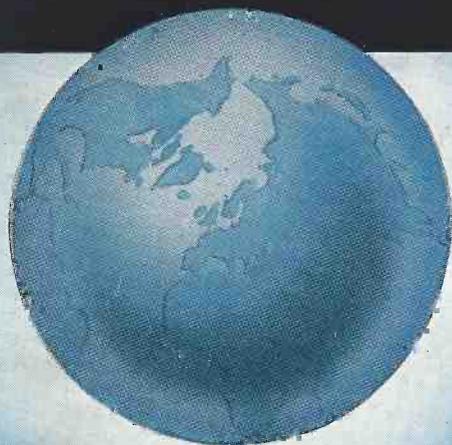


2/-

*The*

# SHORTWAVE

*Magazine*



*Curtis*

**EXCLUSIVELY FOR THE  
RADIO EXPERIMENTER &  
TRANSMITTING AMATEUR**

**VOL. VI No. 4 JUNE 1948**

# WEBB'S

BULLETIN NO.

2



## EX-SERVICE MATERIAL

We are not "SURPLUS" dealers, and we are not normally very enthusiastic about surplus Service Equipment, but the Crystal Calibrated Wavemeter detailed below, and the panel mounting meters constitute something of special interest.

### WEBB'S TYPE "D2" CALIBRATED WAVEMETER

A most useful piece of ex-Government equipment, essentially a Crystal calibrator giving markers at every 100 Kc/s, and also discriminating markers at 1,000 Kc/s, combined with continuous calibration on dial reading single kilocycles between each 100 Kc/s. It is applicable to both Receiver calibration or Transmitter monitoring, and for the latter purpose a telephone jack is incorporated. It is exceptionally well-made, with refinements such as temperature-compensating Condensers and separate 100 Kc/s and 1,000 Kc/s Crystals, which feature gives a greater accuracy and reliability than the dual type Crystal. Incidentally, the Crystals alone would cost more than our prices. Contained in neat metal case with hinged top lid, overall size  $7\frac{1}{2}'' \times 7\frac{3}{4}'' \times 6\frac{1}{2}''$  high, and with stout outer wooden case for heavy transport use. Each instrument has been tested and adapted by Webb's for either operation on 6·2v A.C. or 6 volts D.C. The Wavemeter comes to you ready for immediate operation from 6·2 volts A.C., with easy internal provision for change-

over to 6 volts D.C. The original Army Service Manual of 26 pages, with full circuit diagrams, is included, also a page of Webb's "Simplified Instructions." PRICE £6 17s. 6d.

Webb's "D2T" Transformer for external connection from 210, 230, 250 volts A.C. ... .. 14/-

### PANEL-MOUNTING METERS

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### Flush-mounting External Flange $2\frac{1}{4}''$ square. Fixing hole, round, $2\frac{3}{8}''$ diameter:

0/5 milliamps ... .. 5/9 each  
0/5 amp. R.F. with self-contained thermo-couple ... .. 5/9 each

*The internal thermo-couple can be disconnected, when the fundamental movement is a sensitive milliammeter, full-scale deflection between 1.5 and 3 m.A.*

Four of the above meters (two of 0/5 m/A and two of 0/5 amp. R.F.) at special rates. Four for 21/- (Post free 22/-).

0/150 milliamps ... .. 6/6 each  
0/1 milliamp ... .. 10/- each

### Flush-mounting $2\frac{1}{2}''$ round type meters External Flange $3\frac{1}{4}''$ dia.

*Fixing hole,  $2\frac{3}{8}''$  diameter :*

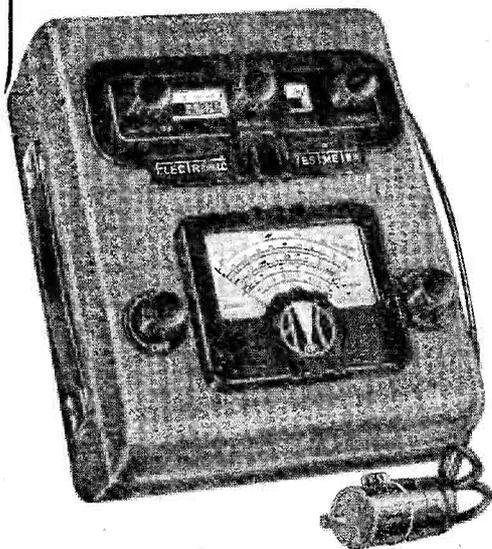
0/1 amp. R.F. with self-contained thermo-couple ... .. 7/6 each  
0/20 volts A.C. (moving iron) 8/6 each  
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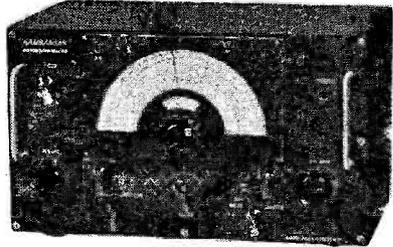
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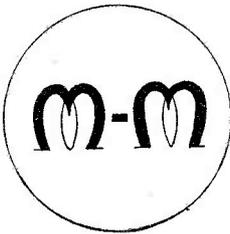
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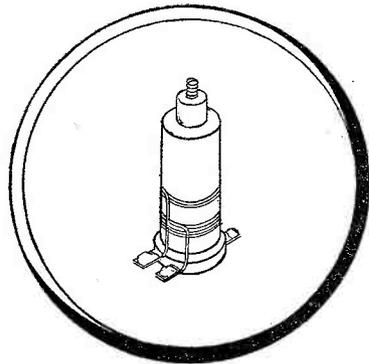


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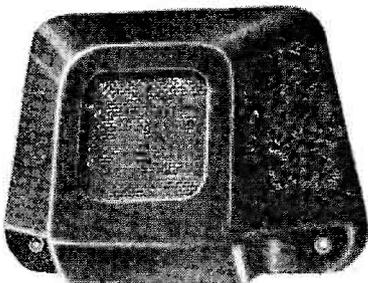
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The Midget 2 Cabinet Model CT117 (as illustrated) uses the P2V Speaker in its bakelite cabinet of modern design which is available in a variety of pleasing colours.

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Price less transformer **£1:9:6**  
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## MIDGET 2 CABINET MODEL CT117

Size: Height 4½" Width 6½" Depth 2½"

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The second edition of our 1948 illustrated catalogue will be shortly available. If you are not already on our mailing list, be sure to send for your copy. (Please enclose 3d. stamp with request)

### R.F. Units Type 26

The article on page 160 of *Short Wave Magazine* for May quotes these as being not commonly available but we now have a limited number to offer. In good condition and including valves. Price 27/6 (postage 1/9). Also type 27 at the same price.

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We are pleased to be able to offer these units complete with valves and in perfect order at 55/- each, plus 2/6 postage and packing. If you intend building a T.V. receiver, we suggest that you order by return.

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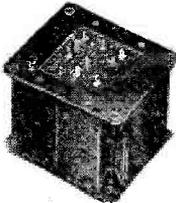
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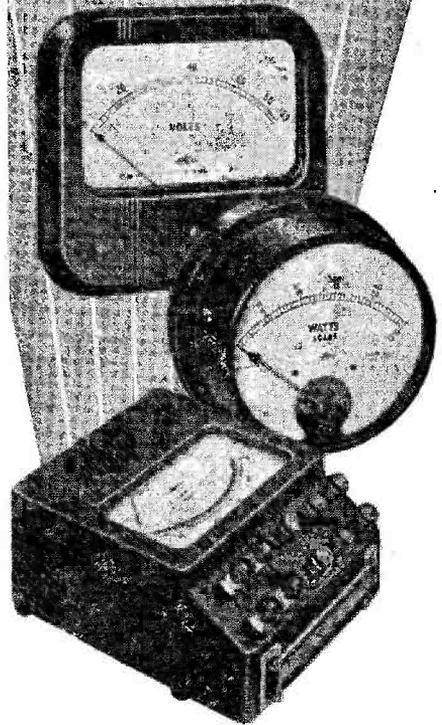
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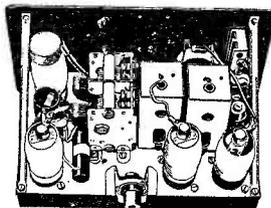
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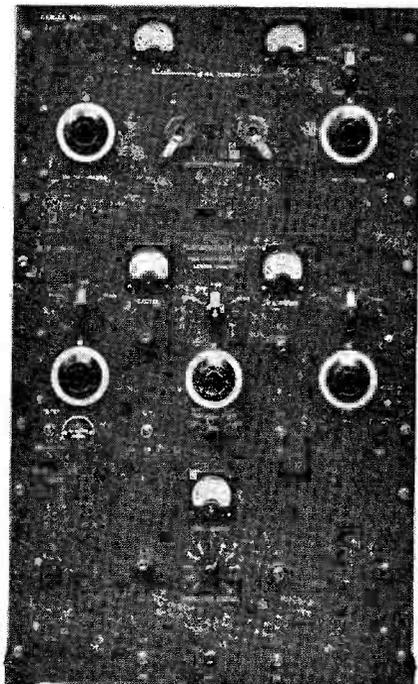
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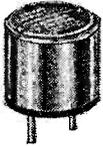
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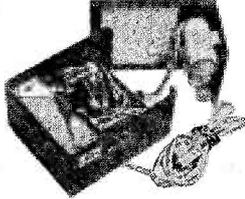
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FOR THE RADIO AMATEUR & AMATEUR RADIO

Vol. VI

JUNE 1948

No. 59

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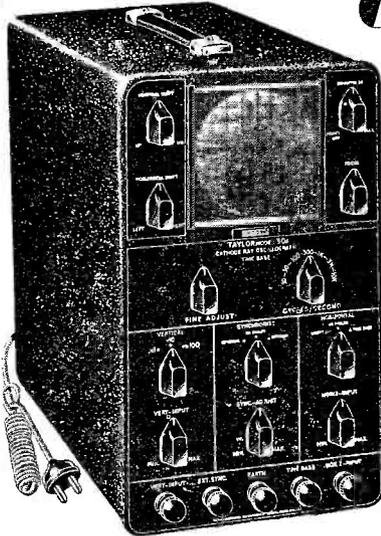
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## EDITORIAL

## Perspective

In this space two years ago we discussed the law of the penny bun—it can only be sold at a penny if the demand for it is such that it can be manufactured profitably for a halfpenny.

The situation now is still much as it was then, in spite of the rosy prospects held out for the future by misguided individuals who, if they had not forgotten anything, had certainly learnt nothing.

Price is, however, becoming more of a factor now than it was two years ago, and we are also beginning to see the expected contraction of the British radio industry; this is partly due to the artificially restricted home market (the pressure of a high purchase tax) and partly because of reduced and much more difficult export sales (market saturation and intensified foreign competition).

Though these trends are inevitable and must occasion wide misgiving and anxiety for the future in the set-making section of the industry—which represents probably 80 per cent. of British radio manufacturing capacity as a whole—it need not yet occasion any deep concern for those manufacturers catering for the specialised markets. These include equipment for railway, police and fire services at home and abroad, for the great Government research programmes, for the tremendous commercial development of electronics in a large number of new applications, and to a lesser but none the less important extent for the highly specialised and individualistic Amateur Radio market.

It may well be that in the long run amateurs will benefit by the availability of equipment suited to their needs at prices lower than ever before—because with the coming technical development in the art of Amateur Radio much of the demand in our field will be the same as the requirements in the new fields of commercial electronics.

*Austin Forster G6FO.*

# Single-Sideband Suppressed Carrier

An Outline of the System, and Its Possible Amateur Application

By J. WOOD (G3VG)

(Post Office Engineering Department, Radio Branch)

THE article on Single-Sideband Suppressed Carrier (S.S.S.C.) working in *QST* for January seems to have aroused some interest in this subject amongst amateurs and prompted the writing of this paper.

The principle of Single-Sideband transmission is not new—it has in fact been in constant use on British commercial circuits since as long ago as 1925.

At that time it was in its simplest form and only operated at very low frequencies—the first application being Transatlantic S.S.B. telephony on a frequency of 60 kc. A great deal of development has taken place since then, and there are now several systems in use. The principal systems are classified below:

DOUBLE CHANNEL — SUPPRESSED CARRIER  
SINGLE CHANNEL — SUPPRESSED CARRIER  
SINGLE CHANNEL — CARRIER UNSUPPRESSED

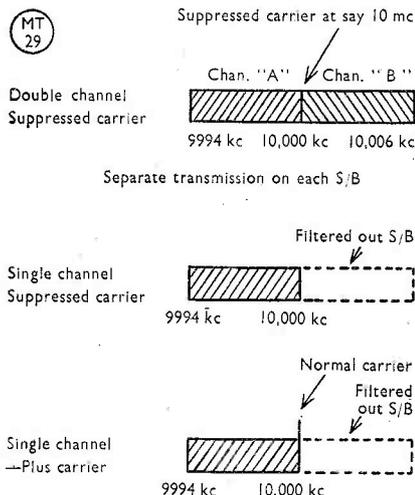


Fig. 1. Frequency spectrums of single-sideband suppressed carrier systems. In each case a band-width of 6000 cycles is desirable for high-fidelity transmissions. This can be reduced for acceptable quality speech transmission.

Some preliminary notes on the subject were given in our issue for February, 1948. Here is a fuller description of what the S.S.S.C. method of telephony transmission actually entails from the practical point of view. We might also add that, for all the publicity S.S.S.C. has had on the other side of the Atlantic, it is—like most other radio developments of fundamental importance—entirely a British system of commercial telephony working. As such, it has been used by our GPO on certain of their radiophone circuits for 20 years.—Ed.

The various frequency spectrums of the systems mentioned are shown and will help to clarify the definitions. (See Fig. 1).

In the Double-Channel systems separate intelligence is conveyed on each Sideband, *i.e.* two separate transmissions. This is achieved by the use of several balanced modulators and filters and is very complex.

In a normal Double-Sideband Transmission (ordinary amplitude-modulated 'phone transmission) the power distribution is as follows:

50 per cent. of total radiated power is Carrier.  
25 per cent. of total radiated power is Upper Sideband.  
25 per cent. of total radiated power is Lower Sideband.

Since the carrier does not contain the intelligence this is 50 per cent. of wasted power and since only one Sideband is necessary to convey intelligence this is a further 25 per cent. of wasted power. It therefore follows that a saving in power of 75 per cent. can be achieved by the use of S.S.S.C.

The essential components of such a system are:

- (1) An S.S.S.C. drive unit, the purpose of which is to generate the system.
- (2) A linear transmitter or RF amplifier to amplify the generated S.S.S.C. transmission.

## Drive Unit

There are in general two methods of producing an S.S.S.C. signal:

- (a) By the use of Filters.
- (b) Phase-shift method.

The balanced modulator is used in both methods and a circuit of a typical B/M is shown in Fig. 2. It will be seen

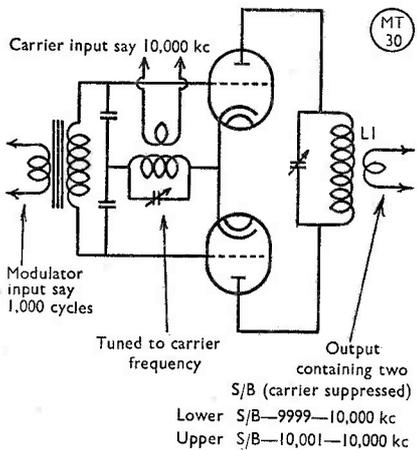


Fig. 2. Fundamental circuit of the balanced modulator, an essential unit in the system.

that the modulation is applied in push-pull, whilst the carrier is applied in phase. The output is taken from the tank circuit  $L_1$  and will consist of several frequencies, being the various sums and differences of the injected component frequencies. If  $L_1$  is made resonant at the frequency of the carrier, the output will then consist of the modulation at carrier frequency  $F_c + F_m$  and  $F_c - F_m$ , the carrier being suppressed. Even in a well designed B/M the carrier is not completely balanced out but is still present at a level of -50-60 dB to the Sideband. However, since -60 dB is a power ratio of one in  $10^6$  it is to practical purpose balanced out.

The output from the B/M then consists of an upper and lower S/B. This is fed

ABBREVIATIONS USED IN TEXT

S.S.S.C.	Single Sideband, Suppressed Carrier.
D.S.B.	Double Sideband.
A.M.	Amplitude Modulation.
$F_c$	Carrier Frequency.
$F_m$	Modulation Frequency.
B/M	Balanced Modulator.
S/B	Sideband.
O1	Oscillator No. 1.
O2	Oscillator No. 2.

into a band-pass filter eliminating one of the Sidebands. The resultant is the Single-Sideband, carrier suppressed. In practice it is standard to use more than one stage of modulation. This helps to simplify the filtering out of the undesired inter-modulation products. The first carrier injected into the first B/M is preferably a low frequency carrier.

Balanced modulators have a low efficiency and so it is better to generate the S.S.S.C. system at a very low level and then amplify it by using a linear transmitter. The schematic of a typical S.S.S.C. transmitter is shown in Fig. 3.

Advantages of S.S.S.C.

The advantages of S.S.S.C. over a normal AM transmission are outlined below :

- (1) Band-width only half as great as with usual AM system.
- (2) Multi-path fading greatly reduced.
- (3) Power economy at transmitter. Since Tx is Class-B linear there is reduced power consumption when modulation is off.
- (4) Signal-to-noise ratio improved by 9 dB; 6 dB is due to suppressed carrier, and 3 dB to reduction of band-width and consequent reduction of noise.

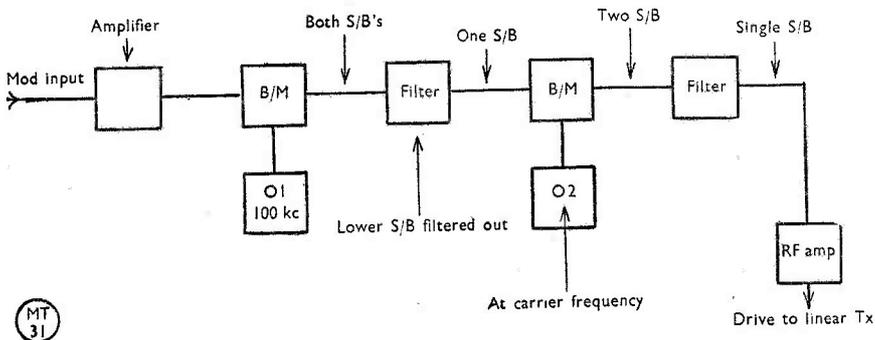


Fig. 3. Schematic of a typical S.S.S.C. system.

Nine dB is a power gain of 8, so a 150-watt S.S.S.C. transmitter will produce a field strength equal to a 1.2 kW transmitter using the normal amplitude-modulated system.

### Disadvantages

Offsetting the advantages one must bear in mind the ever-constant disadvantages of:—

- (1) Complexity of design and construction.
- (2) Increased initial cost of equipment.
- (3) Greatly increased fault liability.
- (4) The re-insertion of the carrier at the receiving end must be of the correct frequency and phase with respect to the suppressed carrier. This presents difficulty although in some systems a "pilot" carrier is transmitted with the S.S.S.C. signal.

### Carrier Re-insertion

Undoubtedly the biggest difficulty that will arise in amateur S.S.S.C. transmission is the replacing of the carrier at the receiving end. It will be appreciated that the re-inserted carrier frequency must differ as little as possible in frequency from the original, because the difference in frequency will cause the demodulated intelligence to be that same amount different from the original modulation.

A tolerance of five cycles is usual. However, since correct frequency response is not so important in amateur DX working, a somewhat greater frequency difference is permissible and commercially ground close tolerance crystals could be used with satisfaction.

The phase of the re-inserted carrier with respect to that of the original will not be so important in amateur working and can be neglected completely.

In amateur systems, the re-inserted carrier can be injected into the RF or IF stages of a normal receiver.

### Filters

The last important obstacle is the design and construction of the Band-Pass filters—following the B/M stages.

These filters should have a band-pass-width equal to the sideband transmitted—a width of 2,500 cycles is ample for good speech—and must possess sharp cut-off characteristics. The successful design and

construction of such filters is somewhat complicated and will prove an obstacle. A simpler scheme recommended by the writer is to dispense with the filters.

This would also mean that only one stage of B/M is now required. A schematic diagram and circuit of this arrangement appear in Fig. 4. The resultant signal would be D.S.B. carrier suppressed. However, this would still retain some of the advantages outlined earlier—notably the 6 dB improvement in signal-to-noise ratio as a result of the carrier being suppressed.

6 dB is a power gain of 3.9, so this simplified system would give performance equal to a normal 600-watt transmitter when using a 150-watt transmitter operated D.S.B.C.

### Linear Transmitter

Finally, a few notes on the transmitter which is now to operate as a linear amplifier.

The push-pull stages are operated in Class-B. Actually, best results are obtained with the valves biased to "projected

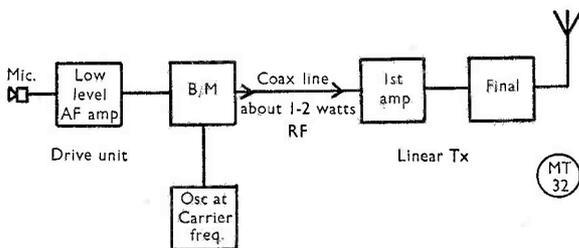


Fig. 4. Schematic of a suggested simplified system for amateur S.S.S.C. operation.

cut off," i.e. slightly less than cut off. The output should be proportioned to input volts and the plate current flows in pulses that are half-sine waves possessing an amplitude proportional to the excitation voltage. The linearity is best checked on an oscilloscope.

The theoretical maximum efficiency of a linear amplifier is 78.54 per cent, and the highest practical efficiency obtainable is 60 per cent, at crest of modulation.

*S.S.S.C. will be further discussed in future issues.—Ed.*

# Transitron VFO Unit

## Design for a Stable, Directly Keyed Driver

By A. G. WOOD (G5RZ)

THE present crowded state of the amateur bands makes the VFO almost a necessity, and for the CW man an instrument capable of being used for break-in is also a considerable advantage.

The writer therefore makes no apology in offering details of yet another VFO, especially in view of the interest which has been shown over the air in respect of this particular version. No special credit is claimed for the circuit details; indeed, grateful thanks are due to many operators for their helpful suggestions during the initial testing period.

The main requirements of a VFO are (a) Extreme stability; (b) good keying control; (c) good output, and (d) a good frequency range.

After considerable work on the Franklin and other VFO's the writer has lately developed the pentagrid Transitron oscillator with which it can honestly be claimed that all the points mentioned are fully satisfied. Into the bargain, the results have been achieved with considerable economy in valves and current load as compared with other types of standard VFO circuit.

### Circuit Arrangement

As will be seen from the circuit diagram in Fig. 1 the pentagrid in use is a 6A7, but it is believed that the 6A8 would serve equally well with the added advantage that the latter has the standard 8-pin base. The output from this oscillator is fed into the grid of a 6V6 which is arranged to operate in Class-A. This point is important so that, in theory at any rate, no load is placed upon the oscillator.

In the circuit shown no voltage stabiliser is employed and so free is the note from any semblance of chirp that one is not considered to be necessary. Both the oscillator and its buffer are fed from their own source of power, at 350 volts, and the total current drain of the oscillator is about 11 mA and that of the buffer 20 mA. Since the latter is operating Class-A this current imposes a steady load on the power supply when the oscillator is keyed, which is, no doubt, one reason why voltage stabilisation is unnecessary.

The oscillator and its buffer should be

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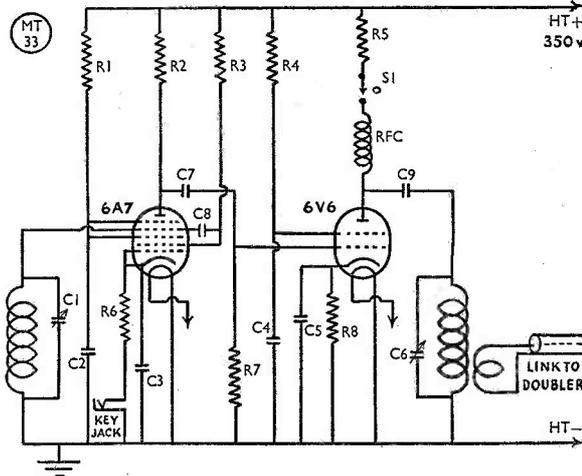
The VFO as primary drive has come to stay and, indeed, is almost a necessity on the DX bands under present-day operating conditions. In our issue for June, 1947, the Transitron oscillator was described and its application as a particularly stable RF generating source in a driver unit discussed. Though our contributor has employed a TU5B tuner as the constructional basis for his design, the circuit he suggests can be built up in any other suitable form.—Ed.

---

well shielded and it is also important to see that the HT and LT power leads are properly screened and kept as short as practicable. Some trouble was experienced at first in getting a true T9 note when driving the PA and there were traces of chirp which were absent when monitoring the oscillator unit unloaded. This trouble was traced to RF feedback in the supply cables and upon screening these and earthing the screen all trouble disappeared. Another point to watch is the cathode by-pass condenser. As will be seen from the circuit, this condenser also parallels the key jack and thus reduces key-clicks to a minimum, the capacity and cathode resistor acting also as a filter.

### Construction

Constructional design is a matter of individual taste but details of the writer's model will no doubt be of interest. The VFO and buffer are incorporated as one unit in a TU5B tuner which may still be obtained on the surplus market for a modest 25s. or so. All the internals of the TU5B were removed with the exception of the two tuning sections and the linked switch gear; this just leaves comfortable room for the installation of the two valves, one on either side of the internal screen. On the front panel (making use of the holes left) were fitted a jack for the key and a toggle switch which cuts HT to the buffer; this is also employed when adjusting the VFO frequency for subsequent operation. The output coupling coil on the buffer tank was reduced to three or four turns and taken through the front of the panel by means of a length of co-ax terminated in a plug. Three-core screened cable is led through



VFO arrangement incorporating a Transistron oscillator and buffer stage. The author's own version is built round a TU5B tuning unit.

### Table of Values

Fig. 1. Transistron VFO

C1, C6 (see text)	
C2, C3, C4, C9	= .01 $\mu$ F, mica
C5	= .1 $\mu$ F, mica
C7	= 100 $\mu$ F
C8	= .002 $\mu$ F
R1	= 100,000 ohms
R2	= 10,000 ohms, 1 watt
R3	= 50,000 ohms
R4	= 56,000 ohms
R5	= 1,000 ohms
R6	= 450 ohms
R7	= 1 megohm
R8	= 385 ohms

the rear of the screening box for plugging into the power unit. An earth terminal is also provided. The main feature of the TU5B is the excellent slow-motion dial on the oscillator circuit and the temperature-compensated coil inside and so well does this work that scarcely more than a few cycles' drift can be detected on 3.5 mc even when starting up from cold. The frequency covered in four switched positions is 1.5 to 3.0 mc and the RF output is more or less constant over the whole of this range.

### Operation

The writer normally operates the VFO on the 1.75 mc setting, at which frequency it takes 8 deg. to cover 1 kc.

The 1.75 mc drive is link-coupled to the grid of a 6SN7GT twin-triode working within its rated capacity as a push-push

doubler on 3.5 mc and the output from this little valve drives the KT8c PA up to about 25 watts. Somewhat greater drive can be obtained by substituting a 6SL7GT and adjusting the grid bias accordingly and with this about 35 watts input to the PA can be obtained on 80 metres.

In operation the toggle switch on the front panel is cut and the VFO adjusted to the desired frequency by listening to the oscillator harmonic on the operating frequency. In some stations it may be difficult to pick up the 14 mc harmonic, but in the writer's case the VFO unit stands right on top of the receiver and this harmonic is just nicely audible.

Having adjusted frequency a touch on the toggle switch will bring the buffer into operation and the whole transmitter is live the moment the key is pressed.

With a basic range of 1.5 to 3.0 mc many frequency multiplying combinations will suggest themselves to the user; for example, tripling into 7.7 mc from 2.333 mc, but as with all VFO units care should be taken to make absolutely certain that the signal is within the band by checking the calibration at frequent intervals against the station standard measuring apparatus.

In conclusion the writer can modestly claim that with no less than 172 QSO's using this unit only 12 were reported as less than T9 whilst 15 contacts gave T9x reports and many add the remark "FB."

### "THE TYPE 145 OSCILLATOR"

The author of this article in our April issue, G2NS, points out that as the result of correspondence arising from it, there would appear to be a number of minor variants of the Type 145 in readers' hands. There were apparently certain small modifications to the original design, which may or may not have been incorporated in some units which eventually found their way to the surplus market.

# Two-Stage Battery Transmitter

## Simple Design for No-Mains QRP Operation

by C. FINCH (G3AHO)

**JUDGING** by the activity on the amateur bands during the power cuts last winter, it would appear that many stations still use batteries for power supplies, and it was thought that the small transmitter about to be described might prove of interest. The writer is without mains supply and this transmitter, together with a simple 1-V-1 receiver, was used for a long time on 7 mc, during which time many interesting contacts were made.

### General Design

The transmitter follows conventional design and no snags should be met in construction and operation. The circuit consists of a crystal oscillator driving a Cossor 230XP in the PA. This valve is a super output triode, and has been driven to 12 watts with 200 volts on the plate—although this, of course, is not advisable for any length of time.

