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The SHORT WAVE LISTENER AND TELEVISION REVIEW

DEVOTED TO
SHORT WAVE RADIO RECEPTION
AND AMATEUR TELEVISION

JUNE 1950
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THE SHORT WAVE LISTENER
AND TELEVISION REVIEW

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Payment at good rates is offered for articles of short wave listener interest.

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JUNE 1950

EDITORIAL

Comment

It is with pleasure and some pride that we can report—though this is being written within a few days only of the first appearance of the *Short Wave Listener and Television Review* under its new title—that readers generally have "responded with acclamation," as they say, to the idea of our covering television in this journal, in addition to its established SWL features.

However, it is fair to record that we have also had one letter from a single reader whose view it is that the eight additional pages by which the *Short Wave Listener* has been enlarged to cater for TV interests could more usefully have been devoted to (you've guessed it) Calls Heard and the other purely SWL DX articles which—though he does not say so—are a source of such inspiration to less well-favoured contemporaries. Truly, one of the penalties of original thinking is to see imitators sail as near the wind as they dare.

But the theme of this comment is not that. It is that the enlargement of the paper does not, in any way, affect the established SWL features, as we were at pains to explain in our comment in this space last month. And from the correspondence, it is clear that the majority of our readers thoroughly understand this, even if they did not read last month's Editorial.

The function of the *Short Wave Listener and Television Review* is, so far as it is able, to mirror the trends of the time, while pointing the directions in which SWL effort can usefully be expended. And there can be no question that the practice of TV falls within our terms of reference, as so many readers agree.

Modification Details for the BC-348

POWER SUPPLY—SIGNAL FREQUENCY CIRCUIT ALTERATIONS—VALVE CHANGES—IMPROVING AUDIO OUTPUT—ADDING NOISE LIMITER AND S-METER—CONVERTER FOR TEN METRES—FAULT TRACING SEQUENCE

PART

By W. A. SPARKS (G3DGT)

(Many thousands of the BC-348 series of war surplus receivers have found their way into amateur hands, and we are constantly asked for details respecting possible modifications. This article, without question the most complete and informative yet to have been published on BC-348 conversions for amateur use, will answer most if not all such queries in the minds of owners. As many readers will know, the BC-348 was in its time quite the best of those sets produced for airborne operation in heavy aircraft of the U.S.A.A.F.—Editor.)

MANY models of the BC-348 series of airborne communication receivers have now found their way into the hands of amateurs through the surplus market. This receiver is probably one of the most effective of any released for amateur purposes due to the performance which can be obtained both initially (that is immediately on connecting a power pack) and finally after carrying out the various recommended conversions or modifications, published and otherwise, which it is the purpose of this article to explain.

One very important point regarding conversions should always be borne in mind. Each stage of the conversions should be independent, and if the owner of the receiver does not wish to carry out all the listed conversions he should be able to select those most suited to his particular requirements and should not have to rebuild completely.

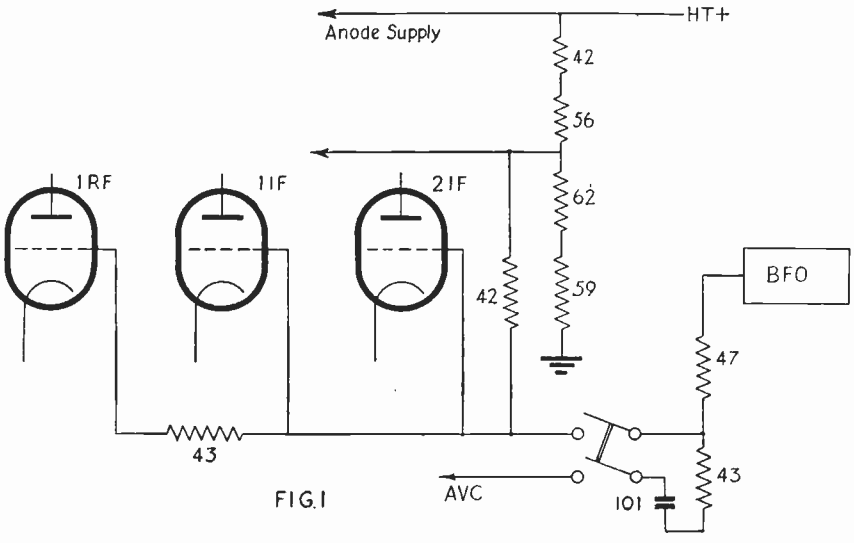
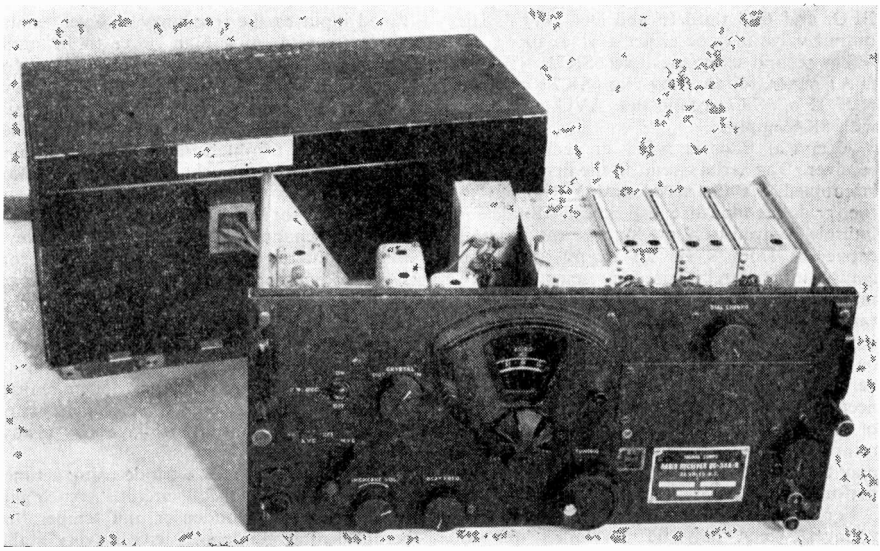


FIG.1

Fig. 1. HT feed connections for the BFO.



General view of the BC-348, removed from its case

The conversion details to be covered will be divided into a number of sections :

(a) Description of the theoretical layout in order to familiarise the reader with circuit peculiarities.

(b) Simple methods of getting the equipment working on AC mains.

(c) More complicated conversions including noise limiters, S-meters, selectivity adjustments, gain adjustments, and so forth.

(d) Range extension, that is specially designed converters for extending the range to the ten-metre band.

(e) Servicing details and alignment instructions.

(f) Component values.

General Description

The receivers generally fall into two classes, one series using double-ended valves of the more conventional variety (to be called Type A in this article), and the other the single-ended valves of the more recently developed type (which we will call Type B). Of the two categories, the first is probably the most suited to amateur needs since the receiver is more robustly built and appears to be slightly more sensitive in its original condition than the other series. Typical models in the first class are lettered C, E, M, P, R, and some others, the manufacturers including such firms as R.C.A., Bendix, Belmont and Stromberg-Carlson, among others. Receivers in the second category were mostly manufactured by Wells Gardner. Individual models of each class vary slightly in electrical and mechanical construction, but modifications given can invariably be carried out without detailed instructions for separate models of the same basic type being necessary.

The first series mentioned above use two 6K7's as tuned RF amplifiers, followed by a 6J7 mixer with 6C5 oscillator. The IF stages consist of a 6K7 first IF, 6F7 second IF and

TABLE OF SELECTED VALUES—BC-348

The values shown here may vary from model to model and are given solely as a general guide. Only those parts of importance are included. The numbers refer to those used on the wiring circuit in the instruction manual; the second number is deleted since, for example, items 9-1, 9-2 up to 9-18 are all the same value.

Ref.	Value	Ref.	Value
9, 10 & 11	0·01 μF 400 VW paper	46	56,000 ohm ½ watt
12	0·005 μF 500 VW paper	47	58,000 ohm, ½ watt
13	0·000375 μF 500 VW mica	49	180,000 ohm, ½ watt
14	0·00224 μF 500 VW mica	50	470,000 ohm, ½ watt
15	0·0015 μF 500 VW paper	51	560,000 ohm, ½ watt
16	0·00067 μF 500 VW mica	52	1·5 megohm, ½ watt
17	0·000147 μF 500 VW mica	53	220,000 ohm,1 watt
38 & 39	0·5 μF oil-filled 250 VW	56	10,000 ohm, 1 watt
40	470 ohm, ½ watt	57	27,000 ohm, 1 watt
41	1,000 ohm, ½ watt	58	3,500 ohm, rheostat
42	4,700 ohm, ½ watt	59	Gain control, front
43	10,000 ohm, ½ watt	—	20,000 ohm ; Back 350,000 ohm
45	15,000 ohm, ½ watt	61	2,400 ohm, ½ watt
		62	47,000 ohm, ½ watt
		63	68 ohm, ½ watt
		101	0·05 μF 400 VW paper

BFO, and 6B8 third IF and Det. AVC. The output valve may be either a 41 or 6K6.

The second series uses two 6SK7's RF with 6SA7 mixer, followed by two 6SK7's and one 6SJ7 IF's, 6SR7 second det, AVC and BFO, with 6K6 output.

A crystal filter is fitted in each type of receiver. The aerial circuit in the first category is coupled, via the aerial tuning trimmer, to the grid of the first RF stage. Sufficient latitude is given to allow for a range of aerial capacities from some 20 to 50 $\mu\mu$F. The actual input circuit used presents a good match over the greater part of the receiver range for a co-axial feeder of about 70 ohms impedance. However, satisfactory results can be obtained with most unbalanced types of aerial besides balanced types. A resistor connected across the aerial and earth terminals of the receiver is intended to provide an earth return for static changes. This component may be removed without having any effect on performance.

For protection against excessive RF voltages which may be developed due to transmitters operating locally on adjacent channels, the input circuit makes provision for the building up of a negative bias across the grid filter resistance whenever there is sufficient voltage input to drive the grid positive. This voltage is additional to other bias supplied to the first RF valve and has the effect of minimising trouble due to overloading.

There are two tuned stages of RF before the frequency changer which, together with the tuned input to the frequency changer, enable an image-ratio of a high order to be maintained down to the highest operating frequency. Separate coils are used for each particular range and each individual circuit. The range coils are all tuned with air-spaced padders and trimmers, and the RF gain of each stage is kept fairly uniform by selection of the proper turns ratio between grid and anode coils for each range. The input to the frequency changer is maintained at low level to avoid interference due to cross modulation.

A 6J7 is employed as a frequency changer in the first (or double-ended valve) design of receiver. Spurious responses are reduced to a minimum by the high degree for preselection and the low input level. The oscillator is coupled to the mixer via the cathode circuit of the 6J7 and separate coils of each band assure that optimum output voltage is always available.

The RF oscillator is a triode using a tuned grid anode feedback circuit. A highly stabilised tuning condenser and temperature compensating condensers give a very stable circuit. The effect of loading by the frequency changer is reduced to a minimum by the use of low impedance coupling coils in the cathode of the 6J7. On the four lower frequency bands the oscillator is on the HF side of the mixer, whilst on the two higher frequency ranges it is on the LF side.

Three IF stages each working at a low stage gain and coupled by double tuned IF transformers are used. The IF coils are slug-tuned and have comparatively high fixed

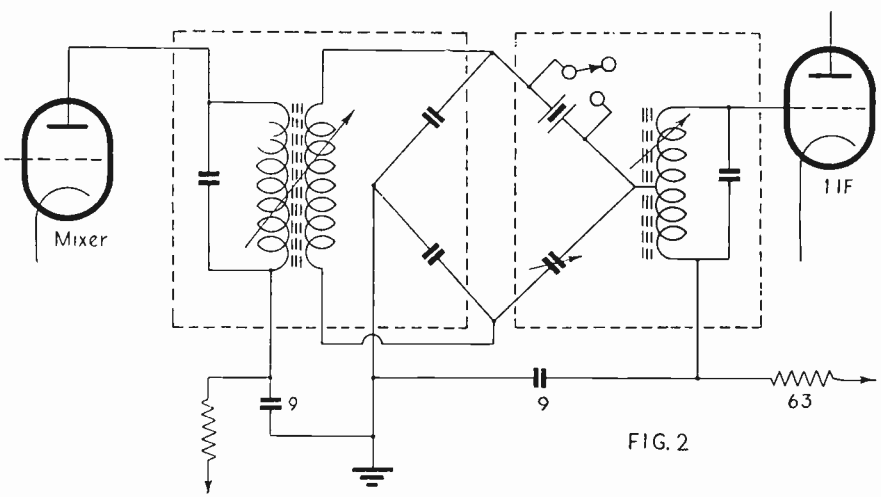


Fig. 2. The band-pass crystal filter unit, fitted as standard to the BC-348.

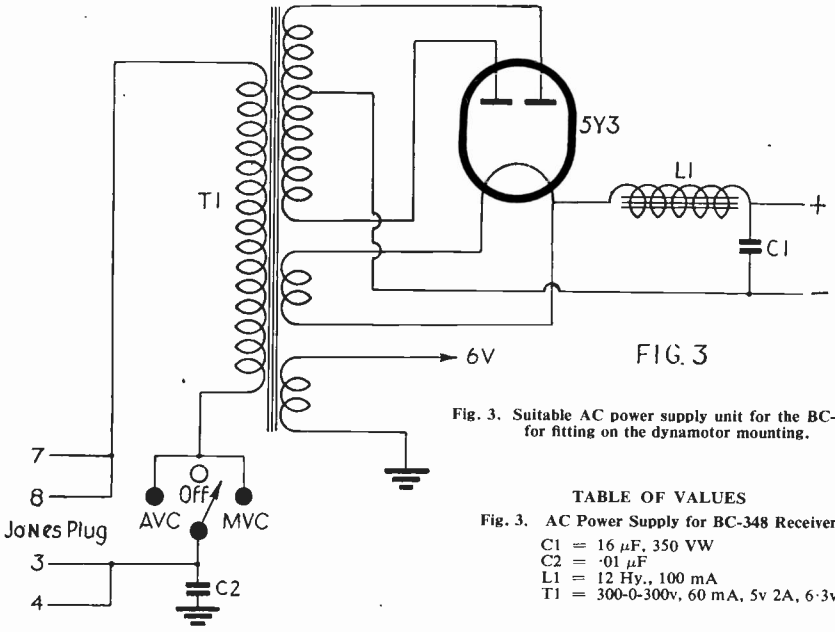


Fig. 3. Suitable AC power supply unit for the BC-348, for fitting on the dynamotor mounting.

TABLE OF VALUES

Fig. 3. AC Power Supply for BC-348 Receiver

C1 = 16 μF, 350 VW
C2 = ·01 μF
L1 = 12 Hy., 100 mA
T1 = 300-0-300v, 60 mA, 5v 2A, 6·3v 3A

capacities across them, thus contributing to an extremely stable amplifier. Slug-tuned coils give a moderate degree of selectivity, although the use of a high value of capacity tends to reduce the maximum degree of selectivity obtainable.

The BFO uses the triode section of the 6F7 triode pentode second IF valve as an oscillator in a tuned grid anode feedback circuit. The BFO coil is slug-tuned approximately to the IF frequency of 915 kc and a phasing condenser operated by a flexible drive from the front panel gives a sweep of approximately 4 kc either side of zero beat. Temperature compensation is used in the tuned circuit of the BFO to avoid drift, and the stage output is purposely held down to minimise the effect of harmonics. The output of the stage is capacity-coupled to the second IF plate circuit from the BFO grid. The last IF valve is not controlled by either the AVC or manual gain, and consequently a fairly high input level is maintained at the diode of the second detector. This circuit arrangement also permits the use of AVC on CW reception. When the BFO is switched on, the AVC time constant is increased by the automatic switching in of a condenser. The BFO high tension supply is taken from the screen grid circuit of the RF and LF valves ; on switching in the BFO the screen voltage is reduced, thereby reducing the noise level to the same value as when receiving telephony transmissions. Advantages to be obtained from using this circuit (Fig. 1) are as follows :—In order to have sufficient oscillator output to handle high signal levels whilst still keeping the output below the normal AVC operating level, it is desirable to have the BFO output rise as the input level rises or as the AVC voltage increases. This is accomplished by the use of a fixed bleeder supplying the screen and BFO high tension voltages. As the input level increases screen current decreases and the voltage across the bleeder tap increases, thus increasing the BFO output.

The Crystal Filter

A crystal filter circuit of the band-pass type is fitted to the receivers (Fig. 2). This consists of a balanced capacity bridge adjusted to provide a pass band of from 800-3,000 cycles at 20 dB down. The band width setting may be adjusted from underneath the crystal filter can. The impedance of the bridge circuit is matched to the first IF grid by the circuit shown.

The second detector is of conventional design and provides audio to the output stage direct from the diode and also a high level of delayed AVC bias. The high level of input which is maintained at the diode gives freedom from distortion due to operation of the diode at the lower end of its characteristic curve.

A rheostat which is connected in the cathode circuit of the second RF valve and is located on the end of the main tuning condenser serves to maintain the noise level over the tuning range of the receiver at a reasonably constant level. Bias applied as the condenser traverses towards the HF end of the range reduces sensitivity and keeps the noise level constant.

DETAILED MODIFICATIONS

For the reader who wishes to convert the originally 28 volt DC operated BC-348 to AC working a variety of modifications are possible. A source of high tension of between 230 and 250 volt DC capable of supplying some 65 mA, and a low tension supply of 24-28 volts AC at about 0·6 amps will get the receiver going with a minimum of effort. In any case, the dynamotor must be removed and this constitutes the first step. The dynamotor and its associated filters should be stripped from the platform and the mounting dimples carefully flattened out. The five spade terminals which connect to the sub-base of the dynamotor platform should not be disarranged since they are the HT and LT feeder circuits, and if the power supply is built on the dynamotor platform they will provide a satisfactory method of power distribution.

A typical power supply suitable for erection on the dynamotor platform is shown in Fig. 3, whilst the necessary filament circuit alterations are shown in Fig. 4. Removal of the 28 volt DC circuit wiring from the Jones plug on the receiver rear apron can be most effectively carried out as follows: Cut the earth connection free from pin No. 7 on the plug and remove the dial light supply wire from terminal (1) on the front section of the AVC-MCV switch on the front panel (orange or yellow tracer in most receivers). Then the pins No. 7 and No. 3 may be used to feed AC into the receiver with a front panel-operated switch controlling the mains input as shown in Fig. 3. It is recommended that the balancing resistance (Fig. 4) be removed from the circuit altogether or wired across, using the ends of the resistance as soldering points. In order to wire the heaters in parallel with a minimum of disturbance the recommended circuit should be followed. An important point to watch is that HT negative should be returned to the tag board in the dynamotor and *not* to earth, otherwise the biasing network will be shorted out. Pins 2 and 6 on the Jones plug at the rear control the screen supply voltage. A stand-by switch should be fitted on the front panel in place of one of the phone jacks and wired across these pins. Connection to the mains will now enable the receiver to be tested for satisfactory operation on AC mains. It should be mentioned that the dial light wire is reconnected to the AC filament supply on the ungrounded side and the lamps rewired in parallel with the other end, being grounded directly instead of through the balancing resistor and dimmer rheostat.

(*Part II will follow next month.*)

NEW TV CONTROL ROOM EQUIPMENT

Emitron Television, Ltd., a subsidiary of the great firm of Electrical & Musical Industries, Ltd., of Hayes, Middlesex, has recently supplied a major item of new TV gear to the BBC. This is a Mobile Central Control Room for use on actuality broadcasts when more than three cameras are firing. Twelve camera channels can be controlled from a central programme-producing point, and the unit also provides for transmission of the sound and picture signals from the O.B. site to the main transmitting station. This equipment was employed for the first time for the Boat Race TV broadcast, and gave an extremely good account of itself as viewers who saw the transmission will agree.

Television for Beginners

AN OUTLINE OF THE SYSTEM

TRANSMITTING SEQUENCE — THE TV CAMERA — THE CATHODE RAY TUBE

PART II

by W. N. STEVENS (G3AKA) and L. E. HOWES (G3AYA)

WHEN it is remembered that there are something like two thousand valves in the Alexandra Palace transmitting equipment, the relative complexity of the modern television system can be realised.

Broadly speaking, the transmitting sequence can be broken down to the block diagram of Fig. 4. The microphone channels are taken to the studio control room where they are amplified and fed to the central control room and the central apparatus room. The vision signal, however, is a much more involved item. In the central apparatus room a master oscillator giving output at 10,125 kc and 50 kc (locked to the mains for stability) is fed into the camera unit to supply the scanning requirements.

The vision signal is amplified in the camera unit itself and is then fed into a larger amplifier and to the illumination corrector which, as the name implies, corrects as far as possible any distortion in illumination values. At this point the master oscillator is again picked up.

Then comes another stage of amplification and the suppression and synchronisation mixer. After this the line component is added and yet another stage of amplification ; the vision signal is then ready for the central control room, at which point the sound signal has also been collected.

The signals are then at a junction point. For the London transmissions, the output from the central control room is taken direct to the Alexandra Palace transmitter itself which follows orthodox VHF practice for the frequencies involved, and thence is radiated off the massive aerial system of 16 dipoles-plus-reflectors.

(over)

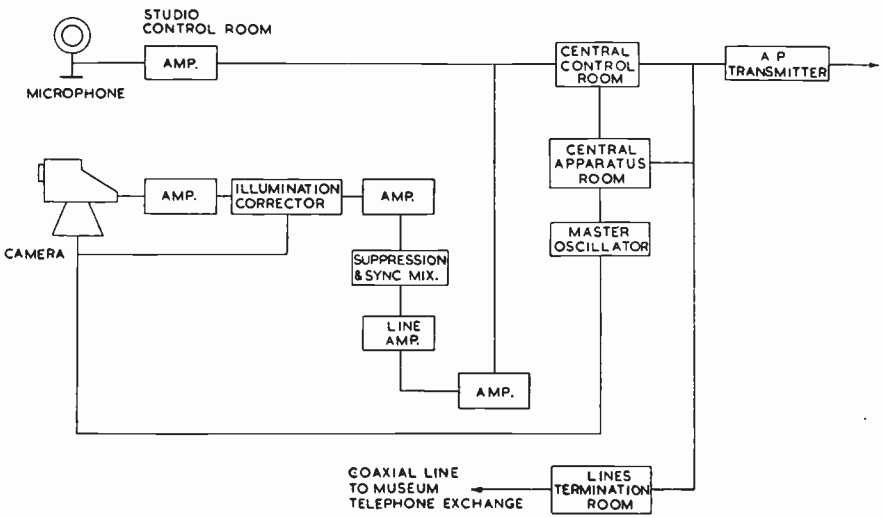


Fig. 4. Block schematic showing how sound and vision signals arrive at the transmitter.

