Preston; H. Wright, Hemsworth; C. Garcia, Worsing; R. A. Miller, London, S.W.15; P. Gould, Tiptree; M. Fisher, Bradford; R. Hyde, RAF Locking; C. J. A. Morgan, Walsend; D. Garrad, London, S.E.23; R. Thorneycroft, Shifnal, D. Maunder, Settle; K. F. Bone, Chard; R. Bagwell, Frimley; L. Harwood, Wirral; M. J. Quintin, Wotton-u-Edge; R. Nicholls, Narborough; G. S. Braund, Taplow; C. Price, Bolton; and P. Sharman, Bromley.

**Deadline**

November 7 is the deadline for the next time—a little short this, but it can't be helped, with the inevitable Christmas mail delays snarling up the afterend of the production schedule for the January issue. Address 'em to "SWL," SHORT WAVE MAGAZINE, BUCKINGHAM, to arrive in time, and J.C. will be waiting for them with open arms!
COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

quite a month, both personally and by way of band conditions. Personally, because of a holiday predominantly non-radio, but with highlights in the way of visits to two amateurs, both well-known on the DX scene. To them both, and their XYL’s, thanks go for making a normal holiday memorable, and incidentally showing the writer the truth of his own oft-repeated assertion that it is the aerial that counts!

However, all this meant that your scribe, in the nature of things missed out on quite a bit. Conditions were pretty good during the month, except for one period, and it is of some interest to note that this seemed to coincide with the arrival over Scandinavia of the fallout from a “dirty” bomb let off by the Chinese, if a report from Sweden datelined “dirty” bomb let off by the Chinese, Scandinavia of the fallout from a “dirty” bomb let off by the Chinese, if a report from Sweden datelined “dirty” bomb let off by the Chinese, Scandinavia of the fallout from a “dirty” bomb let off by the Chinese, Scandinavia of the fallout from a “dirty” bomb let off by the Chinese, Scandinavia of the fallout from a “dirty” bomb let off by the Chinese.

One wonders if others have noticed the effect by noise on the HF bands of a rather unusual level. One wonders if others have noticed the effect by noise on the HF bands of a rather unusual level. One wonders if others have noticed the effect by noise on the HF bands of a rather unusual level.

QS. Managers

Three letters on this point are especially deserving of mention, either pro- or anti. G3MCN (Liverpool) mentions that his correspondence with an American magazine regarding missing cards brought a reply from the Colvins saying that all the cards for their expedition had been despatched via bureaux. If any G is missing a card he can re-apply to the Yasme Foundation, 5200 Panama Avenue, Richmond, California. In addition, Harry mentions the QSL manager who, in response to his third request and s.a.e., wrote back saying “G3MCN did not appear in the log”—a pity, because another letter from the same manager, reference the same contact, arrived by the same post—containing the QSL! ZC4GM (R.A.F. Episkopi) regards any suggestion of foreign stamp-collecting by QSL managers “as at best uncharitable and at worst impudent,” while 9H1BL (Malta, G.C.) who, like ZC4GM, also has a QSL manager of whose quality there can be no doubt, remarks on the advertisements he has seen in U.S. DX bulletins by QSL managers who are offering thousands of IRC’s at cut prices; and 9H1BL goes as far as openly to admit to a belief that the whole business is wide open to “fiddling.”

Turning back to the G3MCN letter, already mentioned, Harry has the most pointed comment of them all when he says that according to his records he lacks a verification from fifteen countries—and all are through QSL managers, with IRC’s or s.a.e.!!

Ten Metres

Here we can make a start by taking a look at the list from G3XBY (Wombourne) who says his activities have been somewhat reduced by a holiday job, and then by joining in the GB2GD expedition, as a result of which he ended up with a short spell in bed! However, SSB accounted for A2CAQ, CSEFQ, CR6’s, CR7’s, CX6BBW, EA9ER

SIX-BAND DX TABLE

(All-Time Post War)

<table>
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<tr>
<th>Station</th>
<th>Countries</th>
<th>28 mc</th>
<th>21 mc</th>
<th>14 mc</th>
<th>7 mc</th>
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Note: Placings this month are based on the “14 mc” Column.
(Spanish Sahara), ET3USA, GC5AET, JA's, KG6AQY, KR6JT, LUBDKA, MP4B's, MP4TDA, ODS's, PY's, SV1DB, UD6KGF, U05BGD, VP8KL, VQ8CV, VQ9EP, VS6DR, VU2DK, all W call areas other than 7, YV4UA, ZE's, ZS's, 4X4's, 5H3KJ, 5N2AAF, 5Z4LS, 7Q7AM, 9J2DT, 9Q5CP—which adds up to quite a crop for a station that claims to have been rather inactive.

9H1BL regards Ten as having been the star turn of the month, and made Sideband QSO's with HPIJC, 5N2AAF, CR6LE plus a couple of all-time new ones in VP2VI and VP28KL; CW was not neglected and from this mode came contacts with UM8KAK, VS6AF, VS9MB, VU2XX, 8R1J and 9L1HC, not to mention loads of JA, W, UA0 and ZS. Alan has only one complaint as far as 28 mc was concerned, which was the number of stations worked having operators by the name of Vlad!

Contrary to the general view, G2DC (Ringwood) did not find the bands generally much to shout about. Jack does not seem to get on the air so much as of yore, for one thing, and for another his favourite operating period—1630 to 1830z—has not been the best time for the DX. Nonetheless, although nothing in the way of new stuff has been worked, CW did yield KZ5K and PY2DEH, VK4LV and XW8CQ.

Better luck, in terms of increasing his band totals, has attended the efforts of G3DO (Four Oaks), who rang the bell with HK0BXK, and VP5AA to take him over 200 on ten metres.

The report from G3NOF (Yeovil) is quite one of the most optimistic in outlook Don has sent in—general state of Ten infinitely better than it was, and mentions: W4AMMO /KC5 to DOTM; GD3PBD to DOTM; VU2BE to W3BWZ; XW8AL to F2WS; 9Y4AA (ex-ZD8Z) to W6CUF; VK9DD through the VK Bureau; TR8MC to P.O. Box 3135, Libreville; VP2V1 to P.O. Box 75, Tortola; KC4USV to K1NAP; CE0AE to Det 517, APO NR, N.Y., 09877; YAIHD to DJ0DK; XW8CS to VE6AO; YB1BM to P.O. Box 288, Bandoeng—incidentally, the latter is YB1 QSL Bureau manager; and C1AP to Andorra City, Republic of Andorra.

**Top Band**

As ever at this time of year, the mail has both a national and an international aspect, in terms of DX-chasing. Looking at the latter end first, we have a note from W1BB on the current series of Transatlantic and Transpacific tests. The former are down for November 30, December 14 and 28, January 11, February 1 and 15, from 0500 to 0730 GMT. Call “CQ DX Test” in alternate five-minute periods, the W/VE stations leading-off. Clocks should be set accurately, and the times adhered to closely unless actually in mid-QSO. Europeans on 1823-1830 kc, and possibly on 1851-1861 kc, which is a clear spot on the other side of the Pond. East Coast W's 1800-1820 kc, West Coast 1975-2000 kc.

The Transpacifics are a day ahead of those just mentioned, i.e., November 29, December 13 and so on. W frequencies as already given. JA's 1907-5-1912.5 kc, ZL's around 1876 kc, and VK's 1803 kc approximately. Times 1330-1600z and, for the JA sunset tests 0730-1000z.

In January, we hear that 9H1BL and G3VPS will be joining forces to try to dish out some contacts from 9H1-land—all being well, the last week of January and the first of February.

Reading the RSEA Newsletter, there is a very good article by SZ4LE which is clearly intended to stimulate DX activity on 160m. this winter, and suggests that skeds could well be set up—perhaps SZ4LE would care to join the party, since there is no doubt that activity from East Africa would certainly find plenty of takers, if made known in advance.

G3RTU/4X4 is interested in Top Band, although the 4X4's are not licensed for it, and would welcome cross-band skeds—the address is Zvi Kahn, G3RTU/4X4, c/o Friedman, Rechov Avoda 23, Herzlia, Israel.

An interesting letter from K1PBW to G3VLX which comments on various things; one of which is that quite a few W9, W0, and W5 stations are on, but probably not getting a QSO through the barrier of the East Coast—so they will be doubly appreciative of a report which lets them know they are getting over, even if not making a
contact. Ernie also says that he, and probably other W's, will, in order to combat the "free-for-all" on their side, be calling with a frequency attached—"CQ DX 27," or "CQ DX 1827" for instance. It is strongly suggested that the European stations try to line up on the suggested frequency, in order to avoid an interfering station on the W side. As a matter of interest, K1PBW uses a Central Electronics 20A exciter to a pair of 813's at 100 watts input, feeding a 142-foot vertical directly through coax, against 100 radials, of which 70 are a full half-wave long. On the receiving side is an SX-101, with a Beverage aerial 2500 feet long and 6-10 feet off the ground. This is strictly used as a receiving aerial, in which service its directivity and low-noise characteristics give it the edge over most other types.

A quarter-wave at a maximum height of 45ft, was put up by G3UOF/A (Bristol) which produced spectacular results, contacts being registered with W1BB/1, W2E0Q and VP9GJ, the latter incidentally being S88c—which should at least have the merit of making him clearly distinguishable from the "pirate" versions!

Just after last month's piece went down it was learned that KL7IR was active on 160m. on Wednesdays in September, and worked W3, KH6J and VK's. The JD1YAB expedition also had a stab at Top Band, QSO's resulting with KH6J and W7DL/7.

Over the past few days there have been various buzzes as regards the possibilities of 3V8 on Top Band, but at this writing no firm information is available—albeit the W lads would dearly love a crack at this one! Rather more firm is one that, by the time this reaches the bookstands, will, all being well, raise cheer in the souls of a good many DX'ers. Over the week-end of October 25-26, PJ0DX will be on from Curacao—this contest station will be operated by the W3MSK crew, and will be available 0300-0600z for contacts on Top Band. The point here is that they are a contest team, and will be dishing out the QSO's at a high rate-of-knots, so plenty of satisfied customers should ensue.

On a more domestic note a cheerful letter from G3CFV (Yeovil) remarks on the strength of K1PBW, and comparative strengths over there of some G's; it seems that G3OLI is most consistent, '3KRA however peaking higher to well over 99, with 'MYI, 'RPB, and G3CFV himself following in descending order—however he mentions that G3MYI has been having planning difficulty with his 91-foot vertical—let us hope John wins out. Back to the W's again, and here G3CFV mentions, for the benefit of the Phone wallahs, that K1PBW will be looking out specially for SSB contacts on Top Band during the CQ WW DX SSB contest.

It is startling to find, as did G3XYD, that the HB0 stations on Top Band, both SSB and CW, did not find as many takers as they would have liked—possibly Liechtenstein was not realised as being a rare one, even if not so very far in distance. John, as also G3VLX, is putting up a top-loaded vertical, worked against ground radials; both stations find a 47-foot a convenient length, when made, possibly, of a common-enough surplus mast, and reckon it outperforms a horizontal at real DX.

G3HDQ (Alvechurch) has some pertinent comments to offer on the changes he has noted in things after a twelve-year spell. Most of all he sees the decline in CW activity, and the great ease with which SSB brings in the GDX—albeit Wilf is of the opinion, with which your conductor would agree, that it always was possible with AM, provided one had a really stable signal both ends and used the exalted-carrier technique in the receiver. But there, verily, is the rub; just how many AM signals on Top Band can be regarded as much good in this context? Not many, for most of them show FM, or pulling while the PA is being tuned up, drift, or poor neutralisation. Hence, the tyro with some boodle to spare buys himself a transceiver, and finds it difficult to use it to resolve AM—indeed your scribe himself heard the QSO which Wilf reported on, of the laddie who had a new call, and a KW-2000B, which he was plaintively saying he could not use to receive AM—as if the receiver could or should be blamed for the defects in the other chap's signal! Given a stable AM signal, most SSB operators would never notice the carrier, says Wilf, and
cites as proof the QSL from G3KFE which says “2 x SSB,” when he was using AM. *Toche*!

