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SHORT WAVE LISTENER AND TELEVISION REVIEW



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AND AMATEUR TELEVISION

MAY 1950
VOLUME 4 • NUMBER 6

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THE SHORT WAVE LISTENER AND TELEVISION REVIEW

VOLUME 4

MAY 1950

NUMBER 42

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EDITORIAL

Enlargement

This issue of the *Short Wave Listener* marks another step forward in our policy of development and expansion—a policy which aims generally at constant improvement with the object of giving readers better value for their money.

Though the cover price and subscription rates remain unchanged, now and henceforth the *Short Wave Listener* will contain an **additional eight pages** devoted to amateur television from the practical point of view. The underlying intention of this new move is not only to make TV comprehensible to all who can read a circuit diagram, but also to give detailed information of the kind likely to be of practical value to the amateur who has reached the stage of building (or thinking of building) his own TV receiver.

It is, however, *not* the intention to try to cover what may be described as the programme aspect of television, which is the function of the BBC and is now the common interest of a number of journals, including daily newspapers.

As many readers will appreciate, we could easily have introduced the subject of TV simply by cutting down on the material which during the last few years has become the speciality of the *Short Wave Listener*—still the only paper in the world devoted to the needs of the SWL. Thus, TV now appears as an additional interest, and the general character of the *Short Wave Listener* remains unchanged.

We are sure that our many thousands of constant readers will welcome this move and that they will assist us in popularising the *Short Wave Listener & Television Review* among those of their friends who are interested in television.

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The RF-27 on Two

MODIFICATION DETAILS FOR TWO-METRE OPERATION

by E. P. HARRIS (G3GFN)

IN dealing with the problem of receivers for 2 metres and 70 cm, it would seem that there are three methods of approach.

First, a separate receiver for each band. Secondly, converters working into the station receiver(s), and thirdly, converters working into a common IF-AF unit.

Considering each of the possibilities in turn, the author is of the opinion that the third method gives the most satisfactory solution from the amateur's standpoint.

The first method—that of separate receivers—is the ideal, but has the disadvantage of being costly, not only in initial outlay, but also in maintenance. Furthermore, considerable time would have to be spent on each receiver before optimum performance could be secured; generally speaking, time is at a high premium with all amateurs.

The second method—that of converters working into the station receiver(s) is, on first consideration, attractive. In the case of sensitive receivers, however, it is difficult to eliminate breakthrough from stations working

(The RF-27 is undoubtedly one of the most versatile as well as the most easily obtainable item of surplus equipment ever offered to the amateur. Here are full details for a conversion to the 145 mc amateur band, showing how the RF-27 can be put to work for two-metre reception.—Ed.)

on channels adjacent to, or on, the IF frequency. Also, due to the relatively high selectivity of the IF strip in the main receiver, even with the selectivity control in the "broad" position drift due to one cause or another will entail retouching the converter tuning from time to time.

It would seem, therefore, that the use of a common IF strip, on a frequency of about 10 to 12 mc, with a certain amount of bandwidth control, plus a good BFO, noise limiter and AF section, would give the best results with the minimum monetary outlay, with a saving in that other ever-short commodity—time. Any converter which was built could be

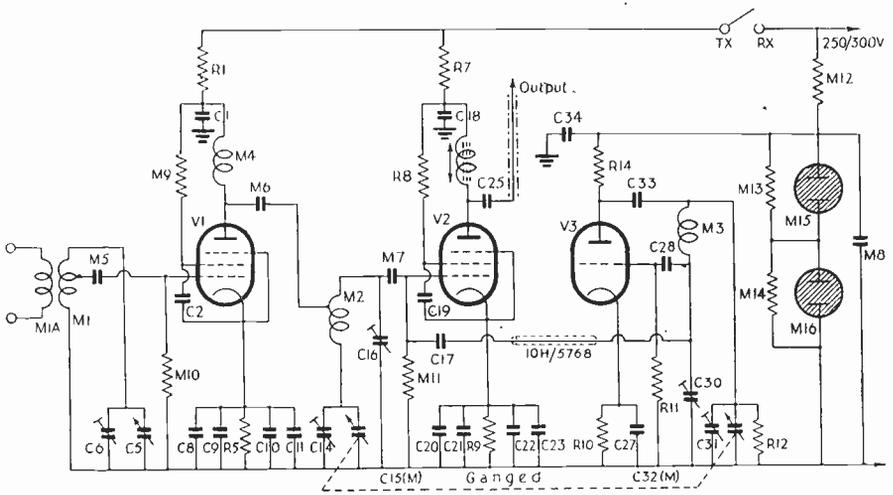


Fig. 1. Circuit of the RF-27 Unit as modified for Two Metres. Circuit elements marked M are modification items (see accompanying photograph).

arranged to have the required IF, and also to draw its supplies from the unit.

Such a unit is under construction, and after due testing time, may perhaps form the subject of a further article.

Approaching the RF-27

At the moment, pending the completion of equipment on these lines, Method Two is in use; apart from very occasional breakthrough, it is proving reasonably satisfactory.

The converter is a much-modified Type 27 RF unit, which has often been the subject of conversion designs in the *Short Wave Listener* and the *Magazine*. Inspection of the RF 27's internal layout with its good screening,

robust construction and sound circuit, led the author to believe that it would be possible to modify it for two-metre operation.

For optimum performance the modifications proved a little more comprehensive than were at first envisaged. The performance of the unit now, however, compares very favourably with others handled, and heard, using valves of the 6J6 and 6AK5 type.

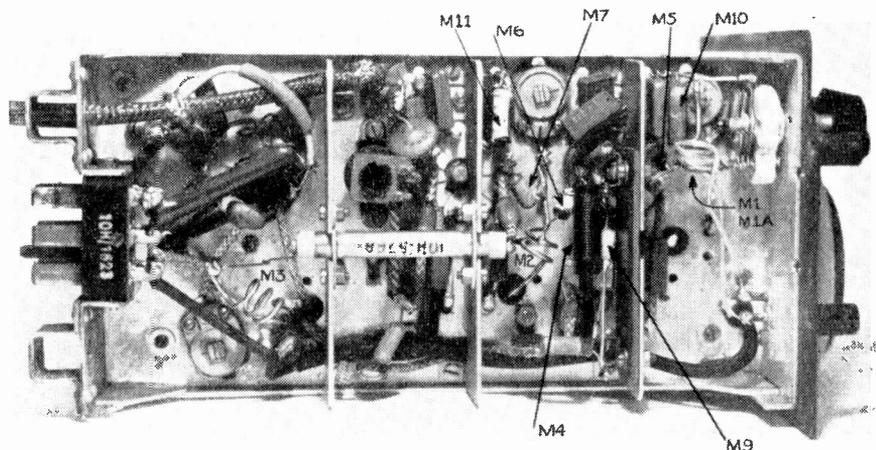
The initial conversion took only a matter of three hours, including the location of the band, but the performance, and particularly mixer noise, left a great deal to be desired. By circuit changes, and ensuring that the local oscillator was the requisite amount LF of the signal, the performance was improved beyond