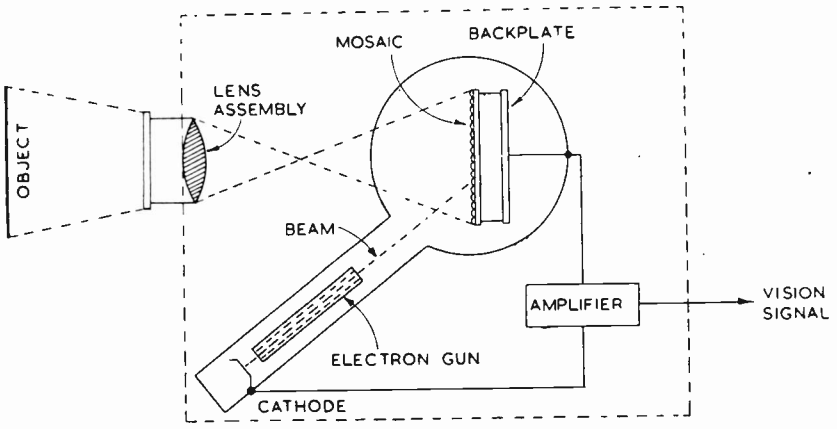


Fig. 5. A sketch showing a typical camera unit assembly. The working of this device, which is the heart of the whole TV transmitting system, is discussed in the text.

For the Midlands transmission, the sound and vision signals are conveyed from the central control room to what is called the lines termination room. Here the coaxial cable route starts and the signals are "piped" to the Museum telephone exchange where the sound signal is fed into the London-Birmingham cable line and the vision signal via the terminal modulator to the VHF radio link.

At Birmingham the signals are collected and passed through coaxial line to the transmitter at Sutton Coldfield, where the processes of preparing the signals for transmission are undertaken.

In order fully to appreciate the functioning of the television receiver it is necessary to understand, first, how the vision signal is obtained and, secondly, the character of the waveforms. Furthermore, the action of the cathode-ray tube is easier to grasp once the principles of the studio camera are known. Therefore, the workings of the image orthicon, or television camera, should be understood.

The TV Camera

The camera unit consists of a lens assembly, the Emitron tube and an amplifier (*see* Fig. 5). The whole basis of the Emitron is the mosaic,

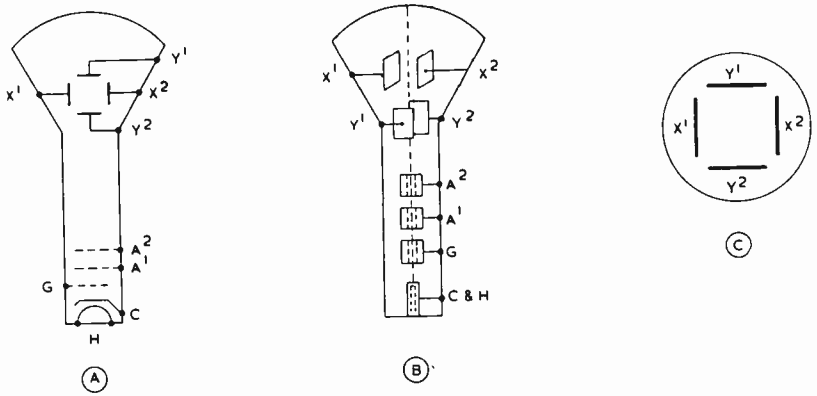


Fig. 6. Theoretical representation of an electrostatic CR tube, sketch A. In B is a pictorial outline of the electrode assembly. C shows the correct positioning of the deflector system when viewed from the face of the tube. In tubes of the electrostatic type, the cathode is the source of electron emission ; the grid controls the flow of electrons to the screen and is used for the brilliance control ; Anode 1 is the electron lens or focusing anode ; and Anode 2 is the final anode.

which forms a photo-emissive cell. On the face of the mosaic are impressed tiny globules of silver and cæsium so that a film of photo-sensitive material covers the area. These globules, however, although extremely small are all isolated from each other, and the whole mosaic can be described as an artificial retina, somewhat similar to the sensitive screen at the focus of the human eye.

At the rear of the mosaic is a metallic back-plate which is separated from the photo-sensitive face by an insulating strip. Thus the cæsium globules form, in conjunction with the metal backplate, an enormous number of small condensers.

When an object is being viewed, and is focused by the lens, light of varying intensity will fall on the mosaic. The strong light elements will cause electrons to be emitted from the mosaic at a rapid rate, less intense light rays producing a proportionately smaller electron emission and black portions no discharge at all. In this way an *electrical impression* of the scene televised is produced ; each of the tiny "condensers" is holding a charge of varying voltage dependent on the illumination focused on it.

Now, besides the mosaic, the camera has a more or less orthodox cathode-ray tube assembly—with the "electron gun" and other electrodes. When the electrodes and the back-plate are connected by external circuits, a stream of electrons is "fired" through the electron gun and made to fall on the mosaic so that the external circuit is completed. The "condensers" discharge and thus produce the varying voltages which are called the "Vision Signal".

The electron beam, by methods which will be discussed later, is made to cover the entire face of the mosaic (the beam itself is larger than one of the individual globules) by "scanning" it, thereby making the globules negatively charged and again responsive to further light beams.

The Cathode-ray Tube

There are two types of cathode-ray tube used in television receivers—the electrostatic and the magnetic—the difference being simply in the method of deflection. In Fig. 6 (A) is shown the theoretical symbol of a typical electrostatic tube which has heater, cathode, one grid, two anodes and a deflection system comprising two pairs of plates, mounted at right angles to each other and known as the X and Y plates.

The electrostatic tube can be likened to an ordinary radio-type pentode valve as regards both the electrodes and its operation. The grids and anodes, however, are made in the form of cylinders—*see* Fig. 6 (B)—the anodes collectively being known as the "electron gun".

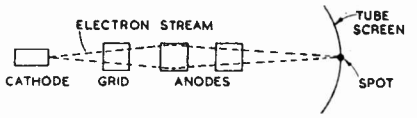


Fig. 7. Showing how the beam of electrons from the cathode is focused by the first anode so as to produce the spot on the screen or face of the tube.

The electron stream emitted from the cathode passes through these electrodes and between the deflector plates on to the face of the tube ending as a spot (when no varying voltages are applied to the deflection plates) or as a "raster" when the time-base saw-tooth waveforms are applied to the plates (as in actual television reception).

Some tubes have three anodes, anodes 1 and 3 being strapped together. The final anode usually has the highest positive potential ; the screen and the deflection plates are maintained at the same positive potential as the

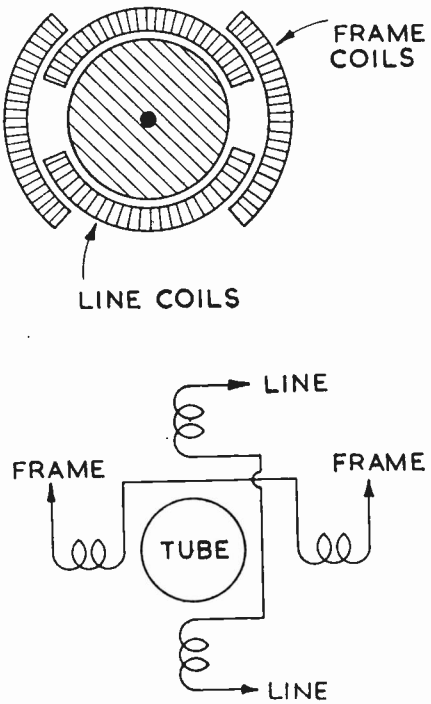


Fig. 8. Showing the positioning of the line and frame coils round the neck of the tube. Below is the theoretical diagram of coil assembly.

final anode. The screen, of course, must be at such a potential that the electron beam will be attracted to its surface.

The electrostatic tube is not favoured in modern television receivers but some tubes (such as the VCR97), owing chiefly to their cheapness on the surplus market, have had some measure of popularity. The general tendency, however, is to use magnetic tubes around which a much more efficient receiver can be built.

The magnetic tube is in essence the same as the electrostatic tube but without the pairs of deflector plates and the electrostatic focusing assembly. In this case the deflection system depends on externally mounted coils (*see* Fig. 8) situated around the neck of the tube, the actual position depending on the characteristics of the tube used.

The beam is deflected vertically by the frame coils and horizontally by the line coils. These coils are fed with the outputs from their respective time bases, the line coils usually through a transformer since the coils are of low resistance and the frame coils either from a transformer or by resistance-capacity coupling.

All this will be considered in greater detail, and from the practical point of view, in future articles in this series.

Sound-Vision Receiver for Midlands

UTILISING R.1355 AND RF-26 UNITS

FOR amateur TV constructors, a very practical method of obtaining sound and vision reception is by utilising the surplus units R.1355 and RF-26. These units are generally available at very reasonable prices and when modified are capable of satisfactory results.

However, it is felt that many constructors who have embarked on this combination may

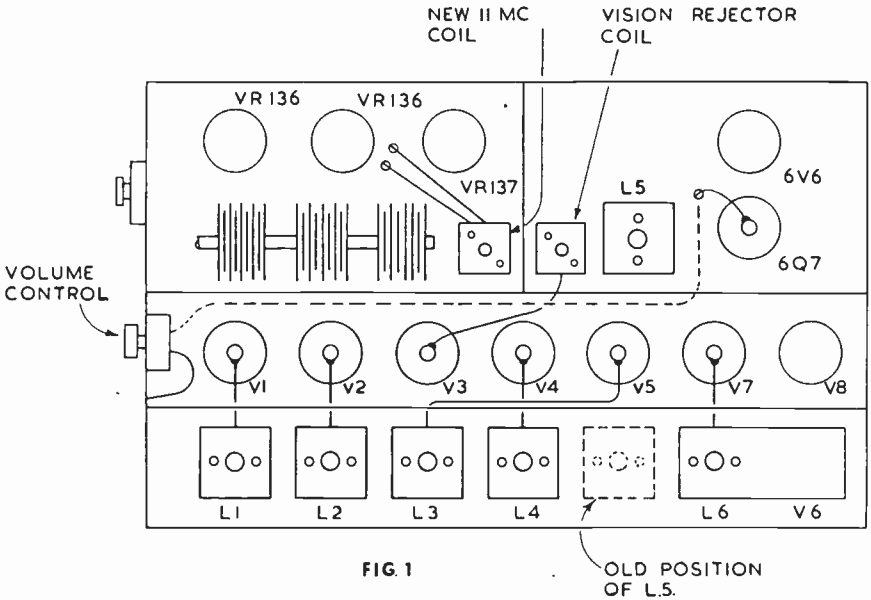


FIG. 1

Fig. 1. Block outline showing disposition of the components in the modified R.1355 unit. Note the alteration in the IF strip sequence and the location of the audio stages (for sound reception) in place of the original power supply section.

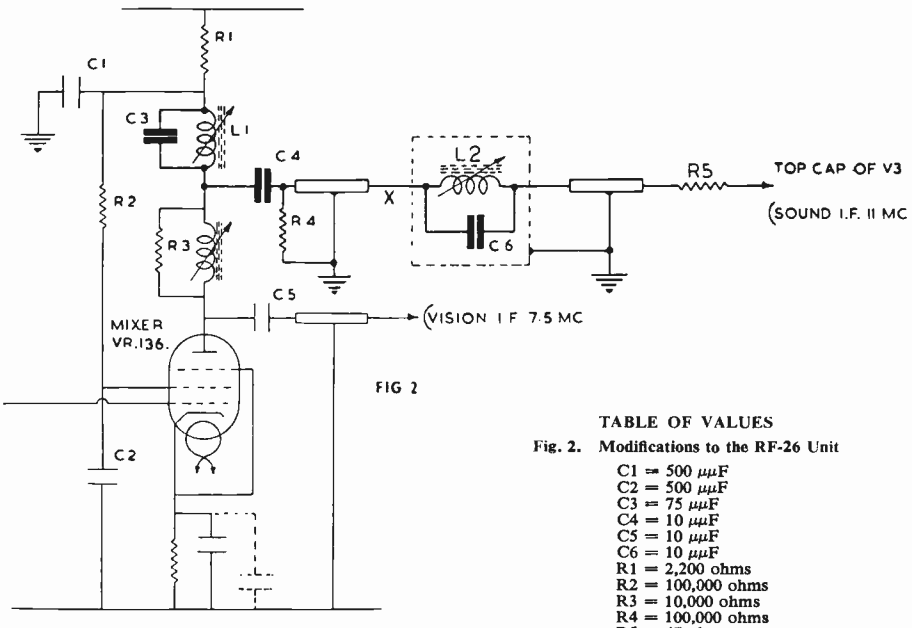


FIG 2

Fig. 2. The RF-26 Unit as modified. New wiring and components are shown in heavy line. The lead marked "X" is taken to the spare pin on the Jones plug.

TABLE OF VALUES

Fig. 2. Modifications to the RF-26 Unit

C1 = 500 $\mu\mu$F
C2 = 500 $\mu\mu$F
C3 = 75 $\mu\mu$F
C4 = 10 $\mu\mu$F
C5 = 10 $\mu\mu$F
C6 = 10 $\mu\mu$F
R1 = 2,200 ohms
R2 = 100,000 ohms
R3 = 10,000 ohms
R4 = 100,000 ohms
R5 = 47 ohms
L1 = 20 turns 28 SWG enamelled copper wire on ¼-in diam. former, close wound, with iron dust core; tuned to 11 mc.
L2 = 35 turns 34 SWG enamelled copper wire on ¼-in diam. former, close wound, with iron dust core; tuned to 7·5 mc.

be missing the best that can be obtained from these units. In the first place, the five stages of IF amplification in the R.1355 are normally too great for practical purposes and are to some extent wasted. Additionally, it is normal practice to use separate sound and vision receivers.

In the system about to be described a great saving can be accomplished by splitting up the five IF stages—three being used for the vision side and the remaining two for sound, thereby eliminating the need for two separate receivers.

It will be assumed that the constructor has already carried out the necessary initial modifications to the R.1355 in order to make it suitable for TV reception and that he has some practical knowledge of the unit. Since such alterations have already been extensively publicised in recent years it is not intended to go over the same ground again. Incidentally, should the constructor wish for a complete circuit diagram of the R.1355 it can be obtained from Air Ministry Forms and Publications Store, RAF, Kidbrooke, London, S.E., or from Messrs. Clydesdale Supply Co., Ltd.

In brief, the modifications necessary for single-unit reception are as follows :—

(1) The five IF stages are split; three being used for vision and two for sound.

(2) An additional tuned stage is inserted at the mixer output.

(3) A double-diode triode stage is added for demodulation and AF amplification.

(4) An output audio stage is added.

Fig. 1 shows the block layout diagram of the complete vision and sound receiver after modification. It will be observed that all the power supply components have been removed and that the cathode follower valve (V8 in the Air Ministry circuit reference) has been removed. Also notice that one of the IF transformers (L5) has been taken from its original position to a new place alongside the added 6V6 and 6Q7 stages. From this section is taken the new gain control for the sound receiver. Other points to note are the positions of the added vision rejector coil and the additional 11 mc sound IF coil.

Valve Sequence

Regarding the valves shown, V1, 2, 3, 4, 5 and 7 are the original VR65's (SP61), and

V6 (the video demodulator) is mounted in the final IF coil box. The three valves indicated in the RF-26 section are the originals —two VR136 (EF54) and one VR137 (EC52). The 6V6 and 6Q7 are, of course, new stages. Finally, note the altered sequence in the coupling of the IF transformers and their associated valves: the grid of V3, for instance, is shown taken to the vision rejector coil and the IF coil originally taken to V3 now goes to the grid of V5.

The first task is to remove all the power supply components in the R.1355, if these have not already been taken out, as the space will be needed to accommodate the two new audio stages.

Then disconnect the lead from L3 to the V3 top cap and take it to the top cap connection of V5. Since this lead is a little longer it would be advisable to use a length of screened cable for the purpose.

The coil L4 tunes to 7·5 mc, but as this must now resonate at 11 mc it will be necessary to remove five turns in order to lower the inductance. A little trial-and-error adjustment may be necessary. The next step is to remove the coil L5, but as this will be used elsewhere at a new frequency of 11 mc this will need attention. It should first be modified (as was L4) to resonate at approximately 11 mc and then another winding overwound with the same number of turns. Thus the modified L5 will have two 11 mc windings, which, incidentally, should be insulated from each other by a covering of tape or other insulating material.

The cathode follower valve can then be removed as this will not be required. How-

TABLE OF VALUES

Fig. 3. Modifications to the R.1355 Section

C3 = 500 $\mu\mu$F
C4 = 500 $\mu\mu$F
C5 = 0·01 μF
C6 = 100 $\mu\mu$F
C7 = 8 μF 350 V wkg. elect.
C8 = 25 μF 25 V wkg. elect.
C9 = 0·05 μF
C10 = 25 μF 25 V wkg. elect.
R2 = 4,700 ohms
R5 = 4,700 ohms
R6 = 4,700 ohms
R7 = 100,000 ohms
R8 = 10,000 ohms
R9 = 500,000 ohms variable
R10 = 2,200 ohms
R11 = 22,000 ohms
R12 = 47,000 ohms
R13 = 1,000 ohms
R14 = 220,000 ohms
R15 = 2,200 ohms
R17 = 240 ohms
XL5 = 11 mc double wound coil on old L5 former (*see text*).

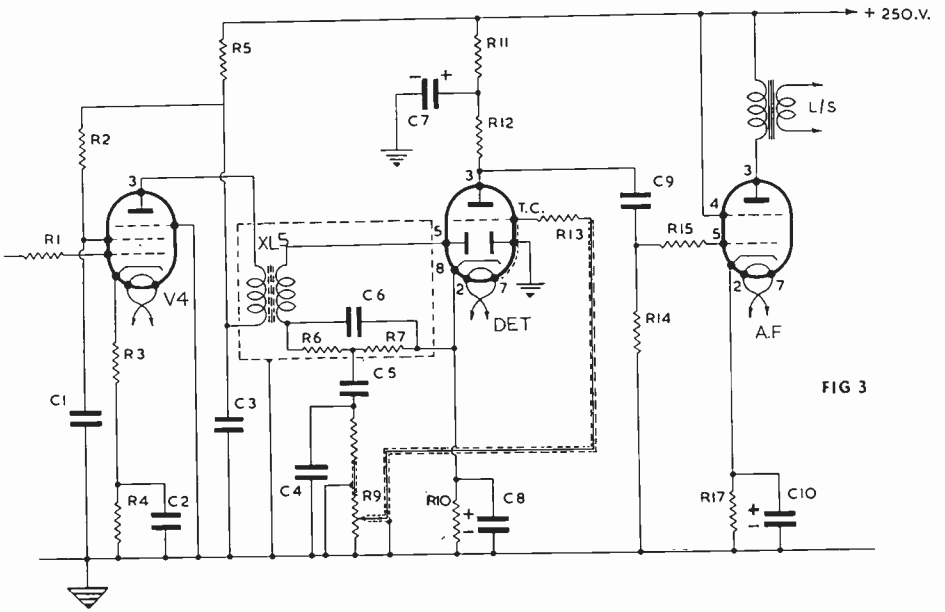


FIG 3

Fig. 3. Modifications to the R.1355 IF amplifier for sound and vision reception. All damping resistors should be removed from the IF coils in the sound section.

ever, should a noise limiter be considered necessary this could conveniently be accommodated at this position.

Little more need be done as regards the "IF strip" If the unwanted coils, resistors and condensers have not already been removed this may be done at this stage. In some of the anode circuits will be found 100,000-ohm decoupling resistors (such as, for instance, R39) ; these should be replaced by resistors of 4,700 ohms. Also the screen-grids of V3, 4 and 5 should be modified so that they are fed as in the case of V1 and V2, *i.e.*, they are taken, via a 15,000-ohm resistor, to the junction of the anode load and decoupling resistors instead of through the resistor network as originally.

Referring again to the Service circuit markings, R46 is removed and replaced by R45. Then C45 is shorted out and removed. In the anode circuit of V7, C47 is removed and replaced by a condenser of 8 μF rating. Should there be any doubt in the mind of the constructor regarding which are the unwanted components, it would probably be better to leave them in. The "ZXYN" switch, when in position "N," switches these components out of circuit.

The Sound Receiver

Turning our attention to the sound receiver, first of all increase the anode load resistor of V3 to 27,000 ohms. Also remove damping resistors from the sound IF coils ; this can be done when the coils (L4 and L5) are being modified to their new frequency of 11 mc.

The next step is to wind the vision rejector coil. This consists of 35 turns of 34 SWG wire wound on a $\frac{1}{4}$-in former which may be housed in a small metal can to avoid unwanted pick-up. The two extra stages (6V6 and 6Q7) can now be built up in the space left by the removed power supply components ; the circuit is shown in Fig. 3. The IF transformer XL5 is in actual fact the rewound L5 as previously described. A gain control can be fitted to the front panel as shown in the layout sketch of Fig. 1, using screened cable for both potentiometer leads.

The sound receiver is fed from the fourth IF valve in the original strip (V4) and the details of coupling can be clearly seen from Fig. 3.

Modifications to the RF-26 unit are perfectly straightforward and can be seen from Fig. 2. The bold lines indicate new components ; the thin outlines represent those existing. The sound IF output from L1, which with C3 resonates at 11 mc, is fed through C4, via a length of screened cable, to the spare pin on the Jones plug at the rear of the RF-26 unit (this is indicated on Fig. 2 by "X").

The output is then taken to the vision rejector circuit, comprising L2 and C6, which are contained in a screened can, and thence by means of another length of screened cable and through R5 (a grid stopper) to the top cap of V3—the third IF amplifier in the original circuit, which now becomes the first sound IF amplifier.

The New RCA Vidicon

SMALL TV PICK-UP TUBE OF UNUSUAL DESIGN

THE recently-introduced RCA industrial television system — which has been described as the smallest and simplest ever devised for non-broadcast, industrial working —is based on a remarkably small and sensitive pick-up tube known as the Vidicon.

Dr. Weimer, of RCA laboratories, gave details of the Vidicon tube in a paper read before the Institute of Radio Engineers. In describing the tube, he said that, despite its reduction in size to less than a tenth of a normal image orthicon,* the new tube is able to transmit pictures at normal lighting levels and to attain a resolution of more than 500 lines. The tube, incidentally is only 1 in. in diameter and 6 in long.

The Vidicon is simplicity itself ; it contains only an electron gun and a target, as contrasted to the gun, two-sided target, image section and electron multipliers of the large image orthicon tube. Furthermore the associated equipment is proportionately less complex.

Target Design

The difference from normal pick-up tubes is that the Vidicon operates on the principle of photo-conductivity, rather than using photo-emissive cells as in the image orthicons. With an eye to using the tube for colour television,

* *Television camera tube.*

Dr. Weimer stated that a number of materials have been found satisfactory for the photo-conductive target and that, by proper selection and processing, it is possible to make a target sensitive to the entire visible range of the spectrum.