In the writer's transmitter a permanent meter was included with suitable shunts and resistors, switched, for measuring the HT and LT voltage and PA grid and anode currents. But this is, of course, not necessary providing jacks are included in the respective leads and a suitable meter is available having ranges of 5 and 50 mA.

As both sides of the condensers are at HT potential, it is important to make sure that they are well insulated from the panel. All supply leads are taken to a terminal strip at the rear of the chassis.

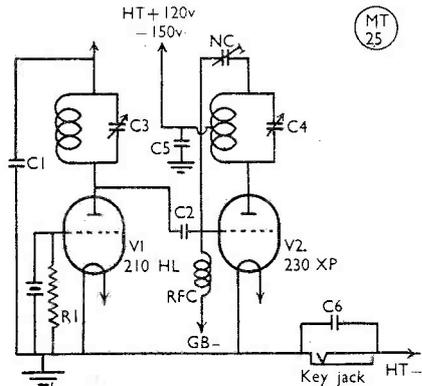
### Adjustment

To operate the transmitter, the meter should first of all be inserted in the grid lead of the PA with HT applied to the CO only; when the crystal is oscillating a reading will be obtained. Next, the PA should be neutralised, and the method used by the writer was as follows: Insert the PA coil and rotate the PA tuning condenser. On passing through resonance a kick will be observed on the grid milliammeter. The neutralising condenser is then adjusted until no movement is

observed when passing through resonance. It may be necessary to retune the CO slightly for maximum grid current during this operation.

When the PA has been neutralised it should be biased to twice cut-off value, and the HT applied. With the meter in the PA HT lead, the PA should now be tuned for minimum current, which will be 3.5 mA, from approximately 40-50 mA when out of tune.

It will be observed that keying is by breaking the HT negative lead, and with a 2  $\mu\text{F}$  condenser across the contacts, no



Circuit of G3AHO's battery CO/PA—simple but efficient.

### Table of Values

#### Two-Stage Battery Transmitter

- R1 = 20,000-ohm resistor
- C1, C2 = .001  $\mu\text{F}$  condensers
- NC = Neutralising condenser
- C3 = .00016  $\mu\text{F}$
- C4 = .0001  $\mu\text{F}$
- C5 = 0.1  $\mu\text{F}$
- C6 = 2  $\mu\text{F}$

#### Coil winding data for 7 mc band

- CO = 18 turns, 20 SWG
- PA = 25 turns, 18 SWG, centre tapped

trouble should be experienced with key-thump or chirp.

The writer has only used this transmitter on the 7 mc band, but there is no reason why, with suitable coils and crystal, it should not be used on other bands.

As regards results obtained, some excellent contacts were made with many European stations with a maximum input of 5 watts, although mainly the input was in the region of 2-3 watts. The best DX was Italy, with 5 watts input.

# Steel Lattice Mast

## Self-Supporting Structure for the Rotary Beam

By F. N. BEDWELL (G8DT)

*(Those interested in a sound engineering job, within the capacity of the average constructor able to work in metal, will find this article useful. It will easily support a 10-metre beam at a height of 30 ft.—Ed.)*

THE mast to be described can be easily constructed with a little patience. It can be built up on the ground and hoisted after completion with the help of three or four persons. It is strong enough to hold a 10-metre rotary beam and will withstand rough weather without guying.

The materials required are :

Eleven 18 ft. lengths of  $1\frac{1}{4}$ -in.  $\times$   $\frac{3}{16}$ -in. angle iron ; 300-ft. of 1-in.  $\times$   $\frac{1}{4}$ -in. mild steel strip.

The bolts throughout are 1-in.  $\times$   $\frac{1}{4}$ -in. BFS, HS, as these are much stronger than mild steel. The total cost is about £8 and the writer had no difficulty in obtaining this material.

### General Design

The mast is on a base 5-ft. square, tapering to 9 ins. square at the top, and is 32-ft. 6-ins. high. The top section forms a square cage and is made to hold the rotary axle for the beam ; the sides taper in a sweeping curve to the base. The construction should start with bolting two lengths of angle iron (which must be exactly the same length) together to form the corner pieces (four in all) and making the base of angle iron 5-ft. square. The two 9-in. squares of the same material for top and bottom of cage should also be assembled.

One of the cage squares should now be bolted to the tops of two corner pieces and the other 3-ft. 1-in. down ; this part remains square and the whole should then be laid flat on the ground, cage squares uppermost, and the bottom of the corner pieces splayed out and bolted to one side of the base, which will stand upright without support.

The distance pieces should now be bolted at the correct points to shape the side up ; the writer used angle iron for the first one up from the base to add strength, the remainder being 1-in. strip.

The cross bracing should then be done with 1-in. strip bolted at the cross-overs ; a length of strong twine tied from the centre of the base at A to the centre of B will enable the side to be squared up

correctly if the twine is brought into the centre of each spacing piece.

### Constructional Details

After this side is complete it should be turned on edge and the second one made, when it will be found that the base will support it. Anti-rust paint should be run well into the joints and the surfaces that overlap each other should be given a coat before bolting together. One side has extra cross-pieces from 10 ft. up to act as a ladder and a small platform at a convenient working height enables one to stand easily. Two plates with 1-in. drain holes should be bolted to top and bottom of the cage pieces to act as bearings for the axle, which consists of inch-pipe with a 9-in. plate fixed to the top on which the aerial array can be bolted. This plate runs on an old ball race for ease of turning. A visit to a car scrap yard produced an "Austin 7" steering-box with worm and pinion ; with a little care it was adapted to bolt to the bottom cage-plate, the steering column coming out horizontally. A pulley was fixed to this for a drive from the base, or if preferred the centre axle can be taken down the full length of the mast and a motor drive fitted at the base. As the axle is hollow the coax feeder can be run up the centre of the tube if desired.

Fixing down of the mast was accomplished by four 18-in. Lewis bolts in 9-in. square concrete blocks 24 ins. deep at each corner, so that the bolts were just inside the angle at the corners. ;  $\frac{3}{8}$ -in. plates were bolted corner-wise to hold each leg down.

### Hoisting

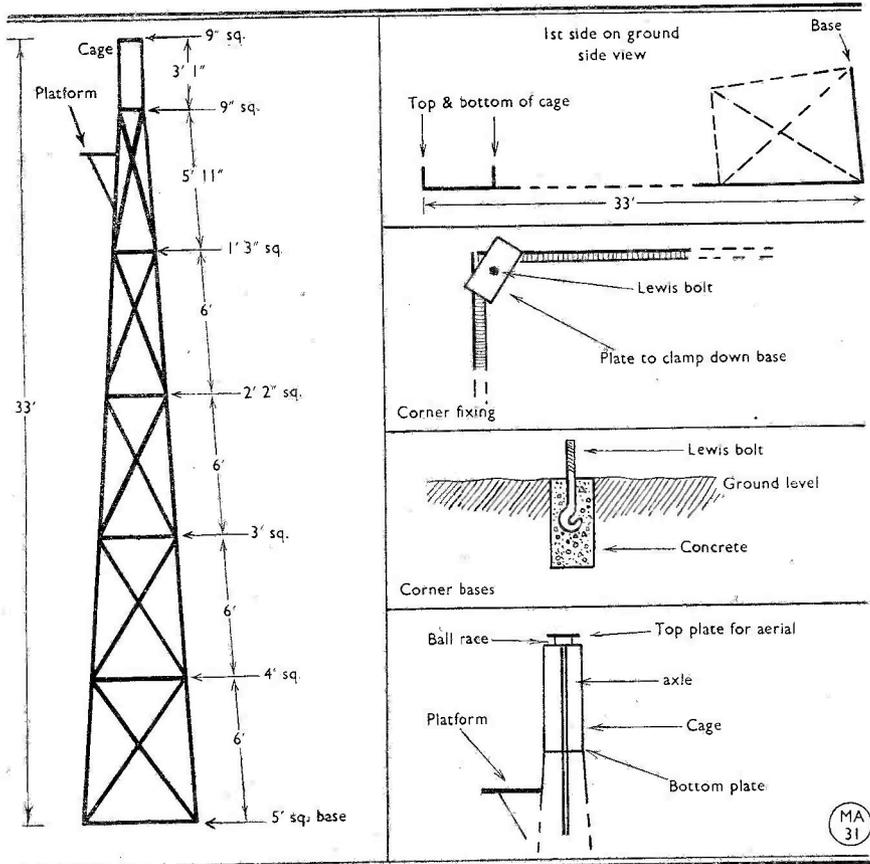
The mast can be raised either with the help of a gin-pole or simply by pushing up with a ladder or pole while one helper pulls from behind and two others keep the whole thing steady with guy ropes until it is vertical. The construction is such that the top would have to sway at least 3 ft. before the centre of gravity came outside the base area, which obviously could not happen if the base is held down

in the manner described. A pulley is fixed to the top member so that a long-wire aerial can be hoisted if wanted.

Constructing a mast of this type has the advantage that one can build up on the ground, and if in a few years' time any

serious repairs are needed, it can always be let down again to effect these in comfort!

The writer's thanks are due to G8ML for very useful suggestions on the construction.



MA 31

MORE ON THE DA's

As if in confirmation of the various comments on this situation which we have printed recently, we have just received a copy of the "official" notice circulated to all DA's by their own under-cover organisation asking them to desist from further illegal operation.

This notice asks for "complete radio silence in Bizonia" since negotiations concerning the issue of licences have reached a decisive stage. There are good reasons to hope that German nationals will be freely

and officially licensed beginning about the middle of July, but it seems that for this to become possible, all DA operation must cease forthwith.

We also gather from this same notice that there has been a vigorous round-up of active DA's, the result of a "betrayal" to the authorities by one of their own number! The circular also makes it clear that S.A.C. (the German under-cover organisation) will accept no further responsibility in the negotiations for licences if DA operation is not immediately suspended.

# BCI From 1.7 and 3.5 mc

## How Receiver IF's Affect the Case

By G. C. TURNER (G5IH), Cdr., R.N.

IT is often reported that an amateur station is heard on the medium and long-wave broadcast wavebands as a "tunable" signal and sometimes heterodyning a BBC station.

This type of interference can occur at some miles from the amateur station and on a frequency which appears to bear no relation to the transmitted frequency and/or the intermediate frequency of the receiver concerned. It does, of course, depend on these frequencies or their harmonics, although their derivation is often difficult to visualise.

For clarity, in the simple formulæ given below :—

QRM = the frequency on which unexpected reception occurs.

QRG = the frequency on which the amateur station is transmitting.

IF = the intermediate frequency in the receiver.

The first two cases are the obvious ones which need hardly be mentioned :—

(a) Where the transmitter is tuned to the second harmonic of the frequency on which it is received (interference usually weak and limited in range) :—

$$QRG = 2QRM \dots\dots\dots(1)$$

(b) Where the transmitter is tuned to the second channel of the receiver :—

$$QRG = (QRM + IF) + IF = QRM + 2IF \dots\dots\dots(2)$$

Remembering that the expression (QRM + IF) is the frequency to which most oscillators are tuned, the next two combinations of frequency are the cause of most of the mystifying reception of 1.7 and 3.5 mc transmissions on the medium and long wave-bands.

If we consider the second harmonic of the oscillator in the broadcast receiver, 2(QRM + IF), when the transmitter is tuned the number of kc on the intermediate frequency either side of this frequency (assuming the receiver is a superhet of the comparatively unselective "aerial straight into the mixer stage" type) quite a strong signal can be tuned in on the

This is a very interesting analysis of how the receiver IF can produce tunable interference right on a BBC transmission, and the article also shows how to calculate the radiating frequencies to be avoided in particular cases.—Ed.

broadcast bands. Thus :—

$$\begin{aligned} QRG &= 2(QRM + IF) \pm IF \\ &= 2 QRM + 3IF \dots\dots(3) \\ \text{or} &= 2QRM + IF \dots\dots(4) \end{aligned}$$

More mystifying still, the second harmonic of the amateur station can cause interference in the same way, i.e. :—

$$\begin{aligned} 2QRG &= 2(QRM + IF) \pm IF \\ \therefore QRG &= QRM + 3/2 IF \dots\dots(5) \\ \text{or} &= QRM + 1/2 IF \dots\dots(6) \end{aligned}$$

Taking the six formulæ above we can find the frequencies to be avoided in order to miss, say, the Home Service on 877 kc on a receiver using the normal IF of 465 kc :—

$$\begin{aligned} QRG &= 2QRM \dots\dots\dots(1) \\ &= 2 \times 877 \\ &= 1754 \text{ kc} \end{aligned}$$

$$\begin{aligned} QRG &= QRM + 2IF \dots\dots(2) \\ &= 877 + 930 \\ &= 1807 \text{ kc} \end{aligned}$$

The other formulæ for 877 kc do not fall in the amateur bands.

For the medium-wave Light Programme on 1149 kc, taking Formula 3 (the only formula that affects the 3.5 mc band when an IF of 465 kc is being considered) :—

$$\begin{aligned} QRG &= 2QRM + 3IF \dots\dots(3) \\ &+ 2298 + 1395 \\ &= 3693 \text{ kc} \end{aligned}$$

And Formula 5 :

$$\begin{aligned} QRG &= QRM + 0 IF \dots\dots(3) \\ &= 1149 + 697.5 \\ &= 1846.5 \text{ kc} \end{aligned}$$

As far as the amateur bands are concerned, the long-wave Light Programme on 200 kc is only affected by formula 3 :—

$$\begin{aligned} QRG &= 2QRM + 3IF \dots\dots(3) \\ &= 400 + 1395 \\ &= 1795 \text{ kc} \end{aligned}$$

Thus, in the Home Service area there are five spot frequencies in the amateur bands which can cause this type of interference. It is not suggested that these frequencies, and corresponding ones in other BBC areas, should be avoided (not forgetting that all receivers do not use 465 kc as intermediate frequency!). But the details given may be of some use in avoiding interference where it is known to exist, and where its intermittent nature, in the sense of different receivers at varying distances, has not previously been explained.

# Going Portable

## Advice and Suggestions

By THE OLD CAMPAIGNER

*(This pseudonym conceals the callsign of a well-known amateur who for many years has made the outdoor aspect of Amateur Radio operation his special interest. His article discusses portable operation from the strictly practical view point and is based on personal experiences.—Ed.)*

AT this time of year when the call of the open air rivals the attractions of the shack, what could be more inviting than the prospect of using one's station (or part of it) out-of-doors and so carrying on the favourite hobby whilst enjoying whatever a British summer may have to offer? The bogey which often frightens off the likely starter is the problem of power supplies, but this can be surmounted and it is truly surprising to discover how much can be done with portable QRP equipment. The bogey is further dispelled by the prospect of being able to erect a  $\frac{1}{2}$ -wave aerial for 1.7 mc or a 5-metre beam 1,000 ft. above sea-level, according to which happens to be one's favourite band.

### Licences

Most readers will be aware that the G.P.O. is prepared for a modest supplementary fee of 10s. per annum to grant facilities for portable operation on all the amateur bands. The power limit is 25 watts input and the radius of operation is 10 miles from any fixed point chosen by the licensee. Stations licensed for portable work use the prefix /P when operating as portable stations.

### Sites

It should be realised that the holding of a portable permit gives the operator no right to set up his station on private land and it is always a wise precaution to approach the landowner or farmer before committing a trespass. A few words of explanation and a statement of one's intentions will be well repaid and will usually result not only in willing permission but often in active help and welcome interest.

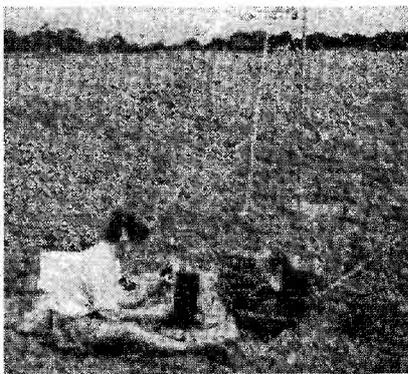
### Portable or Mobile

The prospective outdoor operator must be systematic and painstaking. This is no pastime for the commercially-minded ham who "has no time" for designing or

building his own gear. The privileges of working a portable station are generally reserved for those with an experimental turn of mind and a touch of ingenuity.

The first main question is of course the means of transport and one must decide between *Portable station* working or a truly *Mobile station*. The former may be regarded as a station which is assembled at and operated from a chosen site, whereas a mobile station is one which moves about as a whole, can be operated from any point and perhaps be "on the air" whilst actually moving.

Choice of the above will obviously depend on available transport. The design of mobile transmitters and "transceivers," sufficiently light to be carried whilst walking, demands real skill and in the writer's opinion is a branch of Amateur Radio which merits considerable attention. Short-wave listeners can get endless pleasure from a home-built midget receiver for the amateur bands which can literally be carried in the pocket, to be taken on holidays and elsewhere. This type of activity has become increasingly worth-



Running a portable outfit under open-air conditions is not as easy as it looks.

while since midget low-consumption valves and light-weight high-tension batteries have come on the market.

Crystal-controlled transmitters employing one or two valves only and operating with a plate-voltage of 100 or 120 volts have a surprising range when properly coupled to well-designed aerial systems.

### Transmitters

It is not proposed to give detailed advice on the design of apparatus in these notes, but rather to leave this to individual choice which will largely depend on requirements. In any event, economy of power consumption must be the key-note in design and this means a minimum of valves and a careful selection of types. Three will usually be the limit for the transmitter, even if modulation is included. A simple 6F6-6L6 or similar combination will serve on most bands and even a 6L6 crystal-oscillator alone is capable of giving excellent results on the lower-frequency bands. For 58 mc, a separate power-amplifier stage is to be preferred and this can be achieved if a tri-tet CO using a 7 mc crystal is followed by a double-triode such as the 6N7, each half of which acts as a frequency doubler. The DET19 makes a highly efficient PA on this band.

VFO's can of course be employed but frequency checking apparatus should then be available as even the best-made units are liable to suffer from the "ups and downs" of portable operation.

### Receivers

Questions of portability and power consumption usually call for simplicity and compactness in receiving equipment for outdoor work and it is generally worthwhile to build special apparatus for the purpose. There are one or two important considerations to be borne in mind if this course is adopted. Additional rigidity and the protection of all vulnerable parts of the receiver must be secured, together with stout external connectors which will stand up to constant use.

If the receiver is to be used in the open air, the signals will often be heard through QRM from outside sources, such as conversation, dogs barking, passing aircraft or traffic. Some reserve of LF amplification is therefore desirable to drown this kind of interference. Secondly, with the apparatus out of doors and often situated in windy locations, special precautions must be taken, particularly on the higher frequencies, to ensure that the receiver tuning is not affected by movements of the

aerial or its feeders. This generally demands the isolation, in a straight receiver, of the detector stage from the aerial by a stage of RF amplification. On 58 mc a second stage may be necessary to ensure absolute stability. If it is essential to use a receiver employing one or two valves only a partial cure may be secured by coupling the aerial feeders very loosely to the input stage—though some loss in input is of course inevitable with such an arrangement.

As with the transmitter, the final choice of design depends on the exact purpose of the operator, but the above points should be always borne in mind. It may be possible of course to use a superheterodyne receiver with the portable station, and provided sufficient power is available, this will probably produce the best results. A check-up on consumption and a careful comparison with the capacity of accumulators or other sources of supply should be made before setting out with a multi-valve receiver.

For the "foot-slogger" or cyclist, there is now a good range of midget valves available which enables one to put together a 3- or 4-valve receiver in a remarkably small space and to supply it adequately with a single flash-lamp cell for the filaments. A small layer-built HT battery will deliver the necessary plate voltage.

### Aerials

As mentioned earlier, the real pleasure of outdoor work often lies in the opportunity of erecting the best types of aerials in the best kinds of location.

Perhaps the first problem to solve is the method of support. For the longer-wave bands, where long wires are needed at considerable heights, trees offer the natural solution. Tree-climbing is not necessarily involved—in fact, the practised hand can do even better with a large stone at the end of a string, to be whirled round in a vertical plane and released to fly over a high bough so that the stone descends on the far side of the tree. With the two ends of the string "in hand" it is an easy matter to pull a length of rope or cord over the bough to replace the string, and the aerial insulators may then be attached ready for hauling up the aerial itself. If two trees a good distance apart are used, the aerial may be positioned well clear of both of them. A very impressive half- or full-wave aerial is quickly erected in this way.

It is generally a good plan to stake down the feeder *via* a suitable insulator leaving

a free length for connection to the apparatus. This avoids any danger of the gear becoming "air-borne" should a wind arise. When operating from a vehicle, the feeder may be similarly secured to the coachwork.

For 5- or 10-metre work rotary systems or rigid dipoles may be preferred, in which case the construction of a light duralumin mast on the fishing-rod principle may be undertaken. The mast is conveniently lashed to the car-bumpers or to a tree-stump or may be held vertically by guy-ropes. Various methods may be employed for rotating these aerials, but it will be a convenience if the rotation can be carried out by the operator whilst he is listening to incoming signals.

### Power Supplies

As there are many possible sources of power for the portable station, it would seem logical to deal with these in order of size and capacity, commencing with the smallest.

At the start it must be realised that a station, if not employing a combined receiver and transmitter (*i.e.* a transceiver) needs low-voltage supplies for receiver and transmitter and high-voltage also for both.

The advisability of using throughout heaters or filaments of the same voltage will be obvious.

Simple receivers may employ midget valves with 1.5-volt filaments. Such valves could be used in a very low-power transmitter—in which case all low-voltage requirements would be met by installing one or two dry cells.

Most apparatus, however, is likely to contain indirectly heated valves with 6.3-volt heaters and these may be adequately supplied from car or motor-cycle accumulators. If the station is to be operated regularly from a car it is convenient to run a pair of leads from the car accumulator (or one half of it if 12-volt) to a suitable plug screwed to the coachwork. Never-



The lighthouse supports the far end of a 1.7 mc 1-wave aerial (264 ft.), and the operators on this station worked in shifts.

theless, for prolonged use of the station, the operator will be well advised to carry a spare accumulator to guard against possible exhaustion of the car battery and consequent immobility of the car itself.

For medium-sized apparatus, 6-volt motor-cycle accumulators provide satisfactory sources of heater supply, and can easily be carried by hand. A single M/C accumulator will supply a 3- or 4-valve receiver reliably for a full day's operating, the total consumption being in the region of 1 to 1½ amps.

Turning to high voltages for plate supplies, the simplest source is obviously the dry high-tension battery. This will be quite adequate for all receivers except large multi-valve affairs and will also give reasonably long service to transmitters requiring an input of not more than one or two watts. As hinted above, this kind

of genuine QRP work provides one of the most fascinating forms of outdoor experiment and can give surprising results.

The more substantial forms of high-voltage equipment require motor transport and the power is generally derived initially from accumulators. A high-powered portable station will usually carry a petrol-motor or other equipment for charging the accumulators in turn.

Low-voltage DC current is converted to high-voltage DC in various ways. Vibrators and rotary-converters are most generally used by amateurs. In either case smoothing of the output by means of the usual combination of condensers and LF chokes is essential. Particular care in the design of the smoothing unit will be required if it is to be used in conjunction with receivers, modulators or variable-frequency oscillators.

Many types of vibrators are now available, some styled "self-rectifying" and giving a DC output, others requiring separate rectifiers. Voltages of 200 or 300 may readily be obtained by means of vibrators, though the smoothed DC current available should be carefully checked against the total power consumption of the transmitter or receiver to be used.

Rotary converters have happily come on to the market in vast numbers in recent

months, and are noted for their absolute reliability, long life and wide range of outputs. For use with accumulators, the 6- or 12-volt input types are most handy, but it is well to remember that a high wattage output, however desirable, will be a severe tax on standard batteries and may possibly harm them. The wise plan is to match the input requirement of the converter to the maximum safe output of the accumulator and to operate the transmitter at whatever power is thus made available.

### Power

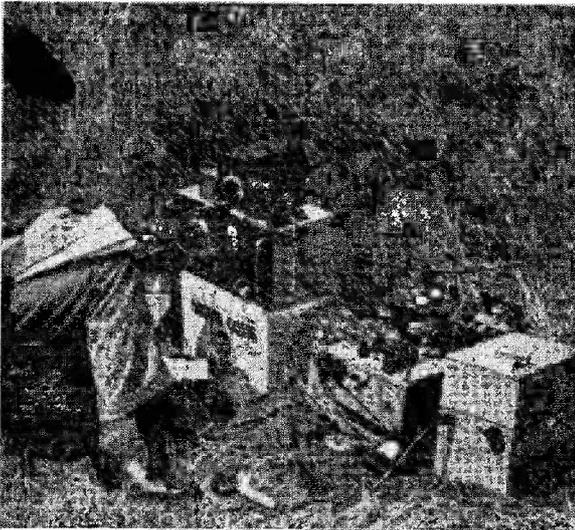
Another important advantage of rotary converters is the possibility of "under-running" them. For example, a 12 volt-input machine, rated to give 800 volts output will usually work very satisfactorily from a 6-volt accumulator, and give a good output at about 400-volts. It might even rotate and give something over 100 volts from a 2 volt source !

Although capable of standing up to severe wear and tear, rotary converters always respond to good treatment and careful adjustment of the brushes. An occasional check on the ratio of input to output wattage will indicate the working efficiency and show whether adjustments are needed.

### Assembly

Everyone knows the story of the battle which was lost "all for the lack of a horseshoe nail." The moral of this legend might well be applied to portable radio—the missing crystal which ruined a field-day—the 'phones which someone should have remembered before the receiver was transported to the country !

Two precautions carefully followed will prevent this kind of minor tragedy. Make a list of everything which will be needed on the day and check it over before leaving. Secondly, assemble the station temporarily at home and if possible test it "on the air," thus ensuring not only that everything is included but also that all the gear is in working order. Incidentally, it is a good



G2ATK/P, with an all-6V6 Tx and a Type 26 converter into an R.103 receiver. Each unit is built in an I.F.F. case, utilising the original rotary transformer supplied for this particular radar equipment.

plan to attach circuit diagrams to all pieces of home-made apparatus to assist rapid fault-finding should trouble arise.

Always be prepared for minor breakages and disconnections by taking one or two small tools, spare lengths of wire, clips, connectors, etc. The handy loop and flash-lamp bulb will be useful for quick checking of the transmitter output at each stage.

Other pieces of apparatus to be taken, if transport arrangements permit, are a field-strength meter (especially if beam aeri-als are to be used), voltmeters for checking accumulators and plate voltages, a milliammeter and perhaps an absorption wavemeter.

### Operation

By far the best way of avoiding muddle and confusion in operating the portable station is by designing some kind of operating panel either to fit into the car or to stand on the ground. In a tent it may

be possible to erect a trestle table to take the operating panel.

The design of this piece of gear will depend on the apparatus with which it is to be used but amongst the fittings there will usually be aerial terminals, aerial change-over switch, key, microphone jack, rheostats for power control, sockets for connection to the transmitter, receiver, accumulators, power unit, modulator and so on. The key, microphone socket and change-over switch should be conveniently placed; there may be room on the panel for the log-book and it is a good idea to attach the pencil by a piece of string otherwise it is sure to get lost in the grass or in the bottom of the car when urgently needed.

Some readers of these notes may by this time have come to the conclusion that they are mainly superfluous, others may decide that there's more in "this portable business" than they thought! The Old Campaigner's last remark is "Wait till you've tried it. Portable radio *isn't* quite as easy as you'd think! But it's great fun!"

### THE GATTI-HALLICRAFTERS EXPEDITION

This American-sponsored expedition is working through the British East African territories of Kenya, Uganda and Tanganyika on a scientific survey, the objectives being Mt. Kilimanjaro, the Ngorongoro Crater, the Serengeti Plains and the Mountains of the Moon in Western Uganda.

Callsigns as follows have been allotted to the Expedition: Uganda, VQ5GHE; Tanganyika, VQ3HGE; Kenya, VQ4EHG; and VQ5HEG. At the end of April, the Expedition had reached Arusha, 150 miles west of Kilimanjaro. It is hoped to operate from the very tip of that 19,000-ft. mountain, the highest in Africa, using VQ3HGE, and a special QSL card has been produced for all QSO's made from Kilimanjaro.

Due to the seasonal closing of the 28 mc band, on which VQ3HGE has been operating, contact has been lost by the Expedition's base station W9CGC, Chicago, at the Hallicrafters headquarters. Operating schedules and frequencies are: 1400-1600 and 1700-2200 BST, channels available being 28050 and 14160 kc for CW working, with 28375 and 14380 kc for 'phone; the Expedition operators are W6PBV and W0LHS.

The mobile equipment carried by the

Expedition consists of two Hallicrafters HT-4E transmitters and an HT-18 VFO unit, the receivers provided being S-38, SX-42 and SX-43. The aerial system is a prefabricated rhombic designed for 7, 14 and 28 mc, which can be set up or taken down in an hour.

In view of the prevailing conditions on 28 mc, VQ3HGE will no doubt be showing up on the 14 mc frequencies by the time this appears.

