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- We have developed and produced the TMR-5 in our own unhurried time. Stability, sensitivity and selectivity are very very good. (100 c/s, 1µV and 4-2 kc/s.) Write or phone for its full specification (3 foolscap sheets on what 20 semi-conductors in a box just 6” square by two and a bit high can do) 160, 80, 4, 2 and 70 cm. bands calibrated in Mc/s. on its engraved dial. The TMR-5 above (a prototype) has its 230v. a.c. psu attached. Into this is clipped a Mk. V 70 cm. Converter. As a mobile Rx the B.C. band will prove useful. Manufacture and testing of a receiver like the TMR-5 requires a good deal of patience and time. We have lavished upon our new-born, all the expensive test equipment it has wanted. We make no apologies for the result. A receiver, out-performing your own (except the most expensive) that's twenty times smaller as well. As with other GREEN equipment, more so in this case, we built the TMR-5 and Mk. FIVES to please ourselves and are delighted with the result.

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<tr>
<th>Type</th>
<th>Power (Watts)</th>
<th>P.P.</th>
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<tbody>
<tr>
<td>UM0</td>
<td>10</td>
<td>3/3</td>
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<tr>
<td>UM1</td>
<td>50</td>
<td>4/4</td>
</tr>
<tr>
<td>UM2</td>
<td>60</td>
<td>5/5</td>
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<tr>
<td>UM3</td>
<td>120</td>
<td>6/6</td>
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JOYSTICKS

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<tr>
<th>Type</th>
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<tr>
<td>Joystick de luxe</td>
<td>5 0</td>
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<tr>
<td>Joystick standard</td>
<td>4 0</td>
</tr>
<tr>
<td>Joymatch, type 3 tuner, for receiving</td>
<td>2 0</td>
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<tr>
<td>Joymatch, type 5 tuner, for transmitting</td>
<td>1 0</td>
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<tr>
<th>Type</th>
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<tr>
<td>3½ x 3½in.</td>
<td>3 8</td>
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<td>2½ x 5in.</td>
<td>3 8</td>
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<tr>
<td>3½ x 5in.</td>
<td>5 2</td>
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<tr>
<td>Pkt. of terminal pins</td>
<td>3 0</td>
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<td>P.P. 6d. per item extra. Orders over 10/- post free.</td>
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<tr>
<td>CR70A</td>
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<td>T28 160/90m. mobile receiver</td>
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<tr>
<td>CC/40 control unit</td>
<td>6 10</td>
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<tr>
<td>PR30 preselector</td>
<td>5 10</td>
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<tr>
<td>PR30X (self-powered)</td>
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<tr>
<td>RG10 Q-multiplier</td>
<td>6 15</td>
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<tr>
<td>RG10X (self-powered)</td>
<td>8 8</td>
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<tr>
<td>ATS transmitter</td>
<td>16 10</td>
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<tr>
<td>250/S mains p.s.u. for ATS</td>
<td>8 0</td>
</tr>
<tr>
<td>12 M/S mobile p.s.u. for ATS</td>
<td>11 5</td>
</tr>
<tr>
<td>12 R/C control unit</td>
<td>2 7</td>
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Joystick

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We at Partridge Electronics are keeping 'mum' on why it works and our patent applications are firmly filed!

CQ Magazine, December '65

(extracts from readers' letters)

"I bought a Joystick antenna from Partridge Electronics Ltd., in England and believe you me, your recommendation wasn't far off. I live in an apartment complex in New York and I tried window verticals, an indoor doublet and a few other configurations. When I got the Joystick I was skeptical. But after hooking it up I was amazed. The other antennas I had tried in my particular location were far below the Joystick's performance. I was allowed to mount it on the top of the building (which I did with a special bracket I made) and when I hooked it up to the matching network also supplied by Partridge I was able with my KEM-2 to work Europe without the difficulty I had before ..."

"If you are up high enough the antenna will operate (especially at 15-20) as well as the well known 3 element beam with which we compared it. The tests were 'operational not theoretical!' We find that if we can hear 'em we can work 'em ... and in most cases with a 100 watts input."

There is now a whole range of Joystick Systems—made to match your QTH, your rig and your pocket. The SYSTEMS cover TX/RX, SWL, indoor and outdoors, mobile and even a new JOYMAST! Made only in the finest materials the SYSTEMS are reliable and permanent. TRADE ENQUIRIES INVITED.

MORE JOYSTICK TRANSATLANTIC 160 METRE QSO'S

W2EQLS sends these latest reports

Worked HB9CM (extract from QSL letter) "It was great to QSO you again this morning on 160 metres at 0635Z. When I was RST 569 I was using my half-wave inverted vee antenna. When I became RST 229 that wasn't QSB. I changed over to my English made Joystick antenna which is only 7½ feet long, 22 feet above ground."

"... On the Joystick I also QSO'd G3RFS at 0755Z getting RST 329. On my half-wave inverted vee antenna I was RST 569 ..."

"... With this Joystick I've worked on 160 the following: W1, 2, 3, 4, 5, 8, 9; VE1, 2, 3; GYS; VP2; VP9; G; HB.

"Another one to list in my 160 metre DX with the Joystick. It is now 0730Z and at 0613 QSO'd G3PQA. On my half-wave inverted vee got RST 579 when in clear but bad QRM from fish Phone on 1799 and 1806 kcs. I was on 1803 5 kcs. On Joystick John got me RST 229 through this fish Phone QRM."

Here are a few more extracts from the letters we get every day:

"WA5LEM—Henry Wilkins III, of Houston, Texas, writes: "The Joystick really surprised me; it really works like you said it would ... I took all my dipoles down."

"L. G. Rigden, Leighton Buzzard: "I cannot speak too highly of my internal Joystick which continues to give most excellent reception."

"G3UGB—A. Woffenden, Bristol: "I have used the Joystick for some months now and am more than pleased with its performance ... extremely good reports on 160M and 80M."

"Frank McAuley, Glasgow: "I am beginning to make quite a few contacts with my De-Luxe Joystick and tuning units on 80 and 160 metres using 8 to 10 watts. The Joystick is indoors using the 8 feet feeder and some of my contacts are quite surprised when they hear my Joystick is indoors. As you stress many times I have removed all other antennae and am finding quite a difference. Quite a few of the local amateurs are using the Joystick."

"G2FMR—F. W. Broomfield, Nr. Leamington Spa. "Joymast ... is giving satisfactory service on transmitting and receiving using DX100TX, SSB100 adaptor and AR88."

"G4PJ—William L. Honeywill, Salcombe. "I am still using the Joystick indoor, with 40 ft. feeder and getting results all-round on every band, needless to say I am very pleased."

"K6MDJ—Fred Tulpin, California. "Early results are astounding. I've been using a trap dipole for 40-20-15. This Joystick out-performs the dipole 2 x 1."

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**THE SHORT WAVE MAGAZINE**

Volume XXIV

THE SHORT WAVE MAGAZINE

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THE B.I.E.T. IS THE LEADING INSTITUTE OF ITS KIND IN THE WORLD
**Editorial**

**Service** All through the years—and that means since long before Hitler's War—there has been a sufficiency of licensed radio amateurs willing to give their time and apply their skill to some activity in the national interest. These services are given with neither hope nor expectation of any reward—merely because there are amateurs who would like to use their knowledge and ability to help some local organisation.

Many A.T.C. (Royal Air Force) squadrons are desperately in need of instructors in radio, radar and W/T. The Air Training Corps is the cadet force for the R.A.F. In most districts there is a squadron, consisting of youngsters up to the age of 17 or so, who are taught elementary aviation, gunnery, navigation, aircraft recognition and the use of instruments and apparatus.

They also learn that discipline involves not only the giving of orders but the accepting of them.

Most A.T.C. squadrons have their own social organisation—involving parents and friends—and there is an "annual camp" during which they spend some time on a regular R.A.F. station, with opportunities for flying. Officers of A.T.C. squadrons are almost always ex-R.A.F. types who take the job on as a duty to the Service. The fact that they are given local rank and draw certain small allowances is a secondary consideration—all officers of the A.T.C. give in time and effort far more than they get back in terms of payment for hours-put-in.

Squadrons of the A.T.C. are permitted to operate on the 5 mc training band, using their own call-signs and Service W/T equipment. The difficulty for many of them is that they have nobody to teach them Morse or how to use the gear.

This means that there is an opportunity for licensed amateurs to give a little time—usually not more than a couple of hours on one evening a week—to instructing keen youngsters. You can make contact with the commanding officer of your neighbouring A.T.C. squadron by getting his name from the local newspaper and giving him a ring. If you are really keen to help, and cannot make contact otherwise, write to: The Air Secretary, Royal Air Force, Ministry of Defence, Main Building, Whitehall, London, S.W.1, saying that you wish to be put in touch with the C.O. of your local A.T.C. squadron.

You will not get anything out of it, financially—but you will find that you are doing a worth-while job for the young, which will be a satisfaction for its own sake.
AN LF-BAND TRANSMITTER

FOR TOP BAND AND EIGHTY METRES — CIRCUITRY AND CONSTRUCTION

F. G. RAYER (G3OGR)

THE circuit used for this rig is basically that described in “Eighty Metres with a Top Band Transmitter” in the October, 1963, SHORT WAVE MAGAZINE. It is straightforward and reliable, running 8-12 watts on 1.8-2.0 mc and 3.5-3.8 mc. The cost of building is small and the finished appearance not unpleasing.

Fig. 1 is the transmitter circuit. V1 is a 6AM6 or equivalent, and the VFO tunes 1.75-2 mc by means of VC1, through a small ball drive. To avoid any difficulty with the VFO coil, a Wearite PHF6 can be used. This is a fixed inductance coil, manufactured to a high degree of accuracy, and connections are made to it so that the two windings are in series. It is thus only necessary to adjust trimmer C18 for correct coverage. Other coils, modified to give suitable coverage if needed, could be used. But the PHF6 is an easy means of obtaining correct coverage without experiment. The VFO is operated from a stabilised 150v. supply.

A second similar stage acts as buffer/amplifier, and as doubler for 80 metres. L2 is broadly resonant at about 3.65 mc, and L3 at about 1.9 mc. The nuisance of home-wound coils or experimentation to obtain the correct coverage can be avoided by using Osmor QA5 (Blue-blue) coils in each position. For 160 metres, initially screw L3 core fully into the winding. Remove 31 turns from the other coil, for L2, re-solder the end, and set the core flush with the coil end.

For the PA, V3, a 5763 is used, and grid current with the values shown was approximately 2 mA on 80 and 3 mA on 160 metres. This can be checked by placing a meter between R7 and chassis (positive to chassis). The usual pi-output circuit is employed, with a two-band coil L4; this consists of 70 turns of 24g. double-cotton-covered wire, side by side, centre tapped. Bandswitches S5 and S6 are separate, with small knobs, and both are rotated clockwise for 80 metre coverage.

Normal operating anode current for the PA is about 30-40 mA and a 0-100 mA or 0-50 mA meter will do. An 0-5 mA meter, shunted to read 0-50 mA, was actually fitted.

V4 is a high-gain two-stage amplifier, C14 and C15 being selected to lift response a little towards the higher frequencies. No gain control was provided, as modulation was about right with normal speaking into a crystal microphone, and it is not difficult to get accustomed to having the mike at a fixed distance.

V5 is the Class-A modulator, and the 6BW6 is adequate for this PA input. Any attempt to overmodulate causes bad distortion, not because of splatter but due to breaking the carrier. So reports of distorted speech indicate the need to get back from the microphone a little! The modulation choke Ch. can be an 80 mA or 100 mA mains pentode output transformer, with the secondary ignored. Temporarily connecting a speaker to the secondary is a good way to check the modulator section. (Keep the loudspeaker away from the mike.)

A 3-way switch provides for net (VFO and buffer on), receive (aerial switched to receiver) and transmit.
Fig. 1. Circuit complete of the VFO-BA-PA transmitter and modulator described and illustrated in the article. The PA (V3) is a 5763, a highly efficient miniature type, and the modulator (V5) is a 6BW6. The BA stage (V2) effectively isolates the VFO (V1) from the PA. With the exception of L4 (see text), commercial coils are used throughout. A transmitter built to this design would make a very handy job for 80/160m. working, or as a first Tx for a beginner starting on the air.

Positions. Section S1 switches the VFO, S2 the buffer HT, S3 the modulator and PA, and S4 the aerial.

Chassis and Case

Fig. 2 is the layout on top of the chassis. A neat and inexpensive case is derived from a Home Radio (Mitcham) "universal chassis" measuring 10in. by 6in. by 3in. An extra 10in. by 3in. runner forms the chassis. Cut the corners of this so that it will fit inside the 6in. by 3in. runners. The chassis is bolted about four inches from the top of the panel. Most of the transmitter can then be assembled and wired. Cut and check large holes before matching any parts. A number of quarter-inch holes are also punched for ventilation and for leads.

Table of Values

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>56 µF, 1/2%</td>
</tr>
<tr>
<td>C2, C3</td>
<td>-001 µF, 1%</td>
</tr>
<tr>
<td>C4, C7, C8</td>
<td>.01 µF</td>
</tr>
<tr>
<td>C5, C10, C11, C14</td>
<td>-002 µF</td>
</tr>
<tr>
<td>C6, C9</td>
<td>100 µF</td>
</tr>
<tr>
<td>C12, C15</td>
<td>-001 µF</td>
</tr>
<tr>
<td>C16</td>
<td>-005 µF</td>
</tr>
<tr>
<td>C17</td>
<td>50 µF, 6v.</td>
</tr>
<tr>
<td>C18</td>
<td>50 µF, 50v.</td>
</tr>
<tr>
<td>VC1</td>
<td>30 µµF tuning</td>
</tr>
<tr>
<td>VC2</td>
<td>300 µµF, tuning</td>
</tr>
<tr>
<td>VC3</td>
<td>500+500 µµF, BC</td>
</tr>
<tr>
<td>R1</td>
<td>68,000 ohms</td>
</tr>
<tr>
<td>R2</td>
<td>47,000 ohms</td>
</tr>
<tr>
<td>R3</td>
<td>2,200 ohms</td>
</tr>
<tr>
<td>R4, R7</td>
<td>22,000 ohms</td>
</tr>
<tr>
<td>R5, R12</td>
<td>100,000 ohms</td>
</tr>
<tr>
<td>R6</td>
<td>33,000 ohms</td>
</tr>
<tr>
<td>R8</td>
<td>5,600 ohms, 2w.</td>
</tr>
<tr>
<td>R9, R11</td>
<td>1 megohm</td>
</tr>
<tr>
<td>R10</td>
<td>220,000 ohms</td>
</tr>
<tr>
<td>R13</td>
<td>1,000 ohms</td>
</tr>
<tr>
<td>R14</td>
<td>470,000 ohms</td>
</tr>
<tr>
<td>R15</td>
<td>270 ohms, 1w.</td>
</tr>
<tr>
<td>R16</td>
<td>4,700 ohms, 1w.</td>
</tr>
<tr>
<td>RFC1</td>
<td>2.5 mH, min.</td>
</tr>
<tr>
<td>RFC2</td>
<td>2.5 mH, 60 mA</td>
</tr>
<tr>
<td>L1</td>
<td>PHF6, Wearite</td>
</tr>
<tr>
<td>L2, L3</td>
<td>QA5, Omor</td>
</tr>
<tr>
<td>L4</td>
<td>see text</td>
</tr>
<tr>
<td>Ch</td>
<td>100 mA choke*</td>
</tr>
<tr>
<td>SI, S2, S3, S4</td>
<td>4-pole, 3-way</td>
</tr>
<tr>
<td>S5</td>
<td>1-pole, 2-way</td>
</tr>
<tr>
<td>S6</td>
<td>SP on-off</td>
</tr>
<tr>
<td>V1, V2</td>
<td>6AM6, EF91, 8D3</td>
</tr>
<tr>
<td>V3</td>
<td>5763</td>
</tr>
<tr>
<td>V4</td>
<td>12AX7, ECC83</td>
</tr>
<tr>
<td>V5</td>
<td>6BW6</td>
</tr>
</tbody>
</table>

Notes: Ch* can be primary of pentode-type speaker transformer. All resistors rated 1-watt except where stated. Meter can be miniature 0-50 or 0-100 mA, or 0-5 mA shunted. Case is 10in. by 6in. by 3in. universal chassis, with 10in. by 3in. runner (Home Radio).
VC2 can be about 250 µF to 500 µF and was a non-miniature air-spaced capacitor as used for receiver tuning. VC3 is a 2-gang capacitor with its sections in parallel; a 2/365 µF or similar condenser could be used, but occasionally the extra capacity given by a 2/500 µF condenser could be useful. With fairly large capacitors, and L4 switched, loading into most normal aerials or tuners is easy.

The audio choke (speaker transformer) is mounted to one side, which also carries two coax sockets, for aerial and receiver; these sockets were actually one over the other. A small tag strip supports C11. V1, V2 and V4 need cans. The use of cans on V3 and V5 seems optional.

VFO Box

The VFO screening box is essential for Top Band. It is bent from aluminium, and bolted to the panel and chassis. VC1 is on a strong bracket. L1 is below VC1, a 6BA bolt through the panel going into its tapped hole. C18 is bolted to the chassis, and can be reached through a hole in the box top.

When the VFO is wired, bolt on the 6in. by 3in. side, which further strengthens it. A small plate is secured on top of the box with self-tapping screws. The ball-drive lug is bolted to the panel, and a small pointer travels over a scale, later calibrated.

Under the Chassis

Fig. 3 shows the under-chassis wiring. A tag strip provides anchorage for the power supply leads and some other items. The microphone socket connection did not need screening, but runs against the chassis. (The external microphone lead must of course be screened.)

The heater circuit, tags X, is wired first. Keep
Inside the 160/80m. transmitter, showing general layout and construction. The VFO section is in the screened compartment on the right, with the PA tuning condenser VC2 next in view. The valves visible, from right to left, are V1, V2, V3 (the RF section) and V5 (modulator) — see circuit diagram Fig. 1 and layout sketch Fig. 2. The iron-cored component at left front is the modulating choke, with the panel meter (white case) immediately behind. The switched coil L4 is the central winding, and the load capacity VC3 is immediately below.

Adjustments

VFO coverage can be checked, but calibration is left until last. Accurate calibration is possible with a receiver and 100 kc crystal marker. With the switch at "net" the VFO is adjusted to zero beat at 2 mc in the receiver, with VC1 nearly open. This is achieved by rotating C18. Then 1-75 mc will be found at 3-5 mc on the receiver (VFO harmonic) with VC1 nearly closed.

Calibrate first at 1-8, 1-9 and 2-0 mc. Then 1-8 is also 3-6 mc, and 1-9 is also 3-8 mc. Tune the receiver to the 100 kc crystal marker beats at 3-5 and 3-7 mc, to calibrate the VFO for these frequencies. (The 50 kc points can be put in by tuning the receiver through 7 mc, etc.) The 10 kc points can be inserted by eye.

VC1 was the easily obtainable small SW type of tuning condenser having 9 plates on the rotor. A 75 µF condenser was originally fitted, and plates were removed one by one until the coverage was 1-75-2-0 mc with a little rotation unused each end of the bands. The capacitor then had 5 moving and 6 fixed plates left, and was measured as approximately 30 µF.

Put a meter in between R7 and chassis. With the VFO at 1-9 mc and S5 at 160m., rotate the core of L3 for maximum grid current. Repeat with L2, with S5 set for 80m. and the VFO at 3-65-3-7 mc. Any grid current between about 2 mA and 3 mA is satisfactory. If necessary, the value of R6 can be changed to raise or lower grid current. This should not be necessary.

Panel

A varnished plywood sheet the same size as the aluminium panel was fitted to cover the numerous bolt heads. Knobs, microphone socket, and meter have to be removed. The panel is held by the meter bolts, mike socket, and the two bolts each side which go into the 6in. by 3in. members. Control bushes and nuts rest in clearance holes. The remaining...
panel bolts were round-headed, so depressions to suit were made in the rear of the panel with a countersink bit. Drilling positions can be found by putting ink or paint on the bolt heads, and pressing the wooden panel on to these marks.

Power Supply

It may be possible to use an existing 250-300v pack. Heaters require 2-1 amperes at 6-3v. The VFO drain is under 5 mA, preferably regulated. Reasonable results can be expected with a 80 mA 250v supply, but a pack maintaining the full 275v, or a little more, at 100 mA, allows a larger input.

If the HT supply is a little meagre, a radio-frequency output meter will show that RF tends to fall off when loading raises the PA anode current above 30 mA or so. With an adequate HT voltage, RF output continues to increase. Insufficient grid drive (low grid current) gives a similar effect. Maximum input for the 5763 is 50 mA at 300v. (15 watts) but an input of between about 8 watts and 12 watts seems most satisfactory.

PA input is, of course, Anode Voltage x Anode Current. So 30 mA at 300v would be 9 watts, while 40 mA at 250v is 10 watts. Top Band input loading should not exceed 10 watts.

Fig. 4 shows a suitable power supply. The VR150 could be an OA2. A transformer and choke of adequate rating help to maintain the voltage on load.

Operating Notes

A newly-licensed operator may welcome a few working details. A first test can be made with a 15 watt 200/250 volt household lamp connected across VC3, or to the aerial socket by a spare coax plug. A short aerial lead from the receiver can be placed near the lamp.

S5 and S6 must always be set for the same band. With the switch at “net” find the carrier on the receiver. Then with the switch at “transmit” and VC3 closed, rotate VC2 for a dip in anode current. Open VC3 progressively, restoring the dip with VC2, until the meter shows the required input (30-40 mA). This is best done with two hands. The bulb should then light fairly brightly.

With the receiver RF gain well back, speech in the microphone should be clearly heard in the speaker. (Avoid feedback to the mike which will cause “howling round the loop.”)

Working into an aerial involves the same procedure. Some 75-ohm coax with a plug connects the receiver to the transmitter Rx socket. A dipole for 80m. can be plugged directly into the aerial socket.

Many random length end-fed aerials can be worked directly from the transmitter. Load up into the aerial in the same way as described with the lamp. A good earth is helpful with end-fed aerials. End-fed wires can be used on either band. Should an ATU be employed, fit a short coax lead from the transmitter to this.

The “net” position is used either to tune the VFO to a clear channel found on the receiver, or to allow the VFO to be set up on the frequency of another station, to which a reply is made.

A solid metal plate back must not be used on the case. But a back cut from expanded metal, small mesh wire-netting, or similar material, can be fixed to the back with self-tapping screws.
RTTY Topics

DX NOTES AND OPERATING NEWS—B.A.R.T.G. SPRING CONTEST RULES AND SCORING — TUNING FORK FREQUENCY STANDARD

W. M. BRENNAN (G3CQE)

This feature normally appears bi-monthly (that it was not here in the last issue was due to unavoidable circumstances) and deals with the technical interests and on-the-air activities of radio teleprinter operators on the amateur bands. Our contributor is himself an outstanding exponent of the mode, and is well placed to provide reliable technical information for his feature as well as up-to-date news coverage.

Editor.

A GAP of two months since this feature last appeared has produced a fair pile up of news and so it's straight down to happenings in the RTTY world.