Now to G2HKU who mentions only PD3PN on SSB and PD3SNG on the key, as an interesting change on the band and something to make the ears prick up.

A nice letter comes in from G3LXD (Church Crookham) who makes a first entry in the Table, even though he, like the writer, is no believer in burning midnight oil. However, John says his main object is to get G3PQF rattled!!

**The Tabular Matter**

Quite a large number of entries needed taking in this time, and equally a number to be purged. However, the purging process has made a sad mess of the First-Year Table, and it thus has to follow that unless some of the newer licensees are game to “have a bash” then obviously it will have to be dropped.

**Comments**

G2HKU recently had the pleasure of a visit from ON4CC and his XYL; those with long memories may care to recall winning three ARL DX Contest on the trot in the late forties, and then becoming one of the pioneers of SSB by making a start in 1950, at a time when people were wondering if there would ever be a possibility of DXCC on SSB—hence the use of “SSB” QSL cards in modern practice.

Back now to G3HDQ, who wonders how the transceiver chaps fare without the facilities of split-frequency working, and then goes on to discuss the relative merits of transceiver plus auxiliary VFO, or transceiver plus separate outboard receiver and switching for it. Will goes the bundle on using a separate receiver rather than auxiliary VFO, his main argument being that you may well find that on switching from one to the other, some of the QRM will disappear, being due to cross-mod in the other receiving element. A Good Point this, particularly as G3HDQ is, obviously, fairly close to Droitwich and has a transceiver which uses the PA *pi*-tank as receiver input tuned circuit.

G3NMH (Swindon) asks readers to note that VP8KO is out of commission, owing to trouble with his gear— and hence, in that remote spot, is likely to be off for some time. In the interim, obviously, there were no VP8KO cards to be handled by G3NMH, as from October 8—and Hal is indeed not handling any, since he is up-to-date and there is no backlog to be picked up.

**Fifteen and Twenty**

These two are lumped together this time, and of course we have first to consider the note from specialist-in-Fifteen GM3JDR (Golspie) who used CW mainly. Don reports contacts in this mode with ZD9BM, ZE1DG, VQ9MK, L1Z10/AM (over Malta), CR6LV, W0JKV/MM (Panama) KL7RAE, PY6XQ, OK4CM/MM (at S54-bland), VS6FK, SZ4MG, UW0TB, ZS1A, M1B, UA0L, UW9SG, HP1IE, ZS4AK, ZC4CB, VK2APK, OH9AM, LA0AD, IS1ZL, PJ2PS, YV1AD, GC5AET, PJ2CK, PY1BLO, PY5YC, ZS6BT, UH8CS, HL9UZ, TG4SR, VQOCC, ZS5FC, TAE, ZS5CD, VK6OV, ZS5WH, KH6AG, XW88B, UI8AI, UI8KAB, PZ1CM, 4S7EC, YV7BL, OX3LP, sixty-seven JA’s, all W call areas, and all VE call areas! SSB yielded ET3USA, UA9KAX, GD3THU(!), UL7BF, ZL3KA, 3S, JA, and all W and VE call areas.

G2DC (Ringwood) offers CR6GO, CR6PP, CR6UX, EP2BQ, FG7XX, FL8RM, FL8RC, QA4NA, VU0VZ, XE1NQ and 7Q7AM, all worked on Fifteen, while Twenty gave the usual crop of signals from all continents but nothing of outstanding interest.

W6AM (Long Beach, California) dropped a welcome line which, sadly, just missed the deadline for last month. Don has mentioned his 5BDXCC totals, at 10/102, 15/131, 20/149, 40/82, 80/49 and also says that on August 30 he was surprised to raise BY5BB, who previously would not work W stations, during the All-Asian DX Contest. On a technical note, Don mentions that in order to enable him to change bands more quickly for 5BDXCC purposes he now has three VFO’s— CW, SSB, or AM—which can be instantly switched to any one of his six finals; and any one of the latter can likewise be switched to any one of the 18 rhombic directions. There is a seventh final mounted, and part completed, with all the switches and relays available, which will one day become part of the system. Thus, if a station is game to QSY from, say 14 to 7 to 3-5 mc, Don can handle the band-changes that much faster. While many people will be green with envy at the thought of the W6AM aerial farm, it is only fair on the other hand to stop a moment and consider the formidable engineering problems of constructing such a set-up and making it work in the desired manner. No wonder W6AM is still, after all these years, sitting at the top of the DX tree!

Now to G3XBY, who used CW...
on Fifteen to hook DL7NS/OH0, G3JFF/MM (off Timor), UF6FN, UH8AE; and SSB for EF2BQ, ET3USA, FG7XX, JA's, LU8DKA, UL7BF, VP9MI, VS6AL, W6's, 4X4's, 5H3JL, and HC2GE. As for Twenty, it was all Sideband, and the crop included LU8DKA, PY8KC, TF2WLQ, TR8MC, VP8FL, VP8KD, VP9BK, VU2CT, and ZP5CE.

Fifteen for G3DO meant a new country for the band—and to make sure of it he did the job twice!—by way of JX4YM and JX8IL.

G3NOF worked his SSB to good effect on 14 mc to achieve QSO's with C31AP, CE9AE, FK8AH, JA's, KP4's, KV4FZ, VE6NH/VE7, VK's, VP2VI, VP8KD, VP8KO, VR2EK, VK0CK, VK0RM, VK0UK, ZL's, 4S7TYL, 9V1ILG and 9V1PA. The list is a little slimmer on 21 mc, with JA's, VK2AVT, VK2FA, VU0OLK, WA5TYY/KG6, 9Y4GT/KG6 (who gets around at bit—he is ex-G5AKG, YB1BM and 9V1PA).

At 9HI1BL the hunt is on for Zone 27, which just refuses to allow itself to be booked into Alan's log, although it is not all that difficult normally. 9K2BF on Sideband, HL9UZ, KR8DU (who was running 10 watts to a diapole) and YN1AA were booked on Fifteen, with the first a new one for the band and the last an all-time new country. Twenty was not particularly rewarding, the SSB stuff hooking up with 5H1KJ, and CW doing the necessary with SU11M, TG4SR, 5Z2LW and 9Y4AA (ex-ZD8Z) raised.

G3RTU/4X4 mentions the problems of getting on the air from the home-QTH and as a result has been doing his playing on the mobile rig. There are, he says, only three 4X4 mobiles, and he himself is the only G/4X4/M; he would welcome more U.K. contacts and is about on all three HF bands from the car.

The long silence of GW3UUZ (Llantwit Major) is explained in his latest letter, in that there has been considerable intrusion into his operating time by various other things—like work, for instance!—which have rather put a spanner in the system. However, Andy is still around, and in the next few months should be rather more in evidence than of late. CW is nowadays the favoured method of attack, and on 21 mc the aerial in use is the forty-metre dipole. GW gave all W call areas, including W0EFJ in North Dakota on SSB, who asked GW3UUZ to keep his keying speed right down as he had not worked any CW since he had started on SSB years ago. AM was given one whirl, but a CQ yielded nothing but a deafening silence in return, plus one SWL report of 59 plus 20 in Greece and another of 55 in South Australia—well may Andy conclude that “there just ain’t no justice!” Other CW stuff on Fifteen included VK3OP and XE1OOL, both of whom were rendered difficult by the hordes of Europeans who insisted on calling GW3UUZ even though it was obvious he was in QSO. Down to Twenty, where the only area worked into was W/VE, albeit there were more than enough of these.

The usual morning session on Twenty enabled G2HKU to talk to ZL2KP, ZL3Q, ZL3S, ZL3SE, PY5JI, VK5MB, VK3BBA around 0700z, but one odd late-night turn of the switch to the same band tuned in VP9DC, who was raised at 2345z.

As a transition from discussion of the HF bands to that of the LF allocations, now seems to be the appropriate moment to comment that Mary Goldsborough, G3WOP, is having her call pirated; it seems to have been mainly on Eighty and Twenty and cards are still landing in from the Bureau. As G3WOP only operates on 70 mc, and there but rarely, any “G3WOP” heard on the HF/LF bands is a definite phoney, and OM G3ERD would very much like to know all about it, with any useful information which could lead to catching the unchivalrous blighter.

Forty and Eighty

There seems to have been quite definitely an upswing in the number of reporters on these bands, particularly in the WAE affair; and no doubt there will be some more violent activity during the 7 mc Contest over the weekend November 8/9, 1800 to 1800z.

The SSB section of WAE was tackled for 5½ hours by Roger, G3KMA, who came out of it with CO2DC, HPIJC, HR1JAP, XE1J, VP1DW, VP2AA, VP9BK, KZ3II, 9Y4KR, YV1BI, YV4TI, YV4UA, HC2GG/1, ET3USA, CR6GO, UA9KAX, EP2BQ, ZL1AGO, ZL3GO, plus 4X4 and a couple of PY’s. The CW end yielded QSO’s with U8AI, UMS6PM, UM8KAA, ET3USA, CT3/DJ5JK, 3V8AA and 6W8XX—all raised running the
KW-2000 to a dipole, used also for Fifteen in the inverted-V shape, the feed-point being up at sixty feet.

The summer weather out there rather took the shine off the enthusiasm of ZC4GM, together with the indifferent conditions, but as winter draws near Gordon will be back in the shack as much as ever. Prior to his letter this process had already begun, in fact, and the November rain will accelerate the shift of interest. The outdoor Joystick has been put to some good use in working G's and Northern Europe on 80 and 40, around 0100 to 0200z. Eighty is a band on which Gordon hopes to impress his signal regularly on Sunday mornings, with SSB around 3790 kc as often as he can do so.

Forty for G2NJ (Peterborough) has been mainly a question of working CW with the /MM's, YO4AJE having been raised on two successive days, the first time off Gibraltar and the second near Cape St. Vincent. Another was G3RSP /MM, off the coast of Muscat (MP4M) with a very fine signal — which answers a question that was asked recently of your conductor as to whether G3RSP was at home or not!

Forty in the morning and Eighty in the evening for G2HKU, the former band producing SSB QSO's with VK2AVA, VK3ZL, VK5EF, and VK7AZ, all around the 0700z mark, while 3.5 mc Sideband did the trick with 4U11TU, JW7UH, LX1SK, OY1X, JX3X1 (a new country for Ted), LX1BW and PA0ADP, who was located near the German border and using 1 watt; all around the 2200z hour.

GW3UUZ is a devotee of Forty, and reports contacts with ZL3GQ, ZL4IE, a brace of VE3's and all W call areas. The September 24 session gave Andy three W6's on the run, followed by a 45-minute yarn with W7MB — and the cards all landed in his box on the morning of the 27th, which is pretty quick going. ZS4AC was also brought to book on the same morning for a new country. Not much 40-metre operation was indulged in by 9H1BL during the period we are looking at, although CW reports were exchanged with F9VN/FC, HC8AI, KP4AN, OY, PY, UI8, VK5NO and W6. There is a similarly short list for Eighty, with F0HI/FC/M and KV4FZ on SSB, plus UL7GW on the key as pick of the crop.

G3XBY found himself a holiday job, and so rather flinched from burning the midnight oil when a question of a 07.30 start next morning was at the other end — and who could blame him for that! However, some operation during the profitable night hours was undertaken, with the result that OH2BI/MM (CW) F0CH/FC, and 3V8AA (SSB) were landed on Eighty; and CW exchanges made with F0RS/FC, PY’s including PY7AWD on Fernando de Noronha, TF2WJQ, UF6CQ, UI8AW, UL7BI, ZS6CR, 6W8XX and YA2WHL plus SSB with CO2DC, CR6GO, DJ1FH, E13USA, LG5LG, OH0AM, YY5DCO and 9H1BA on Forty.