### DX OPERATING MANUAL

A new publication by the Short Wave Magazine, Ltd., and the first of its kind in this country, the *DX Operating Manual* will appeal to all in any way interested in working or hearing DX. Of seven chapters, each complete in itself and dealing fully with one particular aspect of DX working, it makes a practical approach to the subject in a manner never previously attempted. Well printed on art paper, of 40 pp. with colour cover, the *DX Operating Manual* costs 2s. 6d. (2s. 8d. post free) and can be ordered direct from the Circulation Manager, Short Wave Magazine, Ltd., 49 Victoria Street, London, S.W.1.

# DX COMMENTARY

## ON CALLS HEARD, WORKED & QSL'd

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

Greetings once more, after a rather duller month than usual. Yes, we know the DX is always there, but it *has* been a bit harder, hasn't it? And no one would claim that 28 mc had been wide open all the time, would they? (Or *would* they?)

It seems to us that summer conditions arrived rather early this year; all of a sudden one was conscious that one had to get up rather early in the morning to find 14 mc at its best, and one also realised how unpleasant continuous static can be in the evenings.

But these slight difficulties don't deter the DX fraternity in the slightest, and as usual we have some very interesting letters and claims in the mail-bag.

### Hot-under-Collar Department

We have always had the idea that some of these spiv-types are not really so clever; lots of listening during the past month has confirmed it. In the course of testing several different aerial systems on 14 mc by using them on the *receiver*, all sorts of interesting things have come to light. One evening in May we decided finally that if certain quite well-known operators were as well supplied with brains as they appear to be with watts, they would have the makings of quite sensible beings.

This particular evening we happened on KB6AD, working an ON4. KB6AD is the kind of call-sign that produces a violent reflex action and sends the right hand stretching out for the transmitter switch, but on this particular occasion it wouldn't have been much good for us, because the transmitter wasn't there! So we listened. *Every time* that KB6 came over to the ON4 in the course of his QSO, two Italians, one OK and several G's called him frantically; *every time* the ON4 went back over, the same thing happened. When KB6AD finally signed off, he sent, very slowly and carefully "Closing down now until tmw . . . SK SK."

Well, that really started things; and for a solid *six minutes* after that, there were half a dozen or so stations calling KB6AD. One of them was still at it nearly 15 minutes later. Meanwhile some quite nice

DX a few kilocycles away was passing unobserved.

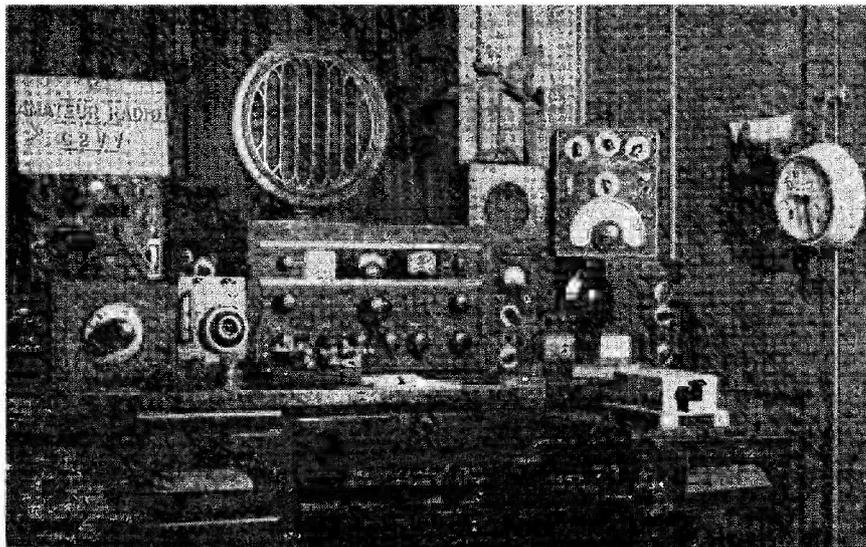
Ah, well! There's another one born every minute. But this sort of thing has been happening every day of the month, and it is gradually forcing your commentator to the opinion that competitive DX just isn't worth the trouble. After all, while the neurotic brigade are indulging in this sort of foolery one can have a really good QSO in perfect peace with a ZS or a VQ3, only a few degrees farther up the dial.

### News from Overseas

So let's go overseas and forget the Brainless Wonders for a while. Some very interesting news to hand, too. First, ZC1CL came on the air on April 24 for the first time. He is Dan Lockyer, ex-LI2CL, ex-MD1D. Whether he will still be about, in view of the situation in the Middle East, we don't know. He worked 8Z and 17C during his first five days on the air.

VS1CR (Singapore) has been on since April 14, with 20 watts on 14,020 kc—full QTH in panel. VS9ET and VS9GT have both returned from Oman, although we have heard another VS9GT active during the past few days. VS9ET, now at Skegness, tells us that he was using a 6L6 driving an 807 to about 15 watts; the aerial was a half-wave Windom about 12 ft. high. The actual location was by the side of the airfield at Sharjah. 'ET says he got rather fed up with the California Kilowatt gang, who used to form a queue, but were not too particular about their relative positions in the queue. All outstanding QSL's will be sent when 'ET can press the XYL into service with the secretarial work!

VS9GT, now at Hull, also says "Please have patience, chaps, and you'll get 'em." We have one of his cards and we never even worked him—so he *has* got some! 'GT says his chief troubles out there were the humidity (guy ropes snapped at night unless one loosened them) and the way sandstorms made their way inside the rig.



General view of G2VV, Hampton-on-Thames, Middlesex. Equipment on the left includes a modified Type A Mk.III Transceiver, a Hartley ECO driver for 3.5 and 7 mc, and a modified Type 27 Converter unit for the VHF's.

The QRN they caused was also rather trying. VS9GT now patiently awaits his G call, and will see what it's like to try to raise some rare DX!

Harold Owen of ZD4AM writes from Newcastle, Staffs, where he is enjoying some home leave. He has had a few personal QSO's round about Rugby, and hopes to be in London later on. He, after reading certain remarks last month, hands the G's a bouquet for operating, and says the worst spivs are the W's; but he does agree that G notes seem to have deteriorated.

MT2E (Tripoli) confirms that Tripolitania and Cyrenaica are now officially two separate countries. He, too, writes from home, but is going out there again. His experiences in getting on the air are worth retailing; he had to build his transmitter from all sorts of U/S bits and pieces of service gear, and his shack was a bathroom! Having first got the receiver working nicely, he turned to the transmitter and describes the next part of his experience as "three months' soul-destroying purgatory." But it eventually worked.

The "gen" from Tripoli is that amateurs are licensed for 25 watts on 7, 14 and 28 mc, and the majority use 14 mc only. Active ones are MT2A, MT2C, MT2D,

MT2E, MT2F (all civilians), and MD2B, MD2G (ex-T1NS), MD2H and MD2I (all Services), plus TR1P, an American type using 600-900 watts!

MD5AK (Canal Zone) is still going strong and comments on the freak conditions on 28 mc during April. The band had been folding up by 1900 GMT, but he suddenly found W's and VE's coming through right up to midnight and even later.

VS2CH (Kedah, Malaya) is ex-G2CQJ, and at the time of writing is rock-bound with only one frequency—14,316. He is in a fine location, but has no mains; so he is using an HRO vibrapack and a 6L6 tritet with only 200 volts, and the DX lads will really have to listen for him. Later he hopes to acquire a generator and run 100 watts of 'phone.

VU2FL (Siliguri, Assam) is active on 14 and 28 mc and is particularly keen on contacting GM stations. He has a Vee-beam on the U.K.—QTH in panel.

Peter Lovelock, ex-G2AIS, comes up with a long letter from New York, where he is now living. While on the air here he worked 650 W's, and is now trying to revisit as many of his old QSO's as possible. The only gear he has of his own is an

## ZONES WORKED LISTING

Station	Post-war		1948	
	Zones	Countries	Zones	Countries
'Phone and CW				
G8KP	40	176	38	125
G2AJ	40	162	37	100
G6QB	40	158	36	92
G3DO	40	157	37	107
G2WW	40	157	29	87
G4CP	40	142	38	104
G3AAE	40	120	37	88
SV1RX	39	149	38	120
G2VD	39	136	28	64
G3TK	39	126	32	81
G2AVP	39	118	34	70
G8IP	39	114	33	77
G5MR	39	108	30	41
G6PJ	39	76	22	40
MD5AK	38	152	—	—
G4AR	38	125	27	75
G3BI	38	107	35	68
G2AO	37	112	28	70
G2EC	37	110	—	—
G8KU	37	105	32	72
G6XX	36	99	26	52
G3BDQ	36	98	24	61
G2BXP	36	94	26	60
G8PL	31	93	31	80
G2HPF	31	90	29	48
G3DAH	31	77	31	72
G2BJY	30	92	—	—
G3ACC	30	86	15	32
G5HH	30	83	14	41
G3BNE	25	60	23	51
G2BBI	18	52	18	52
G3DCC	14	32	14	32
ZC1CL (since Apl. 24)	8	17	8	17
'Phone only				
G3DO	37	122	33	87
G3ZI	37	122	21	42
G8QX	34	108	24	58
G2BXP	32	80	26	59
G3DAH	30	71	30	66
G6CB	29	70	25	37
G2VJ	25	56	16	24
G2BBI	18	48	18	48

S38 receiver beside the bed, but he has been offered lots of the proverbial American hospitality and has managed to work several of his old G friends.

ZC6WL writes from Kendal, Westmorland to say he is now QRT in

Palestine and that all his contacts have been QSL'd; if anyone is still short of his card, please get in touch *via* BCM/QSL, London, W.C.1.

An interesting letter from ON4WX (Brussels) points out that all three-letter ON's are pirates, and that the maximum power permitted the licensed stations is only 35 watts—not very much with which to fight the bedlam from the W's, as he puts it! ON4WX has now obtained his DXCC, and cards from C8YR and VQ8AE; he says that ON4TA has his 40Z and will be the first Belgian to WAZ.

## The 14 mc DX

The event of the month has been the appearance of ZD9AA on Tristan da Cunha, which has caused at least as much excitement as VR6AA's appearance last year. Several of the gang have worked him, but the first G station to do so appears to have been G5VU (Nottingham). 'VU snagged ZD9AA for his fourth QSO and his first G—fine business.

G2PL (Wallington) weighs in with some caustic remarks about the behaviour of "overgrown schoolboys on 'phone" and suggests that some of them should be made to operate CW for a while—preferably those who actually *boast* about their complete lack of Morse knowledge. But all this is by the way—'PL says 99 per cent. of his time has been spent listening, and the other 1 per cent. working ZD9AA, VPIAA, W00ZW/KS6, UF6KAB and KAC, and RV2/FO8. The latter is another one that has occasioned some hectic chases lately (including some pretty bad behaviour, again).

Now we have to report a kind of deputation, headed by G2WW (Penzance) on the subject of C6YZ. 'WW states the case more fully than the others and says that he is not prepared to accept a blunt statement from CQ or ourselves that "all C6's are in Zone 24." As he rightly says, C6YZ is in Sian; Sian, on the *Magazine* Zone Map, is in Zone 23; and that boundary was drawn from CQ's own map. So what? We, too, have been sorely bothered by this one, and it is obvious that the discrepancy is between CQ's map and its own "list of contents" of the various Zones. The answer, even though highly unsatisfactory, is this: *We* will acknowledge C6YZ to be in Zone 23; we are absolutely satisfied that he is. But if you send the card to CQ with an application for a WAZ Certificate you will surely have it returned. The same applies to C6ATE, also in Sian. So the gist of the matter is that you can score

40 Zones with us, but you can't score "WAZ" with CQ; not until you produce a card from a C8.

Incidentally, G2WW, in common with ourselves and many others, has received a card from UF6AA for a QSO which never happened! 'WW only needs a UM8 to complete his round-up of USSR districts.

On the subject of Russians—an amusing exchange was heard by G3ATU (Sunderland). A UA3 called a UB5; he received an immediate reply from a UA1, who, in turn, was promptly called by a UA6. All we can think of is "Spivski." 'ATU also queries the C6YZ position, and wants to thank a WØ in Missouri for wrecking his QSO with an HP station. Every time 'ATU called the HP, this WØ came back on the same frequency and told him his sigs were FB!

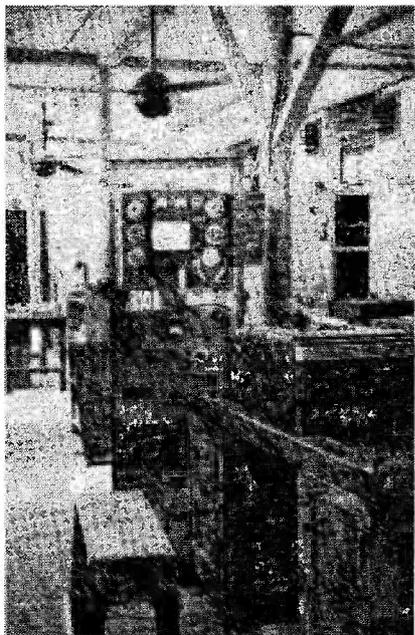
### Piracy Again

Two reports of pirates this month. G2FRY (Nottingham) says that a DA1 has adopted his call and says "QSL via G2FRY"—but *he* disowns it completely. G2PV (Leicester) is accused of using 'phone on 7, 14 and 28 mc, and tells us that although he is 52 years of age he still pounds the brass; and he hopes that the GPO will find the culprit and lighten his purse of a few odd coppers!

G2FFO (Burnley) has worked M1B in San Marino and received a card direct—so *he* is genuine. QTH in panel. G2AO (Malvern) brings up the C6YZ query, and adds that he has worked KB6AD, who is on Canton Island. This island once used the prefix KC6 (we worked K6ETF/KC6 last year for nis first G contact and never got a card!) but now comes under the Phoenix group like Baker Island and is KB6.

G8PL (London, N.W.3), of indoor aerial fame, complains of being flooded with reception reports from USSR. 'PL has worked ZD1LQ and sends his QTH, and was also pleasantly surprised to have a QSO of sorts with KA1ABZ, although the latter said the DX bar was still in operation.

G5WC (London, S.E.19) has scored his century at last with his 40 wazts of CW and 'phone. He would like to know more about KN1ZA—we seem to have heard of this one before. G3DAH (Herne Bay) tells us that he was the G station who worked W6YIL while the latter used first 3 and then 0.25 wazts. (See p. 198, May, "QRPP.") He held the W6 for 40 minutes on the low power, recorded him and played him back!



G. E. Tompkins, ex-RAF and now of Hull, put Trucial Oman (Arabia) on the DX map by opening up VS9GT out there, using a modified T.1154 and an AR-88. Many excellent G contacts were obtained, and a total of 30C had been rolled in when VS9GT went QRT in August of last year.

G8KP (Wakefield) sends an impressive list of DX, as befits the top-of-the-list man. His six new post-war countries were VP2, F (Corsica), UL7BS, CR4 and GD. 'KP says there are so many phoneys around that we should really run the Zones Worked list on *confirmations* only. He has 120, post-war—and we are delighted to cap that with our own 123! But what do other readers think? Say the word—and if you want the list restricted to confirmed contacts we will be pleased to accept it.

G5FA (London, N.11) has added on another 7 Zones and 16 Countries this year. He collected WØOZW/KS6 without realising he was a new country (thought it was Swar Island!). "Came the Dawn" while going home in the tube the following evening.

### What is DX?

Small prize to G3BQR (Christchurch) for the first really good answer we have ever seen to the question above. His answer is "Any country, until you have

## DX QTH's

AP2G	c/o Harbourmaster, Karachi, Pakistan.
AP2N	Norman Henry, Police Training School, Karachi.
AP5TM	Capt. T. M. McLuskie, 160 The Mall, Lahore.
C6ATE	Postal Bank, Sian, China.
CR7MB	Box 12, Quelimane, Portuguese East Africa.
EA8EDZ	Apartado 11, Villa Cisneros, Rio de Oro, Spanish West Africa.
EQ1RX	Radio Workshops, Abadan, Iran.
FF8FP	Box 583, Dakar, French West Africa.
HC2OL	Box 1293, Guayaquil, Ecuador.
KA1ABZ	520 Signal Base Depot, APO 707, c/o PM, San Francisco.
KM6AH	c/o C.A.A., Midway Island, Central Pacific.
M1B	Geom. Mario Graziani, Repubblica di San Marino.
MT2E	H. T. Orrell, Cables and Wireless Ltd., Box 400, Tripoli, Tripolitania.
RV2/FO8	Roland d'Assignies, Isle de Raivavae, via Tahiti.
VP6SJ	Box 252, Bridgetown, Barbados, B.W.I.
VS1CR	Cpl. R. S. Baldwin, Signals Centre, RAF Changi, Singapore.
VS2CH	J. C. Harvey (ex-G2CQ J), Dublin Estate, Karangan, Kedah, Malaya.
VU2FL	A. C. Watson, Gayaganga P.O., Siliguri, Assam, India.
W0OWZ/KS6	c/o Naval Station, Pago Pago, Samoa.
W3FOJ/KL7	Box 1310, Fairbanks, Alaska.
W7MY	3211 Lambourne Avenue, Salt Lake City, Utah.
W4MCI/KG6	Amph. Trac. Co., 1st Marine Brigade, c/o FPO, San Francisco.
YV5AY	Box 1247, Caracas, Venezuela.
ZC1CL	F/O D. E. C. Lockyer, Officers Mess, RAF Amman, British Forces in Transjordan.
ZD1LQ	Lungi Airport, Freetown, Sierra Leone.

worked it and got your card." G4QK (Croydon) argues that we are revising our ideas of what constitutes DX, and says that in spite of the overcrowded conditions prevailing, it is easier to work VK, ZL and W6 than before the war. He adds that one can easily work 60 or 70 countries without including any real "DX" in the list.

G3TK (Leigh) has stopped calling it DX and says "not so usual" QSO's include VQ4KTH, ZD1LQ, YA3B, and LZ2AA. TK has to go off the air for a while to learn a new job, and hopes to find Zone 23 thickly populated on his return.

G6XY (Bigbury), who is ex-G8WL was among the lucky ones who worked RV2/

FO8, and sends his full QTH, which appears in the list. G6BB (Streatham) has at last raised his missing VK6 on 14 mc, and sends some nice QTH's along.

G2HNC (Wirral) voices a mild protest against too many "rubber-stamp QSO's"—even with rare DX stations. He says, "It seems to me that when it becomes a matter of working DX stations to get an RST and a QSL and nothing else, it's a poor look-out for the future." We agree; it's a matter of keeping a sense of proportion. Chew the rag with the W's and the VK's and the ZS's—but don't hold up the KB6's and the ZD9's too long. They won't often encourage it, anyway. G2SO (Leigh-on-Sea) views the prospect in a different way and thinks that the competitive scramble will soon reach such a pitch that everyone will be trying to work 100 countries in a month, and again with each new transmitter that one builds. (But we argue, you don't *have* to do it if you don't like it; watch the others collecting their nervous breakdowns and duodenal ulcers, but take it easy yourself!) 'SO worked VR6AB, who said his home QTH was the Swan Hotel, West Street, Horsham, Sussex, and that he would be returning shortly.

G2AVP (Stradishall) has been working some very good ones, such as KG6DI, TI8RB, CR6AI, KZ5BE, PK6XA, KM6AH, VP5MU, CO6AJ and W0OZW/KS6: all on 14 mc CW.

## Quick QSL Section

Our remark last month about a rapid QSL from LU has produced some amusing notes. G2BJY (West Bromwich) worked W6AY on April 24 and received his card on April 27! G2FFO (Burnley) worked a KG6 on March 20 and had his card on the 27th. And he did a two-way QSL with a W2 in eight days last year. G4CP (Dudley) worked ZD3B on Friday and had his card by the Monday—but ZD3B flies for BOAC!

## QRP

G2AYQ (Bristol) raised CT2AG with an input of 5 watts and habitually works on 7 mc with inputs of 3 to 5 watts only. His slogan is "More QRP, less QRM", and he wants a QRP Contest on 7 mc during a week-end—phew! G3DJD (Brighton) writes about his friend G3DIU/A, who is a T.B. case and very poorly at present. He has spent the greater part of three years in hospital, learnt the code by listening on the amateur bands, and by the generous co-operation of the GPO passed the Morse test in bed. G3DIU/A

is now working on 7 mc with 8 watts, and a 9 ft. 6 in. rod aerial, with the bed as a counterpoise. He is CC on 7028 kc, and works between 0930-1115 and 1415-1530 when he is fit enough. So please look out for G3DIU/A and try to keep the channel clear for him if you can; if anyone ever appreciated Amateur Radio as a hobby, a chap in these circumstances will. And hats off to him for his perseverance!

G3CWW (London, N.W.4) claims to have heard a UM8—normally the one district missing from the USSR scores. UM8KAB, he says, was about T3, starting at one end of the band and finishing at the other. CWW suggests that some of the grouse about rotten notes should listen to their own occasionally (we are not sure whether we like the sound of that one!) And he thinks his call is being pirated—on the strength of having received cards for contacts never made.

G6WX (Coventry) has received his DXCC Certificate for 100 countries on 'Phone. He must be the only Mayor in this country with a DXCC!

G3CVG (Wakefield), who was complaining about the absence of Russian cards, has now received about 40! He spoke too soon. He protests about the growing habit of certain G's—passing the rare DX along from one to the other. Very pally, as he says, but it shuts out the rest of the gang and is forcing him to abandon his rock and build a VFO.

G3DBF (Mansfield) would like the QTH of LF2O. We know he's a Norwegian, of course, but take it he means

the full QTH. Can anyone oblige? G8ML (Cheltenham) passes on a message from PAØMM to the effect that VP6SJ is active most nights on 7060 kc. His QTH appears on the list.

David Mitchell (ex-GW6AA, ex-G2II) noes to be collecting a ZLI call before very long. He is taking his own gear with him to New Zealand and will be looking out for all the G QSO's he can muster.

### Stop Press

G3CHN writes from the SS *Francine Clore*, at Port Arthur, Texas, and expects to be on the Texas run (in a tanker) for some time. On the ship is a very fine transmitter running 450 watts to a pair of 813's—VFO controlled and would cover 3.5, 7 and 14 mc. . . . He would like the sea-going amateurs to organise themselves and plead with the GPO for a Maritime Mobile permit. But, as we see it, they are not under GPO jurisdiction when on the high seas; it is surely up to the master of the ship and, through him, the Board of Trade. This is, however, not a matter on which we are qualified to advise and we do not want to be held responsible for encouraging what might be illegal operation!

Next month's deadline is June 17, first post. We would like to have your Zone and Country claims, in the order shown in this month's column, on a post-card, and separate from your letters. And if you would *please* divide your letters into paragraphs headed "14 mc," "7 mc," "DX QTH's," and so on, it would ensure that nothing is overlooked. As it is, we read about sixty letters for this feature and have to try to remember them all in case three or four people refer to the same thing.

Address all your news to "DX Commentary," *Short Wave Magazine*, 49 Victoria Street, London, S.W.1, and watch that date! 73 until then—and may you always get T9x.

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### THE NEW CALL BOOK

The Spring 1948 issue is another monster production, and testifies to the rapid growth of Amateur Radio activity all over the world.

The G listings, in 34 columns, comprise about 4,000 addresses, and give the G calls printed in "New QTH's" up to and including our issue of March, 1948. But the G figure is still about two-thirds only of the total of amateur licences now in issue in the U.K.



".....Jinin' Old Timers' Club, Jarge?....."

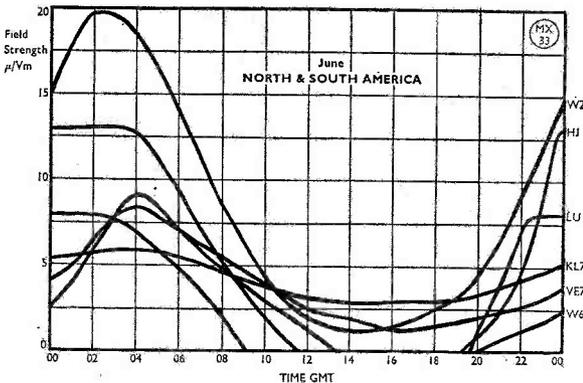
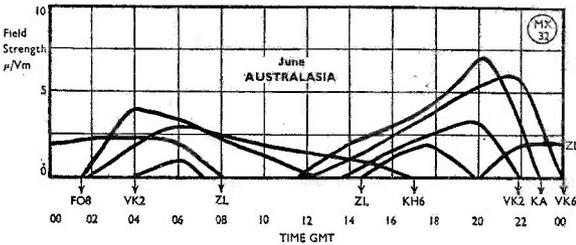
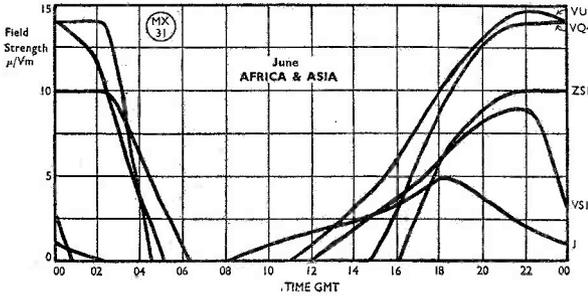
# Twenty-Metre DX Forecast

## Predictions for June

by I. D. McDERMID,  
A.R.T.C (GM3ANV)

THE maximum field strengths and periods of activity for nearly all areas have by this month reached their lowest ebb in the yearly cycle. Further, it will be seen that the slopes of many of the curves—such as VQ4, VU and ZS1—between 1200 and 2200 GMT show slower rates of recovery to their peak strengths than last month, and incidentally slower than for next month. VK2 has contracted quite appreciably and lost the morning period double-hump that was evident in May. There is little comment to be made with regard to the remainder of the graphs, since although they all give decreased peak intensity and periods of activity, the shapes of the individual curves have not altered substantially.

It might be of interest to note that the noisy land areas due to local static have by now shifted and will remain virtually unaltered in the following positions until September: In Africa, the main belt of high noise source stretches between the latitudes 05 deg. N and 15 deg. N and includes the Southern tip of Arabia; in America, the noisy area embraces the whole of Central U.S.A. and the Eastern seabords of North and South America from latitudes 05 deg. S to 35 deg. N, including the West Indies; in Asia, the noise covers an area bounded by approximately 80 deg. E to 130 deg. E by 25 deg. N to 05 deg. S. The above should be compared with the areas given in the April issue.



# Simple Break-In System

## Circuit for BK

Devised by R. J. DONALD (G3DJJ)

**B**REAK-IN operation does not seem to be used by amateurs nearly as much as it deserves to be, and in this article it is proposed to describe a system which is comparatively simple and can be adapted to any superhet receiver.

The essentials are :—

- (1) An oscillator than can be keyed.
- (2) A separate receiving aerial.
- (3) A key with back contacts.

If the erection of a really efficient receiving aerial is not possible, it is suggested that the best be made of a bad job and an aerial of some sort be put up (even though it be only a bit of wire across the room) on the argument that it is better to be able to work BK on some contacts that not to be able to work BK at all. When working weak signals the scheme can be dropped for the time and the main aerial used.

Basically the idea is to use the back contacts of the key to mute the receiver. Any method could be used, such as breaking the HT line to the Rx, but at G3DJJ a very small "mod" was made to the station superhet, as follows :

The earthy end of the cathode resistors in the RF and FC valves were disconnected from the chassis and connected together and to one side of a closed-circuit jack socket. The other side was connected to earth so that with the plug out the circuit remains unchanged. However, when a plug connected to the back contacts of the key is inserted and the key depressed the receiver is muted an instant *before* the Tx begins to radiate and the muting is removed an instant *after* the Tx stops radiating. It was further found that by connecting a resistor across the jack connections the Tx signal could be heard when the key was pressed—the size of the resistor being governed by the sensitivity of the Rx and the power of the transmitter ; 50,000 ohms is a good value to start with. If desired, and panel space permits, the resistor could take the form of a 5,000 or 10,000 fixed resistor and a 100,000 ohms variable resistor in series so

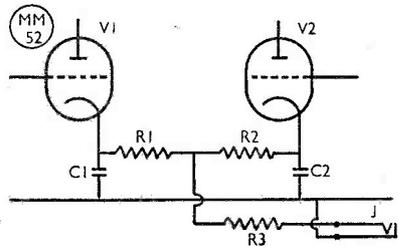
These notes will suggest the means by which BK operation can be achieved by the average amateur. Break-in working should be possible at all stations fully equipped for CW operation. When conditions allow, it is a most satisfying method of working.—Ed.

giving control of the signal strength on "listening through."

Break-in means that in effect you can "listen through" when transmitting and it is therefore possible for the operator with whom you are in contact to let you know if he misses part of your message because of QRM or other interference. To stop you keying he should send either your call sign or better still a series of double dots . . . . .

### Operation

With the modification described the procedure is as follows :—Listen round for someone calling CQ, tune to his zero beat, switch off PA HT, swing VFO with the key down until the signal is heard in the muted receiver, check the VFO against the nearest crystal check point (see *Short Wave Magazine*, April 1948) tune the VFO to a suitable point 2 or 3 kc off the calling station's signal, let the key come up, switch on PA HT and as soon as invited to do so transmit. If working BKS the same applies except that the VFO is tuned to zero beat instead of to one side . . . . and the whole operation can be performed in a matter of seconds, though it takes so much space to describe.



Muting circuit applicable to any multi-stage receiver. The back contacts of the key are connected across the jack.