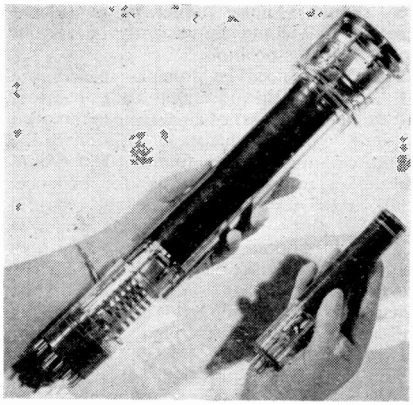
Light sensitivity obtained with photo-conductive cells is many times greater than the sensitivity which can be achieved with photo-emissive cells and theoretically it is possible to devise a photo-conductive tube ten times as sensitive as the image orthicon. Another advantage of the Vidicon is that ordinary 16 mm. motion picture lenses can be used ; these, of course, are relatively inexpensive.

Working Principles

The operation of the Vidicon is easily understandable Light—representing the elements in the picture being scanned—passes through the glass face of the tube and thence through a transparent coating on the inside of the tube which forms the signal plate The light then strikes the photo-conductive target which, on the side next to the signal plate, carries a positive charge of from 10 to 30 volts.

The inside surface of the photo-conductive target is maintained at ground potential, or zero voltage, by the scanning beam depositing electrons upon it. Because the target material is an insulator, very little current flows while it remains dark.

When light strikes the target, it increases the conductivity of the material sufficiently to permit current to flow across the target and to charge the light-struck area a volt or two positive in the $\frac{1}{30}$th of a second between successive scans. (The unit, being American, operates on a supply mains of 110 volts, 60-cycle.) As the scanning beam deposits enough electrons to neutralise this accumulated charge, it generates the video signal



The Vidicon is a new type of small pick-up tube developed by RCA for use in their industrial TV system. The comparison is the image orthicon as generally used in TV transmission.

which is taken off the metal lead ring attached to the signal plate. Finally, this signal passes by cable to the monitor-control unit where the image is viewed.

The camera in the system using the Vidicon tube is just 10 in long, 5 in high, and 3 in wide. The complete industrial system is capable of transmitting a signal over a distance of 500 ft. through a coaxial cable closed circuit, which makes it extremely useful for a wide range of industrial, scientific and miscellaneous applications. Richard C. Webb, also of RCA Laboratories, claims that the system is almost comparable with standard TV broadcasting techniques and contends that home television receivers can be adapted to use as monitors by the addition of a single tube, with accompanying resistors and condensers, at a very modest cost.

TELEVISION AT CASTLE BROMWICH

The National Radio Exhibition, this year being held at Castle Bromwich, Birmingham (from September 6-16), will again feature television in all its aspects.

A BBC studio is to be built so that visitors will be able to see "behind the scenes" items in the production and transmission of TV programmes Part of the television programmes arranged by the BBC in the exhibition studio will be radiated every day from the transmitters at Alexandra Palace and Sutton Coldfield.

Arrangements will also be made for a communal demonstration of TV reception where, after witnessing the production of the programme in the studio, visitors will be able to see the reproduction on the television screens. Special demonstration rooms are not being provided at the Exhibition, but manufacturers will be able to operate sets on their stands provided that the sets are so arranged that the screens are not visible from the gangways—a condition which is deemed necessary to avoid undue crowd congestion.

Amateur Television Transmission

BRITISH AMATEUR TELEVISION CLUB IN ACTIVE OPERATION

by **M. BARLOW (G3CVO)**

(We are very glad to welcome the British Amateur Television Club to these pages, and henceforth regular reports on Club activities, technical and otherwise, will appear under this heading. The B.A.T.C. is worthy of the support of everyone with an experimental interest in amateur television transmission, which is itself one of the newer branches of the art of Amateur Radio. The immediate aim of the B.A.T.C. is to obtain official permission for the operation of their own TV transmitters on part of one of the amateur VHF bands. In the meantime, successful closed-circuit demonstrations are being given and the B.A.T.C. is in touch with similarly interested amateur groups in other countries. The Hon. Secretary of the B.A.T.C. is M. Barlow, G3CVO, Cheyne Cottage, Dukes Wood Drive, Gerrards Cross, Bucks, and the B.A.T.C. publishes "CQ-TV" as its own Journal.—Editor.)

THIS is the first article in a series to be contributed by the British Amateur Television Club, and some notes on the Club itself may be of interest. The Club was formed about a year ago to encourage amateurs to experiment with the transmission of TV. With this end in view, contact has been established with some 40 interested operators and SWL's, many of whom have already built various items of TV equipment. The Dutch amateurs, who have been transmitting TV for some years, have given us every assistance and encouragement. It should be emphasised that the Club is not concerned with the construction of BC TV receivers, but only with transmitting equipment, and receivers for amateur TV transmission.

A Club magazine, *CQ-TV*, was started for the benefit of the active members, and negotiations were opened with the GPO for licences. Unfortunately, to date the GPO has not been able to permit the use of any of the amateur bands for TV transmission, but the matter is being pursued.

Points on Gear

Holland, Sweden and the U.S.A. are known to have amateur TV groups in action, and so, in spite of the obstacles in this country with respect to the radiation of TV signals, construction of gear has proceeded with good results. Early on, it was decided to adopt a system whereby a standard BC TV set could be used at the receiving end, thus making for economy.

Accordingly, two sets of alternative standards are in use—200-line, 50 pictures per sec., non-interlaced ; or 405-line, 25 pictures per sec., double interlaced. All other standards are decided simply by whether they will work with a BC TV receiver. It should be added that the Dutch amateur transmitting group are also using these standards, so that a Continental relay is a definite possibility.

Naturally, most of the work has been done over a closed circuit, *i.e.*, with camera and receiver connected by cable. Under these conditions, no lay observer has yet detected any difference at all in definition between our 200-line pictures and the BBC's 405-line ones. In view of this, most B.A.T.C. members are building 200-line equipment, which is also cheaper and less complex.

Camera Equipment

On the equipment side, the only camera tube available is the RCA 5527 Iconoscope ; RCA's Vidicon is not yet released over here. No British manufacturer offers any suitable tube. The 5527 is about the size of a 3-in. CRT, but runs on only a few hundred volts. It is very convenient, but costs some £22, and also requires an import licence. At the time of writing, only one member possesses an "Ike," although two more are hoping. The remainder of the members are concentrating on Intermediate Film Cameras (IFC's), which are, however, limited to the transmission of still photographs, transparencies and cine film. The theory of this device is a development of the old Flying Spot camera. The raster on the face of a scanning CRT is focussed on to a photocell, passing through the film on the way. In order to keep up the definition, very short-persistence tubes are essential for scanning—normal green trace tubes give an upper limit of about 80 lines only. Long persistence tubes with colour filters to remove the long afterglow but pass the short activating glow are being tried, as is the use of an Infra-red Image Converter with a CRT as a sort of home-made iconoscope. Nevertheless, good pictures are being obtained, and improvements are being made all the time.

Have you heard?

AS usual, with summer weather and conditions coming along, we find a wonderful divergence of opinion about DX. Some listeners say "The bands have been superb" ; others report "Practically no DX this month" ; and a few just list the stuff (some of it very nice indeed) without comment. So that's where I propose to leave the subject.

The 14 mc Set Listening Period on April 29 was quite well patronised and provided some worthwhile DX, but hardly anyone even mentioned the 28 mc period on the following morning ! So all the SLP lists refer to the 14 mc evening period. . . . Here are the prefixes that were heard by the combined effort : AR8, CE, CM/CO, CN, CT2, CX, EA8, EK, FA, FF, HC, HK, HP, KP4, LU, MI, OA, OQ, OX, PY, PZ, TI, VK, VP5, 6, 9, VQ4, VS7, XE, YS, YV, ZB1, 2 and 3V.

There are 34 different DX countries in that little lot. Add to them all the local prefixes that must have been there as well, reflect that this was all on *one* band and in the space of *one* hour chosen at random—and you will realise that the logging of 100 countries is not really a very arduous business these days.

PLUM OF THE MONTH

Lots of fortunate listeners have pushed up their total by one country owing to the activities of HC8GRC. This station was operated by HC2JR and other members of the Guayaquil Radio Club, and was situated on the Galapagos Islands, 600 miles off the coast of Ecuador. Operation continued only for a few days, and there may never again be an active station on the islands. So those that did hear him on 28 mc or 14 mc phone have, indeed, stolen a march on those that didn't.

I heard him on two or three mornings between 0700 and 0900 GMT, usually coming over at S9 plus on about 14150 kc phone. The lucky ones who own up to logging HC8GRC are SWL's Bachell, Beal, Bannister, Brooker, Corder, Good, Goulding, Hall, Hayden, Kendall, Logan, Neal, Norden, Parvin, Poppi, Singletary, Spencer, Stott, Strudwick, and Warren. They are undoubtedly going around wearing that "plus-one" smile.

CALLS HEARD

After the jam, the powder. It's time for a small-scale blitz on those Calls Heard again. This time it comes from you yourselves, rather than from your poor old Scribe. It is uncanny how many readers have suddenly decided to complain about the gradual relaxation of the limit of 25 calls. I admit it—I have been very lax over this and have not been keeping correspondents up to scratch.

Well, there it is ; many of the lists are far too long. Once upon a time, we managed to squeeze in every list received by asking you to keep them down to the "Best 25." Will you please start doing this again ? Quality, not quantity, is the cry.

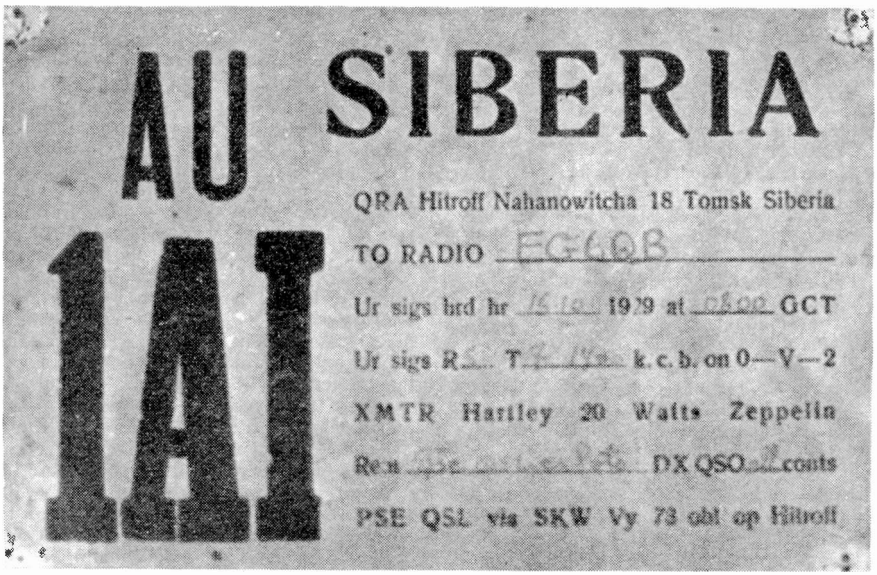
When we have the next reprint of our Calls Heard Report Forms (which should be due fairly soon), we will make them smaller in size and give spaces for only 25 calls ; furthermore, we shall give preference to those who use them, because some of these loose bits of paper are becoming shocking ! This month the largest list received (not on our form) was 13 in. by 8 in., and the smallest was 2½ in. by 1 in. Please try to keep the actual contents to roughly post-card size, whatever the size of the paper—and preferably use paper rather than post-cards.

As a final kick, may I also appeal to you *not* to sneak in odd Europeans, VE1's, W2's and the like, which have no business in the 14- and 28-mc lists ? (Well, I hope you'll agree that that was a very nice polite little blitz ? Thanks)

THE MONTH'S DX

Practically all the worthwhile DX has been on the 14- and 28-mc bands this month, so I will deal with those in some detail and then cover all the rest of the news. Rather than extract all the DX on the bands, as I have been doing, I am going to credit individual listeners with their best pieces—but only super-DX will qualify.

On *Ten* we have really had a surprisingly good time. The terrific conditions of the last few years graded themselves down, it is true, but the stuff is there at many odd times, and, as usual, is almost entirely on phone. Take the



A Russian "heard" report of 1929

list from R. S. Stott (Upminster) : CP1AS, 4DE, MS4A, VS1AX, ZP1AE, 2AA and 3AW, VP2GG and HC8GRC. All pretty nice. Then D. W. Bruce (Eltham) weighs in with CP5FB, FM7WE, HZ's, KR6's, PK's, VS7's, YS1ES, ZD1BD and a Maritime Mobile off Korea.

R. J. Line (Birmingham) mentions CR4AC, SV5UN and YN4VN ; C. Watts (Liss) logged AC3DH (doubtful ?), PK's and VS's. H. M. Graham (Harefield) found things "spasmodic" but logged plenty of DX, including KG6FAA and four new countries for the band.

A very comprehensive report on Ten from O. A. Good (Oswestry) brings in CP4DG, FD3RG, HR2RF, VK9QW, XZ's and YI2A. L. Corder (Hadleigh) mentions "FG3RG," but it must have been FD3RG, who is in Togoland and quite well known. L. C. heard HP, HR, VS1, XZ and HC8GRC. FD3RG was also heard by D. W. Waddell (Hitchin), along with CR4AC, HI6EC, KG6's, PK's, VS1's and 6's, plenty of West Indians and ZS3D.

Perhaps the best from A. H. Edgar (Newcastle) was KL7UL, because KL7's on Ten are still mighty rare birds. D. L. McLean (Yeovil), although he hasn't liked the band very much, has found it open to South America on occasions at 2300 and after ; and he has heard VQ4RF as early as 0730. Best from D. S. Kendall (Potters Bar) were FD3RG, HC8GRC, MS4A, PK's and YN4VN.

A regular watch on the band was kept by J. C. Beal (North Wembley), who says it has been in its dying throes as far as W's are concerned (although even the 6's and 7's appeared on occasions). But very often after the band had been nearly dead for the morning and afternoon, it opened up in fine style in the evening. J. C. B. was delighted to add HC8GRC and FD3RG to his total ; other nice ones were KG4AA, VP2GG and ZP3AW.

R. G. Goulding (Wrexham) remarks on the occasional "selective" conditions on the band ; for instance, on one morning JA2CO and 2HB were both S9 plus 10 dB, without another signal in sight anywhere.

Now all the foregoing refers to 28-mc phone, but L. M. Singletary (Bicester) pulled out a nice plum on CW when he logged VP8AI at 1900 CMT. His phone plum was HC8GRC ! D. G. Martin (Cheltenham) collected most of the usual stuff plus TI2OI and XE1PY—neither of them mentioned by many others. P. H. Strudwick (London, N.W.11) made hay with the Far East stations on April 8, which was good for VS6, PK4, KG6, XZ and the like. He also collected CP1AM, HR2RF and FD3RG.

E. J. Logan (Hertford) must have heard practically everything that was going on the band ; his Calls Heard list speaks for itself. A. Bannister (Manchester) thought things

were at a low ebb, but nevertheless brought in HC8GRC, VS1's and XZ.

Did anyone hear ZS7C on the band on CW last month? M. G. Whitaker (Hálifax) says he was surprised that no one mentioned him. R. A. Hawley (Goostrey) heard most of the available DX (see Calls Heard) and remarks on the strange habit that W4's have of persisting long after all the other districts have ceased to come through. MM's continued to give him much of interest.

T. Spencer (Slimbridge) heard some 43 DX countries on the band during the month but admits that you have to concentrate to get them. A nice one from C. S. Pollington (Chichester) was ZS8A, in among the Far Eastern DX. J. P. Warren (Croydon) spent time on a friend's receiver as well as his own, and seems to have heard most of the available DX, including the Galapagos !

D. K. Cocking (Farnborough) was very pleased with the DX on Ten, and after boosting his total with PK's in Java and Sumatra he was delighted to add PK6HR. K. Parvin (Thornton Heath) had a burst of luck which gave him three new countries in 1½ hours: CT3, HC8 and VP2GG. He tells us that the Americans on phone have been heard working KJ6AF, KM6AO, KX6BA, 6BH and VP1BOY—any one of whom would mightily please a lot of us if they appeared in these parts.

TWENTY-METRE DX

If the bane of 28 mc has been the unreliable conditions, 14-mc operators have been even more worried by short skip. Of the two, I should say it was the more annoying. Personally I'd sooner listen to a nice solar hiss than to a welter of S9 Italians modulating 300 per cent.

DX QTH's

AG2AG	Capt. S. L. James, Jr., H.Q. Trust APO 209, c/o PM, N.Y.C.
AR8BA	Nicola, 37 Ave. des Francais, Beirut, Lebanon.
EA6AP, EA6AM	Box 135, Palma de Mallorca, Balearic Islands.
FF8PM	Box 566, Dakar, French West Africa.
PK3 QSL's	Box 222, Soerabaja, Java.
SVØWL	USAAG, APO 206, c/o PM, N.Y.C.
TI2OHC	Box 16, San Jose, Costa Rica.
VP4LL	C. C. Ingrahm, T.L. Ltd., Pte-a-Pierre' Trinidad.
VP9KK	Dean Snyder, Navy 138, c/o FPO, N.Y.C.
YU QSL's	Box 48, Belgrade, Yugo-Slavia.
ZP3AW	L. O. MacMurdy, c/o American Embassy, Asuncion, Paraguay.

The DX has been on the band, and some of it very nice, too. If 28 mc is the phone man's paradise, there is no doubt that the CW man is better off on 14 mc. Really nice ones heard by your Scribe, for instance, have included VR1C, ZK2AA and ZS8MK. Other active ones have been CR10AA, FB8AX, 8XX and 8ZZ, KX6BA, KP6AA/KS6, FN8AD, VP8AO and a welter of PJ5's. Most of these, you will agree, are DX in anybody's language.

But the phone enthusiasts have by no means been starved. Active DX phones have included HC8GRC, several YS's, ZP's, and even the famous AC4RF ! So many reports have been received about this band that I am only going to mention those that really have something unusual. W. E. Bachell (Prittlewell) heard UAØBM quoted as "Bering Sea," which puts him in Zone 19, but see later.

Worthy of mention by D. H. Swain (Manchester) was VP7NU on phone. A. W. G. Boulton (Norwich) also scored heavily with KJ6AH on CW. Not many listeners seem to have heard HC8GRC go on to CW, but one of them was J. Neal (Birmingham). A. L. Higgins (Aberkenfig) logged ZS7S, and asks whether he would be phoney or not ?

W. J. C. Pinnell (Sidcup) scored a new one with FY7YA, and also logged VK9JC. He asks whether the Admiralty Islands count as New Guinea, to which my answer is Yes. Most of the well-known VK9's have been in Papua Territory, apart from occasional appearances on Norfolk Island, which is quite a different story. That leaves the third group, consisting of those on New Guinea or the Admiralty Islands.

H. E. Heyman (S. Holmwood) reports for the first time with a nice list of DX from 50 countries outside Europe. He is missing out on five Zones, which are Nos. 17, 18, 19, 23 and 39. Probably the most difficult of all—or what do *you* think ?

From M. G. Shortland (Sunderland) comes a nice tale of DX including ZS7C and ZS8MK on CW ; he also heard FB8AX for a new one, and we mustn't overlook KP6AA/KS6. M.G.S. would like to know whether AC4NC (1650 GMT on 14150 CW) might be genuine. Well, there *is* a genuine AC4NC but that's as far as we can go. Finally, the said M.G.S. wonders whether he is the first to score all 40 Zones with a 0-V-1 receiver ? Whether he is or not, it's mighty good going.

J. L. Hall (Croydon), as far as I can trace, was the only listener to report hearing ZK2AA. He has been very active in the mornings on about 14120 kc CW—but not exactly strong. I think he is very QRP. He has only to show his nose and dozens of W6's miraculously appear on the frequency.

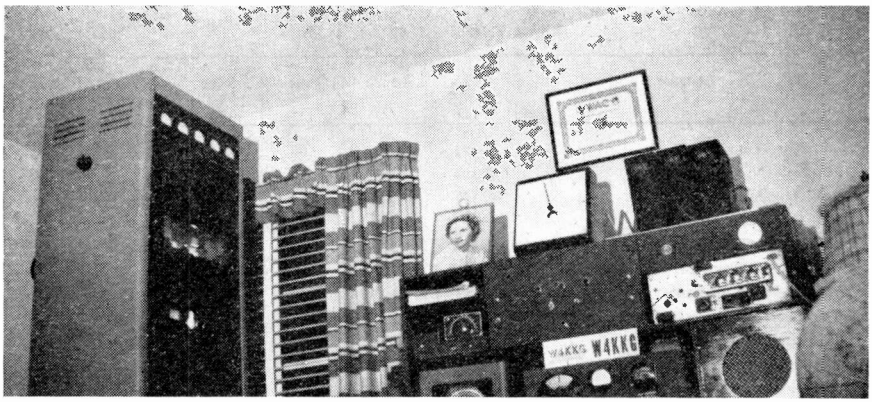
M. G. Whitaker says the band has been excellent for VK's in the breakfast hours and

FOUR-BAND DX

(STARTING JANUARY 1, 1950)

Listener	28 mc (1)	14 mc (2)	7 mc (3)	3·5 mc (4)	Total Countries (5)	Total Score ★
R. S. Stott (Upminster)	121	168	85	42	176	416
J. C. Beal (N. Wembley)	108	156	72	27	166	363
D. W. Waddell (Hitchin)	101	140	70	22	160	333
W. J. C. Pinnell (Sidcup)	105	139	62	22	152	328
D. W. Bruce (Eltham)	116	130	38	22	144	306
L. Singletary (Bicester)	93	122	48	21	142	284
N. S. Beckett (Lowestoft)	61	127	69	26	129	283
D. S. Kendall (Potters Bar)	111	111	25	27	131 (P)	274
P. H. Strudwick (London, N.3)	106	121	20	23	144 (P)	270
A. Bannister (Manchester)	101	117	28	21	131 (P)	267
R. A. Hawley (Goostrey)	91	115	42	17	132	265
E. J. Logan (Hertford)	117	93	24	20	127 (P)	254
A. M. Norden (London, N.W.11)	100	91	23	23	121 (P)	237
M. G. Whitaker (Halifax)	88	89	33	20	126	230
T. W. Jones (Birmingham)	45	114	48	12	121	219
E. Cafley (Gt. Yarmouth)	80	112	9	12	132 (P)	213
J. M. Graham (Glasgow)	78	72	30	24	110 (P)	204
F. K. Earp (London, S.W.11)	68	88	26	16	116	198
E. J. Parish (Watford)	80	85	13	17	116 (P)	195
T. Spencer (Slimbridge)	80	85	17	13	113 (P)	195
L. Corder (Hadleigh)	72	89	17	15	108 (P)	193
J. P. Warren (S. Croydon)	77	93	10	11	114 (P)	191
D. Shallcross (Derby)	80	82	15	14	113	191
H. M. Graham (Harefield)	59	88	24	15	109 (P)	186
L. Tombs (Swindon)	68	76	23	15	106 (P)	182
R. J. Line (Birmingham)	79	61	23	15	107 (P)	178
K. M. Parry (Sandwich)	81	84	4	8	114 (P)	177
M. S. Gotch (Saffron Walden)	87	59	13	14	113 (P)	173
W. Eyre (Whaley Bridge)	56	69	27	17	100	169
D. E. Tomkinson (Brighton)	53	75	19	19	96 (P)	166
P. Bysh (London, N.8)	60	66	21	18	103	165
K. Smeeton (Barnton)	32	86	35	12	101	165
B. Hummerstone (Harrow)	60	63	19	17	99	159
R. A. Fowler (Marlow)	53	62	25	16	96	156
F. A. Herridge (London, S.W.12)	33	59	38	15	76 (CW)	145
D. G. Martin (Cheltenham)	53	61	17	9	93 (P)	140
C. D. Zangerl (Dornbirn)	21	101	1	1	124 (P)	124
E. A. Parkinson (Leeds)	56	50	9	9	78 (P)	124
D. K. Cocking (Farnborough)	37	59	16	6	82 (P)	118
A. L. Higgins (Aberkenfig)	27	59	16	16	75	118
G. Murray (Newcastle)	49	38	15	15	75 (P)	117
R. T. Gabriel (Derby)	39	44	13	15	84	111
G. Musk (Blackpool)	18	69	7	14	78 (P)	108
A. O. Frearson (Birmingham)	32	46	13	7	65	98
T. Ward (Ilminster)	6	68	11	8	76 (P)	93
C. A. Naylor (Farnworth)	45	27	7	7	57 (P)	86
O. R. F. Mason (Prittlewell)	4	28	12	13	36 (P)	57
D. E. Hayes (Hoddesdon)	25	13	3	4	28 (P)	45

★ *Sum of figures in Cols.* 1, 2, 3 *and* 4.