TABLE OF VALUES

Fig. 1. The RF-27 Unit showing modifications for Two Metres

Original Components		
C1, C2, C8, C9, C10,		R14 = 5,600 ohms
C11, C18, C19, C20,		R5 = 150 ohms
C21, C22, C23, C27,		R10 = 100 ohms
C34 = 500 μ F		R9 = 1,000 ohms
C17 = 2 μ F		R11 = 10,000 ohms
C5 = 6.5 μ F		
C16, C31 = 7.5 μ F		Modification Components
C6 = 13.5 μ F		M1, M1A, M2, M3 = See Coil Details
C14, C30 = 15 μ F		M4 = RFC
C28 = 20 μ F		M5, M6, M7 = 27 μ F
C15, C37 = 75 μ F (modified)		M8 = 8 μ F
C33 = 100 μ F		M12 = 2,000 ohms*
C25 = 10 μ F		M9 = 4,700 ohms
V1, V2 = EF54		M10, M11, M13, M14 = 270,000 ohms
V3 = EC52		M15, M16 = VS70 Stabilisers
R1, R7 = 2,200 ohms		
R8, R12 = 100,000 ohms		

*Dependent on HT line voltage. Correct value given by M12 = On load HT Voltage minus 210v/Ohms



Sub-chassis of the modified RF-27 Unit, showing general layout after modification; the references "M" are all modification items, as detailed in the text.

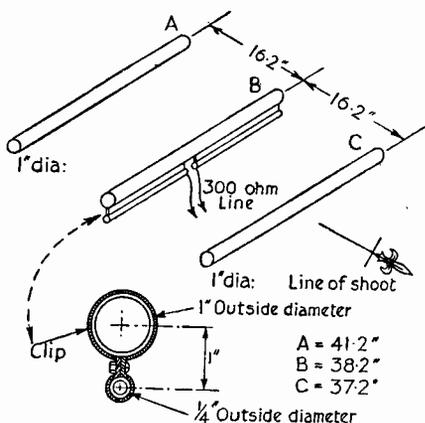


Fig. 2. Design for a suitable three-element beam for Two Metres, for operation with 300-ohm line.

all recognition, and the mixer noise was reduced to a fraction of its former level.

The circuit diagram is that of the modified unit, and the details following, coupled with inspection of an RF-27, will enable conversion to be easily accomplished.

RF Stage Alterations

It will be seen that the RF stage has been converted from series to parallel tuning, the circuit being tuned to resonance by a panel trimmer. The original RF section of the three-gang tuning condenser is no longer used. The setting of the panel trimmer (which is that originally in the unit) is quite broad over the band, and generally need not be touched after the initial adjustments.

The conversion from series to parallel tuning gave a better match to the feed line, and also an improvement in gain. The screen resistor of this stage has been reduced from 10,000 ohms to 4,700 ohms, and the original 10,000-ohm anode load replaced by an RF choke. A further improvement was obtained by isolating the tuned circuit from the grid by means of a 27 μF condenser, and tapping this condenser down the tuned circuit.

In the original circuit, the required bias was fed to the RF and mixer grids *via* the coil through a resistor in parallel with the series tuning condenser. It is felt that this practice is to be deprecated at the frequencies concerned, since it makes operation considerably more noisy; hence, in the modification the grids of both the RF and mixer stages were isolated from the tuned circuit, and a suitable resistor placed directly from grid to ground

for the purpose of bias feed.

The choke used in the anode circuit of the RF stage in place of the original 10,000-ohm resistor was obtained from an IFF Set and has the reference number 10C/5741. If this choke is not available it can be made by winding 27 in. of fine wire on a $\frac{1}{4}$ -in. former to a length of 1 in.

Mixer and IF Stages

The original coupling condenser between RF and mixer stages was 100 μF . A large amount of the mixer noise first experienced was found to be due to the high damping this condenser imposed on the mixer grid circuit. By suitably reducing its value, and tapping down the mixer coil, a reduction in noise was effected, and an increase in signal level obtained.

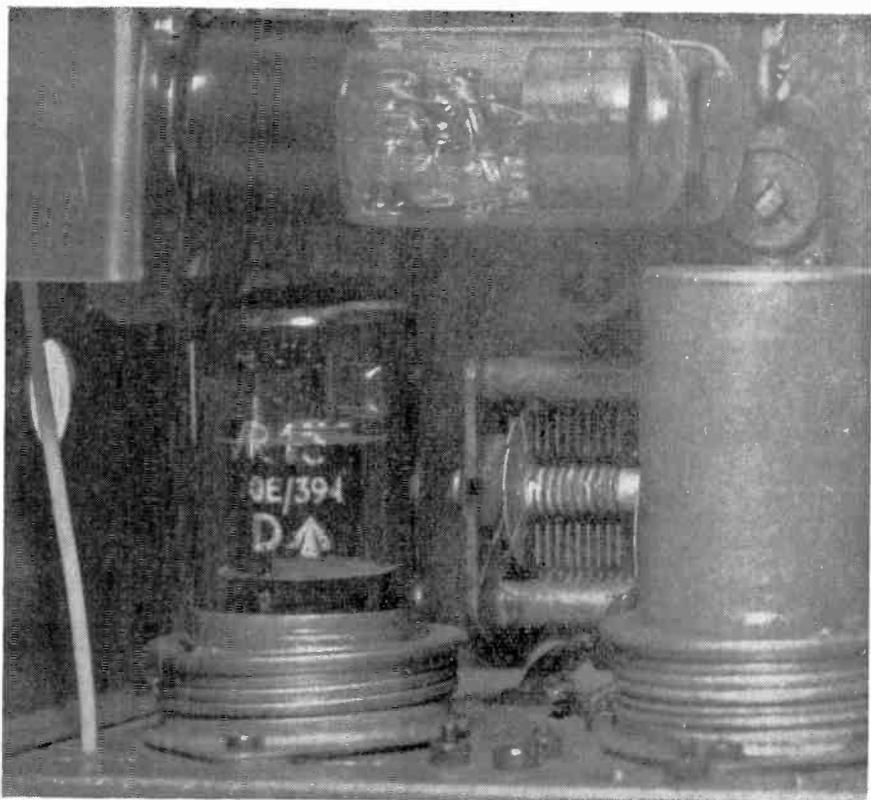
The mixer grid circuit is series tuned, but the section of the three-gang condenser concerned is considerably reduced in capacity by the simple expedient of removing all but one of the rotor plates. The oscillator section of the tuning bank is also reduced in capacity until only one plate is left on the rotor. (The plates not required can easily be removed by gripping them one at a time in a pair of long-nosed pliers, giving a slight twist, and a sharp pull. The plates left are, in each case, end plates.)