### Table of Values

Fig. 1. Receiver muting circuit

- V1 = RF valve
- V2 = FC valve
- R1, R2 = Existing bias resistors
- C1, C2 = Existing bias condensers
- R3 = See text—about 50,000 ohms
- J = Closed circuit jack connected to back contacts of Key

Note : In the case of keys with a common moving contact—i.e. metal arms—care must be taken to see that short circuiting does not occur.

# THE VHF BANDS

By E. J. Williams, B.Sc. (G2XC)

*First Spor-E Working—*

*Excellent GDX Conditions—*

*Increasing Activity—*

*VHF Century Club Founded—*

ACTIVITY on 58 mc has been at a consistently higher level during the past few weeks than has ever before been experienced. It has been a pleasure night after night to swing round the dial and hear so many signals on the band. Whatever the cause may be, it is much to be hoped that this activity is going to continue for as long as we have the use of these frequencies.

No new distance records are reported, although some new trails have been blazed. Starting with the GM3OL/G5GX contact, mentioned last month, GM3OL effected QSO with several Lancashire, Yorkshire and North Midlands stations and has been heard in Birmingham by G5JU and also in Rugby. G3BW (Whitehaven, Cumberland) has been doing similar excellent work and records reception of G5BM (Cheltenham) and G5PP (Coventry), for really good long-haul paths. And just as we started this, the Newcastle group broke through to Hull, G2BS and G3CYY working G3ALD (Hull) on May 14. On the same evening, G6OS of that city worked G2BS and G5GI in Sunderland, and G3CYY and G4LX (Newcastle). So the North is pretty active.

All these contacts are the reward of much hard trying and we congratulate the operators concerned.

With such excitement in the North southerners have had their thrills in the way of new counties. G3KX/A and G4RX appeared in Somerset, G2RY and G3TN in Dorset and G5AM in Suffolk. For those not already having included Worcestershire in their list, G2HX re-appeared, during M.A.W.E. No. 3, after a year's absence from the band. In the Channel Islands GC4LI is listening and has logged G5BY and G3AVF.

## Band Planning

As will be gathered from the foregoing, conditions have been generally good. M.A.W.E. No. 3, like its predecessors, was blessed (or cursed, whichever way you look at it!) with fine weather, but this time both conditions were good and activity high. So exceptional was the latter that the LF end of the band became

one mass of QRM on the Sunday evening! One South London station left his receiver set on a frequency near the LF end for 30 minutes and during that period 14 different stations appeared on that one spot! Several well-known stations shifted up towards the HF end and we have been asked to appeal to all concerned to spread out more evenly over the band. In supporting this appeal, we must ask your forgiveness if G2XC continues to operate on 58.67 mc. Truth is, that if we go much higher up we are liable to cause harmonic interference to a local airfield, and this same restriction applies to several stations in the South Hampshire area.

However, when we get going on 144 mc G2XC will be in the HF half even if it does mean no QSO's! Or will some of you come and keep us company? If so, order a crystal between 8055 and 8111 kc! G2XC will be on  $18 \times 8070$  kc, and G6VX on 145 mc.

But returning to the present band, all operators are urged to use the QLM, QHL, QMH, QML procedure signals to indicate the direction of search after a

M.A.W.E. No. 4

The next Magazine Activity Week-End is June 12-13, starting at 1500 BST on the Saturday. Please report results to reach us by June 18.

CQ. Further, if all stations (particularly, those outside the London and Home Counties area) would tune the band alternately from the HF and LF ends, it would encourage a migration towards the HF end. At present, any London station who moves above 59 mc is a hero!

And while on the subject of operating, may we remind those pestilential VFO swoopers that the spiv tactics they see fit to employ on the LF bands are NOT wanted on the VHF's. Complaints are beginning to come in about this, complete with the offenders' call signs. We don't want to start a black list, but suggest that GDX stations refuse to QSO operators seeking contacts by intentionally parking on top of a successful station.

### Sporadic-E

The only spor-E contact on "five" reported so far is G6ZQ (Cheltenham) with OK2MV, on May 5 at 1305, although G6DH (Clacton) worked WIPPH/MM 28/50 cross-band on May 10, when the WI was near Gibraltar. That same evening some queer signals were heard around 58.5. Fading was severe and identification impossible, but it was almost certainly due to spor-E. G2ADZ logged OK3BV/3 for a few minutes around 1430 BST on May 16.

EP3H is active in Persia, beamed on G with 20 watts (CW only). Another station is on in Dhahran, Saudi Arabia, on 60 mc. Reports can be sent *via* BCM/QSL. London. From his letter we gather EP3H may be on 56 mc, *i.e.* outside our band.

### Swiss Note

HB9BZ writes that the HB's are lined up for when the spor-E season gets going. HB9AT and HB9BZ have been carrying out some interesting propagation tests. With 100 km. separating them, the circuit is generally very poor with fading when beams are lined on the direct path, but if *both* stations aim their beams at the famous Jungfrau-Massiv the field strengths increase by 8 dB above the maximum on the direct path, and fading is eliminated. These tests have been repeated at different times of the day and over several weeks.

HB9BZ is active at 1200 and 1700 GMT daily and hopes to QSO G's before long.

### Individual Reports

Thanks to G5BM (Cheltenham), amongst others, for encouraging G4RX (Bridgwater) on to the band and so enabling us to add Somerset to the Counties list. Outfit at G4RX is a 25-watt 807 power doubler on 58.6 mc, a fixed dipole firing NE/SW, and a BC-342 with a Type 27 converter. His best DX so far is G5GX and G6OS—and very good, too. The other Somerset station, G3KX/A, is installed at the QTH of SWL Bodeo-Yanez (Banwell). The input is 20 watts to an RK34, used as two separate doublers, following a KT66 tritet. The Rx is the same as at G4RX, but a 3-element w.s. rotary 16-ft. high is in use.

G2BMZ (Torquay) has been busy experimenting with a new convertor, which he hopes may be effective on 144 mc later on. It has a series-tuned parallel-bar circuit with two EF54's in push-pull. Coupling between the EF54's and the

6J6 frequency changer is by self-resonant coils (9 turns  $1\frac{1}{8}$ -in. diameter). The 6J6 has grids in push-pull and plates in parallel. Another 6J6 is used as oscillator link coupled *via* coax to the frequency changer.

G3AVF (Torquay) reports for the first time; he is on 58.98 mc, rather badly screened east and north, but is doing well with 22 watts to an RK34 push-push doubler, into a 4-element w.s.r.b, with a Type 27/R.107 combination on the Rx side. He is another of those who observed the brief spor-E opening at 1800-1830 BST on May 10.

### The North

From the south-west to the north, where GM30L (Dumfries) and GM3BDA (Airdrie) have both been active. The latter, situated midway between Glasgow and Edinburgh, is 500-ft. a.s.l. So far we have no reports of any G's other than G3BW contacting him, but GM30L has been doing some fine work, up to 200 miles. He has been looking for G6VX at 2230 each evening. May 7 was a good night, and a determined effort was made to get through, but G5MQ and G3ARS,

### VHF CENTURY CLUB

The following members of the Five Band Club have shown 100 QSL cards confirming two-way contacts on frequencies above 50 mc, and thus become Founder Members of the VHF Century Club:

G5PY	R. Clark (Clapham Park)
G2AJ	R. Joss (Hendon, London)
G6VX	M. D. Mason (Hayes, Kent)
G2MR	W. J. Thompson (Surbiton)
G5BY	H. O'Heffernan (Thurlestone, S. Devon)
G5BD	A. C. Simmons (Mablethorpe)
G2XC	E. J. Williams (Portsmouth)

### ASSOCIATE MEMBERS

Following is a list of those who, having shown totals of over 100 stations worked, are granted associate membership pending receipt of the necessary QSL cards:

G5RP	E. Wake (Abingdon)
G5LQ	J. Tovell (Chiswick)
G3BLP	J. Haydon (Selsdon)
G6OS	J. W. Gill (Hull)
G4RO	A. E. Read (Welwyn)
G2RI	L. Ridgway (Leicester)

both in Lancashire, were the best contacts achieved.

South of the border G3BW (Whitehaven) has provided a new county for some of the Northern and Midland stations. He is working G3APY (Kirkby) regularly. The Tx at G3BW is a Type 37 driving an 832 PA on 58.9 mc, into a 3-element rotary (a 4-element is under way). The Rx is an EF54-EF50-EC52 converter into an SX16. Operating hours are from 2130 nightly and all day on Sundays. Sunday, May 9, when G3APY, G3DA, G6MZ, G5TH, G6LC and G3BY were worked and G5BM heard was the best day of the month in Cumberland.

On the north-east coast a large group is active in the Newcastle area, from 2130 to 2300 BST nightly. The calls include G2BDQ, G2BS, G2CO, G3ACK, G3CYY, G4LX, G5GI and G5KL.

G2BS (Sunderland) is using an acorn superhet, while the Tx is all EF50, the final being two in push-pull with 7 watts input. A 3-element beam 12 feet high will be raised to 30 feet as soon as the mast is obtained. G2BS is on "five" only and we are glad to know that he has got through to Hull after but 3 weeks on the band.

The past month has been one of great achievement in the Hull area, to judge by the almost daily arrival of letters and even telegrams reporting new results. Not a little of this enthusiasm is due to G5GX and we are very glad to welcome him to the Fiveband Club this time. During the past month G5GX has worked 26 different stations and heard 20 more. His most consistent DX signals are GM3OL (whom he can hear whenever he comes on), G4RX, G5RP and G6XM. G5GX receives G3BW well but the Hull stations are not audible in Whitehaven. By May 17 G6OS had worked Newcastle for four nights in succession.

#### Midlands

G5PP (Coventry) has a single dipole 42 feet high radiating NW and SE, and fed from a 5-stage Tx ending in a DET 12. The Rx side is a Type 26 converter into an HRO. He has been putting a very consistent signal down to the south coast and has started to climb up the counties table. G3ABA, still looking for Sussex and Devon, found M.A.W.E. 3 good, and comments on the number of stations still on the air at 0115 on the Sunday morning!

In Northants G2AUA (Wellingborough) hopes to have a 4-element beam up shortly, while G3BBA (Towcester) is a welcome newcomer. We wish we had space to give all the very interesting detail on his equipment which G3BBA has sent.

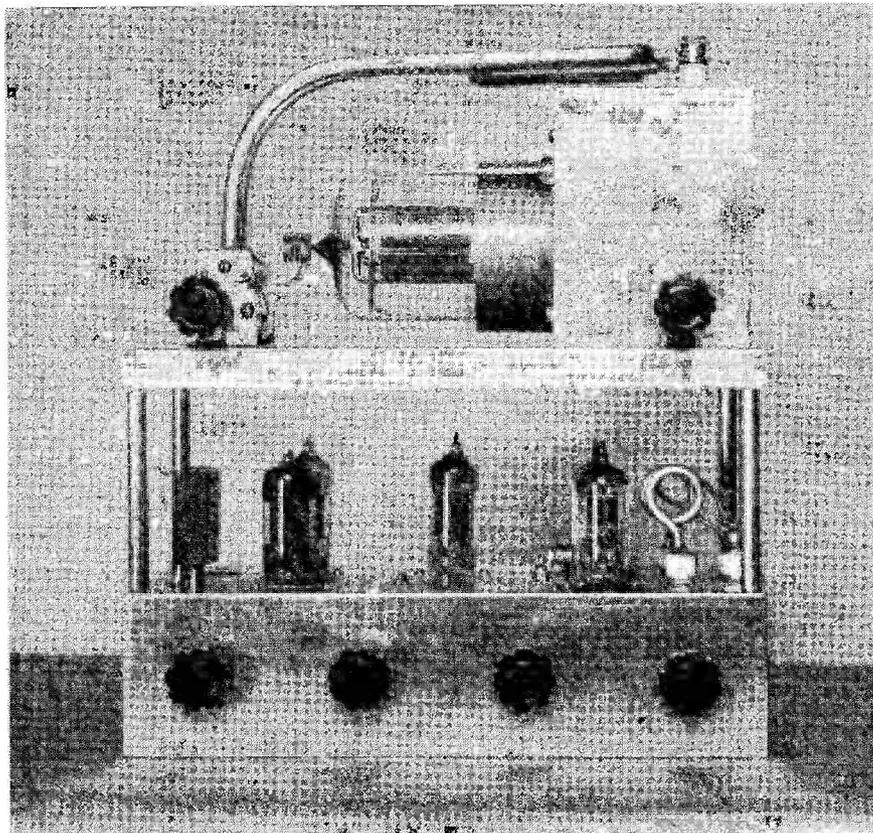
In brief, his Rx is a double superhet (3.2 mc and 465 kc) with EC52 (GGT) and EF54 RF's, EF50 mixer and 6J5 oscillator. Variable IF bandwidths are available, while the noise limiter follows the audio waveform. This Rx is also capable of receiving FM. The Tx starts with a VFO on 7.75 mc and finishes with an RK34 strapped and cathode driven from an 807. FM with an available deviation of 20 kc is in use. A 4-element rotary will soon be in position to replace the 40 ft. high dipole used so far. G3BBA is also ready for 144 and 420 mc and promises details in due course. Preparations for 2300 mc are under way, too—he

### FIVE-METRE COUNTIES WORKED LIST

Starting Figure, 14  
From Fixed QTH only

Worked	Stations
31	G3BXE (126), G5BD (147), G6XM (211) G5BY
30	G2MR, G2NH (251), G5MA, G6OS (124), G6VX
29	G2ADZ (102), G2OI (106), G2XC (257), G3BLP (163), G5BM, G5RP (124), G8UZ
28	G2CIW (139), G5MQ, G6LK (225)
27	G2AJ (191), G4LU, G5PY (207)
26	G2RI (102), G3ABA, G3IS (102, G6MN/A
25	G5GX (110), G5JU, G8SM
23	G3MY, G3PZ, G4IG (163), G6OH (129)
22	G2ATK, G5IG, G6YU
21	G2AOK/A, G4AP, G4RO (110), G6KB (109), G8KZ
20	G2BMZ, G2YL, G5PP, G8AL
19	G2NM, G6HD
18	G3BK, G5LQ (141)
17	G2KF, G3WW, G6CW, G6LX, G8QM/A
16	G3AAK, G3DCV
15	G4AJ, G3BOB, G6VD
14	G2AUA, G2HDY, G5BJ, G5HN, G5MR, G6UW

*Note: Figures in brackets after call are total of different stations worked: starting figure 100.*



Tx for 144 mc designed and built by G6VX, Hayes, Kent. The driver uses Mullard EL91 miniature valves, and the final is an 829. We shall be publishing full details of this very fine transmitter as a constructional article in an early issue.

is to be congratulated on his initiative and enterprise.

In Nottingham, G3DG started activity on "five" during M.A.W.E. No. 3 with a 6J6 mixer-osc. into an AR88. His Tx is 4-stage finishing with an 809 PD. A 3-element c.s. beam should be up by the time this is in print. In Rugby, G3IS has been joined by G8VN, who reports that G6YU has returned to 58 mc after a long absence. Since April 20 G8VN has had a two-element beam in operation and 25 watts to an 807 PA. He would appreciate reports on his signals subsequent to that date.

Following on G2AJ/P's portable effort in Bedfordshire, G3CGQ (Luton) has commenced operations from a fixed QTH. He has a Type 27 convertor into

a 1-V-1 Rx, which answers some of those people who say a communications receiver is the only alternative to a super-regen on five. With it he has worked G3WW at 50 miles! His aerial is seven half-waves long and fed  $\frac{1}{4}\lambda$  from one end by low impedance line. The Tx has an 832 PA.

Not far away, G5UM (Knebworth) continues active, when not preoccupied with things other than Amateur Radio. He still uses the line-up he described in the *Short Wave Magazine* for November 1946. One more county will see him in the Counties Worked panel.

#### South

G2KI (Walton-on-Thames) recently installed a 3-element beam  $0.2\lambda$  spacing,

## FIVE-METRE CALLS HEARD

G5GX, 30-32 Princes Avenue, Hull, Yorks.

**Worked:** G2ACZ, 2ADR, 2ADZ, 2AJ, 2RI, 2XC, 3ALD, 3APY, 3BK, 3BLP, 3BUR/A, 3WW, 4RX, 5BM, 5GS, 5MA, 5RP, 5RS, 5WP, 5YV, 6BX, 6TF, 6VD, 6XM, 8RN, GM3OL.

**Heard:** G2BMC, 2FKZ, 2FZR, 2HX, 2MV, 2NH, 3AEX, 3BOB, 3AUS, 3BW, 4OF, 5PP, 5RP, 5US, 6DH, 6MN, 8AL, 8UZ, 8WV, GM3BDA.

G5BM, Berriville, Arle Drive, Cheltenham, Glos.

**Worked:** G2ADZ, 2XC, 3BY, 3KX/A, 3YH, 4RO, 4RX, 5BD, 5BK, 5LO, 5RP, 5YV, 6ZQ, 8WV.

**Heard:** G2BMZ, 5MA, 5PP, 5WP, 6OS, 6VX, 8UZ. (May 1-14.)

G2OI, 25 Boothfield, Winton, Eccles, Lanes.

**Worked:** G2NH, 3BW, 3DA, 4RX, 5PP, 5MA, 5US, 6XM, 6LC, 6SQ, 8UR.

**Heard:** G2AJ, 2MR, 2ADZ, 2XC, 2ALN, 2MV, 2FKZ, 3DG, 3ZK, 3DH, 3APY, 4OS, 5MQ, 5BM, 5HN, 5RP, 5GX, 5BD, 6VX, 6OS, 6TL, 6QT, 6PD, 6SN, 8VN, 8AL. (May 7-9, M.A.W.E. No. 3.)

G6KB, Stoke Row, Henley-on-Thames.

**Worked:** G2BMZ, 2AOK/A, 2XC, 2YL, 4KD, 4RO, 5LO, 5LQ, 6BP, 8AL, 8TH.

**Heard:** G2FWD, 2MV, 2NH, 3BLP, 3WW, 5HN, 5NF, 5RP, 5US, 6HC, 6OH, 6UH, 8KZ, 8WC. (May 9-M.A.W.E. No. 3.)

G3IS, 59 Eastlands Road, Rugby, Warks.

**Heard or Worked:** G2ADZ, 2AJ, 2AOK/A, 2FKZ, 2MR, 2MV, 2NH, 2OI, 2RI, 2XC, 3ABA, 3APY, 3BBA, 3BJO/A, 3BUR/A, 3BLP, 3BYI, 3DA, 3DCV, 3DG, 3WW, 3ZK, 4LU, 4RX, 5BD, 5GX, 5JU, 5MA, 5MQ, 5MX, 5PP, 5RD, 5RP, 5UH, 5WP, 5YV, 6GR, 6MN/A, 6OS, 6SN, 6VD, 6VX, 6XM, 6YU, 8AL, 8UZ, 8VN, 8WV. (April 15-May 12.)

G5BD, The Elms, Church Road, Mablethorpe, Lincs.

**G2ADR, 2AJ, 2AUA, 2CIW, 2FKZ, 2HDY, 2MR, 2MV, 2NH, 2OI, 2RI, 2XC, 2XV, 3AEX, 3ALD, 3BK, 3BUR/A, 3COJ, 3DA, 3DCV, 3IS, 3WW, 4LU, 4OF, 5GS, 5GX,**

**5KH, 5MA, 5MQ, 5PP, 5RP, 5RS, 5PY, 5YV, 6DH, 6HC, 6LC, 6OS, 6XM, 8AL, 8DV, 8KZ, 8SJ, 8UZ, 8WV. (April 15-May 10.)**

G3AVF, 3 Clarendon Park, Tor Vale, Torquay, S. Devon.

**Worked:** G2NH, 4RX, 5MA, 8AL.

**Heard:** G2AJ, 2FKZ, 3AAT, 3BLP, 3TN, 5RP, 5US, 5WP, 6KB, 6VX, 6XM. (May 1-13.)

G3BLP, 52 Littleheath Road, Seisdon, Surrey.

**Heard or Worked:** G2ADZ, 2AK, 2BMZ, 2HX, 2PT, 2OY, 3ABA, 3AEX, 3AEZ, 3AUS, 3BBA, 3BHJ/A, 3BK, 3BUR/A, 3FP, 3KX/A, 3WW, 4LU, 4RX, 4OS, 5GX, 5JO, 8KL, 8TL. (April 18-May 14.)

G2NH, 75 Woodlands Avenue, New Malden, Surrey.

**Worked:** G2AUA, 2BMZ, 2OI, 2XV, 3ABA, 3BBA, 3BK, 3WW, 5BD, 5JO, 5PP, 6OS.

**Heard:** G2ADZ, 2XC, 3AUS, 3AVF, 3DG, 3IS, 3ZK, 5BY, 5GX, 5LO, 6MN/A, 8KL, 8TH, 8VN, 8FNW. (All over 50 miles. M.A.W.E. No. 3.)

G5MR, South Lawn, Admiralty Road, Felpham, Bognor Regis, Sussex.

**Worked:** G2ADZ, 2MV, 2XC, 4RO, 5PY, 6NA, 8LO, 8RO.

**Heard:** G2FZR, 2HLF, 2NM, 2YL, 3AUS, 3CWW, 5HN, 5MA, 5RP, 5WP, 5US, 6KB, 6XM, 8DV, 8WV. (All during M.A.W.E. No. 3.)

G5LQ, 12 Cambridge Road, Chiswick, W.4.

**Worked:** G2XC, 3ABA, 4GB, 4IG, 4RO, 5LO, 5PP, 6NA, 6KB, 6PA.

**Heard:** G2ADZ, 2HX, 2KI, 2MV, 2PT, 2RX, 2YL, 2ZV, 3BLP, 3BOB, 3NR, 4CG, 5BM, 5HN, 5KH, 5KJ, 5UM, 5VB, 5WP, 6HC, 6HD, 6NK, 6UH, 6XM, 8AL, 8DV, 8TH, 8WV. (M.A.W.E. No. 3.)

G8VN, 7 Lawrence Road, Eastlands, Rugby.

**Heard:** G2ADZ, 2AJ, 2AK, 2AOK/A, 2MV, 2MR, 2NH, 2OI, 2XC, 3APY, 3BBA, 3BLP, 3BUR/A, 4OA, 4RX, 5BD, 5BM, 5JU, 5MA, 5MO, 5PP, 5RP, 5UR, 6OS, 6SN, 6VX, 8AL.

**Worked:** G2RI, 3ABA, 3IS, 4LU, 5GX, 5US, 5YV, 6VD, 6XM, 6YU, 8UZ, 8WV. (May 1-10.)

G2AUA, 29 Hill Street, Wellingborough, Northants.

**Heard or Worked:** F8ZF, G2FKZ, 2MV, 2NH, 3BBA, 3BK, 3BOB, 3CGO, 3WW, 4IG, 4RO, 5BD, 5JO, 5LO, 5MA, 5PP, 5RP, 5US, 5WP, 6HD, 6OH, 6XM, 8AL, 8KZ, 8WV. (M.A.W.E. No. 3.)

G8WV, 3 Church End, Hanslope, Nr. Bletchley, Bucks.

**Worked:** G2AJ, 2AUA, 2CPT, 2NH, 2XC, 3AEX, 3ALD, 3BBA, 3BOB, 3BUR/A, 4IG, 4RO, 4RX, 5BD, 5BM, 5PP, 5RS, 6HD, 6PG, 8AL, 8VN.

**Heard:** F8NW, G2OI, 3AAT/A, 5WP, 5YV, 6HC, 6OS. (May 1-10.)

G3WW, North House, Wimblington, Cambs.

**Heard:** G2XC, 3AAT, 3AEX, 3BLP, 3BUR/A, 5XD, 6HP, 6KB.

**Worked:** G2AUA, 2FKZ, 2APP, 2MR, 2MV, 2NH, 2PU, 2XV, 3BK, 3BLP, 3DCV, 4IG, 4KD, 4RO, 5BD, 5GX, 5IG, 5JO, 5MA, 5PP, 5RP, 5WP, 6OS, 6VX, 6XM, 8AL, 8KZ, 8SK.

G5HN, 1 Conisbora' Way, Caversham, Reading, Berks.

**Heard:** G2ADZ, 2AUA, 2MR, 2NM, 2YL, 3AAT/A, 3ABA, 3BUR/A, 3WS, 4IG, 5GX, 5IO, 5MR, 5NF, 5PP, 5WP, 6HC, 6NA, 6VX, 6XM, 8AL, 8PA.

**Worked:** G2FKZ, 2HLF, 2HX, 2KI, 2MV, 2XC, 4RO, 5BD, 5JO, 5KJ, 5LO, 5RP, 5RS, 5US, 5VB, 6HD, 6KB, 6UH, 8TH. (May 7-10.)

G3DG, 5 Albert Avenue, Carlton Road, Nottingham.

**Heard:** G2ADR, 2AJ, 2CPT, 2FKZ, 2MV, 2NH, 2RI, 3APY, 3BK, 3BUR/A, 3IS, 3WW, 3ZK, 5BM, 5GX, 5JO, 5PP, 5RP, 5WP, 5YV, 6MN/A, 6OS, 6VD, 6VX, 6XM, 8AL, 8SJ, 8UZ, 8VN, 8WV.

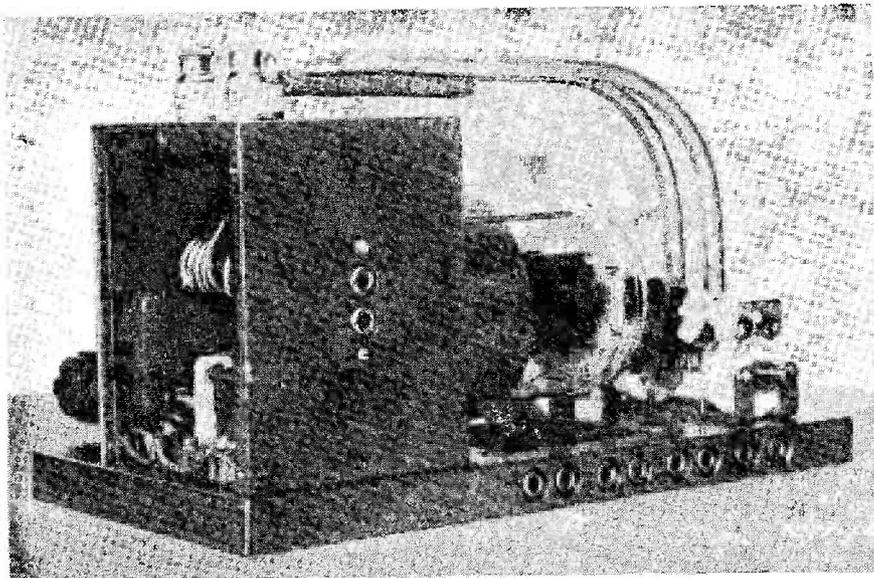
G6HD, 40F Wickham Road Beckenham, Kent.

**Worked:** G2AUA, 3ABA, 8WV.

**Heard:** F8NW, G2ADZ, 2HX, 3BUR/A, 3IS, 3WH, 4LU, 5LO, 5PP, 5RP, 6DH, 6OS, 6KL, 8UB. (M.A.W.E. No. 3.)

and now hears even G2XC's 'phone! G5RP (Abingdon) has tried eight different converters since January 1947—seven of them home-built and three are still in use. These are (a) Type 26 into HRO (b) 6AK5-955-955 into HRO—and (c) The

latest, a crystal controlled job into AR88. This last uses EF54 RF, EC52 cathode-coupled mixer and EF50 trebling tritret with 6 mc crystal and further EF50 trebler to 54 mc. G5RP asks us to mention that he QSL's 100 per cent. and will send one



View of an 829 PA for 144 mc, as designed by G6VX.

direct by return of post to anyone who hasn't had one.

G2HDY (Roehampton) found it "just murder" on the Sunday evening of M.A.W.E. No. 3, the QRM being the worst ever experienced on five metres! He heard *at least 80 stations* during the week-end, including much GDX. G5RS (Guildford) has been putting out a useful signal from his 3-element beam 12 feet high, and worked G5GX for a good GDX contact on May 10.

G2NH (New Malden) and your earnest conductor are having a friendly race in the stations worked (but not necessarily QSL'd) marathon. We think we are leading by a few at the moment. G2NH's latest score (to reach us) is 251, while we have 257. Our QSL's received amount to 170 which is just two-thirds of the total worked. G2NH also found the QRM tough on May 9, and as a contribution to easing the trouble he is temporarily moving higher up.

### The Clubs

Membership of the Fiveband Club is growing steadily, as will be seen from the second list of members herewith. We shall be organising some club events in the next few months and members will be notified of these in due course.

Applications for the VHF CC have also started coming in and we print the list of founder members this time. Several correspondents have criticised Rule 2 (*see page 191 last month*). When it was decided to introduce this rule, we were of course, expecting that differences of opinion might arise and very careful consideration was given to the point. It was felt that the man who is keen enough to build and operate portable equipment should be rewarded. In addition, such enthusiasts have frequently provided the stay-at-homes, like ourselves, with new counties. Further, some 5-metre home stations are in poor locations, while others start with a tremendous advantage. To permit portable contacts to count allows the operator who for many reasons cannot work out from his home location to prove his zeal and ability by collecting his QSL's by portable work. The primary object of both Clubs is to encourage VHF work, and although we want to set a high standard for the VHF CC, to make its conditions of membership too difficult will lead to discouragement and the defeat of its objectives.