At G2DC the impression was that both bands were pretty fair, particularly in the early morning 0600-0700z period, when a few VK/ZL stations can always be raised, albeit always the same few enthusiasts for the band; ZL3GQ is a keen as ever, and has a vertical for general DX work as well as a Vee-beam aimed on U.K., both of which are used in conjunction with Drake equipment. Thus, the bookings at G2DC came out to VK2EO and ZL3GQ on 7 mc plus ZL1CH, ZL1AH, ZL2PS, ZL3GQ and ZL4IE on Eighty.

G3TKN (Wallasey) makes a return to the piece after a longish absence and reports that he has been experimenting with 3.5 mc aerials — a vertical, 65 feet high, tuned as a ground-plane against the old Top Band earth-mat seemed to give a first hop of 800-1000 miles, producing CW QSO's with VP9JG, W3BY, W3JD, W2YJN, EA2BY, YU2ACD, UA9GW and a few more, whereas the previous aerial, an inverted-Vee with the apex at fifty feet, produced very little at a range of greater than 500 miles. So Vincent is quite definitely converted to the vertical, at least as far as Eighty is concerned.

Sad News

Fire is always a disastrous thing, and it has hit hard at W2QHH, who was victim of a very bad one on September 19, which wiped out 90% of his home, together with his entire radio station and about 200 awards. DX-ers everywhere will sympathise with Howy and hope that all will be sorted out so that he can get back on the air again — though nothing can replace what was lost in the records of the station.

Sign Off

A good month, as was indeed to have been expected. For next time, the deadline is November 10, to arrive first post, and addressed as always to "CDXN," SHORT WAVE MAGAZINE, BUCKINGHAM. Till then, 73 es DX de G3KTE.

"INTRODUCTION TO LOGIC SWITCHING"

September Issue

Our contributor G3TDT now writes as follows: When the electronic keyer was first built it was much more complex than the version published in the September issue. Unfortunately two errors sneaked through in the process of writing up the simplified design. The first is a simple circuit error and can be corrected by removing Pin 6 to Pin 2 and Gates A.

The second and more serious error occurred in the operating description. In fact the keyer will produce a space before it settles in to normal working. This does not present any operating problem but it makes a hash of some of the sequence notes. At rest, the output of the various gates is as follows and from this it is a simple matter to trace the correct operating sequence:

\[
\begin{array}{cccccccccc}
0 & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 0
\end{array}
\]

Since the article was published Radiospares have discontinued their supply of tantalum capacitors (there is an international shortage of many components). However almost any paper or similar capacitors can be substituted, space permitting, but not electrolytic. When first switched on, the keyer may lock-on. This is because the JK’s can take up random settings — but a single “dit” or “dah” will clear the keyer.
worked from Herne Bay. The Dundee two-metre beacon, DL0ER and DL0PR were also audible in the South on the second day, and OE2OML on SSB was worked on both bands. By the 12th, propagation was virtually back to normal, although GM3NPO/P in Wigton (on his way back to Leeds) was still a good SSB signal in the late evening, at times stronger than he was from Argyll.

Auroral warnings were issued during the last week in September, but apart from a weak and short-lived effect on four metres, did not greatly influence the VHF bands.

A feature of the extended tropo openings was the pronounced ducting effects noticed on both Two and 70 cm. For instance, on Saturday morning, October 11, G3GZJ in Cornwall was heard working DJ/DL at around the 5/9 mark when they were barely audible in Herne Bay. By about 1100 hrs. they were pouring in to G3DIV near Eastbourne, and it was not until just before 1200 BST that similar reports could be given from the South-East. A plot of the German terminals showed them to be concentrated in and around the Cologne area, with nothing audible from the North of the country but a weakish signal from DL0PR. G3LOR reports similar ducting on 70 cm.

Operating Practices

The apparently arbitrary use of frequencies in the two-metre band for RAEN working is causing a fair amount of disquiet. Reports have been received of stations operating within their Zones being peremptorily ordered off a frequency because it is reserved for RAEN. There is no special frequency allocated for this game. Groups make their own selections. The guidance offered is that on four metres, these nets should use the higher frequencies in the band, but nothing has been laid down for two metres. To prevent further bad feeling, it looks as if a bit of planning and co-ordination is required here.

A CQ call consisting of the tedious repetition of the symbol, and one's own callsign given once at the end, rarely brings results. The old maxim of three-plus-three, i.e., the CQ, or the distant station's call, repeated three times and then the calling station's identification repeated three times, gives better results, particularly when QSB is bad. Long spells of cross-band operation without any callsign identification, is an offence, as is the radiation of an unmodulated carrier for long periods without identification and without regard for other possible users of the channel.

It is advisable to give location, beam heading and tuning intentions when initiating a CQ call, as this helps the distant operator to peak up a weak signal, gives him an indication of where to QSY (if that is his intention) and facilitates the decision on how long to call in return. How often one hears the announcement “tuning from the LF end,” only to find a station on 144-1 mc calling back for an unnecessarily lengthy period.

Over-modulation is tantamount to gross indecency and the distorted signal at the far end, to say nothing of the distorted visages of nearby users of the frequency, decreases rather than increases the possibility of a good contact.

These all too frequent instances of rotten operating techniques are getting us a bad name which it should behove all of us to help to eradicate by judicious and timely advice. Helpful guidance will rarely be taken amiss.

While on the subject of operating techniques, the writer would like to pay tribute to the unknown soul(s) responsible for seeing that newcomers to the VHF bands are given some help to assist the newcomer. This applies not only to technical assistance, but also to help in mastering operating techniques. There are times when the two-metre band sounds like the U.S. Citizens Band in full cry on a wet Sunday morning!

There is absolutely no justification for the gabbled callsign sent under the impression that it is "slick operating." All that happens is that the DX, who may be only just reading you, may get his call, but isn't sure of yours, and frequently no QSO results. A clear and distinct enunciation, with the use of phonetics is what is required.

VHF BANDS

A. H. DORMER, G3DAH

ALTHOUGH from past records, one could have expected September and October to produce some good extended-tropo propagation, and even an Aurora or two, conditions have been far from startling, apart from a couple of minor lifts.

The going was tougher than last year for VHF/NFD, with heavy QSB on all DX contacts—though the GW portables seemed to have been having a ball in spite of it all, with GW3BA in Montgomery, GW3NUE in Brecon and GW3TXR in Denbigh all scoring above the 200 mark. Conditions on 70 cm. were similar.

There was an opening to OZ over September 18/19, and F9FT was heard in contact with OK1VHN on September 23, but September 28 saw a peak in propagation with HB9 stations coming through, the most prominent being HB9ABH/P in DH66f near Berne, on the SSB channel.

Activity and conditions were generally poor again during the 70 cm. contest on October 5. Although the early morning produced some good DX, by midday reception was made difficult by very unstable paths for contacts at 100 miles or so, and the number of signals on the band had decreased considerably.

October 10-11 produced some of the best DX conditions, with EU on Two and 70 cm. at good strength. The opening was fairly widespread, since both G1 and GM were also
Edinburgh area are on the right lines. It was a real pleasure while on a GM holiday recently to have efficient and courteous QSO’s with so many G8/3’s. They were a fine example of what the band should sound like to all of us.

There seems to be a mistaken impression going around that CW may only be used at the LF ends of bands. This is not so—it may be used anywhere within band limits, although there are distinct advantages in a quick QSY to the lower frequencies when the DX is about. Care should be taken to avoid beacon frequencies. What is important is that under no circumstances should phone be used in the CW allocations—contest or no contest!

In the context of claims for our Annual Tables and VHFC, it has been decided that DM may count as a separate prefix, and claims should be amended as required.

VHFC Awards

Quite a bit to catch upon this time, so here goes!

Awards this month are to G8AUN, G8BKR, G3OHC, G8CEA, G3WQG and G8CJU for operations on two metres, and to G8AYN and G3MCS for work on 70 cm. To all —congratulations.

From Norwich, Reg Chiddick, G8AUN, has made the Two-Metre Award. He runs a Pye base station with about 40 watts input and a 6CW4 converter. The aerial was a six-over-six, but a 9-ele job has now been erected. Although the QTH is at 100ft. a.s.l, the proximity of a main road is a menace. Fortunately, the noise limiter in the Trio Rx takes care of most of the QRN. A total of 242 stations was worked in fourteen months to get the 100 QSL cards—a very low return rate.

John Woodham, G8BKR, operates from a 190ft. a.s.l. site three miles NW of the City of Bristol. The take-off is restricted in most directions but is worst on an Easterly heading, as the ground rises to 250ft. within ½ mile, with another ridge at 290ft. within 1½ miles. Stations in London, Kent, the Channel Islands and France have been heard, but no QSO has resulted as yet. The Tx runs 18 watts to a QQV03-10 modulated by a pair of EL84’s. A Heathkit Two’er is also available.

For reception, John has a JXK FET converter tuning 28-30 mc into a Hammarlund HQ-170A, with a Mohican as a stand-by. The antenna is an 8-element J-Beam at 31ft. Gear for 70 cm. transmitting and receiving is also available, using a QQV03-20A to an eight-over-eight, and reception on 23 cm. it catered for with a “K6AXN” converter and a six-over-six. A tripler to that band using a 2C39A is in hand. The necessary 100 QSL’s were obtained in the main from the 160 contacts who were sent s.a.e’s, which shows either a lack of courtesy or an inefficient postal system!

G3OHC, Graham Badger, is in Sutton Coldfield, and runs 10 watts to a QQV03-10 PA. Most contacts were made using a Nuvistor converter, but this was recently changed for 2N3819 FET type feeding an EC-10. The antenna was a four-over-four, but is now a ten-element Yagi, both installed indoors. It took QSL’s for 391 contacts before the 100 cards required for the Award were received, and this in spite of the fact that many s.a.e’s were sent. Graham also operates /A and /P on Two, and is on Four from his own QTH. He hopes to be on two metre SSB shortly.

When not busy flying Chipmunks, Richard Spencer, G8CEA, operates from Chobham in Surrey with a modified HW-17 and a 10-element long-Yagi at 35ft. from a QTH 150ft. a.s.l. He is also portable with a Honda 300E and a four-element beam on the luggage rack of a Mini, plus the HW-17. After getting 65 QSL cards in return for the 200 he sent out, he took to sending envelopes, when the return rate went up to 75%. He mentions particularly the promptness with which GC8AZ/P and GW3NUE/P had QSL in spite of the fact that they must both be smothered with demands. G8CEA was operating from Brittany recently with the call F0PV/P.

The Flackwell Heath, Bucks, site at 350ft. a.s.l. must have been an important factor in the gain of the Award by Dave Chalmers, G3WQG. His main transmitter is an Ameco TX62 with a measured 20 watts RF out, and the standby is a home-built job with a QQV03-10 in the final. For those contemplating using the Ameco equipment in TV Channel 9 areas, Dave recommends changing the multiplier stage from 48 mc to 72 mc, since 144 mc + 48 mc can give trouble. The receiver is a Nuvistor converter into the Ameco Rx. The eight-over-eight phased folded dipole on a home-built tower is used for VHF and this also supports the TA-33 Jr used for the HF bands. The QSL return rate is about 50%. Best DX to date is with F9NL in the Pyrenees, achieved with the help of G3C0J, who is a near neighbour. Dave does a lot of listening, particularly to G2JF, and this helps in determination of optimum headings for the DX.

G3C0J is now G3YUA, Brian Pickers, of Markfield, near Leicester. The Tx runs 150 watts with series gate modulation, a system which can be made to work very well, as was observed during a recent QSO with Brian. Reception is by G3BQK FET converter into an AR88LF tuning 24-26 mc. (One cannot help wondering how many of these converters are now in use in the Leicester area—every other station working there seems to have one!) The aerial is a ten-element Skybeam, and the QTH is on the side of a 700ft. hill and is clear in most directions. Once again, the QSL rate is very poor—70% of cards were sent direct, but only 38% came in. Brian is also mobile on Two with 18 watts to a QQV03-10, a quarter wave whip and a BC-454/ FET converter tuning 1-4 mc into the car radio. A solid state Tx for local working has an output of six watts, and has also been pressed into service in the car to keep the load on the electrics down. Plans are in hand to get two J-Beam Parabeams up on a new tower and use low loss 363 coax—which should have a certain effect!