Apart from coil changes, and the addition of stabilisation, the oscillator circuit is unmodified. Consideration was at first given to the idea of harmonic mixing, thus allowing the oscillator to work at a lower frequency; it was decided, however, to try the existing oscillator circuit at the required higher frequency. The performance far exceeded all expectations, and apart from warm-up creep over the first ten minutes, the oscillator drift is negligible.

Receiver Coupling

As has been stated, the converter is at present in use with a receiver, and the link between the two is 80-ohm coaxial cable. In order to eliminate IF breakthrough as far as possible, the original coax line in the RF27, which terminated at the Jones plug at the rear, was taken out. A new length of coax was run through the hole left by the removal of one of the spring spikes (rear of unit) and connected to the output coupling condenser, as was the original coax. This new run of cable must be of sufficient length to connect directly to the receiver A and E terminals.

The IF coil in the unit trims between 7 and 8 mc by means of the iron core, and the writer has found that 7.6 mc was the best frequency to use to avoid breakthrough. (Some IF coils are loaded with a 10,000-ohm resistor, which



Mounting of the VS70's and modification to the oscillator tuning condenser (repeated for the mixer condenser) as described by G3GFN.

should be removed.) It will be found that the peaking of this IF coil is quite sharp and consequently it is impracticable to tune the receiver; but by leaving the receiver set, and tuning the converter, IF breakthrough is minimised. In the author's version of the RF-27 as converted the range 144 mc to 146 mc spreads from 50 deg. to 150 deg. on the dial. That is 100 divisions of the 180 division dial—a spread which is quite adequate.

Setting Up

To get the converter "operational," the receiver and converter should be switched on 20 minutes prior to alignment. By means of the slug in the IF coil, and with the receiver set on 7.6 mc (or the chosen IF) the IF coil should be peaked for maximum hiss in the receiver. One could rely upon received local signals for the alignment procedure, but this method is most unsatisfactory. The use of an accurate signal generator is advised, which if

not already in the possession of the constructor, should be "begged, borrowed or otherwise acquired."

(over)

COIL TABLE

RF STAGE

- M1. $1\frac{1}{2}$ turns 18 SWG, $\frac{1}{8}$ in. inside diameter to length of $\frac{3}{8}$ in. Grid tapped down $\frac{1}{2}$ turn from "hot" end.
- M1A. 4 turns 24 SWG, Polystyrene insulated, $\frac{1}{8}$ in. inside diameter (see photograph for position).

MIXER

- M2. $1\frac{1}{2}$ turns 18 SWG, $\frac{1}{8}$ in. inside diameter to length of $\frac{3}{8}$ in.; input from RF stage tapped down $\frac{1}{2}$ turn from grid end.

OSCILLATOR

- M3. $2\frac{1}{2}$ turns 18 SWG, $\frac{1}{8}$ in. inside diameter to $\frac{1}{2}$ in.

After allowing the generator time to become stabilised on a frequency of 36 mc or 72 mc, the latter being preferable, the output lead should be laid near the mixer coil. With the dial set to about 150 deg., the oscillator trimmers should be set so that the modulated tone of the generator is heard. During the alignment operation, the receiver RF gain should be fully on and the AF gain suitably reduced. The receiver S-meter can be used as a reliable guide to output.

By means of the attenuator control on the signal generator, or if this is not too effective, by increasing the distance between generator and converter, the input signal should be kept down to a reasonable level. An S5 meter signal is convenient.

Having now set the oscillator, the mixer trimmers can be adjusted for maximum output. In all probability there will be a great increase in output as the circuit is brought into line, and the generator output must be reduced in step, by either of the methods described in the preceding paragraph.

Finally, the RF stage trimmers are adjusted, as are those of the mixer, with the panel trimmer at half capacity. At no time should it be necessary to make a direct connection between the unit and the generator's "hot" output lead. It should only be necessary to "show" the hot lead to the coil concerned.

Final Adjustment

Once signals are being received, the final trimming of the RF and mixer stages can be undertaken using these signals, in order to get that "last ounce." Note, however, that strong local signals should *not* be used for this purpose.

The input to the converter is designed for 300-ohm line, since this has only small losses at these frequencies. Comparison between figures for 75- to 80-ohm line and 300-ohm line proved rather enlightening.

75-ohm line—attenuation per 100 ft. at 144 mc is of the order of 7 dB, while its capacity per foot is approximately 19 μF .

300-ohm line—attenuation per 100 ft. at 144 mc is of the order of 3 dB, while its capacity per foot is approximately 6 μF .

The accompanying photograph shows the underside of the converted unit, and will perhaps aid in modification. A Type 26 RF Unit has also been converted in precisely the same way, and is proving just as satisfactory.

Input Arrangements

Most of the original work on the unit was done with a simple dipole made from wire strung tautly between insulators on a wooden batten, and fed into the converter with a short length of 75-ohm line. Aerials are, however, of major importance on Two Metres. On the

erection of a simple three-element beam coupled through 300-ohm line, the improvement in all S-meter readings was astounding—not only due to the theoretical gain of 9 dB of the beam, but also because of the use of more efficient feed line.

The construction of the beam is given in Fig. 2. It is quite possible to use this beam indoors, as it is of reasonable physical size, but improved results will, of course, be obtained if the beam is erected outside.

Since it is impossible to determine how much use the valves in a purchased RF-27 have had, it is advisable to obtain spares. While some EF54 valves function satisfactorily at lower frequencies, they may not do so in the converter due to the higher frequency of operation. Should the converter fail to give good results, therefore, please try changing valves before writing to the Editor!

It is hoped that this article will encourage more activity on Two Metres, and also that it will show that simple gear can be made to give good results.