We are well aware that spivs and drones will always find the loopholes in any set of rules! Some portable stations have, of course, been combined efforts rather than one-man expeditions, so we simply ask those

who have worked portable not to include cards for such contacts if the bulk of the operation has not been their own personal effort. In other words, the individual will know very well whether or not he has earned the card within the letter and spirit of the rules.

Rule 3 (QSL'ing 100 per cent.) has also been criticised as being insufficient. Expulsion of offending members has even been suggested. Well, we hope it won't come to that, but if you see a station listed who has not replied to your QSL, write him direct and let us know if there is no result within 14 days.

A complete list of all members of VHF CC will be published monthly (space permitting) and we shall be pleased to add in brackets the total number of QSL's

received. Note, however, that we shall want to see the extra cards at the 150 and 200 marks—but until you reach those figures just let us have your monthly score. Another point—it would help a lot if all applicants would enclose with their hundred cards a complete list of the calls.

We would like to address a word or two to those who live in out-of-the-way spots from where 100 contacts are unlikely. We do appreciate this factor, but hope it will not prevent joining the Fiveband Club and trying for the VHF Century Club. If you can suggest any other standard by which we can assess VHF achievement, please let us have it. In particular, send along regular reports and lists of calls heard and worked and we can promise you a fair share of our quota of space.

### THE FIVE BAND CLUB

Secretary : E. J. WILLIAMS, B.Sc., G2XC

#### SECOND LIST OF MEMBERS

G5BY	H. L. O'Heffernan (Thurlestone, S. Devon)
G5BD	A. C. Simmons (Mablethorpe)
G8LY	Miss C. Hall (Lee-on-Solent)
G2AJ	R. Joss (Hendon)
G6VX	M. Mason (Hayes, Kent)
G3ABA	L. J. Kennard (Coventry)
G2DBF	J. F. Squires, M.B.E. (Bournemouth)
G2MR	W. J. Thompson (Surbiton)
G2BS	C. S. Anderson (Sunderland)
G5GX	H. M. Rix (Hull)
G3ALD	G. W. Spivey (Hull)
G3WW	R. F. G. Thurlow (Wimblington)
G2KI	G. A. Spencer (Walton-on-Thames)
G5RP	E. Wake (Abingdon)
G5LQ	J. Tovell (Chiswick)
G5UM	J. H. B. Hum (Knebworth)
G3WS	F. S. A. Jenkins (Romford)
G2RI	L. Ridgway (Leicester)
G3BLP	J. Haydon (Selsdon)
GM3OL	G. Percy (Dumfries)
G8UZ	A. J. Marriott (Sutton-in-Ashfield)

### Short Ones

A number of interesting reports were almost too late to catch this, so can only be covered very briefly. G2FCJ (Chiswick, London) writes for the first time; he has a Type 27 into an Eddystone 640, and the Tx frequency is 59.2 mc ... G6HD (Beckenham) found GDY conditions greatly improved during the month, and for him M.A.W.E. No. 3 produced a total of 77 stations in 20 counties ... G6VD (Leicester) has achieved 15C on 59 mc for ten months' spasmodic operation, using a pair of N-S/E-W dipoles ... G8UZ (Sutton-in-Ashfield) has pulled up to 29C, but G3BW—worked several times by his neighbour G3APY—still eludes G8UZ ... G4LU (Oswestry) has worked or heard a number of new stations and is after G4RX for another county ... G4RO (Welwyn) has caught up on his late start on the band with 110 stations now worked and five new counties, and found conditions excellent for M.A.W.E. No. 3, when 60 stations were logged at G4RO.

G5BY found spor-E openings on May 10, when IRL was S7 on 59 mc 1400-1430, and a BC harmonic came up on 58.5 mc, 1730-1850 BST; no amateur signals were heard. ... GM6WL (Glasgow) reports that he is on 59.9 mc practically every evening 2000-2359 BST, and works G3BW at 100 miles. ... G2CIW (Brentwood) has found general conditions good, and also traced brief spor-E openings on May 11 and 12, both about 1315 BST. ... G2AJ (Hendon) was reported heard by F3PD (Paris) on the evening on May 15, and F8NW (Boulogne) was worked by G2AJ on May 14 and 15. ... On the evening of May 18, G2XS (Kings Lynn) showed up for Norfolk and was worked by G6VX; as G2XS was reported to be using a ½-

wave vertical wire on 58.8 mc, a number of keen county-men promptly rigged up verticals and went after him! G2XS is there around 2300 BST, almost nightly. . . . ZS6GX reports very regular reception of Alexandra Palace TV in Johannesburg.

On July 4, G3PZ will be /P in Herefordshire to give us a new county, from a site 1,000 ft. a.s.l. . . . G3APY (Kirkby) now has 32C with 149S worked, but was too late to catch the Panel this time; he found conditions good again on May 18, hearing F8NW and working G5GS (Grimsby), G5JO (Cambridge) and G2XS (Kings Lynn). . . . On May 17, G3DA (Handworth) heard F9BG and OK31D—so the Europeans are there all right. . . . G4AP (Swindon), inactive for about a month, is on again now, and, mentioning that he has been rather lax with QSL's, asks anyone wanting his card to write and it will be forwarded without delay. . . . G2FQP (Ramsey, Hunts) is another up for a new county, and has started making local contacts. . . . W1PPH/MM was heard on 50 mc by G6DH when 200 miles west of Naples on May 10. . . . On May 13 and 15, spor-E was evident to about 55 mc, and FA8IH and OK31D were heard on 50 mc.

### Calls Heard

We were very glad to see so many lists for this issue, but once again would ask that they be set out on separate sheets, headed callsign and address, with operating period and other data below the list; all callsigns should be in numerical and alphabetical order and divided into "heard" or "worked" sections—in fact, as we have so often said, *please* make up your list in exactly the same form as it appears in print; it makes the work of preparing the Calls Heard sheets very much tidier and quicker.

### Magazine Activity Week-Ends

The following are dates of forthcoming M.A.W.E.'s: June 12-13, July 10-11, August 7-8, September 11-12. It is hoped also to organise a full-dress Contest in October.

### Conclusion

Final date for next month's reports is June 18. The address is, as usual, E. J. Williams, G2XC, *Short Wave Magazine*, 49 Victoria Street, London, S.W.1. Thanks, again for the load of mail and BCNU, July 7 in the next issue.

## British Old-Timers' Club

### Consolidated Membership List

Since the third Membership List was published in April, bringing the total to 100, nine more members have enrolled. Here they are, in order of "seniority":

Capt. G. F. Steven (GM5BA), 1910; G. W. G. Benzie (VU2BG/GM4KU), 1912; H. B. Dent (G2MC), 2AV in 1919; S/L L. D. G. Morrison (G2BU), 5JJ in 1923; G. S. Samways (G6OH), 1923; H. E. Smith (G6UH), 1926; D. E. Scarr (G6XX), 6DR in 1926; L. W. Gardner (G5GR), 1927; R. A. Minter (G5RM), 1928.

And here, so that all who belong to the B.O.T.C. shall have a reasonable chance of recognising other members when on the air, is a consolidated list, making the total of 109 collected up to the present date:

G2AD, 2AK, 2BC, 2BI, 2BN, 2BU, 2CN, 2DC, 2DX, 2DY, 2FK, 2HP, 2IP, 2JC, 2JZ, 2KF, 2LP, 2MC, GM2MG, G2NH, 2NM, 2PC, 2QB, 2SK, 2SU, 2TG, 2VU, 2WD, 2WT, 2XV, 2YI, 2YN, 2ZC; G3ASP, 3HT, 3JZ, 3SD, GW3ZV; G4FX, 4KI, 4MH;

GM5BA, G5BD, 5BK, 5BS, 5BY, 5DM, 5FH, 5GG, 5GR, G15HU, G15HV, GM5JK, G5JM, 5KH, 5KP, 5LH, 5LJ, 5LY, 5MF, 5MM, 5NO, 5PO, 5PS, 5QA, 5QB, 5QP, 5RM, 5RS, 5RZ, 5TV, 5UF, 5UX, 5UY, 5XD, 5YN; G6BB, 6CI, 6DY, 6FI, 6FO, 6HR, 6IO, 6KM, GM6LS, G6MC, 6MI, GM6MS, G6NF, 6NK, 6OH, 6OM, 6OO, 6PF, 6PG, 6QB, 6QC, 6UH, 6UT, G16WG, G6XD, 6XL, 6XS, 6XX, 6YQ, 6YU, G16YW; VE3BWY; VU2BG.

Remember that the Old Timers' Dinner is to be held in London in the early autumn; this was announced on p.110 of our April issue. If you wish to be there, please notify either the RSGB or the *Short Wave Magazine* not later than June 30. B.O.T.C. members should write us direct, and other old timers, not intending to become members of the Club, should inform the RSGB if they want to attend. And if you wish to join the B.O.T.C., your eligibility is determined by clause (b) on p.110 of our issue for April—so let us know.—L.H.T.

# Superhet for 420 mc

*Designed and Constructed by GALU*

*(Here, on a practical basis, is a first solution to the problem of a receiver for our coming 70 cm band. Employing accepted techniques and not involving any circuit complications, it is a sound design upon which many constructors will be basing their ideas.—Ed.)*

BEING half-prepared for the release of the new 420 mc band, thoughts were turned to the question of obtaining a suitable receiver. Enquiries failed to disclose a suitable ex-Service type for modification, and it was decided to attempt the construction of one. If amateur technique on the new band progresses with the same rapidity as on the lower frequency bands anything of the super-regenerative kind would soon be outmoded. A superhet was therefore decided upon and the simplest form of such a receiver—consisting of a mixer and single channel IF amplifier—was made the basis of the design. An IF of 40 mc was chosen because this has been standardised in radar gear and the amateur who has a suitable IF strip could use it in place of the IF amplifier described later.

The valve line chosen consists of two EF50 amplifiers at 40 mc, followed by an EF50 leaky grid detector. A 6AC7 high-gain audio stage and 6J5 output stage are used after the detector valve, the 6J5 providing sufficient output for headphones or small speaker.

By careful attention to design and layout a stable IF amplifier was made and formed the foundation for the receiver. The whole was conveniently assembled on a chassis 8 in. square by 2 in. deep, which left sufficient room to mount the mixer and oscillator circuits as a separate sub-assembly. This mode of construction was adopted because of convenience in experimenting and if needs be the mixer and oscillator can be used separately as a converter ahead of a receiver tunable to 40 mc.

## Mixer and Oscillator Assembly

The mixer and oscillator circuits are mounted on a  $\frac{1}{2}$ -in. brass panel, 5-in. by 6-in., ensuring rigidity and hence mechanical stability of the oscillator circuit. The panel is fixed to the main chassis by four 4 BA bolts, and can easily be removed by unsoldering three leads (*i.e.*, HT, LT and output). A 955 acorn triode is used as a diode mixer and the anode-grid capacity of this valve is utilised as the

coupling capacity from the mixer circuit to the first IF transformer.

Another 955 acorn triode is employed as the local oscillator in an ultra-audion circuit; stray capacity is relied upon for the coupling to the mixer. The mixer input circuit consists of a capacity-loaded quarter wavelength transmission line, and the aerial is tapped on one line and the mixer grid on the other, as shown in the circuit diagram. The lines are roughly 3 in. in length, spaced 1 in. apart and are made of  $\frac{1}{4}$ -in. diameter brass rod. These lines are mounted vertically in a brass block,  $\frac{1}{2}$  in. thick, which is screwed to the base plate. The block is split along the common diameter of the rods and the two pieces are secured by a couple of 4 BA bolts. This facilitates easy removal of the lines during the cut-and-try process of the initial tuning.

The tuning condenser consists of 2-in. diameter brass discs mounted on the open ends of the lines. One disc is made adjustable by mounting it on a length of 4 BA studding, so that the separation of the plates may be varied for tuning purposes. The studding is attached to an insulating rod to reduce hand capacity effects.

The tapping points on the lines are made by small brass clamps which can be tightened by an 8 BA bolt in each clamp. The mixer grid connection of the valve holder is a very short length of flexible copper strip which is soldered direct to its respective clamp. The cathode and earthy heater connection are likewise soldered to a short length of copper strip which in turn is fastened to a small brass block. This block is secured to the base plate by a single 4 BA bolt which runs in a slot; the height of the mixer grid tapping point on the line can thus be adjusted.

## Oscillator Circuit

The oscillator tuned circuit also consists of a capacity-loaded transmission line. The lines comprise two lengths of 14 SWG tinned-copper wire about 2 in. long and spaced  $1\frac{1}{4}$  in. apart. The tuning condenser is of the butterfly type with a maximum

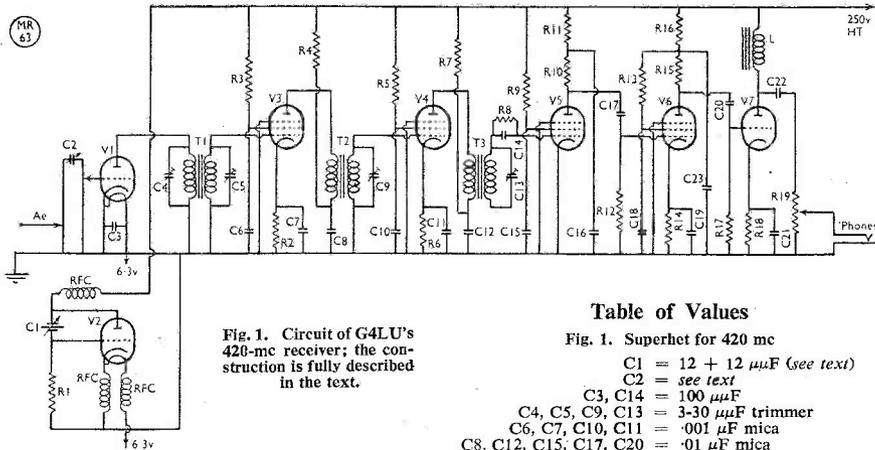


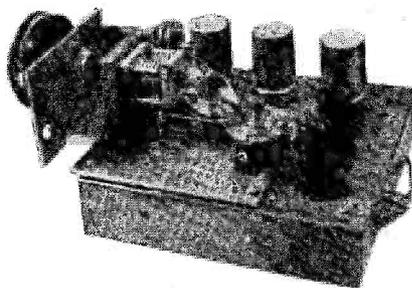
Fig. 1. Circuit of G4LU's 420-mc receiver; the construction is fully described in the text.

**Table of Values**

Fig. 1. Superhet for 420 mc

- C1 = 12 + 12  $\mu$ F (see text)
  - C2 = see text
  - C3, C14 = 100  $\mu$ F
  - C4, C5, C9, C13 = 3-30  $\mu$ F trimmer
  - C6, C7, C10, C11 = .001  $\mu$ F mica
  - C8, C12, C15; C17, C20 = .01  $\mu$ F mica
  - C17, C20 = .01  $\mu$ F mica
  - C16, C18 = 0.5  $\mu$ F paper
  - C19, C21 = 50  $\mu$ F, 12 v. electrolytic
  - C22 = 1  $\mu$ F paper
  - C23 = 8  $\mu$ F electrolytic
- All condensers rated 350-volt DC working
- R1, R4, R7 = 20,000 ohms,  $\frac{1}{2}$ -watt
  - R2, R6 = 200 ohms,  $\frac{1}{2}$ -watt
  - R3, R5 = 10,000 ohms,  $\frac{1}{2}$ -watt
  - R8 = 2 megohms,  $\frac{1}{2}$ -watt
  - R9, R10, R15, R17 = 100,000 ohms,  $\frac{1}{2}$ -watt
  - R11, R16, R19 = 50,000 ohms,  $\frac{1}{2}$ -watt
  - R12, R13 = 500,000 ohms,  $\frac{1}{2}$ -watt
  - R14, R18 = 1,000 ohms,  $\frac{1}{2}$ -watt
  - RFC = 10 turns,  $\frac{3}{4}$ -in. diam.,  $\frac{3}{4}$  in. long, 22 SWG enam.
  - T1, T2, T3 = see text
  - L = LF choke
  - V1, V2 = 955 acorn
  - V3, V4, V5 = EF50
  - V6 = 6AC7
  - V7 = 6J5 or L63

capacity of 12  $\mu$ F + 12  $\mu$ F. It is a well-known component, having been incorporated in a war-time IFF unit and is fairly easily obtainable from surplus equipment. This particular method of tuning was decided upon after a number of different ideas had been tried but discarded either due to being noisy or having restricted tuning range. The circuit described operates lower than the signal frequency and provides a range slightly in excess of that required to cover the band. The lines are soldered direct to the condenser lugs at the one end and to the valve-holder tags at the other. The condenser itself is mounted on a piece of material, Keramot or Paxolin, and the spindle is driven through a flexible coupler from the dial. This construction ensures minimum stray capacity to earth. The valve-holder is mounted away from the base-plate by two long 4 BA bolts through spacers so that the plane of the lines is parallel to the baseplate. It is suggested that the valve-holder be not finally fixed to the base until the actual length of the lines has been determined on test to give the required tuning range. In the writer's model, the valve-holder spacers took the form of a block of Keramot through which two 4 BA clearance holes were drilled. The middle of this block was cut away to clear the bottom of the valve and two soldering tags were mounted on it to form anchoring points for the filament chokes. A tag was also mounted on the tuning condenser support and the anode choke was connected between it and the condenser connecting lug. The grid leak is



Top view of the receiver showing construction of the oscillator side.

wired between the base-plate and the other condenser lug. The tuning dial is mounted on a metal panel as a precaution against hand capacity effects.

**The IF Amplifier**

The construction of the IF amplifier is

quite orthodox and should not be difficult. The IF transformers, which are home made, are wound on  $\frac{3}{8}$ -in. diameter Paxolin tube. The windings are terminated on short lengths of 14 SWG tinned-copper wire which are a tight fit in holes drilled through the formers. No lugs are provided for the coupling coils on T2 and T3 because they could be wired conveniently to the appropriate points in the circuit. The formers are spigoted into blocks of Paxolin for mounting purposes, and a slight smear of shellac on the former will

of the valve. The internal screen and suppressor connections are each joined to the spigot connection which is connected to a soldering tag fitted under one of the valve-holder fixing screws. The screen grid and anode by-pass condensers are returned to this point. The cathode by-pass condenser is returned to an adjacent earthy pin and the earth return of the grid circuit is made to this same pin. The grid tuning condensers on T1 and T2 are wired direct to the appropriate pins on the valve-holder.

The single-point earth feature is also used in the 6AC7 stage. The 6J5 audio stage could be replaced by a 6V6 or 6F6 for speaker working, although a 6J5 will operate a 5-in. speaker quite well. The volume control circuit is a little unusual, but here again the circuitry was dictated by what was available. The 50,000-ohm potentiometer was rather small to be used in the grid circuits of the audio stages but was large enough to be used in the position shown. A more conventional arrangement might introduce the possibility of hum pick-up on the longer grid leads thereby entailed.

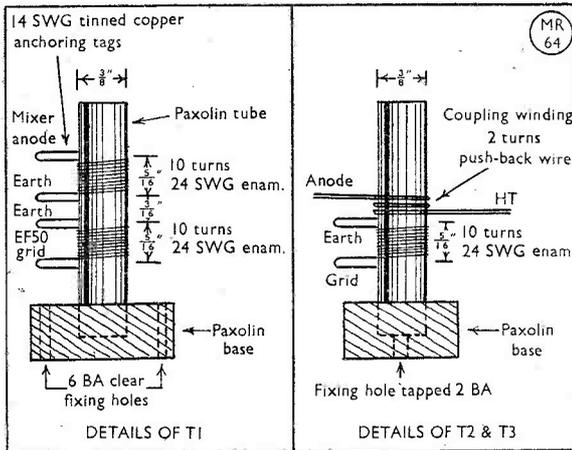
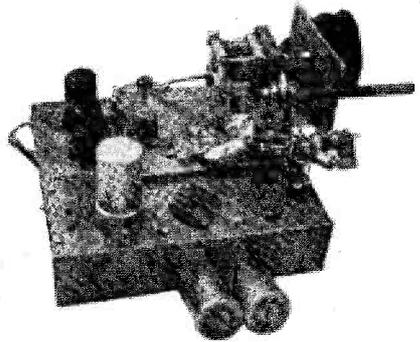


Fig. 2. Making the IF transformers T1, T2 and T3 for the 420-mc receiver.

attach it firmly to the base. These IF transformers are not represented as ideal but they will work, although the performance of the receiver could no doubt be further improved by spending a little time on producing less makeshift transformers. Suggested lines of experimental work could be the provision of tuned primary windings as well as the tuned secondary windings so that the coupling is entirely inductive. The writer was limited in his scope in these experiments by attempting to build as much as possible from equipment at hand and all the available trimming condensers were used up in the present design.

Shielding is provided between the input and the output circuits of the EF50 valves by a screening partition placed across the centre of each valve-holder. A cut-out is necessary in each screen to clear the spigot

Lining Up The Receiver  
Lining up the receiver is as easy, but perhaps not quite so convenient, as lining up a lower-frequency



Top view of the Rx with IF valves out. The first IF transformer and mixer tuned circuit are in the foreground, and the oscillator circuit to the rear.

receiver. An oscillator with 40 mc output is required for the IF amplifier and the procedure is conventional in that the detector grid circuit is first tuned, then the second IF amplifier grid circuit and finally the IF input circuit. The writer used the second harmonic of an oscillator working on 20 mc for this part of the work with the advantage that its frequency could be checked with reasonable accuracy on a communications receiver. Alignment is facilitated if the oscillator is modulated by an audio tone.

The next step is lining up the local oscillator so that it covers the proper frequency range for the 470 mc band. Lecher wires or a wavemeter are a "must" for this job. If lecher wires are employed sufficient output can be obtained from the oscillator to light a 60 mA bulb at the current antinodes, or alternatively a low-reading thermo-milliammeter can be used. The length of the oscillator lines is adjusted until the oscillator covers a range slightly in excess of 380-420 mc; having determined the correct length the valveholder can then be fixed to the base plate.

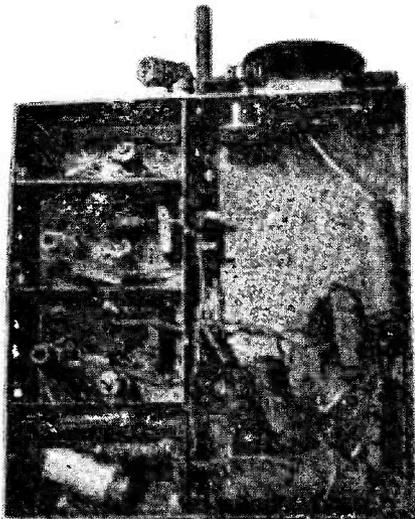
The alignment of the signal circuit requires the use of an oscillator capable of operating in the proposed band. The signal is tuned in on the oscillator control and the signal circuit tuning condenser is adjusted until the signal peaks in strength.

The input lines may require pruning to obtain a tune over the full range of the band. The writer's lines started off 6 in. long, and were adjusted  $\frac{1}{4}$  in. at a time until a satisfactory length was obtained. This tuning operation is carried out with the mixer grid tapped as far down the line as possible. A dipole aerial can then be connected to the receiver input socket and the aerial and mixer grid tapings on the lines adjusted to produce maximum signal. The tuning range of the circuit should again be checked and any necessary adjustment made to the line length. During the alignment of the signal circuit the test oscillator had to be removed to an adjacent room in order to reduce its field strength, even though no aerial was connected to it. A screening cover over the RF assembly was found necessary to prevent direct pick-up on the signal lines from masking the aerial tapping adjustment.

### Performance

Little can be said about performance, since obviously "on the air" tests cannot be conducted until the band is released. As an experiment the test oscillator was fitted with a simple modulator and microphone and was set up about 60 ft. from the receiver. The receiver was connected to a dipole and headphone. The over-all gain of the circuit was sufficient to set up a howl, due to audio feedback between the headphones and the microphone. The oscillator tuning control is not difficult to use and tuning is quite as easy as on a lower frequency receiver.

It is hoped that this description of a simple receiver, constructed mainly from spare parts and with the minimum expense may suffice to stimulate interest in the new band. CU on 420 mc, OM?



Under-chassis view. Note screening partitions across the EF50 valveholders.

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### AUSTRALIAN COMMENT

In the course of a recent airmail letter, a VK correspondent remarks as follows :

"In my opinion, radio in Australia is a pricked balloon from the trading angle, though it is still good business for the commercial broadcasting people feeding moronic material to receptive illiterates. If you know of any G's thinking of leaving home to start in radio here, tell them to think again ; there are neither homes nor security to be had and to make more than average money one must be a lottery winner. One G I know here (in Australia) rues the day he came. . . ."



The "640" Presentation. G2AJV (left) receives his Eddystone Amateur Band Receiver from the Mayor of Grimsby, Councillor W. B. Bailey, J.P. G5GS, the chairman of G.A.R.S., is on the Mayor's immediate right, and on the right in the photograph is G6XJ, Sales Director of Messrs. Stratton & Co., Ltd. (Courtesy Fearnley Photos)

## Grimsby Occasion

### Presentation of the Eddystone

#### "640" Receiver

ON the evening of Friday, May 7, the Mayor of Grimsby (Councillor W. B. Bailey, J.P.) presented the Eddystone "640" Communications receiver won by R. C. Jennison, G2AJV, in the home section of the recent Essay Competition organised by Stratton & Co., Ltd. The winning entry appeared in the May issue of the *Short Wave Magazine*.

To mark the occasion, the Grimsby Amateur Radio Society (which has been in existence for 17 years) organised an Amateur Radio exhibition, which was open to the public for the whole evening. A very good show resulted, with many excellent examples of amateur-built equipment. Much interest was taken in the actual operation of the Grimsby Club station G3CNX/A, which was active on 3.5 mc and made many contacts during the evening.

A large number of people witnessed the presentation. G5GS acted as chairman, and expressed appreciation of the honour conferred on G.A.R.S. by the Mayor's presence. Mr. A. C. Edwards, G6XJ, Sales Director of Stratton's, explained the nature of the Competition and gave some interesting details regarding the efforts made by his firm, over a period of many years, to look after the requirements of amateurs.

The Mayor prefaced his own remarks by enquiring if the Birmingham contingent had come to scout for football talent—Grimsby finished bottom of the League table! He congratulated G2AJV on his success in the "640" Competition, and mentioned how proud they were that he is a citizen of Grimsby.

Following the presentation, the Mayor was escorted round the Exhibition and was persuaded to speak over the air to G4GI (Boston, Lincs.) from G3CNX/A.

Altogether, a very successful and well-organised affair, reflecting great credit on G3TZ, Secretary of G.A.R.S., and those who assisted him with the committee work that such an event entails.

# Here and There

## Corrigendum

Another of these lil' errors crep' in, drat 'em. On p.172 of G5UM's article in the May issue, what purports to be an energy distribution curve in Fig. 2 is obviously wrong; the curve as shown represents neither voltage nor current for that particular element length. Fortunately, this drawing slip in no way affects the argument, since the system G5UM suggests can still be fed at current at that point. Thanks to the eagle-eyed who showered us with post cards about this—but, again, it was one of those we noticed when it was too late!

## Piece of Cake

It really is a piece of cake, this DX racket. For instance, you want a contact with W7 so, of course, you call "W7". Not if you know what's what, you don't. One little "CQ W7" is guaranteed to bring back at least a couple of UA1's, possibly an I and in any case half the East Coast of the USA.

On the other hand, should you be silly enough to reply to a CQ from HP2X, you'll have your ears blown in by a bird in Salt Lake City, madly anxious to shake your hand across the oceans. But just try calling Salt Lake City, and see what happens.—From *Sunderland Radio Society Newsletter*.

## Change of Name—Mullard

The great concern which for many years has been known as the Mullard Wireless Service Co., Ltd., changed its name to Mullard Electronics Products, Ltd., with effect from April 22. Mullard's originally started in 1920 as the Mullard Radio Valve Co. and by 1925 had made such progress that a separate company had to be formed to handle the products of the valve manufacturing side of the business. In the last few years, the firm has entered into many activities in the wide field of electronics, and the manufacture of valves is now only one of Mullard's interests.

## DX Operating Manual

Elsewhere in this issue is an announcement regarding our new *DX Operating Manual*, the first publication of its kind originated in this country. Written and produced by the staff of the *Short Wave*

*Magazine* with L. H. Thomas, M.B.E. (G6QB), our Assistant Editor and well-known DX writer as chief contributor, it deals with every aspect of DX working. We dare say that the *DX Operating Manual* will in due time become the standard work of reference on the subject. Chapter headings are: Amateur Operating Procedure, Using the Bands, What IS DX, How to Work DX, The QSL System, Competitive Amateur Radio, and Countries of the World.

The first printing will become available very shortly after this appears. In *Magazine* format, of 40 pp. on art paper with colour cover, the *DX Operating Manual* can be obtained direct from us at 2s. 6d. (2s. 8d. post free). Write The Circulation Manager, *Short Wave Magazine, Ltd.*, 49 Victoria Street, London, S.W.1.