Now to 70 cm: Roger Whitbread, G8AYN, joins the few who have achieved the VHFC Award on both two metres and 70 cm. He operates from a QTH at 425ft. a.s.l. in New Addington, Surrey, which, in spite of the height, is screened in all directions except North-East. The Tx runs 25 watts input to a QQV03-20A and the Rx uses a transistor converter with two BF180 RF stages and a T1888A mixer, tuning 12-14 mc into an AR88D. The antenna is an 18-element Para-beam. He is also active on 23 cm.
Finally, Bill Hawthorne, G3MCS. He operates from Lacey Green in Buckinghamshire—the QTH is 730ft a.s.l. and must be one of the best in the South. The Tx is a 4CX250B modulated by push-pull 811’s and this feeds the ten-element Yagi at 50ft. The Rx is an AF239 pre-amplifier into a valve converter, the first stage of which is an A.2521. Bill also operates on two metres, but is probably best known for the work he is doing on the higher frequency bands.

Although he gained his Award for two-metre work back in August this year, details of the gear in use at F1VP are only just to hand. Paul Reynolds is in Cheltenham (Department 86) with a QQE03-12 Tx running 12 watts input and modulated by push-pull EL84’s. The Rx is an Army surplus job Type RU93, and this is preceded by a transistor pre-amplifier and converter.

**QRA Locator Maps**

A new QRA Locator Map is now available from SHORT WAVE MAGAZINE, 55 Victoria Street, London, S.W.1, at 9s. including postage. As this system has been adopted throughout Region 1 as the standard position-finding aid, the Map is a “must” for all serious VHF operators. The revised version is based on the ON4IB original, but now includes the whole of Scotland and north to the Faroes, and large areas of Scandinavia. It measures approximately 2ft. 6in. by 3ft. 4in. A smaller version for desk use is to be produced later.

**Four Metres**

G3VPS advises that 9H1BL and 9H1AY can only listen on four metres as that band is not open to them while it is being used by other services on the Island. He, G3JSV and SWL Allin made a successful sortie to Hereford recently to put that county on the four-metre map. The QTH was Vagar Hill, about eight miles SE of Hay-on-Wye, at approximately 1,300ft. a.s.l., and although conditions were not very good, they managed to keep all the skeds which had been arranged. They were pleased to note the number of stations operating on CW, since due to screening, they were only able to contact stations in the North using that mode. The equipment con-

<table>
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<tr>
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<th>THREE BAND ANNUAL VHF TABLE</th>
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The THREE BAND ANNUAL TABLES show total claims to date from the year commencing January 1st, 1969. Claims should be sent as here-to-fore TO—VHF BANDS, SHORT WAVE MAGAZINE, BUCKINGHAM.

Summaries by bands will be published at suitable intervals.
sisted of a 20-watt Tx with a TT15 in the final and a four-element beam at 24ft. The Nuvisor converter fed an AB46, the whole outfit being 20 watts p.e.p. and a very nice signal it is. He had ample opportunity during the last lift to try it out and got G3FVL at 5 and 7/8 both ways among other choice GDX.

Do not despair, there is still some two-metre activity from this county. G8BMI (Keighley, Yorks) suggests that when the band seems dead, to try calling "Q and tuning two metres and Top Band", as contacts seem to result from this. He and G3SMB were operating /P on the Moors for VHF/NFD, and it seems that a good time was had by all. Best DX called, but not worked, was GW3TXR./P.

Seventeen-year-old A. Newman is now RTTY on Two from Milton, Portsmouth, and expects to have 70 cm. gear ready shortly. The call is G8CXC. G8AMG/M has now worked all the G prefixes while mobile.

The Farnborough and District Radio Society has completed its Club project of a two-metre transmitter and has many of them already on the air. The next project, now well in hand, is the modulator and PSU for the Tx.

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Two Metres

G3KMT (Rayleigh, Essex) is now putting out a fine SSB signal on two metres. The Tx power has been increased to about 250 watts p.e.p. to a blown QQQ07-50. The antenna is fixed NW at the moment.

For those who worked HB9AMH/P on Two during the recent openings, his home call is DJ5VU and he was running 200 watts p.e.p. to a 44-element Yagi. The QTH was near Berne at 1,600 metres a.s.l.

At last, identification of the German beacon which has been operating just outside the lower limit of the two-metre band, and to which reference has been made previously in this Column. It is a VOR navigational aid, the frequency is 143-966 mc, power output 200 watts to an omni-directional antenna, transmission continuous tone-modulated carrier and the QRA Locator is DJ63j, which puts it about 65 km. SSW of Aachen.

Operations on two Metres b...
apparent. Simon also worked DL and HB9 on the same day.

GW8AWS, operating from Mold in Flintshire during the recent 70 cm. openings, has been working PA0 from there, and was heard in DL.

The Sutton Coldfield 70 cm. beacon should shortly be operational again with its official callsign GB3SC. Power will be at least 50 watts. The exact QRG has yet to be announced in view of the new Band Plan.

G8AYN (New Addington, Surrey) and G8ARM (London, S.E.3) are both on 70 cm. between 2200 and 2330 each evening looking for contacts. QRG is 432-76 mc and 433-04 mc respectively. German stations are being encouraged to come on 70 cm. every Friday evening between 2000 and 2200Z to look for G contacts. Should we not do the same?

G3EHM (Stoke-on-Trent) reports that there is planned 70 cm. activity in his area on Monday and Friday evenings from 2130 clock onwards. Look for G3UBX, G3UQK and G3EHM—all beaming South at that time.

G3COJ (High Wycombe, Bucks.) has at last worked his own county on 70 cm. this year! Having a new baby around has its advantages, says Brian—when he woke at 0400 on the morning of the four-metre contest, Brian was able to get on the air and work a few more counties, as witness his increased score for the Annual Tables.

On The UHF's

23 cm. At G8AYN (New Addington, Surrey) the 23 cm. Paraboom of 22 elements is ready to go up to 40ft. with some new low-loss coax and this should give a useful improvement over the existing eight-over-eight at 34ft. A G8AEJ converter is under construction. G8ARM has built a triple trough to go with his converter in place of the radial cavity, and this is showing a slight improvement due to better antenna coupling. G8AUE (Shottle, Derby) was operating on the band during VHF/NFD, and had ten QSO's, the best DX being with G2RD/P and G3LTF/P at around 140 miles, both stations in Sussex and both SB. Other contacts over the 100-mile mark were GW3HAZ/P in Montgomery, G3NNP/P in Berkshire and G3WGC at Hertford, Herts. To top it all off G8AUE took a S9+ signal from G3BNL/P on 13 cm. with a converter which had never before seen an antenna—it was a quart oil can!!

Conditions during the contest on October 5 were apparently vastly indifferent. G8AEJ (Penge, London) who is pretty experienced on the band now, reports that he made only five contacts, even though at infrequent intervals this band was better than 70 cm., which doesn't say much for the lower frequency propagation!

Conditions around mid-October have been interesting. G2RD had a fine two-way from the South coast with G8AKE in Leicester, although the northern station was not audible on the London area. G8AEJ (London) worked PA0, DC0 and ON4, while the lift was on, but OE2OML could not be contacted. Most of the EU's were talking about their success with the atomic station, but few G's seem to have made it with him on either Two or 70 cm.

13 cm. Latest on the 13 cm. tests between G3EEZ and G3BNL/P: On August 3, a test was set up on the 100-mile path between Clee Hill and a QTH eight miles South of Aylesbury, and 5 and 9+ signals were exchanged in spite of the torrential rain at the time. A move to Long Mynd, just 15 miles to the west of Clee, lost the signals entirely. On September 14/15 a 183-mile path between Glaisdale Moor, Yorks., and Dunstable was tried, but conditions were so poor that little more could be done than to resort to AI on two metres and exchange reports about the frightful weather.

9 cm. G3EEZ/P and G3BNL/P can claim a new British record for this band with their QSO of 50 miles over a path from Painswick to Enville. Signals were 5/9+ at the former site and 5/5 at the latter. G3EEZ was using pulse gear for which special permission had been obtained from the GPO, and G3BNL had a klystron in a dish feed. Similar equipment was tried from G3EEZ but no signal was readable, which shows the advantage of pulse operation on these frequencies. G3BNL is now in the process of building a pulse cavity for further tests. This new record on 3,400 mc is possibly the first pulse transmission between amateurs on this frequency. Antennas were a three-foot dish with waveguide feed at G3EEZ, and a 4ft. and 30-inch dish at G3BNL. A fine achievement, and congratulations to both these pioneers.

General

G3VOJ (Maldon, Essex) met two keen VHF operators while on holiday in Austria recently. The first was OE7IB who lives in the Tyrol, and is the manager of the airport radio control section there. He was particularly pleased with a QSL card which he had received from an SWL in Dundee to confirm reception of his signals from the Patscherkofel mountain whence he was operating /P with five watts to a vertical. The site is nearly 7,000ft., a.s.l! The second was OE7GB, who operates from Innsbruck and who occasionally works /P from the Zugspitze, whence he has raised SM, so a U.K. contact could well be possible from there.

Another unexpected encounter was that between G6RH, who was quietly minding his own business with a cool drink in a café in Corsica, and GM3NJ, whom he found to his surprise was at the same table and similarly contemplative.

G8ALM reports the formation of a new Club in London. This is the North East London VHF Group and the address is:-The Shack, Wanstead Community Centre, The Green, Wanstead, London E11. They are already QRV on two metres and will soon be on 70 cm. also, with AM and TV. Active members are: G3SVQ/G6ABV, G8CIX, G3KWV, G8APJ and G8ALM himself. The Group meets every Friday at 7.30 p.m. and further details may be obtained from G8ALM, QTHR.

Congratulations to G8BBB on his win in the latest SSB contest on 144 mc. The next two-metre SSB event is scheduled for November 3, and the time has been extended to three hours from 1900 to 2200 GMT. For the first time the contest is also open to Club and /P stations.

Deadline

Deadline for the next issue is November 8 and the address for news, claims and comments is: "VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM. Cheers for now, and 73 de G3DAH.
FROM THE EXHIBITION

The pictures on these two pages were taken by our Staff Photographer during the afternoon of October 1, the opening day of the Radio Engineering & Communications Exhibition at the Horticultural New Hall, London, S.W.1. Keying on this page is as follows: (A) Lowe Electronics, with Bandit Bill well to the fore (white shirt, inside left at his stand), very busy at this year's Exhibition; he offered a wide variety of small items as well his regularly advertised equipment. (B) Radio Shack, Ltd., has an extensive display of new, second-hand and attractive equipment. (C) The Heathkit (Daystrom, Ltd.) stand at the Exhibition, their speciality being the well-known range of kit equipments for all radio-electronics requirements, including some excellent test gear.

General view of the Exhibition Hall during the afternoon of October 1st, the opening day, with Trio (right) and K.W. stands in the foreground. This year's Show cannot be said to have attracted quite the attention and support that some of these Exhibitions have enjoyed in the past.
A view of the Trio Stand at the recent Exhibition, with a fine display of the latest equipment under the by now well-known marque. Items like the Trio TS-510 attracted particular attention—and well it might, having regard to the operating advantages it gives. The Trio range is beginning to achieve a degree of supremacy in the radio amateur context.

(Above) Rowley Shears, G8KW, principal of K.W. Electronics, Ltd., presiding at his Stand during the Exhibition. His two main items—the new K.W. Atlanta and the KW-2000B—attracted much admiring attention. They represent the best obtainable in the way of amateur-band equipment produced for the U.K. and overseas markets. (D), upper right, the J-Beam stand showed a selection from this firm's wide range of products in the field of antennae—at centre foreground is Vic Hartopp, G8COB, one of their directors. (E) Don Hayter, G3JHM, had a small stand at the Exhibition, representing his interest in the German UKW-Berichte organisation.
THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for December issue: November 7)

(Please address all reports for this feature to "Club Secretary," SHORT WAVE MAGAZINE, Buckingham.)