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The DX Three

PART II

by W. N. STEVENS (G3AKA)

LAST month's photograph and layout sketches show quite clearly the positioning of the main components. The chassis measures 10 in. × 6 in. × 2 in. and the panel is 10½ in. × 8 in. Dimensions are not given for the drilling as individual constructors will no doubt wish to use different sized components. However, the positions will present no major problems providing that the main components are first of all assembled and moved around until the most convenient positions are found. That is one of the golden rules of construction—take as long as you like in planning the layout, the time will be well spent.

The main slow-motion drive shown in the photograph is one obtained on the surplus market. It is in new condition, however, and has been very successful. Other suitable drives are readily obtainable, both "surplus" and proprietary. The top controls are aerial trimmer (left) and bandspread (right). Along the lower front panel, reading left to right, can be seen Reaction (R5), Volume control (R9), Fuse-holder, Phone jack and On/off switch. The preset reaction control C8 is situated beneath the chassis.

The first constructional job is, of course, marking out and drilling the holes for the coil-holders, valve-holders, choke and twin-gang variable condenser. Then comes the drilling of the feed-through holes. When accomplished, bolt on the valve and coil bases. Next, mark off the positions of the front panel holes—except the one (or ones) for the drive and tuning condenser spindle in the very centre. Drill these through and also those for bolting the chassis to the panel. It is always better to drill the holes separately where you have to pass through two thicknesses. So, after the bottom panel holes have been marked, drill through with a small drill first. Temporarily bolt the chassis to the panel and then mark through the centres of the five holes along the lower section of the panel. Unbolt the panel again and drill the two sets of five holes separately. And don't forget to clean off all the burr from the holes!

Now the necessary fixing holes for the drive can be made, together with the hole for the tuning condenser spindle. There only remains the holes on the panel for C5 and C4 and the terminal and supply lead holes at the back of the chassis and that part of the job is finished.

The choke and the twin gang can now be bolted on.

Before any wiring is started, don't make the mistake of fixing the panel on. You will not need this for a while and not only will soldering be easier without the hindrance of the panel but it will reduce the risk of damage to the components fixed to the panel. So, until the rest of the wiring is completed, forget the panel!

Of the actual soldering, the writer prefers to say nothing except, perhaps, to reiterate the golden rules. Make a good mechanical joint first and then a good solder joint. Keep leads rigid and as short as possible. Be specially careful to keep grid leads rigid and use a heavy gauge of wire for the purpose. And, if you use the Denco coil bases, make your solder joints reasonably quickly or else the heat will cause the polystyrene to melt! Also, insert match-stalks into the sockets as a drop of solder can easily ooze into the interior through the spiral slits. A very wise precaution from one who didn't take it the first time!

Regarding slow-motion drives, apart from the one used for the main tuning gang, these were used for both the bandspread and reaction controls. The necessity for slow motion on the bandspread condenser is obvious. The photograph will show that no dial is fixed and the writer will no doubt be censured on this account. The point is that the receiver was constructed merely as a stand-by job and the expense of a slow-motion drive was not warranted—a spare epicyclic unit was on hand and this was used. The constructor who will be using the receiver as an everyday piece of gear will be advised to fit some form of slow-motion drive with a dial included.

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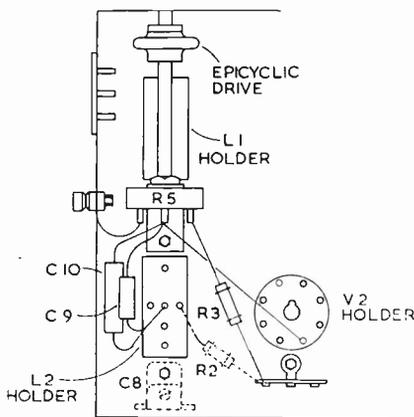


Fig. 3. Mounting of the parts on the RF side. This drawing should be examined with Fig. 2.

As far as the reaction control (R5) is concerned, an epicyclic drive is ideal. It is small, compact and easy to fit and it is not necessary to take dial readings for reaction. But it is vital to fit a drive of some description in order to get the best out of the receiver. In a TRF of this nature, the reaction control is probably the most important, so make sure you have a good smooth slow-motion drive fitted.

Conclusion

Assuming that the receiver is now completed, run over the wiring and make certain that everything tallies with the circuit diagram. Even should this prove satisfactory, take no chances. Get your test meter (or borrow one) and check for shorts between the HT positive line and chassis. And leave the valves out when you first connect up the supply leads and check that the right voltages are getting to the right places—especially the filaments. Valves are expensive!

How about the HT supply? On the original tests a stabilised power pack was used (and which will shortly be described in the *Short*

Wave Listener) giving an output of 150 volts. The average listener will doubtless use an HT block of 120 volts or an eliminator giving about the same voltage, or perhaps less. This will, of course, be quite satisfactory, but if you can get the extra 30 volts use them.

As to actual performance, the receiver has given good account of itself on all amateur bands from 1.7 mc to 28 mc. During one week of intermittent listening, over 100 countries were logged on the 14 mc band, under conditions which could fairly be described as average. Reaction is smooth, as it should be, with none of the annoying "plops" and howls associated with many straight receivers. If the receiver has been well constructed the detector should slide into oscillation gently and smoothly.

The DX Three is ideal for constructors wanting something a little better than their 0-V-1's or for those who need a stand-by receiver for their more elaborate rig. And the latter fraternity would probably be duly surprised at exactly what can be heard on such a simple receiver as a TRF3!

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Television for Beginners

AN OUTLINE OF THE SYSTEM

PART

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

THIS series of articles is being produced with the object of imparting a working knowledge of the principles underlying the modern high definition television system, both transmission and reception, to radio enthusiasts who feel that their understanding of television is scant—or perhaps even non-existent.

In preparing these articles it is assumed that the reader already possesses a basic knowledge of ordinary electrical and radio theory. This does not suggest that we expect a high standard of technical proficiency, but merely that the reader should know the basic facts relating to radio fundamentals. For instance, although the treatment will be essentially elementary, the reader is assumed to understand how a condenser works, what the functions of a transformer are, how an ordinary thermionic valve operates, and so forth. In other words, the articles will be designed for radio enthusiasts who have gleaned sufficient knowledge to read a circuit diagram and to understand how a simple radio receiver operates.

Another factor in this series of articles is that the approach will be non-mathematical as far as possible. Where it is essential to give any mathematical data, these will be presented in the simplest possible manner and will be explained in full detail.

