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This pentode is designed for operation from 120 volt supplies and is, therefore, convenient for use in conjunction with the 6AK5.
Noises  Radio reception at any frequency from MF to VHF, almost anywhere in this country, is subject to noise interference of all kinds, at varying levels and degrees of intensity. Some of this noise is caused by natural phenomena over which man can have no control—but a lot of it is directly due to apparatus, machinery and power distribution systems that are inherently noisy and uncontrolled in the purely electrical sense. To this great barrage are shortly to be added two tremendous new weapons, which will almost certainly have a paralysing effect on all radio equipment operated within their range. These sources are the British Railways main line electrification scheme, and the Super-Grid. What nobody can say now is exactly what their interference areas are likely to be.

The former development we have referred to already (p. 107, April 1956 SHORT WAVE MAGAZINE). Briefly, the plan is that British Railways' electrification shall be at 25,000 volts AC collected. As the highest voltage at present in use, by rail conduction, in this country is 660v. DC (which itself creates very considerable local interference) it is a fair assumption that the new system will produce a high level of noise over a wide area—not only by reason of the voltage involved, but because the feeder line will be equivalent to a long, well insulated aerial of constantly varying inductance.

As regards the Super-Grid, now under construction, this envisages a high-pylon power distribution network operating at 275,000 volts, more than twice the EHT grid transmitting voltage in service at the present time.

The effect of noise radiated by EHT lines on radio frequencies is well known already. For the Super-Grid, the highest voltage yet used is to be doubled. In our climate, one can imagine what the state of the insulators will be for most of the time, and how frequently corona effects will develop under particular atmospheric conditions. Yet at all such times the primary requirement will be met—the system will operate quite satisfactorily as a means of transmitting power.

However, it is pertinent to ask whether any practical or theoretical investigations have been carried out to arrive at some conclusion as to the area of radio interference likely to be created by the British Railways network on 25,000 volts AC, and by the Super-Grid energised at 275 kV.

If no such information is available, and nothing is being done to minimise radio interference, then it would seem that both the Central Electricity Authority and British Railways—while they have produced schemes which are entirely sound in the strictly engineering sense—are about to add enormously to the general radio noise level over wide areas of the country. Moreover, this is being done without the slightest regard either for the convenience of the public or for the efficiency of many of the very important radio communication centres, operated by the Services and various organs of Government, which will certainly be brought within range of these new noise sources.
A Practical Oscilloscope Design
FULL CONSTRUCTIONAL DETAILS
W. E. THOMPSON

The range of amateur work, on the bench and on the air, can be considerably extended by the possession of an Oscilloscope having the proper auxiliary circuits. The attractive design described and illustrated here is a practical piece of equipment which can easily be built from readily obtainable parts and materials. Once you have seen, and understood, a trace on the tube of an oscilloscope you have put together yourself, you will begin to realise its value as a test and measuring instrument. The applications of the oscilloscope in Amateur Radio will be dealt with in a later article. In the meantime, here is all the information required to build one.—Editor.

NOT long ago a colleague asked the writer if he could provide him with a circuit for a simple oscilloscope. Several published designs were examined and the desired layout produced by marrying two separate circuits which embodied required facilities. It then occurred to the writer that he, too, could find a use for just such an instrument, so it was decided to design one around the circuit produced for his colleague.

During the time when a certain amount of sleep was being sacrificed at the altar of "The Design," the local club competition was announced, wherein the president was offering a trophy (in the form of a pewter tankard) to be awarded each year to the member producing the best piece of home-made apparatus chosen as such by an independent judge. This provided the incentive to produce an instrument that might be worthy of entry from the aspects of utility, design, appearance and workmanship.

Basic Circuit

The time-base, Y-amplifier, and sync. circuits were taken from the one shown on p.21 of The Oscilloscope at Work (by Haas and Hallows, published by Iliffe). This uses an EC50 (an obsolete type) thyratron in the time-base circuit, so the modern EN31 was chosen. The characteristics are identical, and the main feature of this valve is its unusually high maximum operating frequency, namely, 150 kc. An EF39 is arranged to give constant-current charging of the timing condensers, but a 6SK7 was used as an alternative here. Unlike the EF39, which has a top-cap connection for the control-grid, the 6SK7 is single-ended; this, together with the slightly different pin connections, produces a very simple wiring layout for this particular stage.

The Y-amplifier has a 6C5 cathode-follower input stage feeding into two 6AC7's in para-
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Circuit of the Oscilloscope.

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<td>0.1 µF 350V., paper</td>
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<tr>
<td>C2, C8, C16, C17, C18, C19</td>
<td>0.2 µF 350V., paper</td>
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<tr>
<td>C3</td>
<td>8 µF 450V., electrolytic</td>
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<tr>
<td>C4</td>
<td>0.05 µF 350V., paper</td>
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<tr>
<td>C5</td>
<td>500 µF 350V., mica</td>
</tr>
<tr>
<td>C6</td>
<td>16 + 16 µF 450V., electrolytic</td>
</tr>
<tr>
<td>C7</td>
<td>0.25 µF 1kV., paper</td>
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<tr>
<td>C10, C11, C13, C21, C22</td>
<td>0.01 µF 350V., paper</td>
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<td>C12, C14</td>
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<td>C26, C27</td>
<td>0.25 µF 1kV., paper</td>
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<td>R1</td>
<td>3.9 megohms, 1-w.</td>
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<td>R2, R17</td>
<td>4,700 ohms, 1-w.</td>
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<td>R3, R18</td>
<td>1,000 ohms, 1-w.</td>
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<td>R4, R23, R24</td>
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<td>R5, R9</td>
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<td>R11, R14, R21, R22</td>
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<td>R12, R16</td>
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<td>R14, R19, R20</td>
<td>100,000 ohms, 1-w.</td>
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<td>R15</td>
<td>0.25 µF 1kV., paper</td>
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<td>R16</td>
<td>3 megohms, 1-w.</td>
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<tr>
<td>R17</td>
<td>3 megohms, 1-w.</td>
</tr>
<tr>
<td>R18, R19, R20</td>
<td>50,000 ohms, 1-w.</td>
</tr>
<tr>
<td>R21, R22, R24</td>
<td>1 megohm, 1-w.</td>
</tr>
<tr>
<td>R26</td>
<td>500 ohms, 2-w.</td>
</tr>
<tr>
<td>VR1</td>
<td>10,000 ohms, 1-w.</td>
</tr>
<tr>
<td>VR2</td>
<td>100,000 ohms, 1-w.</td>
</tr>
<tr>
<td>VR3</td>
<td>1 megohm, carbon</td>
</tr>
<tr>
<td>VR4</td>
<td>50,000 ohms, 1-w.</td>
</tr>
<tr>
<td>VR5</td>
<td>100,000 ohms, 1-w.</td>
</tr>
<tr>
<td>VR6</td>
<td>1 megohm, carbon</td>
</tr>
<tr>
<td>VR7</td>
<td>2 megohms, carbon</td>
</tr>
<tr>
<td>VR8</td>
<td>1p-3w. (part of 1p-8w.) switch</td>
</tr>
<tr>
<td>S1</td>
<td>1p-8w. (part of 1p-12w.) switch</td>
</tr>
<tr>
<td>S2</td>
<td>1p-12w. (part of 1p-12w.) switch</td>
</tr>
<tr>
<td>S3</td>
<td>On/off ganged with VR3</td>
</tr>
<tr>
<td>MR1, MR2</td>
<td>SenTerCel K3/15, Brimar</td>
</tr>
<tr>
<td>V1, V2, V3</td>
<td>6AC7, 6SK7</td>
</tr>
<tr>
<td>V4</td>
<td>EN31, Mullard</td>
</tr>
<tr>
<td>V5, V6</td>
<td>6X5GT, VCR.139A</td>
</tr>
<tr>
<td>CRT</td>
<td>VCR.139A</td>
</tr>
<tr>
<td>Ch</td>
<td>15H 60 mA choke</td>
</tr>
<tr>
<td>T1</td>
<td>Mains transformer, see text</td>
</tr>
</tbody>
</table>
phase to produce symmetrical deflection. The only change here is the use of a 615 in place of the 6C5, since several of the former, but none of the latter, were to hand. Such small differences in characteristics that published data for the two types reveal are of no consequence in the cathode-follower application. The simple arrangement for synchronizing the trace has been retained, though provision has been made in the instrument design to incorporate a 6AC7 as an auto-sync. stage at a later date.

In the Haas and Hallows circuit the tube network forms part of the circuit arrangement for a DG72 cathode ray tube. Having a VCR139A and several circuits appertaining thereto on hand, it was finally decided to replace this with the arrangement given by E. N. Bradley in The Oscilloscope Book (published by Norman Price, Ltd.). This circuit also has provision for variable beam-blanking on the return X-trace, and it is hoped that this can be adapted later for use with the thyratron time-base circuit.

In place of the now obsolete J50 metal rectifiers specified by Bradley for the EHT voltage-doubler, SenTerCel K3/15 selenium elements were chosen, and circuit values adjusted accordingly. The rectified HT from the 6X5 has been stepped up to about 350v.; otherwise the features of Bradley's circuit have been retained.

**Mains Transformer**

A suitable design for a transformer to provide all required voltages was produced using a 1¼-in. stack of 1¼-in. waste-free type laminations, taken from old transformers on hand. A bobbin was fabricated from sheet paxolin and the windings put on with a simple winder fitted with a modified cyclometer as a turns-counter. A tapping at 250v. in one half of the 350v. HT secondary was brought out so that some means would be available of setting the EHT voltage correctly. Finer adjustment, if required, can be obtained by altering the value of the 100,000-ohm smoothing resistor, R26. Winding details of this transformer are given in the Appendix. A commercially-made component of about the same ratings can, of course, be used instead.

**Layout and Construction**

Among the various bits and pieces stowed away because "they might be useful sometime" was a louvred metal case from an ex-Government unit acquired long ago. With its frontal opening of 11¾-in. high by 8¼-in. wide, and depth of 12-in., it seemed just the thing to use. Thus were dictated essential measurements of front panel and depth of chassis measurements. The location of the panel controls was set out on paper, the position of each being related as nearly as possible to the wiring layout which would ensue, having regard to a functional and symmetrical placement of parts on panel and chassis. Thus, the X- and Y-shifts, brilliance (incorporating mains on-off switch) and focus controls are grouped around the CRT on the upper part of the panel. Below the tube are the remaining controls, and along the bottom

Half-rear view of the Oscilloscope, showing construction round the tube, a VCR139A. The general arrangement is discussed in the text.
are ten Clix wander-plug sockets to serve as access connections for the instrument. Bulgin K370 knobs and K371 plain bevelled escutcheons produce a very pleasing "instrument" appearance, while the tube surround is the bakelite case from one of those cross-over meters which are available on the surplus market. If need be, this mount could be reversed to form a hood for the tube-face. Whichever form of mounting is adopted, the tube-face fits nicely into the aperture after removal of the glass from the meter case.

All round the front panel is a ¾-in. lip to make it rigid. The simple chassis deck and the rear upright chassis, like the front panel, are made from 16 SWG sheet aluminium, very few bends being required. Two ¾-in. diam. rods form triangular bracing to strengthen the assembly.

The front panel is finished with "Belco" Winchester Blue brushing cellulose. Legends and figures for the controls are Panel-Sign transfers. The only screw-heads visible on the front panel are those used to secure the tube surround. Two countersunk screws which fix the chassis to the panel are concealed by the outermost escutcheons immediately below the tube mount.

Valves for the time-base and Y-amplifier are mounted on the chassis deck. Viewed from the front panel, the time-base valves are on the left of the tube, the EN31 being nearest the front panel. The 6AC7 for future use as auto-sync. is at the rear. The 6J5 cathode-follower nearest the panel, with the two 6AC7 Y-amplifiers behind. A simple support made from 16 SWG aluminium forms a clamp which fits snugly round the tube neck to locate it at the correct height above the chassis. Under the chassis, and along its centre, is a group board on which are mounted resistors and condensers. Other components of this sort are wired directly to valveholders and panel-controls where possible.

The rear panel carries the 6X5 rectifier and the other HT and the EHT components. At the top of this panel, each side of the tube socket, are two small group boards carrying the resistors and condensers associated with the tube circuits. The mains transformer and the smoothing choke are mounted well away from the tube to avoid magnetic deflection of the electron-beam.

Appendix

TRANSFORMER WINDINGS

<table>
<thead>
<tr>
<th>Primary:</th>
<th>0-210-230v. 50 c.p.s. 605 + 58 turns 28 SWG enam. Layers interleaved with 3-mil paper.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screen:</td>
<td>1 turn insulated foil.</td>
</tr>
<tr>
<td>HT sec.:</td>
<td>350-0-350v. 60 mA, with tapping at 250v. in one half. 1080 + 770 + 310 turns 38 SWG enam. Layers interleaved with 1-mil paper.</td>
</tr>
<tr>
<td>LT sec. 1:</td>
<td>6.3v. 2.5a. 20 turns 18 SWG enam. in one layer.</td>
</tr>
<tr>
<td>LT sec. 2:</td>
<td>6.3v. 1.3a. 20 turns 22 SWG enam.—part layer.</td>
</tr>
<tr>
<td>LT sec. 3:</td>
<td>4v. 1a. 15 turns 22 SWG enam.—part layer.</td>
</tr>
</tbody>
</table>

The last two windings are on the same layer, placed at each end of the layer. Interleaving paper, and material for the screen, obtained from discarded paper condensers. All windings separated from each other by three turns of 5-mil Empire cloth. Two turns of same material over the whole winding as a finish.

Quantities of wire: 5-oz. 28 SWG enam. 3-oz. 38 SWG enam. 2-oz. 18 SWG enam. 1-oz. 12 SWG enam.

Calculated efficiency at full load is 86.5 per cent.
Liberal use has been made of tag strips, either as such or in pairs to make group boards. Some detailed consideration of component layout in relation to the schematic circuit enabled the writer to design particular forms of tag strips which locate components just where they are needed in relation to wiring and other parts. Such items are easily fabricated from Radiospares 28-tag strips, the tags being rearranged as required and the strips cut to the desired lengths.

Conclusion

As with any apparatus design which reveals evidence of some thought in its production, this instrument is the result of a fair amount of preliminary planning. This entailed the "placing" and "wiring" on paper of components and parts before a single hole was made in the metalwork. The design thus evolved and pictured here is thought to be reasonably presentable, as well as being open enough in construction to allow easy access to all components for maintenance purposes—a requirement all too frequently overlooked in the build-it-as-you-go technique. Incidentally, it did succeed in winning for the author that pewter tankard referred to earlier!

Acknowledgments

To the authors of publications mentioned in this article whose circuits have been used or adapted; to colleague F. Blakemore for cutting into a full size sheet of 16 SWG aluminium for the metal-work, and bending it much neater than the writer could have done; to J. L. Warne for taking the photographs illustrating this article. And, finally, to the XYL for allowing the dining room to be commandeered so that the thing could be built in comfort.

Modulation with Economy

MODERN CATHODE-CONTROL UNIT

C. J. MORRIS, D.F.M. (G3ABG)

Modulation on the cathode of a PA stage is no new idea, though the older circuits involved some sort of transformer or matching network to achieve full control, and hence power in the modulator section itself. In the circuit discussed here, the ubiquitous 6Y6—well known for its capacity to take punishment in the clamp-tube application—is used as the cathode series element, modulation of the PA then being obtained by grid control of the 6Y6. The HT for the audio section is taken from the PA cathode itself—thus, this modulator requires no separate HT supply, and so can be constructed as a unit to plug into the cathode side of any RF power amplifier. It should be noted that, as in all such systems, it is only possible to get deep modulation by reducing the carrier level to about 60% of that obtainable under full CW conditions. However, this is no great disadvantage at stations where telephony operation is not of prime importance, or when a simple modulator system is required only for the convenience of working the locals.—Editor.

This circuit is a modified version of a unit which has been published, and achieved great popularity, in the U.S.A. It is excellent for mobile operation where economy of power supplies is essential, and for the amateur who operates mainly on CW, but likes the occasional phone contact. The simplicity of the circuit should appeal to the newly-licensed amateur, who may not wish to embark on relatively expensive high-level modulator and power pack.

The main feature of the circuit is that no HT power supply is required; the only transformer necessary is a small heater transformer capable of providing 6-3 volts at 2 amps. When the modulator is inserted in series with the cathode of the transmitter PA valve by means of a jack plug and socket, HT is obtained automatically, the 6Y6G valve acting as a variable cathode resistor, varying in accordance with the audio voltage applied to its grid from the 6SL7 speech amplifier.

Few components are required and the average amateur will have most of these in his stock pile. The modulator at G3ABG was constructed in an empty RF-25 unit case. No details of the construction have been given, as any small chassis will be suitable, and no special precautions need be taken in the layout, other than ensuring that the microphone side is well screened to avoid hum and RF feedback troubles. The grid resistor, R1, can be mounted directly in the microphone housing. Ch. can be any audio choke which will pass 20 mA or so.

Using a cheap crystal insert of the "surplus"
Circuit of the cathode modulator unit, in which the control valve V2 (6Y6 or KT66) is the series element in the PA cathode, modulation being effected by audio control of V2 grid, in the usual way. The circuit is so arranged that HT for the audio side is obtained from the PA cathode line, there being a voltage drop across V2. The twin-triode circuit V1A, V1B will give enough gain for a crystal microphone, and the whole unit can be built as a self-contained piece of apparatus, to plug into the cathode of any PA—see text for discussion.