On the DX side, there are a number of newcomers and as usual, some of them are real collector's pieces on any mode. In Korea, amateurs are now permitted to use RTTY on all bands and two stations there that are rapidly digging themselves in on 14090 kc are HL9KG and HL9TM. They expect to be joined by HL9TT very shortly. Another rare one due to appear in the near future is FB8XX (Kerguelen Island) and his appearance on 20m. is guaranteed to create a monumental pile up at any time; late afternoon and early evening here is the time to watch for him. Another addition to the list of starters is XU2EN (Cambodia) and although this country does not appear on the ARRL "Official Countries List," it does not appear to have greatly reduced the demand for QSO's with him. Still another country to join in on RTTY is Uganda, 5X5FS being the callsign to watch for—again on 20m. Many stations have reported working this newcomer recently. Also from Africa, EL2F (Liberia) has been spending many hours on the air trying to keep pace with the country hunters. The operator at EL2F is W9GEK when back home in the U.S.A. RTTY also appears to be catching on pretty well behind "The Curtain" with both Hungary and Czechoslovakia now being available, represented by HA5KBP and OK1KUL respectively. In the Ukraine we have both UB5AC and UB5UN. From Estonia there is regular activity by UR2BK and UR2KAX, whilst UA4KN and UA4KED are on from European Russia. It is good to hear of activity building up from these directions since it was only a few months ago that many RTTY operators had grave doubts about there ever being any hope of such QSO's due to the difficulties of different alphabets, let alone the language barrier.

Difficulties are also caused by "non-standard" licensing regulations for RTTY operation in some countries. Belgium is a case in point, where originally RTTY was limited to a speed of 50 bauds only. This restriction tended to confine the ON4 stations to 80m. and 2m. operation only, since on the HF bands the speed used, almost without exception, is 45.5 bauds. The situation has now been resolved by permission for Belgian stations to use both speeds. Japan, on the other hand, is still an "odd one out" country since over there RTTY is confined to the 10m. band. However, both KA2RJ and KA2LD are looking for DX QSO's in the neighbourhood of 29 mc. This information comes from W6CG who mentions that

The station of Tom Serur, P.O. Box 2309, San Marcos, Texas, who has an interesting array of equipment and is a keen RTTY operator. The teleprinter gear is along the bench on the left. He also works CW and Sideband phone and is well heard on the DX bands.
there is a Japanese beacon station (JA1IGY) on CW on 29 mc and listening for this can be a useful guide for 10m. openings to Japan. It does seem as if 28 mc might be producing such openings. Both KA stations are there regularly at weekends.

ZL1WB’s FSK and CW signals have been heard in Australia on 432 mc via the Oscar IV satellite and, according to W6CG, a recent bulletin from the ARRL Hq. station WIAY announced “K2MWA and K2GUN have reported their own FSK signals through the satellite Oscar IV for continuous periods and they say that the translator can capture continuous inputs such as FSK (RTTY).” It certainly looks as though the first RTTY QSO via a satellite may not be all that far off. This is, of course, an instance where automatic tape equipment will come in very handy indeed.

A nice example of some more normal DX working was a recent contact between VK2EG and W6CG over the long path. This works out to an actual path length of 17,374 miles—which must be something of a record for RTTY. Any advance on this mileage?

VK2EG and VK3KF have spent a lot of time operating recently; the latter can be found on 40m. most mornings around 0800z Woking not only for 40m. contacts but also for RTTY’ers willing to give it a whirl on 80m., too!

Other new callsigns noted from recent mail are: KP4CMK, KP4CMP, JA8RUL, ZS6BCT, HB9ET, HB9IT, PY2ON, YV3LD, and W8NTZ/VO2 (Labrador). The latter callsign is quite a handful for the keyboard but it is worthwhile reminding readers that VO2 counts as a separate country during the three RTTY Contests and so may be worth the struggle! Another longish call reported recently is HB9XJ/MM aboard the m.v. Arania; the gear on board includes an HT-32 Tx, a 51J4 Rx and an American Navy CV57 T.U.

B.A.R.T.G. Spring RTTY Contest

The event of the coming month is undoubtedly the RTTY Contest sponsored by the U.K. RTTY society (The British Amateur Radio Teleprinter Group) and open to all comers. With conditions improving on the HF bands almost daily, this is a chance to see how the RTTY gear performs on DX with plenty of RTTY QRM just to help give it a real going-over! Not everyone wants to, or even can, operate for the full 48-hour Contest period but if everyone puts in a few hours of operating it will add to the zest of the occasion and give other contestants something to chew on. At the same time you will most likely be able to add to your list of countries worked. The rules are as follows:—

(1) The contest starts at 0200 GMT 12 March and finishes at 0200 GMT 14 March 1966,
(2) Bands to be used are 3·5, 7, 14, 21 and 28 mc,
(3) In order to qualify for points the messages exchanged must contain the following: Message Number, Report (RST), Time in GMT and Country of origin,
(4) Countries will be as per the ARRL Country List with the exception that KL7, VO, and KH6 will count as additional countries,
(5) Stations may not be worked more than once on any band but additional QSO’s may be made with the same station on each other band.

(6) Scoring:—All two-way RTTY contacts with stations in one’s own Country will earn two points.
All two-way RTTY contacts with stations outside one’s own Country will earn ten points.
All stations will receive a bonus of 200 points per Country worked, including their own.

(7) Final Score: (A) Two-way exchange points times total Countries.
(B) Total Country points times Continents worked.
Add the results of (A) and (B) together for final score.

Example:—

(A) Exchange points (302) x Countries (10) ... ... = 3,020
(B) Country points (2,000) x Continents (3) ... ... = 6,000

(C) Add (A) and (B) scores ... = 9,020

Total score is 9,020.

(8) The Contest will be divided into two sections, one for single-operator entries and the other for multiple-operator stations. The transmission of RTTY on more than one channel at a time will be disallowed.
Headphone bobbins
Bias magnet

Fig. 2. Mechanical arrangement for the tuning fork oscillator discussed by G3CQE in his article. The essential requirement is to get the fork firmly clamped at its root. The fork is driven by the coils (removed from old headphones) which are themselves energised by the oscillator circuit shown in Fig. 1. The result is a highly stable and reliable AF source, enabling RTTY equipment to be accurately adjusted. While it might be supposed that the 50-cycle AC mains would provide a suitable frequency standard, in fact not only does this frequency vary too much (under overload and compensation conditions) but it is possible to obtain, from a good musical instrument shop, forks very near to the frequencies required—see text.

(9) Logs and score sheets should be sent to:

The Hon. Secretary, B.A.R.T.G.,
A. Walmsley, G2HIO,
The Woodlands,
Bath Lane,
Meir.

In order to qualify, they should arrive not later than 1st May, 1966, N.B. It would also be of great interest to have check logs from SWL's able to print on RTTY.

With the exception of the ruling on multi-operator entries, it will be seen that the rules for this Contest are the same as for last year—but it is worth noting that in some details they are different from those for the Worldwide RTTY SS Contest.

Tuning Fork Audio Frequency Standard

For several years now the writer has relied upon either tape recorded tones or a simple two tuned-circuit AF discriminator with a channel level indicator as an aid to the setting up of the 850 c/s carrier freq. shift required for FSK operation. Of the two systems, the recorded tapes were the most accurate, the original tones having been taken from a calibrated AF signal generator, whereas the discriminator circuits, although of high-Q by most standards, are still flat enough on their peak response to mask a tuning error of some tens of cycles. Even the tape recorder is somewhat dependent on the frequency of the mains supply and this can be a variable factor. During periods when the Supply Authorities are reducing excessive load the mains frequency falls somewhat and later the frequency is increased above the normal 50 c/s in order to bring electric clocks back to the correct time. The final blow to both systems came when during a contest an Italian station reported that the shift was about 30 c/s short and this in spite of careful checks having been made prior to the contest! As the tape recorder was fished out to the sound of several exotic RTTY signals emanating from the Rx, it was decided that an accurate frequency standard would have to be produced. Of course, with the advent of 170 c/s shift it becomes even more essential to have accurate standards available and accordingly it was decided to build one or two simple audio frequency tuning-fork oscillators, preferably driven by transistors in order that they could be self-contained units.

Tuning fork oscillators as frequency standards are by no means a new idea. At least two other circuits have been published for use as RTTY standards and before the advent of the xtal oscillator, tuning fork oscillators followed by several stages of frequency multiplication were used to provide the RF drive for radio transmitters.

Fig. 1 shows a simple oscillator which is quite adequate for RTTY purposes. Originally, the writer experimented with a more complex circuit incorporating a limiter stage for controlling the amplitude of the fork vibrations in order to produce a pure sine-wave output. However, it was found that providing circuit values were carefully chosen and it was accepted that the oscillator would take a few seconds or so to build up to its full output, the limiting circuitry was unnecessary. The freqs. normally used by RTTY stations running at a carrier shift of 850 c/s are 850, 2125 and 2975 c/s. The two higher frequency tones are those fed to the terminal unit from the receiver and are of course the tones produced by the receiver BFO from the 850 c/s shift at signal frequency. These freqs. are all harmonics (2nd, 5th and 7th) of 425 c/s and therefore this frequency was chosen for the standard.

Construction of the whole unit is more of a mechanical problem than anything else and Fig. 2 is a sketch of the layout. The end of the fork must be solidly clamped to the baseboard and how this is effected depends upon the actual cross-section of the fork. In the writer's case this section was square and
so the mount consisted of a piece of \( \frac{3}{8} \) in. diameter brass rod with a slot slightly smaller than the width of the fork "handle" cut into it. The fork was simply hammered into the slot and this gave an extremely rigid mounting. Incidentally, operations on this end of the fork have only a slight effect on the fork's resonant frequency. The bottom of the brass rod was drilled and tapped to take two 4BA brass screws and these secure the fork mounting to the baseboard. The excitation coils were removed from an old headphone of the 2,000-ohm impedance variety. (There are four such coils in a pair of headphones and so each coil is of about 500 ohms.) The two coils are removed from the single headphone along with their original armatures and each coil is mounted with the business end of its armature parallel to and about 1/32in. away from the tines of the fork. A pair of brackets had to be made to carry the coils and their armatures. The gap between the two mounting brackets must be such that with the addition of a small permanent bias magnet they form a complete magnetic path from one fork tine to the other. In this particular application most of the small Eclipse magnets (generally available from ironmongers and tool merchants) are rather powerful unless the reluctance of the magnetic path is increased by introducing an air-gap or a piece of some non-magnetic material such as paxolin between the magnet and the armature brackets. This gap can be between 1/16 and 1/8in. and is not critical.

From an electrical viewpoint, the circuit requires little explanation. It can be looked upon as a transformer coupled oscillator, the transformer having a core which is highly frequency selective and therefore performing only as an effective transformer at the resonant frequency or a harmonic of the core, i.e. the tuning fork. The transistor used was an OC81 but almost any small transistor will do. Provided that the collector current is held down to 1.5 to 2 mA by a suitable base bias, the output waveform is reasonably sinusoidal. To adjust the base bias, alterations can be made to the value of the 40K resistor shown in the circuit. The oscillator starts quite readily and its output is sufficient to give a good signal into a pair of high-impedance phones, or to the Y-amplifier on an oscilloscope for frequency checking. An additional AF amplifier can be added if it is desired to use a speaker.

The tuning fork itself was obtained from a local musical instrument shop and here it is best to tell them what frequency is required since there appear to be several different pitches for a given note. (The shop usually carries a catalogue which gives the frequencies.) In fact, it seems that there is not an exact 425 c/s fork available but the nearest frequency will do since the final output frequency will depend to some extent on the mounting of the fork and its coils and will have to be adjusted to the desired frequency anyway. Once the fork is working satisfactorily, it can be brought to its final frequency by filing the tines an equal amount if the frequency is too low, or by filing the crotch if the frequency is too high. Having produced a unit which is capable of maintaining a high degree of stability it is worthwhile going to a lot of trouble to obtain the use of some instrument such as a frequency counter as an aid to setting it up accurately.

**Results**

The combination of the standard and an oscilloscope will permit extremely accurate freq. checks to be made using the type of oscilloscope display known as Lissajous figures. Readers who are not familiar with such measurements may find it useful to read up the subject in the appropriate chapter in one of the Handbooks. The output from the fork is fed to the Y-amplifier of the oscilloscope and the frequency to be checked is fed to the X-amplifier (if one is available) or direct to the X-plates if not. The normal timebase is of course disabled. The actual 'scope displays that will be obtained for the fundamental, second, fifth and seventh harmonics are shown in Fig. 3 (A), (B), (C) and (D) respectively.

For example, to check carrier shift, the station receiver audio output is fed to the X-plates of the 'scope and with the transmitter in the "net" condition, the mark signal is tuned to zero beat on the receiver. The FSK keyer is then held over to space and the shift adjusted until the 'scope shows the Fig. 3 (B) trace. This exercise may then prove to be a surprising demonstration of the poor short-term stability of the Tx/Rx combination!

An extension of the frequency checking facilities at the writer's QTH is the provision of another fork standard for 170 c/s and harmonic amplifiers which provide a direct output from the 425 c/s stage of 850, 2125 and 2975 c/s at a high output level via a switched AF amplifier. This can be used as an alternative to checking with an oscilloscope, allowing a quick reference to be made using audio beat—but
more about this another time.

Finally, a further reminder about the B.A.R.T.G. Contest: Please put in an hour or so of operating at least, preferably on both the Saturday and the Sunday. Twenty should be busy most of the day and evening but 15m. can produce equally good QSO’s with a great deal more comfort. The European stations will be available on 80m. almost day and night and there should be some DX available on Forty if you can beat the QRM! Ten cannot be ignored either—it has a habit of springing surprises these days. Jump in, get your feet wet, enjoy yourself and when it is all over please send in your logs to G2HIO even if you only had time to make a couple of QSO’s.

73, and see you in the Scramble—de G3CQE.

THE MORSE TEST AT G.P.O.

HEADQUARTERS

(The piece following is based on a contribution by G3UXA to the January issue of the Echelford Amateur Radio Society “Newsletter”. It is reproduced here for the guidance and information of those who have yet to take a Post Office Morse Test.—Editor)

IT is hoped that these notes will be of interest to those who will be taking the official Morse Test; they are based on the writer’s recent experience.

At Union House take the lift to the 6th floor and in Room 603 ring for service; you will be provided with a form to fill up. You may then have time for a cup of G.P.O. tea (at 3½d., but bring your own cup !).

The examiner will appear at the appointed time and conduct you to the Examination Room on the ground floor. Do not be alarmed at the array of marine Tx and Rx equipment—it is there for candidates for the P.M.G.’s 1st and 2nd class certificates, who have to pass at speeds of up to 25 w.p.m. and show how to carry out emergency repairs.

Your interest will be in the two Morse keys screwed to a table in the centre of the room. You are allowed one or two practice runs, and then you’re off! First receiving, and then sending. The writer was checked out at 11½ w.p.m. Easy, you say? It didn’t seem so at the time, in spite of the fact that 14’s could be copied word-perfect before attempting the official Test. So the writer advises the following:

(a) Even if you are not normally a nervous type, you may be when it comes to the Test. So get some practice in beforehand with a comparative stranger, preferably someone who regards 15-16 w.p.m. as just idling,

(b) Practice sending with a heavy brass key, never faster than 12 w.p.m., aiming to be perfect in character formation and spacing,

(c) Since the audio oscillator used for the Test appears to have enough output to drive at least a hundred pairs of phones, if you object to being deafened, make up and take along an attenuator. This can consist of a P.O. jack-plug across a 50K potentiometer, with a jack-socket across the slider and one side of the potentiometer; you can then adjust the audio level to suit yourself. (You can also take your own headphones, if you wish.)

(d) And do arrive at the appointed hour, if possible with a little time in hand. A dim view is taken, and rightly, of candidates who arrive late and upset other people’s appointments.

The officials concerned are invariably courteous and helpful, they know you may be nervous and you are given time to get settled. The only thing you have to do is to show them that you do know the Code, at up to the required standard.


The new Burgess instant-heat soldering gun produces full heat in 5 seconds, and is equipped with 8 inter-changeable tips to suit the work. The instrument is well balanced, fully insulated and control is by trigger action. The price complete is £3 19s. 6d.
OSCILLOSCOPE FOR THE
AMATEUR STATION

CIRCUIT CONSIDERATIONS
FOR ADEQUATE
PERFORMANCE—AND A
PRACTICAL DESIGN

Part I

C. BOWDEN (G3O CB)

Our well-known contributor has produced a very
table design for a CRO, suitable for home con-
struction, with a wide variety of applications.
First, he discusses the theoretical aspects and
the choice of values for the Y-amplifier—the
most important factor in the design for good
wide-band performance. Part II will follow to
complete the circuitry and construction.
—Editor.

THE Oscilloscope is undoubtedly one of the most
useful "tools" ever invented, and the owner of one
can greatly increase his enjoyment of Amateur Radio.
There are several good 'scopes available on the
market these days but they are still rather expen-
sive to buy and the constructor can build his own at
quite a saving in cost—and he can often obtain
better performance than from 'scopes in the medium-
price range.

Many constructors fight shy of building an
oscilloscope, in the belief that it is beyond their
ability. Very few published circuits try to provide a
very exciting performance and there is seldom any
discussion of wideband-amplifier techniques.

When the present 'scope was designed it was de-
cided to keep the circuitry simple so that the con-
struction would be straightforward without unduly
sacrificing performance. As the whole project depends
on the Cathode Ray Tube and Y-amplifier circuit,
we will, with the Editor's permission (granted—Ed.)
go into the design of this part of the equipment in
some detail. This will enable the constructor to alter
the design to suit his own requirements. (It will be
assumed that the reader has some knowledge of
valve amplifier and cathode ray tube circuitry.)

The ideal oscilloscope will be one in which the
deflection of the spot will be the same for a given
input whether the frequency is zero (DC) or
thousands of megacycles. However, it is very difficult
to design an amplifier with a level response over
such a wide range as this.

If we look at the circuit (Fig. 1a) we see that in
addition to the physical components, there are hidden
stray capacities Cs due to the wires and valve elec-
trodes forming capacitors. At medium frequencies
(from about 100 c/s to 10,000 c/s), the circuit ampli-
ifies very well (Equation 1 in Appendix, p.28).

As the frequency is lowered the reactance of the
capacitor C1 will rise and a potentiometer will be
formed as shown in the circuit (Fig. 1b) and the
temperature reaching the grid of the valve will be re-
duced causing a drop in gain. At DC, the reactance
of C1 will be infinite and the gain will be zero. Also,
as the input frequency to the amplifier is lowered the
increasing reactance of the condensers Csg and Ck
will result in ineffective decoupling of the screen
and cathode. This will cause negative feedback and
loss of gain.

The amplifier can be made to give constant gain
down to zero frequency by the use of DC coupling
between stages, and by other low-impedance circuitry.
But to make the amplifier give this sort of per-
formance would require circuit complexity out of all
proportion to the benefit obtained. It is rare for the
amateur to need to amplify and display DC levels.
However, careful design will ensure a level response
down to a few cycles, which should be adequate for
all normal purposes.

Reference to the diagrams (Fig. 2a and 2b) shows
how the effect of Cs is felt at high frequencies. Cp
is the power supply smoothing capacitor and as its
reactance, and that of C1, are very low at high fre-
frequencies they can be ignored. Thus we see that Cs
is in parallel with RL and Rg. In an audio amplifier
typical values would be RL=100K, Rg=2M,
Cs=30 μF. The reactance of 30 μF is about 95K
at 50,000 c/s and hence the effective anode load of
the valve is due to the 100K and 2M resistors and the
95K reactance, all in parallel. The effective load
impedance is thus only about 68K. Hence, the gain
at 50,000 cycles will come out at 70 per cent or so
of its value at medium frequencies, i.e., 3 dB down,
and will be even lower at higher frequencies. (The
bandwidth of an amplifier is the range over which
the gain is within 3 dB of its gain at medium
frequencies.)

In order to make use of our oscilloscope for
analysis of TV signals, SSB signals, IF alignment,
etc., we will require a level response up to 10 mc
or more, with useful gain to even higher frequencies.
It is thus obvious that we need to consider our circuit
more carefully with a view to removing or over-
coming the effects of capacitance at high and low
frequencies.

High Frequency Performance

The basic method of improving the high fre-
quency response of an amplifier is by reducing its
anode load, thus ensuring that the reactance of
Cs cannot appreciably shunt RL until a higher fre-
quency is reached. This is all very well, but as RL
is reduced the gain at all frequencies is reduced. To
compensate for this we must use valves with a
higher mutual conductance in our amplifier. Thus,
two circuits may both exhibit a gain of 20. In one
case we may employ an RL of 10K in conjunction
with a valve having a Gm of 2 mA/V and in the
other case we may use an RL of 2K and a Gm
of 10 mA/v. The second amplifier will have a level response to a frequency some five times greater than the first amplifier.

A popular method of counteracting the effect of $C_s$ is to place a coil in series with the anode load resistor. If the coil is correctly chosen, its rise in reactance with frequency will offset the fall of reactance of $C_s$ up to a certain frequency, above which the gain will fall off even more rapidly than before. This circuit is better avoided in home-built equipment because the required value of inductance will depend on the value of $C_s$, which is difficult to measure or estimate accurately. Too large a coil will give rise to “ringing,” which may distort high frequency components of the display, while too low a value will have little effect at all.

The use of negative feedback is also useful as a measure to overcome this problem, but any increase in bandwidth is always accompanied by some loss of gain. Negative feedback can be useful, however, as it reduces distortion in amplifier stages operating at high signal levels. One common way of introducing negative feedback is to omit the cathode bias condenser. This results in loss of gain at all frequencies (Eqn. 7) but overcomes the main shortcoming of the normal cathode by-pass capacitor, i.e., the rise in reactance of the by-pass capacitor at low frequencies which results in negative feedback at LF only.

For example a cathode bias capacitor of 10 $\mu$F would start to lose its decoupling effect at several hundred cycles when a bias resistor of 300 ohms is in use. At 50 c/s there would be a noticeable drop.
in gain while at 5 c/s the capacitor would be ineffective. When the capacitor is omitted this variation in gain is not apparent but the overall gain of the circuit is reduced.

It is possible to shunt the bias resistor with a very small condenser which starts to decouple the cathode resistor at the same frequencies at which the stray capacitances in the anode circuit begin to reduce the gain. In this way the frequency at which the gain falls by 3 dB can be considerably increased. Too large a capacitor in this case can result in excessive gain at the higher end of the response curve which can cause distortion of the display, so care must be exercised when applying this sort of compensation. The circuit finally described does not use cathode capacitive or anode inductive compensation—see Part II.

There are other circuits which can be considered, such as the anode follower and the long-tailed pair (Fig. 3). These circuits are slightly more complex making it most difficult to obtain a satisfactory performance over a wide frequency range. The long-tailed pair has certain advantages, however, especially as far as the application of shift voltages is concerned and is very popular. Normally, anode compensation is used with this circuit in order to obtain a good high frequency performance. In view of this fact and also that it is difficult to obtain a well balanced output over a wide frequency range the circuit will not be dealt with in any detail here.

There is another way in which the undesirable capacitance effects can be overcome to some extent. This is by the use of cathode followers. The cathode follower stage has three peculiarities, all of which are of extreme importance and usefulness in wide-band circuits:

1. The input resistance is very high, (Eqn. 2);
2. The input capacitance is very low, (Eqn. 3); and
3. The output impedance is very low (Eqn. 4).

In addition to these features the gain of the stage is never greater than unity (Eqn. 5). Usual values range from 0.5 to 0.99. This point is not so attractive but the other features are so useful that we can afford to ignore the loss of gain.