This preamble, then, is intended to show that radio beginners need have no qualms in following this series of articles. Essentially simple, it will enable short wave enthusiasts to grasp the basic principles of the television art.

The TV Receiver

Before going into detailed accounts of how the television receiver works, it would be best to describe the fundamental differences (and similarities) between the normal radio receiver and the television receiver.

As in ordinary radio work, either superhet or TRF receivers can be used for reception of the television signals. The design of either type is basically similar to the normal receiver but with certain differences dictated by the nature of the signals to be handled. Commercial manufacturers use superhet or TRF units, according to the sensitivity required. Normally the superhet is used where extra sensitivity is called for, such as in the case of reception in and beyond the fringe areas.

With amateur TV constructors the TRF finds the greatest favour on account of its relative simplicity in comparison with the superhet which, at television frequencies, requires considerably more care in construction and alignment if the advantages it offers are to be fully exploited. This is not to say that constructors should fight shy of the superhet, but it is felt that due warning should be given of the additional practical difficulties likely to be encountered.

The TRF

The block diagram of Fig. 1 shows a typical valve line-up for a TRF television receiver unit. As will be noticed, the vision strip contains three RF amplification stages, a diode detector and a video frequency amplifier (which is equivalent to the output stage in a

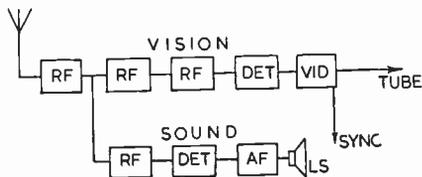


Fig. 1. Block schematic of a typical TV receiver using TRF circuits.

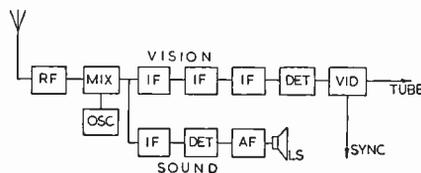


Fig. 2. The layout of the units in a superhet receiver for TV reception.

normal sound receiver). Owing to the nature of the transmitted television signal it is necessary for it to be radiated on the high-frequency bands since it occupies a very wide bandwidth—approximately 6 mc for the Alexandra Palace transmissions and 3 mc for the single-sideband Sutton Coldfield transmissions, considering in both cases the vision carrier.

Since the stage gain at high frequencies is small and owing to the fact that "stagger-tuning" must be employed in order to preserve an adequate bandwidth, it is necessary to use more than the usual degree of RF amplification. In television receivers, high-gain RF pentodes, such as the EF50, are normally encountered in these stages.

Also, as the stage gain is inversely proportional to the bandwidth a compromise must be struck between the bandwidth and the number of RF stages employed. For the greater the stagger tuning, in order to receive the wide vision signal, the lower will be the gain of each RF stage.

The video detector, or demodulator, is normally a diode since this type of valve will handle a large signal with very little distortion. The demodulated signal is then fed to the video frequency stage which is also a high-gain pentode of the EF50 variety. As previously mentioned, the video stage can be likened to the audio output stage of a normal sound receiver but instead of feeding a loudspeaker it is used to feed (or modulate) the cathode ray tube with the picture signal.

The Sound Receiver

The television sound receiver follows normal TRF practice of RF amplifier, detector and AF output. The detector stage is usually a double-diode-triode in which the triode section is used as the 1st audio amplifier. In many instances, as shown in the block diagram, the input to the sound receiver is taken off after the first RF stage in the vision receiver. The reason for this is mainly economy since a valve is saved in the sound receiver; the common RF stage is tuned for acceptance of both sound and vision carriers. Other advantages are that this arrangement allows for more efficient aerial coupling and a common RF gain control can be used for both sound and vision receivers.

The Superhet

Fig. 2 shows a typical valve line-up for a television superhet. Once again the first, and only, RF amplifier must be tuned broadly enough to receive both the sound and vision carriers. This is followed by a frequency changer (with combined or separate oscillator stage) which produces the vision intermediate

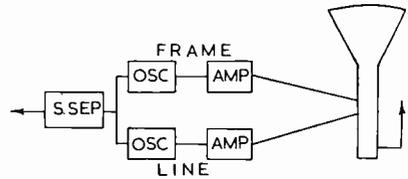


Fig. 3. The synchronisation separator and time base arrangement for a typical TV receiver; this can be used for either TRF or superhet television receiving circuits.

frequency (IF). Also present in this stage is the sound signal which will also produce its own IF; naturally at a different frequency from that of the vision IF signal. In the vision receiver there follow normally three stages tuned to the vision IF signal and these again are followed by the video (or vision) demodulator and the video amplifier stages.

As the sound IF signal exists at the output of the common frequency changer stage, this can be separated and fed to the single sound IF amplifier. After this come the normal demodulator and audio stages.

Time Bases

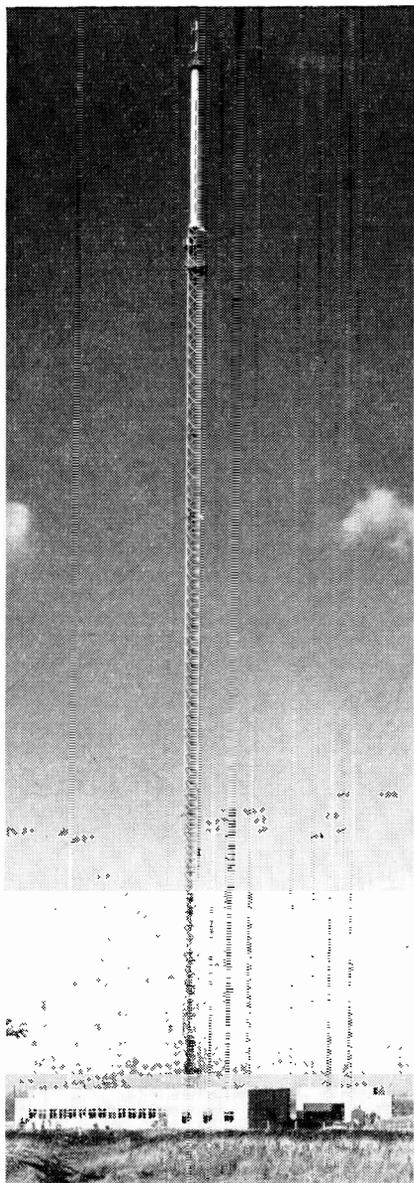
Fig. 3 shows a typical block layout of the synchronisation separator (usually termed "sync separator"), time bases and picture tube. The purpose of the sync separator is to take out the synchronising (or locking) pulses so that they can be fed to the time bases free from the picture waveform. These pulses may be taken from either the video stage or, less commonly, from the video demodulator.