Table of Values

<table>
<thead>
<tr>
<th>Circuit of the Cathode Modulator Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1, C3 = 8 µF, 450v. elect.</td>
</tr>
<tr>
<td>C2 = .005 µF, 350v. w.</td>
</tr>
<tr>
<td>C4, C5 = .01 µF, 500v. w.</td>
</tr>
<tr>
<td>C6 = 50 µF, 50v. w. elect.</td>
</tr>
<tr>
<td>R1 = 3 megsoms, ½-w.</td>
</tr>
<tr>
<td>R2 = 220,000 ohms, ½-w.</td>
</tr>
<tr>
<td>R3, R7 = 22,000 ohms, ½-w.</td>
</tr>
<tr>
<td>R4 = 500,000 ohms, var.</td>
</tr>
<tr>
<td>R5 = 2,000 ohms, ½-w.</td>
</tr>
<tr>
<td>R6, R9 = 100,000 ohms, ½-w.</td>
</tr>
<tr>
<td>R8 = 25,000 ohms, w/wound, var.</td>
</tr>
<tr>
<td>R10 = 500 ohms, w/wound, var.</td>
</tr>
<tr>
<td>C7 = 8 µF, 450v. elect.</td>
</tr>
<tr>
<td>C8 = .005 µF, 350v. w.</td>
</tr>
<tr>
<td>R11 = 3 megohms, ½-w.</td>
</tr>
<tr>
<td>R12 = 2,000 ohms, 2-w.</td>
</tr>
<tr>
<td>S1 = Single-pole toggle</td>
</tr>
<tr>
<td>Ch. = Audio choke, 20 mA</td>
</tr>
<tr>
<td>R4 = 500,000 ohms, var.</td>
</tr>
<tr>
<td>V1 = 6SL7, 12AX7, or ECC83</td>
</tr>
<tr>
<td>V2 = 6Y6, or KT66</td>
</tr>
</tbody>
</table>

Type, excellent quality reports are obtained. The twin-triode 6SL7 valve gives no distortion of waveform, and degenerative feedback is obtained across R5, which is not bypassed.

The writer has tried most forms of “efficiency” modulation and has found that the settings of aerial coupling and PA grid drive are inclined to be critical. But with this system there are no tedious adjustments. Once set for any given RF power input to the transmitter, the modulator unit should require no further attention.

Getting It Going

Setting-up procedure takes only a few seconds and should be carried out as follows:

1. Apply heater voltages to both the transmitter and the modulator.

2. Tune the transmitter PA in the normal manner for maximum input, then switch off the PA HT.

3. Insert the modulator jack plug, wired one side cathode and the other to the base line, switch on PA HT and adjust the “modulation depth” control R10 on the modulator unit until the PA anode current meter shows about 60% of the previous reading.

4. Advance the modulator “audio gain” control R4 until a neon bulb coupled to the aerial circuit shows a perceptible increase on modulation peaks, or there is a 25% increase in the reading in an RF ammeter in the aerial.

Valves to Use

Tests have shown that a 12AX7 or an ECC83 twin-triode valve functions well as V1; no suitable substitute was to hand for the 6Y6G, though a KT66 should work. A 6L6 valve was tried, but control was found to be somewhat erratic. Using a 6Y6G the maximum PA anode current before the modulator is connected is 200 mA, so the system is very suitable for the popular parallel or push-pull 807 combination.

The writer has used this system for several months to modulate an 813 PA on 80, 15 and 10 metres. Results have been outstanding, reports from DX stations comparing very favourably with the reports obtained with a Class-B 807 anode-and-screen modulator. Using simple doublet aerials, S9 reports have been received from W6, ZS and VK, and many DX stations have commented upon the high intelligibility of the signal. Some seven out of every ten stations raised on 80-metre phone when using this system have requested details of the circuit.

The unit has also been tested on the Top...
Band transmitter and local amateurs have come back with such comments as "best quality ever heard from your station."

During CW operation, with the audio gain control turned to minimum, adjustment of the modulation depth control provides a convenient means of varying the transmitter power input to any desired figure up to the maximum.

In conclusion, the writer would like to thank the many amateurs who have co-operated to test the effectiveness of the circuit by means of comparative reports, oscilloscope checks and tape recordings, as well as those who have suggested that this circuit be published in order that British amateurs can enjoy the many advantages of the system.

The push-to-talk switch is wired in the PA cathode in parallel with the key jack. When it is pushed, the screen of the PA takes current which actuates the relay, and the necessary switching functions are performed.

It will be seen that this system will work equally well irrespective of the source of supply, so that the difficulty of fixed operation with mobile equipment is overcome.

The large condenser, C1, connected across the relay performs two functions; first, it bypasses the audio frequency component when anode-and-screen modulation is employed; secondly, it puts a delay on the release of the relay when CW is used.

On CW, the initial "make" of the key will change over as for phone operation, and will hold in this condition until the condenser discharges through the relay coil to the value at which it releases.

Relay Control for Small Transmitters

USING PA SCREEN CURRENT

W. R. OHLEN (G3FVH)

With the advent of portable and mobile working on a much larger scale than hitherto, it is not unusual to find the same transmitter being used in the fixed and portable modes of operation. In either application, it is very desirable to have some form of rapid change-over, and relay control is usually necessary to switch the aerial, VFO, PA, modulator and, sometimes, the common HT supply.

For convenience, it is usual to operate the relays from the LT line when working as a portable or mobile station, and the system adopted will generally be a low-resistance relay with the necessary contacts operated from a "push-to-talk" switch. This system is simple, takes up little space, and will be quite satisfactory so long as the relay supply is DC. If, however, the same transmitter is in use at the home station with an AC supply for the heaters, satisfactory operation is not possible unless the relay system is specially designed.

The merit of the system described here will enable operation from either mains or batteries without modification, and with standard type relays.

Relay Circuit

The arrangement is as shown in the diagram, the general points being as follows: The relay coil is a high-resistance type connected in series with the PA screen, and should be chosen so that satisfactory operation is assured (having regard to the number of contacts) on about 8-10 mA. A standard PO relay of 1000 to 1500 ohms is satisfactory; the value of the normal screen resistance is reduced by that of the coil.

The circuit discussed in the article by G3FVH. The values of C2, C3 and Rc are as normally used, the screen resistor would have to be reduced by the resistance of the relay (Rs-Ry) and C1 is explained in the text. J1, J2 could be combined as one, the action of the device being that when the cathode circuit is closed, the valve draws screen current, thus actuating the relay, used for the control and change-over circuits. The valve operating conditions must, of course, be such that cathode current is not completely cut off when it is undriven—there must be some standing current to work the relay.
By suitable choice of value for C1 the relay can be made to "hang" over the spaces between keyed words, and a very useful form of modified "break-in" is obtained. The value will depend to a large extent on the relay and its adjustment, as well as on the operator's normal keying characteristic, but something like 25-50 \( \mu F \) is satisfactory; as the voltage-drop across the coil is small a low-voltage type can be used.

The system as described has been used in a small mobile/portable/fixed transmitter for a period of a year or so, and has proved very reliable in operation both on phone and CW, with a PA which takes a small standing cathode current when undriven.

In the author's transmitter, where space was at a premium, the two jacks, J1, J2, were replaced by the single three-contact jack; then, by suitable plug wiring, the same jack is used for microphone, key, and tuning millimeter.

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### CHANGING CRYSTAL FREQUENCY

#### SIMPLE GRINDING TECHNIQUE

**R. H. Wright (G3IBX)**

As there are a quantity of quartz crystals (outside the amateur bands) available at the present time suitable for regrinding, a few words on the subject for the benefit of the relative newcomers to Amateur Radio might be timely.

As things are these days, there is a marked tendency to control transmitter frequency by means of a variable frequency oscillator (VFO). While such a method has many advantages in the hands of an experienced operator, for the beginner the well-trodden "CO-PA" path is usually to be preferred—at least until some experience in amateur work has been gained—since transmission frequency is always in the band and RST reports almost invariably T9 or T9x.

To change the frequency of a quartz crystal—and, incidentally, the frequency can only be increased by this method—the first necessity is a sheet of good plate glass about a foot or so square. Very fine grade carborundum paste can be used as the abrasive, but for the beginner a slower but surer alternative is one of the standard household scouring powders such as "Vim."

**To Grind the Crystal**

Scatter a quantity of the powder on to the centre of the glass and add a little water to make a stiff paste, place the crystal in the centre of the mess and rub in a figure-8 pattern, applying medium pressure to the back of the crystal with the first two fingers of one hand. This motion assists in keeping the crystal flat. If the crystal is hard to move across the glass add a few spots of water to the paste. As the paste becomes smooth more powder and water may be added, a little of each at a time. In general, about ten minutes of this rubbing will increase the frequency of a 5 mc crystal by about 300 kc, but frequent checks of the frequency should be made, particularly in the later stages as the crystal approaches the desired frequency. It is not possible to be specific about grinding time against frequency—this technique is very much a matter of "cut-and-try." It is advisable always to grind the same face of the crystal.

Before replacing the crystal in the holder for a frequency check, it should be thoroughly scrubbed in warm water using an old soft toothbrush and then carefully dried; remember that these crystals are easily cracked and should, therefore, be handled with great care. Another method of cleaning is to dip the crystal in a bath (egg-cup) of "Thawpit," the well-known household cleaner, which is carbon tetrachloride.

Should the crystal fail to oscillate after a spell of grinding, provided it has not been fractured in any way the most probable reason will be dirt or moisture on the crystal itself or on the electrodes, so be sure that these are clean and dry. If the activity of the crystal is still down, it can often be restored by bevelling all eight edges, but this will also increase the frequency of oscillation.

To test the crystal easily and quickly, make up a Pierce oscillator—see any handbook for the circuit—which is untuned and will go off at any frequency from one megacycle upwards. Alternatively, the tuned CO which is to work with the crystal can, of course, be used. The station communications receiver will tell you where you are with the frequency.

One final word of warning: Before using the crystal in a transmitter, have it checked for frequency to ensure that your transmission is within the band. It is almost certain that at least one member of your local club will have a 100 kc crystal standard or a Pierce oscillator—see any handbook for the circuit—which is untuned and will go off at any frequency from one megacycle upwards. Alternatively, the tuned CO which is to work with the crystal can, of course, be used. The station communications receiver will tell you where you are with the frequency.

**GETTING IT REGULARLY**

Like almost all other periodicals, SHORT WAVE MAGAZINE can be obtained through any bookstall or newsagent—whether in the heart of a great city, or in a village post office where they sell sweets with the daily newspapers. This does not necessarily mean that the Magazine will be stacked on the counter to catch the eye of casual customers. Rather is it to say that your local newsagent, whoever he is or wherever he may be, can always obtain SHORT WAVE MAGAZINE, in any reasonable quantity, from one to one hundred copies, either through his usual wholesaler or by order direct to us. It will help him as much as it helps us if you place an order for your copy.
Eddystone "888"

AMATEUR BAND COMMUNICATIONS RECEIVER

TEST REPORT

As we know, many readers have been waiting for a comment on the new Eddystone 888, the first British receiver designed and built exclusively for amateur band reception.

It is not intended here to repeat the performance data and the technical specification, given in detail in the makers' descriptive literature, but rather to discuss the "888" strictly from the point of view of its operation, handling and behaviour on the amateur bands, under practical on-the-air conditions—that is to say, the results the receiver is capable of giving in the hands of the discriminating user.

The first point to make is that the price has been built into the "888." Nowadays, it is not possible to produce a really good article cheaply. In the case of the "888," its list price merely reflects the high cost of developing the design and, hence, the quality of the finished job, considered as piece of mechanical and electrical engineering produced for a specific purpose.

Band Spread and Calibration

All six amateur bands, Top to Ten, are well spread over a wide, fully calibrated scale; this is scanned by a free-running cursor moved smoothly by a flywheel mechanism. One can either spin rapidly across a band or, with equal ease, tune closely on to a signal with absolute certainty.

The degree of band-spread provided and the accuracy with which tuning can be done are features of particular importance on our bands as they are today. In the "888," tuning on 10 metres is as smooth and easy as on 160 metres—and on all bands one can read off the frequency to well within the limits practicable, or necessary, in normal amateur working. To be able to get within, say, 5 kc on 10 metres would be near enough for most people—but, in fact, you can do much better than that (to within 2 kc on 28 mc) while on 160 metres a frequency can be set up within a fraction of a kilocycle. On the bands between, the scale and calibration accuracy varies between these limits, as one works either up or down in frequency.

This is only possible because calibration accuracy is maintained by a built-in crystal calibrator, giving 100 kc points throughout the whole tuning range, combined with an oscillator fine-setting adjustment as a front-panel control. The crystal calibrator is itself push-button controlled from the front panel; when the button is pressed, the receiver is muted, and, with the main dial set to the band-edge (or any 100 kc scale point) the oscillator control is adjusted to zero-beat with the crystal calibrator.

For accurate working, the oscillator has thus to be re-set with each change of band—a matter of a few seconds only.

Noise Limiting and Selectivity Controls

In the "888," noise can be limited, or controlled, in three ways: By use of the noise limiter itself, by increasing selectivity, and, in CW reception, by use of the AF filter at the audio end of the receiver.

The noise limiter will cut staccato peaks to a low level, and is particularly effective on Loran, on stray noise such as occurs when the receiver gains are well up, and on sideband splashing or key clicks from a nearby transmitter.

In previous Eddystone designs, a system of constantly variable selectivity has been used, and this is incorporated in the "888." It permits a variation of selectivity over a wide range on the IF side; under the normal conditions of amateur-band reception it is a most essential operating control. As the IF response is sharpened, so selectivity is increased and noise-level is reduced, enabling more gain to be used. The inherent selectivity is in any event high, because the receiver is a double-superhet with 85 kc as the second IF channel.

The Audio Filter

For the CW operator, this will be found to be a most fascinating refinement. The filter comes in, by switching, before the final output stage, and can be made to "ring" at 1,000 cycles on an incoming CW signal; the effect is to pick out and build up the wanted signal to a much higher level than is possible without the filter. It is brought into operation first by tuning the wanted signal in the ordinary way, then switching in the filter, and finally ringing the signal by adjustment of the BFO. When the 1000-cycle beat is obtained, the gains can be turned up and the signal will stand out clear of noise and interference. Hence, it can be described as an additional selectivity control.

An interesting feature of the AF filter is the
Underside view of the Eddystone "888," showing general construction. The central complex is the heart of the receiver—the RF, mixer and oscillator tuning assembly, fully screened in an aluminium casting. The lower compartment is the RF section, followed by the mixer, with the oscillator section nearest panel. The band-change switch mechanism is the control on the left; it gives smooth but positive action. The rod on the extreme right is the variable selectivity control, engaging the cores of T2, T3 (see circuit diagram). Construction throughout is meticulous, with good accessibility for maintenance and servicing.

way it can be used to check the stability of the signal on tune—the filter is so sharp that the slightest drift or irregularity is shown up. It will be found that in listening to a DX signal or, even more particularly, when working one, very few will stay within the narrow pass-band of the filter. Yet, even on 10 metres, there are stations so stable on frequency that they will come back and ring the filter every time. This is a test of the stability both of the distant station and the receiver itself.

Sensitivity and Gain

The overall sensitivity of the "888" is such that full gain—RF and IF—can seldom be used. Nevertheless, at normal loud-signal settings, the receiver is extraordinarily quiet—so much so that in tuning between phone stations on, say, 10 metres, it sounds almost dead, until one hits a signal.

During tests, the performance of the "888" was tried in comparison with some seven other receivers of different types and makes. Taking 10 metres as the test band, the "888" produced louder, steadier signals, much easier to find and tune, than any of the other receivers.

The time constant for the delayed AGC has been set at a good average value, and telephony signals are held steady over a wide range of input variation.

It can be said, therefore, that in terms of gain, sensitivity and AGC action the "888" gives an outstanding performance. At all times, one feels that there is plenty in hand, and that there is no need to squeeze the receiver to get the utmost in sensitivity. One obvious reason for this is that the design takes full advantage of the fact that with only the six amateur bands to cover, the circuits can be peaked to give optimum results over what are relatively narrow frequency ranges.

SSB Reception

In taking an SSB signal, it will be found that entirely satisfactory results will be obtained by using the BFO, with the RF gain right up,
and controlling the level on the IF gain, with whatever AF setting is required to give a tolerable audio output. This is the usual method of tuning an SSB signal on a receiver not specially adapted for sideband reception.

Additional Features

So much for the general behaviour and performance of the "888," and its handling.