Let us consider how we can make use of these features:

1. **High input resistance.** If we refer to Eqn. 2 we see that the actual physical value of Rg wired in the circuit (Fig. 4) appears to the preceding stage as a resistor (1/1-A) times larger (where A is the gain of the stage). As an example, if we assume A=0.8 and that the actual resistor wired in circuit is 2 megohms, then as far as the preceding stage is concerned the actual resistance looks like: 2.0 (1/1-0.8) M=10M. Thus, the effect of the increase in reactance of Cl (Fig. 4) will not become effective until the frequency is five times lower. Consequently, the higher input impedance of the cathode follower helps to improve the LF response. Conversely, we could use a value of Cl five times smaller for the same LF response as we had previously; this would be a smaller condenser physically, thus helping to reduce the value of Cs (Fig. 1).

2. **Low Input Capacitance.** The input capacity of most valves is in the region of 8-20 µµF, when used as a normal amplifier. When connected as a cathode follower however, the effective capacity is reduced by a factor of (1-A) times. If we assume that the input capacity of the valve is 10 µµF then the effective input capacity will be: 10 (1-0.8)=2 µµF. Thus, there is a considerable reduction in input capacitance. The average output capacity of the preceding stage will be about 2-3 µµF and by careful layout wiring strays can be kept to about 3-4 µµF making a total stray capacity (Cs) of about 8-10 µµF compared to some 16-20 µµF in the case of two
amplifying stages coupled directly together. This effective halving of the stray capacity results in a doubling of the bandwidth at the HF end of the range.

(3) Low Output Impedance. The output impedance of a cathode follower stage is quite low. An average value would be about 120 ohms. This, despite the fact that the actual resistors wired into the circuit (Rk and Rb in Fig. 4), may total thousands of ohms. The input capacity of the next stage, together with strays, may total 20 µF or so. The frequency at which the reactance of these strays falls to 120 ohms is so much higher than the “3 dB” frequency of the preceding amplifying stage that its effect on the overall response curve can be neglected.

The fourth factor—loss of gain—must be allowed for by designing the amplifiers to have a little more gain than would have been required in the absence of the cathode follower stages.

It should be realised that when stages are connected in cascade, i.e., one after the other, then if they are identical and each has a bandwidth of say 10 c/s-mc, then the overall bandwidth will be less than this. With n stages the response at these frequencies will now be 3n dB down and the bandwidth will be reduced. If in fact we wish our amplifier to have a bandwidth of from say 2 c/s to 20 mc, then with n stages the gain of each stage must be not less than 3/n dB down at these frequencies (Fig. 5).

Low Frequency Performance

Strays have no effect at low frequencies but as already mentioned the reactance of coupling and decoupling capacitors cause loss of gain. In addition to the use of cathode followers there is another method by which the gain at low frequencies can be improved. (Fig. 6). As shown in the diagram it is normal practice to decouple the HT supply to the anode of an amplifying stage; Rd and Cd are the decoupling components. At very low frequencies the reactance of Cd increases and the capacitor becomes ineffective as a decoupler. The impedance formed by

![Fig. 5. General bandwidth characteristic of an RC amplifier. At (A) is the general effect of excessive inductive or capacitive compensation; (B) shows correct compensation; and (C), the effect of no compensation at all. LF compensation would show similar effects at the LF end. Curve is taken with approximate values of Cs, 10 µF; Cg, 0.1 µF; RL, 1.5K; and Rg, 150k. See text for discussion.](image-url)
Fig. 6: LF Compensation

$R_d$ and $C_d$ in parallel increase the effective anode load and this results in an increase in gain. If the frequency at which this effect occurs is chosen (Eqn. 6) to be the same as that at which loss of gain due to increase in the reactance of the grid capacitor occurs, then the effect is compensated to some extent.

As with the other forms of compensation mentioned application of the wrong amount can cause distortion due to an uneven gain-frequency characteristic. It is, however, easier to calculate the performance of an amplifier at low frequencies since the capacities are known values, so compensation can be more accurately applied.

Non-Sinusoidal Inputs

So far we have only considered the behaviour of an amplifier when sine waves are applied. But it is often necessary to view square or pulse waveforms, e.g., TV signals, multivibrator outputs, and such. We must therefore consider how our circuit responds to such waves.

A square-wave consists essentially of a sine wave combined with an infinite number of odd harmonics added in phase. We thus require that the bandwidth of our amplifier is wide enough to accept these harmonics. One important consideration is the time involved for the leading or trailing edge of a pulse waveform to rise or fall. Rise time ($T_r$) is commonly taken as the time it takes for the wave edge to rise or fall from 10 per cent to 90 per cent of its full value (Fig. 7).

If a square-wave is applied to the grid of a valve the anode current will follow this change of state instantly. The anode voltage, however, is controlled not only by the resistive load, but by the stray capacities present. Hence the anode voltage cannot follow instantly, but only as fast as the strays can charge or discharge through the anode load resistor (if we ignore the grid resistor which is effectively in parallel with the strays but is much larger than the load resistor).

It takes a time of about $5C_sRL$ secs. for a capacitor fully to charge or discharge through a resistor (where $C_s$ is the value of the stray capacitances and $RL$ is the load resistor in this case). For example if we assume a load of 1,000 ohms and strays of $10 \mu \text{F}$ then $T_r = 5 \times 1,000 \times 10 \times 10^{-12}$ secs., which is about 50 milli-microseconds. Any waveform rising or falling faster than this at the grid of the valve will emerge from the anode circuit with its waveform slowed to this figure.

Due to their low output impedance cathode followers are much better in this respect. In the case above if we assumed an output impedance of 100 ohms in place of the load of 1,000 ohms then $T_r$ would now be only 0.5 milli-microsecs. However, the overall rise time of an amplifier cannot be faster than the rise-time of its slowest stage. As cathode followers are so much superior in this respect it is usually the amplifying stages that determine the overall $T_r$. It should be noted however that if the fall-time of the negative going edge of any waveform is faster than the time constant of the cathode circuit of a cathode follower then the grid will fall much faster than the cathode can follow. The valve will therefore cut off and the time constant of the cathode circuit will increase as the output impedance is no longer $1/G_m$ but is $R_k + R_b$ in series (Fig. 4). This could result in distortion of very high speed waveforms if the performance of the amplifiers were extremely wideband or where a cathode follower input stage is used.

The rise time of an amplifier can be related to its bandwidth by the expression $F_h \times T_r = 0.4$, where $F_h$ is the high frequency 3 dB point and $T_r$ is the rise time. For example, if an amplifier has an upper 3 dB point of 15 mc, the rise time will be about 26 milli-microseconds. Such a performance should be sufficient for all normal amateur requirements. As the latter formula implies, if the Y-amplifier is designed for wide bandwidth then the rise time will automatically be short.

The final performance factor which concerns us is the effect that the LF response may have on a square wave. It is this factor which determines the amount of "sag" in the "top" of the waveform. Whereas it is the stray capacitances that effect the performance as far as the edges of the waveform are concerned, it is the effect of the coupling and decoupling capacitors that cause the droop in the top of the waveform.

If a square wave is applied to the grid of an amplifier the leading edge will cause the valve current to rise or fall and the anode voltage will then...
follow as fast as the anode time constant will allow (or at the speed of the waveform if this is slower). The coupling capacitor $C_1$ (Fig. 1) had until the arrival of the waveform been charged to a voltage equal to the anode voltage of the valve, as its one end is grounded (via the grid resistor) and the other is connected to the anode. After the waveform edge causes a change in anode potential due to change of valve current, the plates of the condenser connected to the anode follow the anode voltage as it changes. The capacitor cannot alter its charge or change through the circuit resistances. Since the capacitor cannot change its charge instantaneously, it follows that the voltage on the plates on the grid side must respond instantly by the same amount as did the anode plates and in the same direction, i.e., more positive or more negative, depending on polarity of input waveform.

The capacitor then begins to charge or discharge through $R_g$ so as to return the voltage on the grid side to zero. It is this change of charge that causes the “droop” of the waveform. If the trailing edge of the pulse is a long time coming the coupling capacitor may have completely discharged through $R_g$ before it arrives. When do arrive the charge again cannot change instantaneously, resulting in the grid now being taken in the opposite direction. The resulting waveform is shown in Fig. 8A. The remaining diagrams (Figs. 8B, C, D) show the improvement in performance obtained by increasing $C_1$ or $R_g$, i.e., increasing the time it takes for $C_1$ to discharge through $R_g$.

From Fig. 8B it can be seen that the droop is really the first part of the charge or discharge curve of $C_1$ through $R_g$. If these components are large enough, the trailing edge of the pulse will arrive before appreciable droop occurs.

Over the first part of a C-R discharge curve, the rate of change is almost linear. At this rate of change the time that would be required for a complete discharge would be CR secs. (Fig. 9). Let us consider the minimum value of $C$ and $R$ required such that a 50 c/s square wave would be passed with only 1 per cent droop. (The droop of each stage will add to make the overall figure even worse.) The time between successive leading and trailing edges of the wave is -01 sec. Thus, the charge on $C$ must not change by more than 1 per cent in -01 sec. If this is a linear rate of discharge then the capacitor would be completely discharged in one second. This is therefore the CR required, and we could use either 1 µF and 1 megohm, or 0.1 µF and 10 megohms, or a similar combination.

**The Cathode Ray Tube**

We have now considered quite fully the behaviour of the Y-amplifier. Before we can finally design our circuit, however, we must look at the performance of the CR tube itself.

Unfortunately it takes quite a considerable voltage to give a reasonable deflection of the spot on most cathode ray tubes, and to obtain such a large deflection demands that we use output stages with high anode load resistors. This is what we wish to avoid in order to preserve a good HF response. The only course open to us is to select as sensitive a tube as possible and to use high-gain, high-current output stages feeding into low anode loads.

As the anode voltages on a tube are reduced the deflection sensitivity increases but the focusing and brilliance are usually poorer, and it becomes more difficult to eliminate the effects of stray fields. A 3BP1 and also a VCR-138 were available and some comparisons were made. It was found that minimum acceptable performance was obtained with a final anode voltage (relative to cathode) of about 1,000 volts with the former tube and about 900 volts on the latter. Under these conditions the focus and brilliance of the 3BP1 was superior but the VCR-138 was far more sensitive. The VCR-138 gave a deflection of one inch when 5 volts r.m.s. was applied to each Y-plate, but the 3 BP1 required about 18 volts r.m.s. to each Y-plate for the same deflection. (It is considered that a deflection of one inch is about the minimum acceptable in a high-performance voltmeter). In fact, the VCR-138 is one of the most sensitive tubes available on the surplus market. A larger tube could be used but as those available as surplus are no more sensitive it is impossible to obtain a greater deflection without undue sacrifice of HF performance.

Undoubtedly, one of the more modern PDA tubes could be employed; the focus and brilliance would be superior and the sensitivity would probably be better in most cases, but a much higher EHT
voltage would be required. The tubes are also rather expensive.

The performance of the VCR-138 is quite adequate for general purpose work and if the brightness control is kept down quite a good focus can be obtained, although under these conditions some screening of the tube becomes desirable in bright locations, especially at fast time base speeds.

The VCR-138 unfortunately has rather high input capacitances to the deflection plates (about 25 µuF) but by using cathode follower driver stages the bandwidth can be kept quite high.

The chosen tube requires a drive voltage of 10 volts r.m.s. to one plate, or 5 volts r.m.s. in push-pull to both plates. The latter is a better choice for the following reasons:

If an anode load of say 1,000 ohms is to develop 10v. r.m.s. in one driving stage, then only 500 ohms will be required by two push-pull stages. If the bandwidth of the single stage using 1,000 ohms is in the region of 10 mc, then it will be about 20 mc in a stage using 500 ohms. The overall bandwidth of two stages in push-pull, each with a bandwidth of 20 mc, will be about 14 mc. Thus, in the push-pull mode we obtain a better bandwidth and any tendency to trapezium distortion or deflection defocusing is eliminated.

(To be continued)

APPENDIX

Eqn. 1 Gain of RC Amplifier when RL is small compared with Ra:

\[
A = Gm.RL. \tag{1}
\]

where \(A\) is the gain,
\(Gm\) is the mutual conductance in mA/v.
\(RL\) is the load resistor in K ohms

Eqn. 2 Input resistance of cathode follower:

\[
Rg = \frac{Rg}{1-A} \tag{2}
\]

where \(A\) is the gain,
\(Rg\) is the grid resistor in megohms
\(Rin\) is the effective input res. in megohms

Eqn. 3 Input capacitance of cathode follower:

\[
C_{in} = C_{gk}(1-A)+C_{ag} \tag{3}
\]

where \(A\) is the gain,
\(C_{in}\) is the input capacitance in \(\mu\mu F\)
\(C_{gk}\) is the grid — cathode cap. in \(\mu\mu F\)
\(C_{ag}\) is the anode — grid cap. in \(\mu\mu F\)

Eqn. 4 Output impedance of cathode follower:

\[
Zo = \frac{1}{Gm} \tag{4}
\]

where \(Zo\) is the output impedance in K ohms
\(Gm\) is the mutual conductance in mA/v.

Eqn. 5 Gain of cathode follower:

\[
A = \frac{u.Rk}{Ra + u.Rk} \tag{5}
\]

where \(Ra\) is the anode res. of the valve in K ohms
\(u\) is the amplification factor
\(Gm\) is the mutual conductance in mA/v.
\(Rk\) is the cathode resistor in K ohms

Eqn. 6 For compensation at Low Frequencies:

\[
C_{l}.Rg = C_{d}.Rd. \tag{6}
\]

where \(C_{l}\) is the coupling cap. in \(\mu F\)
\(C_{d}\) is the anode decoupling cap. in \(\mu F\)
\(Rg\) is the grid leak in megohms
\(Rd\) is the decoupling resistor in megohms

Eqn. 7 The gain of an amplifier with unbypassed cathode resistor:

\[
A = \frac{Gm.RL}{1 + Gm.Rk} \tag{7}
\]

where \(A\) is the gain,
\(Gm\) is the mutual conductance in mA/v.
\(RL\) is the anode load in K ohms
\(Rk\) is the cathode resistor in K ohms (unbypassed portion)

THE SMALL ADVERTISING

Anyone looking through pp.56-64 of this issue will see that we carry an enormous amount of Small Advertising—readers who have something to buy, sell or exchange—and it is fair to say that the volume of this advertising is such as not only to establish prices, but also to constitute a market-place for anyone who wishes to do a deal. It hardly needs saying that it is no use offering worthless junk; that your price must be fair; that you must be ready to come to terms as regards despatch or delivery; and that if a prospective buyer calls, you must be prepared to show what you may be offering will do its stuff on the air. While we do not guarantee either results to an advertiser or a satisfactory bargain for
a buyer, we can say that complaints are so rarely heard (about three in the last five years) that they are negligible.

All advertising is accepted in good faith. The cost in the Reader space is 3d. a word, with a minimum charge of 5s. (which means that there is no use sending us a postal order for 3s. 9d. if your words only count up to 15). To prepare a good Small Adv. to earn the cheapest rate, make a few rough drafts using the accepted abbreviations, be sure that you have said all that it is necessary to say to make your meaning clear, and send the final copy, with remittance, to: Advertising Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1. We cannot take small advertisements over the phone, and the acceptance of any copy, whether paid for or not, is strictly at Editorial discretion.

The well-known firm of K.W. Electronics, Ltd., manufacture for other fields besides Amateur Radio. Here is their new K.W. "Safcom" emergency R/T beacon, the only such unit so far to obtain G.P.O. type approval for a safety device that is soon to become compulsory equipment on every sea-going fishing vessel or auxiliary craft over 60ft. long. The beacon operates on 2182 kc (the small craft distress channel), weighs only 9 lbs., floats and will withstand the severest conditions. It is simple to operate, works from mercury cell batteries giving a long life, powering a solid-state transceiver, and has a telescopic aerial. It is complementary to the rubber life-raft which recently became mandatory in small craft, has passed the most stringent tests, and its B.o.T. certificate is pending.

LOCAL AGENCIES FOR K.W. APPARATUS

In order to give better sales service to the customers of K.W. Electronics, Ltd., a number of selected local agents have been appointed, who will carry stocks of K.W. apparatus and will be in a position to give after-sales service. Following is the list of agencies so far arranged:


Liverpool & North-West: Stephens-James, Ltd., 70 Priory Road, Anfield, Liverpool, 4.

Derbyshire & District: J. & A. Tweedy, Ltd., 64 Lordsmill Street, Chesterfield, Derbyshire.


Birmingham & Midlands: Chas. H. Young, Ltd., 170-172, Corporation Street, Birmingham, 4.

Nottingham & District: G. Francis, 93 Balderton Gate, Newark, Notts.

Aberdeen & N/E Scotland: L. Hardie, 542 George Street, Aberdeen.

Northern Ireland: W. J. McConaghie, 72 High Street, Bangor, Co. Down.

Eire: Long Bros., Main Street, Dunkineely, Co. Donegal.

Many of these names are already well known in the Amateur Retail trade, with years of experience of catering for the radio amateur market. At any of these addresses, you will find keen and expert interest in K.W. products, with a full range of K.W. equipment available for inspection and discussion.

AWARD OF "THE FARADAY MEDAL"

One of the most sought-after distinctions in the fields of radio and electrical engineering is the Faraday Medal, bestowed annually by the Institution of Electrical Engineers in recognition of some outstanding contribution to the progress of the art. The 44th Faraday Medal goes to J. A. Ratcliffe, CB, CBE, FRS, now retired and until lately Director of the Radio and Space Research Station, Slough, Bucks., at which much of his work was done on the physics of the ionosphere and the related problems of radio-wave propagation on the LF bands. It should be mentioned that the annual Faraday Medal award—commemorating one of the founders of electrical communication—is not confined to I.E.E. members or even to citizens of the U.K. The award is made purely for "conspicuous service rendered to the advancement of electrical science." It is this that makes it such a signal honour.

The series "Discussing Single Sideband" will be resumed with Part IV in the April issue
VHF BANDS
A. J. DEVON

FIRST of all, of course, your A.J.D. must apologise for last month’s non-appearance—which some readers, at least, did notice!—and since the reasons would take too long to explain here, it can only be said to have been due to “circumstances unexpected and unavoidable.”

In fact, there has not been much in the way of operating interest to report—with the possible exception of the advent of Oscar IV, with rather indifferent results. Launched just before Christmas, Oscar IV was a cross-band translator, accepting signals on 144-1 mc and re-transmitting them on 431-9 mc, power being about 3 watts. The satellite also radiated a beacon signal (still audible at the time of writing) on 431-9 mc. The cross-band feature enabled an operator to check whether he was, in fact, coming back on 70 cm. Unfortunately, shortly after the orbit had been established as being at an inclination of 26°35′, with a periodicity of 9 hrs. 50 mins., an apogee (maximum distance out) of 20,600 miles and a perigee (minimum height) of 127 miles, the communication system started to play up. The malfunctioning then became progressively worse until by about January 10, even G3LTF could barely get recognisable call-signs through. The failure took the form of the CW being returned badly broken up, with a marked intermittency which gradually became more pronounced, until finally the translator failed altogether. This must be a great disappointment to the “Project Oscar” boys—and not the first one they’ve had—as the cross-band idea was a very good one and the system had been rigorously tested. However, it is probably just not feasible to guard against all the eventualities of a rocket launch. In spite of this early failure of Oscar IV, there was an opportunity for some very interesting 144/432 mc cross-band DX to be worked. G3LTF was particularly successful in that he heard (or was heard by) a number of DX stations, including K2MWA, but no full two-way contact was obtained due to this malfunctioning. In other words, the signals were there all right, and would otherwise have been quite workable.

Yet another amateur airborne device is the German translator balloon (ARTOB), which receives between 144-08 and 144-10 mc for CW only, and 144-10/144-12 mc for SSB, with re-transmission over 145-88-145-92 mc. The equipment belongs, in fact, to DJ4ZC, and has already made several successful flights, with good translator results. But there are certain practical difficulties involved: When it can go up and in what direction the balloon drifts depends entirely on the Wx: there are considerable problems in the recovery of the gear after the balloon bursts, though the equipment includes a signal beacon on 145-95 mc; and for obvious reasons, it is desirable that any flight should take place during a weekend, either a Saturday afternoon or Sunday morning, as by a simple system of monitoring, it is easier to alert the VHF fraternity. The next ARTOB flight is planned for some suitable occasion during April-May, from the Aachen area, when the met. condition forecasts a drift from west to east, up to a height of about 30 km., roughly 25 miles. However, even at this height, on such a course, the transponder would be of little use to anyone in the U.K (with the possible exception of G2JF and others in the south-east district). Such a device can only be really effective for those right in its fall-out area. Lastly, on the general subject of satellites and emanations from space, it is of interest just to add that those remarkable picture and telemetry signals from Luna 9, on the Moon from 1845z on February 3, were centred on a frequency of 183-5 mc.

Convention Time
This has now come round again, and the first is the big London affair, the VHF Convention at the Kingsley Hotel, Bloomsbury Way, W.C.1, on Saturday, April 2, when there will be a lecture programme and an exhibition, winding up with the dinner in the evening, which is the highlight of the event. All-in cost (Convention and Dinner) is 32s., with tickets obtainable from: Frank Green, G3GMY, 48 Borough Way, Potters Bar, Herts. The London convention is always one of the big events of the VHF year, and should on no account be missed if you can possibly get to Town on April 2—and book straight away, as the dinner sitting is limited.

Up in Scotland, their annual VHF convention will be held at the Mill Hotel, Rutherglen, on Monday, April 30, starting at 3.0 p.m. with an exhibition (SWL’s and younger amateurs specially invited, as the show will feature modern VHF gear). The all-in cost—for exhibition, talks, tea and dinner—is 27s. 6d., but the exhibition alone is open for 2s. 6d. Tickets and any further information from: GM3PMB (QTHR), or GM6ZV (QTHR).

A new venture is the Midlands VHF Convention, to be held at Wolverhampton on Saturday, May 14, with assembly at 1.0 p.m., chairman of proceedings Tom Douglas, G3BA. and of course, a dinner in the evening. The inclusive charge is 30s., and tickets can be obtained from: F. T. Smith, 5 Pinfold Crescent, Penn, Wolverhampton, Staffs.

Band Plan
This has been thrown into the melting-pot again, and will be coming up for discussion and decision before this appears in print. It is not the intention here to prejudge the issues nor to attempt to give advance information—but to make it clear that whatever Plan does emerge will have been worked out by collaboration between the Magazine and the RSGB, and the agreed draft will be published by both journals.

Tabular Matter
Space only to show the Three-Band Annual this time—and please read carefully the small print, under the Table on p.32. For the first time, we are trying multipliers (see small print), and though at first sight it may look as if the two-metres-only types will be left
The ''Oscar IV'' satellite in the final stages of assembly. Left to right are: K6MWR, responsible for the design of the receiving side; Dave Moore, who undertook the mechanical design; W6ZPX, who did much of the final electrical assembly and check-out; and on the right, W6RTG who was associated with the system engineering involved in ''Project Oscar.'' The work is under the control and direction of members of the TRW Radio Club, Redondo Beach, Calif., with W6NLZ as project manager, and W6SAI as president of the Club and ''Project Oscar.'' All the work is done by Club members strictly in their amateur capacity; much of the equipment has been donated by American manufacturers in the radio and electronics field, and the cash outlay so far (met from Club funds) is less than $70.

far behind, in fact there are ways of compensating for that and, in any event, the Two-Metre Annual is being kept running.

All claims made for the various Tables have been carefully entered and it is hoped to make space, in an early issue, for another spread of all the current ones.