W4KKG, Jeffersontown, Kentucky, runs a kilowatt to a pair of 4-125A's, with an SX-25 receiver. He is active on 14, 28 and 144 mc, with rotary beams for all three bands.

for South Americans after 2000; P. H. Strudwick has been winkling out the KH6's, VE8's and Far East stations. Two mentioned by A. M. Norden are VP7NL and FM7WE (both phone). J. C. Beal found the period from 0500-0800 GMT the best, and in addition to the usual VK's, ZL's and W6's he logged JA, KH6, KR6, PJ5, VK9 and HC8GRC. Other good CW loggings were FN8AD, DU1FC, UM8KAA, ZS7C and some UAØ's.

Query from A. Bannister: Is it his imagination, or are conditions bad at night if they have been good during the day, and *vice versa*? Best from D. S. Kendall: CR4AC, EA6AP, EA9AI, TG5DM, ZD2FAR—all phone. And from D. L. McLean: HP1EA, SV5UN, YS1ES and 1MM. G. C. Allen (Thornton Heath) went through nearly all the "U" prefixes and added CR8BC, FK8AB, FY7YA, KX6BA, VK1AS, VP8AO and YN1LB.

A. H. Edgar (Newcastle) suggests that they have more trouble up North with the short-skip conditions than we do in the South. As the skip lengthens and we lose the Europeans, they still get them up there in the frozen North! He also remarks on the "deluge" of Russians—he has heard them all but UJ8 and UM8 during the month. Nice ones on CW were FB8XX and FK8AG. Strangely enough D. W. Waddell *did* hear UJ8 and UM8 during the month; also plenty of UAØ's and a UL7.

O. A. Good logged quite a bit of unusual DX, such as HC4GH, HC7KD, VP7NU and HC8GRC (all 14 mc phone). CW pulled in CE7AK, FN8AD and PJ5CW and 5TR. H. M. Graham has found the month best for South and Central America and the West Indies, but ranks VS7SV as one of his "pet" stations.

To round off 14 mc, here is R. S. Stott's report: HL1CA, FK8AC, FN8AD, FY8AC and CP1JX on CW; CR4AC, ZP2BB, VP7NU and HC8GRC on phone.

THE SIBERIAN ZONES

This is a perennial headache—the whereabouts of UA9's and UAØ's with respect to the Zones 17, 18 and 19. We have already mentioned one reader who quotes UAØBM as Bering Sea, and therefore in Zone 19. J. C. Beal gives a similar report. D. G. Martin also thinks he said Zone 19. But K. Parvin said he gave his location to G2AJ as "Polar Radio Club, Amderma," which puts him in Zone 17.

The rest of the picture comes out like this: Most UA9's are in Zone 17, but those in Novosibirsk are in Zone 18. These apparently include UA9CL, 9KCA and 9KOA. UA9CC is at Sverdlovsk in Zone 17. Of the Zero's, UAØFKA, ØKFB, ØKFD, ØAC and ØKQA are known to be in Zone 19 and UAØAA, ØSI and ØUB in Zone 18. UAØBM remains a mystery. I think there is a very strong case for including the entire expanse of Siberia as one Zone. Then we could make a new fortieth one consisting of the Galapagos Islands!

THE APRIL CONTEST

Last month's "Crazy Contest"—the logging of stations with calls ending in AA, AB, AC or AD—produced some interesting logs. Easily the winner was a newcomer, *J. Jones*

(*Edinburgh*) with his list of 24 calls. Second was W. E. Bachell with a list of 21 calls. Typical DX calls extracted from both lists were FN8AD, VQ8AD, FU8AA, FK8AB, CR4AB, CR4AC, YK1AB, UJ8AA, KG6FAA, KR6AD and KV4AA.

THE MAY CONTEST

And here is the homework for those of you who want a contest this month. I offer a prize of one metaphorical kippered herring to the listener who produces the best list of 12 DX calls heard during any period of one hour throughout the week-end May 27-28, on any one band. That leaves you plenty of choice ; choose your band and stick to it, decide on your best hour and sit down and concentrate. But, remember, only the twelve best calls. Please give the exact times, the frequencies, and whether on phone or CW.

MISCELLANEOUS

Now for the General Patter left over in your many letters after the 14 mc and 28 mc DX news has been extracted therefrom. We can leave 7 mc alone except to comment on the three lists of Calls Heard on that band, all of which show some nice DX which must be the reward for lots of perseverance.

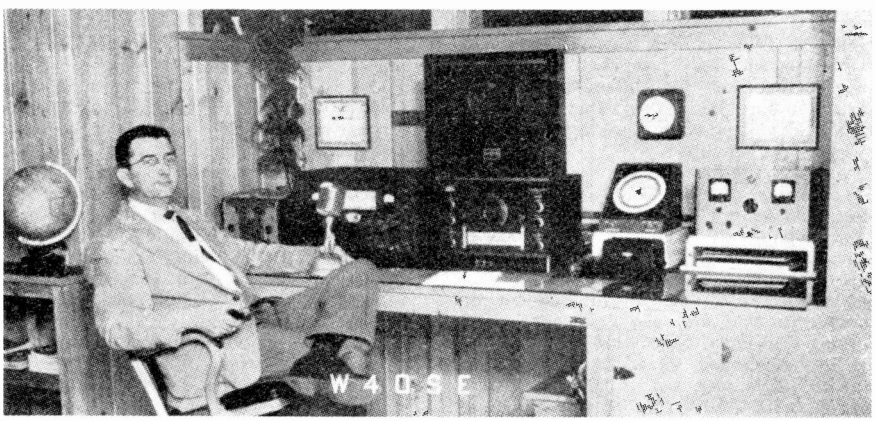
F. M. Spence (South Shields) asks whether Four-Band entries have to be confirmed, and whether there is a starting figure. The answer to both is No—just send in your score when you like. J. H. Hayden (Tunbridge Wells) heard a CE amateur say that there are one or two Chileans active in the Antarctic, using the prefix CE8—very nice chance for someone to claim a "first."

R. J. Brooker (London, S.E.24) has been sticking to 3·5 mc and finds the W's still coming in, but he doesn't like the unearthly hours one has to keep at this time of year. R. Hills (Welwyn Garden City) queries KG5DM, who must almost certainly have been TG5GM in Guatemala (14 mc at 2320). P. Short (BAOR 15) has been giving the Top Band a try, and has been very encouraged by a QSL received from a GM station. He says "As a four-month-old SWL, a cheery word from someone means more than all the DX dripping out of the phones." How true !

QUICKIES

J. Neal rightly says that FB8ZZ is on Amsterdam Island and that a new one will shortly be heard from Wallis Island . . . O. R. F. Mason (Prittlewell) mentions an amateur using the EZ prefix (Saar) on 3·5 mc. Unfortunately this is quite unofficial and not recognised as a country . . . R. J. Line queries ET2AF, heard on 14 mc at 0815 . . . J. P. Warren tells us that that peculiar call PI1RAT is genuinely issued to a Dutch Radio School and is not a pirate at all ! . . . A. M. Norden says that MP4BAB thinks VT1RF is genuine and in Kuwait, and adds that VE8SM (see last month) is in Zone 2 all right.

D. L. McLean passes the news that VP8AM is at Marguerite Bay, Antarctica, and VP8AP on Signy Island, South Orkneys. H. M. Graham heard two G's saying that a VR6 on Pitcairn is active again. He suggests as a contest idea a search for all calls containing the figure 6, excluding Europeans. That sounds pretty good to me—look out ! Further VP8 news from K. Parvin gives the following : 8AJ, Graham Land ; 8AL, Falklands ; 8AN. South Shetlands ; and all very nice to meet.



W4OSE of Gainesville, Georgia, is there on Ten and Twenty, and is anxious to make contact over the air with Norwich, England.

"ZONES HEARD" LISTING
(POST-WAR)

Listener	Zones	Countries
PHONE and CW		
M. E. Bazley (Kidderminster)	40	225
D. W. Bruce (Eltham)	40	213
A. H. Edgar (Newcastle)	40	212
O. A. Good (Oswestry)	40	212
E. Trebilcock (Victoria, Australia)	40	212
R. S. Stott (Upminster)	40	211
R. A. Hawley (Goostrey)	40	196
D. W. Waddell (Hitchin)	40	191
W. J. C. Pinnell (Sidcup)	40	190
J. C. Beal (N. Wembley)	40	181
A. W. G. Boulton (Norwich)	40	172
M. Shortland (Sunderland)	40	167
D. Rickers (Wrexham)	40	138
N. S. Beckett (Lowestoft)	39	173
R. A. Fowler (Marlow)	39	162
B. Davies (Beckenham)	39	148
L. M. Singletary (Bicester)	38	177
F. A. Herridge (London, S.W.12)	37	156
R. G. Goulding (Wrexham)	37	140
B. Hummerstone (Harrow)	37	132
K. Smeeton (Barnton)	36	154
C. J. Goddard (Coventry)	35	123
L. B. Bailey (Stockton-on-Tees)	34	117
PHONE ONLY		
E. J. Logan (Hertford)	40	196
D. W. Bruce (Eltham)	39	187
R. A. Hawley (Goostrey)	38	183
A. Bannister (Manchester)	38	173
D. S. Kendall (Potters Bar)	38	169
R. G. Poppi (Beckenham)	38	161
F. K. Earp (London, S.W.11)	38	161
M. G. Whitaker (Halifax)	38	148

Listener	Zones	Countries
PHONE ONLY		
D. L. McLean (Yeovil)	37	174
O. A. Good (Oswestry)	37	172
K. Parvin (Thornton Heath)	37	164
J. M. Graham (Glasgow)	37	154
J. C. Beal (N. Wembley)	37	150
L. Tombs (Swindon)	37	148
J. P. Warren (S. Croydon)	37	146
A. M. Norden (London, N.W.11)	37	143
G. Moses (Crewe)	37	142
R. J. Line (Birmingham)	37	139
D. Vincent (Beckenham)	37	138
K. M. Parry (Sandwich)	37	136
E. J. Parish (Watford)	36	162
D. G. Martin (Cheltenham)	36	149
M. S. Gotch (Saffron Walden)	36	134
T. E. Botham (Walsall)	36	128
B. W. Sutton (Liverpool)	36	121
D. J. Williams (Pontyberem)	36	105
R. A. Fowler (Marlow)	35	140
H. M. Graham (Harefield)	35	139
A. L. Higgins (Aberkenfig)	35	126
H. E. Hayman (S. Holmwood)	35	116
D. E. Hayes (Hoddesdon)	35	105
C. S. Pollington (Chichester)	34	146
P. Bysh (London, N.8)	34	129
A. O. Frearson (Birmingham)	34	110
C. J. Goddard (Coventry)	34	108
D. K. Cocking (Farnborough)	34	105
W. C. Askew (Melton Mowbray)	33	118
B. L. Stedman (Hawkhurst)	33	103
G. Musk (Blackpool)	31	109
G. Murray (Newcastle)	31	100
O. R. F. Mason (Prittlewell)	31	80

K. P. adds an interesting tit-bit—PY7WS is said to be active *on the Top Band.* "Queeries" from J. C. Beal : M1B on CW, LI3OB (7 mc), UN4UM (14 mc phone).

Speaking of these "queeries," A. Bannister suggests that most of them sound like flying saucers to him ! He asks whether British and Italian Somaliland count as separate countries . . . they do, for sure.

BRIGHT IDEAS

L. M. Singletary suggests that he would like to see a short article concerning the receiver and aerial layout used by some of our keener DX-ers, together with the reasons for their preference. So if you will all send me not more than *one paragraph* next month concerning your aerial system and receiver I will try to weave them all together in a short article. Regarding the aerial, please give length, height, direction and method of feeding it.

R. W. Finch passes on a note of the way he now keeps an extra log, for the benefit of others who would like to make theirs as informative as possible. The headings across his pages are : Date ; Time On ; Time Off ; Hrs. and Mins. (difference between Time On and Time Off) ; Rx Performance ; Conditions ; Adjustments and Maintenance. This, of course, is in addition to the usual detailed log of stations heard, and it forms a time-keeping and conditions check ; together with the last column he keeps a separate book for faults and cures. In a further little book R.W.F. keeps a record of the number of stations logged, divided into CW and Phone, the number of "10-Point" stations, and the number of stations "worth reporting to the *Short Wave Listener*"! These entries are made for each complete week.

J. W. Cave (Parkstone) sends an interesting series of curves drawn to show the strengths of signals received on the 28 mc band from January to April this year. Instead of trying to sum up strengths of all individual signals, he indicates a "9" for days when most signals were perfectly readable and pretty strong. All

DX signals heard were taken into account, leaving out the nearer North Americans, North Africans, Near East and, of course, all Europeans. It is a pity we cannot reproduce the chart in full, but it does show that signals from Africa and Asia were more consistent than the others, whereas those from the Americas reached greater heights and plunged to deeper depths. On the whole there did not appear to be much difference between January, February and March.

TOP BAND NEWS

G. C. Allen has now heard 66 counties and is pleased to report QSL's in the bag from EK1AO, HZ1KE and W1BB. From the latter he received two letters containing photographs and all sorts of interesting enclosures, showing that he really did appreciate the very detailed log that G. C. A. sent him.

Lots of listeners did their bit in straining their ears for the *Milford Viscount* and G. Moses, engaged in this, was startled to hear another trawler, the *Mary Haley*, asking for help after she had gone aground near the Isle of Man. He was just getting ready to raise the alarm when he heard a GD station doing all the necessary, and was most interested to hear the whole affair right through until Seaforth Radio finally gave the "all clear." G. M. very rightly suggests that SWL's should make a point of listening in the trawler bands during bad weather. They might even have a chance to help someone—and if they didn't they would still find it interesting. So I suggest that Top Band fans should make a habit of tuning down to 2050 or 2100 kc on occasions.

M. G. Whitaker, who logged W4FQI in Tennessee on 1·7 mc some time back, has now had his QSL and finds that he was using only 100 watts. In the absence of other claims he suggests that this is a DX record and that no one has heard a more distant W station on the band. There's the gauntlet, well and truly thrown down ; will anyone pick it up before next season ?

SET LISTENING PERIODS

May 26, 2200-2300 GMT, 14 mc CW and Phone.

May 27, 2200-2300 GMT, 1·7 mc CW and Phone.

June 24, 2100-2200 *GMT*, 14 *mc CW and Phone.*

June 25, 1100-1200 *GMT*, 1·7 *mc CW and Phone.*

Closing date for the next issue is ***first post, May* 31**. Please make sure of catching it, and please do go back and read what was said about Calls Heard on the first page of this commentary. Keep your letters short ; keep your claims separate ; keep your Calls Heard to the best 25 ; and you will have my blessings and best wishes. Until then, Good Hunting.

Address everything, as usual, to DX Scribe, *Short Wave Listener*, 53 Victoria Street, London, S.W.1.

CALLS HEARD

SET LISTENING PERIODS

14 mc Phone

April 29, 2200-2300 GMT

D. S. Kendall, 40 Aberdale Gardens, Potters Bar, Middlesex.

CM9AA, CN8BQ, CO7PM, FA9WU, FF8MM, HP1CM, LU1AAP, 3DH, MI3AB, OA4BG, OX3BD, PY1ACP, 1ATI, 2AUU, 2BN, 4KL, 4RJ, 6AF, 7AD, 1YV, VP6BS, 9MM, VS7SV, YV5AB, ZB1BB. (*Rx : Modified R.*1155*a.*)

K. Parvin, 98 Winterbourne Road, Thornton Heath, Surrey.

AR8BC, CO2JA, 7KK, EA8RK, FF3CN, 8MM, LU1AAP, 7BT, MI3AB, PY1ATI, 1AUF, 1GF, 4KL, TI2JC, VK3WU, VP5RS, 6BS, 9MM, VS7SV. (*Rx : S.*640.)

R. G. Poppi, 274 Kent House Road, Beckenham, Kent.

CN8EI, CO2HA, 7AK, 7PM, CT2AE, EA8AV, 8AW, 8RK, FF3CN, HK3CF, HP1PM, PY1AP, 1CA, 1RC, 2ALN, 2BN, 2PS, 7DA, LU3DH, 7CO, VK3WU, VP9MM, YV5AB, ZB1BB. (*Rx : S.*640.)

T. G. Spencer, Cherry Tree Cottage, Slimbridge, Glos.

CN8AG, 8BW, 8EO, CX3CN, FF8FM, LU1AAP, 6ES, MI3AB, OX3BD, PY1ATI, 4EL, VK2AGU, 2XG, 3RW, 3WU, VP6IS, VQ4VL, 4SC, VS7SV, YS2AG, YV5AB, ZB2A. (*Rx : Commander.*)

W. E. Bachell, 24 Hill Road, Prittlewell, Essex.

CN8AB, 8BQ, 8ED, CO7KK, CT2AE, EA8AW, 8BA, FF3CN, 8PM, HC1KN, HK4FG, HP1BR, KP4IS, LU1AAP, 9CI, MI3AB, PY1ATI, 2BN, 7EZ, 7WL, PZ1Z, VP6IS, VS7SV, YV5AB. (*Rx : Hambander.*)

S. Smith, 40 Stoneleigh Road, Kenilworth.

CN8AG, 8BO, 8ED, 8EO, LU1AAP, 6ES, PY7XC, VK2ACX, 3WU, VP6IS, VQ4VL, YV5AB, ZB1BB. (*Rx : R.*1084 *and R.*1116.)

F. M. Spence, 69 Morton Street, South Shields.

CN8ED, LU1AA, OQ5CF, PY1ATI, 7AB, PZ1Z, ZB1BB. (*Rx : R.*1155.)

Please note the following simple rules for sending in lists of Calls Heard :

28 and 14 mc : No Europeans.
No USA except W6 & W7
No VE except VE5, 6, 7 & 8.
7 mc : No Europeans.

Arrange logs in the form given here, with (*a*) prefixes in alphabetical order, but not repeated ; (*b*) numbers in numerical order *and repeated* as part of the call-sign ; (*c*) callsigns in alphabetical order. For example :— VK2GW, 3CP, 4UL, VP1AA, 6CDY, VQ3HJP, 4EJT, W6ENV, 7VY. Please underline each prefix, keep each list to one band, and, in short, make your lists exactly like those below, except that the more space you leave, the better.

R. W. Finch, 36 Bathurst Road, Ilford, Essex.

CN8BQ, HP1TM, LU1AAP, PY1RC, 7AD, PZ1Z, VP9MM. (*Rx : 3-V-*2.)

L. M. Singletary, R.A.F., Bicester, Oxon.

CM9AA, CN8AB, 8BQ, 8MI, CO2LB, 2MA, 7AX, EA8AW, 8BA, 8RK, 8RM, FF3CN, HK5ED, LU1AAP, 3EW, OA4BG, PY1ATI, 4RJ, 7AD, 7FC, 7QR, PZ1Z, TI2PR, VP6BS, 9NN, VS7SV, YS2AG, YV5AB, ZB1BB. (*Rx : Hambander.*)

R. J. Line, 68 Middle Park Road, Selly Oak, Birmingham, 29.

CN8EO, EA8XN, EK1AD, MI3AB, OX3BD, PY1AQM, 6DJ, VK2AGW, 2XG, VS7SV, ZB2A, 4X4BU. (*Rx : S.*640.)

T. R. Lamble, Chequers, Bosham, Sussex.

AR8AP, FF8MN, KP4EE, LU1ALP, VK2QR, VS7SV, XE3AB, ZB1PB.

G. Moses. 65 Railton Avenue, Crewe, Cheshire.

CN8BW, 8ED, KP4EE, LU1AAP, 3DH, 7BT, MI3AB, OA4BG, PY2BN, 4RJ, VP3LF, 6BS, 9MM VS7SV, ZB1BB, 3V8BB. (*Rx : S.*750 *and S.*640.)

E. A. Parkinson, 8 Hawthorn Drive Rodley, Leeds.

CN8ED, FF3CN, 8MM, MI3AB, PY2BN, 7AD, PZ1Z, VP6BF, VS7SV, ZB1BB. (*Rx : S.*504.)

R. Lindley, 35 Vicars Hall Lane, Boothstown, Manchester.

CN8OO, FA3GZ, 9WC, LU4CN, 6ES, 6TS, PZ1Z, VQ4VL, VS7SV, YV5BB, ZB1BB. (*Rx : R.*1155.)

H. M. Graham, 28 Park Lane, Harefield, Middx.

CN8AB, CO2CE, 2JA, 7AA, 7KK, 7PM, CX1FO, EA8AV, 8RK, FF8PM, PY1APK, 4KL, 7AD, 7EZ, PZ1Z, TI2JG, VP6IS, 9MM, VS7SV, YV5AB. (*Rx : 1-V-*1.)

P. H. Strudwick, 159 Hampstead Way, London, N.W.11.

CM9AA, CM8ET, CO2KK, 7PM, HP1CN, KP4EL, 4BJ, LU1AAP, MI3AB, PY1RC, PZ1Z, VP6BS, 9MM, 9NN, VS7SV, ZB1BB. (*Rx : S.*640.)