A useful additional feature is an (internal) aerial input trimmer, C15 in the circuit diagram, adjusted by a knob accessible by lifting the cabinet lid; this is a band-to-band

**EDDYSTONE "888" SWITCHING**

*(See Circuit Diagram)*

Sw.1-Sw.6 — Band change switch assembly
Sw.7 — Calibration push-button, bringing in Crystal Calibrator
Sw.8 — Audio Filter in-out
Sw.9 — Noise Limiter on-off
Sw.10 — BFO on-off (BFO on, AGC off)
Sw.11 — Mains on-off
Sw.12 — Send-Receive, and muting
Circuit complete of the new Eddystone "888," shown in two parts facing for the convenience of this presentation, the numbered junctions being, of course, continuous in the actual wiring. The general front-end arrangement is RF-mixer-oscillator (V1, V2, V3) with the first frequency change, to 1620 kc, in V2, and the second, 1620 to 85 kc, in V4. The IF stage is V5, the variable selectivity control being applied to T2, T3. The audio side is taken care of by V6, V8; the circuitry round T5, controlled by the switch Sw. 5, is the 1000-cycle audio filter for peaking up sharply on CW reception. V7 is the noise-limiter diode, controlled by Sw. 9, and V9 the BFO, brought in by Sw. 10, which also earths down the AGC line. V12 is the crystal calibrator unit, separately controlled by push-button switch Sw. 7, which mutes the front end (for calibration) by bringing in R53. The main send-receive switch is Sw. 12, connected to actuate a relay in the "send" position, if required. The two AF stages V6, V8 can be used separately (for a microphone or other form of audio input), the audio gain control R40 remaining operative under all conditions.

Adjustment, not at all critical unless using end-on aerials of "awkward" length for the frequency.

The other refinement of particular interest is that the receiver gives full monitoring. The send-receive switch, while muting on "send," permits enough pick-up for the transmitter to be heard, without any paralysing front-end blocking effect. The pick-up sensitivity is adjustable, within certain limits, by a contro
inside the cabinet; in practice, once set it need hardly be touched.

Rear-drop connections (aerial, speaker, audio input) are made to spring-loaded terminals, which is very convenient, and there are sockets for plugging in the standard S-meter—which for years has been a feature of Eddystone receivers—and auxiliary power supplies.

Some General Points

Before putting the power lead into a socket, it is advisable to study carefully the very complete notes on installation and operation provided with the receiver. These are most comprehensive and give a good deal of practical information on the handling of the set. The servicing sheet gives the circuit with all values and test voltages, together with full instructions for RF and IF adjustment, should this be necessary at any time.

To get the best out of the “888,” it has got to be learnt in the sense that practice is required in the manipulation of the controls. It is a receiver any keen amateur-band operator would be proud to own. Its figures and performance compare favourably with any modern American type in the same price range, and are better than most. The layout, construction and general finish are excellent and—as with all Eddystone products—the receiver is up to the best British standards in design and workmanship.

The “888” has been discussed here in some detail because it is a noteworthy product, besides which its circuitry and construction will be of interest to all those readers who wish to be au fait with the trends in modern amateur-band receiver design.

Eddystone Receiver Type 888. Twelve-valve double superheterodyne, 1620-85 kc, miniature valve types in ten positions, tuning six amateur bands 1.8 to 30 mc only. Output 2½ watts audio into 3-ohm speaker, or HR headset. Incorporating independent RF, IF and AF gain controls, monitoring, crystal calibration, BFO, audio noise limiting, constantly variable selectivity, AGC, send-receive muting switch. Mains input 110, 200-240 volts AC; power consumption 80 watts, weight 44 lbs., dimensions overall 17 ins. wide, 10 ins. deep, 9 ins. high. U.K. list price £110. Manufacturers: Stratton & Co., Ltd., Eddystone Works, Alvechurch Rd., West Heath, Birmingham 31.
AN INTRODUCTION TO AMATEUR RADIO

STRICTLY FOR THE BEGINNER

PART II

The first part of this article appeared in our March issue, and covered the callsign system, use and behaviour of the different amateur frequency bands, and the Amateur Radio set-up in general. Here we discuss the Q-Code, the QSL system and what might be described as the competitive or sporting side of amateur activity.—Editor.

The “Q” Code was devised for general communication purposes and contains a whole series of abbreviations applicable to commercial radio. Amateurs have, however, adopted it for themselves (somewhat modified), and you are almost certain to hear them using the abbreviations shown in the table of Q Code Signals.

There are many more official “Q” signals, but the examples given are those mostly used (and “intelligently misused”) by amateurs. On CW they also use several other recognised abbreviations, most of which are obvious, such as “Ur” for “Your”; “Cuagn” for “See you again”; “Tks” for “Thanks”—and so on. Strictly speaking, the “Q” signals should apply only to CW working, but they are very frequently and rather unnecessarily used on telephony as well.

The DX Angle

It has already been made clear that the different bands give quite different results, since the distances they cover vary considerably. This also gives rise to the fact that they are put to very different uses and, one might almost say, are used by different types of people—that is to say, amateurs with different interests in Amateur Radio.

The letters “DX” originally stood for “distance,” in the sense of “My DX from you is 3000 miles”; but nowadays they mean something much more mystical and hard to define. The art of working DX is the art of contacting more stations, and particularly more “rare” ones, than the man next-door. DX work is long-distance work, but, to illustrate our point, one solitary station in the Solomon Islands is better “DX” than twenty stations in New Zealand, although the actual distance is not so great.

These solitary stations are much sought-after just because they are so elusive and difficult to work. It is almost as though the amateur, having broken down the barriers of sheer distance, had to set himself another and more difficult goal, by setting out to fill up all the gaps in his coverage. It is quite natural that any amateur, keen on long-distance working, should want to see how many areas of the globe his signals really do cover, and the amateur population of the world is so widespread that a grand opportunity presents itself. Some of the world’s leading operators have worked nearly 250 different countries out of a possible total of roughly 270—the present highest score is, in fact, 271!

The difficult problem of “When is a country not a country?” has to be solved every now and then by consultation between the national Amateur Radio societies and the writers of the various DX columns throughout the world, but there are now only a very few doubtful cases.

Thus the incessant quest for DX means that an amateur station in Saudi Arabia is quite a nice “catch” but by no means a rarity; when, however, the same station moves itself across the border into the territory of Yemen (recognised as a separate country and with a prefix of its own) he becomes a fabulous collectors’ piece and everyone in the world is on his tail at once!

This gives a hint of the implications of the term “DX”—and, as you might imagine, some sort of proof of contact is essential.

The QSL System

Many years back a British operator, G2UV, startled the stations he worked by following up his chats over the air with a post-card, bearing details of his station and also the signal “QSL” (meaning “Please acknowledge”). This certainly started something; brighter and better cards were produced, usually with the call-sign in brilliant colours and large letters, and someone had the brainwave of papering the walls of the station with these trophies. It became the fashion and is now an essential part of Amateur Radio; no good DX contact is complete until the other fellow’s “QSL card” has been received. QSL’s are regarded as the final proof of a contact and a deterrent to optimistic spirits given to drawing the long bow.

As the number of amateur stations increased, it became expensive to QSL every contact by direct post, and so the system of “QSL Bureaux” grew.

Q CODE ABBREVIATIONS AND MEANINGS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>QRG</td>
<td>Frequency (in kc)</td>
</tr>
<tr>
<td>QRI</td>
<td>Tone</td>
</tr>
<tr>
<td>QRJ</td>
<td>Signals are weak</td>
</tr>
<tr>
<td>QRK</td>
<td>Signals received (strength)</td>
</tr>
<tr>
<td>QRL</td>
<td>I am busy</td>
</tr>
<tr>
<td>QRM</td>
<td>Interference</td>
</tr>
<tr>
<td>QRN</td>
<td>Static</td>
</tr>
<tr>
<td>QRO</td>
<td>High power</td>
</tr>
<tr>
<td>QRP</td>
<td>Low power</td>
</tr>
<tr>
<td>QRQ</td>
<td>Send faster</td>
</tr>
<tr>
<td>QRS</td>
<td>Send slower</td>
</tr>
<tr>
<td>QRT</td>
<td>Stop transmitting</td>
</tr>
<tr>
<td>QRU</td>
<td>I have nothing for you</td>
</tr>
<tr>
<td>QRV</td>
<td>I am ready</td>
</tr>
<tr>
<td>QRX</td>
<td>Stand by (listen)</td>
</tr>
<tr>
<td>QRZ</td>
<td>You are being called by</td>
</tr>
<tr>
<td>QSA</td>
<td>Readability</td>
</tr>
<tr>
<td>QSB</td>
<td>Fading</td>
</tr>
<tr>
<td>QSC</td>
<td>Faded out</td>
</tr>
<tr>
<td>QSL</td>
<td>Acknowledgment (see text)</td>
</tr>
<tr>
<td>QSO</td>
<td>Contact</td>
</tr>
<tr>
<td>QSP</td>
<td>Pass message</td>
</tr>
<tr>
<td>QSV</td>
<td>Send series of V's</td>
</tr>
<tr>
<td>QSY</td>
<td>Change frequency</td>
</tr>
</tbody>
</table>
up. In each country of any importance there is now a Bureau (and in many cases more than one) which takes care of all the outgoing cards, sorts them and despatches them to the various addresses; and, conversely, receives the incoming cards from the other Bureaux throughout the world, sorts them and sends them to their destinations in the home country. Users of the Bureau merely keep it supplied with a few self-addressed, stamped envelopes, and as soon as some cards accumulate for each owner of envelopes, they are put into one and duly despatched.

This cuts QSL costs down to a minimum, as the international traffic in these cards now takes place largely by means of fat parcels instead of individual cards.

All kinds of designs have been developed since the early days, in which the convention was to have a rather full description of the station, with spaces, of course, for the signal report, and a huge overprint of the call-sign. These gave way to more individualistic and more artistic designs, and some of the cards from remote parts are now very interesting souvenirs. Many people even regard them as too good to impale on the wall with drawing-pins, and they either file them in a cabinet or keep them in an album.

Certificates and Awards

Once it was realised that a QSL card could be regarded as a satisfactory proof of contact, it was obvious that the demand for various trophies and certificates should arise. One of the earliest, for instance, was a "Worked All Continents" certificate, issued by the ARRL—the American Amateur Radio organisation—and universally known as a WAC. This was no mean feat back in 1925 and thereabouts, when contacts between Europe and Australasia had only just been made for the first time, and the original WAC-holders had something they could really be proud of—but they could not claim this award, or any other, without the production of the QSL cards to prove they had made the contacts. And so it has been ever since, with the list of available awards growing and growing until, nowadays, the hard worker should be able to paper, not only his radio room but the entire house, with certificates of this and that!

After the WAC came the WBE (Worked British Empire). Then, for really top-notch operators in pre-war days, came the DXCC (DX Century Club), to become a member of which meant working 100 different countries. This was very difficult in the 1930's, but nowadays many members of the DXCC have over 200 to their credit.

The WAZ (Worked All Zones) was based on a division of the world into 40 different zones—as shown on our DX Zone Map—some of which present a really difficult problem. Particularly tough is Zone 23, which includes only Tibet and the remoter parts of China and Mongolia! For some years the only station in this huge zone was AC4YN in Lhasa. Tibet, who became quite fabulous and was undoubtedly "the rarest DX in the world." He is still on the air, but signs G5YN nowadays.

From these beginnings, it now seems that almost every national society has originated its own particular awards. So we have a WAVE for Canada, a WASM for Sweden, a DUF for France and the French Colonies, a WAB for Brazil, and so on almost ad infinitum.

SHORT WAVE MAGAZINE has originated six Certificates for DX workers: as these were discussed in our February issue, there is no need to explain them here.

So QSL cards in bundles of various sizes continue to circulate briskly round the world in order that keen DX men can collect more and more trophies as some sort of return for their concentration and burning of midnight oil.

For the Listener

Keen short-wave listeners, while not trafficking in QSL cards to the extent of the transmitters, do, of course, send out postal reports to rare stations that they hear, in the hope of receiving a QSL in return. Discriminating reporters do well in this respect, by writing only to stations that do not appear to be receiving many replies to their calls; by confining themselves to the wave-bands on which DX reception is less easy; and by keeping a watch on one particular station and sending a useful "period report" covering, perhaps, many days or even weeks.

QSL cards are not invariably forthcoming in return for listeners' reports. A station with an outstanding signal, especially if he be rare DX from the Cook Islands or Tristan da Cunha, will have no difficulty in working scores of amateurs whenever he comes on the air. All these transmitters will naturally
want a QSL from him; and if he is deluged with dozens of listeners' reports as well (which will tell him very little that is news to him) he may well give up the whole business as too expensive or too time-wasting.

But the fact remains that some short-wave listeners, who are intelligent in their choice of stations to report on, and who often succeed in winking out some very weak signals that are not being replied to, do acquire extremely good collections of cards for their trouble. By specialising, for instance, in DX on 40 or 80 metres, it is possible to hear stations to whom it really is news that their signals are getting as far as this... they are duly grateful, and oblige with a QSL.

Among the leading short-wave listeners in this country you will find "scores" of over 100 countries heard on 80 metres; nearly 200 on 40 metres; well over 200 on 20 metres; and perhaps 150 or so on 10 metres. The over-all score of countries heard may be over 240.

But not all listeners are as keen as this on DX work, and some, with little or no knowledge of the Morse code, confine their energies to phone transmissions, their scores therefore being considerably lower.

Much amusement can also be derived from listening merely to the local and semi-local stations; in fact, it is probable that the vast majority of short-wave listeners are by no means keen on DX for the sake of DX. On the 160-metre band there is a very friendly collection of British stations working phone as well as CW. Many of them are glad of listeners' reports on quality of transmission; and even if you are an SWL and never bother to send out postal reports, you soon feel that you are part of the scheme of things. You find that certain transmitters become quite old friends, and when the supreme moment comes for you to take out your own licence, you know the ropes. And you find that you can join in the fraternity of transmitters without making yourself look foolish, because the "procedure" and the jargon are so well known to you by then.

Almost every new transmitting operator on the air has "served an apprenticeship" of at least some time as a short-wave listener; and there is no training to compare with it. It is rather like learning road sense by riding a bicycle before aspiring to the ownership of a small car.

Many ex-Service receivers are now available which, with slight modifications, put up really excellent performances on the amateur bands. They are, in fact, often used by the transmitters, not all of whom can aspire to receivers specially built for amateur-band reception. Home-built receivers are even more fascinating and give as much scope for skill and knowledge as home-built transmitters—probably even more so.

The complete newcomer will find that we are now almost at the peak of an eleven-year cycle of sunspots and that conditions this year are extremely good for DX. Throughout this summer real DX should be quite easy! Next winter, too, will be an outstanding season for DX.

(To be continued)

This is the centenary year of the birth (February 28, 1857) of Heinrich Hertz who, as Professor of Physics at Karlsruhe University, constructed the first apparatus proving the existence of electro-magnetic waves. Hertz's work was based upon the theories advanced originally by the great Scots physicist Clerk Maxwell, who published his treatise in 1873, when he was Professor of Experimental Physics at Cambridge University. Though between them Clerk Maxwell and Heinrich Hertz laid the foundations of radio communication as we know it today, neither took their own ideas any further. It was left to Branly, Lodge and Marconi to develop the experimental side leading to the practical application. The apparatus pictured here is a reconstruction of the equipment used by Hertz, who was able to prove not only the existence of radio waves, but that they behave in a manner akin to light waves. The photograph is a still from the Mullard instructional film "Mirror in the Sky," noticed on p. 34 of the March issue.
FOR more than ten years this Commentary has been kept to a standardised layout whereby the DX on the various bands has been presented under distinct headings. This month, for the first time, a break is being made with tradition by dealing with all the major DX work under one heading.

The segregation into bands had several disadvantages. Many readers (in fact the great majority) cover at least three different bands in their letters, which means that three different extracts have had to be made. This has tended to eliminate general comments which, while applying to no particular band, would probably have been of interest in the story as a whole.

The only readers to benefit from the separation of the DX into headings of Ten, Fifteen and Twenty were those who specialised in one band or another, and their numbers, which have always been very small, are becoming even smaller.

One hopes that with the new layout it will be possible to maintain more of a personal touch with regular correspondents and also to give opinions on the respective merits and demerits of the DX bands which would otherwise be lost after dissecting letters.

We shall, of course, keep Top Band matters entirely separate from the others; likewise, the valuable collection of "DX Gossip" items, derived from foreign publications and letters from overseas readers, will remain.

Thus the only real change, which is not necessarily permanent, will be the grouping together of DX in the "Ten-Fifteen-Twenty" category, with, we hope, certain advantages in its presentation.

The DX Bands

Conditions have remained at a pretty high level all through the month, apart from a few patches of Aurora. One never knows what the latter will do, as it seems to have all effects from improving conditions in certain directions to producing a complete blackout. At all events it makes life interesting, because when you hear those fluttery signals at unusual times you can be pretty sure that the following few days will show freak conditions of one kind or another.

The pattern of the three main DX bands remains unchanged. Twenty is still the place for most of the rare ones, especially on CW, but short-skip throughout the hours of daylight has been a real pest. Fifteen is besieged by all kinds of bubble-and-squeak, but produces DX signals of fantastic strength when it is good. There are not many rarities, but several new countries to be winkled out, particularly on phone. Ten is the band for good solid ragchews with fine signal strength and little QRM, but the DX-chasers who no longer find pleasure in talking to W's are apt to become a little bored with it. At most times of the day the W's account for quite 90 per cent. of the CW population, but it is always worth watching during the mornings, before they arrive. Phone can be expected to produce almost anything, with the enormous benefit that the W's are segregated in their own phone band, vast though it is.

The Five-Band Table shows the relative importance of the bands for sheer Country-Collecting: eight stations have worked more than 200 countries on Twenty, but no-one is yet even approaching that figure for Ten or Fifteen. DL7AA's phenomenal 166 on Forty indicates that something might happen on that band before anyone reaches his mark on the HF bands!