## K2UN—United Nations

At any time from now on, you may hear or work K2UN at the HF end of the 14 mc 'phone band. K2UN has been specially established as the United Nations Amateur Radio station and will operate with the object of furthering world accord and the cause of the United Nations through the medium of Amateur Radio.

On May 13, K2UN was on the air and in QSO with a G8, one of those speaking from K2UN being ex-G2AIS, our American correspondent. He was also present at the official inauguration of K2UN on May 17. In writing us about the station and its objectives, Peter Lovelock mentions that during the initial testing period, K2UN was called by many operators who thought they were on to a new country!

We hope to be publishing photographs and some more information about K2UN when further details are received from America.

## A Shadow Cast

A new one to show up is ZNP8, Jerusalem, on 14320 kc, heard by G8NY (London) at 1700 on May 14, testing with the BBC and asking any listener receiving the signal to report it to the Corporation. G8NY did so, and was apparently first with the news to the BBC, who were also asked to QSL via Cable & Wireless, Haifa.

## NEW QTH's

This space is available for the publication of the addresses of all holders of new call signs, or changes of address of transmitters already licensed. All addresses published here are automatically included in the quarterly issue of the Call Book in preparation. QTH's are inserted as they are received, up to the limit of the space allowances. Please write clearly and address on a separate slip to QTH Section.

- G2AAX A. W. G. Anderson, 93 Maybury Road, Hull, Yorks.
- G2API H. Batty, 1 Marshall Square, Upper Denby, Huddersfield, Yorks.
- G2AQI J. A. Ekin, 43 Bradley Boulevard, Sheepridge, Huddersfield, Yorks.
- G2AUC A. J. Brennan, 34 Lowestoft Street, Rusholme, Manchester 14.
- G2AUP H. Taylor, 18 Colin Street, Barnoldswick, Yorks. (Tel.: Barnoldswick 412.)
- G2AYY T. Pollard, 6 Rosehill Mount, Burnley, Lancs.
- G2BNF W. S. Panter, 23 Cecilia Road, Fenisccliffe, Blackburn, Lancs.
- G2BS C. S. Anderson, 9 Marina Avenue, Fulwell, Sunderland, Co. Durham.
- G2CTC S. R. Cooke, 18 Cross Flatts Avenue, Leeds 11, Yorks.
- G2CVO F. Osborn, 13 Mount Echo Drive, Chingford, London, E.4.
- G2DWM H. E. Hardy, 4 Market Lane, Burnt Oak, Middlesex.
- GM2DYP N. H. McLean Ross, 64 Thirlestane Road, Edinburgh 10.
- G2FRY A. Shillito, 170 Birkin Avenue, Hyson Green, Nottingham.
- G2HN E. Howell, 31 Sheldon Road, Chippenham, Wilts.
- GW3ACW J. McHarg, Glengyle, Penrhos Drive, Bangor, North Wales.
- G3ALC P. C. Spence, The Poplars, Braunston Road, Oakham, Rutland.
- GM3AOR R. B. Brown, 12 Abbotsford Place, Dundee.
- GW3AZQ C. Jones, 12 The Drive, Gilfach, Bargoed, Glam., S. Wales.
- G3BET S. Russell, 1 Raven Street, Hedon Road, Hull, Yorks.
- G3BNV F. Exeter, 2 Abbey Gate, Minster, Sheerness, Kent.
- G3BRV R. C. Bennison, 29 Clarence Square, Brighton, Sussex.
- GM3BST J. B. Tuke, Radio Station, Benbecula, Outer Hebrides.
- G3BXU W. E. Priest, Delabole Radio Service, Delabole, Cornwall.
- G3BYY E. W. Elliott, 51 Kenworthy Road, Homerton, London, E.9.
- GM3BZJ B. Woodward, No. 2 Cottage, Renfrew Airport.
- G3CEB G. A. Garbutt, 52 Scruton Avenue, Durham Road, Sunderland, Co. Durham.
- G3CEU N. F. Wilshire, 13 The Tene, Baldock, Herts.
- G3CFM C. W. Henwood, Redhouse, Bell Weir Park, Wraybury, Bucks.
- G3CGD J. J. Yeend, 30 St. Lukes Road, Cheltenham, Glos.
- G3CHW D. V. Newport, 250 St. Johns Lane, Bedminster, Bristol, 3.
- G3CIK H. D. Romer, 96 Mortlake Road, Kew, Surrey.
- G3CIR W. Caton, 25 Valetta Grove, Plaistow, London, E.13.
- G3CJM D. Clapp, 62 Brodrick Road, London, S.W.17.
- G3CJU A. W. Grimsdale, 164 London Road, Newbury, Bucks.
- G3CNU E. B. Davis, Knowle, Valebridge Road, Burgess Hill, Sussex.
- G3CTX W. M. R. Lockett, 47 Leamington Road Villas, London, W.11.
- G3CUJ M. G. Bulmer, 16 Bentley Grove, Cottingham Road, Hull, Yorks.
- G3CVG S. Jackson, 6 Marlborough Street, Plumpton, Wakefield, Yorks.
- G3CVT C. S. Vanc-Tempest, Woodsgiff, Gander Hill, Haywards Heath, Sussex.
- GW3CZN Maj. A. G. Acland, The Cottage, Narberth Road, Tenby, Pemsb.
- G3DAY G. R. Sanderson, 73 Queens Drive, West Derby, Liverpool 13.
- G3DBF F. Knowles, 8 Victory Drive, Forest Town, Mansfield, Notts.
- G3DBI F/L J. Douglas, 32 Myrton Road, Whalley, Blackburn, Lancs.
- G3DBI/A F/L J. Douglas, Empire Radio School, RAF Debden, Saffron Walden, Essex.
- G3DBO J. C. Brown, Shaw Cross, Kirkheaton, Huddersfield, Yorks.
- G3DDQ V. I. Bowden, 11 Alpha Road, Cambridge.
- G3DER F/L J. P. Wieson (ex-VS1BO), RAF Compton Bassett, Calne, Wilts.
- GM3DGD J. Dickie, 5 Dunedin Terrace, Clydebank, Glasgow.
- G3DGG W. A. Henson, 12 Filton Way, Chippenham, Wilts.
- G3DHC F. Boyes, 31 St. Albans Road, Blackpool, Lancs.
- GM3DHD G. W. D. Brown, 11 Craigcrook Terrace, Blackhall, Edinburgh.
- GM3DHR I. McK. Goodall, 5 Burchlee Terrace, Loanhead, Midlothian.
- G3DIC C. H. Bullivant, 25 St. Fillans Road, London, S.E.6.
- G3DIO D. Counsell-Davis, 58c Lexham Gardens, London, W.8.
- GM3DIQ W. C. Bradford, 39 Sinclair Street, Stevenston, Ayrshire.
- G3DIR F. W. V. Buckland, 24 Norton Crescent, Baldock, Herts.
- G3DJQ B. H. T. Oliver, Wychdene, 131 Church Lane, Handsworth Wood, Birmingham 20.
- GM3DJT J. M. Mitchell, 10 Regent Street, Portobello, Midlothian.
- G3DKF R. R. Stringer, 106 Northfield Road, Coventry, Warks.
- G3DLA W. S. Drake, 73 Kempshott Road, London, S.W.16.
- G3DLB P. H. Draycott, 47 Longreach Road, West Derby, Liverpool 14.
- G3DLO J. E. Wightman, 35 Swift Way, Lutterworth, Rugby, Warks.
- G3DMU S. Thompson, High Street, Crowle, Scunthorpe, Lincs.
- GM3DNO D. H. McLean, 238 Union Grove, Aberdeen.
- G3DNT B. N. Gregory (ex-D2A0), Lower Terrace Road, Town Head, Tideswell, Buxton, Derbys.
- G3DNY R. G. Partridge, 37 Beechwood Avenue, Thornton Heath, Surrey.
- G3DNZ J. K. Robinson, 55 Giles Road, Langley, Birmingham.
- GW3DOF M. B. Skinner, 29 Victoria Street, Cwmbran, Newport, Mon.
- G3DOG R. F. C. Crowther, 8 Gloucester Court, London, W.3.
- G3DOQ C. P. Pirnie, 62/ Marina Drive, West Monkseaton, Whitley Bay, Northumbs.
- G3DOZ J. D. Smith, 9 Greystoke Park Terrace, London, W.5.
- GM3DPK W. McGowan, 16 Barnhill Road, Macduff, Banffshire.

G3DRL J. M. Willies, The Wilderness, Grove Road, Holt, Norfolk.  
 G3DRN E. G. Allen, 65a Melbury Gardens, Wimbledon, London, S.W.20.  
 G3DYQ P. R. Smith, 84 Orchard Avenue, Lancing, Sussex.  
 G4DH G. R. Pearson, 102 Overdale, Ashtead, Surrey.  
 G5VP/A G. F. Kitchen, Royal Aircraft Establishment, South Farnborough, Hants.

**CHANGE OF ADDRESS**

G2ALO R. P. Munn (*ex-G2FUV*), Whitenest, Sandgate Lane, Storrington, Sussex.  
 G2ALO.A R. P. Munn, 163 Dollis Hill Lane, London, N.W.2.  
 G2BU S/L L. D. G. Morrison (*ex-VQ4HBA*), Twyford Hall, Dereham, Norfolk.  
 G2NU A. J. Hall, c/o Tropical Radio Co. Ltd., Senior Works, Church Street, Staines, Middlesex.

G3ADI N. Ward, Talbot House, Mather Road, Birkenhead.  
 G3BFC W. H. C. Wheeler, St. Margarets, Dudsbury Road, Ferndown, Dorset.  
 G3BSL E. B. Hardy, Hill Cottage, Dunstall, Burton on Trent, Staffs.  
 G3COV G. B. Woffinden, 11 Lonsdale Place, Whitehaven, Cumberland.  
 G4QU F. C. Mason, The Abbot's Fireside, Elham, Canterbury, Kent.  
 G5GW S. Bowden, Netherpton, Barton Hill Road, Torquay, Devon.  
 G5YP J. H. Wood, Woodleigh, Park Road North, Middlesbrough, Yorks.  
 G6PG C. H. Targett, 182 Shepherds Lane, Dartford, Kent.  
 G8MP H. Pilbeam, 25 Hardwicke Road, Reigate, Surrey.  
 G8SL H. A. Smith, M.S.R.E., Relay House, High Street, Braintree, Essex.  
 G8UT B. Challis, Aloha, 43 Dorchester Close, Dartford, Kent.

#### CARDS IN THE BOX

If your call is here, it is because we hold QSL cards for you and have not got your full postal address on file. Please send a stamped addressed envelope, about the size of this page, with your name and call sign, to BCM/QSL, London, W.C.1.; the cards will be forwarded on the next G clearance. Should you wish your address to be published under "New QTH's," please mention it at the same time.

2ACZ, 2ADL, 2ADM, 2AI, 2ALB, 2AMA, 2AOF, 2AUU, 2BFB, 2BIP, 2BMW, 2BPB, 2BQ, 2BTU, 2BWL, 2CJ, 2CQ, 2CUA, 2DGF, 2DKV, 2DTG, 2FAF, 2FFP, 2FIG, 2FSO, 2FTV, 2HAI, 2HAV, 2HBH, 2HDC, 2HDO, 2HZF, 2RY, 2ZL, 3AB, 3ACP, 3ADB, 3AKJ, 3ALA, 3ALP, 3AM, 3AMW, 3AN, 3ANF, 3ANX, 3APD, 3ARG, 3ART, 3ASX, 3ATY, 3ATZ, 3AUA, 3AUP, 3AVV, 3AXT, 3AXV, 3AXW, 3AYS, 3BCQ, 3BDI, 3BFG, 3BGN, 3BHW, 3BJ, 3BJU, 3BKH, 3BLR, 3BMV, 3BMY, 3BMZ, 3BNU, 3BOS, 3BPJ, 3BRE, 3BRK, 3BUD, 3BVE, 3BYX, 3CAB, 3CAI, 3CBA, 3CDQ, 3CEV, 3CLB, 3CNJ, 3CNO, 3CPR, 3CQC, 3CQK, 3CTT, 3CUA, 3CVW, 3CWT, 3CXF, 3CXN, 3CXU, 3CXY, 3CYA, 3DAI, 3DCD, 3DDG, 3DDM, 3DEQ, 3DJL, 3DJW, 3DKP, 3FW, 3MM, 3OD, 3SZ, 3TP, 3ZC, 4HT, 4JG, 4KM, 4MW, 4NQ, 4PV, 4YN, 5BC, 5BW, 5CH, 5DZ, 5IS, 5JG, 5RX, 5WL, 6GA, 6KL, 6OY, 6PW, 6SP, 6TU, 6VY, 8AU, 8AV, 8FC, 8KX, 8KY, 8OH, 8PT, 8TB, 8UJ, G13BV, 3CTU, GM2FVS, 3RTX, 3BUX, 3CXE, 3SA, 4AA, GW2CM, 3AUJ, 3BRI, 3CA, 3DDY.

#### XTAL XCHANGE

Here are this month's offers:

G3CEM, 49 Warkworth Street, Lemington, Newcastle-on-Tyne.  
 Has 5000 kc crystal. Wants frequency 8000-8111 kc.  
 GM3DPK, 16 Barnhill Road, Macduff, Banffshire.  
 Has 7044 kc crystal, mounted. Wants 7050-7100 kc.  
 SWL, 20 Nixon Avenue, Leeds, 9.  
 Has 3750 and 7225 kc crystals, holdered, with  $\frac{3}{4}$ -in. pin spacing. Wants similar, same bands, but in CW areas.  
 SWL, 47 Braemore Road, Hove, 3 Sussex.  
 Has OCC Type P5 7083 kc crystal. Wants frequency 7010-7055 kc.

#### NEW QTH SECTION

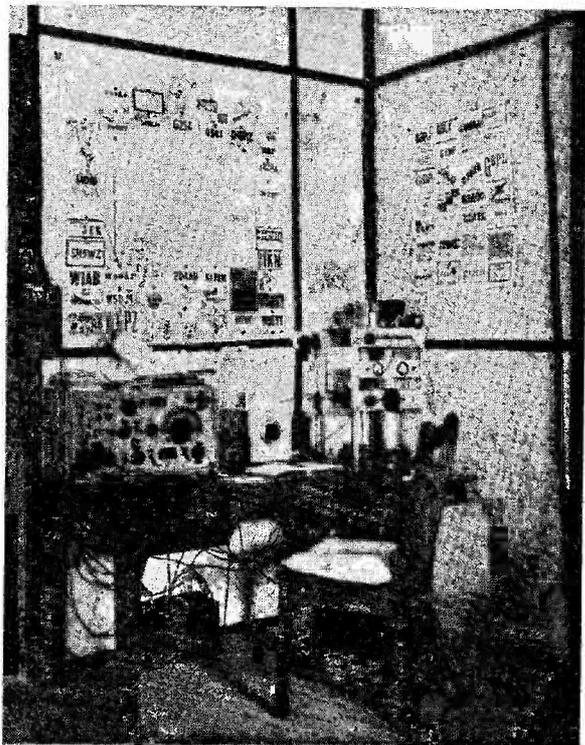
With the appearance of this month's "New QTH's" we are almost abreast of the back-log and any now in hand will appear in the next list. We still cannot guarantee, however, that all those received before the July issue will be published in that list.

#### SMALL ADVERTISEMENTS

Readers will hardly have failed to notice the volume of small advertising we now carry—so much so that we have a spill-over and have therefore decided to apportion a small amount of space in our *Short Wave Listener* for readers' advertising.

Charges in the *Short Wave Listener* are: **READERS'** 2d. per word, minimum rate 3s. Box Nos. 1s. 6d. extra. **TRADE**: 6d. per word, minimum charge 7s. Copy for the next issue, dated July and due out on June 17, must be in hand by June 7 latest, addressed (with remittance) to the Advertising Manager, *Short Wave Listener*, 49 Victoria Street, London, S.W.1.

# The other man's station ZD4AM



Many readers will have worked or heard ZD4AM—Harold Owen, West African Cacao Research Institute, Tafo, Gold Coast Colony—now home on leave at 2 Campion Avenue, Basford Park, Newcastle, Staffs. ZD4AM started as a keen SWL in pre-war days and for years has been a regular correspondent to our DX features.

The outfit out there is very simple, with a home-built Tx—6V6-6L6-P/P 807 combination—running at about 20 watts PA input from DC mains of a nominal 220 volts. Heaters are fed from a car battery, on permanent float charge by being interposed between the refrigerator and the mains.

On the receiving side, ZD4AM has an R.107, with a ten-year old 0-V-1 as standby. On his return from leave, he hopes to add a good VFO and some reliable frequency-measuring equipment.

So far, the station has been operated exclusively on 14 mc, with a dipole cut for that band and slung on bamboos, giving

an E-W run and main directivity N-S; something better is planned for the future to make the most of the 20 watts—the ZD4 licence limit is 25 watts, so efficiency must be the key-note of the installation. Under the conditions outlined, ZD4AM had achieved 64C in 24Z in about 6 months' operation. A card index record is kept of all contacts and QSL's are sent to every station worked for the first time.

Since the *Magazine* has not yet published a great circle map centred on the Gold Coast (!), ZD4AM "sweated one out from first principles" and is very rightly rather proud of it; we are glad that it is just visible in the photograph, as we know what labour such a production must have entailed.

Finally, ZD4AM mentions his great indebtedness to another old friend of ours, David Mitchell (GW6AA), now departed for New Zealand, who gave him a generous measure of assistance in getting going and so helping to put the Colony on the DX map.

# THE MONTH WITH THE CLUBS

## FROM REPORTS

A high level of activity is indicated by the fact that this month we publish reports from 33 Club organisations—for the beginning of the summer season, that figure is quite a record. But, in spite of our repeated adjurations, reports continue to arrive after the deadline (with special requests that we "please squeeze them in"), and at least a dozen have had to be held over again this time.

We give the latest possible date each month for receipt of Club reports for the issue following. As obviously we use a special setting for this feature (in the interests of economy of space), a machine has to be changed over for the purpose of getting it into print; so soon as that is done, the machine is changed back again, and it is just not possible to accommodate late comers; similarly, it is impracticable to open the rules, or borders, round the Secretaries' Address Panel to insert more QTH's after the panel is set. In other words, once the job is done, we cannot make large alterations or additions. We are sure the great majority of Secretaries will agree that this is fair enough.

So please remember: there are only two kinds of Club report—the punctual and the absent! We are always glad to see every report in the former category, and provided it is in by the due date, will guarantee its appearance. The closing date for the next issue is first post on June 17, and the address is Club Secretary, *Short Wave Magazine*, 49 Victoria Street, London, S.W.1—and please keep your report as meaty and factual as possible. And, by the way, we should like to see a few more photographs suitable for this feature.

For the information of Club Secretaries generally, we might also add that the current (June) issue of our *Short Wave Listener* carries nearly 80 addresses of the Secretaries of Clubs now included on our Active Register.

**Stourbridge & District Amateur Radio Society.**—On May 4 they met at King Edward School to hear a talk on the Moving Coil Pick-Up by Mr. H. H. Jones, the inventor and patentee of the first model, which was made in Stourbridge. The talk was followed by a demonstration. Future talks include the subjects of Superhet Receivers and Loud Speakers, and a visit to Droitwich has also been arranged.

**Basingstoke District Amateur Radio Society.**—A series of lectures on The Oscilloscope and its Applications is to be given by Mr. J. A. Lowe at the Cricketers Inn Hall, May Street. Dates will be announced later.

**Thames Valley Amateur Radio Transmitters Society.**—At the May meeting Mr. Wigglesworth of Mullard gave a lecture on Transmitting Valves, covering their operation and the more common failings of their users! The former Secretary, G3JG, has unfortunately had to retire on account of ill health, and his successor is G8SM (QTH in panel). The June meeting, on the 2nd, will be at the Carnarvon Hotel, Hampton Court, at which NFD plans will be discussed, and G2CGX will lecture on the Radio Amateurs' Examination.

**Reading Radio Society.**—Recent meetings have included a Junk Sale (presenting many "weighty" problems to

members), a "Non-Radio Evening," and a lecture by Mr. G. T. Peck on "High Speed Electronic Discharge Flash-Lighting."

**North Kent Radio Society.**—At a recent meeting Mr. S. C. Tucker (G8DT) was elected President and Mr. J. L. Bowes (G4MB) Secretary. Equipment is under construction for NFD, using the call G4MB/P on 1.7 and 3.5 mc. Future meetings will be held at Freemantle Hall, Old Bexley, on Monday evenings at 7.30 p.m.

**Lothians Radio Society.**—This Club, a newcomer to our columns, meets on the last Thursday of each month in the Chamber of Commerce Rooms, Charlotte Square, Edinburgh. Social meetings are also held on the second Thursday of the month in the "Waterloo," and these will continue throughout the summer, although the formal season has just ended. *Radio Amateur News*, produced by the Club, is circulated throughout the membership, and the first issue ran to 70 copies. (*We should also like to see it.*—Ed.) For Secretary's QTH see panel.

**Nottingham Short Wave Club.**—This Club meets every Monday, 7.15 p.m., at 23 Gamble Street, Nottingham, but membership is growing and larger premises are being sought. Morse sessions are held at every meeting, and the annual Field Day event is to be held at the end of May. Three members are sitting for the RAE and hope to be on the air as a result thereof! Secretary's QTH in panel.

**Stoke-on-Trent Amateur Radio Society.**—Meetings continue every Thursday at the Tabernacle Hall, High Street, Hanley, 7.30 p.m. Recent lectures have been on Speech Amplifiers (G3UD), Converters (Mr. J. Roberts), Radio Maths (Mr. Ken Parkes) and Receivers Through the Ages (G2WN). A Field Day is

organised for May 23, and several members are busy making 5-watt transmitters. It is hoped to exchange lectures and lecturers with the Leek & District Radio Society.

**Spenn Valley Radio & Television Society.**—Membership and activity are both growing steadily. Lectures and visits to places of interest are a regular feature, and meetings are held at the Temperance Hall, Cleckheaton on Wednesdays at 7.30 p.m. (fortnightly from May 19 onwards).

**Merseyside Radio Society & Liverpool & District Short Wave Club.**—Both clubs are very active, and publish a joint monthly called *Merseyside Amateur Radio Review*. From this we learn that an NFD Rehearsal is being run on May 29. Several meetings are on the cards for May, but we have no details of June activities. The M.R.S. Club Station G3DPZ is now licensed for 150 watts, and construction of a suitable QRO outfit is about to begin.

**Sutton & Cheam Radio Society.**

—At the last meeting G2NH, now Vice-President, gave a lecture on 144 mc work, and exhibited three converters, a transmitter and a four-element array. The Club's 1.7 mc phone net, at the other end of the spectrum, is active and successful. New members are welcome on the first and third Tuesdays of the month, at Ye Olde Red Lion, Cheam. New Secretary's QTH in panel.

**Bury & District Radio Society.**

—During April, a Hamfest was held, 83 members and friends attending, and the club transmitter was on the air during the festivities. Several contacts were made, the usual "swindles" were organised, and some films were shown. Meetings are on Thursdays at Hodson's Mill, Tottington (7.30 p.m.) except on the second Thursday, when they are at the Athenæum, Bury.

**Medway Amateur Receiving & Transmitting Society.**

—Recent lectures have covered the subjects of Television Receivers, Frequency Modula-

tion, and Apparatus for NFD. In preparation for the latter, members have constructed a marquee to house the gear and the "sleepers." The contest for the Capt. Plugge Trophy has taken place during May, and it is planned to hold a Hamfest on June 28 at Club Headquarters.

**Worthing Radio Group.**

—On May 6, Mr. J. B. McMillan, of the EMI Institutes, gave a lecture on the Directive Properties of Short Wave Aerial Systems. This was illustrated by means of equipment which was on show at Radiolympia. There is much activity prior to NFD and Worthing are hoping to repeat their success of last year.

**Southend & District Radio Society.**

—At the May meeting Mr. Peck's lecture on High Speed Electronic Flash Equipment took place, and great interest was shown in this subject. The June meeting is booked for Friday, the 18th, when RSGB matters will be discussed. The meeting on July 2 is not yet booked.

Following are the names and addresses of the Secretaries of Clubs whose reports appear in this issue. They will be pleased to welcome new or prospective members and to give every assistance:

- BASINGSTOKE.** L. S. Adams, 16 Brambly Drive, Basingstoke, Hants.  
**BOVINGTON AIRPORT (G3DGS).** J. D. Lord, Police Station, Bovington, Hemel Hempstead, Herts.  
**BURNHAM AND HIGHBRIDGE.** T. N. Carter, G3BPV, P.O. Radio Station, Highbridge, Somerset.  
**BURY (G3BRS).** R. H. McVey, 46 Holcombe Avenue, Elton, Bury, Lancs.  
**CHELTENHAM.** H. Brislin, 52 Cleveymount Road, Cheltenham, Glos.  
**COVENTRY (G2ASF).** J. W. Swinnerton (G2YS), 118 Moor Street, Coventry.  
**EAST SURREY.** L. Knight, G5LK, Radiohome, Madeira Walk, Reigate, Surrey.  
**EDGWARE (G3ASR).** R. H. Newland, G3VW, 3 Albany Court, Montrose Avenue, Edgware, Middx.  
**KINGSTON.** A. W. Knight, G2LP, 132 Elgar Avenue, Tolworth, Surrey.  
**LEEDS.** F. W. Kirk, G3ADY, 29 Brookfield Road, Leeds 6.  
**LIVERPOOL (G3AHD).** B. G. Meaden, G3BHT, 10 Alfriston Road, West Derby, Liverpool 12.  
**LONDON, N.W.** H. E. Hardy, 4 Market Lane, Burnt Oak, Middx.  
**LOTHIANS.** J. W. Sime, GM3CVJ, c/o Miller, Etrick Grove, Edinburgh 10.  
**MEDWAY.** S. A. Howell, G5FN, 39 Broadway, Gillingham, Kent.  
**MERSEYSIDE (G3DPZ).** C. M. Johnstone, 6 Flawn Road, West Derby, Liverpool.  
**NORTH KENT.** J. L. Bowes, G4MB, 20 Broomfield Road, Bexleyheath, Kent.  
**NOTTINGHAM.** J. Rowbottom, 9 Mansfield Street, Sherwood, Nottingham.  
**READING.** L. Watts, G6WO, 817 Oxford Road, Reading, Berks.  
**SOUTHEND (GSQK).** J. H. Barrance, M.B.E., G3BUJ, 49 Swanage Road, Southend-on-Sea.  
**SPEN VALLEY.** W. C. Longman, 16 Victoria Terrace, Cleckheaton, Yorks.  
**STOKE-ON-TRENT.** D. Poole, G3AQW, 13 Oldfield Avenue, Norton-le-Moors, Stoke-on-Trent.  
**STOURBRIDGE.** W. A. Higgins, G8GF, 35 John Street, Brierley Hill, Staffs.  
**SURREY (CROYDON).** L. C. Blanchard, 122 St. Andrews Road, Coulsdon, Surrey.  
**SUTTON AND CHEAM.** B. J. Blount, 5 Priory Crescent, Cheam, Surrey.  
**THAMES VALLEY.** A. Mears, G8SM, Broadfields, East Molesey, Surrey.  
**TORBAY.** K. J. Grimes, G3AVF, 3 Clarendon Park, Tor Vale, Torquay.  
**WANSTEAD (G3BRX).** R. J. C. Broadbent, G3AAJ, 24 St. Margarets Road, Wanstead Park, London, E.12.  
**WEST BROMWICH (G3BWW).** W. G. Johnson, G2BJY, 22 Lynton Avenue, West Bromwich.  
**WEST KENT.** R. L. Pluck, G4AY, 9 Prospect Road, Southborough, Kent.  
**WEST SOMERSET.** T. C. Bryant, G3SB, 29 Lower Park, Minehead.  
**WIRRAL.** B. O'Brien, G2AMV, 26 Coombe Road, Irby, Heswall, Cheshire.  
**WORCESTER.** J. Morris Casey, G8JC, c/o Brookhill Farm, Ladywood, Droitwich.  
**WORTHING.** G. W. Morton, 42 Southfarm Road, Worthing, Sussex.

**Kingston & District Amateur Radio Society.**—Their fortnightly meetings continue to be well attended. Final arrangements are now being made for a Field Day on Sunday, June 6; the next regular meeting is at the Kingston Hotel, June 17, at 7.30 p.m.

**London Transmitting Society.**—The next meetings will be on June 2, July 7 and August 4, all at 8 p.m. at the Stag House Civic Restaurant, Broadway, Burnt Oak, Middx.

**Wanstead & Woodford Radio Society.**—The main event since last issue was the May-Day Fete at Wanstead House. The society had two transmitters on the air, G3BRX on 1.7 mc and G2BRR/P on 7 mc; both had many contacts and the public showed great interest. The Secretary would like to hear from other clubs who meet at local Community Association HQ's, with a view to making contacts on the air.

**Edgware & District Radio Society.**—Recent events have included two film shows—one a talkie on Radar and other subjects, and the other a silent showing of NFD and D-F Contest films. When no lecture has been arranged, this Club has tried splitting members up into discussion groups, and this scheme has been so successful that it will be carried out on all "free" evenings in future.