Set Listening Period

It will be remembered that this was set for four metres, over two periods on January 16 last—when, by the immutable Law of Murphy, conditions went off and activity fell low. However, several logs were received, mainly listing a few locals only, together with the rather more successful results obtained by SWL Pete Cayless (Exeter), who heard a dozen different 4-metre stations, with GC3OBM as best DX; and by SWL Trevor Brook (Leatherhead, Sy.), who turned in a log listing nearly 20 different stations, though none at any great distance. It is interesting that both these SWL's make the same remark—to the effect that though the activity was disappointing compared with what it can be under good conditions, little or nothing would have been heard by either if the SLP had been held even a few months ago, so much has occupancy and activity increased on the 70 mc band.

So we will plod doggedly on, and set another SLP for 4-metre CW and Phone, on Sunday, April 10 (Easter Sunday), periods as before: 1000-1300z, and 1500-1900z. Your A.J.D. looks forward to seeing some rather fuller logs for this one, and transmitting operators are reminded that, in the knowledge that there is an SLP on, they should transmit as much and in as many different directions as possible.

General News

There have, of course, been some flashes of good conditions during the last few weeks, when the Wx pattern showed the signs clearly enough. The benefit during the early part of January was in the southerly direction from the southern part of the country, down into France—for instance, G2JF
worked F9NL in the Pyrénées, a
nice 600-mile contact. The January
two-metre contest missed good
tropo. conditions by just 24 hours
(old Murphy again) — and, of
course, the weird Wx since has
been all against anything in the
way of stable EDX, or even GDX,
conditions developing.

Inevitably on the VHF bands,
conditions are always up-and-
down, and it is this mysterious
propagation factor that lends
enchantment to VHF. You, as a
new boy, could come on two
metres with your bit of a rig just
at the time the band is wide open
for EDX — and how often that
has happened — only to have to
wait months before you can work
a few more U.K. counties.
You can have been on the band
for years without ever having
encountered an Auroral opening
(a stupendous experience); a
Sporadic-E manifestation or a
Tropospheric occasion — taking
you into, say, Scandinavia or
Mittel-Europa. Or you can just be
perfectly happy working locals on
a band without TVI problems
(provided you have arranged your
multiplier sequences correctly).

During the Easter vacation,
which means towards the end of
March, the Cambridge University
Wireless Society will be mounting
an all-band expedition to GD:
skeds for 70 mc and two metres
can be arranged by getting in
touch, as soon as may be, with
P. K. Cripps, G3SKT, 61 Devon-
shire Road, Cambridge. (We hope
that ON4FG makes the necessary
arrangement and succeeds in
getting through!)

The 70-centimetre (430 mc band)
boys are working hard and doing
well. G8AKQ (Barnsley) lists no
less than ten 70-cm. stations in that
area, all regularly worked or
heard — and as G6ABK/T he
exchanges A/TV pictures with
G6ABN/T (Tadcaster), while
G3RND and G8AAN take pictures
from him. The G6ABK/T Tx runs
35w. on 432-57 mc for sound, and
436-07 mc vision. (A picture of
his aerial system appeared on
p.77 of our January issue.) A job
in band at the moment at
G6ABK/T-G8AKQ is the convert-
ing of a UHF TV tuner to 23 cm.
Another to write in is G8ACB-
G6KQJ/T (Wolverhampton),
whose beam is a pair of 14-ele
Yagi's on a telescopic tilt-over
tower, swinging up to 50ft. In the
last five months, he has heard,
and mainly worked, more than 100
different Midlands stations on 70
mc. His bench project is a 150-watt
Tx, and in the meantime he is
trying to separate the local
ITA/BBC-2 signals from his 433-4
mc mixer diode, as they produce
a very objectionable bunch of
birdies; a high-Q break and a
tuned emitter circuit give some
relief but also attenuate all
signals.

Developing on 23-cm. are
G3HW R and G5FK (Wembley),
who have made a few contacts.
G3DBF (Mansfield, Notts.) says he
has built the 5-transistor two-
metre converter described by
G3JAM in our June, '65, issue—
having heard about 50 stations on
it, he has been converted to VHF
and is now at work on a Tx.

So that must be it for this time.
Your A.J.D. hopes to
get into gear again, with more space next
month, for which the closing date is:
Friday, March 18, addressed
to VHF Bands, SHORT WAVE
MAGAZINE, Buckingham. 73 de
A.J.D.
COMMUNICATION and DX NEWS

L. H. Thomas (G6QB)

CONDITIONS from mid-January to mid-February were pretty disappointing, with all bands below par for much of the time. Spring, it seems, will be a little late this year. And the general dullness was not so much a matter of the MUF, or the behaviour of one particular layer—it applied to all bands, so that One-Sixty, which is so often extremely good when the others were bad, fell in with the general depression. So here we all sit, waiting impatiently for a sign that the sunspots are about to do their stuff.

The CQ Top-Band Contest missed the boat by just one week, after catching it brilliantly last year. This year, the weekend of January 29-30 was nothing to write home about, but the previous weekend was very interesting. W1WY says that at this time (January 23) he was actually passing over all the G’s he had worked before, in order to look for new countries. During that one night he raised 9L1HX, DL1FF, OL1AEF, OK1ANG, HB9CM, PA0PN and three or four new G’s.

The contest weekend was most peculiar as regards conditions. Over here one could hear W8’s, 9’s and 5’s working each other; very few W’s or VE’s working Europe; and the old faithful W1’s and 2’s were notable by their absence. There’s no doubt about it—something has gone wrong somewhere!

Sun-Spotting

G2TA sends some information from the January 15 issue of Nature, in which D. G. King-Hele discusses the prediction of dates and intensities for the next sunspot maxima. You will remember that the last maximum (1957-58) reached the highest figure ever recorded, not far short of 200. Two schools of thought grew up, one predicting that the next might be higher still, and the other suggesting that we were in for a period of very low maxima. Well, the writer referred to has evolved a formula for predicting the maximum from various recorded figures, and he suggests that the next two peaks will approximate to the figures of 140 (January, 1968) and 110 (May, 1978). The minima, according to the formula, should occur in July, 1974, and March, 1985. So this makes it seem that 1957-58 was an exceptionally high peak; and it also gives a certain amount of authority to the pessimistic American prediction that the 10-metre band might not be fully operational again (in the sense of its 1947 and 1957 performances) for the rest of this century.

Perhaps it is just as well that the 1947 peak was only observed by a small fraction of the operators now on the air! That was the year when, with 100 watts and a rudimentary aerial (in your conductor’s case, a 33ft. Windom) one could work the whole of the Pacific on Ten practically every morning, to say nothing of Japan, China, Hong Kong, North Australia, Papua and the like. Yes, a pair of 807’s, breadboard layout, and a piece-of-wire brought in more real DX that year, on Ten, than most of the succeeding years have yielded on all bands put together. And we say it is just as well that only a few tasted those joys, because there would be an awful lot of disappointed DX’ers otherwise!

Pounding Brass and Tinkling Symbols

The CW fraternity are coming to life—not on the air (they have never been otherwise) but in the mail, in defence of their chosen way of life. Their “outmoded form of communication” is rivalled in popularity by all this new-fangled SSB stuff, it seems; but one comment that we enjoyed was that “SSB is rapidly making Phone almost as efficient a mode of communication as CW has been for the last fifty years”!

Certainly it behaves the Phone boys to keep quiet about their antipathy to CW . . . if all CW operators were to change their spots and appear in the Phone bands on AM or SSB, what a mess that would be. Another comment that crops up in the mail so frequently that it almost looks like a plot, is “I prefer CW because people using it don’t talk such a load of tripe as the preachers on Phone.”

Ah, well, we’ve no intention of starting a war, but it does seem to us that most of the Phone brigade’s jibes concerning CW are off the beam, and read as if they have no real knowledge of what CW is all about. What would be valuable would be a letter from someone who has attained real proficiency in the art of CW, but nevertheless has decided that it isn’t good enough, and changed to Phone . . . we have never yet had such a missive. It seems that all those who decry CW are those who have at some time tried to master it, but have failed. A touch of the sour grapes, could it be?

The Overseas Mail

VO1FB (St. John’s) found Top-Band conditions only fair during January, with high static levels and only short openings. He made only 17 European QSO’s during the Contest, as against 64 last year. An interesting sideline—during MCC, in November (actually between the hours of 1930-2000 on the 14th) he logged G3APF, 3AMW, 3GRS, 3SVC, 3TLM, 3TRF, 3UOK, 3UQD and GM3RCS. And Joe is hoping that his contact with
ZB2AJ (January 8) was an official “first” for VO/ZB2.

9V1LL (formerly 9M4LP) worked some W6’s and W7’s during the Top-Band contest, also DL1FF for their very first QSO after three years of trying. And during this contest Bob says he heard VK5KO calling CQ for two hours, but he couldn’t make a contact. Many G’s have been heard and worked in Singapore; sometimes the band is open for two hours, around 2230-2300 onwards, and sometimes for a few minutes only.

VS6BJ writes to say that he is leaving Hong Kong in April for London, after which he will be resident on Ascension Island, ZD8. ZC4KF reports that he is active, mostly on Fifteen CW and AM, and always on the lookout for G’s: on Sundays he has a try on 28200 kc. ZC4LK is also on the same bands. Conditions on Fifteen have been very good, but Ten has produced nothing, so far.

WA2WOR, who is also W4WFL, comments on G8ON’s outspoken criticism last month of worthless SWL reports. Morgan writes “I still possess with pride and pleasure the cards from my old SWL days. The QSL’s, so many with thoughtful words of advice and encouragement, will always have an honoured spot on my wall... I have received my share of reports in the vein mentioned by G8ON, but fortunately they have been insignificant in number, and where possible I have tried to pass along the few words of advice to put them on the right track.”

6Y5XG, who has been globe-trotting now for many years (VU2XG and 4S7XG, remember?) is leaving the Diplomatic Service in May, and hopes to “grow some roots” in England, reverting to his original call G3HVG. He says he has become a real Top-Band fanatic while in Jamaica, and though success came rather slowly he has been having a good time this year. On January 22 he worked HP1IE, and for the 29/30th his list runs like this: H18XL, HK4EB, VP7NY, VU4CI, DL1FF, VE2UQ and 2LI, VO1FB, 6Y5FH, G3RPB, and all W call areas (in 19 States)!” Until he leaves at the beginning of May he will be pleased to work any G who wants

a snappy QSO and cares to break-in on his skeds with “Dad” (G8VG), which are at 1200 GMT, 14080 CW, on Mondays, Wednesdays and Fridays. (It will have to be snappy, as he has to get off to the office and can’t hang around.)

Peter adds “Of course, as G3HVG I shan’t attract the attention I am used to, but at least I’ll be able to renew old friendships and enjoy long ragchews—something which is almost impossible when one holds a DX call. It’s easier for a G or a W to hold a DX ragchew, or indeed to raise a rare DX station, than for a 6Y5... the lids invariably break up contacts, or when I hear some juicy DX they VFO on the frequency and call me.” (But that’s not unknown, even in G-land.)

VP2VD (Tortola) is Dave Gynn, G3SPB and ex-5N2RDG, running an SR-150 to dipoles on all bands from 1500ft. up on a mountain. He hopes to sign G3SPB/KV4 shortly—awaiting FCC permit at present. His VP2 operations are weekend affairs, the rig being put in a suitcase and taken for a two-hour boat trip and a half-hour ride up the mountain in a Land-Rover. Then it’s “start the engine, put up the antennas and we’re in business... some people have it too easy.”

9H1AA asks us to mention that his QTH is now “234 Signal Sqdn. (Malta) Club Station.” There was some confusion because the original licence was issued to an individual who has now left the island, but the licence is being re-issued as above. The present operator is W.O. II B. W. Thomas.

FIVE-BAND DX TABLE

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<th>21 mc</th>
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MARCH, 1966
Although licensed as G5UZ pre-war, this call being relinquished prior to 1939, Harold Leonard of 47 Windsor Road, Westbury Park, Bristol 6, found that by 1962 all his old enthusiasm had been revived — so he took the R.A.E., passed the Morse Test again, and the G.P.O. (by virtue of his old-timer status) helpfully issued him with G4UZ. A founder-member and official of the Bristol Amateur Radio Club, G4UZ now runs a 10-160m. Vanguard, with an Eddystone 680X as receiver, and has a variety of aerials for operation on all bands. His favourite modes are telephony on 80/160m. and CW on 20 metres, with DX worked as it comes, as typified by the QSL’s in view. One of his regular CW skeds is with KIYCS of Bristol, Maine. The car-plate type callsign plaque was presented to G4UZ by members of the Club.

From Russia With Love

G3KPT forwards a letter from UW3HR (Moscow) concerning Top Band, on which he has heard the following: G3KKO, 3PQA, 3RAU, 3SDX, 3PEZ/A, 3LIQ, 3OIT, 3LOO, 3NXZ, 3RJH, 2FT, 3RSD, 3SYS, 3ORA, 3ORH, 5AQ, 3HJG, 3REM, GM3IGW/A, GM3SDZ and GW3HUM. With only a few exceptions, all were logged at 579, mostly between 1900 and 2300z.

G3SOP sends some interesting information from UQ2-land, via UQ2KFG, who wants British amateurs to know that in Latvia they are only allowed to work SSB between 3600 and 3650 kc. George and the other club operators would like to work more U.K. stations, and hopes they will listen in this part of the band.

Apparently the Italians are also restricted on this band, where they are only permitted to use 3613-3627 kc and 3647-3667 kc (though they have been heard off these frequencies, calling DX).

Around the Bands

G2DC’s admirable band-summary reveals that even Jack has not found much to enthuse about this month. He still laments the dullness of the 0730-0830 periods on Twenty, where even VK and ZL have been quite scarce and “a CQ only brings back a single JA, whereas not so long ago they would come back in hordes.” Fifteen has produced some nice surprises, though, especially during the afternoons, when “anything from the Caribbean area is likely to pop up with a thumping signal out of an apparently dead band.” For the other bands, G2DC dismisses Ten as spasmodic, with nothing new or exciting on it . . . and he admits to having neglected Eighty and Forty, having heard little worth while.

This leaves Top Band, and devotees will be interested to hear that G2DC has been using a base-loaded 45ft. vertical for some time, on which he can raise anything in Europe with ease, including ZB2, but could never get across the pond. So, although he had decided that he had finished with long wires, he strung up a simple end-fed half-wave (only 22ft. high). This brought in a 579 report from VO1FB! So some
re-thinking is going on concerning Top-Band aerials.

G3NOF has, as usual, been round the three HF bands, and reports practically nothing on Ten except for one single morning, when ZE2JA and ZS9G were both S9, AM Phone, on an otherwise dead band. Fifteen was patchy, but with occasional VK's around 1000 and the East Coast W's in the afternoons. Several of the latter were worked on SSB, as well as TL8SW, ZD5R and 9Q5FV.

Twenty has shown unusual conditions at times, with some strange re-openings after the band has apparently died. For instance, ZL2JO was worked at 1920 with the beam due South, and VE7PV as late as 2125. KR6UL, VK's, ZL's and sometimes JA's have been active on the long path up to about 1000, and then the short path to the same area has been open until 1300. W6 and 7 signals have been heard weakly around midnight. Best contacts, all SSB, have been CR4AJ, FG7XX, VU2CK, VK0GW (Mawson), VP2AA, 2AC, 7Q7PBD, M1B and OY4R. ZD8HL, operating from Montserrat as VP2ME and 2MG, was heard several times, though weakly, around 2100.

G3LZQ (Hull) runs a Swan 400 with two VFO's for split-frequency working, a ground-plane for Twenty and Fifteen, and a "very bent trap dipole" for Eighty and Forty. He is back on the air after nearly six years of QRT except for short spells, and thinks he may hold some sort of record for the fewest QSO's (only 2,100 in nearly eight years). However, full steam ahead now, and a couple of days on Twenty CW fetched in VP8HJ, 9V1NM, 9J2AB, OY4R, VK, ZL, VE6 and 7 and so on. He has joined both Five-Band Tables and is obviously intending to make a mark therein.

Forty Metres

G3RRF (Epsom) says a few words "in defence of Forty," where he finds the QRM bearable compared with the frightful noises on Eighty after dark. On Forty he has worked VK4SS, CR7IZ, HZ3TYQ/8Z4, OD5EK and sundry W's. He also remarks that some of the Europeans on the band are really good operators. He welcomes SWL reports (from outside Europe!).

Country Status

Last month we quoted a CQ Editorial about the iniquitous business of "buying QSL's," and DX in general. We didn't mention at the time that K2MGA continued this theme to deal with the absurdity of "inventing" new countries, and suggested that no place should be granted DXCC status unless it possessed a resident amateur.

Colin Squires, who compiles the Saltash A.R.C.'s excellent Tamar Pegasus, forwards us his own comment, written quite independently of the CQ tirade, in which he says very much the same thing. He suggests that the time has come for a complete re-think concerning country-status, and that the Amateur Radio world should stop making itself ridiculous in the eyes of outsiders by giving the word "country" a completely false meaning. As he says, all these little islands and rocks would still remain available for chasers of WPX and, of course, the Islands-on-the-Air Award, and they would qualify in many of the international contests. The situation has become farcical... if someone were to land on Rockall from a helicopter, work one single American station and send him a QSL, Rockall would thereupon become a "country"—even if it had no inhabitants but sea-birds for the next century.

EI Sortie

There will be no "country" nonsense about this one, but an ordinary honest expedition to the Skerries is being run by G3UOL (Coventry), who will be signing EI6BB from thence, April 14-22, Top Band CW and Phone. He will be using a Codar AT5, a G3ROD all-transistor receiver, and a long wire. All reports welcomed, including SWL's.

Top-Band Contest

Grafton's Annual Top-Band Contest is now a well-established
Reporting the HF Bands

The DX Net

G3UDR comments “The top end of Eighty is becoming more and more ridiculous. The 'big boys' and their net just control the frequency, and unless you are one of the privileged ones there is no hope of working DX. So much so, that at the time of writing they take up the whole of the top end, thus making this slice of the band absolutely useless for anyone else. I think many people are getting very angry, and I have already heard some very rude words being voiced over the air. Though they may be in the right, this is not true Amateur Radio... if only you can mention it often enough they might see the light. This doesn't happen on any other band—why should it happen on Eighty?"

Well, we have mentioned it—but we don't expect any drastic change to result. There are some who will argue that the formation of a net, all listening for and trying to work any DX that comes on the frequency, is a space-saver—although it does result in the continuous occupation of one frequency. What spoils the whole idea is the fact that some people can't net accurately; that all members of the group are not getting similar signals, either from the DX or from other members; and that nine-tenths of the time is apt to degenerate into pointless "waffle." The end-result is very often a short and very scratchy QSO with a DX station, and the information passed is little more than a signal report.

Top Band Topics

G3LIQ (Hull) is incensed by the types who talk about One-Sixty as "Grandad's Band," and invites any of them to visit him for...
a weekend and see for themselves whether they are tough enough to take it. Part of the agenda: Digging 6ft. holes (perhaps three in an afternoon); climbing trees, up to 140ft., in total darkness and with a biting wind blowing; throwing a small weight, with cord attached, up to 60ft.; raising a dipole with 160ft. of feeder attached; splicing two 30ft. telegraph poles together, topping them with a lighter 30-footer, and erecting the whole 85ft. pole with 600ft. of jin. hawser. (As an afterthought, they might try erecting 34 other different aerials and supports, all around the 75ft. height, with feeders up to 500ft. long.)

O.K., Grandads? Your help will be most welcome. Then we come to the results, which, one feels, would have to be pretty good to justify the hard labour described. Well, out of 40 DX stations heard on 160 metres during January, 28 were worked. W0VXO and W9YYG were raised on the morning of January 9, and a long list of W's in the late evenings.

G3LIQ finds that between 2130 and 2335 the W signals are very weak, but they will give him good reports; in the mornings they pour in but one can barely raise them. He has worked W1JJS thirty times between the evening hours mentioned, the longest QSO being forty minutes with solid copy.

His present aerial follows mobile whip practice, being a 75ft. vertical with three 60ft. wires fastened to the top and sloping outwards to form a very large "capacity hat"—so large that a series condenser has to be used to resonate the system. The whole is backed up by a good earth system—four 20ft. copper tubes sunk vertically and soldered together with automobile-battery cable, together with four 132ft. radials, two 150ft. fences, an aluminium pre-fab and a 12ft. square of aluminium plates.

Go to it, Grandads—you have nothing to fear but your lumbago. For the rest of the Top Band news, the DX claims are a bit short, many of the regulars having been discouraged by substandard conditions it seems.

G3PMR (Bangor) tried to get a "mammoth aerial" up to the top of a cliff, but the wire broke, and he is awaiting a new drum thereof. He worked LZ1ARN on the band, and would like to know whether he is believed genuine or not. He found the contest conditions disappointing, also the operating standards which, as he says, are normally excellent. However, at one time the whole of Europe seemed to be calling the DX on its own frequency.

G3RRF mentions that one night he heard four or five W's, including two W8's, calling a certain G3T-- station, who heard none of them and went on calling CQ DX. Perhaps he fancies himself as a beacon? G3RRF himself raised OE1ZVW/5 and VO1HN.

G3TXZ sends in one of the very few entries for the new Top-Band Ladder (and we hope to see many more next month). He uses a 132ft. inverted-L with a 45ft. vertical section, "draped round a garden 25ft. by 95ft." A home-brew all-band SSB transceiver is on the way, and meanwhile CW is the main enthusiasm.

G3UBW (Sevenoaks) was very pleased to work VO1FB in the First-Timers' Test on February 6, and now hopes to raise his aerial (and his signal-strength). Cards arrived recently from ZB2AM and OE1FLW.

Tragic DX-pedition

At the time of writing it seems only too certain that Chuck Swain (K7LMU) and Ted Thorpe (ZL2AWJ) perished in the Pacific hurricane at the end of January. They left Wallis Islands in the 38ft. ketch Marinera, bound for American Samoa, and disappeared without trace. Four or five other boats and about 68 people were reported missing, and a full-scale search went on for many days, in the hope that they were out of fuel and sheltering at one of the many small islands in the area. K7LMU was personally known to many DX'ers the world over, and stood for much more than just another rare prefix cropping up from time to time. It is a great tragedy that the yearning for rare DX should have been the indirect cause of the loss of these two amateurs, together with the captain of the boat and two other crew members.

General Chat

VK2AWH (ex-VK0WH, Macquarie) is looking for an amateur in the U.K. with whom he can make a regular sked, preferably on Twenty SSB. Anyone willing is asked to write him direct (Harold Wright, 75 Invercauld Road, Goonellabah, N.S.W.). Thanks to SWL John Woodham, Bristol, for this note.

G3RFH (ex-VP8HF and /MM) is now serving in H.M.S. Hermes, at present refitting in Plymouth. He will not be signing /MM on his next trip, because of "difficulties and extra hazards aboard an aircraft carrier," but he will have plenty of listening time.

G3IDG brings up the interesting point—how old is an Old Timer? The term is a comparative one, of course, and back copies of the Magazine constantly remind one of events already half-forgotten. For instance—do you remember when Top Band was 1715-2000 kc and was known as the 1-7 mc band? Or when Forty was three times its present width? Not to mention the compulsory year on CW and the extra fee for /A operation. All these things date back less than twenty years, but to some of the pre-war amateurs they seem quite recent.

If nostalgic reminiscing continues, G3IDG comments that the present G3U-- types will be able to say in the distant future "Why, I remember when the W's couldn't get a permit to transmit in the U.K." (A nasty streak in our nature suggests that a good gambit might be "I remember when Top Band stations used 10 watts.")