All-Rounders

G3GGS (Preston) was one of the select few who used to report on all six bands (and have his letter carved into six separate bits!). This month he confines himself to the three DX bands, although he says he has used all six again. Ten did not produce anything new.
but many W's were worked. Fifteen gave him two all-time new ones—H22DX and VP2VG. The latter is in the British Virgin Islands, and KV4AA says he is accepted as a new one by CQ, but not yet by ARRL. Others worked by G3GGS were K6ABM/KG6 and a KP4. On Twenty he found two more new ones in VP2LU and VP8BK. ET2US might make up for the MI3 card that he never received, and UI8AF was welcome. Gotaways, an exciting list, included FB8BR and BCC, VP8BS, LUSZC, VP8BK. ET2US might make up even more new ones in VP2LU and KP4. On Twenty he found two MP4K, FB8BP, JZ0PC, VQ5, ZD1, ZD6, ZP and an LU mobile with 15 watts to a whip (all on phone). CW raised UD6 and 3W8AA. On Twenty G3FXB collected OH2AA/0, both CW and phone.

G3DRN (Broadstairs) was mainly on Fifteen, where new ones were ZD4, EA, YU, UQ, Trieste, and KR6RB and OH2AA/0 for all-time additions. The only new one on Ten was ZB1, and G3DNR didn't think much of that band during the period.

G2YS (Filey) raised the first XE of his life when he got XEIPJ on Fifteen; just before that he worked UA9DP. Both in a chance ten minutes' session at lunch-time.

G3JJZ (Locking) had twelve days of leave at the end of February, and pushed his input up to 120 watts. Although reports were not much better than he used to get with 30 watts, he did raise ZL4GA, KA3BE and VS1HC on Twenty one morning; his trouble seems to be not hearing the DX (apart from bags of W's) in spite of trying various aerials. So G3JJZ is now thinking in terms of a 35-ft. tower and a couple of HF-band beams.

GW3DNF found it a rather poor month for his .12 watts, but although one week went by without any DX at all, he also collected his two best new ones in VP8AX (Twenty) and L4UZS (Fifteen). On Forty he raised SM8YF, an /MM between CT1 and CT2.

G6VC (Northfleet) is playing with a "ZL Special," not yet finished. Apart from working OH2AA/0 on Fifteen, his activities have been mostly on Ten phone, where he added IT, HA, ZB2, 4X and ZS to his bag. He laments that the "rare" Russians never come back to him—he would like UD6, UF6, UI88, UI8 and such, but they just don't play.

G3JKF (London, W.5) had a good time on Twenty CW with UL7GN, UA0KKB, FF8, VS9AG, ZS9P, 3W8AA, 15RAM, ET2US, UI8AG, FM7WR, FG7XC, 4X5RE, VQ6LQ, FY7YF and KH6AYG. Ten phone brought him HP3DA, and three ZD6's. A solitary QSO on Forty was VK1AZ (2330). G3H0X (Mitcham) manages to work ZL both at 0830 and 2100, and new ones on Twenty have been CE, UP, UQ and YV (0830). Plenty raised on Ten, but the only new ones were CN8, HZ, PY and ZB1. G3H0X also made, together with G8UG, the last QSO with VP6AM before he pulled down the aerial and left for England.

DX Gossip

Here we pause a moment for a cup of tea and a cozy chat about DX in general, after which we will

...And now, in my crystal I see a VFO...
return to the individual clients! ST2NG is now operating as VS9AG (many people have discovered this) and ST2DB has left for ZD4, so the ST2 territory is now somewhat barren.

G3FXB says SVØWD should be in operation from Crete for about three months... ZAIKUN (phone, 14135) is said to be genuine—Box 55, Tirana, Albania... HS1MQ and HS1A are both active on phone.

Last month G5BZ warned us to look for VQ9 activity on a certain date—too early for last month’s Commentary to have been any use, so we didn’t mention it. Now the story is out. W6VX, on a round-the-world cruise on the *Caronia*, has a portable rig with him. He had arranged to sign VQ9VX from the Seychelles, and so he did: unfortunately the time available was much shorter than he had hoped. Total log of stations worked under this rare call was VQ4AQ, VQ4ERR and VQ5EK. ZS6BJ was heard, but no Europeans. Conditions were so bad on Fifteen that even OLU was inaudible! Meanwhile, look out for intriguing calls with “VX” in them, as Dave is scouting for exotic locations in the region of Bali and other places East.

Labrador stations became VO2’s from April 1. *VO6N* will be signing VO2NA. Newfoundlanders will be VO1’s... CR4AS is on Fifteen phone, very active... ZLSAA, one of the IGY stations, is on Twenty phone and CW. 0900-1200 GMT... FB8CC, much in evidence on Twenty, is old FB8XX... VK0AF is in Antarctica, and there is no activity at present from Heard Island.

GW3CMK (Barry) is now off the air and *en route* for Jamaica. He hopes to be on with a VP5 call as soon as possible, and will be looking for G contacts at all times... Conversely, ZB2Q has now packed up and is in Aylesbury awaiting his G call. He was brought home during the WAE Contest and is still awaiting his log and QSL cards, so please be patient. Meanwhile, he says his good friend ZB2W is now on the air.

### FIVE BAND DX TABLE

**POST-WAR**

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<tr>
<th>Station</th>
<th>Points</th>
<th>3.5 mc</th>
<th>7 mc</th>
<th>14 mc</th>
<th>21 mc</th>
<th>28 mc</th>
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<td>146</td>
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**Top Band Topics**

These years of sunspot maxima are definitely no good to the Top Band DX’ers, and all credit to them for achieving as much as they have done this season. There are no further reports of Transatlantic work, although there is plenty of activity still on the other side. No DX was heard in the States on February 17 or 24, and on March 3 there seems to have been nothing doing over here.

G2HNO (Bournemouth) writes that he will be operating from *Alderney* as G2CHNO between April 16 and May 1, so gather round, County-chasers, and keep him busy. His location will not be ideal nor his aerial very good, but he hopes for a little fun and promises to send us a *post-mortem* report if all goes well.

G2HDR (Bristol) has been busy building an HF-band rig. He reports that activity has fallen off more than ever, and supposes this is because of DX band conditions, which he now proposes to take advantage of himself. G3JUB was working for a new one.

GM3COV (Caithness) is now up to 49/62 and hopes soon to claim his second WABC (first made from Cumberland as G3COV). He confirms that conditions have not been good, although he did work G3JEL (London) on phone at RS56 both ways. Other QSOs were with G6NA, using 0.1 watt, and with G3CSZ/TTX. GM3COV’s disadvantage is that he can’t work his own county or the two adjoining ones—Sutherland and Orkney. He might visit the latter in the summer.

G3LNR (Nottingham) collected five new counties and also worked HB91N. Called in vain were DL2’s, G3JUB and sundry OK’s. GM’s and GW’s. DX heard was W1MOS at 0110 on February 22, and K2KWP at 0515 on March 11—the latter being the only signal on the band and quite deaf to G3LNR’s replies.

SWL lball (Worksop) confirms that there has been very little doing in the DX line, but he was pleased to get a card back from ZBIHKO, thanking him for the first G/SWL report received for Top Band work. ZBIHKO expects to be more active on the band next season.
G3JSN (Harrow) raised DLZ2O and GD3UB; now he would like HB and EI to bring his figure up to the round ten countries, but he has not heard either of them for some time.

G3JHH (Hounslow) has not added to his score (which is 88/88) and is hoping for some new activity at Easter—obviously a ready-made customer for G3HNO!

G2BFA (Morden) worked OK1AEH, I1KKR, 2KBE and DL2Z0, and also heard a ZB1 being called by W1BB at 0345 on March 3, but only RST-239.

Late Flash: One piece of DX is reported by GW3HFG, who worked W1MOF at 0058 GMT on February 19. He also received reports from SM, OE and HB.

GW3HFG, whose QTH is Pembroke Dock, has been trying to get Pembps. contacts to as many as possible since last April, with a break of three months. Now he tells us that he will probably appear from V51 during this summer ... not on One-Sixty.

DLZ2O and Z2K visited Luxembourg on February 20, as planned, having been given permission to operate therefrom on One-Sixty. On arrival they found that the matter had been “re-considered” and they were given permission instead for all bands Eighty to Ten! However, they plan a return trip in June to cover the other bands.

DLZ2O, from his new QTH south of Frankfurt, has worked SP6KBE, who came back to a CQ; also G3KQX/TTX at 504 miles—good going! Later he worked G3CSZ/TTX at 550 miles—better still, and believed to break the existing TTX record. DLZ2O is now licensed as DL4FH, and is QRT on 160 metres until next season, but active on all other bands.

Historic Event

The change-over from Gold Coast to Ghana, at midnight on March 5/6, was celebrated in a big way. ZD4BQ (Tarkwa) tells us that G5BJ of Birmingham was the last station in the world to work the Gold Coast and the first in the world to work Ghana, on CW, as the ZD4BQ/G5BJ contact ran from 2359 on March 5 until 0013 on March 6.

At the same time ZD4BF and G2HQ were in contact on SSB phone, so G2HQ can apparently claim the “first and last” distinction for phone.

ZD4BR had a G station on 21 mc phone at 0001 on March 6, but no further details are known. ZD4BQ worked W9V1N on CW at 0021, giving him the first W contact with Ghana.

ZD4BQ writes: “To give you some idea of the tremendous QRM, it took me from 0012 to 0021 GMT. I tuned from 10 kc below to 10 kc above my frequency and it was jammed solid with W’s calling me.” All the more credit to G5BJ for beating them to it!

Specialists

Under this heading we group a few reports from stations who have stuck to one, or at the most two, bands during the month.

A new cubical-quadrant beam encouraged G3ABG (Cannock) to celebrate on Ten phone, where a week’s operation pulled in such DX as K5HNY/KG6, VO, VE8, KP4, ZC4, ZS, LU, PY, CT2, 5A, HZ, OD5, VP6, CN8, FA, CX, ZBI, VQ2, ZD4 and CO.

G3WL (Plymouth) reports for Fifteen only, where his new countries were AP2RH, VP8CC (Deception Is.), H92DX, PJ2ME, KL7CAW, VS6DN and HC1LE.

G2YU (Cannock) also reports on Fifteen phone only, having worked VP8CH (2000) and VR2BZ (0800). G3HCU (Chiddingfold) has always been a man for the two HF bands. His activity has been less, and will become even lesser, as he is involved in a change of QTH. (The new one will be 500 ft. a.s.l. and “in the clear.”) New ones for him on Ten phone were ZP3CZ, HH2PR (both all-time new, ones), CX8AN, OA4BP, 5A5TE, FA8EV, ZD1DR, F8BHP, VQ5GC and CZ1SA. He is now working 49 countries on Ten this year, with an all-time total of 110. On Fifteen he raised VP2KD, HB1QJNP, F8DJ, OD5BN, CR4AD, EA6AR and CZ2GG, giving 55 countries this year and 150 all-time. In addition to these new ones his log shows lots of DX such as VE7, VK, ZL and the like.

New ones for G3DO (Sutton Coldfield) on Fifteen were CR4AP,
VP2AD, YA1AM and VP8CH. Ten only yielded CT2AH and OX3LD.

Forty

G3BST (Bletchley) uses a modified TA-12 with 130 watts on Forty CW, and says: "I can’t think what all the fuss is about on the higher frequencies, as there’s bags of DX on dear old Forty—such as PY’s, ZB1, FA8, VK2QL (long path), VE, CN8, UH8BA, LX1SN, 5A2CR, Y12RM, plenty of East Coast W’s, and K5AJG. The latter was the only signal one morning at 0500, apart from the Russian jamming, described by G3BST as RST-590!

G3JZK, at a new QTH in Cambridge, flung out his faithful “damp string” and got cracking on Forty CW. He raised 4X4IB, KT1EXO and Y12RM, and says: "This is certainly a weird and wonderful band. At 0100 one night I heard a Russian-speaking BC station being chased furiously up and down by two jammers and a carrier. Even more could be seen on the panadaptor. Maybe one day we will find out what it’s all about.” He adds—Stop Press: worked 457GE at 1700. But we’re not certain whether this was on Forty or not.

G3JSN remarks on how good Forty was during the ARRL Phone Contest, especially the first weekend, when W’s were still S9 as late as 1000 GMT, but not working Europeans. He adds: “It makes me think what a wonderful band it must have been before the war, and before the 41-metre broadcast racket started.” It was, indeed.

SWL Bennett (Bristol) wonders why all the BC stations have to operate where they are, when there are so many clear spaces between 7.3 and 7.5 mc. He finds that the only useful bits of the amateur band are 7270-7290, and 7140-7170 kc (speaking in terms of phone), all the rest being taken up by jammers and BC stations. On March 9 he logged hordes of W’s on phone, between 0040 and 0140 GMT, many at 30 dB over S9. SV0WT was also heard.

News from SWL’s

Continuing with Roger Bennett’s most interesting letter, he also mentions many W’s on the 75-metre band, late on February 23, some at S9 plus. Auroral conditions must have been taking effect, judging by the flurry that he describes. Then on March 9 he logged a whole page of DX on Ten, moved up to Eighty and heard someone lamenting that Ten was dead!

SWL Day (Sheffield) heard W9QHR saying that a VQ2 and ZE2JE had, between them, worked about a dozen W’s on 50 mc. Other bit-tits he forwards are that HS1MQ is on 21200 kc around 1400 GMT; ZD8SC on Fifteen phone around 1830; V51’s and 2’s coming in at good strength again, same band; also KR6R and 6IT, and KG6AGD.

Best heard on Twenty phone were CR5SP (1700), SU1AS (1800), FQ8HG (1900), VP5KJ (2200). On Twenty CW he found UN1AB, FG7XE and tells us that VQ9VX was on for three hours on February 26—but doesn’t say whether he actually heard him.

At this point we should like to explain that while SWL reports like those above are welcomed for these columns, we cannot publish the many others we receive, consisting simply of lists of calls heard, and generally run-of-the-mill stuff at that. But we do welcome any interesting DX snippets picked up by SWL’s in the course of listening to QSO’s, and we should like to see more of them for credit in this space.

Operating Notes

Last month’s paragraph on “Prolongations” brought forth some amusing replies. G3JHH says that the prolongation of what should have been “ R ” has often enabled him to sort out a station to whom he gave a good report, but who was swamped in his second over . . . G3JJZ says that the RST code has been modified on the Continent of Europe, and that RST 599 now means “ R FB dr om but pse dr om agn ur name es QTH es ur fb rig—here local much QRM—yy pse dr om ur QSL—nw QRU vy 73 ” etc. The above, he says, is the actual text of many QSO’s preceded by a 599 report.

Last month’s query about VE0 stations, in reply to which we said that they might be /MM’s, is also answered by quite a few who state that this is the case. VE0ND operates from the Bonaventure (G3JJZ worked him in Belfast) and he will be in London shortly.

G3GGS confirms that the average time of a QSO is getting less, and he often finds stations already well into another contact when one thought they were “ taking a final.” He actually had an “ encounter ” with VP2VG consisting of an exchange of call-signs, without even an RST! When is a QSO a QSO?

G3GGS also suggests that ET2PA’s “ CQ LA,” mentioned last month, might have meant “ Louisiana,” not “ Norway.” (To
which we might add "Or Los Angeles"

News from Overseas

ZB1HKO (Balzan) has been keeping thrice-weekly skeds with W1BB on Top Band, but has not been heard over there yet. He says if there are any G stations who want a ZB1 on One-Sixty, he will be pleased to make skeds. The best time, even for G's, seems to be about 0530, the static level being so bad in the evenings. ZB1AJX is leaving for the U.K., but there are some new calls and at least one old one is being renewed. ZB1BF is spending a lot of time on Forty and Eighty and giving many stations a "new one" on those bands.

K2BZT (Summit, N.J.) worked Station of G3KMD, Grays, Essex, who runs an LG.300 transmitter and an Eddystone S.750 receiver. Above the receiver is a complete CW/Phone 10-watt Top Band transmitter. To the right of the LG.300 is its modulator unit, above which is a low-pass filter and a GDO. All power supplies are in steel cupboards, which support the bench. On 15 metres G3KMD has a "ZL Special," a long-wire being used on the other bands.

WAZ MARATHON, 1957

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ZC4IP on Eighty—his fifth band. The same QSO gave K2BZT his WAC on five bands. But main activity has been on Ten, with a new 3-element beam which "sways precariously above the Twenty-metre beam." In the recent ARRL Contest (first half) he worked FK8AL on Ten and Twenty, CR9AH on Twenty, ZP9AY on Ten (all CW). Best on Twenty phone were FP8AP and FS7RT. K2BZT's fellow club-member, K2GMO, has given up chasing rare ones and is now enthusing over SSB and Two Metres. He claims to be getting out well—says you couldn't have as much TVI as he does and not be getting out!

VS4GT (Miri, Sarawak) will be there for at least two years and is very active on Twenty phone. VS4BO is on most week-ends on Fifteen.

W4OMW (Covington, Ky) wrote (unfortunately too late to catch the last issue) to say that he, with W4KVX and W8EZF, were going to operate from Cayman Is. during the second half of the ARRL Contest. They hoped to be on for a while after the Contest so as to work as many foreign stations as possible. But, by the time you read this they will have returned to the States.

DL7AA (Berlin) worked 3W8AA on Eighty and Ten; Fifteen gave him OH2AA/0, UF6FB and KX6ZB for new ones; and Twenty added OH2AA/0.