E. J. Logan, Linten Cottage, Fanshawe Street, Bengeo, Hertford.

CE2CL, CN8AB, 8ED, CO2LB, 2MA, EA8AP, FA9WV, HP1CL, KP4EE, LU1AAP, 1KAT, 4AC, MI3AB, OA4BG, OX3GG, PY4KL, 7AD, 7FC, VP6DS, 9II, 9MM, VS7SV, YV5AB. (*Rx BC.*342-*J.*)

GENERAL

7 mc

J. C. Beal, 24 Woodfield Avenue, North Wembley, Middlesex.

PHONE: FA8BE, ZB1AJX.

CW: CN8AQ, CO3CU, 8BL, CT3AV, HP1LO, K9AIR, KP4KD, LU3BS, 6EO, MD7WE, OX3UE, PY1AMJ, 2AC, 2APD, 4AB, UA9KCC, 9CF, 9CR, 9KWB, UF6KPA, VE1GU, 4AMD, VO6BD, W1BOR, 2KDF, 5CF, 8EYD, ØNKC. (*Rx : BC.*224-B.)

A. H. Edgar, 15 Dene Terrace, South Gosforth, Newcastle-on-Tyne, 3.

CW: CT3AB, EA8AL, FK8AB, KP4KD, 4SU, PY5AB, UF6AB, UQ2KAB, VK3IV, W1DTS, 1UAQ, 3QIF, 6GUA, 9ANK, ZB2KK, ZE1IK, ZL1AU. (*Rx : S.*640.)

N. S. Beckett, 194 Waveney Drive, Lowestoft.

CW: CO3BU, 8FH, HK4DG, 5CR, 5DH, 5HN, KP4KD, PY2APD, UG6AB, VE7VC, W5BZW, 5DF, 5KQL, 5RCR, 7CE, ØURH, UV5AL, ZB1AH. (*Rx:* 0-*V*-0.)

14 mc

D. C. Stace, Spring Creek, New Zealand.

EA2AC, KG6USA, KH6QQ, KX6BH, MB9BL, VR5GA, XF1A, YK1AA.

M. Shortland, 54 Stratford Avenue, Sunderland, Durham.

CW: AP2F, CR1ØAA, FB8AX, HL1CA, JA9CR, KG6DI, KH6VP, KP6AA/KS6, KR6CF, KX6BA, PK1HX, VK3RW, WØHBY/KG6, ZS7C, 8MK. (*Rx:* 0-*V*-1 Mains.)

R. J. Line, 68 Middle Park Road, Selly Oak, Birmingham, 29.

PHONE: AR8PP, CM2ACQ, CN8BA, 8BW, 8EO, 8MZ, EA6AP, 8AE, 8AW, 8XN, EK1AD, ET2AF, KP4AC, LU6AJ, OQ5CF, OX5BD, 3BF, PY8RJ, PZ1Z, SP1CM, 5AB, 5SG, SV5UN, TA3FAS, VK6MB, VP4LL, 6IS, UA3AM, VQ4RF, 4VO, VS7SV, XZ2SY, YN4CB, YV5AB, ZB1AB. (*Rx:* *S*.640, *R*.1155.)

R. J. White, 29 Devonshire Drive, Greenwich, London, S.E.10.

PHONE: CN8BA, DL4NH (Airborne), FA3JY, KP4AZ, LU4BC, MD7HV, PY1RC, 2BN, 4PI, 4QL, 7AD, SV5UN, ØWL, VK2ACX, VP6IS, VS7SV, YO5LC, 7WL, ZB2A. (*Rx:* *H.M.V.* 1120.)

B. L. Stedman, Gun Green, Hawkhurst, Kent.

PHONE: CN8EX, HP1GR, MD2FJ, OX3BD, 3BF, SV5UN, TI2RC, VE8SM, VK4UL, 5RN, ZC6DH. (*Rx:* *B*.2 *modified*.)

A. H. Edgar, 15 Dene Terrace, South Gosforth, Newcastle-on-Tyne, 3.

PHONE: CR6AQ, CX4LD, EA8XN, HZ1KE, OQ5AJ, SV5UN, UA9KCC, VQ4ERR, YV4BC.

CW: AP2N, CR9AG, DU1FC, FB8XX, FK8AG, HK2CK, KG6DI, KL7AA, MS4B, PK1RS, NAØAC, UG6KAA, UI8KBA, VS5CA XZ2K, ZD4AU, 9AA, ZP1VL. (*Rx:* *S*.640.)

J. L. Hall, 2 Coombe Court, Croydon, Surrey.

PHONE: HC8GRC VS6BI, 6BS, 7SV, YS1MS, 2AG, 2SA, ZD1SS, ZP7AD.

CW: AP5B, FF8JC, 8MM, FM7WE, FN8AD, FY7YA, HC8GRC, KG6DI, 6FAA, KH6BA, 6ES, 6GS, 6IJ, 6LG, 6QH, 6VP, 6ZX, KR6DB, KX6BA, OA5A, PJ5CW, 5FN, 5RE, 5RX, 5TR, PK1RI, 2ZZ, PZ1QM, VK9JC, VP8AO, VR1C, VS6AX, 6BH, VU2JK, WØHBY/KG6, YK1AH, ZK2AA, ZS7B, 7C, 8MK, 9D.

D. W. Bruce, Dunkery Road, Eltham, London, S.E.9.

PHONE: HP1CM, 1EA, 1LA, 1RD, JA2HB, KH6AO, 6GF, 6GG, 6LG, 6ZW, KL7VX, PZ1PZ, 1Z, TG9FD, UAØBM, VS1AD, 1DZ, 2BS, 2CU, 7SV, XZ2KN, YS1MS, 2AG, ZP2AE, 2BB.

CW: HZ1HZ, JA9CR, KH6SO, 6ZX, KL7AAF, 7UM, 7YJ, PJ5CW, PK2ZZ, PZ1QM, UAØAA, ØFB, ØKSB, ØSJ, VQ3JTW, VS1BJ. (*Rx:* 12-*valve* *S.H.*)

J. R. Killeen, 101 Derby Road, Hinckley, Leicestershire.

PHONE: CN8AB, 8AR, 8BQ, FF8AH, KP4EE, LU1AAP, 1CI, OA4BG, PY1RC, 2BN, 4KL, 7AD, VP6BS, 9MM, VS7SV, ZB1BB. (*Rx:* *AR*.88.)

R. W. Finch, 36 Bathurst Road, Ilford.

PHONE: CO8MP, FA3GZ, LU7HJ, OX3BD, VO2X, ZC6DH. *CW:* CE7AK, CO8AZ, CT3AN, FA8DA, FF8MM, HK6JH, KP4AZ, LU9CV, MI3FG, OX3BR, PY7VA, 8MC, VE8NX, VK3GA, 3VJ, VO6EP, VP3FJ, W7DL. (*Rx:* 3-*V*-2 *Mains*.)

J. P. Colwill, Hay Common, Launceston, Cornwall.

CE3CZ, CN8EX, 8MA, CO6BD, CT2AE, 3AK, EA6AR, 8AW, 8CA, 8RK, EK1JC, FA8CF, 9HS, HP1EA, 1LA, 1S1AEX, KH6RA, KP4ES, KZ5AA, LU1AAP, 2BS, 2ND, 3AM, 3EW, 3FU, 5AR, 5CZ 6AJ 6DAS 7BA 7BO 7CK, 7GA, MD2AC, 2FJ, 2MD, 7HV, OX3BD, OY3IGO, PY1ATI, 1ATK, 1FF, 1RC, 2BDP, 2BN, 2RK, 2WM, 3BX, 4LB, 4LZ, 7FC, SVØWB, TA3GVU, VE7CN, VK2AGW, 3XW, 4VD, VO1L, 2W, VP3HAG, 6IS, 6RS, 6TR, 7NU, 9MM, VS7SV, W6CGQ, 6QS, 6YX, YV5AB, 5BQ, ZB1BA, ZC6DH, ZL2KP, 4X4BC. (*Rx:* *McMichael Battery Model No.* 484.)

B. W. Sutton, 117 Utting Avenue East, Liverpool, 11.

PHONE: CN8AI, EK2DA, FA3JY, KP4FN, OX3BD, PY7AD SV5UN, MD2MD, VK9WW, VP1TH, 4TH, VQ4VL. VS7SV, W6TLO, XZ2SY, ZS1BV, 4X4AD. (*Rx:* 0-*V*-1, *Battery*.)

A. Bannister, 58 Demesne Road. Manchester, 16.

PHONE: AC4RF, DU1AF, HC1EJ, HH3DL, HP1OM, 1GR, 1LA, JA2BL, 2BV, KG6AE, 6AI 6EI, 6ER, 6EX, 6SF, KH6OA, OA4BG, FG9AI, UG6AB, VK9JC, VP2LH, VS1AD, 2CU, VU2LU, W2EJV/PK3, YS1GM. (*Rx:* *BC*.1147*A*.)

P. Bysh, BM/GSWL, London, W.C.1.

AR8CC, CE3CZ, CN8BA, 8BV, CO2SG, 8MP, EK1MD, FA9WU, HC1FG, HP1LA, OA4M, OY3IGO, OX3BD, 3WF, PY2HW, TA3GVU, UAØBM, ØSM, VE7ZZ, VK2WR, 3HW, 3WU, 4UL, VP3MCB, 4TB, 4TK, 5AK, 6SD, 9MM, VQ4ERR, 4SC, VS7SV, W7AJS, XE1CQ, YS1MS, ZC6DO, 6JM, ZD1SS, 3V8BB. (*Rx:* *Sx*.24.)

R. G. Poppi, 274 Kent House Road, Beckenham, Kent.

DU1VVS, HC8GRC JA2HB KG6AD, KH6GG, 6GS, 6LL, 6OA, 6QH, KL7SX, 7YY, KZ5AA, PK1RI, UAØBM, UG6AB, VK6NK, VS1AD, 2BS, 2BU 7SV, VU2BL, W4LUS/KV4, XZ2SY. (*Rx:* *S*.640.)

P. Short, Gutersloh, Germany (BSWL 3817).

PHONE: AR8BC 8PP CN8BA, 8BM, 8ED, 8EI, 8EX, 8MZ, 8OA, CO8MP, CT3AK, EA8AE, EK1AD, 1MD, FA3DS, 8CF, 9HS, 9WC, 9WD, 9WU, FF8AH, HC1FG, 2KM, 2KQ, LU1AAP, 6AJ, 7BO, MD2MD, MF2AA, MI3AB, OA4M, OQ5CF, OX3BD, PY1RC, 2AJ, 2BN, 2CK, 4KL, 7FC, 7XC, 7GC, 8IJ, 8RJ, PZ1Z, SVØWB, ØWL, ØWY, TA3AF, 3GVU, TI2HP, UA1BE, 3AM, VK2ABL, 2OQ, 2VD, VP4CK, 6IS, VQ4ERR, 4RF, 4SC, VS6BS, 7SV, W6DLN, 6FSK, 6YX, YV5AB, 5NQ, YN4CB, YO5LC, ZB1BA, 1BB, 2A, ZC6DH, 6DO, 6JM, ZL2GX, 3GX, 3V8BB, 4X4BC, 4BD, 4BL, 4BU. (*Rx:* *QRP* 0-*V*-1, 38-volt *H.T.*)

E. H. King, 2 Chapel Street, Chester Road, Hulme, Manchester, 15.

CE2CC, 3CZ, CN8DD, 8EI, 8EL, CO2SG, 8MP, EA8AW, 8PL, 8XN, EK1AD, 1DI, 1DR, 1SB, EL2A, FA3DS, HP1EA, 1LM, KP4EE, 4JM, KZ5AA, LU1AAP, 4BH, 5CI, 6AJ, 7AZ, PY1AQR, 1RC, 2CK, 2HI, 2WM, 6CO, 7FC, 8RJ, SP5AB, TA3FAS (Airborne), TI2OA, 2OE, ZB2A, ZC6JM, VK2JP. (*Rx:* 5-valve Superhet.)

R. G. Goulding, 10 Earle Street, Wrexham, Denbighshire.

PHONE: AR8BC, CE3AE, CO2SG, EA8CA, HC8GRC, HK3CQ, KP4ES, LU6AJ, MF2EE, QQ5CF, OX3BD, TI2KW, VK2XG, VP3MCB, 9MM, VQ4SC, VS7SV, YN1LB, YS1MS, YV5AO, 5CE, ZC6DH, 6JM, 4X4AD.

CW: EA7AR, 7FC, 9BB, FK2IAD, FM7WE, KZ5CG, LJ2B, MIB, UA9CQ, 9KCC, UD6AS, UF6KAF, UJ8KAA, UO5KAA, UP2KBC, VK3KE, VE8RX. (*Rx:* *Double Superhet plus Preselector*.)

P. H. Strudwick, 159 Hampstead Way, London, N.W.11.

PHONE: HC7KD, 8GRC, HK3DA, HP1AV, 1EA, 1GR, 1PM, HZ1KE, KG4AW, KH6BA, 6OA, 6OR, OA4DW, PZ1QM, SV5UN, TI2HC, 2IW, 2OE, VP3HAG, 3MCB, VQ3AA, VS6SN, XE1AC, 1GR, 2KW, YN4CB, YS1MS, 2JA. (*Rx : S.*640.)

R. S. Fraser, 26 Dirkhill Road, Bradford.

PHONE: AR8BC, EA6AP, 8AW, LU1AAP, 4BC, MI3AB, OQ5DZ, OX3BD, 3BF, PI1LC, PY4AHD, SP5AB, VK4VD, VO2W, VQ4SC, 4VL, W6TLO, YV5AB, ZA1A, 4X4AD, 4BC. (*Rx :* Battery 1-*V*-1.)

J. Neal, 217 Sladefield Road, Ward End, Birmingham, 8.

CW: CR7RF, CX6BT, EA9BB. FM7WE, HC8GRC, HK6JH, HP9FS/M, JA9CR, KG6FAA, KL7GG, KV4AA,KX6BA, OA4BG, PJ5TR, UD6AH, UG6KAA, UI8KAA, UJ8KAA, UAØVB, VP6DG, VQ4BB, YV5AE, ZD2LMF. (*Rx : S.*640.)

F. M. Spence, 69 Morton Street, South Shields.

CN8EO, 8ED, 8EX, CO2MA, CZ2BA, FA3DS, HC1FG, HK1BZ, HP1LL, KP4JF, LU1AA, 4CN, 6AJ, MD2MD, 2FS, MF2AA, OQ5CF, OX3BD, PY1ATI, 6DJ, 7AD, PZ1Z, VP3MCB, 3DM, 4VX, 5AK, 9KK, 9NN, VS7SV, YV5AB, ZB1BB, ZC6DH, 6JM. (*Rx : R.*1155.)

T. Ward, 45 Summervale, Ilminster, Somerset.

PHONE: CN8AB, EA8RK, FA9WQ, KP4JF, KZ5AA, LU1AAP, 4BH, MD2AC, OX3BD, PY7FC, VK2NS, 3AGW, 3AOW, 3WU, VP6IS, VQ3AA, 4RF, 4SV, 4VL, 4WL, VS6V1, 7SV, YK1DC, YV5AB, ZB1AH, 1AK, 1BA, 1BB, ZC6DO, ZS6JS, 4X4AD, 4AL, 4AT, 4BU. (*Rx : R.*1155.)

K. Smeeton, 36 Runcorn Road, Barnton, Cheshire.

PHONE: CE3CZ, 3FG, CX1FO, EA8AV, EL5B, FM7WE, HC2KQ, 2OL, HP1TS, I1TZ/MM, KZ5AA, PZ1Z, SV5UN, VP3HAG, 6IS, 6SD, 9HH, 9KK, VS7SV, YS1A, 1RR, YV1AA, 5AO. ZL2BT, 4AV, 4AW. (*Rx : Hambander and* 1155.*A.*)

O. R. F. Mason, Greenways, Fairlawn Gardens, Prittlewell, Essex.

PHONE: CE2CC, CN8BA, 8MZ, EA8AE, HP1AP, KH6AQ, KL7PE, OX3BD, 3BF, 3MC, TI2OA, VK4WJ, 5RN, W6FTU, 6GAL, 7MBX, XZ2KN, YV5AB, 5AG, ZC6DO, ZD1KO, 3V8AT, 8BB. (*Rx : R.*1155/*A.*)

K. M. Parry, 6 St. Bart's Road, Sandwich, Kent.

PHONE: AP2N, EA8AE, 8CO, FF3CN, HP1LA, HR1GM, KH6AQ, 6OA, KR6AF, OA4AI, 4BG PZ1Z, UA9CL, ØBM, UG6AB, VP6IS, 9D, 9MM, 9XX, VS6BS, 7SV, YK1AD, YS1MS, ZD1SS, ZE2JK, ZP2AE.

28 mc

L. M. Singletary, R.A.F., Bicester, Oxon.

PHONE: AP2N, CE2CC, 3CZ, CO2LW, 7GM, CR4AC, CX2BP, 2CN, 3AA, 4CS 5AV, FF8AH, 8CG, 8FP, HK4AM, KG4AK, 6SC, KZ5GD, 5GM. 5OY, LU4DD. MI3SI, MP4BAB, 4BAO, OA4DW, OQ5AO, 5NK, PK3JF, 4KS, PZ1QM, TI2EV, 2FG, 2RC, VP3MCB, 6JK, 6KM, 9G. VQ4BL, 4NSH, 4RF, VS6BE 7PS, 7PW, ZD2JHP, 4AC, 4AH, 4AX, ZE1JE, 2JA, 2JL, 2KH, 3JD, ZS1CI, 1EZ, 1JD, 1T, 2CI, 2EW, 6AJ, 6JF, 6KD, 6NX, 6OY, 6SC, 6VS.

CW: CE6AB, CN8MR, CT3AV, KZ5DR, LU1EK, 5BT, MI3AB, PY2NX, UA6SF, 9CC, 9CF, UI8AA, 8KAA, VP8AI, ZS5KI. (*Rx : Hambander.*)

C. Watts, St. Mary's Road, Liss, Hants.

PHONE: AC3DH, CE3AE, CX4CS, FF8AH, HZ1KE, LU4DD, OQ5AB, PK3JF, 4KS, VS1AX, 1CS, 9AH, ZD2JP, ZS6DJ. (*Rx : H.R.O.*)

J. H. Hayden, 7 Linden Gardens, Tunbridge Wells. Kent.

PHONE: AR8AB, CE2CC, 3AB, CP1AS, CX5AV, FF8FP, HC1JW, 1TM, 8GRC, HH2W, HR2RF, LU3DH, 4AL, 4CD, 4DD, 5BQ, 6BK OA4DW PY1FR, 1GQ, 2AG, 2CD, 2FW, 3CT, TI2SA, VO2P, 3X, VP2GG, 3AV, 3MCB, 4LL, 5FR, 6CP, 6LD VQ4RF ZE2KH, ZP5UN. (*Rx : S.*640.)

H. M. Graham, 28 Park Lane, Harefield, Middlesex.

PHONE: AR8PO, CN8ET, CX4CS, 5AV, HC1JW, HZ1KE, KG6FAA, LU4CD, 4DJ, 6BK, MI3SC, PY1AEB, 2AG, 4LK, 5DX, 7QD, ST2AM, SVØWB, ØWL, TI2EV, 2RC, VO2P, 3X, VP6JK, 9F, VQ4CRM, 4ERR, W2ZXN/MM, 3NKS/MM, 5AXI/MM, 5OFO/MM, ZB1AK, ZD4AC, ZS1P, 4X4AS. (*Rx :* 1-*V*-1.)

R. A. Hawley, Torview, Brookfield Crescent, Goostrey, Cheshire.

PHONE: CE2CM, 3AB, 3LX, CO2MG, CT3AK, EL2A, FF8AH, 8FP, HC1JW, 1KW, HK3BJ, KG4AO, 6FZ, 6GU, KZ5GD, 5NM, 5OY, KP4DU, LU3EJ, 4EC, 4ES, OA1F, 4DW, ST2AM, TI2EV, VP3CW, VQ2HW, 4ERR, 4NSH, W2WAT/MM, 3KIF/MM, 3NKS/MM, 5AXI/MM, 5HQP/MM, 5LRO/MM, 6YYT/MM, ØDAP/MM, ZD1SW, ZE2KH, ZP2AA. (*Rx : AR.*88 *and S.*504.)

E. J. Logan, Linten Cottage, Fanshawe Street, Bengeo, Hertford.

PHONE: AR8AB, 8BM, 8PO, CE3AB, 3AE, CM9AC, CR4AC, 6AD, 6AI, CT3AB, CX2AW, 3AA, 3DL, 4CS, EL2A, FF8AH, 8FP, HC1FG 1JW, 8GRC, HK4DF, HP1CE, HR2RF, HZ1AB, KG6SF, KZ5GD, 5NM, M1D, MP4BAO, MS4A, OA4AE, 4AO, PK1CR, 1WW, 3JF, 3LC, 3SP, 4KS, PZ1QM, TA3GVU, TI2FG, VS1AX, 1DS, 6AE, 7PS, 7PW, 9AH, VQ4AQ, 4BL, 4CRM, 4ERR, 4NSH, 4PYE, 4SC, VP2GC, 3MCB, 6GF, 6IC, 6IS, 6YB, XZ2DN, YK1AC, YV5ABB, VU2LJ, 2SWL, ZC6UNJ, ZD4AB, 4AC, 4AU, 4AX, ZE1JB, 2JJ, ZP3AW. (*Rx : BC.*342-*J*/*RFU*32.)

D. L. McLean, 9 Cedar Grove, Yeovil, Somerset.

PHONE: AP2J, AR8AB, 8BA. 8MR, 8PO, 8UN, CR4AC, FF3CN, 8AH, 8FP, 8PM, HP1MM, KG4AA, 4AK, KZ5FA, 5OY, MD7HV, MP4BAB, 4BAO, MS4A, PK1CR, 1PH. 3JF, 4KS, PZ1QM, SV5UN, VQ3AJ, 3AK, 4AQ, 4BL, 4CRM. 4ERR, 4HK, 4NSH, 4RF, 5ALT, VS1DS, 6BE, 7GD, 7PS, 7PW, 9AH, VU2LJ, 2SWL, YN4BM, YS1ES, YV4AM, ZC6UNJ, ZD2JHP. (*Rx : Sx.*28 *and AR.*88*LF.*)

C. S. Pollington, 8 Cleveland Road, Chichester, Sussex.

PHONE: HK4AM, 4EB, KG4AK, 6FZ, 6GU, 6SC, KP4IQ, KR6CK, 6CO, KZ5GM, MD7HV, OA1F, 4DW, PK3JF, 4KS, VS6AE, VU2GV, 2LJ, W2ZBA/MM, 4GPY/MM, XE2KW, ZS1CI, 5FI. 6Z. (*Rx : AR.*88.)