Non-Aerial Antennas?

R. T. Dale (Exeter) sends in an account of his short-wave listening with a coax-fed "aerial" consisting of 60-70ft. of bare wire...
lying on the ground. Long-wave reception was excellent, Canadian broadcast was heard on medium-wave, and Top Band reception was possible up to 350 miles. Right down to Fifteen metres, strong signals from most parts of the world were heard on occasion. Signals may have been weaker than with an elevated aerial, but it is claimed that noise was reduced even more, giving an improved S/N ratio. A low-resistance earth connection is highly desirable, and various intriguing effects have been observed, such as varying DC voltages between different earths (due, presumably, to electrolytic action of various kinds).

SWL Dale reminds us that an early textbook (pre-1914) states that a scientist in 1881 measured "a spontaneous EMF of 120 volts" in a line 220 miles long, and was presumed to be due to electromagnetic induction (no overhead HV lines in those days!) A very possible line of research today down a new field.

Late Flashes

MP4BFO (c/o I.A.L., Box 144, Manama, Bahrain) came on the air in January with 150 watts "thrown together"—CW only on Twenty and Fifteen. No G's worked until January 28, when a string of them were contacted on Fifteen, which is "definitely the band for G." MP4BFK is also around on Twenty and Fifteen CW, with 25 watts to inverted-V dipoles, and he keeps an eye on Ten. MP4BEU uses an S-line and ground-plane, but is hoping to be using a Quad before long. Others, also active, are MP4BPH, 4BBL and 4BBA, but roughly 15 attend monthly club meetings—a much higher average than at home! (MP4BFO says that activity is high—there's little else to do.)

6Y5XG sends a late note to say that he worked OK1ADM and 1AEZ on Top Band, February 6. A new country for him and, he hopes, a "first." 9M2DQ now runs a Drake TR-4, which gives five times the output of his old rig. On Twenty he finds most of Europe coming in well, but not G-land. Fifteen is a better bet, but still difficult. He is very sad about the loss of Chuck, K7LMU, who was a personal friend, very popular out there, and organised the S.E.A. Net.

DX Shorts

If you hear an IC1 during March, it will be IK1DB operating from the Isle of Capri... VQ9HB will probably be on soon from Desroches Island, but not from Farquhar until late April... 9M8PH is ex-VS5PH and DJ6PH, and works on 14325 kc SSB at 1500.

VP5AB (Caicos Is.) is operated by W1WQC... ZD8HL will return to VP2M (Montserrat) later in the year... PX1YR is said to be QRX on 3790 kc SSB, Saturdays at 2330... PJ5ME (Sint Maarten) will be activated by a team of W's during the ARRL Contest, March 26-27.

HK9 (Malpelo Is.) will be operated by a gang of HK's during June... G3HS is considering a round-the-world expedition, and already has been issued with the calls 6Y5HS and VR1H... W's licensed to operate from the U.K. under the reciprocal arrangement will receive three-letter calls beginning with G5-

Sign-Off

We could go on much longer, but space won't allow. So we must close with the usual reminder that the deadline for next issue is first post on March 14, with everything addressed to "Communications and DX News," SHORT WAVE MAGAZINE, Buckingham, England. Let us have some more entries for the two new tables, which are only in the embryo stage this month. Good Hunting, 73 and—BCNU.

RECIPROCAL LICENSING

Readers in this country who are in the category of "foreign nationals with whose administrations reciprocal licensing has been agreed" are reminded that they can obtain U.K. amateur transmitting facilities on application to: Radio Services Department, Radio Branch (Amateur Licensing Section), Headquarters G.P.O., St. Martins-le-Grand, London, E.C.1. In the first instance, do not apply for the licence itself, but for the form which you have to complete to get it. In the main, of course, this facility applies to U.S. licensed amateurs who are in the U.K. for business or on Service appointments.

Conversely, if you hold a U.K. licence and will be in the States for employment or on a protracted visit, you should apply to the Federal Communications Commission, Washington D.C., 20554, for Form 610-A, allowing at least two months to complete the formalities.

Any amateur, on either side, obtaining a reciprocal licence is invited to let us have the callsign, with full details. A great deal of effort has gone into the arranging of these facilities, for which credit is due to the RSGB.

"BECOMING A MEMBER"

Every now and again, we have a letter asking "How do I become a member to get the Magazine?" The answer is, of course, that no qualification or membership fee is involved. All you have to do is one of three things: Either (1) You order SHORT WAVE MAGAZINE at a reliable local newsagent for regular monthly delivery, or (2) You send us a remittance for 42s., covering a year of copies sent monthly through the post, or (3) You buy a 4s. postal order on the Tuesday before the Friday of any month, and send it in to us, with a note saying simply "Next issue, please." We publish on the first Friday of any month, and all direct-subscriber copies are posted (for the U.K.) on the morning before the day of publication. The address for all cash transactions is: Circulation Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.
ONE of the pleasant things about writing this feature is that its readers are certainly not shy about saying what they think. And of course we welcome criticism of all kinds, since without it we would be working completely in the dark.

One thing that has emerged, over the last two years or so, is that most of our readers want this to be more of an informal chat than a series of technical snippets about “SWL”. They seem to prefer reading about other SWL’s problems (even personal ones) to being harangued on the technical side.

This is as it should be, for SWL’s are now being served exceptionally well in our pages. In the February issue alone, for instance, there were articles of SWL interest on pages 717 (the 52 Set), 719 (the HRO), 723 (IF Amplifier), and 751 (5-meter circuit). In January they had articles on the HRO and the S.640 as well as this feature. And there are frequently dissertations on subjects, e.g. Aerials, which are of both transmitting and receiving interest.

So, as the small number of letters asking “Why don’t you say more about converting surplus?” or “When are you going to write about ATU’s again (or aerials, or crystal filters, or what have you)?” are heavily outnumbered by those who write and say “Don’t change SWL—it’s already the way we like it,” we intend to do just the latter, and leave it alone.

At the same time we should like to hear of readers’ ideas and tips, whether on modifications to old receivers, original designs, or gadgetry in general. Don’t hide your light under a bushel, if you have done anything in this line. Either tell us, for inclusion in this feature, or send it to the Editor, in the form of a short article, or D-Y-K-T item, which he may be able to use. Then everyone will be happy...

More About SLP’s

Concerning the last SLP (and for a few new readers we have to explain that the letters stand for “Set Listening Period”), there have been quite a few comments. They are equally divided between those who write to say “What a shocking lot those listeners must have been” and those who claim that the fault lies to a large extent with the transmitters, who don’t use correct phonetics.

Colin Beale (Twickenham) points out that “F” and “S” are easily confused (as they were in some cases) but that “Fox” and “Sugar” could not possibly be. In particular he blames the man who rattles everything off too fast, the one who calls CQ twenty times and gives his call once, and the type who meticulously spells out his country prefix and then slurs over his callsign. He quotes an imaginary “G3Y0” who might sound like “Gee Three Whoa”, and adds “however good the equipment which follows the microphone, the first and most important step occurs before the microphone is reached.”

Andrew Niblock (Ilkeston) puts up the same point of view, and says he has heard many contacts in which the operators themselves have got the calls wrong, and no one has spotted it. D. H. Foster (Rainham) says much the same, and suggests that some transmitters need to brush up their “Alpha, Bravo” technique. He thinks that careless SWL’s are possibly in a minority.

On the other hand Pete Cayless (Exeter) maintains that he always strives for accuracy and has no time for those who “scribble down anything and hope for the best, just to fill the log”; and James Brown (Llandaff) was sorry to see that so many of the “spider brigade” sent in such bad logs. Colin Squires (Saltash) suggests that people would be more careful if their loggings were printed together with their names!

Ah, well... and when it comes to the next SLP, we have so many different suggestions, all cancelling each other out (“Any band except 20”... “Make it 20 on a Sunday afternoon”... “Don’t choose an afternoon, it’s all W’s... and so on) that we feel like instituting an SLP for 160-metre CW from midnight to 2 a.m.!! But we promise not to do that...

Prefixes Again

We are continually having to keep up with new readers who don’t understand the prefix situation. B. Macklin, Winchester, surprised us by sending in his very first list with the handsome figure of 402, but then we found that they were callsigns, not prefixes (we have explained to him!). For the benefit of others... only one DJ5, only one G3, and so on. Disregard the actual callsign letters, which come after the numeral, or, in the case of these 4X4-type calls, those which come after the second numeral.

Other newcomers include Andrew Marriott (Bishops Stortford), with a Lafayette HA-230 and a score of
222 to join the ladder; and Anthony Jones (Crewe),
who says he is now a “fully-fledged SWL” with an
HE-30 and a liking for Eighty and Top Band.

Oldest Reader?

In contrast to these relative novices is the veteran
T. W. Moss (Exeter), who has just passed his
eighty-first birthday! He has spent a lot of his years
of listening in chasing elusive SW broadcast, and
has many verifications from really rare ones. Nearly
30 years back he received a card from VPD2 (Suva,
Fiji), using 400 watts in the 31-metre band; this
station was heard on a two-valve home-brew battery
receiver. He’s still as keen as ever, and is setting
about improving his S.640 on the lines suggested
on p.672 of our January issue.

Similarly engaged is P. Freeman (Chessington),
who has several faults in his, and is now engaged
on improving it, with the help of the same article. He
reports a 10-metre opening during December, when
he heard a CN8 and a CX2, very unexpectedly.

Life’s small tragedies flow through our post-bag.

. . . here is Andrew Niblock (Ilkeston), writing
“I was sitting in front of my CR-100 when I noticed
a smell of burning and felt grease dripping on to
my knee. There is now one receiver less in existence!”
But surely it’s not so bad when there’s an obvious
clue . . . it’s when they pack up with no smell, no
dripping, no apparent overheating, that the fault
can be such a devil to find.

Which Mode?

We have always known the SWL as the kind of
person who revels in achieving the impossible, and
who thrives on difficulties (even if of his own
contriving). So we were not surprised to hear from
Pete Cayless (Exeter) that he has been gathering
prefixes for a new entry on the Ladder—by copying
AM Phone only. With this mode he comes in at the
221 level, and admits that he’s never been too en-
thusiastic about SSB, anyway.

If anyone else is voluntarily sticking to one mode
(AM, or SSB) we will annotate their Ladder entry
accordingly. If no comment is attached, we will take
it that they are “mixed”.

Quick Quotes

“Modifying my superhet to double-conversion
with crystal-controlled second oscillator, Q-Multiplier,
and so on” (B. J. Turner, Westcliff). . . . “Would
be very interested in more information about what
sort of aerials people have—for instance, what B.
Curnow used on 40 metres, where he always seemed
to be hearing the more elusive DX” (J. R. Daws,
Leeds). . . . “Best time for DX, I think, is around
1900 GMT on 20 metres, when I have heard ZS3B,
ZS8L, ZL3DX, XW8AX and 601AU, also many
South Americans” (David Rollitt, Navenby).

“I am now nail-biting, awaiting the result of my
R.A.E., and have been ‘brass-pounding’ with the aid
of G3TOK and G3THZ, to whom many thanks”
(Wilfred Smith, West Bromwich) . . . The borrowed
S.640 has been returned to its owner, and I am
back on my BC set, which keeps conking out. Now

The SWL station of R. G. Preston,
42 Freshfield Close, West Earlham,
Norwich, who has recently acquired
a Geloso amateur-band converter to
improve his reception facilities.

SET LISTENING PERIOD
Sunday, March 20, 1966
21 mc Band, Telephony Only
1500-1800 GMT

Listen to everything you can hear on Phone
(either AM or SSB) during this period, and send
in your list of stations heard with your next
letter to “SWL”. Do not log Europe, or the East
Coast of U.S.A. and Canada. Logs should include
(a) Time GMT; (b) Station Heard; (c) RS
Report; (d) Station being called (or CQ).
Mark the log plainly “Second SLP” and address it
to “SWL,” SHORT WAVE MAGAZINE, Buckingham.
the only cure I know (a bang on its side) doesn't work” (Trevor Pinch, Plymouth) . . . “What would be the point of hearing rare DX without all the lids, creepers and Heavy Brigade? The main satisfaction is picking it out from all the clutter” (James Brown, Llandaff).

Top-Band Interest

There are some who look on Top Band as “kid's stuff” and “old hat”; on the other hand some find that it has a fascination of its own. For instance, D. H. Foster (Rainham), when he was surprised to log two ZB2's—ZB2AJ was R4, S6 on SSB. And Steve Wilson (Ossett) says “I am so interested in Top Band that I am getting rid of my old gear and completely rebuilding. New receiver (probably CW only and 160m. only), new aerials, a new ATU, and when I shall be building a Tx, too, as R.A.E. comes up in May.” He has an idea for the receiver of using an IF of 1630 kc, with four crystals in cascade to give a really sharp notch. (This really sounds like business for CW only . . . he has already logged ten W8's, two VO's, one VE, two ZB2's and about 50 OK's, together with many other Europeans.) Yes, Top Band can really become an obsession, once you get in tune with it. Unfortunately so few of our readers can cope with CW that a Top-Band SLP would be a waste of time and only attract about six entries, one fears. What a good thing it would be if the authorities brought back the rule which kept new licensees on CW only for the first twelve months. (And now we'd better build a shelter to retire to when next month's mail comes along.)

Steve Wilson also brings up the subject of blatant pirates on Top Band, including a “VK” at 599, and EA11K, calling himself “Radio Madrid,” running 14 kW and refusing to work amateurs. In true Spanish style, he called them “twits” and would not move off the frequency!

Nine-Hundred Plus

The 900 figure has been broken at last, and on top of the HPX Ladder is Terry Popham (Exeter), now with 909. He reports that “the 21 mc band is terrific, especially for African DX, at most times of the day—in particular the late afternoons.” A lot of the Exeter local activity has been transferred to Four Metres, so he has now got to get busy down there; and the local club is looking forward to a lecture on D/F Operating, so that's another line to pursue.

John Fitzgerald (Great Missenden) is now at Birmingham University, which curtails his listening hours, but the University Radio Society's station, G3JUB, is being renovated and . . . need we say more? He found (from home) that Fifteen was excellent, and noted the way VK2NN gets through when no other VK's are around (he has a rhombic set for the U.K., by the way). SWL Fitzgerald also reports that the stations in the Algerian Sahara now have a separate prefix and sign 7X6 instead of their former 7X3.

DX—TV Results

The real rip-roaring season for sporadic-E tropospheric and other abnormal forms of propagation is not yet with us, of course, but there have been some freak VHF conditions which have enlivened DX-TV reception. Frank Smales (Ponteefract) made good use of the opening on December 11, and logged, among others, Tallinn (Estonia) on Channel R2; Stalingrad (R1); West Germany—various stations—(E4); TVE-Espana (E2); Stockholm (E2); Ostrava (Czechoslovakia) on E3; and a “mystery” station on E2, later identified as Cyprus. As Channel E2 corresponds with a BBC sound channel (48-25 mc), this is a little difficult!

On January 6 there was also some good reception from Europe on Bands III, IV and V. Frank Smales now has a UHF pre-amp, kindly sent him by fellow-enthusiast Roger Bunney (Romsey), so is hoping for interesting things to come.

Meanwhile Dennis Boniface (Ripon) also used the December 11 opening to cover much of Europe, and received the BBC from Crystal Palace on UHF, also Lille on Channel 27. For UHF he has a 23-e aerial through a two-valve tuner into a Bush TV-53. He has logged 79 stations in 21 countries. Final word—"If any SWL's want to start up on DX/TV,"

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</table>

DX-TV Results

(just a reminder of listings included in this issue. Failure to report for two consecutive issues of "SWL" will entail removal from the table. Next list, May 1966 issue—deadline April 1.)

TVE-Espana

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the time is now. Don't wait till the season starts, or you will miss some good DX. All that's wanted to start with is an old five-channel BCB-only set, and a single dipole." And letters to him on this subject, at 11 Holmefield Road, Ripon, Yorkshire, will be welcomed.

Yet another recruit to this branch is Trevor Brook (Effingham), with a renovated Sobell T-278 and a 4-metre beam, which proved its worth on January 4 and 5 with stations from all over the country on Channels 2 to 13, and a French station on Channel 7.

Plenty on Twenty

Willfred Smith (West Bromwich) reports quite a lot of rare prefixes on Twenty during the past month, and adds "last weekend I heard 28 JA's, 13 KA's and 34 VK's, so that area has been excellent." And now he's all set with a two-valve preselector. D. J. Mortimer (Gloucester) likewise has a goodly list on Twenty SSB, but says his future projects include a preselector to improve his CR-100 on Fifteen and Ten—and also an attack on the CW problem—but with finals coming up in June, he's subject to heavy QRM.

P. D. G. Milloy (Doncaster) parted with his old receiver to a school friend, and now is landed with an HRO with only one coil—and Top Band at that! Others are on the way, though, and hopes of more DX. John Daws (Leeds) has swapped his $640 for an AR-88LF, and has put up a dipole for 7 and 21 mc. On 7 mc he has heard 4X4, UL7, SU, ZC4, PY's and W1-4, which makes a good start; this is on CW, of course, and he remarks "Forty is certainly not the beginners' band for CW." Although he says he is quite happy as an SWL, he is "gradually turning towards R.A.E." and may have a go this year, A-Levels permitting.

Deputation

Three SWL's, Dave Bailey and Bill Baker (Dagenham) and George Mansbridge (Basildon) write a joint letter, mainly to make a plea about commercial QRM and the need for action by all amateurs. They say "Sort out those stations from countries who were in the Geneva Convention, and complain unceasingly about their piracy. And then use the power of numbers." They also suggest that Forty might well be made a CW-only band—as CW all over the band might cause a few head-scratchings about the pirates. (We rather doubt this, though—they are mostly listened to in areas where their signals are overpoweringly strong, and a couple of hundred amateurs on CW would be only a fleabite). But keep on griping—that's the main idea of their plea!

(They also ask whether the dates of the regular meteor showers are available, for the benefit of SWL's who are keen on Two Metres . . . we have not got these to hand in time for this instalment, but will dig them out as soon as possible.)

Finally, two sad complaints from James Brown (Llandaff): First, "I took my first paddle into Twenty last week, with an RF-24 unit . . . I quickly went back to Eighty." Secondly, the old, old story: "Although I am drenched in Amateur Radio, I find other people rather unsympathetic . . . I've just lost a girl-friend through my continual nattering about a new type of tripole I've invented!"

The Second SLP

We have fixed the next Set Listening Period for the afternoon of March 20, since that date allows plenty of notice after this issue has reached you, and also ample time for your logs to catch the deadline of April 1.

The band chosen—and we only hope it will be well open by that time—is Fifteen Metres, and the time 1500-1800 GMT. Phone stations only, whether AM or SSB, anywhere in the band. As before, no East Coast U.S.A. or Canada, and no Europeans.

Please send your loggings on a sheet separate from your letter—this is important—with name, QTH, and list of stations heard in alphabetical order of prefixes, giving time, RS report and station (or CQ) being called.

We hope the choice of time and band will work out successfully, but remember—mediocre conditions are liable to make it more interesting than just a wide-open band on which everyone logs scores of DX calls.

So with that we leave you once again. Remember the date for the SLP (March 20) and for the next deadline (April 1), and may all the bands turn up something interesting for your listening. Good Hunting!

Next appearance of this feature—May 1966. All correspondence and photographs (of SWL stations and equipment) by April 1, addressed to Editorial Department, Short Wave Magazine, Buckingham, England. Head the letter "SWL."

MARITIME MOBILE LICENCES

We are informed by the Post Office that /MM permits are now available for the 10-15-20-40m. and two-metre bands. Applicants must hold a current U.K. licence, and all enquiries are dealt with through the Radio Services Dept., G.P.O.
AMATEUR RADIO IN THE U.S.S.R.

From Notes by G3KPT

For a period of 44 days during August-October of last year, G3KPT was in Moscow on business and managed to make contact with a number of local amateurs. A visit was paid to the Moscow City Radio Club and the QSL Bureau, the famous "Box 88."

Like radio amateurs the world over, the Muscovites answered as well as asked questions quite freely and openly. G3KPT found himself very warmly received, and some 15 or so licensed operators in the Moscow district were met personally, and much information exchanged.

Amateur licensing conditions differ considerably from those obtaining in the United Kingdom, and some details are given herewith.

Licence Groups

Ultra Short Wave

Operators from 16 years old:
28 mc and all amateur frequencies above;
three classes of licence:
Class 1—200 watts on 28 mc.
40 watts on 3-5 mc SSB,
5 watts on 144, 430, 1296 mc.
Class 2—40 watts on 3-5 mc SSB,
40 watts on 28 mc,
5 watts on 144, 430, 1296 mc.
Class 3—5 watts on 28, 144, 430, 1296 mc only.
All telephony only.

Short Wave

Operators from 18 years old:
Class 1—200 watts on all amateur bands for Al, A3 and SSB,
5 watts on USW (144 mc up), RTTY on specified bands.
Class 2—40 watts on 80-40-20m., A1, A3, SSB on 80m.,
5 watts on USW, RTTY on specified bands.
Class 3—10 watts on 80 and 40m.,
SSB on 80m.
5 watts on USW.

Club Ultra Short Wave

Operators from 12 years old.

Club Short Wave

Operators from 14 years old.

The Moscow City Radio Club has approximately 2,000 members; around 7.8 per cent are females. It is divided into four sections: USW, SW, D/F and Construction. Test equipment and apparatus are donated by Soviet institutes and the Services.

All would-be amateurs are examined in theoretical knowledge orally and in a written paper by a group of licensed amateurs. The Morse test is also conducted by licensed operators. Three-letter calls starting with K are club stations.

Other three-letter calls are those issued under the USW group. Two-letter calls are those issued in the SW category. All SWL's may be registered after the age of 12 years.

You may hear U.S.S.R. stations working between themselves using a different CW code; this of course is essential if they wish to converse in Russian.

UW3HR and UW3AX intend to apply for Top band permits. Apparently this is possible—and a word of warning here: The Russians lost 160 metres because of lack of activity!

VE3UC, VE3BUL and VE3BZA were also in Moscow around the same period, and they also managed personal contacts with the Russian boys.

There is no commercial Amateur Radio equipment available in the U.S.S.R., so the accent is on home brewed rigs. The standard of design and construction appears to be pretty good, too.

It would seem that radio periodicals sent direct to private persons in the U.S.S.R. are accepted as they stand, although the writer understands that those entering through official channels (for libraries and technical schools) are photostated selectively and a selective distribution is made. Advertisements tend to disappear in this process!

G3KPT

RUSSIAN CALL AREAS

UN1, UAl, UW1, UV1
UA2, UP2, UQ2, UR2, UC2
UA3, UW3, UV3
 UA4, UW4, UV4
UB5, UT5, UY5, UQ5
UA6, UW6, UV6, UF6, UD6, UD6
UG6
UL7
UJ8, U18, UM8, UH6
UAl, UW9, UV9
UA0, UW0, UV0
UN, UA, UW, UV
UB, UT, UY
UC
UD
UF
UG
UH
UI
UJ
UJ
UL
UM
UM
UA
UA
UAIKAE
UAIKED
NOTE: There are further sub-divisions, by the figure in the prefix, within Regions.