THIS issue should be in the hands of readers about a week or so before the dates set for the annual MCC Contest on Top Band—see pp.511-513 of last month's SHORT WAVE MAGAZINE for all the details. The Supplementary List of Identification Codes (meaning Clubs that have signified their wish to enter since the October issue came out) will be found on p.577. Competitors should consult this, as well as the main list on pp.512-513, October, when making their contacts.

It looks as if we may well have a record entry—and a good entry always makes for more good sport all round. Remember that accurate time-keeping is essential, and that any out-of-time QSO's logged by the invigilators will be heavily penalised. It will not pay to try "slipping in a crafty one"! As in previous years, we would again ask—and perhaps again in vain—for more spreading out. There is no need for quite the congestion that usually prevails. And, as usual, we would be glad to have check-logs from anyone who cares to take an interest in the Contest.

One final point: It is essential that we have all entry logs by the due date, Friday, November 21, or earlier if possible, because there is little enough time for adjudication between that date and getting the January issue cleared for press. The work of checking the logs, etc., starts immediately, over the weekend November 22-23, meaning that entries received during the week after cannot be taken in—every year, we have a few late ones, though actually we give competitors more time to get their entries in than we allow ourselves to do the adjudication.

We look forward to a keen, clean (notes!) and well-fought Contest.

* * *

Now to the reports, and first about new Clubs: Formed on September 23, North Leeds remark that initial discussions went with a swing, and the Hq., fixed up as the Oakwood Hotel, Leeds, 8, with meetings down in November for 4th and 18th. Already there have been discussions about an R.A.E. course, and slow Morse; no doubt ere long a programme will be firmed up and the result will be yet another active group to add to our already long-as-your-arm file.

Is there anyone in the Bolton area interested in the formation of an Amateur Radio club? D. Catterall is hon. sec. of the Bolton School ARS, but wants either to get in touch with and possibly join any Bolton Club which may already exist, or, alternatively, if there is none, is prepared to take the initiative if there is enough interest in the area. Incidentally, this is by no means the first time that one of the younger chaps has been instrumental in forming a good group—one recalls G3VWC and the efficient way in which he got things cooked up for that initial meeting, followed by a very successful year in the onerous office of hon. sec. Returning to Bolton, if there is any interest, contact David at the address shown in our Panel, p.576.

Casting an eye down the rest of the North of England and Scotland clip, we come first upon Spen Valley, who are "at home" to visitors and prospective members every Thursday evening at The Grammar School, Heckmondwike, the start being timed for 7.30. Sadly, we have all the gen on the October activities, but not the November programme, albeit there is normally something of interest organised each week.

Fulford are arranging their talks at the last moment, though the R.A.E. and Morse course is pressing on as previously detailed. Find them on any Tuesday at the Scout Council Hut, 31 St. George Street, York.

November 19 is the next date shown for Northern Heights, when G3ADQ will be giving the lecture, his subject being SSB. Looking back a little, your conductor was amused at the reference to the recent Surplus Sale; the hon. sec., somewhat ruefully, one suspects, claims the auctioneer, G8CB, could easily sell snow to an Eskimo! The lads have their meeting-place at the Sportsman Inn, Ogden, near Halifax.

Wirral DX Association are in session on our publication day, October 31, at G3AKW, when G3UFO/MM will show some slides of the "far-away places with strange-sounding names" of the old song, which he has visited on his travels around the world. November 28 sees them at G3UFO, when a tape-and-slide talk on Aerials will be given. The report also mentions that they are especially grateful for the trouble taken by G3YFZ for them in going round the Decca Navigator station at Neston.

GM is represented this time by Lothians who have a Junk Sale down for the 13th and a Visitors' Night on the 27th; the programme for the latter meeting includes a couple of films, one of which deals with the making of specialised electronic valves, and the other, in cartoon form, the effect, for better or worse, of TV on people! At the AGM of the South Shields crowd all the main officers of the club were re-elected for a further year. The routine of meetings is every Friday evening except the fourth in each month, and the place is the Trinity...
House Social Centre, 134 Laygate, South Shields. Of particular interest, we note that on November 14, the son of the Club president, David Clarke, will be talking about DX Television.

Bradford next, where they have moved into new Hq. at 10 Southbrook Terrace, Great Horton Road, Bradford, 7 which is the office of the Bradford Liberal Federation. November 4 is a Junk Sale, November 11 is set for a return to the old Hq. at Bradford Technical College to see the Mullard Lecture and Film Show, and for the 18th the card is still open.

At Derby (Nunsfield House) November starts off with the AGM on the 7th. November 14 at Hq. sees G8BFC talking about Radiography, while the 21st is an Open Evening. A show of films rounds the month off nicely on the 28th. As the name of the group implies, “home” is in Room 8 of the Nunsfield House Community Association, which lies in Boulton Lane, Alvaston, Derby.

Also in Derby is the group called Derby and District, who have a total of 221 fully paid members, and a programme to keep them all. The Junk Sale, on November 5 is always a popular event, while D/F, which comes up for discussion in theory and practice on the 12th, is also a very popular activity in this part of the world. An Open Evening is November 19, followed by a visit to the Railway Technical Centre Research Department, which ought to be of great interest.

Wales, the West and North-West

Bangor—Gl. not GW!—lead off, with a mention of their very successful show at the Civic Week, in Holywood, Co. Down, as a result of what sounds like good teamwork, with both SWL and licensed members combining to show the public what it is all about, to make sure the report in the local paper made sense—a good point, this—and to demonstrate the practicability of world-wide QSO’s. As for the next meeting, it looks like Friday, November 7 to us, at the Silverstream Unionist Hall, where visitors are welcome indeed. However, it would be as well to check with the G130LJ—see Panel—just to make sure.

Back on the mainland, Chippenham have Bill Lowe’s “western bandits,” G3CHW, on the rostrum on November 25; Vic is to demonstrate the “goodies” and to follow up with a talk on the pitfalls to be avoided when loading-up SSB transmitters.

A change, both of venue and of meeting date, is announced by the Rhyl chaps, who from November onwards will be foregathering on the second Tuesday in each month at the Mona Hotel, Market Street, Rhyl. This gives November 11, and it is understood there is a film show on the cards.

Cornwall is a big county, hence the Cornish group have not only their “main meeting” which is at the SWEB, Pool, Camborne, on November 6 with a potted talk on the Show for those who did not get up this year and the main talk, on a three-band semi-conductor transceiver costing twenty pounds; in addition they have a Newquay section which uses Treviglas School as Hq., and is in session on November 12 and 26.

It sounds rather as if the Saltash crowd are in for trouble in November! After the serious business of the AGM, for which there is a move to the Wheatsheaf Inn on November 14, there follows a recital of “The Life and Times of G9BO” which is to be introduced by G2DFH, back at Burraton Toc H Hall, Warraton Road, where incidentally, the lads get together on alternate Fridays.

Not far away is Plymouth, where Hq. is at Virginia House, Bretonside, on the first and third Tuesday in every month. November 4 is a Brains Trust, and the other date of especial importance during the month is the 15th, when the annual dinner will be taken; tickets 22s. 6d. and the “do” at the Davie Hall, North Hill, Plymouth, almost opposite the Blind Institute.

Wessex next, where the unusual arrangement of dates shows the first Friday and the Monday falling seventeen days later as the ones to be reserved each month. These chaps make a special point that they are always glad to see visitors, whether licensed or SWL, at the Cricketers Arms Hotel, Windham Road, Bournemouth.

Membership is still steadily rising, reports the hon. sec. of Exeter, who also mentions that the meetings have been shifted to the YMCA, St. Davids Hill, on the first Tuesday in every month, the subject for the current month being Video Tape-recording.

The scribe at Yeovil has missed writing for some months now, but reappears this time saying the members have threatened to lynch him if he doesn’t write! Only snap—although he tells us that November 5 is set aside for a talk on his experiences with Frequency Modulation by G8BVS, he forgot to tell us where—so it becomes necessary to enquire from the hon. sec. at the address in the Panel, p.376.

Over at Reading, the “Victory” in Meadway Precinct is the place to look for this Club; November 4 is down for a guest speaker who will talk about Military Radio, and, it is hoped, have some working exhibits. On a little to November 18, when the Junk Sale starts the ball rolling, followed by a lecture by G3XOW on the Techniques of Home Construction, illustrated by reference to his “G2DAF” transmitter which will be brought along, and possibly put on the air as well.

National and International

Here the top of the pile is with WAMRAC, who by the time this is in print will have held their first conference, at Unstone Grange, Derbyshire, to discuss the future of their organisation through the Seventies. The group is truly international, with members, both of the Methodist and other persuasions, in many countries throughout the world.

The Royal Navy A.R.S. is certainly a booming group, the more so since the decision to permit associate membership to members of foreign navies—23 new members booked in by one committee meeting! This must be something of a record! The issue of the News Sheet
currently hand to be memorable, for your conductor at least, by virtue of the very good description of the raising of the Ulswater steamship after 67 years, by a team led by G3HQU who couples his abilities as an amateur with skills in diving, and withal has an extremely able pen.

Mobile operators are catered for by A.R.M.S., through its Mobile News and MCA award, the latter being a version of DXCC in which all the contacts have to be made from the /M rig; as to what the /M rig is capable of in the way of DX'ing, we notice F3DJ/M at the top of the list with 202 countries confirmed!

RAIBC, of course, looks after the interests of the blind and invalid members of our hobby, both the fully licensed and the complete newcomers. Contacts are maintained by way of the nets, **Radial** which this month has an amusing blast at amateurs by an XYL, and licensed and the complete newcomers.

On to Civil Service, who have a most palatial Hq., at the Civil Service Sports Centre, Monck Street, S.W.1, where they get together on the first and third Tuesdays at 5 p.m., with a chance of contacts of one sort and another.

### Names and Addresses of Club Secretaries reporting in this issue:

- **CREWE**: R. M. G. Fowler, G3XV, 39 Stratford Road, Crewe, Cheshire.
- **HARROW**: R. H. Medcraft, G3JVM, 134 Dulverton Road, Harrow, Middx.
- **SOUTH SHIELDS**: D. Forster, G3KZZ, 41 Marlborough Street, South Shields.
- **SILVERTHORN**: D. Standley, G3XSA, 212 Westward Road, Chingford, London, E.4.
- **ROYAL NAVY**: C/RS K. Randall, G3RFH, HMS Mercury, Edinburgh EH4-2EF.
- **SALTASH**: J. A. Ennis, G3XWA, 19 Coombe Road, Saltash, Cornwall.
- **SHEFFORD**: C. W. Stedman, G3XWS, 10 Wychwood Avenue, Shefford, Beds.
- **SILVERTHORN**: D. Standley, G3XSA, 19 Coombe Road, Saltash, Cornwall.
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- **SILVERTHORN**: D. Standley, G3XSA, 19 Coombe Road, Saltash, Cornwall.
- **ROYAL NAVY**: C/RS K. Randall, G3RFH, HMS Mercury, Edinburgh EH4-2EF.
or if we have put any group in the "wrong slot," blame his lack of geography at school!

Not much doubt as to which clip to put Midland into! They are to be found at the Midland Institute in Margaret Street on the third Tuesday in each month.

In addition they have a special "do" at the Savoy on November 21, with tickets at 25 shillings.

Quite a while since last we heard from Stratford-on-Avon, who mention that they have a Direction-Finding Contest laid on for November 2, with all comers welcome to compete. RSGB standard rules apply, the contest will be within the limits of Ordnance Survey Sheet 131, and the start will be at Oversley Green, NGR 093571. First transmissions at 1320 clock time. If anyone intends to enter please contact G3RPJ-QTHR. For details of the other activities of this group, get in touch with G3XFV.