The two types of sync pulses are separated and fed to the frame and line oscillator stages respectively. These oscillators produce the waveform which, when subsequently amplified and fed to the deflection systems situated externally round the neck of the picture tube, form or build up the actual "raster" upon which the picture (or modulation from the vision receiver) will later be impressed.

Power Supplies

In the block diagrams no power supplies have been shown. For the vision and sound receivers and for the time base circuits normal HT and LT supplies are required, following ordinary receiver power supply practice. Typical HT supply ratings are 350 volts DC, but since a large number of valves are used, the current consumption is proportionately higher and is usually of the order of 250 mA.

The total LT current consumption is also considerably higher and will depend on the



Transmitter building and 750-ft. mast at the Sutton Coldfield television transmitting station of the BBC, now radiating a picture of high quality over a wide area of the Midlands. Below the actual TV aerial array itself, which is right at the top of the mast, is the slot aerial for eventual use in connection with VHF broadcasting; this is a development for the future.

type and number of valves used. Heater voltages must also be considered.

The picture tube will, however, need an HT voltage which is usually referred to as "EHT" (Extra High Tension), of a varying order dependent on the size and type of cathode ray tube used. Normally an EHT supply of between 5,000 and 7,000 volts is required for normal domestic receivers. The current consumption is fortunately very low, less than one milliamp., and many ingenious methods of obtaining this EHT have been devised; these will be dealt with in a future article. The tube heater is fed from a separate heater winding on the main power transformer and may be 2, 4 or 6.3 volts.

Analysis

The foregoing surveys very briefly the general layout of the average television receiver. In future articles each stage will be dealt with in detail, complete with typical circuits and component values.

In the next issue we will cover the broad principles of the television system as it affects the transmission of the sound and vision signals, including the make-up of the signals, the television camera—and in fact, from microphone and camera to the radiated signal. In the interests of simplicity the double-sideband system, as radiated from Alexandra Palace, will be discussed. At a later date the principles of the single-sideband system, also known as "vestigial sideband," as radiated at present by Sutton Coldfield and later by other regional transmitters, will be explained.

BASIC KNOWLEDGE

For those who feel that they would be helped by an explanation of the elements of practical short wave reception—and judging by our general correspondence, there are many such—we recommend the expenditure of 1s. 8d. on our well-known *Principles of Short Wave Reception*, of which many thousands have been sold. Order, with remittance, to The Circulation Manager, Short Wave Magazine, Ltd., 53 Victoria Street, London, S.W.1.

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Type 3515 Receiver Unit

MODIFICATIONS FOR TELEVISION RECEPTION

TELEVISION constructors who have not yet encountered the 3515 IF Unit will find in this receiver the basis of a very efficient TV receiver. The 3515 is easily obtainable through the usual Surplus channels and can be purchased at prices which vary somewhat, according to condition.

It can be modified for TV reception, being used in conjunction with the RF26 or RF27 units, in a matter of about one hour. The modifications are in no way involved, as will be explained below.

The 3515 is a multi-valve circuit. V1-V6 are VR65 (SP61), V7-VR92 (EA50), V8-VR56 (EF36). The valve reference numbers are stamped on the chassis itself and so identification is simple enough. The seven IF transformers (at approximately 13.5 mc) have a common iron dust core which affects both primary and secondary windings. The final IF can contains the VR92, should the purchaser fail to locate this valve! All IF cans are easily removed by loosening two screws.

Comparisons

The output waveform from this unit, after modification, is of the following polarity: Picture signal—negative; Sync pulses—positive. This, of course, is the same polarity waveform as obtained from the R1355 receiver unit which is used extensively for TV purposes. The 3515, however, is in many ways superior to the much better known R1355 since no extensive modifications are called for to convert it into a really efficient vision receiver unit. In the R1355, for instance, it is necessary to carry out modifications to almost every stage in order to eliminate all unnecessary components. The "anti-jamming" switch, for example, needs considerable attention and the two anti-jamming stages have component values unsuitable for efficient TV reception.

Another factor is the bandwidth, which in the case of the 3515 appears at least one megacycle better on Test Card "C" than that obtained from the 1355. Naturally, this results in a picture of better definition and clarity, without having to resort to "plastic" effects.

IF Adjustment

Stagger tuning of the 3515 IF cores may be necessary in some cases, but in the unit under

test this was not needed, presumably as the cores had already been stagger-tuned by the manufacturers.

The IF cores are heavily waxed and when attempting to stagger-tune they may prove rather obstinate. The remedy is to apply a warm soldering iron to the core(s) in question, taking due precautions not to overheat the coil, and with a screwdriver gently adjust the core. Once the core has been loosened in this way, it will not, of course, be necessary to warm the core again for further adjustments. When final adjustments have been made, the wax can be re-heated and allowed to form a seal.

Modifications

Before any modifications can be undertaken, it will be necessary to remove the large screen which covers the complete valve section by loosening the three screws. The first modification is to remove the 0.1 μ F tubular condenser and the 100,000-ohm $\frac{1}{4}$ -watt resistor, both mounted on stand-off insulators leading from the top cap of V8. These are easily located since they are the only components (other than valves and transformers) which are mounted above the chassis.

The top cap lead from the lower stand-off is then transferred to the upper stand-off insulator and the lower stand-off can then be completely removed. These two insulators actually serve as miniature by-pass condensers of a very low value.

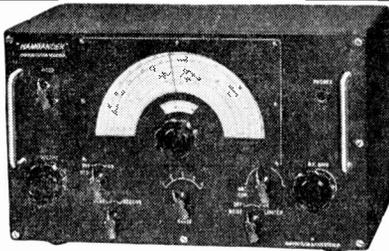
Mounted at the top cap of V8 will be noticed a 1,000-ton $\frac{1}{4}$ -watt grid-stopper which is removed and replaced by a 33-ohm $\frac{1}{4}$ -watt resistor. Incidentally, the top cap is rather small for the SP61, which will be fitted in place of the original EF36, but if the tightening bolt supplied on the top cap clip is removed and the cap opened out slightly, it will be found to fit the SP61 quite easily.