D. W. Waddell, 53 Orchard Road, Hitchin, Herts.

AR8AB, 8MR, 8PO, CO7GM, CR4AC, CT3AV, CX3BL, EA8MR. FD3RG, FF8FP, HC1JB, 1JW, 1OY. 1SA, HI6EC, KG6FAA, 6SC, KZ5GM, 5NM, MD7HV, MP4BAB, 4BAO, OA4AE. OQ5AO, 5CA, 5CC, 5LL, PK1CR, 1HA, 3JF, 3LC, 3SP, PZ1QM, SV5UN, VP3MCB, 5FR, 6JK, 6RD, VQ4AC, 4AQ, 4ASC, 4CRM, 4ERR, 4HK, 4NSH, 4RF, VS1AX, 1AY, 6AE, 6BF, 7GD, 7PS, 9AH, YU2AR, YV4AM, 5AN, ZE1JE, ZD4AB, 4AX, ZS3O. (*Rx : S.*640.)

J. P. Warren, 14 Francis Road, West Croydon, Surrey.

PHONE: AP2N, AR8AB, CE3AE, 3CZ, CR4AC, CT3AV, CX1NE, FF8FP, HC1JW, 2OA, 8GRC, HZ1AB, 1KE, MP4BAB, 4BAO, OQ5AB, PK3JF, 4KS, PZ1QM, SV5UN, VP9G, VQ2HC, VS9AH. YK1AC, ZE2KH. (*Rx : R.*208.)

PSE QSL

The operators listed below have informed us that they would like SWL reports on their transmissions, in accordance with the details given. All correct reports will be confirmed by QSL card. To maintain the usefulness of this section please make your reports as comprehensive as possible.

CR4AC *Box* 61, *Praia, Cape Verde Islands.* Reports on 7, 14 and 28 mc phone and CW.

CT3AD *Rua de Joao Gago* 4, *Funchal, Madeira.* 7 and 14 mc phone, VFO, 2100-2359 GMT.

CT3AN *Rua da Carreira* 197, *Funchal, Madeira.* 14 mc CW, operating 2100 GMT onwards.

DL1BB *Doellingerstr.* 37, *Munich, Germany.* 3·5, 7, 14 and 28 mc phone and CW. Modulation.

DL1EL *H. Hofner, Koditz b/Hof, Oberfr.* 13*a, Germany.* 3·5 mc CW, 1900 GMT; 7 mc CW, 2300 GMT.

DL1FK, *R. Auerbach. Nr.* 81, *Treffelstein/Opf., Germany.* 14150 kc phone, 2000-2300 GMT; 28 mc phone, 1200-1400 GMT. Modulation, QRM.

DL1FV *J. Sick, b/Rendsburg Nr.* 2, *Hamdorf, Germany.* 3·5, 7, 14 and 28 mc CW, 1800-2200 GMT.

DL1GK *Teichstr.* 19, *Kiel-Laboe, Germany.* 3·5, 7, 14 and 28 mc phone and CW, 1800-2200 GMT.

DL1MN *Spichernstr.* 11, *Hagen, Germany.* 14 and 28 mc phone and CW, 1500-2000 and 2200-2359 GMT.

DL1TB *Helmstedterstr.* 20, *Braunschweig. Germany.* 28 mc phone and CW, 1700-2100 GMT. Quality.

DL3EF *Anf der Klusc* 22, *Witzenhausen/Kassel, Germany.* 7 and 14 mc CW, 1900-2200 GMT.

DL3NG *Hauptstr.* 30, *Weiler b. Sinsheim/Elsenz, Germany.* 3·5, 7 and 14 mc CW, 1500-1800 GMT.

DL3PG *Waldweg* 28. *Fassberg, Kr. Celle, Germany.* 7, 14 and 28 mc CW, 0600-0800, 1100-1200 and 1800-2200 GMT. Tone quality and any chirp.

DL3RL *Faulhaberstr.* 1, *Traunstein Ob. Bay, Germany.* 3620 and 3698 kc phone, and 7040 and 14080 kc CW, Saturdays 1300-2000 GMT. Modulation.

DL3UJ *Moltkestr.* 26. *Bremerhaven, Germany.* 14 mc CW, 0630-0730 GMT; 3·5 mc phone and CW. 1700-2359 GMT.

DL4FY *Arnold Strasse* 1, *Landsberg/Lech, Germany.* Reports on 28 mc phone.

DL4OE, *C. Welch, Sig. Div. H.Q. EUCOM, APO.* 403, *c/o P.M., N.Y.C., U.S.A.* 14 and 28 mc phone, 1900-2100 GMT and week-ends. Quality and modulation.

DL4ZU *R. R. King,* 7801 *S.C.U., APO.* 169, *c/o P.M., N.Y.C., U.S.A.* Comparative reports, 14090 kc CW, 1800-2200 GMT.

EA8AH *P.O. Box* 215, *Santa Cruz Tenerife, Canary Islands.* 14 mc phone and CW, 1900-2359 GMT.

EK1SA *A. Simony, British P.O. Box* 57, *Tangier, Tangier Zone.* Reports on 14 mc phone.

FF8JA *A. Jeannot, Adjudant-Chef Cie. Radio, Tiaroye, Senegal, F.W.A.* 14 and 28 mc phone and CW. at 0730 and 1800-2200 GMT. Quality of modulation.

G2BFK 4 *Whitmore Road, Harrow, Middlesex.* 7015, 7032 and 7048·5 kc CW, 0630-0700 and 1900-2300 GMT. Reports outside Europe only.

G2BND 16 *Gayhurst Road, Dalston, London, E.*8. 14 mc CW and phone, evenings and weekends.

G2LS 86 *Blenheim Crescent, Luton, Beds.* 7, 14, 28 mc phone, evenings, weekends. DX reports.

G3BEX, G3GNR } 112 *Southwick Street, Southwick, Sussex.* 1·7 mc CW, 1900-2300 GMT. Over 100 miles.

G3FUW 32 *Bowling Green Road, Hinckley, Leics.* 1·8 mc CW, 2000-2200 GMT, Saturdays 2200-2359.

G3GIS *c/o* 71 *Brynland Avenue, Bristol,* 7. 1·7, 3·5 and 7 mc phone and CW, 1930-2145 GMT.

G3HAA 81 *Breckfield Road South, Liverpool,* 6. 14 and 28 mc CW, 1300-1430 and 1800 GMT.

G4FO *c/o BCM/QSL, London, W.C.*1. 7 mc phone, 0800-1000, 1100-1400 and 1500-2300 GMT.

G5QB 35 *Colville Square, London, W.*11. 145·5 mc phone, 2230-2359 GMT.

I1ARK *Via Sermide* 6, *Roma, Italy.* 7, 14 and 28 mc phone and CW, 0530-0730, 1500-1600 and 2000-2200 GMT.

JA2DD *D. Dickinson,* 71 *Sig. Serv. Bn., GHQ-FEC, APO.* 500, *c/o P.M., San Francisco, Calif., U.S.A.* 28600 kc phone, 0800-1100 GMT.

K4WAR *Radio Club, Camp Gordon, Augusta, Georgia, U.S.A.* 7157 kc CW, 2300-0300 GMT.

KH6HY *P.O. Box* 16, *Lawai, Kauai, Hawaiian Islands.* 14 mc CW, 0800-0900 and 1730-1830 GMT.

KP4JM *Box* 4151. *San Juan, Puerto Rico.* 7 and 14 mc CW, 28 mc phone, 1200-1700 GMT. Comparative reports, modulation, condx and Wx.

KZ5AC, KZ5PC } *P.O. Box* 64, *Ancon, Panama Canal Zone.* VFO-controlled 14 and 28 mc phone and CW.

LA2HC *J. Ottersen, Hafslund pr Sarpsborg, Norway.* 3·5, 7 and 14 mc phone and CW, 2100-2300 GMT.

MD7XP *P.O. Box* 451, *Nicosia, Cyprus.* 14 and 28 mc CW, 0001-0700 and 1600-2000 GMT. Condx. and RST of stations in QSO with MD7XP, if heard.

ON4HL 182 *stw. op. Brussel, Melle, O.V., Belgium.* 3·5 mc phone and CW, 1800 GMT and weekends.

ON4TU *P.O. Box* 12, *Bruges, Belgium.* Reports on 14 and 28 mc phone.

OZ2NU, *Himmerlandsgade* 1.III, *Aalborg, Denmark.* 3·5, 7 and 14 mc CW, 2000 GMT. From Wales.

PAØOA *Hacquartstraat,* 7*h, Amsterdam, Z, Holland.* 14 mc phone and CW. Modulation and tone.

PAØTV *Enterweg* 166, *Rijssen (O), Netherlands.* 3·5 and 14 mc phone, 1530-1900 GMT.

PAØZGD *de Genestetlaan* 34, *Driehuis, N.H., Netherlands.* 3·5, 7 and 14 mc phone, 1800-2000 GMT. Modulation of NB.FM phone.

PY1AHL *P.O. Box* 4022, *Rio de Janeiro, Brazil.* Reports on phone and CW operation, all bands.

PY4NS *Caixa Postal* 300, *Belo Horizonte, Minas Gerais, Brazil.* VFO-controlled phone, 2100-2359 GMT. Condx and times of best reception.

PY6CN *Eng. Silva Lima* 17, *Salvador. Bahia, Brazil.* 14 and 28 mc phone, 0900-1100, 1500-1600 GMT.

PY6DU *Fabio Pereira da Silva, Praia do Itapoan, Salvador, Bahia, Brazil.* 7 and 14 mc phone and CW, 0700-0830 and 2000-2359 GMT.

PY7BN *Pacifico dos Santos* 103, *Passandu, Recife, Pernambuco, Brazil.* 14 and 28 mc phone.

SM5GG *Wittstocksgatan* 12, *NB. Stockholm, Sweden.* 7 and 14 mc CW, 0400-0700 and 2000-0100 GMT.

SM5WN *Soedervaegen YB, Viggbyholm, Sweden.* 7 and 14 mc phone and CW, 1600-2300 GMT.

SP5SG *P.O. Box* 320, *Warsaw, Poland.* 3·5, 7 and 14 mc phone and CW, 1500-2100 GMT.

VE2AFE 27 *Aberdeen Street, Quebec City, Canada.* 14 mc phone, at 0001, 0330 and 1515 GMT.

VE3AFY 150 *Dowling Avenue, Toronto* 3, *Ontario. Canada.* VFO-controlled 14 and 28 mc CW, 1300-1700 GMT and weekends.

VE3AWL *D. Buck, Summerville Street, Carlington P.O., Ottawa, Ontario, Canada.* 28404, 28482 and 28488·8 kc phone, 1400-1800 GMT.

VE4BM 308 *Marjorie Street, Saint James, Winnipeg, Canada.* 14155-14190 kc phone, 0100-0400 and 1600-1800 GMT.

VE4EO *P.O. Box* 148, *Flin Flon, Manitoba, Canada.* 14 and 28 mc phone, weekends 1400-1800 GMT.

VK2AMB 31 *Murdoch Street, Cremorne, N.S.W., Australia.* 7 and 14 mc CW, 14 mc phone, 0800-1400 GMT.

VK3ZA 265 *Clarendon Street, South Melbourne, Australia.* Reports on 3·5, 7, 14 and 28 mc CW and NB.FM phone. Details of condx.

VQ3SS *P.O. Box* 457, *Dar-es-Salaam, Tanganyika,* 7, 14 and 28 mc phone and CW. 1600-2000 GMT. Comparative reports.
VQ5AI *C. Jackson, R.A.F., Masindi, Uganda,* 14 mc phone and CW. 1900-2200 GMT. Speech quality.
W1DBS 11 *Dwight Court, New Britain, Conn., U.S.A.* 3·5, 7 and 14 mc phone and CW, 0500-1100 GMT.
W1RGY 284 *Ash Street, Waltham,* 54, *Mass., U.S.A.* 28057 and 28088 kc CW, 1230-1400, 1630-1900 and 2130-2330 GMT.
W2KSN 17 *Nunda Avenue, Jersey City, N.J., U.S.A.* 14 mc phone, 1700-2200 GMT. Comparative reports.
W2LBK *J. Kugler, Brookside Drive, Port Washington. N.Y., U.S.A.* VFO-controlled 3890 kc phone. 2300 GMT. Comparative reports.
W3DLI 166 *Aluminium City Terrace, New Kensington. Pa., U.S.A.* 7 mc CW, 0001-1200 GMT.
W3LMM 6214 *Hampton Street, Pittsburgh,* 6, *Pa.. U.S.A.* 3·5, 14 and 28 mc phone and CW. 0001-0400 GMT, and at weekends 1700-2200 GMT.
W3ORU 5031 *Bond Avenue, Drexel Hill. Pa., U.S.A.* 7 mc CW, 2200-0700 GMT. Comparative reports.
W3QWW 423 *Parkwood Road, Pittsburgh, Pa., U.S.A.* 27 and 28 mc phone, 1300-2000 GMT, Wed. and Sun.
W4CPG, 402 *W. Pear Street, Lakeland, Fla., U.S.A.* 3·9-3·91, 14 and 28 mc phone, 2300-0300 GMT.
W4HRR 2555 *Washington Road, Augusta, Ga., U.S.A.* Reports on 14 and 28 mc phone.
W4LF 1604 *Market Street, Jacksonville, Fla., U.S.A.* 14002-14010 kc CW, 1000-1500 GMT.
W4NGP 1301 *Gunby Avenue, Tampa,* 6, *Fla., U.S.A.* 7 and 14 mc CW, 0100-0600 and 2100-2300 GMT.
W6BUN 13824 *Valerio Street, Van Nuys, Calif., U.S.A.* 27 and 28 mc phone, 1500-2100 GMT.
W7LEB 1319 *North 7th Street, Boise, Idaho, U.S.A.* 28·6 mc phone, 1300-1900 GMT.
W8BEP 432 *Gros Cap Avenue, Sault Ste. Marie, Mich., U.S.A.* 7180 kc phone and CW, evenings; 28 and 29 mc phone and CW, weekends.
W8BLB 10321 *Halcyon Drive, Palma Heights, Ohio, U.S.A.* Reports on 28 mc phone.
W8DMJ *F. Williams, RFD.* 4, *Kent Munroe Falls Road, Kent, Ohio, U.S.A.* 28535 kc phone.
W8WWK 873 *Prospect Road, Ashtabula, Ohio, U.S.A.* Mobile on 27225, 28700, 28851 and 29307 kc phone, 1500-1700 GMT.
W8YHO 1368 *Roslyn Avenue, Akron,* 2, *Ohio, U.S.A.* 28 mc phone and CW, weekends 1300-1800 GMT. Comparative reports and modulation quality.
W9FEI *Box* 330, *Angola, Indiana, U.S.A.* 14 and 28-30 mc phone, 1330-1430 GMT.
W9ZUL 5920 *Lincoln Ave., Morton Grove, Ill., U.S.A.* 28 mc phone, weekends. Comparative reports.
WØIKG 915 *Douglas Street, Omaha, Nebr., U.S.A.* 14284 and 28568 kc phone, 0730-0830, 1015-1030, 1100-1130 and 1500-1630 GMT.
WØTEX 4348 *North 37th Street, Omaha, Nebr., U.S.A.* 14014, 14034, 14064, 14100, 14132 and 14146 kc CW, at 0200 GMT.
XE1QB } *Arcos Belem* 13, *Mexico,* 1, *D.F., Mexico.*
XE1SA } 7000, 7010, 7020, 7040, 14126, 14132 kc CW, 14184, 14308, 14330, 28372, 28454, 28485 kc phone, 0200-0500 GMT. Keying and modulation.
YN4CB *Christian Brothers, Colegio San Jose, Bluefields, Nicaragua.* 14154, 14171, 14180, 14187, 14198, 14260, 14308 and 14320 kc phone, 0600-2300 GMT.
YS1RR *P.O. Box* 323, *San Salvador, Salvador.* Reports on VFO-controlled phone.
ZS2CR } 318 *Cape Road, Porth Elizabeth, S. Africa.*
ZS2EC } 14 mc phone and CW, 1600-2200 GMT.
ZS5JN 137 *Moore Road, Durban, Natal, S. Africa.* Stability of 7 and 14 mc CW, 1500-2000 GMT.
4X4AF *E. Blegun, Hazaltim Street, Ramat-Gan, Israel.* Stability of 14 mc CW and phone.

THE VHF END

by **A. A. MAWSE**

The 4-Over-4 Beam— Some Seventycem Results— Individual Reports— Calls Heard and The "Best Ten"

FIRST of all this month, here are the details of that 4-over-4 beam, frequently mentioned in this column, for fuller details of which there have been numerous requests. The two beams are mounted one above the other, and in each case the dimensions are :—

Reflector	**40 in.**
Driven Element	**37½ in.**
1st Director	**36 in.**
2nd Director	**36 in.**

The spacings between elements are :—

Reflector/Driven Element ..	**16 in.**
Driven Element/1st Director	**24 in.**
1st Director/2nd Director ..	**27 in.**

These are the original measurements given in the September 1949 issue of *Short Wave Listener*. The tubing used is ¼-in. dural, and the booms are of 1-in. tube.

The vertical spacing between these two beams is 40 inches, and the accompanying diagram shows the driven element, AB, of the upper beam, and the driven element, HL, of the lower beam. The sections EF and FG are made of 300-ohm ribbon feeder and, at their junction F, they also join with the 300-ohm feeder to the receiver. EF and FG are each made an electrical quarter-wave long. For the ribbon feeder used this works out at 16½ in. It is important that these lengths be correct as the whole system depends on the quarter-wave transformer effect so obtained. If the impedance at E and G is, in each case, 150 ohms, then a quarter-wave length of 300-ohm line will transform it to 600 ohms, and hence both these sections, EF and GF, present an impedance of 600 ohms at F, and in parallel match into the 300-ohm ribbon to the receiver.

It is now only necessary to match the driven elements into the feeder at the 150-ohm points E and G, and this is done by a Y-match method. The feeder between these points and the element is fanned out to find the correct tapping points on the element. Approximate dimensions are as follows :—

CE, DE, GJ and GK each	**5 in.**
CD and JK each	**6½ in.**

If a suitable field strength meter is available, an experimental check on these lengths for optimum performance is advised, but if not, then it can be assumed with reasonable confidence that the figures quoted will give a satisfactory performance.

To those who already have a single-tier beam in operation, it is pointed out that the gain due to this stacking is unlikely to exceed about 3 dB—so do not expect it to bring that S3 signal up to S9 !

Seventycems

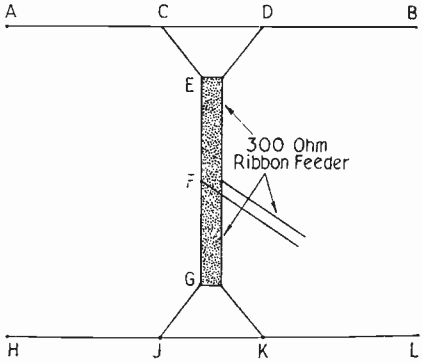
A. W. Blandford (Mitcham) has been listening on 70 cm and has succeeded in hearing G2FKZ, G4CG, G5DT and G5PY. His location is only 60 feet above sea level, so this is good going. Activity on the part of the Tx men continues well on the increase and amongst those operating on 435 mc regularly, and obtaining results are colleague G2XC (Portsmouth), G6LK (Cranleigh) and G5TP (Henley). G2XC on 435·86 mc is in regular contact with G6LK on 435·2 mc. The distance is 32 miles and there is a 700-ft. hill in between them. Signal strengths are S6 on CW with some fading. G2XC has also worked G3EJL (Southampton) and heard G3BHS (Eastleigh) and G3DEP (Ryde), while G6LK has heard G5TP. All this should serve as further encouragement to listeners to get going on the band. G2XC comments that once one realises the type of circuit wanted, the construction and setting up of a 70-cm. converter is considerably simpler than the 2-metre job ! Your conductor would commend, for your serious attention, the circuits described by G5BY and G3EJL in the May and (forthcoming) June issues respectively of *Short Wave Magazine*. Although the latter uses crystal control for the oscillator section, a satisfactory converter can be made with a self-excited oscillator in conjunction with the mixer circuit described by G3EJL. The oscillator can be a 9002 tunable from 140 to 143 mc, when enough third harmonic injection will be obtained to give an IF of around 10 mc.

Station News

Conditions generally have been disappointing on two metres, although there have been periods of good activity to compensate. E. A. Lomax (Bolton) has twice erected a "City

Slicker" aerial (four folded dipoles stacked), the gales blowing it down the first time. This beam, in the first place, was made to the dimensions given in the original *QST* description, but on the second erection some adjustments were tried and 37½ in. was found to give a better performance than the original 38 in. for the elements. The spacing between the elements was made 51½ in. He has constructed his elements of ¼-in. copper tube, each in one piece, and clamped them to the metal mast. If there is a demand for further details of this array, we should be glad to give them in a future issue. E.A.L. feels it is working well and is just waiting for a spell of reasonable conditions so that he can give a verdict on it.

A. L. Mynett (Wembley) has not yet noticed the promised improvement in either conditions or activity, and feels that snowstorms and DX just don't go together ! Many of his regular 150-milers have been heard only rarely during April, and have then been usually weak and fading. He has added a second Yagi below his first and says it appears to give 4 or 5 dB gain. He has also put up a 16-element colinear stack for 70 cm. Good work, A.J.M. ! Now get that 70-cm Rx under way ! There are quite a number of South Coast stations who would be delighted to get a report from the London area on the Seventycem band ! On Two, A.L.M's best days were April 6 (heard



Method of feeding the 4-over-4 beam for two-metre operation. This design is discussed in the text.

16 stations over 50 miles), April 22 and 23. Amongst the more exciting stuff in his log he mentions G3AKU (Hunts.), and G3DIV/A (Eastbourne).

P. J. Towgood (Bournemouth) thinks he must have chosen the wrong times to listen during the past month, although he did manage to log G2CPL (Lowestoft) at long last. His location near Hurn Airport causes him quite a bit of trouble with flutter fading. He has

TWO-METRE CALLS HEARD

E. A. Lomax, 28 Welbeck Road, Bolton, Lancs.

G2HCG, 2OI, 3AHT, 3AOO, 3BW, 3CXD, 3DA, 3EHY, 3ENS, 3GMX, 4LU, 5CP, 5RW, 6NB, 8SB, GW2ADZ. (*April* 1-30. *6J6 to AR*88. 10 *m. folded dipole and "City Slicker"* 40 *feet high.*)

J. E. Harman, 10 Royal Sussex Crescent, Eastbourne, Sussex.

G2AFV, 2AOL, 3CIW, 2CPL, 2FJD, 2KF, 2MV, 2NH, 2UJ, 2WJ, 2WS, 2XS, 2YL, 3ANB, 3BLP, 3CGQ, 3DAH, 3ENS, 3EYV, 3FD, 3FIJ, 3FXG, 3GNF, 3GSE, 3WW, 4AU, 4HT, 4KD, 4MW, 5IB, 5LK, 5MR, 5UD, 5VD, 6CB, 6LL, 6LO, 6NB, 6UH, 6WU, 6XM, 6YP, 8IP, 8KZ, 8SK, 8VR, F3LQ, 8AA, 8GH, 8LO, 8NW, 8OL, 8QL, 9DI, 9FT, ON4HN, 4IF, 4YV, PAØPN. (*April-May* 3. *"Short Wave Listener" wide spaced beam,* 30 *feet high. 6J6 pre-amp., EF*54 *RF, EF*54 *mixer,* 9002 *osc.*)

F. W. Hattemore, 75 Parchment Street, Winchester, Hants

G2BMZ, 2DSW, 3ABH, 3BHS 3DEP, 3EJL, 3ESS, 3RI. (*Rx : Eddystone Converter into R*1116*A on* 10 *mc. Aerial : Single dipole. April* 6-22.)