South Birmingham have recently had an AGM, and a new secretary takes over the reins of office—see Panel. We gather that at the same time certain minor changes were made in their rules and slight alterations to the routine, so the hon. sec. should be consulted for all the "gen" although we can say that the venue is, as for some years past, at the Scouts Hut in Pershore Road, Birmingham 29.

Now to Solihull, who are nicely holed up in the Signals Hut of Shrewsbury School. November 6 is set aside for an MCC dummy run, so as to ensure the Club continues each year to improve its position—good!—while Warrers are coming along to talk about Soldering Equipment on November 13. The Club call will be aired on the 20th, and on the 27th, G3FHL will talk about Selectivity, and some unusual types of transmission.

Wolverhampton have a place at Neachells Cottage, Stockwell Road, Tettenhall, Wolverhampton where there is something each week. Thus, November 3 sees G3NUE expounding RAEN, and on the 10th there is to be a Natternite; November 17 for Mr. Charles Pitaway to talk about Model Aircraft Control Equipment, and on the 24th a committee meeting.

The first meeting of their second year of existence takes place for Solihull on November 18, so the secretary pleads "please bring your friends and your money!"

At Coventry they are to have a "University Challenge" type Quiz on November 7, while on the 14th and 28th the Club station will be on the air. As for November 21, this is set aside for a Junk Sale, otherwise described as "New Homes for White Elephants"—a new twist on an old and ever-popular theme.

Redditch is the home-town of the East Wores. crowd, who will be in session on November 13 at the Old People's Centre, Park Road, Redditch. For their enjoyment there is a tape-and-slide talk on ARRL HQ.

November for Melton Mowbray means a lecture on Construction Techniques by H. Miles, at St. John Ambulance Hall, Holiswell Works, Asfordby Road, Melton Mowbray, plus possibly a Saturday visit to Old Dalby REME Workshops sometime during the month, details of which may be obtained from G3NVK, as in Panel opposite.

The first Monday and the third Tuesday every month see the Lichfield Gang getting together at the Swan Hotel in Bird Street; the former meeting—November 3—is of considerable interest in that the firm of Amateur

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N.B.—This list includes all additional requests for identifications received up to October 14. Any asked for subsequently will have been allotted but cannot now be published before the Contest, November 6-9. These "unlisted identifications" will be in the same sequence as the published lists. See also pp.512-513, October issue.

Electronics, G3FIK, will be coming along to demonstrate some of the gear they sell.

London and the South

Cheshunt missed the deadline last time, but luckily had the November information in the same letter. The 7th it is, for a tape lecture entitled "Radio Aurora" at the Methodist Church Hall, opposite Theobalds Station, Cheshunt.

At Acton Brentford and Chiswick, memories of the sunshine will be recalled on November 18, when the lads are going to show an assortment of their holiday slides. They assemble at 66 High Road, Chiswick.

The hon. secretary of Cray Valley wonders where the copy for October went—a pity, because your scribe always thought that here was at least one reader! As for this month, the dates are November 6 and 20, with the first meeting as usual given over to a lecture, this time by C. A. Jones of Mullard on Integrated Circuits. The other date is an informal; both are down for the Compliance.

Surrey are in the clip but out of phase with us, so all we can say is that the venue is the "Swan and Sugar-loaf" in South Croydon, that for details one should contact the hon. sec.—see Panel—and that the programme of recent months has been well worth the trouble of a visit.

At Echelford the Newsletter printer seems to be having a spot of bother with his machine—a pity, as this one has always been very good in content over the years. However, it is just possible to make out that the 10th of November is yet to be finalised, and on November 27, G3MFB is to discuss RAEN; both are at "The Hall," St. Martins Court, Kingston Crescent, Ashford.
Now to Basingstoke, where the AGM has been got over; November 1 sees a talk on Basic Radio for the Beginner, and on the 15th one on Frequency Measurement. All their meeting are held at Chineham House, Popley Way, Basingstoke.

Fareham are unusual in that they get together on Sundays, at Portchester Community Centre. During the summer much has been done to improve the shack and the gear, by dispensing with a formal programme. However, they are back at it again, with G2QK reminiscing about the Good Old Days on November 2, and W1BB on tape for November 23. Other sessions are informal affairs.

Now to Norwich, where the November 3 date is organised by G2DX and entitled “Please Explain This.” An informal on the 10th is followed by Business on the 17th, and finally a talk by Mr. Hanks on the Racal RA-17L receiver.

Chiltern have a new secretary, who advises that they are still in existence, and still getting together at the British Legion in St. Marys Street, High Wycombe. By the time this is out, a programme should have been fixed up, so for details we refer you to G3IQF at the address in the Panel.

It was specially pleasant to hear from the hon. sec. of Harrow again, since it was known he had been “horizontally polarised” but now he is well on the mend, and advises that the lads can look forward to a talk on November 7, although the subject is not yet firm. On November 14 and 28 they will be “Practical” and the intervening session will have a talk on El-bugs by G3SCO.

The North Kent chaps—and lasses—are at home on November 13, when the G8/3’s are to discuss Latest Developments, and November 27, for a Natter Session.

If you want to find the Farnborough group, look for the Railway Enthusiasts’ Club, 310 Farnborough Road—and recall it is almost opposite the Railway Station. They have booked the second and the fourth Tuesdays, the former for a Junk Sale and the latter the all-important AGM.

Southdown are pleased to be able to mention that they have obtained a talk and demonstration by K.W. Electronics at the Victoria Hotel, Latimer Road, Eastbourne, for November 3.

November 19 is the date for Verulam members to remember, when G3HRH will discuss the development of the UHF TV Network. As for December, which is AGM time, this is an advance warning that they have the booking for December 10, since the Council want to use their Chamber on Verulam’s normal night.

At Dorking the form is an informal at the Wheatsheaf and the lecture at the Surrey Yeoman. November 11 is the session at the former spot, while on the 25th they have four interesting films, one technical and the others for the families and friends attending.

A wise man is the secretary of Mid-Herts—he marks your conductor’s copy of the newsletter to indicate where the meeting details can be found. Good Idea! The place to find is Welwyn Civic Centre on November 13, to listen to G6OPB/T explaining the intricacies of ATV.

Purley are exactly 20 years old on November 25, after surviving quite a few ups and downs. They have a place at the Railwaymen’s Hall, the first Friday in the small hall and the third Friday in the large one—but never a get-together on the fifth Friday, even though

Some members of the Kings Lynn (YMCA) Radio Club, which meets every Wednesday evening at the YMCA Building, off Columbia Way. Though a comparatively small group, they have often been able to help by putting on a station at local functions in aid of charity. The chairman is G8BQT, second from left, front row, and there are eight other call signs in this picture. Photograph courtesy “Lynn News.”
The Leeds Radio Society was recently reactivated, and members seen here include G3AYK, G4AD, G3TEE, G2HLL and G3YFI.

someone invariably turns up! The former meeting is a Natter, and the later date is reserved for a possible carry-over of the Junk Sale from the previous month.

Talking of long-lived groups makes one think of Grafton; and oddly enough they are next on the pile, to advise that they are still at Montem School, Hornsey Road, Holloway, N.7, every Friday evening.

The dates for Maidenhead are November 3 and 17; the latter informal, as ever, and the former given over to G3VCT to show and talk about his homebrewed transistorised receiver for the amateur bands. Both are at the Victory Hall, Cox Green, Maidenhead.

It is quite a startling thought that the high academic standards in the area served by Silverthorn means that promising youngsters are whipped off to the Universities before they can be “blooded” in office and relieve the old hands. However, that is the way of it, and things still go with a swing at Friday Hill House, Simmons Lane, Chingford.

Talking of long-lasting clubs, Shefford have a 21st annual dinner in prospect for the 29th as well as the usual weekly sessions at the Church Hall, Ampthill Road, Shefford on Thursdays. One of the secrets of their continuing success is that, being as it were out in the boondocks, they still manage to have something to offer each week. November 6 is a film show, while on the 13th Dr. Williams will answer his own question “What is a Watt?” As for the 20th, club members' questions will be answered, while the month is rounded off by G8AKT talking about VHF, to bring them to the Dinner already mentioned.

On to Greenford, who have Hq. at the Community Centre in Oldfield Lane, where they are booked for alternate Fridays. This gives them November 14 and 28, and they emphasise their desire to meet and welcome any new blood to the club.

Conclusion

And there it is for another month. Best of luck in MCC, and don't forget the deadline is November 7, with your news for December, addressed, “Club Secretary,” SHORT WAVE MAGAZINE, BUCKINGHAM. As for the MCC logs, these should be in, to the same address, by first post on November 21.

FIRST-CLASS CW OPERATOR'S CLUB - ANNUAL DINNER

This was held on the evening of October 4, at the Lord's Cricket Ground Banqueting Suite, and was again a great success, the attendance being some 135 members of F.O.C. and their friends, including 14 members holding overseas callsigns, who had made the journey specially to be there. GB2FOC on the air for most of the day, working F.O.C. members round the world. The speakers at the Dinner included G2QB, G8VG (the hon. secretary, who made all the arrangements and for some years now has worked hard for the Club), G3FXB (selected president for the ensuing year), G3JAF, G2YS and W4ZM. Messages were read from G6FO (who holds membership No. 1 and, so far as is known, is the most senior member still active from pre-war days) also from some other members unable to be present.
THE SHORT WAVE MAGAZINE

THE OTHER MAN’S STATION

THE photograph shows the station of Leslie Lewis, ZL2BCJ, 50 Chalmers Road, Gisborne, New Zealand. Interest in Amateur Radio started before Hitler’s War, when medium and short-wave DX broadcast and amateur stations were hunted for on a domestic receiver. After the war a Hallicrafters S.40A was procured and interest was renewed in SWL activity, both BC and short wave DX. Then there was a lull till 1964, when a technician licence was taken out as ZL2TCT. The full licence was granted after passing the Morse Test in 1965, and ZL2BCJ came on the air with a A.R.E.C. 2C1, graduating to a Geleso VFO, with parallel 807’s in the PA, and 807 Class-B modulators, still with the S.40A as a receiver, and a long wire antenna. The present-day station is as in the picture.

The shack is a room in the garage, away from the house, size being 12ft. x 10ft. with floor to ceiling window on the North side, carpet on the floor, concealed lighting, panelled walls with pinex planks to the ceiling. The equipment includes an Eddystone 640 receiver, on top of which is Drake-2B Rx, a phase recorder, Rustrak recorder and speaker. These four items are used in experiments to measure the electrons in the ionosphere, a brief description being as follows:

Outside is a box approximately 4ft. x 3ft. x 2ft., mounted at an elevation of 45°, aimed at the communications satellite Syncom 3, which is in a geostationary orbit at 180° long. over the equator. Inside the box is an electric motor driving a 5-element Yagi array at one revolution a second, also a nuvistor converter employing a crystal oven to keep the IF stable. The Drake-2B receiver employs triple conversion with a tunable first IF from 3·5 to 4 mc, a crystal of 10·5 being used for first conversion, giving a range from 6·4 to 7·0 mc; there are two further conversions to 455 kc and 50 kc, producing a bandwidth adjustable down to 500 c/s, the value required for recording Syncom 3. Rotation of the aerial causes the satellite signal to drop out twice each second when the aerial becomes perpendicular to the incoming polarisation. With the AVC off this 2 c/s modulation is fed into the signal channel of a narrow band 2 c/s amplifier in the phase recorder box. This amplifier reduces the effective band width to about 0·05 c/s. A 2 c/s reference signal obtained from two magnets fixed to the rotating aerial is fed into the other channel. After filtering and squaring, the relative phase of these two signals is recorded, giving a measure of the angle at which the satellite signal is polarised. This angle varies with the number of electrons in the ionosphere between the receiver and the satellite. Frequency of the satellite is 136·980 mc with a 2-watt telemetry signal.