INDEX—Vol. XXIII

Every copy of this issue, the start of a new Volume, should contain, as a free Loose Supplement, the Index to the Volume just concluded. Any reader who may find his has been missed can obtain one on request with a large stamped addressed envelope.
**OBITUARY**

It is with deep regret that we have to record the passing of:

---James Norman (Jerry) Walker, G5JU, of West Heath, Birmingham, on January 30, at the age of 60. His death came as a great shock to his many friends and colleagues, not only in the amateur context, but also in the radio industry—for, as Eddystone's technical sales engineer for 20 years, he was a well known and welcome figure all over the country. As an amateur, G5JU was keen and active in the whole field of Amateur Radio, from Top Band to VHF—indeed, he was one of the handful of pioneers on five metres in pre-war days—and he will also be remembered as a prolific contributor to SHORT WAVE MAGAZINE. He was typical of the keen and intelligent "professional amateur"—because radio communication was part of his being, he was able to do a first-class job as a business man, and at the same time he could use his amateur interest as a relaxation. Jerry Walker served in the R.A.F. during Hitler's War, and came out as a squadron-leader, having had considerable responsibilities as a Signals officer concerned with radio-countermeasures—and by the time he left the Service he had 500 operational hours in his log-book. His widow, his daughter, his three sons, and his brother G2WO (Stevenage) will have the sincere condolences of all who knew G5JU. And for nearly 40 years he was a good friend of the writer of this memorial. A.J.F.

---William Squires, GW3IYI, of Bryn, Llanelly, on January 6, the son of Mr. and Mrs. J. Squires, of 53 Penllwyngwyn Road, Llangennech, Llanelli, Carm.  

---Norman Jones, G3JVI, of Bishop's Stortford, Herts., a founder member of the Harlow & District Radio Society, who had been blind since boyhood. He died on January 15 after a long illness.

---Anthony Stimson, G3RKY, of Harrogate, Yorkshire, on January 17, at the age of 61. He was an engineer with wide interests, from radio to music, and during Hitler's War was commissioned from the ranks. At his death, he was an official of Harrogate Corporation, in a post he had held since 1939.

---Edward Moor, G2CIP, of Southport, Lancs., aged 46 years. He was a keen member of the Ainsdale Radio Club and came of an Amateur Radio family, in that he was the son of G2AG, Bournemouth.

---Peter Birks, G3FBQ, of Stoke-on-Trent, Staffs., who died suddenly on February 10, at the early age of 37 years. He was in the radio/TV business in the Newcastle, Staffs., district and had helped many locals to get their licences.

**WHERE DO WE GO FROM HERE?**

**THOUGHTS ABOUT MOBILE RALLIES**

SYLVIA MARGOLIS (xyl/G3NMR)

Our authoress is well known as an enthusiastic worker on the social side of Amateur Radio. With a nice style of her own, she has succeeded in making the Amateur Radio Mobile Society and her "Mobile News" quite a factor in the contemporary scene. Asked to comment on how we now stand in the Mobile Rally context—after ten years of JM rallying—what she says here, on the opening of the new season, will be of interest not only to those responsible for Rally organising, but also to those who attend them.—Editor.

Just over a hundred years ago a mathematician named Charles Dodgson, lazing on a river bank near Oxford on a hot Summer's day, improvised a story to entertain three little girls. Did he know, when he first sent Alice down the rabbit hole, that he was to write the most famous of all children's books? And in that same Alice-in-Wonderland Oxford, in 1955, did the man, who thought that a gathering of "mobile" radio amateur enthusiasts might be amusing, know just what he was starting? They chose the Perch Inn at Binsey—just outside Oxford. This was such a very small, esoteric group that only a very small room was booked for tea. For little could come of this new bizarre technique! (It was reported in the November, 1955, issue of SHORT WAVE MAGAZINE, and was the first /M Rally report ever published, in any Amateur Radio periodical.)

The tenth anniversary of that first mobile rally was celebrated with another Rally last summer in Oxford. How far had we come since 1955?

The location for the Anniversary Rally was pleasant and efficient. There was little organised entertainment. But those who came—and many came—did so in the spirit of nostalgia, rather than seeking diversion. Expecting little, they went away quite happy at the end.

Ten years is a hefty slice of Amateur Radio's fifty-odd and this had been as hectic a decade as it had ever known. Since 1955 we had seen the ever-growing interest in mobile operation, the increasing popularity of SSB, great strides in VHF and satellite techniques and, just as significant, the inexorable advent of commercial equipment. Each innovation generated its own chain reaction of pontification, dogmatism and pompous burblings.

In 1965 an attempt was made to round up as many possible of the original amateurs who had been at Binsey, to photograph them. A little greyer, a little heavier than before; slightly sheepish, for the Englishman is mighty embarrassed at any public display of sentiment. If this had been France there
would have been processions, flags a-flying, kissings-on-both-cheeks, a military band and wine. None of that here, except for the wine—raffle prizes of Spanish Sauternes, heaven help us! There was a lot of shuffling to be decently inconspicuous, the inevitable jokes about breaking the camera and QSY-up-the-frequency and the image was recorded.

How will that picture look in another ten years' time? Rally organisers are continually asking Where Do We Go From Here? Rallies have become huge, sophisticated events, lavish with entertainments. They vie with each other to provide more elaborate attractions and unusual locations. Service bases, airfields, factories, stately homes, with all manner of films, lectures, competitions, exhibitions and demonstrations—so far no Amateur Radio event has taken place in Wembley Stadium, not in a Royal Park, but the peak must surely have been reached last year when the Amateur Radio Mobile Society collaborated with the Red Cross on an occasion which drew several thousand people, where a pageant with a cast of over 150 players was only part of a programme which included three bands, Scottish dancing, Army displays, flower and baby shows, tombola, bingo, dancing and a barbecue!

Shape of Things

Organisers agree on only one firm principle. Experience proves that the British radio amateur deplores competitive events, particularly when they entail further driving after the ordeal of negotiating Summer-Sunday roads. This is vividly, and shamefully demonstrated when G's have attended Continental events.

European rallies nearly always involve fierce technical and achievement contests, on the car-rally plan, no holds barred, where the competitors play to win. British visitors inevitably come at the bottom of the list because they will not go to a rally to work. They want to enjoy themselves.

So the London SSB Dinner, when people flocked in from 27 countries to attend an evening which had to cost nine or ten pounds a couple, was a huge success. Large numbers of Britons, too, attended the 1965 nosh-ups at Knokke and Geneva, both sophisticated and expensive. But whether the radio amateur is drinking Bollinger '59 or Truman's Brown is immaterial. The wonderful annual Barnet Party, six bob and a buffet supper thrown in, is always crowded. There are no contests, no concours d'elegance, no safety or building competitions—all that is provided is an excuse for people to get together and talk.

Lately there has been a tendency to run these purely social occasions. The reason for their success is two-fold.

Of all hobbyists the radio amateur is, by the very nature of his hobby, immensely articulate. He likes to talk. Some, of course, who prefer CW, like to tap. When he goes to a rally where little is demanded of him except to enjoy a pleasant location, he can meet his cronies and rag-chew in peace, putting a face to a voice that has been only a callsign for years.

Proof of this is to be found at Woburn, Barford, Longleat, Derby, all big events. At Barford, with an attendance up in the second thousand on a fine day, the technical contests which the organisers feel ethically bound to provide attract, perhaps, a dozen entries.

The social event scores, in the second place, over the purely technical event, because of its appeal to the amateurs' wives, who can imagine they are at an ordinary party, not a symposium on advanced electronics. And, let's face it, women are here to stay.

First, then, an attractive location. And local knowledge, which is an immense asset if our rallies are to improve and not regress—the committee member who is a Rotarian or local big-wig can put the black on those who can provide all kinds of attractions. Another gimmick is to hitch your wagon to the bigger star, like that Red Cross event. All you need is to set up your talk-in stations—and bingo!

Publicity Factor

A great asset, which can now be exploited to the full, is reciprocal licensing. Judicious publicity at U.S. Bases and in overseas publications can bring not only an increase in attendance, and the resultant lolly, but spices up the mixture-as-before with overseas visitors.

Publicity, of course, is one of the main secrets of the successful rally and an element which is sadly neglected by the inexperienced. The Amateur Radio press will collaborate, provided they get the information in good time and that it is properly presented. A few, illiterate, scrawled words on a page torn from an exercise book is hardly likely to induce a professional Editor to give space to a Coming Event. The voluntary periodicals are usually only too glad of the extra copy that a detailed write-up will provide. Local newspapers will help and most public libraries will permit the display of posters. A notice (competently written, too, please) to the nearest British or American Service base—addressed to the Entertainments Officer—often gives gratifying results. Local schools and youth clubs are glad to be kept in the picture.

All this assumes that success depends on large attendance. We once went to a dreary, never-repeated affair in Kent. They foolishly asked what I thought of it and I told them, but prettily, and they said that their rally had never been intended to attract a big crowd, but to appeal to a small, select group of experts! (Go away—this is my pub and I'm going to drink all the beer in it!)

One clear fact emerges and the organisers who ignore it might just as well go home and look for Don Miller. All the fierce effort put into Mobile Rallies is destined to attract and please that capricious, terrifying, omnipotent, demanding and sinister figure, who hovers continually in the radio amateur's conscience, ready to pounce and make him feel guilty—his Wife!

What do these fearful women really want? Recently I wrote in Mobile News:

"Engage the Beatles and the Royal Marines Band, give a Rolls Royce as a prize and hold the thing in the gardens of
Buckingham Palace—and somebody will be bored, offended, peeved or won't be able to find the lavatory..."

I talked to them at Oxford. One woman had come along for the ride. A harassed Mum was determined her husband shouldn't dodge his Sunday chore of taking the kids off her hands; so the whole family had come, enjoying this Sunday afternoon like a wet Monday morning. One woman thought there should be a cookery demonstration. I invited her to work with me on a committee and, herself, get the demonstration laid on. She disappeared, sharpish-like. Another wife wanted to know why her spouse no longer came home every night. Was it my business to tell her?

The same characters appear at every Rally. The faces may change but the dialogue and action don't. There is the type who comes not only prepared for boredom or personal slight, but who goes to look for it. Ostentatiously detached, she reads her newspaper. Then there is the Never-let-it-be-said-I'm-not-a-staunch-companion-to-him Brigade, bringing to the rally that same joyous enthusiasm that they would contribute to a cervical smear session. And there is the "nit-picker." If there's a raffle, she wants a tombola; she saw the beauty demonstration at last week's Rally; she can't go in for the fashion competition because she left her glasses at home and that police dog has a nasty look in its eye.

But there are, too, those precious few sensible wives who admit that Amateur Radio is the finest of hobbies—that with it their husbands are happily and healthfully relaxed—that there are far worse ways for a man to spend his spare time and that Amateur Radio is as rewarding a social sphere as any. They enjoy the Rallies. They meet their friends, gossip, make gentle fun of those eternal boys, arrange to have dinner together at the Communications Exhibition, and who is that gorgeous man over there?

To rally organisers—find a couple of these unique females, appoint them to your committee and you are home and dry.

THE MOBILE RALLY PROGRAMME

The dates are filling up rapidly, and below is the latest listing. As in previous years, we shall give some general information (where it is supplied) about each event, and organisers are specially asked to get their paper-work through to us in proper time—by March 12 latest for the April issue.

March 20: RSGB booking (no details).

April 24: North Midlands Mobile Rally, at Trentham Gardens, near Stoke-on-Trent, on the A.34, with Bob Palmer, G5PP, as chairman of the organising committee. This is always one of the biggest Rally events of the year, with an exhibition section, closed-circuit amateur TV, an RTTY demonstration, fully licensed catering, ample parking on hard standings, and plenty of covered accommodation in case of bad weather. The talk in will be by G3GBU/A on 160m. AM; G3COY/A on 80m. SSB; and by G3MAR/A on two metres. For any enquiries or further details, write G5PP, QTHR.

April 24: RSGB booking (no details).

May 8: Thetan Mobile Rally.


May 30 (Whit Monday): Saltash Mobile Rally, Cornwall (details later).

June 12: RSGB booking.

June 26: Hunstanton (Norfolk) bucket-and-spade party. Details from J. G. Taylor, G3SAW, 42 Station Road, Heacham, Kings Lynn, Norfolk.

July 10: Wessex Amateur Radio Group Mobile Rally at Hurn Airport, near Bournemouth, in conjunction with the British Aircraft Corporation Radio Club. There will be plenty to see and do, as this is also the B.A.C. Open Day. For information apply: W. G. West, G3MKN, 23 Palmer Road, Poole, Dorset.

July 10: South Shields (Co. Durham) Mobile Rally (details later).

July 17: Worcester & District Amateur Radio Club Mobile Picnic (details later).

August 29 (Bank Holiday): Peterborough Mobile Rally.

September 11: RSGB booking.

September 16-18: International Amateur Convention and Mobile Rally at Knokke, Belgium, with three-day programme of meetings, demonstrations, parties and tours, at all-in prices. Further details later. U.K. amateurs can obtain full information in due course from: J. C. Foster, G2JF, Wye College, near Ashford, Kent.

September 25: Harlow Mobile Rally.

SPECIALY ON THE AIR

This space is available to Amateur Radio groups and societies intending to put a station on the air for the public gaze. This is always an important and worthwhile undertaking, because one of the things we have to do is to explain Amateur Radio to the mass of the people. Please set out your notice in the general form shown here, with full details.

GB3LRS, April 20-23: At the Hobbies Exhibition, Granby Halls, Leicester, where the Leicester Radio Society will be operating an AM/SSB station on 15-20-80 and 160 metres. The QSL address is: J. Ball, 45 Bryce Road, Leicester.

GB3PAS, July 19-21: At the Peterborough Agricultural Show, running 80m. and other bands as conditions allow. Address for QSL's and other details: D. Byrne, G3KPO, Jersey House, Eye, Peterborough, Northants.
NEW QTH's

EI4BB, B. Daly, 20 Captain's Avenue, Crumlin, Dublin, 12.
EI6BB, W. F. M. Hahn, Skerries, Co. Dublin. (QSL to G3UOL, QTHR.)
G8AMF, K. W. Fowler, 30 Somersete Avenue, Exmouth, Devon.
G8G6S, R. Trevitt, 28 Delves Avenue, Tunbridge Wells, Kent.
G3UZL, W. Mansfield, 7 Carnegie Hill, East Kilbride, Glasgow.
G3UWD, E. G. Thomas, 3 Landor Avenue, Killay, Swansea, Glam.
G3UWU, W. Mansfield, 7 Carnegie Hill, East Kilbride, Glasgow.
G3U6YD, E. T. Clarke, 34 Pitman Close, Basingstoke, Hants.
G3UXY, H. J. Groves (ex-ZD2HHG/5N2HHG/VPTNY), 76 East Road, Langford, Biggleswade, Beds.
G3UZF, A. J. Green, (ex-G8AEK), 178 Long Chaulden, Chaulden, Hemel Hempstead, Herts.
G3UZL, F. A. Cook, 120 Hulham Road, Exmouth, Devon.
G3UZM, C. P. Haddock, 12 Seymour Avenue, Exmouth, Devon.
G6SSE/T, R. Trevitt, 28 Delves Avenue, Tunbridge Wells, Kent.
G8AKI, J. T. Eden, 14 Broadwell Road, Solihull, Warks. (Tel. SHE 7321.)
G8AMF, K. W. Fowler, 30 Somerset Avenue, Draycott Park Estate, Rugeley, Staffs. (Tel. Rugeley 2074.)
G8G6S, R. Trevitt, 28 Delves Avenue, Tunbridge Wells, Kent.
G3U6YD, E. T. Clarke, 34 Pitman Close, Basingstoke, Hants.
G3UXY, H. J. Groves (ex-ZD2HHG/5N2HHG/VPTNY), 76 East Road, Langford, Biggleswade, Beds.

CHANGE OF ADDRESS

E1SP, P. J. Fitzsimons, 27 Sweetmount Park, Dundrum, Dublin, 14.
G3AFG, R. L. Edginton, (ex-ZC4GF/5B4GF), 8 Springfield, Ashby Gardens, Kegworth, Derby.
G3BG, N. M. Button, 31 Gold Street, Hanslope, Wolverton, Bucks.
G3WBC, H. M. Syne, Pass Draw, Ruthin, Denbighshire. (Tel. Ruthin 2917.)
G3CM, J. A. Scott, 24 The Grove, Potters Bar, Herts.
G3DPI, A. E. Smith, Westering, The Drive, Ifold, Loxwood, Sussex.
G3ESV, Rev. F. Ness, 24 Bowling Green Road, Castle-town.
G3H4LW, D. A. Pilley, 27 Oxted Road, East Grinstead, West Sussex.
G3IOA, A. B. Langfield, 201 St. Mary's Road, Moston, Manchester, 10. (Tel. FAllsworth 5406.)
G3JWZ, A. Rowley, 6 Woodrow Way, Ashley, Market Drayton, Salop.
G3LB, A. R. Yates, Kangel Acre, Littlethorpe Road, Ripon, Yorkshire.
G3MKU, A. F. Bower, 82 Anson Road, Shepshed, Loughborough, Leics.
G3OAZ, I. Akehurst, (ex-DL2VM / SA4TZ / DL2BC / GW30AZ), 2-A Downs Avenue, Eastbourne, Sussex.
G3OHX, I. Jackson, 9 Lothian Avenue, Hayes, Middlesex.
G3PEX, L. France, 15 The Green, Trefechan (Breconshire), nr. Merthyr Tydfil, Glam.
G3PJP, P. I. Park, Kranji, South Street, Minlaw, Aberdeen.
G3RE, C. F. Peers, 21 Abbotsbury Gardens, Eastcote, Pinner, Middlesex. (Tel. PINer 6959.)
G3RG, P. J. Toynot, Wildhern, Old Mead Lane, Henham, Bishops Stortford, Herts.
G3RLF, D. J. Price, 8 Newland Road, Droitwich, Worcs.
G3RSI, I. Trays, (ex-GM3RSI / G3RSI / 5A3CD / ZC4AK / SA2CV), 2 Sgdn., 5 Flight (Radio), No. 32 Maintenance Unit, R.A.F. Station, St. Athans, Barry, Glam.
G3TRW, D. H. White (ex-DL2DW/G3TRW), 13 Ar-Y-Bryn, Pembrey, Carmarthenshire.
G3TYG, B. D. Winslow, 18 Sycamore Drive, Twyford, Reading, Berks. (Tel. Twyford 533.)
G3UAF, P. Parker, 23 St. Michaels Close, Rough Common, Canterbury, Kent.
G3U0I, J. C. Firby, 7 Salisbury Avenue, West Lane, Baildon, Shipley, Yorkshire, W.R.
G3U0V, D. M. Cliff, 49 Derby Road, Belper, Derbyshire.
G5UF, P. H. Trafford, 32 Queens Road, Banbury, Oxon. (Tel. Banbury 2283.)
G6OG, F. Gee, White Cliffs, Dean Swift Crescent, Lilliput, Poole, Dorset. (Tel. Canford Cliffs 79460.)

AMENDMENT

GC8MF, T. de Putron, Green Acres Hotel, Les Hubits, St. Martin's, Guernsey.

“Short Wave Magazine” covers the whole field of Amateur Radio, has been established for nearly 30 years, is independent and unsubsidised, and circulates in 80 countries outside the U.K.
THE OTHER MAN’S STATION

THE station of G. W. Lawrence, G3RLI, is established at 44 Elizabeth Road, Leamington Spa, Warwickshire. Himself an ex-operator, Royal Signals, he says he wishes he had taken out an amateur licence long ago, and “regrets the lost years”.

Basically, the equipment consists of a K.W. Vanguard for 10 to 80 metres, with a CR-100 as receiver. The latter has been considerably souped-up by the addition of an S-meter, a Heathkit Q-multiplier, a converter for the amateur bands, and a facility for sidetone monitoring. The ancillaries include an SWR meter, a Raymart band checker/monitor, a band-edge marker with 100 kc crystal oscillator, a straight pump-handle key, and a Jap xtal microphone.

Outside, the aerial system involves a full-size multi-band doublet, a Mosley trap vertical, a 20-metre ground plane, and a Quad for 10 and 15 metres.

Naturally enough, the operating preference at G3RLI is for CW on the HF bands, but telephony is worked on 80 metres at weekends. Though G3RLI says he would like to go QRO, he feels that the right line to take is to improve the antennae to make the most of the power he has got. Eventually, of course, he will be going SSB. In the meantime, he has a neat and effective station.

Readers who follow this feature are reminded that we are always glad to see suitable contributions—the primary requirement is a good, clear photograph accompanied by full descriptive notes.

This means not only a run-down on the equipment in view, but also such personal details as are acceptable for publication—what your amateur operating interests are, what you do for a living, how much (if any) of your gear has been built from SHORT WAVE MAGAZINE articles, when you were first licensed, and how you acquired your first interest in Amateur Radio. All this can be expressed in “own words”. We write the story round the picture, and payment is made at full space rates, on publication. We do not mind whether you are an old timer or a new timer, or whether you have been licensed for 30 years or three months. What we want to know about is the gear you use and your personal interest in Amateur Radio, and how you got started. Send your story, with a good picture, to: Editor, SHORT WAVE MAGAZINE, Buckingham.

CORRECTION NOTE—“Control Circuit for Quick Change-Over

In this article in our February issue, it should be pointed out that the relay RLB ought to have been specified as “with two normally-closed contacts and four normally-open,” and that in the circuit the contacts RLB/4 should be shown as normally-open. It might also be added that multi-contact relays can usually be adapted (by alterations to the contact mountings) to give any motion required.
THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for April Issue: March 11)

(Please address all reports for this feature to "Club Secretary," Editorial Dept., Short Wave Magazine, Buckingham.)

ONE of the most remarkable features of the Club scene, noticeable over the last five years or so, has been the enormous growth in the number of Club publications reaching us each month—every local group now feels that it should be putting out some sort of a newsletter. They come in all shapes and sizes, and one often wonders whether one can judge the nature of the Club itself from that of its published effort.

On reflection, this seems improbable, since so many of these newsletters-cum-magazines depend so very much upon the effort of one individual, or a small group of members. Among these, certain Clubs may even have a local professional journalist who helps the thing along as a labour of love, while others are unable to free themselves from the slavery of an ancient hand-duplicator (which has seen better days) and a few willing but inexperienced amateurs who feed in the material.

Taken all in all, between them they cover much of Amateur Radio interest, and one who had the time to read and collate every word in every such publication would indeed be a real gen-man.

This whole manifestation is a very healthy feature of the Club movement, and long may it continue. We can only hope that those who spend much time and trouble in the production of local newsletters are duly appreciated. On the average, we should say that for every one enthusiastic and dedicated Club member, there are between 20 and 50 more or less apathetic types who are just willing to "go along," without being keen to take any active part. (However, without their subscriptions most Clubs would be in a bad way, so they have their uses, too!)

A Club periodical is surely a useful way of getting at these non-productive members, and we are glad to see that this is becoming recognised more and more. So—if you run any sort of publication—don't be afraid to come out with some strong opinions. Nothing is as interesting as controversial stuff, nothing as boring as platitudes on which everyone agrees.

ACTIVITY REPORTS

Basildon report a most interesting talk by G3DGN on Communications by Light at their February meeting; on March 24 they will hold a Junk Sale in the restaurant of the "Van Gogh," Paycocke Road, Industrial Estate, Basildon, first lot to be auctioned at 8 p.m. All are welcome.

Clifton hope to have a demonstration of a transistor SSB exciter on March 11. Recent meetings have included a Junk Sale and a talk on Air Traffic Control (with slides and recordings) by G3TR of the Crawley Club. Action, Brentford & Chiswick held their AGM and elected G3IGM chairman, G6RC vice-chairman, and G3GEH secretary, treasurer and press agent—he is the chap who does the work! On March 15, 7.30 p.m., there will be a discussion on Power Supplies (at 66 High Road, Chiswick).