DX Miscellany

HS1A runs 100 watts and a beam, and is on 14190 kc phone daily from 1400 to 1600... There will soon be three new VQ6 amateurs, VQ6AB, 6AC and 6AD... It is whispered that W6MHB (remember T9MHB?) will possibly be operating from ZD8-land some time in the near future.

There has apparently been no allocation of VK8 calls for the Northern Territory of Australia. VK0's at present in action include VK0AA and 0CJ (both Macquarie); on the Antarctic mainland are said to be VK0AB, 0AC, 0AS, 0DC, 0DJ, 0JP, 0PK, 0PR and 0ZM—not all active, by any means, but there!

FB8YY is expected to show up from Adelie Land; FB8XX is unlikely to operate from Kerguelen this year... The elusive VP2VG (Buck Island, British Virgin Is.) is operated by KP4DE and KV4BB, liable to turn up in other spots around the B.W.I... PJ2ME
(Sint Maarten) has been showing up all over the place, including Eighty CW.

It is said that future HB stations on from Liechtenstein will be using the suffix /FL, not /HE.

ZC6UNJ/ZC6UN is active on Ten phone with a PA operator—QSL to UN HQ, Government House (Communications Section), Jerusalem. (Thanks to SWL V. Kelly for this last-minute item.)

Contests and Awards

The Helvetia 22 Contest, briefly noted last month, will be held from 1500 GMT on May 18 to 1700 GMT on May 19. The object is for stations outside Switzerland to work as many HB stations in each of the 22 Swiss Cantons as possible. All bands, contacts CW-CW or phone-phone. Usual six-letter or five-letter exchanges, comprising RST (or RS) plus three-figure progressive number for the contact. Three points per contact, and points on all bands multiplied by number of Cantons worked on all bands. Maximum multiplier possible is 44—22 on phone and 22 on CW. Entries and usual declaration to HB9QO not later than June 6.

The second week-end of the WAE Contest (CW section) runs from 1200 on April 6 until midnight on April 7. Note that all stations worked during the first week-end may be worked again.

The well-known Frankford Radio Club of Philadelphia is celebrating its 25th anniversary, and to mark the occasion has issued a new sheepskin, known as the FRC Award. A certificate is given for proof of contact with 15 members of the Club, with stickers for higher numbers. Nearly all members are W3’s, but the full list is too long to publish here. (Thanks to G2YS for translating and forwarding the above, from Radio Rivista.)

Acknowledgments and thanks to the NCDXC, WGDXC, "Ether Waves” (Ohio Valley), the IDXRC Bulletin, The Malayan Radio Amateur and others to whom we are always indebted for interesting news items.

And may we add one of our infrequent words of thanks to all our regular correspondents, whose DX exploits and gossip help so much to make up this feature. Without them it would not exist—your Commentator is only the secretary-bird who pieces things together. Let us hear from even more readers in the future.

Next month’s dead-line is an early one, first post on Friday, April 12, so please get down to it right away and write that letter. Overseas readers please note that the following deadline is May 17. Address everything to “DX Commentary,” Short Wave Magazine, 55 Victoria Street, London, S.W.1, and please see that we get it on time. One day late is too late. We work to a very tight schedule, and it is seldom possible to write in late items. Until next month, Good Hunting, 73 and BCNU.

Station of GW3DNF, Chirk, Denbighs., who at one time was G3DNF in London. Though the gear looks elaborate and high-powered, in fact no more than a maximum of 12 watts is put in on all bands. The aerial at present in use, at a very good location, is a 200-ft. wire, end fed.
**SSB Topics**

**TECHNICALIA, ACTIVITY & OPERATING RESULTS**

**Conducted by R. L. GLAISHER, G6LX**

Judging by recent correspondence to “SSB Topics,” many prospective Single-sideband operators have been deterred from trying the system because they consider their technical knowledge is too limited. Other correspondents have complained that it is not possible to purchase (in the U.K.) commercially constructed audio phase-shift networks and band-pass filters. Several readers have asked where they could buy complete SSB transmitters, exciters or receiving adaptors.

The writer will be the first to agree that to use some commercial sub-assembly would be an excellent time saver, but one cannot so readily accept the view that commercially made equipment and piece-parts are necessary to produce a good SSB signal, nor support the contention that one has to be a highly qualified electronics engineer to understand the workings of SSB equipment.

There are now well over 4,500 SSB amateur stations and this number increases daily, despite the fact that for many of these new operators it is their first attempt at something outside the scope of the normal AM and CW amateur techniques. SSB circuitry is not difficult to understand and the construction of suitable equipment is no more difficult than building the modern complex multi-stage band-switched transmitter or communications receiver.

*SHORT WAVE MAGAZINE* will continue to publish constructional and technical articles covering SSB equipment. One of the purposes of this column is to help potential sideband operators to get a better understanding of all aspects of SSB operation. The “Query Department” is available for readers’ questions and in this connection, the writer would like to thank the members of the Sideband fraternity who assist by providing so much of the information and circuits requested by correspondents.

**The G3BFP SSB Exciter**

Readers may be interested in some further notes on this design, as published in the March issue of *SHORT WAVE MAGAZINE*. They arise as the result of immediate correspondence and queries over the air. An SCR-522 driver transformer can be used in place of the component specified at T7, p.11.

If a fundamental frequency of 85 kc and a second IF of 455 kc are used, crystals X2 and X3 will be 370 kc and 540 kc respectively. Both these frequencies are readily obtainable on the surplus market.

There appears to be a temporary shortage of 85 kc crystals, although these do “appear from time to time as “surplus.” G3JXA has made an exciter using the 85 kc BFO unit as the fundamental oscillator and reports excellent results. G3IRP is also using the same system, which eliminates the awkward 85 kc crystal.

Choice of valves is very flexible and a 6SN7, 12AU7 or 12AT7 should be quite satisfactory in the balanced modulator position, V2. A 6J5 will, of course, serve in lieu of the 6C4 oscillator, V1.

G3BFP says that he cannot over-emphasise the need for the 85 kc oscillator to be well screened, so that it feeds into the balanced modulator and nowhere else. He warns that the constructor will be plagued with a carrier that just will not balance out unless the screening is first-class. The sideband energy must get to V4 via the filter and not by any other random route.

And in the circuit on p.15 (March) note that C4 should be 500 µF, and not as given. It must be an HV test item, too.

**Unusual Linear Amplifier Circuits**

Information has been received from DL4WM about his experiments with cathode-follower linear amplifiers. He claims that he has obtained good results with the circuit shown in Fig. 1. The valve used in the tests was an Eimac 4-400 tetrode, but he says other pentodes and tetrodes work equally as well.

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**Table of Values**

![Fig. 1. Cathode follower Linear RF stage](image)

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<tr>
<th>Component</th>
<th>Value</th>
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<tbody>
<tr>
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<tr>
<td>C2, C3</td>
<td>0.002 µF</td>
</tr>
<tr>
<td>C4</td>
<td>500 µF, rated for anode voltage</td>
</tr>
<tr>
<td>M1</td>
<td>Cathode meter rated for total current</td>
</tr>
<tr>
<td>RFC</td>
<td>Double-wound bifilar choke, 22 turns</td>
</tr>
<tr>
<td>12 SWG</td>
<td>1-in. dia. by 2-ins. long (for 20 metres)</td>
</tr>
<tr>
<td>T1</td>
<td>Filament xformer of suitable rating</td>
</tr>
<tr>
<td>V1</td>
<td>Any suitable tetrode or pentode</td>
</tr>
</tbody>
</table>

![Fig. 1. The cathode follower Linear RF Amplifier used by DL4WM, and discussed in the text. It will work with any tetrode or pentode.](image)
Obviously, the cathode RF choke must be a good one—data given are for 20 metres.

Theoretical consideration of the circuit shows that the overall efficiency will not be high because of the inherent overload characteristics of the arrangement. Separate tests made by ZB1CZ and the writer indicate that under strictly linear conditions the efficiency was about 30%, only.

GW2DUR has sent in details of his new 813 screen-controlled linear. The circuit is shown in Fig. 2, and the method of operation is as follows:

With no grid-drive the 5763 control valve V1 will not conduct and little or no screen voltage is applied to the 813. When drive is applied the U78 rectifier V2 produces a DC voltage across the common load-resistance R1 which allows the 5763 to pass current and apply voltage to the PA screen-grid. The final amplifier screen current is determined by the amount of grid-drive and the standing PA anode current runs at approximately 10 mA. The main advantages of the circuit are that the need for stabilised bias and screen supplies are eliminated, a most important factor. GW2DUR has found that in his particular layout neutralisation was not needed for stable operation. He adds that the drive requirements are very small and that two watts peak will be sufficient for maximum power input.

Query Department

First, several questions on current SSB practice from G3FFPQ (Oxford). He wishes to know the average sideband suppression that can be expected from phasing and filter exciters; the amount of carrier attenuation necessary for good sideband operation; and if sideband switching is an essential feature to incorporate in new equipment.

The theoretical maximum attenuation of the unwanted sideband is about 40 dB in the types of 90° audio phase-shift networks used in amateur equipment. In practice, between 30 and 35 dB is more usual and this attenuation is not difficult to attain over the speech frequency range of 300-3000 c/s. The simpler type of crystal-filters operating in the 400-500 kc region have attenuation figures between 30 and 40 dB when correctly aligned, while the more complex types provide upwards of 60 dB. To quote practical examples, the G2NH filter exciter using a simple band-pass filter with two crystals has about 33 dB sideband attenuation. (It should be mentioned that this exciter uses a third crystal in the filter as a "brute force" carrier suppressor.) The Collins KWS-1, which has a 250 kc mechanical filter in the sideband generator, has at least 60 dB attenuation of the unwanted sideband, while the G3CWC and the "Multiphase" series of phasing exciters using the so-called passive type of phase-shift networks achieve attenuation figures of better than 30 dB.

Although the filter method is inherently capable of higher attenuation, in practice the difference is often masked by non-linearity and spurious products generated in the frequency conversion and amplifier chains following the sideband generator. The A.R.R.L. consider that 30 dB average suppression of unwanted emission of all types, including the undesired sideband and carrier, represents good amateur performance at the present time.

For single-band operation, sideband switching, although not essential, is certainly desirable. The same sideband (upper or lower, depending on the frequency band in use) is used by all stations in a net. At times two or more stations wishing to leave a net temporarily will do so by switching to the sideband not being used by the other members of the net. Most multi-band transmitters use mixer arrangements for converting the sideband-generator frequency to the required amateur band. As lower-sideband is used on the 1.8, 3.5 and 7 mc bands and upper-sideband for the higher frequencies, it is obvious that the ability to be able to switch sidebands allows much greater flexibility in the choice of mixer injection frequencies for multi-band operation.

G3GHB (Birmingham) asks for further information on the transformers specified in the recent QST article "Cheap and Easy Sideband" by W2EWL. The answer to this query appeared in "SSB Topics" for August, 1956, but in case this issue of SHORT WAVE MAGAZINE has been mislaid, here again is the information: W2EWL has found that the ratios are not at all critical, and satisfactory results can be obtained by using normal anode to voice-coil transformers of the type used in small BC sets. All three transformers can be of the same type and should have as high a primary impedance as possible. Shunt feed, as suggested in the original article, is recommended. W2EWL is at the moment working on the design of a new exciter using the Crosby transformerless balanced-modulator.

A reader who is interested in the G3GEN Exciter (SHORT WAVE MAGAZINE, October, 1955) wonders if it can be used as a basis for a multi-band transmitter; he also asks if the performance of this exciter is good enough for operation on the DX bands. Answers are that it is possible to use this exciter for multi-band operation by generating the RF at some neutral frequency and then mixing the output by means of a separate outboard heterodyne unit into the required amateur band. If 9 mc is used for the generator frequency, a VFO operating in the region of 5 mc will give output in the 14 and 3.8 mc bands. The VFO frequency can be multiplied by a separate stage and will permit operation on the other bands. By doubling, 1.8 and 21 mc can be covered, by tripling, 7 mc is obtainable, and by quadrupling, output is available on 10 metres.

The modifications necessary for 9 mc operation are to change the values of R17 to 100 ohms and C14 to 210 μF. The 9 mc crystal oscillator output should be coupled into the exciter by means of a low-impedance link matched as nearly as possible to 75 ohms.

Another alternative method of band-changing would be to use the external mixer unit to convert the 3.8 mc signal to the required output frequency. This method, although more convenient, does have the disadvantage that the unwanted sideband attenuation will suffer if the 3.8 mc frequency is moved by more than a few kc, and this of course limits the operating frequency range on the other bands.

G3GEN did not quote a performance specification.
Table of Values

<table>
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<th>C1, C3</th>
<th>C4</th>
<th>C5, C6</th>
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<th>C8, L2 = Normal tank circuit</th>
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<tbody>
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<td>1,000 v.</td>
<td>.002 μF, filament bypass</td>
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</table>

for the exciter in his original article in the October, 1955, issue, but checks made with several stations using his circuit on 3.8 mc indicate that unwanted sideband attenuation runs between 20 and 30 dB. VQ4EU is using the circuit on 14 mc and reports that he can obtain near 30 dB suppression when the exciter is on or near the RF phase-shift design centre frequency. The performance does, however, become degraded if a large frequency shift is made. For this reason, sideband generation at a fixed frequency, with subsequent frequency conversion to the required amateur band, is the procedure to be recommended.

Single Sideband Contest

Late news from CQ Magazine is that over 2,000 SSB stations were active during the contest. Log checking is well under way, but this is a mammoth task—400 entries have been received! The contest certainly achieved the object of the organisers in getting SSB stations on the air and many old timers were back after spells of inactivity. During the peak DX periods the QRM on the high end of 10, 15 and 20 metres had to be heard to be believed; what it would have been like if this had been an AM contest we shudder to think!

It is too early to spotlight the cup winner, but the following high scores may give a pointer:

- CN8MM 489 contacts 1458 points
- CN8JD 475 1416
- SV0WA 437 1247
- HR2WC 535 1118

Other top liners include CN8GD, KA2YA, BV1US, DL4CX, TG9AD and VQ4EO. The highest G score claimed to date is G3AOO, with GW2DUR a close second. A full report of the contest is promised by CQ in time for publication in the next “SSB Topics.”

News and Views

The posting has come through for DL2TH and he is now G3HSR at RAF Locking. In just over a year of SSB operation from Hanover he clocked-up 958 contacts in 55 countries. His XYL was also active on sideband as DL2YL and she will now appear as G3HSQ. Perhaps with his influence the R.A.F.A.R.S. Hq. station G8FC will appear on SSB.

G3GKF (Purley) has run into TVI difficulties on 21 mc and with the increased TV hours, finds that his operating time is very limited. He has a new final amplifier under construction, which he hopes will cure the trouble. He has incorporated the NC-300 6BE6 product detector circuit in his Eddystone S.640 receiver, with good results.

G5YH (London W.4) has recently taken an interest in SSB and will shortly appear on the DX bands with a filter-type transmitter. During his first three weeks of operation, GW3LLU (Llanelli) worked 28 countries on 14 mc sideband; he adds that it was SSB that finally persuaded him to take the Morse test. (Work that one out!—Editor.)

DL4SV (Munich) will return to the States later this month for a spell of home leave. He does not expect to return to Germany, as a re-assignment is due; SV0 appears to be the next port of call. Also scheduled for return to the States are DL4KS and DL4WM. New SSB calls from Germany are DL4AV, DL4GLM and DL4HAB.

K2GMO sends the word that he will be passing through London early next month. During the three-day stop-over he hopes to meet some of his SSB friends in the Greater London area.

G5BJ (Birmingham) reports that his new filter exciter is progressing well. After a spell of inactivity due to over-work he is back on 3.8 mc.

GW2DUR (Llanelli) enjoyed the contest although his operating time was limited to the two Saturdays.
G3COJ (Maidenhead) who has been off for some time, fired up the SSB transmitter for the fracas. LA6J rebuilt his station for the test and gave many of the newcomers a new country; he asks his old 80-metre friends to look for him on 14 mc.

Old timers on Sideband will remember DL4AP who was so active in the early days. Writing from Colorado, he is now W0TTL. G3JPE reports that he has been testing a 3-wire quarter-wave vertical on 3.8 mc with excellent DX sideband results.

Welcome back to G2AJS (Caterham), who returned to Eighty SSB recently after 12 months' absence. Newcomers on 3.8 mc SSB include G3BWH, G3KEU and GM8CH.

**DX Notes**

During this period, conditions have been generally patchy on all the DX bands.

A further visit by W6ITH to St. Martin, over most of February, gave many sidebanders a chance to collect two new countries. Having experienced difficulties in moving his station from Dutch St. Martin to the French side during his previous visits, he played safe this time by taking two complete KWS-1 transmitters and 75A-4 receivers on the trip! The first was set up at FS7RT and the second at PJ2MC and both stations were located within 12 miles of each other, but on opposite sides of the international boundary. W3DZZ type multi-band trap aerials were used at both locations and operation was on 10, 15 and 20 metres.

BV1US in Formosa has been very active and has been using a new crystal frequency of 14305 kc for SSB operation. The U.S.A.F. club station HZ1AB in Saudi Arabia has recently changed over to SSB, with a Collins KWS-1 providing the talk-power. Another convert is OD5BZ who is on the high end of 20 metres with a very potent signal. 5A5TH is also a newcomer to sideband. KT1DD reports that the KT1 series of calls have been cancelled and all stations in Tangier now use the CN2 prefix.