An interesting and unusual amateur layout.
NEW QTH's

DL2AH, J. T. Worrall (G3XBA), 1 Div. HQ & Sig. Regt., B.F.P.O. 32.
DL5ZZ, C. A. Dodd (G3XZM), J.S.B., B.F.P.O. 40.
E18BZ, J. Klinkenbergh, Proby Square, Blackrock, Co. Dublin.
G3YLR, E. Howard, 2 The Green, Kempston, Beds.
G3YQN, R. M. Trott, 169 Browning Road, Aldridge, Walsall, Staffs. (Tel. Aldridge 52706.)
G3YQQ, S. J. Whiteman, 3 Stanley Cottages, Woodside Close, Kearsney, Dover, Kent.
G3YQB, D. A. Rankin, 6 Woodfield Road, Deal, Kent.
G3YNW, C. J. Booker, 42 Southwell Road, Deal, Kent.
G3YMP, P. A. Lovell, 42 Southwell Road, Deal, Kent.
G3YNL, I. J. Stevenson, 21 Sonner Close, Canterbury, Kent.
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G3YKQ, M. A. Comrie, 57 Dunagoyne Drive, Bearsden, Glasgow.
G3YRP, I. C. Dudley, 31 Belle Vue Road, Ashbourne, Derbyshire.
G3YRR, E. K. Egber, 109 Abbey Road, Grimsby, Lincs. (Tel. Grimsby 4718 or 57353.)
G3YRU, P. R. Wilby, 137 Wood Lane, Rothwell, Leeds, Yorkshire. (Tel. Rothwell 3218.)
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G3YSR, D. R. Hood, 7 Mountbatten Close, Hastings, Sussex.
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G8CXH, VHF Group, University of Bristol Amateur Radio Society, Students Union, Queens Road, Bristol, 8.
G8CXL, D. Phillips, 14 Hall Place Crescent, Bexley, Kent.
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G8BLI, M. L. Hollebon, 53 Tankerville Road, Streatham, London, S.W.16.
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WANTED: Collins, brand-new or in mint condition, equipments Type 312B-5 VFO-console; portable PSU PM-2; Speaker 312B3; TD-1 dipole antenna; new Asiatic D.104 crystal microphone. Details and prices, pse.—Box No. 4851, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

OFFERING: KW-201 Rx, with calibration manual, absolutely as new, only few hours' use, accept nearest offer to £90.—Haines, 12 Cemetery Road, Laceby, Grimsby, Lincs.

WANTED: Electroniques valve-type amateur band front unit Type QP-166, to complete G3HTA Rx.—Bourne, 111 Woodhouse Lane, Bishop Auckland, Co. Durham.

SELLING UP: G2MA-type Linear, with AC/PSU, 450w. p.e.p., coverage 16 to 80m., with spare 813, £20. Valves: 2/TT21 at 30s.; 3/8254 (miniature 807), at 20s.; 546, 60s.; 2/2E29 at 15s. Z-match ATU, for 10 to 80m., including dummy load, meter, etc., £30. Monimatch reflected-power meter, 60s. 80-ohm 100w.; carbon resistor, 28s. Numerous 87G and 9A valves at 3s. each. Buyers to collect.—Champion, 11 Eden Way, Warlingham (near Croydon), Surrey. (Tel: Upper Warlingham 2483).

FOR SALE: TCS-12 Rx, with PSU, speaker and spare set of valves, price £8 or offer.—Ring Eaton, 061-928 0025 (Cheshire).

GOING ABROAD: So have for sale Complete Station, consisting of Trio SSB Transceiver TS-500, with power supply and speaker unit, PS-500 AC/PSU, remote VFO-5, all in as-new condition after only three hours work on the air. Price £195.—Brain, 6A Whaddon Road, Newton Longville, Nr. Bletchley, Bucks.

FOR SALE: In new condition, Trio Transceiver, latest exhibition model TS-510, with companion PSU, price £183, carriage paid.—Jones, G5ZT, 3 Bircham View, Austin Crescent, Eggubuckland, Plymouth (76552), Devon.

SALE: Heathkit RA-1 receiver, with crystal calibrator, and in immaculate condition, price £32 10s.—Kroquist, Trees, Rogate Road, Hill Brow, Liss, Hants.

NO OFFERS: A K.W. Vespa Mk II, hardly used and an excellent performer, also a HA-350 Rx. covering 10 to 160 metres, the two together comprising an FB station for SSB operation, price £150.—Derrick, 218 Winchester Way, Bolton (20768). Lanes.

DISPOSING: Receivers—Heathkit RA-1, with calibrator and speaker, £27; Codar T.28, £13; R147S with PSU, £10. Also transmitter DX-40U, with VF-1U VFO, £20. And an Oscilloscope Type 13A, complete, £20.—Eggleton, G3TXG, 13 Beacon Heath, Exeter (670693), Devon.
SMALL ADVERTISEMENTS, READERS—continued

FOR SALE: TV Vidicon cameras ready to feed into 50-cm, transmitter and commercial monitors, complete with all relative time-bases, PSU’s, etc. for amateur TV station operation.—Jones, G6ABC/T (G52T), 3 Bircham View, Austin Crescent, Egguckland, Devon.

WANTED: Mains PSU for 19 Set Rx/Tx. Price and details first, please.—Heslop, 4 Willow Close, Brandon, Co. Durham.

December issue “Short Wave Magazine” due out November 28. Single-copy orders, 4s. (or 4s. 3d. “first-class”) post paid, to reach us by Wednesday 26th, for despatch on Thursday 27th. These copies are sent flat in an envelope.—Orders, with remittance, to: Circulation Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Collins 325-S1 Exeliter, 516-F2 PSU, 7533-B receiver, and 310-L1 Linear Amplifier. All in immaculate condition, ex-QTH and with manuals. Price all-in £525.—Wilson, G13CWY, QTHR, or ring Whitehead 3260 (Co. Antrim, Northern Ireland).

Top quality polypropylene non-rot rope. Diameters: 1/16, 13 lbs. breaking strain; 5/16, 1180 lbs. B/S; and 1/4, 3100 lbs. B/S. Send s.a.e. for sample.—Powell, GW3HUM, 21 Tanybryn Estate, Valley, Anglesey.

WANTED: Pye Radiotelephones Type AM10B, AB10D and AM26T, also small quantity QV03-10 valves.—Austen, 28 Valebridge Road, Burgess Hill (63409), Sussex.

SALE: Receivers: R.450/FRR.28, 540 kc to 54 mc; Lafayettecrafters 540 kc to 109 mc, 27 to 145 mc, 38 mc to 1000 mc, BC-348, £12 10s. R.1155, £5 11f. Bendix, 30s. Receiver-Indicator, £3. R.C.A. 150-metre Tx, size 6 x 6 x 6in., £12 10s. BC-251, £10. Multimeter, 30s. HRO coil pack, 20s., crystal 20s., dial 30s., PSU 50s. New Teleprinter, R.C.A. crystal multiplier, 70s. Marconi ATU, 25s. Valvetester and other items; send s.a.e. for list. Carriage extra.—Wright 249 Sandy Lane, Hindley, Wigan (39046), Lancs.

Exchange: R.1475 Rx, coverage 2-0 to 20 mc, with original 12v./250v. PSU, working but modifications need finishing for an R.1155 with D/F section complete, and “B” dial drive— or offer for R.1475? Could deliver to 25 miles.—Vinson, 22 Constable Grove, Enfield, Middlesex. (Tel. 01-360 3516.)

WANTED: A good Drake-4B receiver. Details, price and all particulars.—Steed, 2 Cliff Road Gardens, Leeds LSE-26EY, Yorkshire.

WANTED: By an SWL, a Lafayette HA-53A receiver. Please quote price, with age and full details; all letters will be answered.—Box No. 4844, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: CR300 receiver, regen. RF, with PSU and Q-multiplier, price £12.—Philpott, Russet House, Rye, Sussex.

Selling; CR-100 Rx in good condition, price £14. Also an R.205 receiver (12v. version), with matching headphones, at £10. Prefer buyers collect, but could deliver up to 100 miles or so by arrangement.—Wallis, 10 Middlewood Road, Manchester (497), Durham.

CQ-CQ-CQ de G3VQM/KW

Having got the Exhibition behind me I am now wading through the paperwork which always follows. Thanks all those of you who called at K.W. Stand. Hope you derived some benefit from your visit. Not so the thriving rat-bags who relieved us, without pecuniary adjustment, of a Vibroplex ‘Vibro-keyer’ and two Hitachi Short Wave Adaptors.

Beam Rotators. These are essential for the HF and VHF/UHF enthusiasts. We have in stock the C.D.E. AR10, AR22R, TR-44 and Ham 'M'. The AR10 is suitable for light-weight VHF/UHF aerials such as 3 ele. 4 metre yagis, BBC2 Antennae etc. The AR22R is OK for all ‘Junior’ beams like TA-33JR, TH3JR. If you use a Senior beam i.e. Mustang, TH3 Mk 111, Quad etc. you need a TR44 and if you want to turn a block of flats or a 6 ele. 20 metre Quad the Ham 'M' is a must. Prices ? We don’t talk about prices! (See "Live now—pay later!"). O.K. AR10 is £18; AR22R is £25, TR44 is £40 and Ham 'M' £70—all carriage extra of course. Prices include the control unit. These CDE Rotators really are good. I know they’re expensive but they are the very best available.

All models turn through 360° and have limit switches so you can’t over-run and screw your feeder off. We can supply cables for AR10/AR22R at 2s. 3d. yard, TR44 at 4s. 6d. yard and Ham 'M' at 5s. 6d. yard.

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de Mike

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**EXCHANGE or SELL:**

Exchange or sell: An Edystone 840C, at £36 (plus carriage), or would Exchange for a B.40, B.41 or EC-10 with appropriate cash adjustment—Sadler, 13 Daneston Terrace, Bridge-of-Doon, Aberdeen, Scotland.

**SALE:**

- Heathkit RA-1 receiver, with speaker, £27.
- T.W. two-metre receiver, including speaker, £18.
- Codar PR-30X preselector, 40s. Heathkit GP-1-6, 60s. Joystick aerial with tuner, 30s. Two-metre 5-ele Yagi, 20s. Also antennas, capacitors and other parts.—Holbrough, 8 Bay Tree Close, Kingsmead Road, Loudwater, Bucks. (Tel. High Wycombe 29847.)

**SALE or EXCHANGE:**

- An R.C.A. AR88D receiver in good condition, at £40, or Exchange for Edystone EB-35, EB-36 or similar portable.—Poulsen, 21 Whilton Place, Newcastle-upon-Type 7 (or ring Newcastle 661827).

**SELLING:**

- Heathkit HW-12A 80-metre transceiver, with PSU, price £58. Garex two-metre converter, new, IP 23-7 to 25-7 mc, £7. Lafayette KT-940 communications receiver, £17. All equipment in mint condition and professionally constructed.—Andreae, 1 Bushwood Drive, Dorridge, Solihull, Warwickshire. (Tel. Knowle 4225.)

**EQUIPMENT of The Late G6XJ:**

R.C.A. AR88D receiver, price £35 or near offer. National HRO RX, with PSU, general coverage coils and four bandspread coil packs, £20, BCC-69 for 4 metres, with PSU and leads, 60s. Small oscilloscope, £6 or offer. Ex-Govt. VHF TX, QV03-10 in final, 40s. Can be viewed in Ealing, London.—Box No. 4843, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**WANTED:**

- B2 transceiver-receiver, as a complete outfit, or TX section with its PSU.—Tee, G5UA, 33 Red Lees Road, Cliviger, Burnley, Lancs.

**SALE or EXCHANGE:**

- Sommerramp FR-100B receiver, in perfect and in absolutely mint condition, with its manual and in original packing, genuine bargain at £85, plus carriage. (South Wales).—Box No. 4846, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**SELLING:**

- G-Line KW-2000, with both AC and DC PSUs. Price £135.—Ballance, G3KNB, QTHR.