The next operation is to remove the valveholder of V8 and replace it with one of the Mazda octal type. The chassis should be turned over so that the base of the valves and associated components are showing. Clip off *all* connections to V8 valveholder as close to the valve tags as possible. Remove the miniature RF choke between pin 3 of V8 and the tag strip and also remove the red/yellow lead connected to tag 7 (certain tags are numbered 1 to 9 in white lettering and these are the tags that are now being discussed).

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Then remove the green lead connected to tag 8. It should be noted that when the lead from pin 4 (of V8) is disconnected it will leave a 0.0023 μ F condenser and a 1,000-ohm resistor ($\frac{1}{4}$ watt) “floating.” The resistor should be removed but the condenser must be retained as it will be used as a cathode by-pass condenser for the new video stage.

On the tag strip will be found a 36,000-ohm 1-watt resistor, which is taken out, as is the 0.1 μ F tubular condenser mounted alongside. Also remove the 36,000-ohm $\frac{1}{2}$ -watt resistor adjacent to the aforementioned components.

The removal of the original international octal may prove tricky, but this must now be accomplished and a Mazda octal holder substituted. Re-wiring of the new V8 holder is the next step, which is accomplished as follows :—

Pin 1—Taken direct to chassis.

Pin 2—Via a 56-ohm $\frac{1}{2}$ -watt resistor, in parallel with a 0.0023 μ F condenser, to chassis. The condenser is the component already existing and which was clipped from pin 4 on the original valveholder.

Pin 3—Via 4,700-ohm 1-watt resistor to HT positive line. (Tag 4 on strip).

Pin 4—Direct to tag 4 on strip (HT positive).

Pin 5—Direct to pin 2 (V8 holder cathode pin).

Pin 6—Direct to chassis.

Pin 7—Blank. May be ignored or taken to chassis.

Pin 8—“Live” side of the heater supply. When the original holder was removed, and the two wires clipped from pin 7, one of these was the heater by-pass condenser (0.0023 μ F) and the other the “live” LT lead coming via the RF choke filter circuit. Both these leads are now taken to pin 8 on the new valveholder.

The 0.1 μ F condenser, previously removed from the tag strip, is now used as the coupling condenser from the anode pin of V8. One end of this condenser is taken direct to pin 6 on the V8 holder and the other end to any blank tag on the strip. This will be the *Video output terminal point* and is best fed to the time base unit with screened coaxial cable.

The tag marked “1” on the strip is the cathode return for valves V2 and V4. A 2,500-ohm wirewound standard potentiometer is connected between this tag and chassis in the following manner : One end is taken to tag 1, the slider taken direct to chassis, the other end of the potentiometer is ignored. This constitutes the gain, or “contrast,” control and is adjusted accordingly in operation. Since this control must be mounted above chassis, it will be necessary to drill an appropriate clearing hole for the shaft and also one hole in the chassis to feed through the cathode return lead from tag 1. A

soldering tag can be fitted on the chassis to take the slider connection.

Power Supply

Now that the major modifications have been carried out, which although seemingly involved will take only about an hour to complete, all that is necessary before the unit can be tried out is to fit leads for feeding in the necessary power supplies to the unit. The requirements are 250 volts DC at 60 mA and 6.3 volts AC at 4.5 amp. These leads can conveniently be taken to the numbered section of the tag strip and the tag connections are as follows :

Tag 1—V2 and V4 cathode return, which now connect to the contrast control.

Tags 2 and 3—Already earthed to chassis and therefore one side of the LT supply and the HT negative lead can be taken to this point.

Tag 4—250v HT positive is taken to this tag.

Tag 5, 6, 7 and 8—Unused, and therefore any connections existing to these tags may be traced back and removed.

Tag 9—The "live" LT connection and 6.3v at 4.5 amp is taken to this point.

There is one further modification which, though not essential, the constructor may wish to carry out. The advantage is that by effecting this modification every unnecessary component is removed from the unit. The largest IF can on the strip contains the diode detector and associated components. There are a few components in this compartment which can, if desired, be removed, viz : the two 27,000-ohm $\frac{1}{4}$ -watt resistors and a 0.0023 μ F condenser that is taken to the junction of the two resistors. These can be completely removed without affecting the functioning of the unit.

In the same section, a green lead will be observed going from the lower 27,000-ohm resistor and disappearing through the chassis. This finally terminates on tag 5 on the numbered strip which, as previously mentioned, can be removed. This green lead is also anchored to the tag strip where it comes through on the underside of the chassis and is by-passed by a 0.0023 μ F condenser, which also is not needed.

As a point of interest, the sync signal could be taken from the diode circuit, as happens in some commercial designs. Therefore, should the modifications to the diode section referred to above not be carried out, the sync signal could be taken from tag number 5, via the normal sync separator circuit to the time bases. Due regard, however, must be paid to the polarity of the sync pulses, which would now be positive-going with respect to the picture waveform.

RF Section

At the front of the unit will be noticed two Pye sockets and these are the IF input from the RF unit which will ultimately be used. It is possible to run an RF25 or an RF26 for reception of the Alexandra Palace transmissions, simply by adjustment of the trimmers on the RF units. No tests have yet been carried out on Sutton Coldfield transmissions, but there is no doubt that with either the RF26 or RF27 units satisfactory reception will be obtained in the Midlands.

With regard to the two Pye sockets, both of these are in the input circuit to V1 in the 3515 unit. Either may be used for the IF feed, but slightly better results may be obtained off one as the other is attenuated. It will, of course, be necessary to feed power supplies to the RF unit, of approximately 250 volt HT at 20 mA and 6.3 volt at 2 amp. With the output from the RF section connected to the input of the 3515, via a short length of screened coaxial cable, the power supplies to both units connected and the aerial on, adjustments should now be made to the oscillator section of the RF unit corresponding to the switch selection. On the RF25, London transmissions are received on positions 3, 4 and 5 and with the RF26 unit the dial should be rotated until the vision carrier comes in. The various adjustments of the oscillator, mixer and RF stage trimmers are gone through in that order, until maximum results are obtained.

Some trouble may be experienced, as is likely in television superhets, by direct pickup of signals at the IF. Operation of the units with all screening cans fitted, the spare coaxial input socket screened and all exposed circuit wiring screened, is essential if this trouble is to be avoided. Even the "Jones" plug on the rear of the RF unit should be screened, and both units bonded together by the earthed braiding of the coaxial cable. A baseplate, if one is not obtained with the unit, can be fitted to the underside of the 3515.

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DESCRIBING THE T12/46

ONE of the most troublesome operating maladies of the picture tube has been the appearance of ion burns on the surface. Manufacturers have gone to great lengths in order to eliminate or reduce these manifestations, culminating in special ion traps and in aluminium-backed tubes.