**Burnham & Highbridge Amateur Radio Society.**—This Club is now firmly established with over thirty members. Recent lectures were on Aerials (G3CPV) and An Unconventional CO-PA Transmitter (G8PG), and a successful junk sale was also held. Plans for the club transmitter are afoot and some talks on Radar are also being arranged.

**West Bromwich & District Radio Society.**—A full programme of talks and lectures has been arranged to cover the next six months, and the Club continues its fortnightly meetings. These are held on alternate Mondays at Charlemont Schools, 7.30 p.m.—new members will be welcomed.



Taken at the April meeting of the Burton Radio Society, G2RH (chairman) points out certain features of his oscilloscope. Among those to be seen in the photograph are: Standing, left to right; G3BSL, G3AFS, G3ACR (the Burton QRP king), G3BBM and G2AQV; G3CYL is seated, right, and the lady is second operator at G3BSL.

**West Somerset Radio Society.**—The first meeting of this newly-formed club took place on May 7. Interest covers amateur transmission, HF, VHF and television reception, and high-quality reproduction as well as radio control of models. All interested persons in the locality are asked to contact the Hon. Secretary at the QTH shown in the panel.

**Cheltenham.**—A talk was recently given by G3AKZ on "Noises from the Sun," illustrated by slides and an epidiascope. G3ACT lectured on Radar as applied to Anti-Aircraft Work. It is hoped to run a film show shortly; meanwhile, the slow Morse transmissions are going strong and a 20-metre beam is nearly ready for NFD.

**Leeds & District Amateur Radio Society.**

An item of sad news from Leeds this month mourns the loss of the society's past Chairman and Secretary, Mr. S. Chester, who died suddenly on May 2. He was an old stager in the radio world and had been held in high esteem from the Club's teething days; his loss will be keenly felt.

**Worcester & District Amateur Radio Club.**—MD5AF and several members of the Malvern Radio-Society visited this club for the May meeting, and it is hoped that closer co-operation between the two societies will result. Worcester are paying a return visit in the near future. A lecture with film illustrations on "Valves" will be given at the next meeting, on June 3.

**Coventry Amateur Radio Society.**—Readers will know by now that G6WX, President of the CARS, has been elected Mayor of Coventry. He has also acquired a lesser distinction in the shape of his DXCC Certificate for 100 post-war countries on "Phone. At a recent meeting Mr. T. R. Theakston, B.Sc., lectured on "Mathematics—How and Why." This talk, which was an outstanding success, was followed by a demonstration of High Quality Sound Reproduction by Messrs. Gardner and Orange.

**Torbay Amateur Radio Society.**—During May 24 members went on an "outing," the main purpose of which was to visit G5BY at Bolt Tail. G2DYM's "shack" was also visited on the return journey.

The club will be delighted to welcome any amateurs visiting the district for their summer holidays, and meets on the third Saturday of the month at the YMCA, Torquay, 7.30 p.m.

**Wirral Amateur Radio Society.**—Activity continues at a high level, many members being busy with NFD preparations. June meetings are booked for the 9th and 23rd, both at the YMCA, Whetstone Lane, Birkenhead. Recent lectures have been on Carrier Telephony, by G3DLF, and Aerial Coupling, by G3AKW.

**Bovingdon Airport Club.**—The club transmitters are now on the air, and some interesting contacts have been made with 3 or 4 watts on the Top Band. A high spot was a visit to the

GEC Research Department at Wembley. Bovingdon extends a welcome to other clubs to visit them; a conducted tour of the Airport will be arranged, including examination of all the modern radio equipment. Best time is a Saturday afternoon, and the Secretary will be pleased to discuss and make all arrangements.

**Surrey Radio Contact Club (Croydon).**—Those who attended the May meeting were treated to a very interesting talk on Practical Work on the 12-cm Band. Messrs. P. Bradsell and K. W. Drummond, who gave it, are both members of the recently-formed South London Micro-Wave Group. Next meeting is on June 8, Blacksmiths Arms, Croydon, at 7.30 p.m.

**East Surrey Radio Club.**—This club meets on the fourth Thursday of the month, and thus our reports are always somewhat out of date. At the April meeting, on the 22nd, two excellent sound films on General Electronics, loaned by the BTH Company, were shown, and received with great interest. New members will be heartily welcomed.

**West Kent Radio Society.**—First report from this newcomer, catering for amateur activity in the Sevenoaks and Tonbridge area. Premises have been obtained at Culverden House, Tunbridge Wells, and talks have been given by G3BGU on Transmitter Design, and by G2UJ on The 144 mc Band. An NFD station will be operated by the club at Southborough.

#### THE AT CODE

Since we started talking about this, more comment has come in, including some votes in support from operators who said that at first they thought the Code was hardly worth introducing in face of the existing Q Code.

G3XT, originator of the AT Code, writes as follows: "An encouraging point is the absence of any valid criticism; the only criticisms that have been forthcoming so far will not bear examination. For instance, the suggestion that the Q Code covers all amateur needs is obviously incorrect, as there are no Q equivalents to the ATC abbreviations ATD, ATE, ATG, ATI, ATO, ATP, ATT, ATU and ATW. The criticism that the 'AT Code is an unnecessary complication' does not seem very convincing either, when one realises that even a beginner can learn it in a few minutes; moreover, being a self-evident code, one can actually guess correctly at most of the meanings. If the AT Code had by chance appeared *before* the Q Code, no amateur would have bothered with the latter, any more than he does with that other commercial abbreviation system, the Z Code. The idea that the AT Code might not catch on with foreign stations is also unfounded. At a meeting of 200 members of V.E.R.O.N., the majority of the PA's present were in favour—though here again it was the old-timers who were against a change. The AT Code has also been reprinted in the German amateur paper *QRV*."

Thus G3XT, and the points he makes are sound. The main difficulty, and probably the only one, is the natural reluctance of many operators to change their habits, though it is not at all improbable that if people who like the AT Code would use it, in time it might become universally accepted.

In the meantime, we invite Editors of overseas Amateur Radio publications to reprint the original article on the AT Code, which appeared in the *Short Wave Magazine* for February, 1948, and to ask their readers' opinions on it.

★

#### ORDER ON US

If you have difficulty in getting the *Short Wave Magazine* regularly and on time a direct subscription order on us will guarantee its despatch to you by post on the day of publication—the first Wednesday in the month. The cost is 20s. for twelve issues and the address for your order The Circulation Manager, Short Wave Magazine, Ltd., 49 Victoria Street, London, S.W.1.

★

#### BLACK CRACKLE FINISH

We have had a number of enquiries as to a source of supply for black crackle paint. We are informed that it can be obtained from Gedge & Co., Ltd., 88 St. John Street, Clerkenwell, London, E.C.1.



### THE IDEAL TRANSMITTING AND RECEIVING AERIAL FOR THE AMATEUR

This very practical kit consists of a "T" strain insulator, 80 ft. of cadmium copper wire and 80 ft. of L336 balanced twin feeder with plug and socket to suit (see illustration below) and two glass end insulators. The "T" insulator in the illustration on which sensible terminals and "cable grips" are provided, has been designed to take the feed from the centre of a half-wave di-pole.

For receiving purposes, the length per half-section is not critical to within a few inches, but for transmission the lengths given are approximate only and must be slightly re-adjusted to the correct length from the formula:—

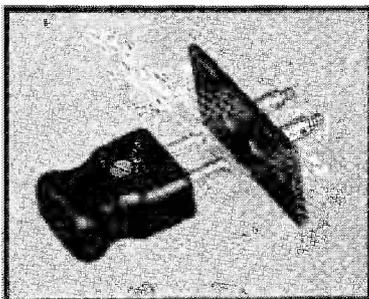
$$\text{Length of half-section in feet} = \frac{224}{\text{Frequency in Mc/s}}$$

Cadmium copper is supplied as this will not stretch—a most important matter if the aerial is being used for transmission. Suitable for 200 watts RF up to 28 mc/s. The complete kit L609. **PRICE 35/9.** The "T" strain insulator L333 supplied separately. Price each 3/3, also L336 Balanced twin feeder at 7½d. per yard.

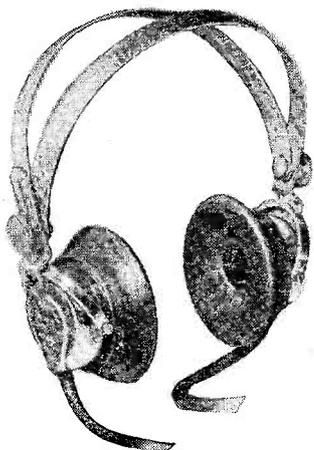
Short Wave Amateur Band		Short Wave Broadcast Band	
Frequency in Mc/s	Length in feet	Frequency in Mc/s	Length in feet
7.0	32.75	6.0	40
14.0	16.5	9.0	27
28.0	8.0	12.0	20
58.5	4.0	15.0	16
		18.0	13
		21.0	11

Length given is per half-section

**BELLING & LEE LTD**  
CAMBRIDGE ARTERIAL ROAD, ENFIELD, MIDDX



## HEADPHONES WHICH UPHOLD BRITISH PRESTIGE



TYPE "K"

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The S. G. Brown Type "K" Moving Coil headphones supply that High Fidelity Reproduction demanded for DX work, monitoring and laboratory purposes, etc.

#### OUTSTANDING CHARACTERISTICS

**D.C. RESISTANCE, 47 Ohms.**  
**IMPEDANCE, 52 Ohms at 1,000 c.p.s.**  
**SENSITIVITY, 1.2 x 10<sup>-12</sup> watts at 1 kc. = .0002 Dyne/cm<sup>2</sup>.**

Price **£5 : 5 : 0** Per Pair

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OSCILLOGRAPH POWER UNIT KITS. Input 230v., 50c. include transformer, metal rectifiers, voltage doubling and smoothing condensers. Type 409, output 900 v. 25/-; Type 310, output 1,800v., 30/-.

SPECIAL HEADPHONE OFFER. High-grade Double Headphones, using balanced armature units, D.C. Res. 60 ohms, 3/6 per pair. Matching Transformer if required, 2/6 each.

OSCILLOGRAPH FOUNDATION KIT. Comprises a transformer giving an output of 800v., condensers, metal rectifiers, 3½-in. Cathode Ray Tube and base, and L.T. Transformer. Price 55/-.

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NEW 2-VALVE SHORT WAVE KIT. 16 to 2,000 metres, Switched Coil Pack ready wired and tested. 2 Mazda HL23 Valves, Phones, H.T. and L.T. Batteries, Condensers, resistors, diagrams and steel case, all ready to assemble. £3/19/6

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COLLARO ELECTRIC UNIT with Magnetic Pick-up and Auto Stop. A.C. only, 100-250v., £9/13/6.

DITTO UNIT with Crystal Pick-up. A.C. only, 100-250v., £11/2/2.

CONRAD RIM DRIVEN ELECTRIC GRAMOPHONE MOTORS with 9-in. Turntable. Fixed Speed (78 r.p.m.) for 200-250v. A.C. only, £4/19/3.

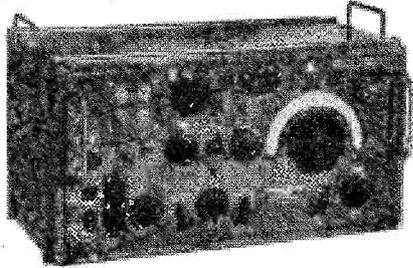


C.R. TUBES, VCR97, 6-in. diameter, green screen, 4v. 1a. Heater, 2,500v. max. H.T. Complete with socket, in maker's original cartons, 55/-.

MULLARD M.W.18-2 TELEVISION TUBES. 7-in. diameter. 2v. Heater. 5kV max. H.T. Mazda Octal Base, £5/19/6, in maker's cartons.

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VR92	(EA50)	5/-	VR70 (7475)	7/6
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6B7	—	5/-	6K8	6/6
			185	5/-

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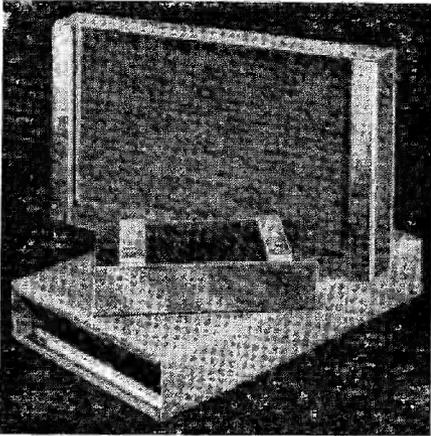
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Post and packing 1/- extra  
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Delivery by return of above sizes. Other sizes, prices in proportion, delivery 2 to 3 days.

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**POWER SUPPLY for the R.1155.** Complete with amplifying stage, only requiring a loud speaker. Input 200/250 v. 50 cycles. In grey crackle case, with leads and Jones plug. **£4/15/-**  
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Ex W.D. C.R. Indicator Unit less C.R. Tube.

Steel case 6½" wide, 8½" high 12" deep.

Hinged glass window, removable cover and bottom plate. Welded 3½" deep chassis.

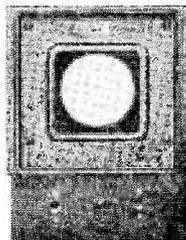
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An Ideal Foundation for an Oscilloscope. Offered at 13/- each plus 1/6 Postage. 2½" or 3" C.R. Tubes at 50/- each.

Complete Kit of parts including mains supply with circuit for building the G6HP Oscilloscope for Wave envelope or Trapezoidal pattern examination at **£6** inclusive. Oscilloscope built and tested with full instructions at **£7/10.**

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I am offering, this month only, a complete kit of Duralumin tube for Elements and Boom, with cast Aluminium head to make a very efficient 10 METRE THREE-ELEMENT BEAM. COMPLETE DETAILED INSTRUCTIONS SUPPLIED FOR ASSEMBLY AND OPERATION.

You have only to drill a few holes, find two nuts and bolts, to complete the Beam array.

BEAMS ARE POPULAR BECAUSE THEY PUT THE SIGNAL WHERE YOU WANT IT, ALSO GIVING YOU THREE TIMES INCREASE IN SIGNAL STRENGTH OVER A DIPOLE AERIAL.

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EXTREMELY LIGHT, YET SUPER STRONG FOR ANY EXPOSED LOCATION, LOOKS NEAT WHEN ERECTED. I can supply three lengths of Duralumin tube with insert sleeves to make the IDEAL MAST 30/32 ft high.

You have only a few holes to drill, then bolt sections together, some wire for guys to complete. ONLY WEIGHS 11 lbs, YOU CAN ERECT IT WITHOUT HELP.

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Full circuit diagram with each receiver dead stable and excellent performance.

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Power requirements	12v model 12v-1 amp	H.T.
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		80ma

3 prices 12v model £6/10/0

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Without tubes £4/0/0

Packing case 30/- refundable.

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We can offer a limited number of double motor generator units fully smoothed, two separate machines made for the above receivers and a portable T.X. 400v 200 mA supply, with starting relays by the best American makers, only £2/10/0 each.

Also we can offer 12v Vibrator packs by Mallory fully smoothed suitable for above (output 300v 100 mA) at 29/6.

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FEW only unboxed but brand new 813's with ceramic holder £2/10/0 each.

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Communication Receivers best selection of reconditioned receivers in the Midlands. RCA, RME, National, etc., write for a list.

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fitted with output stage £10  
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Types R3090 and R3121, complete with  
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**(G4PF)**

Limited Number only

BC348 Rx's ... .. £16/10/0

Modified, Complete with  
Speaker ... .. £25/10/0

TU5B, modified as per QST,  
into VFO, Complete with  
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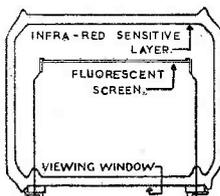
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Desk Stand Mike ... (post free) 12/6

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**45 PRIORY RD., ANFIELD,  
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**ATTENTION. Denco COMMUNICATIONS RECEIVER SHORTLY AVAILABLE. A REAL STEP FORWARD IN SHORT WAVE TECHNIQUE. YOU SIMPLY MUST HAVE THE DATA SHEET OF THIS FINE INSTRUMENT. Denco COMPONENTS ALWAYS AVAILABLE. ILLUSTRATED CATALOGUE PRICE NINEPENCE. S.A.E. NOW TO MASON'S (S.W.), WIVENHOE, NR. COLCHESTER, ESSEX.**

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## BEAM POSITION INDICATORS

We have pleasure in announcing a large purchase of remotely-controlled, 360 degree Electronic Beam Indicator Units.

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1. **The Transmitter Head**, consisting of a 360 degree potentiometer in a waterproof housing, with extended spindle suitable for the fitting of pulley or sprocket. Height 8½" x 4½" wide including fixing plate.

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PRICE complete with transmitter head, Indicator Unit and wiring diagram ... .. 20/-  
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**ZIFF DAVIS LIMITED**, publishers of *Radio News*, require a first-class man, preferably an active transmitting "Ham," to edit and prepare for publication MSS. on practical and constructional radio. A sound and up-to-date knowledge of all branches of radio is essential, together with experience in radio journalism or publishing. The position is permanent and offers considerable scope and advancement. Write giving particulars of age, experience and salary require to Ziff Davis, Ltd., Grampian Building, Western Gate, London, W. 6.

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**MSS RECORDER**, brand new, latest model, with matching transformer; B.S.R. 30-watt amplifier, and selection of blanks, cutters, etc. Cost £140. Offers. S.A.E. for details.—Box 309.

**MAGNETOPHONE** studio-type tape recorder, German manufacture, new condition, precision-made instrument suitable for recording or broadcasting studio work, etc. Details on request, offers Box 310.

**G2AK** See page 280 for Special Offer in Communication Receivers. A pageful of Bargains.

**CROSSOR 339** Double Beam Oscilloscope, unused, £35. Weston precision portable AC Voltmeter, 0-150, 25-2400 c., £3/10/-. Ex-Govt. VHF Signal Generators, 18/6, carr. paid.—Wardley, 887 Manchester Road, Castleton, Rochdale.

**QSL'S** and **LOGS** by MINERVA. Always new and attractive designs. Samples from Minerva Press, Elm Park, Essex.

**ELECTROSTATIC** Voltmeters: Ferranti 0-2000 volts reads DC or AC. 3½-in. diameter flush fitting. Brand new, boxed 21/- each or 2 for 37/6. Post paid.—Storer, Oak Lodge, Wanlip Road, Syston, Leicester.

**ALUMINIUM** chassis to your requirements, any size, plain or punched, from 3/9.—EAD, 13 Bence Lane, Darton, Barnsley.

**USA** 4000-ohm headphones, 8/6 pair. 8 in. 3-ohm PM speakers, 18/6. 2½-in. PM midget Celestion, 15/7. 5-in. Alnico PM, 15/8. All less trans. 6C4 VHF B7G triodes, 10/-. TU8B, 6-2 to 7.7 mc tuning units, 26/6. Selenium rectifiers, 250v 40 mA, 2/6. Solon 60-watt 200-220-v chisel bit soldering irons, with cable, 15/9. All post free. From National Radio Supplies, 66 Holdenhurst Road, Bournemouth.

SMALL ADVERTISEMENTS

TRADE—continued.

**G200** VRI150/30, 954, 955, 956, 10/6 each. GT.C-6D6, 6C6, 6F7, KTW61, 6K7, 5/- each. 6SG7, 6SH7, 6SA7, 6SK7, 12SG7, 12SH7, 12A6, 12SQ7, 12CR, 12SK7, CV18 (RK34), NR43 (PM24A), 6/6 each. 6J5, 6H6, 4/ each. Billey or R.C.A. 100 kc xtals, 17/6 each.—A. C. Hoile, Loose Village, Maidstone. Phone 83579

**TX** Power Packs, 200-250v, 50 c input, 1200v 200mA DC, smoothed output, metal rectifiers, relays, etc., H.D. job in ventilated Metal Case. Rx Power Pack 200-250v, 50 c input, 6.3v at 13 amps. DC and 250v 110 mA smoothed output, metal rect., H.D. in ventilated metal case. Both brand new, originally cost over £60. Real bargains at £16 pair, with carr.—**HUGHES (LOWESTOFT), LTD., 88 TONNING STREET, LOWESTOFT, SUFFOLK.**

**YOUR** Xtals. Ground to your frequency or re-activated. Send S.A.E. for details and list.—D. Shackleton, 167 Margaret Street, Ashton-under-Lyne, Lancs.

**REWINDS AND SPECIALS. MAINS, INTER-VALVE, OUTPUT AND MODULATION TRANSFORMERS MANUFACTURED TO YOUR SPECIFICATION. COMPACT TRANSFORMER FOR BC-348, 26V FILS., NO ALTERATION TO WIRING, 36/-; CHOKO TO MATCH, 10/6. 2.5 mH 120 mA RF CHOKES, 1/6. TRADE ENQUIRIES INVITED.—G6VS, CARLTON COILWINDING CO., 8 CHURCH ROAD, BIRKENHEAD.**

**WHY** buy IF's? Wind your own on a **KAYNITE** winder. Stamp brings particulars from manufacturers.—Richard Sheargold & Co., Sunbury-on-Thames.

**BF0** UNITS, complete in screened box, less valve, 5/6. Power packs for Receiver 1294 15/-, postage 2/-. 7R7, 7Q7 Valves, surplus to requirements, all new. R.T.S. Res and Cap. Bridge, Model EA.20, £10. B.P.L. Signal Generator, Model R.S.600, £12. AVO Valve Tester, complete, £12.—Radio Repairs Unlimited, 381A Dunstable Road, Luton, Beds.

**VALVES**, new and unused, ex-Govt., at 8/9 each: 6K7, 6K8, 6V6, 6F6, 6I7, 6Q7, 6L6, 5U4, 5Z4, MU14, EL32, EF50. S.A.E. for list. C.W.O. only.—A.G. Supplies, 90 Melrose Avenue, Mitcham, Surrey.

**G5CP** offers American multi-ratio 200 watt modulation trans. 25/-, ratios supplied. Oil filled 4 MFD 1000 volt working 3/-. 1 MFD 1500 volt 2/6. 35 K. 35 or 50 W. vitreous bleeder res. 1/6. Black. crackle steel cabinet and chassis 20 in x 5 in x 8 in, 6/6. BC348's R.1155 and Scope, S.A.E. for details:—33 Manley Road, Sale, Manchester.

**READERS' ADVERTISEMENTS**

3d. per word, min. charge 5/-, payable with order. Box numbers 1/6 extra.

**GOING ABROAD:** For Sale. Communication Receiver 1.7-7.5 mc, 9 valves. Specially made cabinet, Brand new £30. 12 in. Vitavox Spkr., Brand new £5. Various components, valves, etc.—212 Woolwich Road, Charlton, S.E.7.

**DC-312D.** Mod. for Mains, Crystal Phasing. Good condition. £14, 10, 0 or offer.—Capell, 115 Wood End Gardens, Northolt Park.

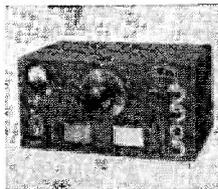
**WANTED.** Portable DC/AC communications receiver such as Hallicrafer S-39.—Martin, Three-ways, Crown Street, Dedham, Near Colchester, Essex.

**TRANSFORMERS.** 500-0-500 volts 250 mA, 5v 4a, £21bs. 25/-, carriage 3/6; 385 volts 50 mA 4-1v 1a, 4-25v 2-3a, 35/-, carriage 3/6; 860-0-860 volts 50 mA, 5v 3a, 22/6.—Box 280.

**SALE.** Termans *Radio Engineers' Handbook*, £1. 830B, with socket, £1. 832, with socket, £1. Or exchange for good bug key.—G3CSP, 89 Tideswell Road, Sheffield 5.

**TANNOY** 60-watt amplifier, 4 KT66, 4 6J5, 2 418, 230v. 50c., £10. No valves. Buyer collects.—Brown, 62 Bower Street, Maidstone.

**NATIONAL SENIOR 'HRD'**



Nationals, RCA AR88, AR77, RME 69, 99, Howard, Hallicrafer's, Collins, etc.—always something new in high-grade communications receivers. Your present equipment accepted in part-exchange.

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TEL. 4080

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**LOW FREQUENCY CHOKES**

Max. D.C.	Inductance	Resistance	Weight	Price
100 mA	10 H	100 ohms	2½ lb	7/6
100 mA	20 H	350 ohms	4½ lb	10/6
250 mA	10-15 H	100 ohms	6½ lb	10/6
250 mA	15-20 H	200 ohms	6½ lb	10/6
500 mA	15-20 H	80 ohms	20 lb	25/0

Please add Postage.

**VIBRATOR UNITS**

12v input. Output 120/150v. 50/30 mA, including GB and LT for battery valves. U.S. made by Jefferson-Travis to A.M. specification. 19/6 each, plus postage.

**CHANGE-OVER RELAYS**

6-pole 2-way, as used in 1154 Transmitter. Operates from 3/6v, can be used for switching complete transmitter and receiver, including aerials. Price including postage 7/6 each.

**1N22 SYLVANIA CRYSTAL DIODES**

Designed for general instrument use, such as Test Probes, Power Indicators. Ideal for field strength Meters, Monitors, etc., using up to 5 mA movements. 2/6 each. 10 for £1 post free.

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2 in. Flush Type, 0-120 microamps. F.S.D. Calibrated 0-120. Used as Oil Temp. Meters. Ideal for use with Crystals above for field strength meters, etc. 3/- each post free.

Write to us for all your equipment and components. We offer you keen service and prices.

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For **FIELD** and **SHACK** Use

## ★NEW POWER PACK★

giving 170v at 80 mA and operated from  
110/250v 50 c.p.s. A.C. Mains  
or  
a six-volt car battery

Fully smoothed. Size:  $10\frac{1}{2}'' \times 6'' \times 4\frac{1}{2}''$ .  
Black crackle case, complete with **6X5**  
valve, Leads and Plugs

**£5/19/6** net cash

Carriage Paid



Write for full specification or send your  
order, with cash to:

**G 2 Y O**

**Rainbow Radio Mfrg. Co. Ltd.**  
Blackburn, Lancashire

# G 2 O O

**SPECIAL offer this month.**

Combined 12v Vibropack and LF amplifier unit No. 1, output 120v 30mA. The LF amplifier is complete and uses a twin pentode ATP4. Two centre-tapped selenium rectifiers and many other useful components, guaranteed perfect as new, only 24/6, post 1/6.

**EXTRA-special offer** for the V.H.F. enthusiast, a few only.

Radio Altimeter Units R.T. 34 APS 13, transmitter and receiver working on about 430 mc, containing 16 button-base tubes, one VR105/30, five 6J6's, two 2D21's and nine 6AG5's complete with all tubes as new, £10/15/-, delivered to your door for less than the cost of the tubes at surplus prices.

**POWER SUPPLY Units No. 4 Mk. 1** about 300v.100 mA, output containing four metal rectifiers (worth 7/6 each) 500v wkn. Electrolytics, 12v Vibrator, Transformer, Panel light and many other items, a gift at 19/6.

For this months valves see Classified advertisements.

**A. C. HOILE**

**LOOSE VILLAGE, MAIDSTONE, KENT**

### SMALL ADVERTISEMENTS

READERS'—continued.

**BC342H** as new, 230v, MCRI complete, new, 10-watt 'Phone/CW Tx, with modr., coils, 160, 80, 40. What offers.—3AHK, 153 Old Castle Road, Llanelly, Glam.

**COMPLETE** set "Mains Power Pack" for driving Marconi 1154. Tran's and Receiver as used on ground stations, £12. set. —Bishop, Manuden. Bishops Stortford, Phone Stansted 3315.

**BC348L** plus separate power pack (AC), fine condition, with diagrams. First offer over £22. secures.—BRS-14,483, 28 Allenby Road, Cadishead, Manchester.

**BC348** Communication receiver, perfect condition, with motor. Filaments wired for six volts, ready for power pack, £18.—Scales, 12 Tuthill, Scarborough.

**FOR** sale R.107, good condition, Bargain, £12. Wanted 7-14 mc Bandsread HRO coil.—Brigham, 45a Northumberland Road, Tweedmouth, Berwick.

**FOR** sale. Hallicrafter SX-28 Super-Skydrier. Also Hallicrafter S-20 Sky Champion. Both excellent condition. What offers?—Box 281.

**COMPLETE** B2 Trans/Recvr, with power supplies and accessories, £12. Modified 1116A Battery Rx 142 kc-20 mc in 7 bands, £6. Ham-built CRO, Ampl or Attenuators, etc., £10. 520 kc-1500 kc, 12v. 6-valve Superhet, variable coupling IF, £6. 7BL Trans/Recvr tuneable 112 mc, 15 valves, £6.—42 Southfarm Road, Worthing.

**358X** EDDYSTONE, SERVICE NO. B34. £1 OFFERED FOR CIRCUIT OR BOOK. REPLIES PLEASE.—16 CONISTON ROAD, REDDISH, STOCKPORT.

**COMMUNICATIONS** Receiver, RF, 2 IF, BFO, Filter, 2 watts output, 6 ranges, 1.5-23 mc continuous, £20; or complete B2 and £10. Going portable.—G3AGQ, Cheznous, Beggars Bush Hill, Benson, Oxon.