**FOR SALE:**

- FT-150, with microphone, new and boxed, price £180. Also Hustler mobile AEC, with base, spring, coverage 10-15-20-80m., £20.—Surman, Dunsfold Aerodrome, Godalming, Surrey.

**WANTED:**

- Swan 500C, with AC/PSU, in mint condition and professionally constructed. —Foulkes, G3UFZ, 21 Pishiobury Drive, Sawbridgeworth (plus carriage), or would Exchange for a B.40, price 35s.

**FOR SALE:**

- Collins 516F-2 PSU. Offers, please.—Foulkes, G3UFZ. 21 Fishioby Drive, Sawbridgeworth (3088). Herts.

**FOR SALE:**

- Joystick aerial, 25s. Copies “Short Wave Magazine,” 50s. in all, 1966-67-68, price 20s. Home-built preselector, coverage 1.7 to 30 mc in three switched ranges, using Denco coils, with EL183 RP. EF80 cathode follower, price 35s. Carriage extra all items.—Crichtley, G5UTK, 63 Rachael Gardens, Park Hill, Wednesbury, Staffs.

**WANTED:**

- Labgear Quad, with or without spreaders. Also a 60ft. crank up free-standing tower.—Persson, G3AMH, 122 Gunnersbury Lane, London, W.3.

**SALE:**

- BC-221 Frequency Meter, with its charts and headset, price £15. Also a BC-453, QFiver, 30s., and a G2DAF-type Linear, £10.—Bowen, G3ZGO, 31 The Crescent, Donnington, Telford, Shropshire.
SALE: Eddystone $40 communications receiver, with speaker, headphones and stands, all in excellent condition, price £97 10s., or near offer. Prefer buyer collects, London area.—Box No. 4853, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: Frequency meter. absorption type or otherwise, to cover 144 mc and above. Reasonable price paid.—Hood, Heath Cottage, Nutley, Uckfield, Sussex.

SELLING: Peto-Scott Commercial TV Studio monitors, 17in. video, ideal for the A/TV station, bargain at £10.—Jones, G6ABC/T, 3 Bircham View, Staffs.

FOR SALE: BC-348Q Rx modified with 85 kc IF strip, new jln. panel, S-meter, symmetrical control layout, complete but requires some attention. 60s. Also Geloso converter, coverage 10 to 80m., 4.6 me, bargain at £10.—Jackson, G3SIE, 8 Longmeadow Road, Orchard Hills, Walsall, Staffs.

AVAILABLE: Some back-number issues of "Short Wave Magazine." Six assorted numbers between 1960 and 1968, 8s. 6d. inclusive post/packing. (Shelf condition and G.P.O. approved type. Also a good TCS-6 Tx and manual, £5; TCS-47, £3.)—Box No. 4849, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

EXCHANGE or Sell: Hallicrafters Sky-Champion receiver, for good tape recorder. Offers and enquiries.—Blackburn, 32 Park Hill, Carshalton, Surrey. (Tel. 01-697 9763.)

REQUIRED: A Q-multiplier. Rx covering most of 200-600 kc, such as Nova-Tech, Bendix or W.H.-Y? Tx for CW only. Converter for 10-15m. ATU’s for Top Band and HF bands. (Lancashire).—Box No. 4872, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.


WANTED: Small commercial Yacht transmitter/receiver for 12-volt supply; must be in good condition and G.P.O. approved type. Also a good TCS receiver.—Box No. 4848, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

EXCHANGE: FL-DX500, new in February, for FT-100, or sell at £110, or near offer.—Morris, G4HU, QTHR, or ring 0161-430 3858.

EXCHANGES, or Sell: Square solid-brass box cavity for 70-cm push-pull 4Z250B's, holders, £15. Also a National HRO-MX with PSU and all coll packs, £15.—Foster, G2JF, Wye College, near Ashford, Kent.

FOR SALE: K.W. Vespa Mk. II with AC/PSU, 8 months old and as new, £110. Heathkit RA-1 receiver, with crystal calibrator and matching speaker, in first-class condition, £30. Mosley RV-4 antenna, £10. New de luxe Joystick, 80s. Offers considered, carriage extra.—Donne, G3YBK, QTHR, or ring Exeter 78710.

WANTED: Lhsgear LG-300 Tx in good condition. SELL or EXCHANGE: Codar A.T.5 Tx, £14; C52 Tx, with manual, £8; TCS-6 Tx and manual, £5; Minimitter, coverage 10 to 80m., £10.—Jackson, G3SIE, 8 Longmeadow Road, Orchard Hills, Walsall, Staffs.
NEW ROTARY RELAYS. R.C.A. 12v., 3 -sets c/o. 1-4M/B. Beautifully made. F.B. for 160-2m., (or cars), 11/6 each plus 2/6 P. & P.

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TRIO KS59DE Receivers £42.10

TRIO TS150 Transceiver with AC and speaker £122

TRIO VFO 5D matching VFO for T510 £32

LAFAYETTE HA600 solid state receiver for mains or battery power £45

S.E.L.L.I.N.G:

KW Vespa Mk II with AC p.s.u. £135

KW 2000B Receiver £35

KW EEZEE Masch £12.10

TRIO T5110 and P5110, £30.0

TRIO KS59DE Receivers £42.10

TRIO TS150 Transceiver with AC and speaker £122

TRIO VFO 5D matching VFO for T510 £32

F.O.R.S.A.L.E:

KW Vespa Mk II with AC p.s.u. £135

KW 2000B Receiver £35

KW EEZEE Masch £12.10

TRIO T5110 and P5110, £30.0

TRIO KS59DE Receivers £42.10

TRIO TS150 Transceiver with AC and speaker £122

TRIO VFO 5D matching VFO for T510 £32

F.O.R.S.A.L.E:水晶-controlled converter, two metres and 70 cm, 11 valves.

WANTED: 5ft. or 6ft. enclosed rack with rear door.

—Ring 01-599 9149, after 7.0 p.m.


WANTED: Panadaptor for 455 kc IF. Sell: RTTY CFS-T.U., complete in transit cases, with plugs, PSU and documentation, price £12. Addie, GBLT, Spring Hill, Wappenham, Towcester, NN12 8ST.

S.E.L.L.I.N.G: Eddystone EC10 receiver, in excellent condition, with manual and headphones, price £136. Bradely, 6 Linden Grove, Folkestone Street, Beverley Road, Hull, Yorkshire.

WANTED: Duf HRO, in any condition, also coil packs, similar. SELLING: G.E.C. "Oceans 10" Rx, coverage 10 to 2000 metres, with RF, 2/IF's and 10w. output, for 230v. mains, with headphones and speaker. —13.—Smith, G8ATY, 1 Rymer Close, Long Street, Hanslope, Wolverton, Bucks.

F.O.R.S.A.L.E: "23DAF" type Rx, with mechanical filter, £45. Tx for 80/160m., 10 watts, with modulator and PSU, £7 16s. Tx for 15-40-160m., 50 watts, with AC/DC PSU's, speakers and microphones. —Would consider Transceiver. —Grant, GBMUG, Easter Bogs, Buckie, Banffshire, AB5-2EL, Scotland.

WANTED: Pair of Heathkit HW-12 Transceivers, with AC/DC PSU's, speakers and microphones. Would purchase units individually if necessary. —Secretary, R.A.F. Amateur Radio Society, Royal Air Force Station, Lancing, Weston-super-Mare, Somerset.

WANTED: Command Receiver. 1-5 to 3-0 mc model. Also Tx for 130 metres. Details and price, please. (Eire). —Box No. 4840, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

S.A.L.E: K.W. Vanguard Mk. II, AM/CW Tx, in mint condition and perfect working order, price £35 or near offer.—Holt, G3PTS, Dovehouse Farm, Dovehouse Lane, Solihull, Warwickshire. (After 4 Nov.)


S.A.L.E: K.W. Vanguard Mk. II, AM/CW Tx, in mint condition and perfect working order, price £35 or near offer.—Holt, G3PTS, Dovehouse Farm, Dovehouse Lane, Solihull, Warwickshire. (After 4 Nov.)

OFFERING: National HRO, with five coil packs, similar. SELLING: G.E.C. "Oceans 10" Rx, coverage 10 to 2000 metres, with RF, 2/IF's and 10w. output, for 230v. mains, with headphones and speaker. —13.—Smith, G8ATY, 1 Rymer Close, Long Street, Hanslope, Wolverton, Bucks.

WANTED: For a two-metre Tx, a good HC-6U crystal between 12-3250 and 12-1025 mc. Please state your price.—Struthers, GM3CVN, Ravello, 17 Wilton Hill, Hawick, Roxburghshire, Scotland.

WANTED: Genuine R.C.A. S-meter and trimming tools for an ARBBD. Price and details.—Richardson, 2 Edna Road, Maidstone, Kent.
SMALL ADVERTISEMENTS, READERS—continued

SELLING: Heathkit RA-1 amateur-band receiver, covering 10 to 160 metres, in excellent condition, asking £30 or near offer.—Winter, G3XCD, 48 Ann Road, Wythall (6086), near Birmingham.

SALE: National HRO receiver, nine coil packs, original PSU, speaker, new capacitors, manual and spare valves, £25.—Sharman, 39 Kechill Gardens, Hayes, Bromley, Kent. (Tel. 01-462 2083.)

SELLING— Transformers, standard primaries: 650-0-650v. 250 mA, 100v. bias, 6v., 5v., heavy core, 30s.; Woden de luxe MT.15 500-0-500v. 150 mA, 6v., 5v., 40s.; UM modulation type, 15-watt, 30s. SCR-522 mod. transformer, 7s. 6d.; auto-transformer, 230v./110v., 500 watts, heavy, 30s. Collect big stuff, please, but will deliver to 30 miles.—Ingram, 5 Springhill Cottages, Snowshill, Broadway, Worcs.

STUDENT SWL Selling: Eddystone 840A, latest model, communications receiver covering 480 kc to 30 mc (10 to 600 metres), including shipping and distress bands, complete with manual, 8-meter, aerial trimmer, and isolation transformer, in excellent condition, £23 10s. or near offer. Brec mains and battery receiver, coverage 13 to 125 metres, with battery and mains PSU, ideal for beginner, needs slight attention, 65s. Bush receiver Type AC II, for long, medium and short-wave reception, new model, hardly used and in excellent condition, £6 10s. or near offer. Also many copies “Short Wave Magazine.”—Ring Shams, 01-556 0312, after 6.30 p.m., or weekends.

METERS: Ranges 0-50 mA, 0-350 mA, 10s. 6d. New moving-coil microphones and headsets, 12s. 6d. New AFV 33 Sets, in original packing, with PSU, aerial and base, spares, etc., also handbook, £6 10s. Other items available, send s.a.e.—Vaughan, 65 London Road, Benfleet, Essex, SS7-5TG.

MUST SELL: HRO-500 in excellent condition, offers or exchanges. Also unused electronic key, preselector, Swan-500 little used, and Swan external Vox unit, new. Also a few other bits ‘n’ pieces. Prices?—let’s talk.—Ring Romford 61191, evenings only (QTH: 114 Lodge Lane, North Romford, Essex).

LARGE Supply of 8 mc crystals, HC-6U, brand new and sealed, many on same frequency (for nets, etc.), send s.a.e. for list.—Pickers, G3YUA, 8 Croftway, Markfield, Leicestershire.

SALE: Drake L-4B linear amplifier (current price £415), used few months only and in as-new condition, £350.—Walker, G3AZT, Woodcote, Tubney, near Abingdon, Berks.

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Completely self contained, ready to clip on sun visor. Detects radar speed traps and is covered by domestic licence. Ham and Radar Scatter signals picked up even round bends up to approx. 1/3 of a mile. (Up to 2 miles warning on Motorways). Fully guaranteed. Size: 41" x 31" x 3" £13.5.0 inc. P/P. For details ring 01-660 2896 or 8d. stamp. No extra charge for C.O.D.
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