Although at least two stations in Monaco (3A2AH and AM) are equipped for SSB operation, the lack of activity has been responsible for the sponsoring of a Sideband-only expedition, which is due to take place within a few weeks under the guidance of a group of PA0 sidebanders.

An interesting new station now on SSB is LU7AS, who is active on all bands; his first U.K. contact was with G3GKG. And yet another interesting one: If you hear VP2VG, it will be the callsign of an expedition to Buck Is., off Tortola, in the British Virgin Isles, operators being KP4DE and KV4BB; they will be on 20 metres.

ZD4BF is back in Ghana after his spell of leave in the Channel Isles. Much to his surprise the transmitter still worked—at least, it did for a few days, then the exciter blew up with a loud bang and a cloud of blue smoke. Having no local junk-shop he had to wait for replacement components from England before resuming operations in March. ZD4CF is ready to go with a 20A exciter and 811 linear. ZD4BQ, who was featured in the “Other Man's Station” in the last issue, is taking an interest in sideband and may be on soon.

**DX Round Table**

Following the successful 14 mc WAC round-tables held earlier this year, many of the regular 21 inc operators have been trying to arrange a similar get-together. Five-Continent hook-ups have been a regular occurrence on both bands, but on 15 metres Asia has been the stumbling block. The arrival of HZ1AB in February proved to be the key and under the net-control of F7AF a series of schedules were arranged for the period February 25-March 1 for 1800 GMT.

Propagation conditions were excellent throughout the week, but for the first two days South America was the missing link. On Wednesday, February 27,
The stations participating in these interesting and a similar WAC contact took place on March 1. Schedules were arranged for the following two days. Six-Continent W6ITH, G3MY, G3GKF, CN8MM, F7AF, ZD4BF will be active from several African countries until on 21 mc, he was heard testing on 14 mc on March 16: he will be active from several African countries until the middle of the month, including 0Q5. A new country appeared on SSB in late February, the next appearance will be in June, for which reports are No. 1022/1 and No. 1038/2, the categories in both instances being Humidity Class H1 and Temperature 40/100.

**TELEVISION SOCIETY EXHIBITION**

This year’s Television Society Exhibition was of particular interest because continuous demonstrations of colour television, to the N.T.S.C. standard now under test by the BBC, were being given. The subjects were stills, transmitted over a closed circuit, and the results can only be described as quite startlingly good. Colour shading, tone and definition were excellent, and it was quite evident that the main technical problems in the transmission and reception of colour TV have been largely overcome. One other interesting demonstration was the effect of ghosting and multi-path interference on a colour picture, showing that here there remains a problem to be solved. Among the firms represented at this important private exhibition were Cossor Instruments with their Valve Voltmeter and Oscilloscope constructional kits — the latter we hope to discuss in detail in an early issue of SHORT WAVE MAGAZINE — and Hallam, Sleigh and Cheston showing their cabinet parts and designs for the individual ("one off") constructor. The Television Society, and its secretary, Mr. Geoffrey Parr, of Chapman & Hall, are to be congratulated on organising such an interesting, useful and effective Exhibition.

**SMALL ADVERTISEMENTS**

The quantity (and quality) of our Small Advertisement columns proves the value of SHORT WAVE MAGAZINE in disposing of unwanted equipment, or in obtaining items in the "wanted" category. Readers who are thinking of using Small Advertisements are asked to set out their notices clearly, with full punctuation and using the accepted abbreviations. The cost of a Reader’s Small Advertisement is but 3d. a word, minimum charge of 5s., with an additional 1s. 6d. for a Box No., if required. Readers who would like to know can take it that there is an immediate response for really attractive items for sale or wanted.

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**CORRECTIONS AND AMENDMENTS — MARCH ISSUE**

Some slight, but nevertheless much regretted, errors crept into our last issue. In G3BFP’s article on his Inexpensive Single-Sideband Exciter, the value for C4 in Fig. 6 on p.15 should be 500 µµF. In the Simple Grid Dip Oscillator, G3IJ points out that in the circuit in p.18, R4 should have been given as 100,000 ohms and R5 as 500 ohms. In the amateur band table on p.41, the 40-metre band, of course, to have been shown as 7000-7150 kc, and hence the phone area as 7050-7150 kc.

**EDDYSTONE APPROVED COMPONENTS**

All tuning condensers of Eddystone manufacture have now been quality approved for inclusion in equipment produced to meet Service standards. This means that they are equally suitable for incorporation in commercial transmitters, receivers, test gear and measuring instruments. The appropriate Radio Components Standardisation Committee references are No. 1022/1 and No. 1038/2, the categories in both instances being Humidity Class H1 and Temperature 40/100.

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Table corrected to March 4, 1957

CE2HV and KC4USA joined the group and the Six-Continent round-table was achieved. Further schedules were arranged for the following two days and a similar WAC contact took place on March 1. The stations participating in these interesting tests included: F7AF, F7BN, F7EM. DL4RY, CE2HV, YV5FL, KC4USA, 5A2TP, 5A5TH, CN8MM, HZ1AB, KH6AQ, KH6AR, W8TI1/KG1, W8DPF/4, W6ZNT/5, W6QIV, W8QIN, W7KVU and W9RUK. with the K4LIB expedition on safari in FQ8. At first A new country appeared on SSB in late February, with the K4LIB expedition on safari in FQ8. At first on 21 mc, he was heard testing on 14 mc on March 3: he will be active from several African countries until the middle of the month, including OQ5. Information for this column has been provided by K2DW (CQ Magazine SSB section), DL4SV, W6ITH, G3MY, G3GKF, CN8MM, F7AF, ZD4BF and SWL Amie.

Next appearance will be in June, for which reports to “SSB Topics” will be wanted by April 30. Till then, GL and 73 de G6LX.
Aerial Filter for Two Metres

Home-constructed High-Q Cavity

W. F. Neal (G3FUL)

This simple device and the way in which it can be made will be of considerable interest to VHF operators. The design is based upon the formula for the length of the central tube in a re-entrant cavity.—Editor.

With a two-metre TVI problem in hand, some cogitation led to the conclusion that a cavity-type high-Q filter fitted between transmitter and aerial ought to be possible, convenient to construct, and effective in suppressing TVI.

The required dimensions (for two metres) and method of construction are shown in the sketch. The whole thing is simplicity itself. The outer container was formed by taking two clean empty tins (which had contained well-known brands of food), one 4½-in. high and 3-in. in diameter, having a tightly fitting lid, and another 2½-in. high and 3-in. in diameter. The bottom was cut out of the taller can and both were soldered together.

A piece of copper water tube ¼-in. outside diameter and 6-in. long was soldered centrally to the bottom of the shorter container. Two coax. sockets were fixed through the sides 3½-in. from the top, and stout copper wires taken from the inside pins through two holes in the bottom of the smaller container, and soldered there. The two containers were then solder-jointed and a disc of sheet copper 2½-in. in diameter was fixed to the top of the copper tube.

A 4 BA terminal was soldered to the centre of the lid over a hole and a 3-in. length of 4 BA studding threaded through. Another similar disc of copper was fixed to one end, the rod threaded through, a lock nut put on, then a knob. This is the tuning, and to prevent shorting a sheet of mica is put between the discs. When assembled and working the lid is soldered on.

The tuning is very sharp and can be adjusted by watching the anode meter. It is connected to the transmitter with a half-wave length of coax. There is very little loss of output when using this high-Q filter and an SCR-522 trans-

The filter unit contrived by G3FUL; it is designed for a two-metre transmitter with coax feed (70-75 ohm) between transmitter and aerial. Essentially, the device consists of no more than two suitably-sized tin cans soldered together, with a piece of copper tube of the right size up the middle, tuning being carried out as indicated in the sketch. The dimensions are fairly critical and should be followed. As explained in the article, tuning is sharp and, effectively, only the transmitting frequency can be passed. It is therefore an anti-TVI device, with a low insertion loss by virtue of its high-Q characteristic.

miter which has a 48 mc stage causes only a trace of interference when the two-metre beam fires straight at the BBC TV aerial a few feet away. With 18 watts input to the final, a 15-watt lamp can be well lit at resonance.

The apparatus is not elegant, but it is simple, costs very little—and it works.

Ensuring Continuity

The best way of making sure of your copy of Short Wave Magazine reaching you on the due date each month is to become a direct subscriber. By payment direct to us of 30s. for a year of twelve issues (15s. for six months) you receive the Magazine by post on the day of publication, if you are in the U.K. The overseas subscription rate is also 30s. post free, actual date of delivery depending on surface mails,
DURING the period covered by this report—the month to March 25—things have been altogether much brighter and more cheerful on VHF. We have had runs of good conditions, one or two nice GDX openings, and in general a very encouraging level of activity.

Significant date areas were: March 1-4, 11-12, 14-16 and March 24, with the evening of the 11th probably one of the best sessions yet experienced during early spring. These conditions, as usual, tie up quite closely with the state of the weather over the U.K. For instance, March 11 was a fine, warm day, with a rising glass (though it did not go very high), and by the evening very good GDX conditions had developed over north-south paths. Some Continents were heard and worked from the south-eastern part of the country, but very few penetrated as far as the Midlands, and then only on the peak of QSB, which was rather bad on the longer GDX paths. Conditions were at their best between about 8.0 and 10.0 p.m., with the northern signals noticeably weaker towards the late evening.

On the occasion of March 11, activity was high, and there were far more stations on than could possibly be worked during the time they were coming through. Heterodyne QRM was quite bad around 145 mc, and even up towards 145.5 mc there were several operators who found themselves sharing the frequency with stations not often heard.

An important and interesting negative result was that noted on February 23 and March 10. On both these days, Aurora manifestations were in evidence, and all other bands were affected in one way or another. But on two metres—except perhaps for a very slight flutter on distant signals on March 10—the Aurora produced no effect on either occasion. This is in line with previous experience, and it can be taken that it is the exception rather than the rule for Aurora Bor. to produce the VHF conditions we got back on January 21.

Going on with the survey of the immediate past: March 12 was another fine day; though the glass was lowish, conditions were just as favourable as on the previous evening, and again tailed off towards 11.0 p.m. From what your A.J.D. heard, it appeared that some operators were under the impression that conditions generally were not so good as on the 11th, because they could hear far fewer stations. But this was not so; during the mid-evening period on the 12th, conditions were nearly, if not quite, as favourable for north-south GDX as they had been the night before—the trouble was that there were not enough stations on. A good many people had apparently shot their bolt on the 11th, which was the London area’s Activity Monday. As mentioned in this space in February, one reason why, some years ago, we dropped the idea of regular activity periods was because of this possibility of losing opportunities during a run of good propagation conditions, when activity is wanted.

We cannot all be on every evening, to call CQ and waste precious time listening round on a dead band. But it is not difficult to decide for oneself when conditions ought to be right: A fine, warm day, with a rising glass, getting cool towards the evening, little or no wind, a fairly clear sky with marked stratification of the cloud layers that are visible—and you can take that it the two-metre band (and 70 centimetres) should be pretty well open. One cannot expect this situation to develop regularly on a Monday evening!

By March 13, conditions were dead flat again, but improved on the 14th and remained quite good, for GDX, until the 16th. Yet the activity level had fallen very low, and the opportunities were largely being wasted—except by Bob G5MA, who worked or heard G3BW and GD3UB every evening March 14-16, proving the point.

The next activity night, Monday, 18th, found conditions poor, and during that week there was not much doing. But by Sunday, 24th, conditions and activity had improved again, particularly eastward. For instance, GW8UH (Cardiff) was getting into the Midlands, G3KHA (Bristol) worked G2CIW (Cambridge), and G5YV was workable from the South Midlands.

Some of the Gleanings
On Monday, 11th, G3GHO (Roade) logged a total of 75 different stations ... At 2130 on March 12, G5YV heard and called G5MR (Hythe, Kent) ... Also on the 12th, G5MA (Gt. Bookham, Sy.) worked G3BW (Whitehaven, Cumb.), GD3UB and G13GXP, as nice a bag of GDX as anyone could possibly wish for ... The outstanding signal now being radiated by G8VZ (Princes Risborough) comes off a new stack, fed by 300-ohm open wire line, his PA input still being 12 watts only ... G6JK (High Wycombe) is doing very well with NBFM; not only has it cleared his TVI, but his neighbours on the band no longer suffer from the proximity effects always produced by a near-by station ... We could think of at least one other Bucks. two-metre man who could usefully adopt the same technique! ... G3JWQ/G8VZ have had about 170 contacts on a regular schedule extending over 18
months; their path distance is 97 miles. G6NB has now worked some 60 different stations on 70 centimetres, including four Continents—nice going. G2AUD (Nrs. Bletchley) is ex-VS1FP. G2HCG/G3FAN maintain their schedule, now conducted cross-band Four/Two either way round, with both sides audible on the talk-back from either end. We hope Tony has got that barometer correctly adjusted for his height a.s.l. He has worked some 25 stations on four metres—more good work, from his Ryde, I.o.W. location. G5WW (High Wycombe), who only quite recently became regularly active on Two, has now worked his 100 different stations. The lack of 4 metre activity from the northwestern area of England, due to the Jodrell Bank prohibition, is becoming increasingly felt.

The general impression about Four seems to be that results are not as good as one can expect on Two... G3LOK is a very new two-metre station in the Isle of Wight, and is doing well.

IGY Arrangements

The co-operation of U.K. VHF stations is requested in the collection of data for the study of (a) The relationship between the weather and UHF/VHF propagation, (b) Aurora effects on VHF, and (c) The incidence of solar noise on UHF/VHF.

As regards the first two, most of the answers could be provided by a careful digest of "VHF Bands" (and, "VHF weather Report"), during the last ten years! If there is one thing that U.K. VHF amateurs do know about, it is the effect of weather on 144 and 430 mc propagation, and of the Aurora on five and two metres. Item (c) is not so clear, though we already have the extremely interesting report turned in by G3CGQ (Luton) and discussed in this space in January last, p.598.

Because of the varying noise level at most locations caused by agencies other than the sun, it is not very easy, as a practical exercise, to sort out the noise that does come from the sun, which can at times reach high intensity. For those interested in this investigation—which can be carried out using only a receiver and a rotatable beam with a reasonable back-front ratio—it would seem that the first thing to do is to make a "local noise survey" so as to arrive at some sort of datum from which noise that might be due to the sun can be estimated. This calls for a receiver with an S-meter—for those who have no S-meter, see the article on pp.39-40 of the March issue—the procedure being to get a zero with gains full up but no aerial on the converter, and then to see how much noise shows on the S-meter with the aerial on, taking observations at different times as often as possible so as to establish the datum. Unfortunately, solar noise sounds very like leaky EHT lines and corona effect, which is where the difficulty of separating the two sorts of noise comes in. Obviously, the noise investigation can really only be carried out effectively from locations not normally subject to a high local electrical noise level, or where the noises that do occur can be tied down to some human agency, such as "next-door's vacuum," and thus are not part of the usual background.

The method of following the sun and recording observations was very well explained by G3CGQ, as reported in January "VHF Bands."

As to the collection and correlation of reports, this is being dealt with as a separate exercise, to which we shall refer again later.

Cross-Band 70/72 Mc

We are glad to give prominence to a request from F3XY for G schedules on four metres—which, due to the slight frequency separation between the French and U.K.
allocations, would be cross-band 70/72 mc.
F3XY, located at St. Remy de la Vanne, 50 miles east of Paris, is on 72.3 at 0000 GMT daily, and has a good converter on which he can tune our 70 mc band. So far, F3XY has worked (on 72.3 mc) distances up to 150 miles. It is to be hoped that this notice will produce some F/G contacts, and for those who would like to write F3XY, he is QTHR in any recent Call Book.

Some Technical Items

G3JGY (Malvern) uses 12-in. lines in his 3E29 (829) PA tank, which is tuned half-wave for 144 mc, and three-half-wave for 430 mc, the PA then being operated as a "power tripler"; the tuning capacity is 10 µF at the plate end of the line assembly, 144 mc coming off half-way along, and 430 mc at the end of the line. As G3JGY says, this is the easy way of getting output on 70 cm without having to build a separate tripler; he can change from two metres to 70 centimetres in 30 seconds, using the same transmitter. One disadvantage is, of course, that the 430 mc RF output is pretty low, not more than a watt or so—but with a high-gain stack for that band, it is enough for putting out quite a respectable 70 cm signal.

G3DLU (Sheffield) reports that his tests with the YU1AD converter—using the noise-generator described in our issue for September 1954—show it to have an NF of 4.5 dB, with a final sensitivity factor represented by 10 mW AF out for 0.2 µA RF input, from a no-signal noise level of 1 milliwatt. The converter is so sensitive that it picks up ignition noise with only the signal-generator as "aerial"! Referring to the circuit diagram on p.546 of the December 1956 SHORT WAVE MAGAZINE, G3DLU advises that the position of L1 does not matter so long as it is wound over L2; that the C1, L1 circuit will always tune separately and give the correct match into the feeder line; that the C2, L2 side must be made as high-Q as possible, using the specified value for C2, not a variable trimmer; and that the mixer HT voltage wants to be 65v. for the best performance. All useful, practical information on a converter design which is distinctly out of the ordinary.