Mid-Warwickshire, at their AGM, reported a very successful fourth year of activity, but they enter their fifth determined to increase the membership and improve the financial basis thereby. On March 7 they have a Mullard Film Show, and on the 21st G3LJW will talk on Using an Oscilloscope. April 4 is booked for a visit to the Leamington Telephone Exchange.

Basingstoke held their Annual Dinner on January 29, and report that it was enjoyed by all present. On March 12 (at 7 p.m. in the Immanuel Hall, Wote Street), G3MED will be talking on SSB. York also held an AGM, and elected new officials (see panel for new secretary's QTH). They now meet every Thursday, 8 p.m. at the British Legion Club, 61 Micklegate, York.

Bedford, yet another AGM and another new secretary (see panel). This Club meets at Westfield School on the second Tuesday and the fourth Thursday at 7.30 p.m. (except during school holidays and half-terms). West Kent will discuss NFD plans on March 11, and will hear a progress report on the Club's constructional project on March 25. April 15 is the date of their AGM. They will welcome new members "especially youngsters who are just getting interested." Local SWL's and beginners take note.

Chester have a full programme for March, with a Net Night (160 and Two) on the 8th; a lecture by Mr. Gray of the G.P.O. on the 15th; a Junk Sale on the 22nd; and a talk on the "Two-metre Quick-starter" by G3UWV on the 29th. All meetings are on Thursdays (except the first in the month) at the YMCA, Chester, 8 p.m.

Weston-super-Mare will be meeting on March 4, 8 p.m., for some instruction in Model Control. On April 1 (same time) the subject will be Hi-Fi and Stereo. Bristol will be hearing about Receiver Alignment from G3OUK on March 24—7 p.m. at 41 Ducie Road, Barton Hill, Bristol, 5.
Chiltern will be conducted “around the shacks” on March 31—not by car or on foot, but through slides shown by members, who will describe their own equipment—British Legion Club, St. Mary Street, High Wycombe, at 7.30 for 8 p.m. Dorking drew up a full programme for 1966 at their AGM, and contemplate forming a special section in the Club for junior members.

Civil Service, meeting in the Science Museum, will hold an Informal get-together on March 15. On March 1 they were due for a lecture by Mr. A. Nash (Cosmocord, Ltd.) and demonstration on Piezo-Electric Devices. Echelford will hold their main meeting on March 30 (at the Links Hotel, Fordbridge Road, Ashford, Middx.), when Mr. B. Ayres will be demonstrating the HRO-500 and other receivers. This event will start at 8 p.m.

A new Club, known as the Dynamics Group, has been formed among employees of Hawker Siddeley Dynamics, Ltd., Coventry. They hope to have a station on the air shortly, and projects include Amateur TV, satellite working, and moon-bounce communications—quite a programme! But then, they have the facilities.

Derby will have an Open Evening and Committee Meeting on March 9; on the 16th there will be a Film Show; and on the 23rd a group of members will visit the local Telephone Exchange. They held their AGM on February 2, and the Annual Dinner and Dance on February 12.

Loughborough announce a Junk Sale on March 11, a Film Show on the 18th, and a Night on the Air on the 25th. Torbay will have their Annual Dinner and Social on March 12, at the Telplestowe Hotel, Torquay.

Magnus Grammar School have arranged their programme up to Easter, and report that G3UVT and G3UYU (a newly-licensed member) will have the Club station G3PAW on the air most lunch times. Arrangements are in hand for a visit to see an industrial computer in action. Incidentally, in last month’s report, p.756, the “G3TWB” should have read G3UWB. Apologies to both.

Reading, at their AGM, elected G5HZ chairman, H. Hindle vice-chairman, and G2FQR secretary. In view of his past services as secretary over a long period, G3EJA was elected the first honorary member of the Club. Meetings: March 15 (G8AAG on Unusual Tools) and 29th (Wobbulators and ’Scopes). Luton, on March 8, will have a talk on SSB by an invited speaker. On the 16th (Wednesday) they will spend an evening at Tektronix (U.K.) Ltd., at Harpenden. On the 2nd a two-metre converter using surplus valves will be described (with the Shefford Club as visitors) and on the 29th there will be a Junk Sale. The Constructional Contest will take place on April 5.

North Kent will meet for a Hi-Fi Demonstration by Broadway Radio on March 10—Congregational Church Hall, Clock Tower, Bexleyheath, 8 p.m. Oxford University Radio Society will join forces with the Broadcasting Society on March 6 for a lecture on Informational Broadcasting (what on earth is this?); on the 9th there will be an end-of-term talk and discussion, the subjects being low-cost Hi-Fi and Radio Control.

Purley will have a “general natter” with the four-metre Tx on the air on March 4, followed by a Junk Sale on the 18th; April 1 will be another “General Natter” evening. Southgate held an Extraordinary General Meeting in February to vote on their new constitution, full details of which have been circulated in their Newsletter. Future meetings have not yet been confirmed, but there are plans to cover Aircraft Radio, Electronics in Medicine, Licence Regulations and the (inevitable) Junk Sale. All meetings will now be at Parkwood Girls’ School, Wood Green, at 7.30 p.m. on the second Thursday.

Spen Valley are having a talk on Transistorised Transmitters, by the University of Sheffield Radio Society, on March 10; the meeting on the 24th is “to be arranged.” Surrey (Croydon) had talks on an amateur-band receiver and a transistorised SSB exciter at their February meeting. The March event, on the 8th, will be a Junk Sale. Cash and/or surplus gear will be needed for full participation, members are warned. The AGM will be on April 12, which all members should attend.

Swindon will be meeting on March 9 and 23—no details yet, but the venue will be The Deer’s Leap, Penhill Drive. Wakefield report 53 names on their roll, but quite a number do not attend the meetings (and where have we heard that before?). They have an R.A.E. Course, a constructional class, and a full programme up to the time of their AGM in July. Thirteen of their members hold callsigns. Sessions are on alternate Tuesdays (March 15 and 29) at the Ings Road School, Wakefield.

Worcester continue their meetings every Saturday, 8 p.m. at 35 Perdiswell Park, Droitwich Road. They

“...Could we put the old aspidistra in the junk sale, please, Fred...”
report a successful Club Dinner, and announce their Constructional Contest on April 23, and a Mobile Picnic on July 17. Full details from the hon. secretary—see panel.

Sheffield report a number of lively discussions sparked off at their Open Evening at the end of January; on February 4 G3RXW gave a talk on a transistor receiver, and other items of home-buit gear. Meetings continue every Thursday, starting with January—see panel.

Plymouth have appointed a publicity officer (G3SGV) to relieve their hard-working secretary (G3UKJ) of some of his load, and incidentally, to let him get on with his “A” levels! They report that their GB2USA operations brought them some good publicity in the local press, and also that activities over the last two months have been very successful. Their March programme includes an RTTY demonstration by G5ZT, G3LME and SWL Colin Jones.

Peterborough, at their February meeting, saw some of the latest colour films on micro-circuits, transistors and electronics. A special-activity station (GB3JPS) will be run at the Agricultural Show on July 19-21, and their annual Mobile Rally is fixed for August 29. Pembroke will be taking the air on Two Metres from the top of the Preseli Mountains on March 5-6, in the contest. Special QSL cards are being prepared.

Barnsley attracted an attendance of 65 for the Annual Dinner and Dance, a very successful event organised by G3KM, who will also be talking on Stabilised VFO's on March 11. Then, on the 25th, G6LZ will discuss Recent Developments in SSB. Both meetings at the King George Hotel, Peel Street, 7.30 p.m.

Harrow held their AGM in January, and G2TA was elected secretary (see panel for QTH). The March programme includes two Practical Nights (on the

Names and Addresses of Club Secretaries Reporting in this Issue:

| ACTON, BRENTFORD & CHISWICK | W. G. Dyer, G3GEH, 98 Garnersbury Avenue, London, W.3 |
| AINSDALE | N. Harrocks, G2CUZ, 34 Sandbook Road, Ainsdale, Southport, Lancs. |
| A.R.M.S. | N. A. S. Ritch, G3FPK, 79 Murchison Road, London, E.10 |
| BARNSLEY | J. A. Ward, G4JJ, 44 Northgate, Barnsley |
| BASILDON | C. Roberson, G8AAO, Milestone Cottage, London, W.15 |
| BASINGSTOKE | P. J. Sterry, G3BCU, Ashley Road, Basingstoke |
| BEDFORD | K. Hatton, 49 The Briars, Kempston, Beds. |
| BRISTOL | E. J. Davis, G3SXY, 72 North View, Westbury Park, South Gloucester |
| CARDIFF | E. F. Taylor, GW1SQX, University Hall, Penylan, Cardiff |
| CHESTER | P. J. Holland, 19 Kingsley Road, Great Boughton, Chester |
| CHILTERN | G. Leonard, 13 Priory Road, High Wycombe |
| CIVIL SERVICE | G. Lloyd-Dalton, 2 Honister Heights, Purley, Surrey |
| CLIFTON | J. Rose, G3GOE, 63 Broomfield Road, Beckenham, Kent |
| CORNWISH | M. J. Harvey, Oak Farm, Carnon Downs, Truro |
| COVENTRY | W. F. M. Hahn, G3JGOL, 11 St. Patrick's Road, Coventry |
| CRAWLEY | R. G. B. Vaughan, G3FRV, 5 Filbert Crescent, Green Lane, Crawley |
| CRAVING | C. Fabric, Bury St. Edmunds, Suffolk |
| CRAWLEY | J. R. G. Warm, G3FIY, 5 Lupton Avenue, Littleover, Derby |
| DORKING | J. G. Greenwell, J3AEZ, Eastfield, Henfield Hill, Earls Green, Dorking |
| DYNAMICS RADIO | J. Wall, c/o Hawker Siddeley Dynamics Ltd., White Works, Coventry |
| EDGWARE | G. S. Finnin, G3RAA, 16 Beverley Drive, Edgware, Middlesex |
| GRAFTON | A. W. H. Wannell, G2CJN, 145 Uxendon Hill, Wembley Park, Middlesex |
| GREENFORD | J. J. A. Hedges, G3MQM, 35 Ferrymead Avenue, Greenford |
| HARROW | R. C. Ray, G3TLC, 10 Hellesdon Mill Lane, Norwich, Nor.21.L |
| HULL | W. A. Morgan, G8ADS, 97 Victoria Street, Dunstable, MAGNUS | R. Wallwork, B.Sc., Magnus Grammar School, Newark-on-Trent |
| MAIDENHEAD | E. C. Palmer, G3FVC, 37 Headington Road, Maidenhead |
| MID-WARWICKSHIRE | K. J. Young, 180 Northumberland Court, Leamington Spa |
| NORDALE | R. Carr, G3EHE, 10 Ellesdon Mill Lane, Norwich, Nor.21.L |
| NORFOLK | A. M. Mancini, G3LTC, 10 Ellesdon Mill Lane, Norwich, Nor.21.L |
| NORTHERN HEIGHTS | A. Robinson, G3MDW, Candy Cabin, Oden, Halifax |
| NORTH KENT | P. T. Bamber, 64atham Road, Bexleyheath, Oxford University | A. J. Garratt-Reed, Brasenose College, Oxford |
| PADDINGTON | A. E. Copperwaike, la St. Mary's Mansions, St. Mary's Terrace, London, W.2 |
| PEMBROKE | K. E. Godfrey, Kimberly, Ludlow, Newport, Pembroke |
| PETERBOROUGH | D. Byrne, G3FKO, Jersey House, Eye, Peterborough |
| PLYMOUTH | B. J. Curnow, G3UKI, 112 Mount Gould Road, Plymouth |
| PURLEY | A. Frost, G3FTQ, 62 Goulstone Road, Thornton Heath, Croydon |
| R.A.C.B. | Mrs. F. E. Woolley, G3JLWY, 331 Wigan Lane, Wigan |
| RADIO CLUB OF SCOTLAND | A. Barnes, GMLTB, 7 South Park Terrace, Glasgow |
| READING | N. W. Austin, G3FQR, 20 Worcester Close, Reading |
| REIGATE | F. D. Thom, G3KKT, 12 Willow Road, Redhill |
| SALFORD | D. Bowers, 95 Greendale Avenue, Saltash, Cornwall |
| SHEFFORD | G. R. Cobb, G3JKG, 75 Ampthill Road, Shefford, Beds. |
| SOUTH LONDON MOBILE | B. Negri, G3LXN, 17 Volute Road, London, S.W.4 |
| SOUTH SHIELDS | D. Forster, G3KZ, 41 Marlborough Street, South Shields |
| SPEN VALLEY | N. Pride, 100 Raikes Lane, Birstall, Leeds |
| SURREY (CROYDON) | R. Morrison, G3KG, 31 Seaton Road, Addiscombe, Croydon |
| SWINDON | D. J. Goacher, G3LLZ, 51 Norman Road, Swindon |
| TORBAY | Mrs. W. Western, G3NQD, 118 Salisbury Avenue, Barton, Torquay |
| VERULAM | G. Slaughter, G3PAO, 5 Leggatts Wood Avenue, Wufford |
| WAKEFIELD | E. Price, G3TQV, 31 Elmwood Grove, Holbury, Woking |
| WELWYN GARDEN CITY | J. Hom, G5UM, Wyldes, Burnham Green Lane, Bulls Green, Knebworth |
| WEST KENT | R. Trevitt, G3SSE, 28 Delves Avenue, Tunbridge Wells |
| WESTON-SUPER-MARE | A. E. Seymour, G3GNS, Manor Farm, Hillend, Banwell, Weston-super-Mare |
| WIRRAL | N. Pride, 100 Raikes Lane, Birstall, Leeds |
| WORCESTER | B. A. Jones, 12 Woodside Road, Larkhill, Worcester |
| WROXETER | J. A. Jones, 12 Woodside Road, Larkhill, Worcestershire |
| YORK | J. A. Rainbow, 14 Temple Road, Bishopthorpe, York |

Overseas

AERONAUTICAL CENTER, OKLAHOMA: Post Station 18, Oklahoma City, Okla., U.S.A.

EX-G RADIO CLUB: N. F. Thompson, W5YHO, 1368 Roslyn Avenue, Akron 20, Ohio, U.S.A.
The South Yorkshire Amateur Radio Society held their annual dinner on January 21, at the Rockingham Hotel, Doncaster. The event was well supported by members, YL's and XYL's.

4th and 18th), a Junk Sale on the 11th and a Film Show on the 25th. All meetings are on Fridays, 8 p.m. in the Science Lab., Roxeth Manor School, Eastcote Lane, South Harrow.

Paddington held their AGM on January 19 and elected Mr. D. S. Jewiss president, G3NOZ chairman, G3JDP vice-chairman and A. E. Copperwaite hon. secretary (see panel). On March 16 there will be a talk by G3MHQ on Crystal-Grinding for Crystal Filters, and the Club net continues every Friday, 11 p.m. on 14-2 mc. Meetings are held every Wednesday, 8 p.m. at the Beauchamp Lodge Settlement, Warwick Crescent, London, W.2.

Coventry have now acquired a permanent club-room at the Civil Defence Headquarters, Drapers Fields (off Foleshill Road), where they will gather every Friday at 7.30 p.m. New members and old friends welcomed, and they hope to provide an interesting programme.

Crawley will be meeting for G6QB's "Mixed Bag" on March 23. On Friday, March 18, they will hold their Sixth Annual Dinner, with G2BVN as guest. Yeovil heard a tape on Musique Concrete (by G2BCX) on February 2, and saw a Mullard film the following week. Latest additions to Club equipment are a BC-221 and a Taylor valve tester. Members' home-built apparatus has been on show, including G8AFA's QRO Tx for 432 mc, and a 60-watt 12/300 volt transistor inverter by G3TTC.

Northern Heights have had a talk on The Layout of an Amateur Station (G3FDC), and a Junk Sale (the proceeds of which went to the Club Tx fund, which is growing nicely). Future talks: "On Safari among the Kilowatts," by David Howell, on March 16; NFD Arrangements on March 30; and the AGM will be on April 13.

Reigate held their AGM and re-elected most of their officials. Their membership is now 46, including 30 call signs, and they have gained a fine reputation for contest work during the past year. Next meeting, on March 17, will be a Film Show, to which YL/XYL's are invited, at the George and Dragon, Redhill.

Saltash will meet on March 11 for a talk by the local "legendary character, G9130," and a general natter. March 25 is their Film Night, and their Mobile Rally is fixed for May 30. The recent Constructors' Competition was won by SWL Jack Martin with his receiver.

Greenford continue to gather at the Community Centre, Oldfield Lane, and their March meetings are on the 11th (Junk Sale) and 25th (Mobile Evening...
on One-Sixty and Four), **Maidenhead** have March 15 booked for a talk and demonstration of VHF working, by G3MEV; it is hoped that some two-metre contacts will be made during the meeting. The Club reports good progress, increasing membership, and a welcome for any newcomers, whether licensed, SWL or “just interested,” at their meetings on the third Tuesday in the Hall, East Berks, College, Boynt Hill Avenue, Maidenhead.

**Welwyn Garden City** report some interesting sessions, one of which dealt with the Development Corporation’s edict concerning “TV and other Aerials” on housetops (!). Their annual Constructors’ Competition will be judged by G6LL and Mr. A. H. Beattie at the March meeting.

**South London Mobile Club**, at Clapham Manor Baths, will be holding a Junk Sale on March 12, and a talk on 70 cm. operation on the 26th. The AGM will be held on April 23. All timed 8.0 p.m. **South Shields** meet in the Trinity House Social Centre, Laygate, on Friday evenings and occasional (advertised) Thursdays. On March 3 their Constructional Competition was to be judged by G3BIK and G3SPL. Among the entries were a communications receiver, a transmitter, a transceiver, a two-metre converter and a pre-amp.—which just shows what a Club can do.

**Wirral**, having had a D/F Lecture on March 2, will hear a talk on Communications Receivers on the 16th, and G2FOS’s discussion on Transistory (Part III) on April 6.

Up in **Ainsdale**, they have their annual “Hot-Pot Night” (and what an occasion that can be!) on the evening that this appears, when plans will be discussed for the year’s activities—to include /P gear for the HF bands. They are already fully transistorised on VHF.

Down in Wales, the **Cardiff Radio Contest Club** will foregather at the Griffin, Lisvane, on March 7 at 8.0 p.m., when all locally will be welcome. They have plans for a /P expedition, come the summer.

From **Edgware** it is reported that their Club Net on 1875 KHz (the hon. secretary remarks that he read p.734 of our February issue!) at 2100z is proving useful for local amateur publicity and recruitment. Next meeting is on March 14, when G3SIE will give the first of two demonstrations on the Oscilloscope.

One of the most active London Clubs is **Grafton**, with meetings arranged for March 11 (SWL Corner, by G3KRIH); March 18 (Introduction to Amateur TV, by G6ABA); and March 25 (Easter Junk Sale). Visitors are most welcome, the evening programme starts at 8.30 p.m., and the place to find them is Room 35, Montem School, Hornsey Road, N.7.

**Huddersfield** have now got themselves two rooms at the YMCA, St. Peter’s Street; one will be used for regular fortnightly meetings and it is intended that the other shall be equipped as a workshop with Tx gear for use any night of the week.

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**CLUB PUBLICATIONS**

We acknowledge, with thanks, the receipt of the following Club Publications. (Latest receipts only are mentioned):

- **Coventry** (CARS Newsletter): AERE, Harwell (Q.J.V, January); ARMS (Mobile News, January); Cornish (Cornish Link, February); Cray Valley (QUA, February); North Kent (Newsletter, No. 96); Norfolk (NARC Challenge, Christmas); Purley (Splatter, January and February); RAIBC (Radial, January); Surrey (SRC Monthly News, February); Swindon (Wiltshire Hams, January-February); Worcester (Newsletter, February); Radio Club of Scotland (GM Magazine, January); Saltash (Tamar Pegasus, February); Régate (Feedback, January); Echelford (Newsletter, January); Wirral (Newsletter, January); Aeronautical Center, Oklahoma (Collector and Emitter, January); Ex-G Radio Club (Bulletin, Vol. 5, No. 6); Southampton Group (QUA, February); and Verulam (News Sheet, February).

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**GETTING THROUGH THE R.A.E.**

A very useful practical article for those taking the next Radio Amateurs’ Examination, in May, appeared in the April, 1965, issue of SHORT WAVE MAGAZINE. We would recommend all aspirants to read and re-read this contribution, because it gives the sort of advice and information that serious candidates would find both helpful and encouraging.
AMATEUR RADIO ARRAYS

TYPICAL TWO METRE ARRAYS

BASIC 4 ELEMENT YAGI

Overall Dimensions:
Length 44" Width 41" Height 26"
Vertical Beamwidth between half power points 25°
Cat. No. 2/4Y.

EIGHT OVER EIGHT

Overall Dimensions:
Length 102" Width 40" Height 46"
Horizontal Beamwidth between half power points 40°
Cat. No. 2/10Y.

PLUS UNITS

Plus 2 units — adds 2 elements to any crossboom,
Plus 4 units — adds 4 elements to any crossboom,
Cat. No. 2/4 + 2/4, 2/4 + 2/4.

Examples: To convert 4 Element Yagi into 6 Element Yagi add plus 2 unit.
To convert 4 over 4 into 8 over 8 add two plus 4 units.

N.B.: The Skybeam 10 Element Yagi cannot be extended.

AMATEUR RADIO ARRAYS

PRICE LIST JANUARY 1966

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<th>Band</th>
<th>dB gain over a dipole</th>
<th>Cat. No.</th>
<th>Price</th>
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<td>All aerials available with 75 or 300 ohm feed</td>
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<tr>
<td>3 El. Yagi</td>
<td>4 metre</td>
<td>5 7</td>
<td>4/3Y 52</td>
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<td>7 0</td>
<td>4/3Y 68</td>
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<td>7 0</td>
<td>2/3Y 30</td>
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<td>2 7</td>
<td>2/3Y 42.6</td>
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<td>8 El. Yagi</td>
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<td>2 8</td>
<td>2/3Y 55</td>
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<td>10 El. Skybeam</td>
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<td>2 8</td>
<td>10/3Y 136</td>
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<td>6 7</td>
<td>2/3Y 45</td>
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<td>2/3Y 70</td>
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<td>2/3Y 120</td>
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<td>Plus 2 Unit</td>
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<td>4 7</td>
<td>2/3Y 12.6</td>
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<td>Omni V</td>
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<td>2/4V</td>
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<td>2/4M</td>
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<td>Halo with mast</td>
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<td>2/4M</td>
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<td>X10 Moonbounce</td>
<td>2 metre</td>
<td>13 2</td>
<td>2/3Y 168</td>
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<td>Double 4 Slotbeam</td>
<td>70 cm.</td>
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<td>70/3Y 46</td>
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<td>16 0</td>
<td>70/44/XY 153</td>
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75 ohm Balun
Balance/unbalance transformer
with coaxial socket
75 ohm TV2
Balun with 75 ohm screened twin
Phasing and matching harness to stack
75 ohm CO2
Coaxial matching and phasing harness
70 cm.
Type CO2 with two type TV2
Will match and phase 4 aerials.
Three type CO2 and 4 type TV2
Will match and phase 8 aerials.