**100-WATT** Tx, CW, TT Modulation, TT, Carrier, 8v Rx, Power Supply, £15.—14 Oswald Terrace, Leeds 12.

**COMPLETE** Portable Station, in cabinet, circuit supplied, 3.5-14 mc. Rx superhet, 4 Mullard E valves, loudspeaker, Tx, 6L6, commercial make. 6v. DC supply, vibrator, easy conversion, £13. plus carriage.—Box 282.

**R1155** Chassis, 1191A Wavemeter 1625, 807, VT100, 12J5 RKR72, VI.93, 1629 Tubes unused. Offers all or part to:—Franks, 11/13 Green Lane, Leeds 12, Phone Leeds 22218.

**AR88LFS-MEIER**, Eight Spare Valves, £50 or offer. New Crystal Microphone, £2.—Willmott, 20 Rutland Gardens, Dagenham, Essex.

**BRAND** new Philco 43 Transmitter, using two 813's in the final. 'Phone, CW, MCW, VFO, complete with 19 valves, inst. book. Exchange above for HRO Rx. Vibroplex bug key 30/-.—14 Styal Road, Gatley, Cheshire. Phone GAT. 4367.

**WANTED.** GPO double-current Morse Key, Glass or Brass cover. New or second hand. Good price paid.—Box 284.

**BRAND** New B2 Transmitter—receiver complete £12. 10. 0. B2 receiver and pack for 230v AC £6. New US xtals: 7140, 7173 3, 7206-67, 7240, 7273 3, 7306-67, 7340, 7373 3, 7406-67, 7440, 7473 3, 12s. 6d. Valves, Boxed, 80s £2; EBF11, EF11, EL11, 10s.; VR65's, EF50 unboxed 3/6; CV57 15s.; GTIC, 7A8, 7C7, 12SG7, 6AC7, 7H7, 7/6. Cylodon Tx condenser, 250 pF max. 0.15 in. spacing, ceramic insulation, polished vanes, heavy construction, £2. 10. 0. New Gardners Transformer, 500-0-500 250 mA., 2 x 6.3 3a, 5v. 3.5a.—A. Skillman, 74 Franchise Street, Weymouth, Dorset.

**FOR** sale 3.5 to 58 mc, 150-watt 'Phone/CW Transmitter, PP35T's, Rack Built, All stages metered, Xtal Mike, VFO Unit, AR88 Receiver, frequency meter, Best offer whole or part. S.A.E. full particulars.—Box 285.

## SMALL ADVERTISEMENTS

READERS'—continued.

**UNIQUE** bargain. Midget Tx made for US Agents. About 6 watts on 80, 40, 20 m., measures only  $3 \times 10 \times 2$  in. with a Power Pack for 6-volt, 110v. or 220/230v. which will also charge a 6v. Accumulator from 110v. or 220/230v. Absolutely complete with valves, key, etc., £10. Rx same size works from same power pack, 3-18 mc, £1. extra.—Ingram, 46 Upper Richmond Road, S.W.14.

**SELLING UP:** Eddystone 358x, coils 90kc-31mc, £22; Harvey UHX10, power pack, coils 1-7-60 mc, xtls 1-7, 3-5, 7 mc, mike, key, £30; R1481, £7; T1154, £7; MCR1, power pack, coils, 'phones, £7; TR1196, £5; TR1366, £5; Simpson turntable, £3; or £80 akes all.—Box 288.

**SALE**—Transmitter T.1115, VFO or CO-FD (PX25)-SPA (TZ05/20), Built-in Modulator, 160-80-40-20, 'Phone or CW, complete with set of coils, etc., £10. Or part exchange for BC342 or 348.—Box 287.

**CR100** professionally overhauled, new mains transformer and electrolytics, in perfect order. £25 (buyer collects or carriage extra). MCR brand new, but less battery, £5. Hunts C.L.R. capacity/resistance bridge, as new, £9. Weston E.665 Selective Analyzer, £12. Valves in perfect emission, ML4, SP41, 77, 6S6G, 6H6, 12A6, 7/6 each.—G4RS, 17 Tudor Avenue, Bebington (Telephone Bromborough 1012).

**COMPLETE** commercially-built transmitting-receiving station, 200/250 volts AC or 12 volts DC, 15-watt Tx covers three amateur bands. VFO/Crystal, CW, MCW, 'Phone. 5-valve superhet receiver, plus MW broadcast band. Ideal QRP rig. £30.—Box 289.

**OFFERS**, cash or barter invited for new crated Canadian Philco C.43 Transmitter. Size 4 ft. x 2 ft. x 2 ft., metered, semi-valved, VFO, Exciter, PA Aerial Coupling, Modulator. Uses 807's, 813's. Present coverage 2-12 mc. Too large for present QTH. Must dispose.—Box 286.

**FOR Sale**—RME DB-20 Preselector, all bands to 28 mc; self powered; good condition and working order. Offers to: G6KJ, 20 Church Street, Buckingham.

**AVO** All-Wave Oscillator, hardly used, £9. New valves (2) 6C8, (1) 6J8G, 10/- each. (2) VP23, (2) HR210, 5/- each.—Box 291.

**TROPHY 6**—just re-aligned and overhauled for 65/-—best offer over £10/10/-, or exchanges.—G6BB 35 Criffel Avenue, London, S.W.2.

**AR88D** for sale. Excellent condition, with handbook, £45. Would consider exchange with cash adjustment for S27.—G3DCV, 75 Elwyn Road, March, Cambs.

**WANTED**.—Holder (11-pin) for 2APIA CRT, with screen preferred. Assembly with tube considered.—Symons, 9 Nicholas Lane, Bristol, 5.

**TAYLOR** Model 45 Valve Tester, £11/10/-. Ferranti Woodscope Test Set with 44-in. CRT, requires little attention, £4. Worth double for componentets. Woden 750-0-750, 150 mA, £2/7/6. Other components S.A.E.—G3PO, 54 Granshaw Close, Birmingham, 30.

**WANTED:** B2 pack Mk. III, 12A7 valve, medium and 20-metre coils for MCR1, 145 VFO and pack, 75-watt modulator, IN34 xtal. Will sell BC-348, new, £16. Or exchange 1155, cream cellulose sprayed, chromium plating. S.A.E. list gear for exchange.—Box 290.

**AR88D** £45. RCA BC-348, noise limiter, S-meter, built in 28 mc converter, £24, 1155 modified, £11. All re-aligned and in good condition. Buyer collects.—G8HH, 65 Chart Lane, Reigate, Surrey. Tel. 3968.

**MARCONI** CR100/8 MOD. Has A.N.L., 600-ohm line output, etc. Offers over £30. R103a, new valves, 230v AC or 6v DC, complete with manual, £10. Zenith transformer 600-0-600v 60 mA, £1. Ditto, 4-0-4v, 2 amps, 15/- .MCR1 complete, coils, power pack, spare battery, 'phones, £7/10/-. Wanted B2 Tx/Rx, power pack, coils, complete.—Box 294.

**BARNES RAD-ELEC CO**

2 Elmdale Road, Penn, Wolverhampton

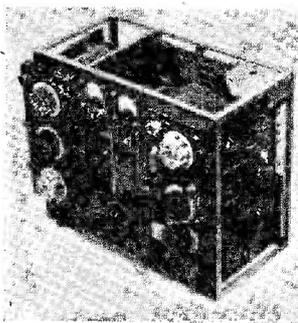
Calling all R116 owners, all constructors and transmitters.

WE can now supply the special aerial socket plug and 2-pin screened D.F. plug for R116 at 1/9. post free the pair. For the complete 'air tested' receivers see S.W. Mag, page 214 last month. They will all be gone before winter season, don't be disappointed by delaying.

NEW June catalogue, hundreds of bargains. Those on our mailing list will have priority and often advance notice.

FINE powerful 2-pole ring magnets 4" dia  $1\frac{1}{2}$ " wide 2/6; 2" wide 3/-. Crystal Monitors in cabinet (3-valve chassis) dozens of parts £1. Valves—V.S. 110A (S.130) neon stabilisers 15/- pair for 230v. Plugs—At last; Jones female plugs with screened cables 10-pin 4/6; 12-pin 5/6. Batteries—30,000 for portable sets, surplus bargain, 1-5v, 2/- for four. Variable Condensers 1500v 50 P.F. for Tx, robust, cheap at 5/6. Fitted boxes of fine transmitting coils; fixed and variable, 1l for 25/- . Special offer of 4 mfd 350v condensers  $1\frac{1}{2} \times 1\frac{1}{2} \times 3$ ", 2/- . New control panels with 2 mc meters, switches, etc., £1 each to clear.

**STOP PRESS** :—We have just bought whole of the stock of well-known B'ham firm and lists are in preparation; for a start we offer (to clear quickly) alum. boxes containing: cross over switch; 3 position switch; 2 knobs;  $\frac{1}{2}$  meg vol. control, insulated aerial terminal, 1000 ohm resistor, scale plate, earth terminal and a free bench tray with each at 3/- only.



1154 Tx. as illustrated, complete with valves, for phone, C.W. or M.C.W., 2/PT15's in the P.A. Price including carriage, £8.

BC603 Rx. Frequency Modulation receiver, with 10 valves, £7 10s. carriage free.

Type 10 Remote Control units, 25 Watt rack mounted amplifiers, mains power pack, brand new, a bargain at £15 10s., carriage free.

High resistance headphones, 8/6., 2 mfd. 500 VV condensers, 9d., .25 mfd 1500 VV, 1/-, EF50's, 5/-, and dozen of other items in our catalogue, which will be sent post free on request.

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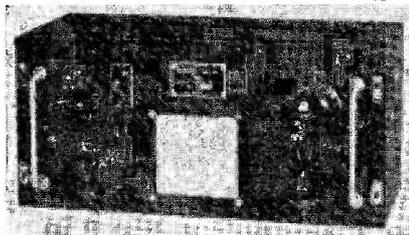
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TU 8-B 6200-7700 Kcs.  
TU 6-B 3000-4500 Kcs.

**TYPICAL UNIT**

- (2) Vernier precision dials.
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- (1) Variable capacitor 20-156 mmf.
- (1) Variable capacitor 8-26 mmf. neutralising.
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Safe Delivery and Satisfaction Guaranteed.

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**SMALL ADVERTISEMENTS**

READERS'—continued.

**WANTED**—A BC-453A Beacon Receiver in good condition, or Receivers "ARCS" or "274N" complete or in parts. Also a Panadaptor 230-250 AC, Type SP44. Offers to G2BYF, 76 Broadway, Sheerness, Kent.

**5-10 METRE** double-superhet, AC 200-250, all coils, nearest £25; H.M.V. electric gramophone unit, almost new, £10.—G3BGS, 149 The Moors, Kidlington, Oxford.

**FOR Sale.** Sky Champion, £23; Weston Analyser E772, £17; Ribbon Mike with stand, £5/10/-; two Weston 242A Valves at 10/- each. 9001, 9002 and 832 valves. Offers?—Box 293.

**FOR Sale.** National HRO Communication Receiver, as new, with Power Pack. Cost £60, sell for £38.—J. Burns, Caversham Lock, Reading.

**HALLICRAFTERS SX-28 Super Skyrider**, condition as new, with Instruction Book, £55 or near offers. Spare set valves, £4. Marconi CR.100, perfect condition, £35. National HRO Coils, 100-200 kc, 0.5-1.0 mc, 0.9-2 mc; with bandspread 1.7-4.0 mc, 14-30 mc. Offers.—Box 295.

**1155** Complete—power pack, 6V6 output, 5-in. L.S., New Panel, S-Meter—£17 or near offer. New valves—6L6, 6AK5, 6SN7/6T, 6J6, EF50, 6AC7, 6SH7, all 10/- each.—A. H. Martin, 30 Mosshead Road, Bearsden, Glasgow.

**HALLICRAFTER Skyrider Marine S22R** 110 kc to 18 mc, 9 valves, Gear Drive, good condition, £17. 3 1/2 amp. thermo-couple meter, 15/- Valves as new, boxed—PP3/250, 6H6, AC/PEN, MH41, 12Q7GT, ECH3, 1Q5GT, 1H5G, TH4B, AC/VPI, 5/- each. 2-volt superhet valves, 3/-. Exchange considered.—P. Malvern, 12 Rotunda Terrace, Cheltenham.

**HAM Surplus.** Brand new. Few of each at 7/6. 42, 6F6G, 6K7G, U14, 6L7G, EF39, ECH35, 5V4G.—G3BBA, Cross Road, Towcester, Northants.

**SCR** 522 100-156 mc Transmitter/Receiver, £18 BC221, £18. R1155, £10. Valves: 813's 50/-, 829, 832, etc., Transformers, Crystals, S.A.E. List. Offers.—Box 296.

**HALLICRAFTERS, S20R, Sky Champion, 6-8-550** metres, good condition, £20 or best offer.—Norman, 45 Collingwood Avenue, London, N.10.

**NEW gear** :—T55, £6. 803, 60/- (base 10/-). 829B, 60/-, 815, 70/-, HK54, 45/-, 808 30/-, 1852, 10/-, 210, 10/-. Woden de luxe 1250v transformer, £6/10/- AVO Signal Generator, mains, £10. M/C meters from 10/- Used but perfect :—T40, 30/-, 800v transformer, 50/-, NC81X, offers. 813's, offers.—R.H. Webb, Bigbury-on-Sea, S. Devon.

**RENNY Private Hotel, Bigbury-on-Sea, S. Devon.** Vacancies June, early July and September. Hams especially welcome. Write for brochure.

**ASSORTED** used valves, inc. U50's, etc., 3 for 11/- No selection. Philips 6v Receiver (no valves), 50/- Bluespot AC/DG, 3 bands, 80/- Lissen AC Receiver, 65/-, R1155, £15.—Box 297.

**SALE.** R116A Rx, Perfect, 142 kc-20 mc, original transit case, circuit, eliminator, trickle-charger, £10. Avo Minor Universal £5.—G3CZW, 4 Brighton Road, Newhaven, Sussex.

**R.1155** fully modified, with built-in 100 kc xtal calibration, £12. CO-PA, (807) with built-in 500v 200 mA PP, external fls. 6-3 and 4v, also stabilized HT output for VFO, metered, £8. Valves: 955, 954, 807, 10/-, EF39, 50, EB34, RL16, 17, etc., 5/-. R1155 and B2 Spares, etc. :—G3JA, 8 Thurlstone Road, Luton, Beds.

**PROCEEDINGS Brit.I.R.E.**, Jan. 1946 to Dec. 1947. 2 Vols., unmarked, £2. Midas F2.5, Taylor, Hobson lens, 9.5 mm Cine-Camera/Projector, as new, £7/10/- Micro-switches, 2/6 ea. CR100 : 6AK5 1st RF, Xtal, Audio Filter, 60 kc to 20 mc, Noise Limiter, S-Meter Bridge, 12 valves, perfect, £45. Flexible steel mast guy wire, 3d, yd. Dural Tube and Sheet, state requirements. Letter with S.A.E. to Radio, c/o 40 Brathway Road, S.W.18.

## SMALL ADVERTISEMENTS

READERS'—continued.

**G200'S** announcements now appear in the Trade Small Advertisements column and on Page 284.

**HRCOILS.** Ex. Condition, 14-0-30 mc BS, (3). 14-0-30 mc GC, 9-2-05 mc GC 48-96 mc GC, 50-100 kc, 100-200 kc, 180-430 kc, £3. each.—Box 298.

**CR100** Coil Packs, £1. New PT15's, £8.7's 9/6. 1000 kc Crystals, 10/6. Numerous Rx Valves, Meters, etc. S.A.E. for List.—Box 304.

**5-METRE** converters, RF Units Type 27 (65-85 mc) and Type 31 (56-72 mc), 27/6 each. RCA 801's, 15/- each.—J. Short, 112 Southwick Street, Southwick, Sussex.

**WANTED,** Hallicrafters SX28, AR88, or HRO Receiver, State Condition and Price.—G3BJB "Keswick", Saint Andrews Road, Malvern, Worcs.

**BSRAC** Amplifier, 3 stage, 2 PX25 Parallel, 500v. Transformer, 2 Chokes, output transformer. Offers.—G4LC, Russell House, Rye.

**ARMY** No. 12 Transmitter, 50 watts CW, 25 watts phone. Continuous coverage 17.5 mc. to 1.2 mc. VFO or Crystal control. Complete with key, mike, etc., ready to go on the air. New condition. £30 B2 Transmitter complete with coils, etc. (less power pack), New condition £3.—Box 303.

**1155A** nearly new, built-in power unit, output stage, and midget speaker, Transit case, £20.—Stebbins, 91 Ridgeway Hill, Newport, Mon.

**RAF1082** Receiver, 1083 Transmitter, 80 watt, 1200 volt Rotary Transformer, Key, Neutralising unit, etc. Received from M.O.S. Sale. Marked RAF serviceable Spare VT 25. Bought in error, £8. 10. the lot. Carr. Paid.—Gidman, Loddon, Norfolk.

**R.C.A.** AR88D. 540 kc to 32 mc, Matching Speaker, £45. CR100 50 kc to 30 mc £22. 10. Both good condition. Buyer collects or arranges transit of above. BC-312N, Same as BC-342, but 12-volt operation, £11. Carriage Paid.—Taylor, 75 Edgehill Road, Winton, Bournemouth.

**V55R** Communications Receiver and Matched Speaker, in perfect condition, £28.—39 Veda Road, Ladywell, London, S.E.13.

**5/10**Tx 6SN7-6L6-815, Modulator PP KT66, Complete, Spares, Power Supply, Relay Controlled, 19 in. Rack, £25. Offers. 5-metre Tx KT61-6F6-807, Xtal, 3 Element Close Spaced Rotary, 16 ft. Mast, £10. 2x2 Element stacked beam 5-10 metre, Coaxial Feeder, £5. S.A.E. Details.—Phone Haslemere 337. Gammon, 20 West Street, Haslemere.

**R1079**-valve, 17.5-1.2mc AC, or 12v. battery, good condition, £15. Carriage Paid.—Box 302.

**SALE.** Hallicrafters Receiver S.38 Perfect, New Condition, £20. Brand New Eddystone VHF Converter, all coils, spare valves, plus power pack, £11. Crypto Rotary Converter 220-240 DC to 220-240 AC, 330 watts, £7. Webbs bug key 35/- new valves. One 813, 40/-, One 814 35/-, One RK25 12/6, One 802 15/-, Three 1625 10/- each.—S. Abbott (G3JU), 139, Melbourne Avenue, Newington, Ramsgate, Kent.

**CLEARING** surplus gear. Type 55A mains operated AF Oscillators, £3/10/-. Wavemeter W.1270 25-130 mc dual unit, mains operated, £4. Various Power Packs, 12v. DC-230v. AC Converter, or exchange, 24v. Ditto.—Martin, Gables, Yoxford, Suffolk.

**832'S** with ceramic base—20/-; less base, 17/6; the ideal 25 watt PA up to 200 mc; slightly used, but money back or replacement guarantee. 2-stage 3-watt AC amplifier with spare set valves, 50/-. MCR1 with Mains Pack and Miniature Speaker, £8.—Box 301.

**POLARIZED** Relays, Standard Type, 12/-. Double Current key with switch, 10/-. Handset, inset, receiver and cord 7/6. Long Phone cords 1/6.—Burnley, 37 Cherryvalley Gardens, Belfast.

**HRO** Broadcast Coils, E and G, £2 each. One HRO Tuning Condenser, complete Dial and Drive, £4. New.—Box 300.

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FOR BEGINNERS AND OPERATORS

**IRREFUTABLE EVIDENCE** of the value of the Candler System of Morse Code training is given in the "extracts from students' letters" included with every copy of the Candler

**"BOOK OF FACTS"** sent post free on request.

**READ THIS LETTER FROM A CANDLER STUDENT!**

Dear Sir,

Some time ago you sent me the first five lessons of the Junior Code Course. Unfortunately the extreme pressure of military matters made it impossible for me to give all the time I should to the course.

(I should explain that I have been training newly enlisted Royal Signals personnel.) However, now I have been demobbed, I have started on the course and am very pleased with the progress I am making. I have already got my Amateur Licence. Could you please send me the remaining five lessons so that I can continue right on with them when I have finished lesson 5? If my progress continues as at present, I shall have got farther than I ever thought possible, but it seems so easy this way.

I close, wishing you all the best for the future, and assuring you that I will recommend your course to anyone who asks my advice on learning Morse.

Yours faithfully,

E. N. B.

P.S.—An old hand, whom I met personally after many contacts on the air, said: "It's a treat to hear a decent list nowadays." Was I pleased! as I had only been working on the course for two months.

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Noted for over 15 years for Short-Wave Receivers and Kits of quality

One Valve Kit, Model "C" Price 20/-  
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These kits are complete with all components, accessories, and full instructions. Before ordering send stamped addressed envelope for descriptive catalogue.

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**EDDYSTONE**

'504,' '640,' '680,' and Full range of S.W. components Also

Valves, condensers, transformers, resistances, etc.

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THE Radio Firm of the South.

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Phone: Brighton 1555.

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You can make a Super V.F.O from the Instructions which the A.R.R.L. League has given permission to reprint from Q.S.T. with the U.S. Signal Corps TUSB Tuning Unit. Price complete with instructions

**BULLS** <sup>(S)</sup>/<sub>W</sub> **22/6**  
246 HIGH STREET,  
HARLESDEN, N.W.10 + 3/6 carriage

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Ferranti 25-watt Modulation Transformers for push-pull 807's to 807 P.A., 25/-.  
Ferranti Electrostatic Voltmeters, 3", 0/2,000, 28/-.  
New Goods Only. C.W.O. or C.O.D.  
Send 24d. Stamp for current 24-page catalogue

## SMALL ADVERTISEMENTS

### READERS'—continued

**VALVES** 6C4, 7N7, 7A8, 6AC7, 6AB7, 10/-, 6SH7, 6SN7, 2X2, 6S7GT, 6SK7GT, 7/6. Electro Voice 600C Dynamic Mic., £2. Vibraplex, £2/10/-. Postage —Box 299.

**R1155F** in nice condition, £11/10/- for quick sale.—Leger, 18 Little Heath, S.E.18.

**WANTED** SCR-522 Transmitter/Receiver.—A.J. Cryer (G2BXL), 33 Prince's Way, Fleetwood, Lancs.

**CONVERTER**, working order 40-65 mc (Receiver 10-60 mc AC 250v.). Full details—S. Brown, 6 Addison Villas, New Eastwood, Notts.

**SALE.** APQ9 420 mc Radar Tx, uses PP 8012 L.L. Oscillator, also 2-807 and 3-6AC7, £3/10/-. 2.5 KVA Autotrans., 230-115 volts, £2. RCA 500 watt Mod. Trans., £2/10/-.—Kimber, 7 Van Mildert Terrace, Stock-on-Tees.

**CR100** Communications Receiver. 60 kc-30 mc. All grey, with matched speaker, ANL, S-meter, spare set valves—instruction manual. Excellent condition, £40.—Dalsh, 302 Bitterne Road, Southampton.

**AR88** For Sale. Perfect order, cabinet model £55. R.C.A. ASB8 12-valve 460-500 mc Receiver, Lighthouse RF stage, Unused, £7/10/-. B2 Tx/Rx., Power Pack, Xtal, 'phones, key, etc., in two steel cases Brand new £10/-/. Collins Tx 25-watt 'phone 50 watt CW, 1.5 to 12 mc, Xtal or VFO. Separate 12-volt power pack, £20. HRO Junior, 5 Coils, S-Meter, etc. £32/10/-. 4 new boxed 6J6, 15/- each. 815, new, £2. Letters only:—292 Kingstanding Road, Erdington, Birmingham 22a.

**FEW** new 9001, 9002, 9003, 8/-; 6AG5, 6C4, 9/-; 6AK5, 6J6, 10/-; One unused 3 1/2 in. PM Goodmans, Wharfedale, 22/6; 5 in. Elac, 4 in. Goodmans, 17/- Wanted moving-coil PU, recording wire/tape, 6AQ5, 50B5.—Box 306.

**DEMOBBED** Radio Officer, resuming technical training October, offers services Amateur Radio, technical or business side, June-Sept. 4 years' overseas experience communications, 15 years radio and television experimenter. Possible permanency or partnership considered later —Box 307.

**HRO** Four gang, straight line frequency condenser, with dial, £5, or nearest offer. Marconi Model 212 Short Wave Converter. 3-23 mc, in 3 ranges; complete with metal valve and instructions £4. MCR1 100-1600 kc, 2-5-15 mc, complete with AC/DC Power Pack, 'Phones, Coils, Aerial, circuit, £7 4 Miniature 465 kc IF transformers, 7/6 each. Valves: 7/6 each: 1D8, 3A8GT, IR5, IS4, 41MTL, TDD4, VP4, 25Z4G, 25L6, 12B8 (2). Mallory 6-volt vibrator, Type 650. G.E.C. Dymomoter, 26 volts input, 250v 60mA output, 7/6.—Box 305.

**BC348R** Tip-top condition, almost new and spot-on calibration, xtal filter, etc., for 230v, 50 c.p.s. mains—£25 (internal power supply.) Brand new, unused 813 RCA, two at £3 each. Other items for disposal, S.A.E. for list to—G3BHD, 136 Lincoln Road, Peterborough.

**NATIONAL** FB7A Receiver for sale. Bandsread coils 10, 20, 40, 80, and two other sets general coverage, 6-3 volt valves, £12; Power Supply if wanted £3. 750-0-750 volt 250 mA transformer, totally enclosed, £3. 2-8 10 amp transformer 16/-; also 2-5 volt 2 amp, and 7-5 volt 3 amp, 16/- AVO Test Bridge, New, £8.—W. B. Stirling, 137 Glasgow St. Ardrossan, Ayrshire.

**FOR SALE.** Hallicrafter SX28, As New, £50.—H. Welsh, 382 Brockley Road, S.E.4.

**58MK. 1.** complete with two pairs' phones and mikes, telescopic and sectional aerials in case, all cables and accessories but no battery. Perfect condition. £8 or nearest offer.—G3BAA/A, 71 Lichfield Road, Stafford.

**ASB8** 420 mc/s. 12 valve double superhet £7. ARC5/BC950 144 mc/s Tx, 815, 2-832's modulation transformer, etc., £9. ARC5/BC942 144 mc/s Rx 10 valve, 9 gang tuning £4. Box No. 308.

**MINISTRY OF SUPPLY SALES are now coming to an end . . . . . BUT**  
**M.O.S. SALES go on for EVER!**

A further selection of our bargains is presented—NOTE every item detailed this month is brand new and unused!

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★ **SPECIAL!** ★

**THE NATIONAL I-10a.** The new improved version of the popular I-10 super regenerative receiver. Frequency coverage I-II metres. Supplied complete with power supply, valves and speaker. Valve line up : 954, 955, 6J5, 6V6. Instruction book included. **£45.**

THE MOST REVOLUTIONARY SALES PRESENTATION IDEA YET EVOLVED BY ANY BUSINESS HOUSE!

**THE M.O.S. NEWSLETTER**

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Send 6d. for the current issue of this monthly informative and novel catalogue. The extension of our interests to other types of merchandise will make this good reading for all the family.

★ **SPECIAL!** ★

Set of valves for miniature superhet comprising one each IR5, IS5, IT4 and 3S4. Guaranteed new and perfect. The set for **27/6** or complete with valveholders **29/6.**

**ENGINE-DRIVEN GENERATORS.** (DC Dynamos). 24v 1000 watt output. Fitted with shaft. **Only 35/-.** (Carriage and packing 7/6.)

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**A.S.V. INDICATOR UNITS TYPE 6.** Latest model complete with 6" Electrostatic CRT, 4 EF50 and 3 EB34 (time base). In transit case with original seals, **£3/12/6.** (Carriage and packing 7/6.)

**MODULATOR UNIT TYPE 189.** Complete with 2 EF50 and 1 EA50 valves. Very compact unit in grey steel case. **Only 19/11.** (Carriage and packing 2/-.)

**TECHNICAL DATA.** R1116 2/3 ; Class D Wavemeter 5/- ; BC348 2/3 ; BC221 2/3 ; Walkie-Talkie 58 set 3/6 ; Walkie-Talkie Vibratorpack 6d ; R1224a 9d.

★ **THE BURGOWNE SEVEN-SECOND SOLDER GUN IS NOW AVAILABLE FROM STOCK, £4** ★

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- 40 watts C.W., 35 watts Phone to KT8C Final.
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- Provision for Low Impedance input from a V.F.O.
- Instant Crystal changing from front of panel.



Transmitter

- The whole completely housed in attractive black crackle finished steel cabinet, 19 ins. by 10 ins. by 9½ ins.

**NOTHING EXTERNAL  
EXCEPT MICROPHONE  
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175-0-175v 60mA, 6·3v 2A CT .. .. .	£1 9 6
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¾" or ¾" (Key 9d.) .. .. .	9/6
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## Q-MAX UNBREAKABLE POLYMAX

Stand-offs .. .. . ½" 6d. 1" 9d. 1½" 1/-	
Beehives .. .. . 1½" 2/-	

- Absorption Wavemeter .. .. . 35/-
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- Microdials 100-1 .. .. . 10/-
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