W. Poynter, Woodend, Oakwood Road, Bricket Wood, St. Albans.

PHONE only : G2AJ, 2AK, 2MB, 3BLP, 4HT, 4KD, 8QC. (*Rx : 0-V-0, EC*52. *Aerial : Half-wave dipole,* 12 *ft. high. April* 22-23.)

A. L. Mynett, 29 Sunleigh Road, Alperton, Wembley, Middlesex.

50-75 miles : G2FJD, 2IC, 2JU, 2XC, 3AFV, 3AKU, 3BHS, 3DAH, 3DEP, 3DIV/A, 3EBW, 3EJL, 3FAN, 3FIJ, 3WW, 4MW, 8DM/A, 8IL, 8LY.

75-100 miles : G2FNW, 2XS, 3ABA, 3ABH, 3CFR, 3ENS, 5UD.

100-150 miles : G2CPL, 2IQ, 3EHY, 3FMO, GW3EJM.

150-200 miles : G2BMZ, 2OI, 3AUS, 5BY, GW2ADZ. (*Rx : 6J6 converter. Aerial : Two* 3*-ele. very wide spaced Yagis stacked, at* 35 *feet. Location* 100 *feet a.s.l. March* 30-*April* 30.)

L. A. Whitmill, 762 Kenton Lane, Harrow Weald, Middlesex.

G2AFB, 2AHP, 2ANT, 2AJ, 2BMI, 2BN, 2CIW, 2DD, 2DRH, 2FAB, 2FNW, 2FPP, 2MR, 2MV, 2NH, 2WS, 2XC, 2XM, 2YL, 3AIU, 3AZJ, 3BLP, 3BOB, 3CGQ, 3CVO, 3CZY, 3DEP, 3EEI, 3EHY, 3EYV, 3FD, 3FFU, 3FXG, 3GBO, 3GHS, 3GSE, 3QK, 3SM, 4CG, 4CJ, 4DC, 4FC, 4HT, 4KD, 5AA, 5CD, 5DT, 5LK, 5MA, 5PY, 5QB, 5RD, 5TP, 5UM, 5WP, 6BO, 6CB, 6JK, 6KB, 6LK, 6LL, 6LO, 6LR, 6NB, 6UH, 6VX, 6XM, 6YP, 8GX, 8IP, 8KZ, 8LG, 8NB, 8SY, 8SM, 8TB. (*Rx : RF*27 *Unit into S*640. 3*-element beam. March* 26-*April* 30.)

P. J. Towgood, 6 Guildhall Road, Southbourne, Bournemouth, Hants.

PHONE and CW: **25-50 miles :** G2XC, 8LY.

50-100 miles : G2AHP, 3BLP, 3EHY, 4GR, 4KD, 5MA, 6LK, 6NB, 6UH, 6VX, 6XM, 8IP, 8LY, 8QC.

150-200 miles : G2CPL, 2OI, 2XS. (*Rx : P.P. 6J6 RF, 6J6 mixer,* 2 x 604 *osc., into xtal controlled* 9 *mc converter, into* 1·6 *mc IF/AF amp. Aerial :* 4*-ele. c.s. beam* 108 *ft. a.s.l. All heard April* 22-*May* 2.)

gathered together the parts for his 70-cm. converter and hopes to start construction shortly. L. A. Whitmell (Harrow Weald) found activity on the increase though not much DX, only G3DEP (Ryde) and G3EHY (Banwell). He has incorporated a 6AK5 in his RF27 unit and finds it a great improvement, and in addition has added a neutralised 6J6 triode pre-amplifier, using the second half of the valve as neutralising capacity. He has now logged 141 stations on two metres.

A newcomer to this column is F. W. Hattemore (Winchester) whose location is far from ideal for VHF work. He is right in the centre of the city, which is itself surrounded by hills. In spite of this he has heard a number of signals and appeals for more signing on CW after 'phone transmissions. This has been passed to G2XC, of "VHF Bands," for possible action. F.W.H.'s 2-metre line-up is an Eddystone converter feeding into an R1116A on 10 mc, while the aerial is a single dipole, fed with 80-ohm line. A converter for 430 mc is under construction and will feed into an RF26 on 56 mc and then into the R1116A.

R. John (Swansea) has been hearing G8IL (Salisbury) quite well on his outdoor beam. He enquires how he can fix two 4-element beams to his mast—an all-metal job. There is no objection to bolting both beams, which can have metal booms, to the mast. No insulators are required. As the potential of both booms will be the same at their point of contact with the mast, no currents will flow in the mast itself.

A. W. Blandford (Mitcham) found April 6, 7, 11, 21 and 29 the best days of the month. Among his best DX were GW3EJM and G2XS. W. Poynter (St. Albans) feels "somewhat guilty" about using a super-regen. on two metres, but, as he says, he has at least found the band and heard signals. We hope he will now be encouraged to build something a little more ambitious, and come to enjoy the pleasures of VHF still more. The first signal he heard was G3BLP who was S9 on phone before the aerial was coupled to the receiver.

P. Finn (Iver) has been trying a 67-ft. wire on Two and obtaining some good results For stations off the ends of the wire, he finds an increase of 2 to 3 S-points, and the most effective angle of pick-up seems to be about 30 deg. from the line of the wire (Theory indicates that for a wire 10 wavelengths long the direction of maximum pick-up is about 16 deg. from the wire, and in those directions a gain of about 7 dB over a half-wave aerial is obtained.) Recent observations by P.F show him that there are at least 30 stations on Two within about 30 miles of London.

J. E. Harman (Eastbourne) produces a log showing that there is considerable continental activity on two metres. The *Short Wave Listener* very wide spaced beam continues to do well. He has it up at 30 feet, and proposes adding the second tier shortly.

BEST TEN OF THE MONTH

Operator	Location	Total Miles	Best DX (Miles)
E. A. LOMAX	Bolton	1,550	155
P. J. TOWGOOD	Bournemouth	1,487	194
A. L. MYNETT	Wembley	1,076	181
A. W. BLANDFORD	Mitcham	700	130

For this monthly contest send details of the best ten DX signals heard on two metres. Signals may be logged once per day (0600-0600). Give date, time and details of all signals.

The Best Ten

E. A Lomax maintains his position as head of the best ten of the month table, by scoring G3EHY 10 times, the distance being 155 miles. P. J. Towgood had G2CPL at 194 miles for his best DX, while A. L. Mynett logged G5BY at 181 miles. GW3EJM provided A. W. Blandford with his greatest distance.

In Conclusion

The Counties table has been omitted again this month, but its disappearance is only temporary. To ensure its correctness next month when, space permitting, it will reappear, will all readers give their up-to-date score when writing their monthly report. The address is, *Short Wave Listener & Television Review*, 53 Victoria Street, London, S.W.1, and the latest date, June 1, for reports to appear in the next issue.

WORLD WIDE RECEPTION OF SHORT WAVE PROGRAMMES

DX *broadcast*

MONTHLY COMMENT BY R. H. GREENLAND, B.Sc.

We are indebted to G. Sewell (Bolton, Lancs) for forwarding the latest list of broadcasting stations in Canada ; it is a 39-page booklet issued by the Controller of Radio, Department of Transport, Ottawa. The CBC has 26 amplitude modulated short wave broadcasting stations, and there are eight additional stations which are privately owned. The CBC has five frequency modulated broadcasting stations, but privately owned FM broadcasters operating between 88·3 and 106·9 mc number no less than twenty

We have just received a fine card in red, white and blue from ZNB, Mafeking, Bechuanaland Protectorate, now operating on 8240 kc with a power of 500 watts ; the verification was for the first report from England for this new channel. The Chief Announcer, Wally Coombs, writes : "With our winter approaching we shall in the near future go back to 5·9 megs till the summer comes round again."

A letter verification from Captain Van de Mewe, acting for the Director-General of the South African Air Force, Air Directorate, P.O. Voortrekkerhoogte, Transvaal, confirms our reception of Radio ZRB, the South African Air Force Broadcasting Station on 9110 kc. The transmitter used is an R.C.A. Type AVT-22 with power output of 5 kW ; and there are three studios, one at the Air Directorate itself, one at the Union's Meteorological Headquarters and the main studio at the Air Directorate Wireless Station. A feature of the service is the frequent transmission of Aeromets received from Bloemfontein, Bulawayo, Durban, East London, Germiston, Kimberley, Port Elizabeth, Windhoek and other airfields.

South America

The S.R.I. English broadcasts have been retimed, and according to D. K. Cocking (Farnborough, Kent) they are as follows : 1655-1800 and 1855-2100 directed to Europe over LRS, 11880 kc, and 0210-0600 directed to North America over LRY, 9455 kc. C. P. Turner (Crewe) says that the first broadcast is swamped by Pakistan's English programme on 11890 kc at 1700., LSD9, 18115 kc is a new one, according to R. Iball (Langold, Worksop), who logged it at 2215 radiating music by the Buenos Aires Symphony Orchestra. J. C. Catch (South Shields) says that the Mendoza transmitter LRM, 6180 kc, was audible at 2340 on April 9 with chimes and call for "Radio El Mundo." J.C.C. also gives us CE622, Santiago de Chile, 6223 kc, logged 2345-0025, the call at 0001 being : "Radio Sociedad Nacional de Mineria" (National Mining Society) ; and he has received a reply from CXA13, Radio Carve, Montevideo, 6155 kc, just ten days after despatching his report ! Another Uruguay station is CXA19, 11835 kc, heard from 2200 onwards by R. A. Savill (Sevenoaks, Kent) despite interference from Moscow and Delhi after 2315.

The Republic of Colombia has been prominent of late. Dr. J. Kyle (Brocklamont, Co. Antrim) has logged HJFK, La Voz Amiga, Pereira, 6103 kc, at good strength with "Cornish Rhapsody" at 0230, and HJEX, Radio Pacifico, Cali, 6054 kc, with a programme entitled "Hit Parade" at 0110. Further, HJCX, La Voz de Colombia, Bogota, 6018 kc, was S8 with Bach music at 0100 on Good Friday, and HJDE, Medellin, 6145 kc, was S9 and obliterating CXA19 at 0140 with popular music, including "Begin the Beguine," which is a great favourite with South Americans at the moment, according to J. K. R. Iball heard HJDE with frequent mention of "La Voz de Antioquia" after 0130 on April 13, and HJCT, Bogota, 11680 kc, at 2245 on March 29, with a talk and slogan : "Radiodifusora Nacional en Bogota, Colombia." J. C. Catch noted HJEX at 0200 on April 2 with the direction : "Radio Pacifico."

C. P. Turner has been listening to HCJB, Quito, 5995 kc, early mornings, 0400 to 0530. Brazil, as usual, has much to offer. PRL5, 11940 kc, is a new station with an excellent signal after 2200 with features which are, according to R. A. Savill and J. M. Simpson (Hayes, Middx), entirely cultural ; R. Iball

ALL TIMES GIVEN IN THIS ARTICLE ARE GMT EXCEPT WHERE STATED

TABULATED SCHEDULES

I. Radio ZRB—South African Air Force Broadcasting Station. P. O. Odonata, District of Pretoria, Transvaal, South Africa.

Frequency : 9110 kc. Power : 5 kw.

Reports to : Director-General of Air Force, Air Directorate, P.O. Voortrekkerhoogte, Pretoria, South Africa.

Schedule : Mon., Tues., Thurs., Fri. :—0445-1515.
Wed., Sat :— 0445-1030.
No transmission on Sundays or Public Holidays.
0445. Opening Announcement.
Aeromets : Weather actuals and upperwind reports at 0500,0700, 0900, 1100, 1500.
Ranad : Airfield and Radio Aids Serviceability reports at 0600, 0800, 1000, 1200, 1400.
Marimet : Meteorological Observations made at sea at 0730.
Ionispheric Predictions at 1300.
Filler Programmes : S.A.B.C. 0445-0630, 0800-1230, 1400-Close.

A recorded light music programme is broadcast during hours when the S.A.B.C. is not operating.

II. Overseas Broadcasting Station, Bangkok, Siam.

HS8PD, 6010 kc ; HS8PJ, 7105 kc ; HSP3, 9790 kc ; HSP5, 11720 kc ; HSJ4, 15910 kc ; 12020 kc.

0000-0100, 1200-1530 : HS8PD, HSP5, HS8PJ. (English broadcast.)
0900-1130 : HS8PD, HSP5, HSJ4, 12020 kc. (English broadcast.)

III. The Voice of France in the Far East, Saigon, Indo-China.

French Service : 6165 kc and 11830 kc.

The Voice of Viet Nam : 7263 kc and 9670 kc.

Radio Dalat : 6180 kc.
Radio Hue : 7205 kc. } Operated under Viet Nam authority.
Radio Hanoi: 6190 kc.
Radio Cambodia : 6090 kc. Under Cambodia authority.

IV. Forces Broadcasting Service, Malta Garrison.

Transmitters : Two, each using 7½ kw.

Schedule : 4965 kc : 0400-0700, 1330-2200.
7270 kc : 0400-0700, 1400-2200.
11895 kc : 0930-1330.

Suggestions welcomed and all listeners' reports acknowldged.

Address : Chief Broadcasting Officer, Malta Garrison.

V. Radio Tromso, Norway.

Transmitters : LKJ, 9540 kc, LLS, 7210 kc, LLH, 15175 kc

Weekdays : 0615-0730, 1020-1240, 1545-2200'
Saturdays : 0615-0820, 1020-1235, 1430-2200.
Sundays : 0755-1445, 1515-2215. (English : 2000-2015 over LLH.)

VI. Privately-owned Canadian Short Wave Broadcasting Stations.

CFCX, 6005 kc, 75 watts. Canadian Marconi Company, 1231 St. Catherine Street West, Montreal.
CFRX, 6070 kc, 1 kw. Rogers Radio Broadcasting Company, 37 Bloor Street West, Toronto.
CFVP, 6030 kc, 100 watts. The Voice of the Prairies Limited, Toronto General Trust Building, Calgary, Alberta.
CHNX, 6130 kc, 500 watts. The Maritime Broadcasting Company, Limited, Broadcasting House, 10 Tobin Street, Halifax, Nova Scotia.
CJCX, 6010 kc, 1 kw. Eastern Broadcasters Limited, Radio Building, 318 Charlotte Street, Sydney, Nova Scotia.
CKFX, 6080 kc, 10 watts. Western Broadcasting Company Limited, 543 Seymour Street, Vancouver, British Columbia.
CKRO, 6150 kc, 2 kw. Transcanada Communications Limited, Free Press Building, 300 Carlton Street, Winnipeg, Manitoba.
CKRX, 11720 kc, 2 kw. Transcanada Communications Limited, Free Press Building, 300 Carlton Street, Winnipeg, Manitoba.

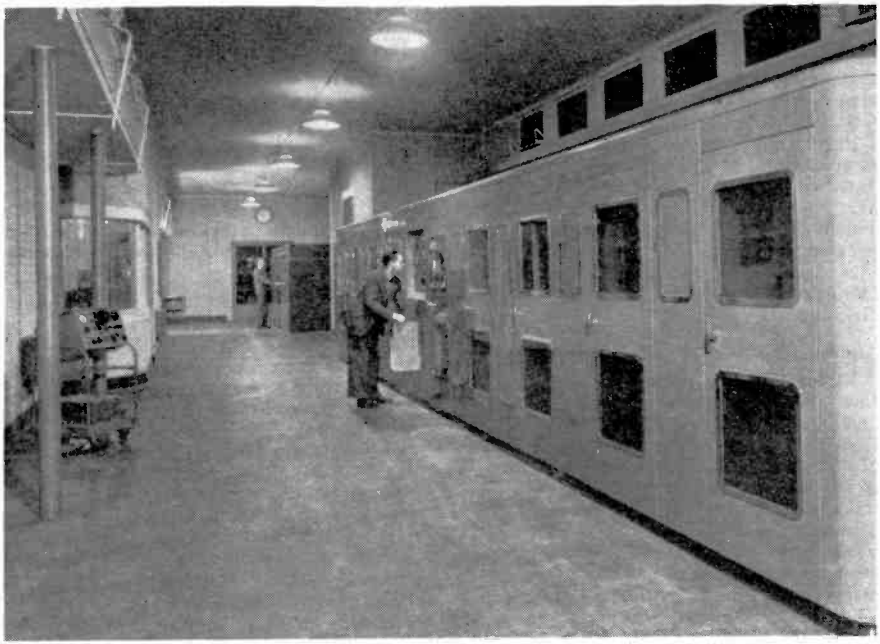
reports that the identification is made frequently and reads: "Pay-Erray-Ellay-Thinko (PRL5), Radio Ministerio de Educacao en Rio de Janeiro." R.I. also gives another unusual one on 11760 kc between 0820 and 0855 with a series of vibraphone notes and direction : "Radio Malan y Radio Nacional" at the conclusion of the period ; this may be ZYB8, Sao Paulo, on 11765 kc.

Others logged at 2130 on April 4, when the President of Brazil was making a speech, were PRL5, 11950 kc ; ZYB, 15156 kc ; PSL, 7935 kc and PRL, 9720 kc. Radio Record, 'ao Paulo, is a new one on 9590 kc, broadcasting daily, 1100-0200, and using the medium-wave call PRB9 ; the address is : Radio Record, Rua Quintilo Doclauga 22, Sao Paulo.

Central America

Dr. Kyle has been busy with Latin-Americans here. YNWA, Radio Mundial, Managua, 6464 kc, was notable with dance numbers around 0315, and an El Salvador station on 6070 kc with the slogan "Radio Victoria" has been heard at 0030 broadcasting religious music, despite interference from HORT on 6060 kc. YSUA, Radio Mil Cincuenta, San Salvador, 6050 kc, has been logged consistently at S5-7 at the same time. J. K. also tells us that COKG, Cadena Oriental de Radio, Santiago de Cuba, 8960 kc, was a clear signal with beautiful renderings of "Largo" and "Ave Maria" at 0020 on America's Good Friday ; COBZ, Radio Salas, Havana, 9026 kc, re-broadcasts the BBC Spanish programme to the West Indies at 0001, according to R. A. Savill.

The island of Haiti has 4V2S, 5951 kc, logged by J. C. Catch, with chimes and



Transmitter hall of the BBC's TV station at Sutton Coldfield showing, in the foreground, the vision transmitter.

call "Radio Port-au-Prince," at 2300 on March 30 ; R. T. Blackmore (Exeter) heard 4VRW, 10135 kc giving music from Léhar's operettas at 2330 ; the call in French followed a series of chimes and read : "Station Radiodiffusion 4VW, Port-au-Prince, Haiti." R. Iball listened to Dominican stations in the same island. HI2T, 9740 kc, was notably good at 2100 on April 1 with the direction : "Transmite La Voz de Dominicana en Trujillo, Capital de la Republica Dominicana." HI1R, 6140 kc, has been logged with rumba music at 0030 and frequent slogan : "La Voz de Fundacion" ; and HIG, 6115 kc, at 0130 gave four chimes and the call : "Radiodifusora Nacional, HIG, Republica Dominicana." "La Voz de la Profecia" on 11840 kc is a new one which broadcasts a religious programme from 0100 to 0130.

In the British West Indies, VP4RD, Port of Spain, Trinidad, 9625 kc, is the best heard station. B. R. Hamilton (Leeds, 8) spotted its sponsored Quiz programme at 2200 on April 2, and P. R. Wyman (Feltham, Middx) its BBC News as early as 2005, whilst P. Fry (Chandlers Ford, Hants) thinks that its power has been increased of late because of the very consistent signal at 2100. On April 5 at 0300 we heard ZQI, Kingston, Jamaica, 3480 kc, rebroadcasting a musical programme from the Edinburgh studios of the BBC, after which it gave a programme preview for the next day and closed with the words : "Good night to all of you until to-morrow" and the strains of the National Anthem.

North America

Elusive Hawaii has been logged again : J. C. Catch heard "American Journal" over KRHX, 11790 kc, at 1330 on April 10, and A. R. Daniel (Clifton, Bristol) spotted KRHO, 15250 kc, at 0930 with News in French. R. A. Savill logged KCBA, 21740 kc, with a clear signal and News in English together with Commentators' Digest at 2300 on April 13 ; and KNBX, 15240 kc, entertained R. T. Blackmore, with "Press Opinion U.S.A." at 2315—2330 at the identification was: "Station KNBX, San Francisco, operated by the National Broadcasting Company, broadcasting on 15·24 mc in the 19-metre band." R. Iball reports WNRE, 9350 kc, at 2115 on April 1, when a German-English programme was heard ; the direction at 2145 was : "WNRE, Bound Brook."

D. K. Cocking gives us Canada's new schedule which now is 1445-1600 (CKNC, 17820 kc, and CKCX, : 190 kc) ; 1600-2015 (CKNC and CKCS, 15320 kc) ; 2030-2300

(CKCS and CHOL, 11720 kc). R. A. Savill mentions hearing CKLO, 9630 kc, as early as 0930, when broadcasting to the S.W. Pacific area (on Sundays only), and he says that CHOL is an S9 plus signal most nights for its European transmission. C. P. Turner has received from the CBC a copy of the *Montreal Standard* with pictures celebrating the fifth year of Canadian Overseas broadcasting. Finally, R. Iball heard a sponsored Oxydol programme over CHNX, 6130 kc, after midnight, with the direction: "This is the Dominion Network of the CBC, CHNX, Halifax."

Australasia

VLG6, 15320 kc, broadcasts the Australian Inter-State programme and has been heard here regularly around 2000-2100 by D. K. Cocking. P. Fry heard the same station on March 6 with a stump-by-stump description of the last cricket Test Match between Australia and South Africa, relayed from Port Elizabeth, South Africa; and we logged VLG6 and VLA6, 15200 kc, in addition, at 0650 on April 1, with an Australian horse-racing commentary. A. R. Daniel hears VLA4, 11850 kc, broadcasting to Japan at 0830. J. M. Simpson noted VLG11, 15200 kc, with News at 0900, and the more elusive VLQ3, Brisbane, 9640 kc, also with English News at 2045.