Which brings us to ON4BZ, with yet another converter. Guy has given us the details, for shaping into an article, of a new experimental design of his involving the Philips E88CC twin-triode, with which he is getting impressive results. He suggests that those who can should forthwith acquire one or several "valvs type E88CC." We will disseminate further details as soon as we can get round to it.

The Station News

G2AHY (Crowthorne, Berks.) puts in claims and is regularly active. And for those who have murmured about GC, Bernard of GC3EBK (Guernsey) writes this time to bring himself up-to-date in the Tables, remarking that he is "looking forward to some hectic DX spells."

G3LHA of Coventry (whom we shall always remember as SWL Bastin and whose hand-writing has been so familiar for so many years) continues to sort them out on two metres, but finds four metres a dead loss owing to TVI—running just the one watt on 70 mc, he can block TV sets at 300 yards; in the Midlands, they are too near Ch.4, apparently. On two metres, G3LHA has heard, and called repeatedly without success, both G13GXP and GW8UH; on the other hand, he can hear neither G3BW nor GD3UB when stations much further south are working them. A noteworthy QSO for G3LHA was G3JGY/M, for Herefordshire.

A note from G3YH (Bristol), an old timer on VHF who has kept in touch since the early days, brings us up-to-date with his scores; he remarks that he can receive on four metres, with a Tx under construction, and that on two metres he has been "trying a few Q0's lately between 0700 and 0730 GMT"; he would like to start a schedule at about this sort of time, for the spring and summer. G2BRR (Wootton Bassett) found himself tangled up in telephone wires when his 6-over-6 Slot-fed job came down in the wind, so for the time being is QRT on VHF till another mast can be erected.

As G3KHA (Bristol) so rightly says, "This period has not been without its moments, but you had to stick to the band otherwise you missed them." How true! See comment earlier about looking out for conditions every evening, not just on Mondays! G3KHA remarks that his most consistent signal from the London direction is now G4DC (Upminster), "readable on phone any time. (He is also a very nice signal from where your A.J.D. sits, though it is not as far as G3KHA.)"

On the two-metre /M front, G3JGY has worked G2ATK, G3CVK, G3EIO, G3HAZ, G3IER, G3LHA, G3NL, G5BM, G5ML and G6NB while running, his PA consisting of a pair of 6C4's taking 15w. input—as ingenious an approach to the RF end as any of which we have yet heard. G3JGY describes his /M
receiver simply as “a double super,” so we can tell you no more than that.

From up in Rotherham, G3KUH is GDX for a great many people; he writes to say that in his part of Yorkshire activity “is not great, but steady”—which is exactly what we thought! The regulars are G3DLU, G3DVK and G3KUH himself, a lot of others coming on “now and then, mostly then,” as G3KUH puts it. Not having written in for some time, he takes the opportunity of reporting that on January 21 he heard G3KHA, for the first and only occasion, with an RST-592 signal on a beam heading of 340°, or N20°W. Coming down to the recent past, G3KUH says that signals on or near 144.75 mc cannot easily be copied up Yorkshire way because of “the harmonic belting in from the Holme Moss TV sound transmitter.” Lastly, G3KUH echoes the plea and the hope so long expressed in these columns—Look not for local phones, but the weak “CW signal; put not your trust in R3, S4 carriers, for they are unsolvable; waste not your time on phones in QSB, for always they will sign in the trough of the fade. In other words, use the key, not the other thing!

Your A.D.J. mops his brow. For more than 20 years—(all right, we know; get on with it.—Ed.)

Round-Up on Four

For an enthusiast for the 70 mc band, you need look no further than Banwell, Som., where Louis of G3EHY is on almost every evening (now using 70.32 mc) and finds there is enough to keep him busy—at any rate, during the period to March 18 he had no less than 80 contacts, at least 60 of them at distances greater than 100 miles. Regular working has been achieved with G3CLW (Bromley, Kent) at 130 miles, who can be raised any night and with whom 30 of the total of contacts mentioned have been made; as G3CLW only runs 10w. it shows what can be done. Apart from several other stations worked in the London area, Louis has also succeeded with G3FAN and G6NB. G3EHY asks for schedules around 11.00 p.m. It would be interesting if he and EI2W could re-establish, on this band, their old marathon of several years back.

In his report, G3EHY compares results and conditions on four metres with those that used to obtain on five metres many years ago, asking why nothing can be heard from Liverpool or Manchester. The answer is simple—Jodrell Bank and the IGY. A very large area of the north-west is completely cut off so far as 70 mc is concerned, and there is nothing whatever to be done about it. With the 50-mile line from Jodrell Bank cutting the northern outskirts of Birmingham, then up through Mansfield and Bradford right round to Blackpool (and Midlands stations generally being deterred by TVI due to frequency proximity of Ch.4) what it comes to is that 4-metre signals can be expected only in the area from the South Midlands to the South Coast, with EI2W as about the one active operator in the north-westerner direction.

Of G3MA we have already spoken, and here it is to mention that now he also is on four metres, with about 10 stations worked to date on QRP. From Beamington in Dorset, G3HKV reports that he is on 70.3 mc, fixed and mobile, using “R.F.E. Communicator” equipment, and would like to make contacts.

SWL Clip

A small one this time. SWL Smith (Diss) has closed down temporarily for overhaul and modification—he may be wishing he had waited a little longer, to catch the recent openings!—and SWL Stokes (Ruislip) sends a useful calls heard list, showing nearly 60S logged in the period.

Scatter Tests

An interesting item in the current issue of Radar reports one of the Marconi tropospheric scatter tests now being conducted over a 200-mile link between Great Bromley, Essex, and Sutton Bank, Yorks. A 30-ft. reflector is energised by a movable horn directed at it, to steer the beam. The transmitter output is given as 500w. and the working frequency 858 mc. The system is to be extended from London to Newcastle, using a 10 kW transmitter, and will be capable of handling either multi-channel telephony or a TV transmission.

Contest Note

We have been asked whether we intend to organise any VHF contests this year—the answer is No. For one thing, there are more than enough of them scheduled as it is, and for another, it is pretty evident that VHF contest working, as such, has lost much of its popularity—that is to say, while contests do encourage activity, what people come on for is the activity and only a small proportion actually go through the whole process of keeping a contest log and making an entry. Unless most operators can be persuaded to enter and to take the thing seriously, the published result is unrepresentative—how often during a contest have you not heard, in tones of carefully cultivated boredom, that “I am only on to give a few points and have no intention of putting in an entry”? So helpful, or is it?

What we feel, therefore, is that it is better to have the activity when conditions serve, rather than an artificial contest producing an unrealistic result.

VHFCC Elections

We are very glad to be able to notify three new ones this time: VHF Century Club Certificate No. 208 goes to R. Furrer, HB9LE (Winterthur); No. 209 to E. Kerr, G3HTY (Far Forest, Worcs.); and No. 210 to R. Stringer, G3DKF (Coventry). All three put in very interesting collections of cards.

Dead-Line —

This must be Wednesday, April 17, for the May issue—and not a day later; Easter falls right in our production period this time, which means the schedule will be tighter even than usual. Send it all to A. J. Devon, “VHF Bands,” Short Wave Magazine, 55 Victoria Street, London, S.W.1. Go carefully over Easter, and look out for an EDX break if you are at home.
High Performance Converter for the 23-Centimetre Band

FURTHER CONSTRUCTIONAL AND MECHANICAL DETAILS

PART II

A. L. MYNETT, B.Sc. (G3HBW)

The first part of this article appeared in our issue for February last, which should be read with the information given here, since there are necessarily a number of important cross-references.—Editor.

The 446A valves V4, V5 in Fig. 4 on p.662 of the February issue are mounted as shown in the drawing at Fig. 5 herewith. The grid disc is supported in a brass ring A with spring fingers to hold the valve in place. This ring is bolted to another, B, of larger outside diameter with a sheet of mica in between, using 8 BA brass screws in insulating bushes (Fig. 6), so that the two rings form a condenser, with the mica as the insulant. The ring B is the foundation on to which the rest of the circuit is built, brass tubes C and D being soft-soldered to each side of it, enclosing the cathode-shell and the anode, respectively.

Inside the cathode-tube C is fitted a polystyrene ring E (see Fig. 6), into which the cathode shell fits. Three phosphor-bronze clips, F, are screwed to one face of ring E, which is then mounted in the tube C in such a position that one of the clips F can be soldered to the centre connector of a Belling-Lee chassis-mounting coaxial socket G which is screwed to the tube C, thus forming the input drive connection.

The inner conductor of the anode circuit consists of two brass tubes, H and J, one, H, inside the shorter one, J, with a strip of 0.06-in. polythene sheet (or something similar) rolled up between them, forming the anode condenser. The outer, J, is a force fit in a turned brass end-plate, K, which is held tightly in tube D, allowing H to protrude from the end of the circuit, as the supply connection to the anode. The anode-circuit tuning discs are made up as shown and mounted in threaded holes in D. Tube L, the anode connector, is soldered on to tube H and then about six longitudinal cuts are made, with a fine saw, in the end of L to make it more pliable, so as to avoid damage to the valve when it is inserted.

The supply grid connection is an 8 BA brass screw, with soldering tag, which is screwed into a tapped hole in the edge of ring A, and passes through a hole in tube C, being insulated from it by a small bush (see Fig. 5).

It should be noted that brass screws can be used, if desired, to hold the various tubes and rings in position, so long as the dimensions are followed. No instructions for doing this are given as the writer prefers to turn the components accurately, to make them a tight push-fit in each other, and so avoid drilling and tapping holes.

Output is taken from each line via small rotatable loops (see Fig. 7). These are made by cutting back the PVC outer cover for a short distance from one end of a length of ¼-in.
coax. After removing some polythene as well, to reveal a very short length of the inner conductor, the rest of the polythene is pushed through the brass tube shown in the diagram, allowing the braid to slide over the outside, where it may be bound with fine wire or lacing twine. The loop is then soldered on as indicated.

The local-oscillator as a whole is accommodated in the larger of the two sub-chassis (see Fig. 2, pp. 658-659, February issue), which has a dividing screen along its length, near one side, forming a long, narrow compartment. All HT and heater leads are taken through this screen with feed-through condensers (C22, C23, C25) and thence through two additional feed-through capacities (C24, C26) inside the narrow compartment, fitted in the end wall of the sub-chassis. A brass cover fits tightly over the chassis and is bolted to the sides and also to a piece of brass angle screwed to the top of the dividing screen. The cover for the local oscillator sub-chassis is 12-in. long by 4½-in. wide, with a ½-in. lip all round.

The two coaxial stages are both mounted inside the sub-chassis by means of 6 BA brass screws, two holes being drilled and tapped 6 BA in the cathode tube, C, of each coaxial circuit.

Separate earth return points are used for each of the earlier stages, all earth connections for a particular stage being taken to a soldering tag on one of the valve-holder fixing screws. To ensure the reliability of these earth connections, the sub-chassis should be made of copper or brass; aluminium is definitely not suitable.

The pi-coupler between the second and third stages permits the earthing leads for these stages to be split, the earth wire on the anode tuning condenser of V2 (C8) going to stage 2 earthing point, whilst that on the V3 grid tuning condenser (C9) goes to stage 3 earthing point.

The earth return for the series-tuning condenser of the link between stages 3 and 4 is the only exception, being taken to an earthed tag on a tagstrip. The next tag on the strip is used to anchor the inner of the feeding coax and one side of the link. The tag next again has soldered to it the other side of the link and the “hot” terminal of the tuning condenser (Philips trimmer C15).

Many of these points can be checked by reference to the photograph on p.661 of the February issue.

It is most important that the layout and
wiring should be followed exactly, particularly in the 200 mc stage, otherwise it may be found impossible to obtain sufficient drive for V4.

The heater and cathode chokes of the 446A's are each soldered at one end to a brass clip, which will fit tightly on the pins of the octal base, no actual valve-holder being used. The other end of each choke goes to a tag on a tagstrip. Ceramic wiring pillars are used as HT anchoring points. Provision is made for metering the grid currents of all stages through feed-through capacities (C2, C6, C12, C18, C21), small resistors being connected to ground from these points to complete the DC path in the absence of the meter.

Mixer and Aerial Coupling Circuits

The mixer uses a silicon-tungsten crystal in a shunt-injection circuit arrangement, with a high-Q filter. The design shown is intended for the shielded type of crystal-diode, e.g., the CV-2154 or CV-2155, but can easily be adapted to suit more normal, unshielded types, such as the CV-102, CV-103, 1N21, CV-364, and similar.

The signal-frequency and oscillator-frequency circuits are both end-capacity tuned quarter-wave coaxial lines, mounted side-by-side (see Figs. 8 and 9). The crystal is tapped about halfway down the signal-frequency line, the inner terminal making contact with a small brass collet, screwed into the inner conductor of the line, as in Fig. 10. The outer case of the crystal (which is its other terminal) is held in a brass collar which is pushed into the outer

Fig. 9. Detail of the circuit arrangement shown in Fig. 8.

Fig. 10. Connectors and clamp for the mixer and oscillator lines, and the CV-2154 crystal mounting.
conductor of the line. The crystal is insulated from the collar by wrapping a strip of 0.006-in. polythene tape round the case. This acts as the oscillator and signal-frequency by-pass capacity—and, as will be seen when the IF amplifier is described, it serves yet another purpose!

The IF output connection is made to a phosphor-bronze (or beryllium-copper) clip, details of which are given in Fig. 10.

The signal is coupled into the line by means of a stub-tuned loop, which can be pushed into the line or withdrawn from it, to tighten or loosen the coupling as required (see Fig. 11).

No trouble should be experienced in making the tuned loop. The loop tube and stub outer conductor are brazed together, as shown in Fig. 11; likewise for the stub shorting bridge and push-rod. After turning it, the bridge is slotted as shown, to make a springy contact. The stub inner and its connector are straight-forward, though care should be taken when tapping the hole for the clamping screw. The loop itself is formed from the inner wire of the feeding coaxial cable, which is a short length of Aerialite “Super-Aeraxial,” a 5/16-in. diameter semi-air spaced 72-ohm cable, with an 18 SWG solid copper inner.

Remove the PVC outer cover from about four inches of this cable and also most of the braid, leaving only about half-an-inch. Then treat the polythene likewise, leaving about half-an-inch of this as well. The inner rod of the stub is put in position and the bared coax. pushed into the end of the loop-tube, allowing the braid to slide over it, the inner conductor of the cable being threaded through the hole in the stub connector. Next, a piece of the polythene dielectric, half-an-inch long, is cut from that which was originally removed from the cable and threaded back on to the coax. inner, to support it inside the tube. Finally, the copper inner is bent round into the required shape, cut to size and its end soldered into the loop tube, the clamping screw on the connector being tightened up on the wire.

The completed loop and stub assembly is a sliding fit in a brass tube soldered into the bottom plate of the mixer line. Longitudinal slots, eight in number, are cut in the protruding end of this brass tube.

The split clamp shown in Fig. 10 is made by brazing a piece of brass strip, 1/4-in. thick, to a short length of brass tubing, 5/32-in. o/d, 5/16-in. i/d, and then slitting both tube and strip with a small hacksaw; then drill a No. 51 hole.
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Committee meetings are milestones in the history of the Club. Held in “Jack’s Snacks” (Cocoa our Speciality) every month, they have their own peculiar atmosphere, partly due to the mid-day boiled cabbage and partly due to the fact that three of the members can only think while smoking shag. On account of the presence of many lorry drivers passing through, discussion tends to drift to m.p.g., m.p.h. and average speeds from point to point until the chairman calls the committee to order.

At the last meeting the chairman himself was off the beam, and was holding forth at some length on the Institute ofAdvanced Motorists, having just failed to pass the Advanced Driving Test himself. Showing every sign of sympathy, Fred suggested that an Institute of Retarded Motorists wouldn’t be a bad thing, and then nearly everybody could join.”

“Come to that,” observed Joe, who had just failed in his Morse test, “an Institute of Retarded Amateurs wouldn’t be no bad thing, neither.” Out of such chance remarks are born the inspirations that shape the course of this world. The chairman was looking at the ceiling, with the fire of the prophet (we are not sure which one) in his eyes, and he began to mutter...

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And so the Idea was born which brought new hope to Retarded Amateurs the world over. No longer would the fluffy operator, the T5 note, the helpful calling of someone who wasn’t there, the chirp and the creep be regarded as the hallmarks of the ineffectual. On the contrary, by them shall the world recognise the holder of the R.R.A.E. sheepskin. (This, by the way, is a handsome certificate displaying the badge of the Club—a self-excited oscillator circuit with raw AC power supply, keyed by a left foot, with carbon microphone recumbent, and the inscription Ritardando ma non troppo.)

Hasty work was necessary, and the committee lost no time in circularising the members of Little Twerpington and neighbouring clubs with full details, enclosing a specimen set of R.R.A.E. Questions. We append these herewith, as a model paper of its kind.

THE R.R.A.E.
A LITTLE TWERPINGTON CONTRIBUTION

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A typical break with tradition was made, it being understood that these would actually be the questions set at the next examination, so that no one need fail.

Question 1: Draw the circuit diagram of an oscillator circuit suitable for the production of a distinctive note on the HF bands. It must not resemble the notes normally heard thereon in any respect. (10 marks).

Question 2: Suggest two alternative methods of keying a normally stable transmitter in order to produce an unstable or distinctive note, e.g. chirpy T6. (5 marks).