<table>
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<tr>
<th>Type</th>
<th>Band</th>
<th>dB gain over a dipole</th>
<th>Cat. No.</th>
<th>Price</th>
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<td>300 ohm PM4</td>
<td>6 metre</td>
<td>6 PH2</td>
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<td>Q Bars only to match two 300 ohm aerials</td>
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<td>4 PH2</td>
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<td>300 ohm PM4</td>
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<td>6 PH4</td>
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<td>Phasing and matching harness to stack four 300 ohm aerials</td>
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<td>4 PH4</td>
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<td>Note: Type PH4 with 2 type PM4 will match phase 8 aerials</td>
<td>2 metre</td>
<td>2 PH4</td>
<td>22</td>
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MASTS AND ACCESSORIES

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<td>6in. galvanised jointing sleeve for 2in. mast</td>
<td>JBL10</td>
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<td>JBL59</td>
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<td>3 hook guy wire clamp</td>
<td>JBL58</td>
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<td>Universal mast clamp to 1in. tube</td>
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<td>Universal mast clamp to 1/2in. tube</td>
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<td>Universal mast clamp to 1/2in. tube heavy duty</td>
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<td>1in. mast clamp to 1in. tube</td>
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<td>Stand off wall brackets 6in.</td>
<td>JBL6</td>
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<td>Stand off wall brackets 8in.</td>
<td>JBL7</td>
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<td>Stand off wall brackets 24in.</td>
<td>JBL7A</td>
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<td>Stand off wall brackets 24in. heavy duty</td>
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<td>Chimney lashing double (2 wires)</td>
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**SHORT WAVE MAGAZINE**

55 Victoria Street : London, S.W.1

**PUBLICATIONS DEPARTMENT**

**CRAFTSMAN** Required for installation and maintenance work on the Communication System of the Midlands Electricity Board. Experience of VHF/UHF transmitters and receivers essential; knowledge of telephone systems an advantage. Salary for successful candidate £335 p.a., plus 10s. 6d. per week productivity bonus. Additional service increments of £20 p.a. payable after 23 years’ satisfactory service. Also holiday and sick pay schemes, and optional superannuation arrangement. N.I.C. conditions.—Apply by letter to: Mr. E. C. Watson, Area Manager, Midlands Electricity Board, (post), Spring Gardens, Ditherington, Shrewsbury, Shropshire.
FOR SALE: Eddystone 680X, first-class condition and working order, price £62.—Cosh & Hammond, 29 Beach Road, Littlehampton (877), Sussex.

RECEIVERS' ADVERTISEMENTS

£12 o.n.o.? or EXCHANGE together with my HRO manual, £35; PR-30X preselector, self-powered, as stone S.840A, with headphones and manual, £30; with improved RF stage and BFO, S-meter, extension speaker, headphones and manual, £45; Eddystone S.840A, with headphones and manual, £30; HE-80, includes two-metre coverage, little used, with manual, £35; PR-30X preselector, self-powered, as new, £35.—G3RCA, 311 Leighty Court Road, Streatham (5746), London, S.W.16.

WANTED: In good condition, Heathkit RA-1 or Eddystone S.640—Box No. 4238, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Complete two-metre station: G. & D. CTX-2 transmitter, PSU and modulator, G. & D. Mk. IV converter, 6-over-6 slot beam, the lot only 6 months old, for £28. Pye 12v. transistor car radio, 4 months old, £8. Labgear wideband multiplier, 10-80m., £3. Labgear driver coil pack, 10-80m., £3. (Both these on brass chassis with valve holders and partly wired.) Frequency Meter TS-69/AP 341 to 10000mc, with 4in. 200 microamp. meter, as brand new, in carrying case, £15. VLF frequency meter, 36 to 63 cycles, vibrating reed type, in oak case, £6. Top Band/80-metre Tx, with PSU, £7. Test Oscillator BC-376H, with mains PSU, needs checking, £2 lOs.—G3SBH, QTHR. Ring Dursley (1000) after 6.0 p.m.

OFFERING: CPY Radio Type MCR-1, complete with AC/DC PSU, matched headphones, plug-in coils covering medium-wave and 3-5 to 14 mc. Sell £12, or consider EXCHANGE good Top Band mobile gear.—Box No. 4239, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WHAT IS A CSE 2A10

EXCHANGE: B.S.R. Civic Tape Recorder deck, cost £18 a year ago, for CR-100 or similar. Consider sale for £12. Prefer buyer collects.—Macklin, 5 Sheridan Close, Stanmore, Middlesex, Hants.

SALE: Class-D Wavemeter, mains, £2. B2 Tx/Rx, with 160m. coverage and including PSU, £6 10s. (Crystals available). Prefer buyer examines and collects, otherwise carriage extra.—GW3LCQ, 12 Penrhos Avenue, Llandudno Junction, Caernarvonshire, North Wales.

SELLING: BC-346R, with internal mains PSU and RF-24 Unit, in good condition and working well, £13 o.n.o.? WANTED: Manual, circuit or any details for CR-100.—Oddy, 2 Carter Avenue, Whitkirk, Leeds, 13, Yorkshire.

OFFERING: Copies “Short Wave Magazine,” Vol. XXI Nos. 2, 5, 6, 8, 9, 10, 11, 12; Vol. XXII Nos. 4, 5, 6, 7, 9, 11 and 12, at 1s. each. Speaker, 8in. in cabinet, 12s. carr. paid.—M/Sig. Livermore, Sgt's. Mess, R.A.F. Stradishall, Newmarket, Suffolk.

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SMALL ADVERTISEMENTS, READERS—continued

WANTED: AR8UD, reasonable price and condition.

SALE: AR88 IF selectivity switches, brand new, 15s. each, post 2s. 9d.—G3FWD, 126 Renton Road, Oxley, Wolverhampton, Staffs. (Tel. Fordhuses 2403.)

SALE: Transceiver HW12 with AC/PSU. Collins, KWM-1, noise blanker, DX adaptor, power supply, novice adaptor. Offers?—Mortimer, 51 Townhead Road, Dore, Sheffield, Yorkshire.

FOR SALE: Eddystone 8880 Receiver, 480 kc to 50 mc, with data sheet, in immaculate condition, £30 o.n.o.?—Box No. 4241, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.


WANTED: Labgear Wideband Multiplier E.5026.—A. Holloway, 2 Burlington Drive, Davenport, Stampport, Cheshire. (Tel. 3884, after 7.0 p.m.)


SALE: Correspondence Course for R.A.E., brand new, unused, cost £12 10s., take £7.—Butfield, Overton Grange, Ludlow (2810). Shropshire.

WANTED: Labgear LG.300, and 14 mc HRO BS coil. Sale: J.36 bugle, LG.70, £8. Commercial 3in. Scope, £8. Olympic 150-watt Z-match, £4. TUSB 80/90m. VFO, rock steady T9x. £2. Geloso 50-watt pi-tank and RF choke, £1. Mains transformers, £10. 300v. 150 mA, 6.3v., 5v. drop-throughtype, 10s.; 400v. 200 mA, 15s.; 6v. 8 amp., 10s. Two speakers, 2s. 6d. All carriage extra.—Smith, G3RB, 10 Malcolm Court, West Monkseaton, Whitley Bay, Northumberland.

AMATEUR OFF SICK for 2½ years needs cash. What offers for BC-221 with original charts; two (American) 50ft. masts, 21in. dural in 5ft. sections, £2. Geloso 50-watt pi-tank and RF choke, £1. Mains transformers, £10. 300v. 150 mA, 6.3v., 5v. drop-throughtype, 10s.; 400v. 200 mA, 15s.; 6v. 8 amp., 10s. Two speakers, 2s. 6d. All carriage extra.—Smith, G3RB, 15 Malcolm Court, West Monkseaton, Whitley Bay, Northumberland.

FOR SALE: Oscilloscope, stabilised 24in., with sinewave-squarewave generator and PSU, in Eddystone cabinet, with handbook, £4 10s. Volt-voltmeter, with 200 microamp. 44in. meter, mains, in aluminum case, with test leads, £3 10s. VHF frequency meter, 20 to 40 mc with harmonic amplifier, audio amplifier and 5 mc crystal calibrator, with special slow-motion dial and calibration chart. In cabinet, £2 10s. HF frequency meter, 3-5 to 3-8 mc with 100 kc calibrator, slow-motion dial, in cabinet, £2 10s. All these items home-built to professional standard and appearance. Converter for BBC/ITA, with built-in PSU, 20s. Absorption wavemeter BC-906D, 145 to 230 mc, with 500 microamp. meter. 30s. Front ends for receivers Type 76. 150 kc to 510 kc; Type 78, 2-4 to 13 mc and 100 kc xtal, 150 kc to 510 kc, with metered PSU, the lot £45. Receiver, no padding available. Gornet 30VH.—G6AAR/T, QTHR.

THE SHORT WAVE MAGAZINE

March, 1966
SMALL ADVERTISEMENTS, READERS—continued

WANTED: To buy, borrow or hire, Servicing Manual for Canadian Marconi Wireless Set No. 52: Hallicrafters S.S.7 Rx £1155 Receiver.—Sarran. 1, Fulgarth View, Durham City.

WANTED: For R.I155 Rx, IF transformers or IF coils; or incomplete R.I155 containing these items.—S. Gaunt, GSPXJ, 43 Appian Close, Kings Heath, Birmingham 14.


EXCHANGE: 24v 15-watt transistor Public Address amplifier, with built in 4-way mixer, Reslo ribbon microphone, two 15in. re-entrant speakers, two 30in. exponential horn speakers, for HRO-MX or HRO-3, or sell amplifier at £18.—Filb, 358 Peppard Road, Reading (72015), Berks.

SALE: Labgear LG.300 transmitter, with matching PSU and modulator, in mint condition, price £40 o.n.o.? Can be seen and tested at this QTH.—4GIK, Woodlands, Leigh, Chard, Somerset. (Tel. Wimsham 295.)

SELLING: Four heavy-duty super grade mains transformers, cheap. Details.—F. W. Hardstone, 43 Shrubbery Road, Streatley (6237), London, S.W.16. (Ring after 6 p.m.)

OFFERING: Minimiter Equipment, Exciter, PA, Q-multipliers. LP filter. Power transformers, HT and heater, all types; power supplies, valves, crystals, meters, Class-D Wavemeter, No. 16 Crystal Calibrator, P-E cells; and much other gear. Exchange some items, others must be sold.—J. Brooks, Marlborough Farm, Falmouth, Cornwall.

WANTED: Circuit diagram Tiger TR-200 Tx. Also Tiger Z-match, or suitable ATU to match TR-200 to 35m. type aerial.—GSOET, QTHR or ring Chelmsford, Essex. 4967 home, 3656 business.

WHAT IS A CSE 2A10

SALE: K.W. Victor, 150-watt Tx, £45. Minimiter Mr4/11 receiver, £35. AR88LF, needs alignment, £20.—G3AOB, Strathleven, Toome Road, Ballymena, Co. Antrim, Northern Ireland.


SALE: HRO dial, new, boxed and with fitting instructions, 35s. HQ-140X manual, 25s.—Box No. 4423, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: Radio Set Type 129 ( miniature combined transmitter-receiver, S.A.S.). Will pay up to £20 for model in good condition.—M. Gee, 11 Whitehorse Lane, Stepney, London, E.1.

SALE: Two-metre converter, £5. Two-metre preamp with PSU, £3. Dependable transistor PSU, £10. T.W. Lemmon.—£20. Minimiter 100m converter, £8. Command Rx, 6 to 9 mc, £3. Also valves and meters (send s.a.e.)—Kidder, G3NZO, 44 Ingatestone Road, Woodford Green, Essex.

FOR SALE: Post Office Course for H.A., £8. Also Sony transistor portable radio, 530 kc to 22 mc, as new, with tuning indicator and service data, £12.—Box No. 4426, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.
### Small Advertisements, Readers—continued

**SALE:** TW2 two-metre station, Tx, converter, PSU, coax relay; also Rabgear Topbander.—J. Brown, G3LFB, Marlborough Farm, Falmouth, Cornwall.

**Selling:** Transmitter TCS-12, modified as “Short Wave Magazine.” £6. Bendix MN-26C Rx, mains PSU, 150 to 1500 kc, IF 112 kc, used as Q5er, £5. TN1/84PS4 tuning unit, 300 to 1000 mc, IF 30 mc. £3. Range Calibrator 820C, with 23 valves including tunable klystron, mains, rack mounting, with 3-cm. horn, new, £6 10s. All carriages paid.—D. Spence, Dept. of Physics, The University, Newcastle-upon-Tyne.

**Offering:** National NCX-3 Transceiver with NCX-A PSU, in excellent condition throughout, superb performance. £30 (all letters answered).—Box No. 4244, Short Wave Magazine, Ltd., 35 Victoria Street, London, S.W.1.

**Wanted:** Eddystone EC-10, also 12v./300v. PSU. SALE: HRO-MX, with 9 coils, two BS, and PSU. £14; BC-34S, external PSU, £12; both excellent condition.—G2VO, Underhill, Glanboy Drive, Kegley, Yorkshire. SALE: Class-D Wave mter, £3 5s. American 8 matching ATU. 286. Both brand new. Postage extra. Offers?—Stephenson, 82 Morris Lane, Leeds, 5, Yorkshire.

**Wanted:** Very early copies of “QST,” prior to 1931; “CQ,” prior to April, 1948; pre-war “Short Wave Magazine” and “Radio”; and any copies of “73.”—G5LY, 33 Downs Road, Langley, Bucks.

**Offering:** An HRO, with PR-80 preselector, complete set of nine coils plus 40m. bandspread, PSU, speaker and spare valves, in excellent condition, £18 o.n.o.—G. Hart, Lyon House, Bruton, Somerset.

**Wanted:** 80/160m. crystals, 10X type preferred. Frequencies and price to.—Box No. 4247, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**Sale:** KW-76 receiver, 10-160m., with mains PSU, 5-meter, Eddystone speaker, and Heathkit Q-multiplier, in mint condition. The lot for £27.—YeO, 8 Bothwell Street, Edinburgh 7.

**Selling:** K.W. Vanguard, 10-80m.; simple 160m. Modification kit available; unmarked as new. Price £35, no offers.—G3OLY, 6 Wetherill, Letchworth, Herts.

**Sale:** Receivers S.36, 27 to 146 mc, £16. BC-342, £11; R107, £10. All in excellent condition. Taylor 45C Valve Tester ; two Evershed Ohmmeters ; CT53 ; Hunt signal generator and other gear (s.a.e. details). Offers ?—R.G. W2EY, Rostelephone—Box No. 4248, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**Licensed Amateur requires AR88 and Panda Cub, or similar types Rx/Tx. Family gear considered if repairable. Can collect 50 miles Lancashire.—Box No. 4245, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

S.E.L.E.: Heathkit RX-1 receiver, little used, £30 o.n.o.—N. Gaunt, 90 Nursery Gardens, Staines (51278), Middlesex.

**Exchange:** Eddystone S740 receiver, 600 kc to 30 mc, in good condition FOR a VHF Rx, such as S.27, S.36 or similar. Consider faulty specimen.—Chatterton, 88 Maple Road, Priory Estate, Dudley, Worcs.

**For Sale:** An AR88LF, in good condition, £30 o.n.o.—Clarke, 119 Brodie Avenue, Liverpool, 18. (Tel. Allerton 3123.)

**Wanted:** Tuning unit for Hallicrafters S.27, or similar types Rx/Tx. Family gear considered if repairable. Can collect 50 miles Lancashire.—Box No. 4245, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**Sale:** Heathkit RA1 receiver, little used, £30 o.n.o.—N. Gaunt, 90 Nursery Gardens, Staines (51278), Middlesex.

**Exchange:** Eddystone S740 receiver, 600 kc to 30 mc, in good condition FOR a VHF Rx, such as S.27, S.36 or similar. Consider faulty specimen.—Chatterton, 88 Maple Road, Priory Estate, Dudley, Worcs.

**For Sale:** An AR88LF, in good condition, £30 o.n.o.—Clarke, 119 Brodie Avenue, Liverpool, 18. (Tel. Allerton 3123.)

**Wanted:** Tuning unit for Hallicrafters S.27, or similar types Rx/Tx. Family gear considered if repairable. Can collect 50 miles Lancashire.—Box No. 4245, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**Sale:** Eddystone S840C receiver, in good condition, 14 months old, £45 o.n.o.—Morphew, 17 Uphill Road, Ipswich (77242), Suffolk.
SMALL ADVERTISEMENTS, READERS—continued

SALE: AR88D receiver, in excellent condition, £35. (H.P. possible.) QY3-125's, £2 each.—Bonnett, 28 Dale Park Road, London, S.E.1. (Tel. LIVingstone 6198.)

SELLING: Geloso VFO 4/102, unused, soiled, valves but no dial, £2. Swinging choke, 5/25 Hy at 250 mA, 25s. Shrouded 8 Hy 250 mA choke, 15s. Fully potted oil-filled transformers: 500-500v, 250mA, £2; 400-400v, 180 mA, 5v, 3/6-3v., 25s.; 360-360v, 150 mA, 5v, 4/6-3v., 20s. All plus post/packing. EXCHANGE: BS40 HRO coil for BS50, National matching only.—ATPB, 10 Hornet Road, Thorny Island, Emsworth, Hants.

FOR SALE: Crystal Calibrator No. 10, with mains PSU; also SWR bridge. Both in stow-enamel cases.—£3. Carriage paid.—G1SSO, 79 Prehen Park, Londonderry, Northern Ireland.

SALE: B2 Transmitter, with extra frequency formers, £5. Pair torque transmitters, 481b.—ln., 320v., 50 c/s, size lrd h.p. motors, £7. Wilcox-Gay master oscillator (VFO), with 2j1000 PA formers, £4. Type 114 Tx/Rx complete, with handbook, lined up 240v. 50 c/s, size 2/24 in. £13. Carriage paid.—G3GLO, 79 Prehen Park, Londonderry, Northern Ireland.

FOR SALE: Power Unit Type RA34, in crackle cabinet 18in. x 20in. x 19in., input 115/230v. AC, output 1200v, at 400 mA and 14v. 3 amps. DC, both fully variable and metered, also 14v. 12 amp. AC. Fully relay operated, incorporating thermal delays and four circuit breakers, and using 866 rectifiers. Push-button control, with indicator lights. Several spare valves, cables, etc.—Price £100 to build. Price £15, carriage extra.—G3FH, QTHR.

WHAT IS A CSE 2A10

FOR SALE: BC-342 Rx, with S-meter, for 250v. AC, £121. 10s. Transmitter, 35-watt, Geloso VFO/807 PA, 10-30 metres, separate 160m. Tx, £20. ATU and monomatch, 20s. Chassis punch kit, 30s. Numerous valves, speakers, etc. Offers and enquiries.—G3OOW, 102 Highbury Road, King's Heath, Birmingham, 14. (Tel. Highguy 3280.)

DISPOSAL: Echophone EC1B communications receiver, 560 kc to 30 mc, with bandspread and internal speaker, noise limiter, for AM/CW. £10 10s. WANTED: Signal Generator.—Garth, Stagbury Avenue, Chipstead, Surrey. (Tel. Downland 51430.)

SELLING: Phasing-type SSB Tx for 20 and 80 metres, 6146 PA, with Vox and PSU built in; mixing four-band Linear, 2xT21, incorporating PSU; £40 the pair. Also G2DAF-type Rx, coverage 10-160 m., with S-meter, noise limiter, etc., in CR-150 cabinet; fine performer and looks good; price £40. TC12, Tx, £15, LM-14 Frequency Meter, £16.—Short, 13 Lumsley Avenue, Skegness (1623), Lines.

WANTED: Drake-2B, preferably with Q-multiplier, speaker, etc.—GM3BQA, 19 Edinburgh Road, Cockenzie, East Lothian, Scotland. (Tel. Port Siton 3131.)

WANTED: “Short Wave Magazine” for August 1958; buy, borrow or hire. SALE: Postal Course for R.A.E. (cost £10), price £4; gram. deck, with mic and pre-amp., £3.—Box No. 4259, Short Wave Magazine Ltd., 55 Victoria Street, London, S.W.1.

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SALE: Mullard 5-10 RC amplifier, £14; ditto 3-3 RC amplifier, £10, or offers? Both brand new. Carriage paid. —Jones, 261 Richmond Road, Sheffield, 13, Yorkshire.

MUST SELL: Green & Davis Linear, in mint condition, not a scratch; overhauled not long ago by Yorkshire. Loading paid. —Jones, 261 Richmond Road, Sheffield, 13.

SALE: 162A Birch Road, Rochdale, Lanes. Packing, £19, 5U4, 5s.; R17, 2s. 6d. Please add plenty for post.

9025 kc, 1600 kc. on HC6/U base, 3s. 6d. each. Valves: 7/EL34, 2/ECC83 and auxiliary 250v. Rx supply. Essex. (Tel. Southend-on-Sea 559246.)

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FOR SALE: Lafayette HA-350 with xtal calibrator, five months old, offers around £55. Also, professionally rebuilt SB-1OU around £30. Both quite perfect and indistinguishable from new.—G3GHE.

MUST Sell: Two double-beam oscilloscopes, nearly new condition, with manuals: Solar, £111-82, £75; Cossor 2000, £60.—Tel. Maldon (Essex) 204.

FOR SALE: Eddyson 840A receiver, 480 kc to 30 mc, unmodified and in good condition, with circuit diagram, £31 or nearest offer. Buyer collects—Ambler, 54 Vesey Close, Water Orton, Coleshill, Birmingham.


SALE: 160-160 metres, with pi-output, modified for xtal mike, AC or battery operation, with AC/PSU, £5. 680 vibrato power pack, 6V, 20s. CR-100 manuals, 20s. HRO crystal filter complete, 20s. Rectifier unit fitted 2/GU50's, with two spares, 20s. "Bulletin's", unbound, '57 to '64, offers? Carriage extra all items.—Lyl, Ewart, Wooler, Northumberland.

WANTED: Panda PR-120V, Heathkit DX-100U or any similar table-top transmitter in good condition. Prepared to collect any distance. Write giving full details and price required.—Box No. 4259, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Eddyson 840C receiver in mint condition, price £45. Will deliver 50 miles.—Fill. Candford, Brook Close, Packington, Leicestershire.

SELLING: Hallcrafters HT-32A, with Shure microphone, price £140. Hallcrafters HT-11 Linear amplifier with spare valves.—E. Hammond, 170Rt. TED, Telechron timer fitted, price £95. For quick sale all three nieces, with spares, etc., £350.—Box No. 4258, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: Complete Mobile rig : AT50C41, 0C42, 0C45, 0C71 for xtal mike, AC or battery operation, with CTR-70 (new QQV02-6's) Trip-Amp. CTR-70 (new QQV02-6's) Trip-Amp. Similar models also wanted—Box No. 4257, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Eddyson 888 Receiver, in good condition, price £45.—Cruvah, 26 Priory Road, Chelmsford, Essex. (Tel. Danbury 2329.)

MUST Sell: Lafayette HA-350 with xtal calibrator, five months old, offers around £55. Also, professionally rebuilt SB-10U around £30. Both quite perfect and indistinguishable from new.—G3GHE.

WANTED: K.W. Vanguard, 10 to 160 metres, factory finished £48. Receiver R4175, with spare plug-in units and circuit diagram, needs some attention, £8. Units RF-26, 15s.; RF-25 (no valves), 12s.—G3SSVI, QTHR. (Tel. Brentwood 2119, 9 a.m. to 6 p.m.)

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FOR SALE: Eddyson 840A receiver, 480 kc to 30 mc, unmodified and in good condition, with circuit diagram, £31 or nearest offer. Buyer collects—Ambler, 54 Vesey Close, Water Orton, Coleshill, Birmingham.


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