According to *Swedish DX*, Radio Noumea, La Voix de la France dans la Pacifique, in New Caledonia, is broadcasting both on 6000 kc and 6100 kc daily.

With the advent of the lighter mornings, ZL4, Wellington, New Zealand, 15280 kc, is improving in signal strength. J. C. Catch heard them at 0945 on April 7, and C. P. Turner at 0845 on Good Friday heard Laurence Olivier reciting a passage from Hamlet. We found ZL3, 11780 kc good at 0659 on April 27 with the call of the tui, after which came the pips Time Signal, a sung anthem and the words: "This is New Zealand. Good Evening, Australia—Good Evening, The Islands—and Good evening, Good morning or Good afternoon to any other listeners who may be hearing us." Their Mail Box was just audible at 0730 (on Thursdays only), and we noted that the broadcast extends from 0700 until 1000. C. Findley (Countesthorpe, Leics.), a newcomer to our ranks, who has received twenty-five verifications, reports receiving that for ZL3 on April 6.

Africa

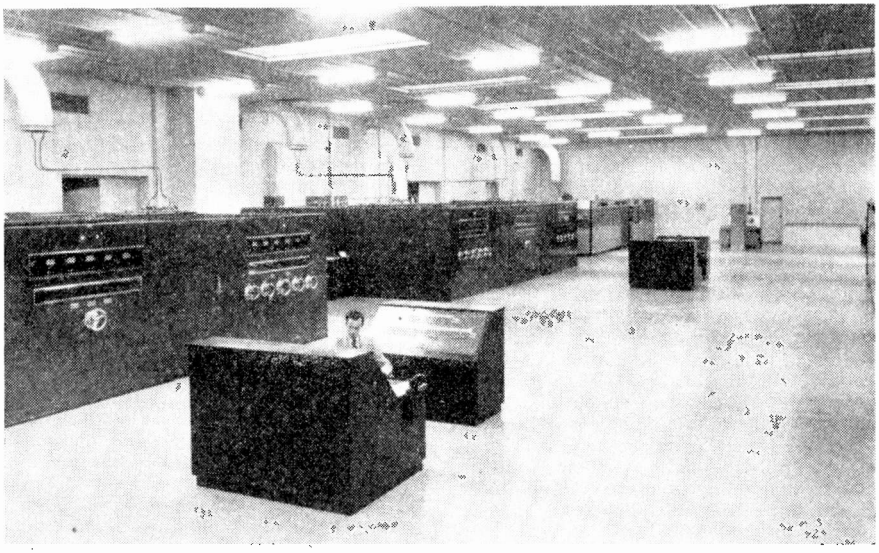
Rhodesia is again in the news. Early in the month J. C. Catch heard weak signals on 3320 kc from Salisbury, Southern Rhodesia, at 1810, when there was a News talk in English. J. M. Simpson confirms our discovery of this service on a new frequency of 4887·5 kc, but suggests the location is Lusaka, Northern Rhodesia. It announced as "Rhodesia Calling" at 1800, and stated . that another Lusaka transmitter was temporarily off the air, but would be back in operation the afternoon following. We have logged this station on numerous occasions and with the same type of announcing on alternate evenings, it sounds very much like the same programme as Salisbury, Southern Rhodesia, on 3320 kc.

On April 3 at 1830 it gave "The Story of Don Bradman," and closed at 2000 with the words: "Good Night To You All" and a shortened edition of "God Save The King." Next day the lady announcer read stock market figures before 1800, and in the local news at 1815 there were items about both the Northern and Southern Rhodesias. On April 5 we noted the BBC News at 1800, a weather forecast at 1814, and an English News compiled by the South African Press Association at 1817, sandwiched between the features already mentioned above. According to *Australian DX'ers*, ZQP Lusaka is on 3914 kc from 1400 to 1730 daily, and the address is: P.O. Box 209, Lusaka, Northern Rhodesia.

J. M. Simpson also heard ZID, Pietermaritzburg, 4878 kc, with pianoforte music at 1815, and ZRI, Johannesburg, 4895 kc, with a religious service in Dutch, at 1820. V3USE, Forest Side, Mauritius, 15075 kc, extended its schedule for half an hour with a play on April 2, closing eventually at 1730 with the National Anthem; this appears to be the practice each Sunday. VQ7LO's transmission over 4855 kc was good on March 30 when, at 1717, there was a re-broadcasting of the ceremonial made earlier that day of the presentation of the charter creating Nairobi a city.

P. R. Wyman's verification from Lourenco Marques contains the information that CR7BG operates on 15196 kc with a power of 10 kW, and he adds: "Its signals here are truly remarkable for such a moderate power." P. R. W. further hears "Radio Clube do Huambo" now on 11910 kc, with best reception before 1845. R. T. Blackmore logged a Portuguese-speaking station on 9730 kc closing with the national anthem (of Portugal) at 1830; as CR7BE on 9671 kc he is not on the air at this time, could it have been CS2MF on 9727 kc?

J. Brooker (Crawley, Sussex) mentions that Radio Brazzaville's News simply rolls in nightly at 2045 on 11970 kc, and R. A. Savill has been successful in logging the lesser known OTC3, 11670 kc, in parallel with OTC2, 9767 kc at 2155. Dr. Kyle reports hearing Radio Omdurman's English at 1730



General view of the main transmitter hall, Shepparton, Australia, housing sets operated for VLA, VLB and VLC.

(on Fridays only), in which there was a talk entitled : "Impressions on Returning to the Sudan." The International Zone of Tangier is in the news again. Radio International itself (6110 kc) has sent A. R. Daniel a view card of the town with the information that their English schedule is 1200-1230 ; J. Brooker heard Radio Africa, Tangier, 7060 kc, at 2030, with dance music and announcements in French, and M. Milne (South Woodford, E.18) logged the Tangier "Voice of America" station with the announcement : "This is Tangier operating on 11·79 mc in the 25-metre band." The complete schedule is : 15210 kc : 1445-2000 ; 11790 kc : 2000-2230.

Asia

The highlight for comment here is YDF2· Djakarta, on 11785 kc. G. Mills (Ilkeston)· S. Neeld (Walton-on-Thames), and P. Fry all comment on the excellence of this station during its English broadcast from 1900 to 2000, which is beamed to Europe. At this time on April 1 J. Brooker listened to news, music and a talk on agricultural, industrial and climatic conditions in Indonesia. In the Philippines, DZH8, 11856 kc, was heard at 0915 by J. M. Simpson, who also logged the Manilla "Voice of America" transmitters closing at 1545. R. Iball gives the frequencies as 11890 kc, 15330 kc and 17770 kc. DZI3, The Republic Broadcasting Corporation, is another new one on 6110 kc.

J. M. Simpson tells us that Singapore is audible on 11880 kc and 9690 kc around 1600 ; J. Brooker once heard a talk on the hydrogen bomb at 1515 over their 15300 kc channel.

We continue to log Peking Radio—this is their official call now—on approximately 15100 kc, with news talks about the China People's Government, from 1330 to 1400 daily. Even the mysterious and forbidden land of Tibet is reported to be giving broadcasts at irregular times in Tibetan, English and Chinese by order of the Tibetan Government over 7245 kc on Mondays, Wednesdays and Fridays. Graham Hutchins, of Radio Australia, suggests that Radio Tibet may possibly be the well-known amateur Reg. Fox, AC4YN, in a new and official role.

Pakistan's transmitter APK3, 11885 kc, has been heard by R. A. Savill at 1840, and the 11546 kc English broadcast at 1520 has been logged by R. T. Blackmore. R.A.S. also gives us Colombo, Ceylon, on 15120 kc, with a perfect signal at 1600, including the words : "This is the BBC broadcasting from Ceylon" ; and Turkey, which has supplied him with the following schedule : TAQ, 15195 kc ; Weekdays : News in English at 1845 ; Sundays : Mail Bag, 2030-2100 ; Thursdays : Talks on Turkey, 2030-2100. R. Iball informs us that the latest frequency for Damascus is 6890 kc ; English News was given at 2030 with the direction : "This is the Syrian Broadcasting Service, Damascus" ; 7100 kc is quoted as an additional channel. From Iran there are some points of interest. J. Brooker tells us

that Edmundo Ros fans had a galaxy of tunes from Teheran over EQC, 9660 kc, on March 22 at 1840. A new station at Ispahan is on the air on 4050 kc from 1530 to 1830; the "Voice of America" Persian broadcast is relayed at 1630 and there is a news at 1800. Yet another is located at Shiraz, operates on 7960 kc, and has been logged by R. Iball and J. M. Simpson around 1800; you may hear Sinatra and Crosby recordings, and the station closes down at 1900, though on occasions it stays on the air until 1930. In Iraq, Emisson-al-Basra, 11935 kc is reported audible around 0600.

Kol-Israel broadcasts on 9000 kc daily in English as follows: 1100 and 1915 (Home Service News); 2100-2145 (Voice of Zion overseas broadcast). On March 14, R. T. Blackmore listened to a discussion on university life in Israel during this second English period. Lastly, we have a station on about 7620 kc suffering from intense Morse interference, but otherwise audible with popular music as early as 1700. J. C. Catch says that it closes with a short march at 1900 on weekdays and 2000 on Sundays; our latest researches on Sunday, April 30 discovered this one closing down at 2100 with the Greek National Anthem.

Europe

United Nations, Geneva, 6670 kc, gives News in English at 1920 according to J. Brooker, for whose benefit we would advise that TFJ, Iceland, has had no broadcasts in English since pre-war days.

R. A. Savill mentions a letter from Berliner Rundfunk announcing that the new Deutschlandsender operates on 7140 kc and 6115 kc; the address is: Berlin Charlottenburg, Masurenallee 8-14. Another verification comes from Bayerischer Rundfunk, Rundfunkplatz 1, Munich 2, which operates on 6160 kc. R.A.S. hears "La Voz de la Falange," Madrid, 7380 kc, with popular music onwards from 1900; the address for reports is: Alcala 44, Madrid. The schedule of EDV10, Radio Seu, Madrid, 7170 kc, is: Weekdays: 1830-2400; Sundays: 1300-1730.

J. M. Simpson gives Valencia, 7038 kc; Malaga, 7022 kc; and Alicante, 7940 kc, all well heard during the evening period.

J. C. Catch hears Ravag, Vienna, on 11785 kc at 1500 and on 6156 kc at 2345; also Rot-Weiss-Rot, Vienna, 9566 kc, 1300-1345, which verifies with a pleasing card, the address being: Sendergruppe Rot-Weiss-Rot (I.S.B. Radio Section), Seidengasse 13, Wien VII, Austria. Then there is Allouis, France, 6200 kc, logged with English programmes between 1845 and 1945 on Good Friday; the items were: "France Day by Day," Talk about La Place de la Concorde, Easter Music and a French lesson.

With good listening to you all until next month and, of course, all short wave broadcast news is welcomed. Please write to: R. H. Greenland, *Short Wave Listener*, 53 Victoria Street, London, S.W.1, to reach this office by June 16.

"CANDID CAMERA" FOR TV

Shown for the first time anywhere in the world at the Annual Convention of Radio Engineers in New York recently and which caused a considerable stir in American television circles was the new Pye camera.

This extremely compact "Roving Reporter's" TV camera measures only 12 in. × 8 in. × 5 in. and weighs less than 10 lb. Uses come readily to mind, but first and foremost it will enable "on the spot" telecasts to become more intimate and will allow a greater latitude for the cameramen. Additionally, the camera is fitted with a turret-type head which allows the rapid selection of three separate lenses.

At the present time, the technical details of this camera are being kept strictly secret.

The Pye "candid camera" for roving TV reporters; it is both portable and compact.

SHORT WAVE BROADCAST STATIONS

Revision 25·35-31·04 Metres

Giving Frequency, Wavelength, Callsign and Location

These lists appear each month, covering the 11·128 metre section of the wave band within which all the short wave broadcasting services of the world operate. For economy of space, this band is dealt with in five sections, a list of active stations in one of the sections being given in full every month. Such revision is necessary due to constant changes of frequency, callsign and operating schedules. All stations appearing in our lists are normally receivable in this country and are under regular observation.

Frequency	Wave-Length	Callsign	Location
11835	25·35		Algiers.
11830	25·36	RW96	Moscow.
		VUD	Delhi.
		VLW3	Perth, W.A.
11825	25·37	ZYK3	Pernambuco.
11822	25·38	XEBR	Hermosilo, Mexico.
11820	25·38	GSN	London.
11815	25·39	HEU5	Berne.
11810	25·40	APK1	Karachi, Pakistan.
		VLC7	Shepparton.
			Rome.
11800	25·42	GWH	London.
11790	25·45	WRUL	Boston.
		WRUS	Boston.
		KNBA	San Francisco.
		KNBX	San Francisco.
		VUD7	Delhi.
			Tangier.
11785	25·46	YDF2	Djakarta.
		FBS	Malta.
			Vienna.
11780	25·47	ZL3	Wellington, N.Z.
		FZS4	Saigon.
		HP5G	Panama City.
		XENN	Mexico City.
11770	25·49	GVU	London.
		YDE	Djakarta.
		WNRA	New York.
		KNBI	San Francisco.
11765	25·50	ZYB8	Sao Paulo.
11760	25·51	CKRA	Sackville.
		VUD11	Delhi.
		VLA8	Shepparton.
		CBFA	Montreal.
			Mecca, S. Arabia.
11750	25·53	GSD	London.
		RW97	Moscow.
		VLG10	Lyndhurst.
11740	25·55	RW120	Moscow.
		CE1174	Santiago, Chile.
		COCY	Havana, Cuba.
11735	25·56	LKQ	Oslo, Norway.
11730	25·58	PHI	Hilversum.
		KGEX	San Francisco.
		GVV	London.
		CE1173	Santiago, Chile.
11725	25·59	JVW3	Tokio, Japan.
		BED4	Taipeh, Taiwan.
11720	25·60	CHOL	Sackville.
		CBFL	Montreal.
		CKRX	Winnipeg, Manitoba.
		PRL8	Rio de Janeiro.
		COH	Havana, Cuba.
			Limassol, Cyprus.
11715	25·61	HEI5	Berne.
11710	25·62	RW104	Moscow.
		WLWS9	Cincinnati.
		WLWR1	Cincinnati.
		VUD5	Delhi.
		VLG3	Lyndhurst.
11705	25·63	SBP	Stockholm.
		CBFY	Montreal.
		CKXA	Sackville.
11700	25·64	GVW	London.
		BEK9	Peking, China.
			Paris.
11697	25·61	HP5A	Panama City.
11680	25·68	GRG	London.
		BCAF	Taipeh, Taiwan.
		HJCT	Bogota, Colombia.
11650	25·75	HSP5	Bangkok, Thailand.
11630	25·79	RW91	Moscow.

Frequency	Wave-Length	Callsign	Location
11570	25·93	APK2	Karachi, Pakistan.
11094	27·04	CS9MD	Ponta Delgada, Azores.
11084	27·06	YDQ3	Makassar, Celebes.
11035	27·19	*CR6RA	Luanda, Angola.
11027	27·20	CS2MK	Lisbon.
10970	27·35	PZR	Paramaribo, Surinam.
10780	27·83	SDB2	Stockholm.
10615	28·26		Tananarive, Madagascar.
10598	28·30	ZIK2	Belize, B. Honduras.
10315	29·08	HCHAC	Guayaquil, Ecuador.
10258	29·25	XNNR	Peking, China.
10220	29·35	PSH	Rio de Janeiro.
10135	29·60	4VRW	Port-au-Prince, Haiti.
10080	29·76	YVKC	Caracas, Venezuela.
10055	29·84	SUV	Cairo.
10000	30·00	WWV	Washington.
		MSF	Rugby, England.
9987	30·04		Brazzaville.
9958	30·12	HCJB	Quito, Ecuador.
9915	30·26	GRU	London.
9890	30·33	HJAP	Cartagena, Colombia.
9870	30·40	HC4NN	Manta, Ecuador.
			Johannesburg, S.A.
9836	30·50		Leningrad.
9833	30·51	COBL	Havana, Cuba.
9825	30·53	GRH	London.
9820	30·55		Budapest, Hungary.
9815	30·57	OAX5C	Ica, Peru.
9805	30·61		Moscow.
9785	30·65		Monte Carlo.
9780	30·67		Moscow.
9770	30·71	PRL4	Rio de Janeiro.
9767	30·71	OTC2	Leopoldville, B. Congo.
9760	30·74	CR6RJ	Bandeira, Angola.
			Moscow.
9755	30·77	CR7BE	Lourenco Marques.
9750	30·77	KNBA	San Francisco.
			Leningrad.
9746	30·78		Omdurman, Sudan.
9740	30·80	HI2T	San Domingo, D.R.
			Moscow.
9732	30·83	CE970	Valparaiso, Chile.
9730	30·83	DZH7	Manila, P.I.
9728	30·83		Leipzig.
9727	30·85	CS2MF	Lisbon.
9720	30·86	RW108	Moscow.
		PRL7	Rio de Janeiro.
9712	30·89		Singapore.
9710	30·90		Moscow.
9700	30·93	GWY	London.
		WOOW	New York.
		WLWS2	Cincinnati.
		KCBF	Los Angeles.
		FZF6	Fort de France, Mart'que.
		CP25	La Paz, Bolivia.
9695	30·94	JKM2	Kawachi, Japan
9694	30·95	FIQA	Tananarive, Madagascar.
9692	30·95	TINRH	Heredia, Costa Rica.
9690	30·96	GRX	London.
		DZH5	Manila, P.I.
		LRA1	Buenos Aires.
			Singapore.
			Moscow.
9680	30·99	VUD3	Delhi.
		HI2A	Santiago, D.R.
		XEQQ	Mexico City.
			Paris.
9675	31·01	GWT	London.
9670	31·02	WNRX	New York.
		KGEI	San Francisco.
9665	31·04	HEU3	Berne.
			Vienna.

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SALE.—Radiovision V55R, matching speaker, perfect condition, £10 or offer. Also 2-metre transmitter/receiver, perfect, £6 or offer.—Farrant, 8 Bertram Road, N.W.4.

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SALE.—R1224, modified output, with circuit, £4. Stabilised eliminator, £1/10/-. Two LT's, 15/-. RF25 converted for 14 mc, 12/6. £6/10/- the lot. Carriage extra.—B. Priestley, 12 Mather Drive, Rudheath, Northwich, Cheshire.

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FOR Sale. CR100 (B28), Mod. 1155. Both in working order, with some spare valves. Also 500v P/Pack with 5U4G rect, 4 and 6v LT. Best offer secures, or exchange Eddystone 504 or HRO Senior, with coils.—Walklett, 63 Pilling Lane, Chorley, Lancs.

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VCR.97 E.H.T. TRANSFORMER

Manufactured by Ellison. Vacuum impregnated and waxed. Fully guaranteed. 2·5k.v. EHT. 4v and 4v
BRAND NEW **32/6** (*Post, Pkg.*, 1/6).

VCR.97 MAGNIFIERS

A super magnifier. Specially designed for use with the VCR 97 tube. No colour or spherical distortion.
BRAND NEW **25/-** (*Carr., pkg.*, 1/6).

VCR.97 MASK

An off-white rubber mask for the VCR 97. For that "professional touch" in your TV receiver.
BRAND NEW **7/6** (*postage* 9d.)

R.1355 IF TRANSFORMERS

Replacement IF transformers for the R.1355 receiver unit. Frequency 7 mc.
BRAND NEW 4 for **5/-** (*post paid*)

SPECIAL OFFER

VCR.97 Tube, plus base, plus rubber mask, plus magnifier lens, at a special price of
57/6 plus 3/6 (*carr. and pkg.*).

TRF COILS

R.M. Coils, medium and long wave, matched pair,
15/- *plus 9d. post.*
DIAMOND medium and long wave matched pair,
6/11 (*postage 9d.*).

TRIMMER KIT

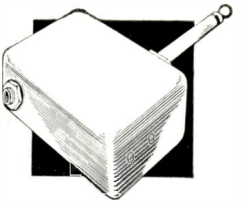
A complete trimmer kit which makes alignment simple and free from all annoying, hand capacity effects. Manufactured by Qualrad. Seven box spanners, five screwdrivers. Vane Setter and thickness gauge. In neat box.
BRAND NEW **35/-** (*plus 1/6 postage*)

JACK SOCKETS

A really unrepeatable offer. Igranic double pole standard jack sockets. Fully insulated. BRAND NEW. Can be used with Headset Adaptors, see next column.
2/- each (*postage 3d.*) OR **6** for **8/-**

BRAND NEW SURPLUS DC AVO MINORS,
in cases. LIST PRICE: **£5.5.0**
OUR PRICE: **£3.10.0**

HEADSET ADAPTORS



Convert those low-resistance 'phones to high resistance by means of this little transformer matching unit. Standard jack plug and socket fitted to each unit.
AS NEW
2/- each
(*Postage 6d.*)

IS A MULTIRANGE METER WORTH 18/6?

This DC Portable Test Instrument covers the following ranges: 0-1·5v, 0-3v, 0-30v, 0-300v, 0-3,000v, 0-60 mA and 0-5,000 ohms when converted.
As supplied, the following voltage ranges are covered: 0-1·5v and 0-3v and also ohms and milliamps. By means of the resistors and terminals which we supply, the voltage ranges are extended to cover 0-30v, 0-300v and 0-3,000v.
A fully detailed and illustrated leaflet is supplied with each kit, giving precise instructions on the conversion. The conversion can be effected in a very short time.

METER ONLY 15/-
KIT & INSTRUCTIONS ONLY 3/11 } Post free
METER, KIT & INSTRUCTIONS 18/6 }

CV1197—RL18

The RL18, which is the same as the Mullard EC53, is a VHF triode fitting into the same diode holder as the EA50, having its grid and anode connections brought out to wire top leads. The RL18 is only a little larger than the EA50 diode.
This valve finds applications in both MF and VHF signal generators and as a local oscillator in converters. By use of a suitable circuit oscillation can be secured up to a frequency of 300 mc (tuned line).
Due to its small physical dimensions, the RL18 allows a neat and compact layout to be obtained, and it can be used in place of most small triodes of the 6J5/6C5 class, with a consequent reduction in the size of the instrument. The rated voltages of the valve are as follows: Heater 6·3v at ·25 amp.; Anode 200v; Anode current 7·5 mA.
BRAND NEW AND BOXED **5/6** each
(*plus 9d. postage*). Valveholder included.

R.1132A

Normally this 10-valve receiver covers the range 100/124 mc. By simple alteration to the coils, the range may be extended to cover 144/146 mc. Additional sensitivity can be secured, if desired, by the use of a 6J6 or 9003 broad band RF stage.
The receiver has a large full vision dial with superb slow-motion control. AVC control is effected on all the normal stages and the local oscillator is voltage stabilized. An S-meter is included.
A few left to clear at only **£2.19.6**
Condition as new.
Carriage and packing (in transit cases), 5/- extra.

Terms: Cash with Order

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