Question 3: Describe a method of modulation combining the advantages and disadvantages of AM, FM, NBFM and SSB. Note that the method of coupling a carbon microphone directly into the aerial coil or final tank circuit has been superseded in many Continental countries, where similar results may now be produced by more complex systems. (10 marks).

Question 4: Give details of the correct procedure for a CQ call which will arrest attention of all listeners near the frequency (say within 50 kc up or down). No time limit is imposed, but the station call-sign must not be sent more than twice. (5 marks).

Question 5: Produce evidence of having called stations in at least 100 countries without having made a QSO. Describe the techniques briefly, e.g., calling-while-sending, calling-on-wrong-band, calling-throughout-ten-minute-QSO-with-rare-DX, or calling-after-CL. (10 marks).

Question 6: A station in your own country has just called "CQ DX." In reply to your first call he called "CQ DX DX," underlining the second "DX." How do you set about working him? (5 marks).

Question 7: A DX station has replied to you with an incorrect version of your call-sign, and the only words he sent were "QSD terrible" before signing off. Should you send a QSL? Was this a QSO? and what did he mean? (5 marks).

Question 8: An inductance of 10 microhens, a resistance of 72 ohms, a condenser of .005 microfarads (U/S) and a pair of high-resistance headphones are connected in series. In parallel with this system is connected (d) the mains; (b) the output of your power-pack. Do you wish to go on? (10 marks).

Examiner's Note: One hundred marks or more constitute a record achievement. Ten to eighty marks constitute a "Pass." Less than 10 marks confers the privilege of applying for the Driving Test, L.H.T.

NEW QTH's

Appearance in our "New QTH" feature guarantees publication of the callsign/address in the Radio Amateur Call Book, which has a world-wide circulation and is the only directory to the licensed amateur stations of the whole world. If you are in the Call Book you can use the signal "QTH"—or "QTH OK in latest CB," for those who are not quite clear as to the former meaning—with complete confidence. We accept new callsign/addresses and changes of address for the Call Book, which is published from Chicago, from all U.K. amateurs, irrespective of whether they are subscribers to or even readers of Short Wave Magazine.

CARDS IN THE BOX

The operators shown here are asked to let us have a large, stamped addressed envelope, with name and callsign, for cards held for them at our QSL Bureau, the full and only address of which is: BCM/QSL, London, W.C.1. If appearance in "New QTH's" and the Radio Amateur Call Book is also required, that should be mentioned when sending envelopes to BCM/QSL, London, W.C.1.

G2LN, 3BFK, 3DGW, 3FUD, 3TH, 3KOB 3KPI, 3KQB, 3KUW, 3KXO, 3LFS, 3LFX, 3LHB, 3LHD, 3LLF, 4NP, 5FO, 5PN, G13JUR, GM3JLX, 3JHV, 3KKD, GW3JQ 3LHK.
GM3BXW, C. M. Mendelsohn, 26 St. Clair Avenue, Giffnock, Renfrewshire.


G3HPG, W. A. Stonehouse, Albert Cottage, Station Road, Plympton, nr. Plymouth, Devon.


G3JEK, G. G. Carr, 63 Wagon Lane, Sheldon, Birmingham, 26.

G3LCO, D. J. Blocksage, 553 Queens Drive, Stoneycroft, Liverpool, 13.

G3LDA, A. B. Fletcher, 2 Fairview Cottages, East End, London Road, Charlton Kings, Cheltenham, Glos.

G3LDE, H. Swindley, 1 Idenshall Cottages, Clotton, nr. Newquay, Cornwall.

G3LKG, B. M. Sandall, 21 Dale View, Ilkeston, Derbyshire.

G3LGN, M. A. Niman, 9 Montgomery Drive, Unsworth, Bury, Lancs.

G3LHH, V. T. Walkley, 43 Gaston Bridge Road, Shepperton, Middlesex.

G3LHV, J. Ellerby, 38 Well Court, The Dean, Edinburgh, 4.

G3LJW, W. G. Dobly, 69 James Street, West End, Stoke-on-Trent, Staffs.

G3LKA, C. D. Mewis, Mikado Stores, Beech Lane, Stretton, Burton-on-Trent, Staffs.

G3LMK, A. Gemell (ex-ZB2T), 10 Windhill Place, Mansewood, Glasgow, S.3.

G3LKI, B. E. Symons, 23 Westhill Avenue, Plainmoor, Torquay, Devon.

G3LMG, J. Spray, 49 Southwater Road, St. Leonards-on-Sea, Sussex. (Tel.: Hastings 7723).

G3LMO, N. G. Cooper, Concord Cottage, Firth, Newquay, Cornwall.

G3LMP, B. Page, 7 Queen's Gardens, Eaton Socon, Hunts.

G3LMT, A. D. Tregale, 41 Normandy Road, Heavitree, Exeter, Devon.

G3LNJ, G. R. Hamilton-Walker, The Timbers, Camden Park, Chislehurst, Kent. (Tel.: Chislehurst 4877).

G3LNR, A. E. Gwynne, 31 Caroline Street, Nottingham, Notts.

G3LNS, G. Beasley, 219 Moseley Road, Highgate, Birmingham, 12.

G3LNU, R. D. Gibson, 24 Middlewich Road, Holmes Chapel, Cheshire.

G3LWJ, J. McGuire, 16 Cliff Road, Newquay, Cornwall.

G3LNX, G. C. Fletcher, 16 Hope Park, Bromley, Kent.

G3LOA, G. R. H. Hartstone, 428 Whitehorse Road, Thornton Heath, Surrey.

G3LOD, D. M. Rowse, Meadows Fair, Hamm Court, Weybridge, Surrey.

G3LOI, A. A. Blythe, 27 Tedder Road, Acomb, York, Yorkshire.

G3LOW, J. Barrett, Porch House, Farnham Lane, Haslemere, Surrey. (Tel.: Haslemere 872).


G3LPH, K. F. Moss, 42 Acresfield Road, Timperley, Altrincham, Cheshire. (Tel.: Sale 6894).

G3LPJ, H. W. Hooper, 3 Normanston Street, Forest Hill, London, S.E.23.

G3LJK, R. Chadbone, Gainsboro, Trees Road, Hughenden Valley, Bucks.

CHANGE OF ADDRESS

G2AWQ, S. Anthony, 53 Stafford Road, Ruislip, Middlesex.


G3AED, D. J. Sole, 22 Halsall Lane, Formby, nr. Liverpool, Lancs.

G3COI, J. Worthington, 65 Hurst Street, Birmingham, 5.

G3Diq, W. C. Bradford, 6 Langside Park, Kilbarchan, Renfrewshire.

G3DXA, C. J. Godden, 26 Westways, Edenderry, Bridge.

G3FEX, B. C. Oddy, Three Corners, Merryfield Way, Storrington, Sussex.

G3GED, B. Bracewell, 108 St. Martin's Road, Blackpool S.S., Lancs.

G3GIL, P. Forrest, 341 Cacotte Road, Otton Manor, West Hartlepool, Co. Durham.

G3GOT, B. W. LeGrys, 46 Shaftesbury Road, Romford, Essex.

G3GUW, T. J. Griffin, 22 Albert Terrace, Middlebrough, Yorkshire.

G3HSF, W. H. Hier, 122 East Clyde Street, Helsenburgh, Dunbartonshire.

G3HII/A, D. W. Auton, 318 Great Western Road, Hounslow, Middlesex.


G3JDR, D. Robertson, Seacraig, Main Street, Golspie, Sutherland.

G3JEM, J. Wallace, 154 The Ridgeway, North Harrow, Middlesex.

G3KCI, A. H. Webb, c/o Pendower Caravan Site, Bassingbourn Hall, Stansted Airport, Essex.

G3KFS, D. V. Preston, 20 Fishers Drive, Dickens Heath, Shirley, Solihull, Warks. (Tel.: Wythall 3214).

G3KLL, B. Mercer, 9 Epping Street, Hulme, Manchester, 15.

CORRECTION

G2BUJ, P. H. Greenwood, 32 Pound Lane, Pinchurst, Swindon, Wilts. (Delete G2BUJ, March list).


G3MTF, W. Davidson, 21 Gordon Drive, Alloa, Clackmannanshire.
JUDGING by the steady increase in the number of monthly activity reports, the Club movement is in a pretty healthy state. There has not been much of a response, as yet, to our query about how Clubs vary the monotony of normal routine, and we are beginning to think that the right answer is the obvious one—they don't!

Routine seems to be the adhesive material that holds most Clubs together, and if it has been proved to be the right routine, what is wrong with that?

All the same, we are always receptive to Bright Ideas, which we shall be pleased to pass on for the benefit of Clubs other than those which thought them out.

Why Club Notes?

From our side, it will not surprise many readers to know that we are often asked why we devote regular space to Club matters which (it is said) "can only be of interest to those concerned." In fact, the significance of this feature goes a good deal deeper than that, and it is far more important than might be supposed. For one thing, the local Club movement plays a large part in the development of Amateur Radio interest and activity; hence, Clubs must have regular publicity support so that their existence can be made known. Secondly, the activities of other Clubs are of mutual interest among the general body of Club members—now numbering, probably, not less than 3,000 amateurs and SWL's. Thirdly, it is a good thing that those who may have a jaundiced outlook on the existence of amateurs and Amateur Radio should see that there is a strong and healthy local Club movement. Fourthly, if all this is true (which undoubtedly it is) then obviously Clubs must have some forum, somewhere, in which they can come together. Fifthly, it is through publicity in this space that many Clubs not only acquire new members, but also find themselves taking an active interest in matters that might otherwise pass them by.

Hence, seeing things from the inside, we have no intention whatever of curtailing the space normally devoted to "The Month with The Clubs," an established feature of SHORT WAVE MAGAZINE since pre-war days.

And so to this month's Activity Reports:

Clifton met recently to hear a talk on Tape Recording by Mr. A. B. Still (Grundig). On April 5 G3HZI, holder of the D-F Shield, will be talking on D-F Equipment and giving details of the forthcoming contests. On April 12 and 26 'there will be the usual Constructional Evenings, all at 225 New Cross Road, London, S.E.14.

Grafton spent an interesting evening when the S.T.C. representative gave a lecture, with slides, on Design and Manufacture of Modern Valves. On April 5 G311R will be talking on "Titivating the Rig," and April 12 is a Practical Evening. After Easter the Club re-opens on April 29 and holds its Field Day on June 15-16. And see announcement regarding the forthcoming Grafton Top Band Contest.

Bradford meet on April 9 to hear G31BN's talk on D-F Equipment and on the 30th they pay a visit to Yeaden Airport, meeting at Broadway, 7 p.m. Normal meetings, fortnightly, continue at 66 Little Horton Lane.

The British Amateur Television Club (Chelmsford Group) meet on April 11, 7.30 p.m. at 10 Baddow Place Avenue, Great Baddow, when the subject will be Transistor Pulse Circuits, and the lecturer Mr. J. Howe.

Bury will be meeting at the George Hotel, Kay Gardens, to hear a talk (subject unannounced) on April 9 at 8 p.m. The following meeting will be on May 14, when G3HZM will talk on Direction Finding.

The programme for Derby consists of a General Discussion on four Subjects of Topical Interest (April 10), a Visit (details to be announced) on April 17, a talk on Radar Equipment, by G3EKK (April 24), and a Junk Sale on May 1. All meetings at the Club Room in the sub-basement, Derby College of Art, Green Lane.

Edinburgh will hold their A.G.M. on April 10, at Unity House, Hillside Crescent, and a large attendance is expected. They hope to do some portable operation on 1.8 and 3.5 mc during the week-end of June 1/2—call-sign not yet decided. Prospective members, and also visitors from other parts of the U.K., are always welcome at meetings.

Harrow have an informal talk by G2TA on April 5, a practical night on April 12, a Group Discussion on TVI on April 26, and another practical night on May 3.

Lancaster have met recently for tape lectures, film strips and a visit from the GPO Interference Engineer, who answered questions on TVI and BCI. A Junk Sale has also been held, and a visit was paid to Squires Gate Airport, Blackpool, on March 17. Meetings are at the George Hotel, Torrisholme, at 7.30 p.m.

GRAFTON TOP BAND CONTEST

Grafton Radio Society are once again running their private contest for the G2AAN Cup. The dates are April 6, 2200 GMT to April 7, 0100 GMT and similar times on April 13 and 14. Competing members will call "CQ GRS" and score five points for QSO's with other competing members, or one point for contacts with other stations. All fully paid-up members of Grafton are eligible, but naturally they will welcome co-operation from all users of the 160-metre band.
Newbury meet on May 3 to hear Mr. H. D. Harwood, B.Sc., of the BBC Engineering Division, on Microphones for Broadcasting. It is assumed that members have overcome the petrol difficulty, mentioned last month (p.49).

Plymouth are now twelve months old, and will be holding a Social on April 10, and their AGM on May 14. A monthly news letter, “QUA,” is issued free to attending members; non-attendants pay postage. Normal meetings every Tuesday at the Virginia House Settlement, St. Andrews Cross.

Purley will be holding a Junk Sale at their April meeting, and the A.G.M. in May. They also propose to visit the Uplands Telephone Exchange in the near future, on a Sunday.

Rhondda Radio Society has just been formed, with GW2FOF as chairman, GW3DRK secretary and GW3ITQ treasurer. Club activities will cover all aspects of radio, and they promise to report each month.

Romford held their AGM recently and elected G2BVN chairman, G2FWJ secretary and G3EBF treasurer. A programme of lectures and visits has been arranged, and the Club station has been re-equipped for all-band operation. Meetings are held every Tuesday, 8.15 p.m., at RAFA House, Carlton Road, Romford.

The Science Museum Radio Society will be meeting in the Lecture Theatre on April 11 at 6 p.m., when Mr. Christian, of the GPO, will lecture and demonstrate The Practical Approach to Transistors. Non-members wishing to attend are asked to communicate with the Hon. Sec., Mr. G. C. Voller, at KEN 6371, Ex. 237.

Scunthorpe will be meeting on April 11 and 23, 7.30 p.m., at the Talbot Hotel, Earl Street, Scunthorpe — no details given.

South Manchester will be together on May 3 to hear some Notes on the Design of a Band-Switched Transmitter, from G3DQU. In June they will be holding their Annual D-F Contest, and would appreciate entries, either from non-members or from other Clubs in the North-West.

Stoke-on-Trent continues to meet every Thursday, with a steady attendance. A new transmitter is being supervised by G3UD. On March 7 G3EHM gave a demonstration of The Practical Approach to Transistors. Non-members wishing to attend are asked to communicate with the Hon. Sec., Mr. G. C. Voller, at KEN 6371, Ex. 237.

Stourbridge report a good attendance at recent meetings, which have included a very successful Junk Sale and some films on Electronics. Every Tuesday evening the members run a Net on the Top Band.

Swindon will meet on April 12 at 7.30 for an Open Meeting. On May 10 Mr. R. Hipperon, of the Plessey Co., will talk on Electrolytics. All meetings are held at the Drove Road School on the second Friday.

Wanstead and Woodford have found the demand for lectures and demonstrations so great that they
have acquired extra accommodation at their headquarters (Wanstead House, The Green, E.11) for the purpose. A complete overhaul of all the gear in their shack is also taking place. Meetings are held every Tuesday at 8 p.m.

Worthing members gather on the second Monday of each month at the Adult Education Centre, 8 p.m. On April 8 there will be a Brains Trust, to which visitors will be welcomed. Future events include Picnic Field Days and, on July 14, the Annual Bucket-and-Spade Party.

RAF St. Mawgan have re-formed their Club and are now back on the air, operating G3KHM. There are seven members with their own calls, as well as several aspirants. Meetings are held every Wednesday at 2 p.m. and visitors are very welcome if they are willing to help with hauling up aerial masts and the like.

Sheffield meet on April 10, 8 p.m., at Albreda Works, Lydgate Lane, for a talk on Audio Amplifiers; also on April 24 at the Dog and Partridge, Trippet Lane, when a "Swindle" will be held. Attendances have been improving, and the recent lecture on Radio Astronomy broke the Club record.

West Lanes held their AGM in March and elected new officials. Morse classes continue under G3KKU every Tuesday at 7.30 p.m., and new members will be welcomed any Tuesday in the Clubroom over Gordon's Sweetshop, 157 St. John's Road, Waterloo.

All Clubs and local groups are invited to use this space for publicity and the reporting of their activities. Reports should be addressed: "Club Secretary," Short Wave Magazine, 55 Victoria Street, London, S.W.1, and posted to arrive on or before the date given every month at the head of the article. Reports received late cannot usually be taken into this feature.

GLASGOW SCOUTS—GM3ATB/A

During the Scout Show at the Kelvin Hall, Glasgow, during April 18-27, GM3ATB/A will be operated on 20-metre phone. Calls are specially requested from any station, at whatever distance, hearing their CQ. The QSL address is: J. Davidson, GM3ATB, Acton, Highburgh Drive, Burnside, Rutherglen, Glasgow.

ECHO FROM THE PAST

Writing in the other day, a well-known Old Timer who started up in November 1927—on the old 45-metre band—mentions CW contacts with, among others, GC6NX. The prefix GC was not, as you might think, for the Channel Isles, but for Scotland. In those days, the prefix structure was "unofficial" and rather different from what we know now.

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4-SPEED Automatic “Golden Box” Record Player in handsome carrying case; plays through your radio; £9 19s. 9d., carriage and packing 4½d extra.—Box (A), Leeds Laboratories, 69 Allerton Grange Way, Leeds, 17.

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