The Ferranti Company have worked on the principle that the best method of preventing ion spots is to process the tube in such a way that there are no ions remaining in the tube to give rise to such burns.

They claim to have developed a method of manufacture which prevents the formation of ion spots; their tubes do not contain an ion trap because there is no necessity for it, nor are they aluminium backed because there is no need to use aluminising as a method of preventing burns. That is one of the reasons

why the new T12/46 is an interesting item for television enthusiasts.

Aluminised tubes are given a thin layer of the metal, evaporated behind the screen, which is considered to give improvement in contrast in comparison with normal tubes. Some observers, however, consider that the improvement is not readily observable and, in fact, put forward the claim that this enhanced contrast is a disadvantage, as it tends to prevent the registration of the half-tone values of the transmitted scene. Also, of course, such contrast is normally only desirable where the picture is to be viewed under conditions of very strong external lighting.

Ferranti choose as their screen material one which gives a nearly white picture with just a faint suggestion of blue. Apart from

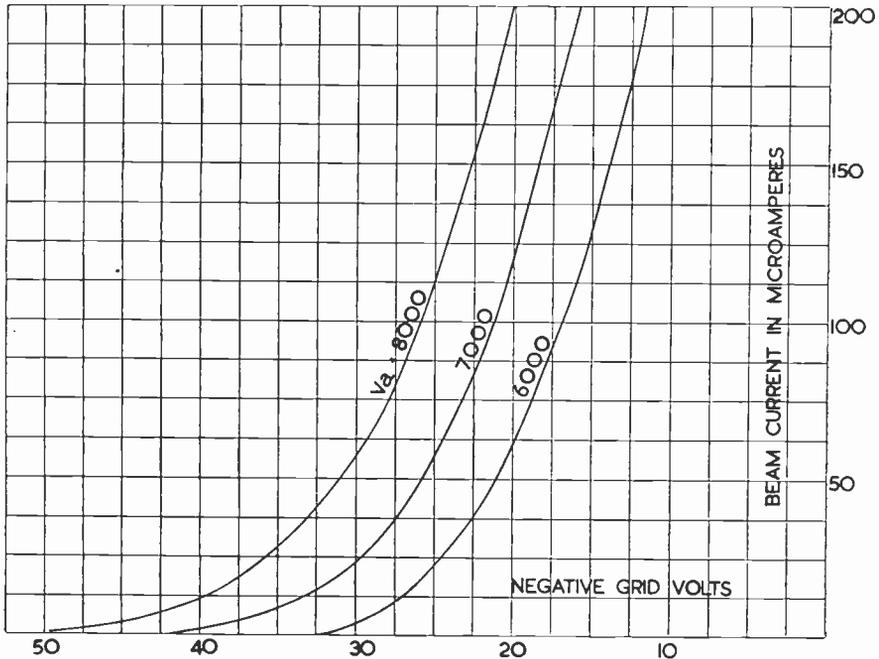


Fig. 1. Typical modulation characteristics of the new Ferranti T12/46 Television Tube, taken at the normal heater supply of 6.3v.

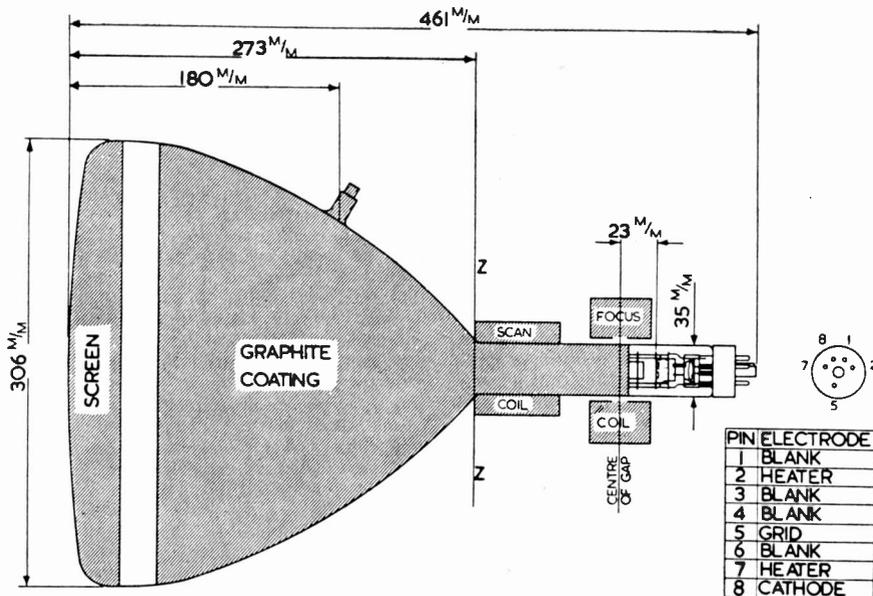


Fig. 2. Dimensional outline and other details of the Ferranti T12/46.

being pleasing to the eye, the fluorescent material is extremely durable. In the T12/46, special care has been taken with gun design and screening techniques ; of course, this is of the greatest importance for a good, even focus.

The focus quality is largely dependent on the correct design of focus coil and positioning of the equivalent lens with respect to the

aperture in the modulator. If the focus coil is close to the modulator the spot size will tend to be larger than if it were situated at a greater distance. Also, should the focus coil be close to the modulator, the beam passes through the coil before it has diverged appreciably and, although this gives rise to a larger focused spot, nevertheless the focus may be better because less aberration is introduced by the focusing lens.

The optimum position is easily determined by trial whenever a new receiver is designed. As a general rule, a shrouded coil of 800 ampere turns (4,000 turns at 200 mA) with a magnetic gap of 11 mm. situated so that this gap is 2.3 cm. from the front surface of the modulator gives very good results.

The T12/46 is manufactured from Hysil heat-resisting glass which has proved to be ideal for picture tubes, both from the point of view of its electrical characteristics and its reliability of fabrication. The raw material is more expensive than that used in bulbs of the lead or soda types.

The tube face is almost flat and gives a picture 10 in. x 8 in. The inner surface is coated with a layer of colloidal graphite in order to reduce internal reflection and to prevent disturbances arising owing to internal charges collecting on the inner walls of the tube.

OPERATING CHARACTERISTICS OF FERRANTI T12/46

Heater Voltage	6.3 volts
Heater Current	0.6 amps
Anode Voltage ..	6 kV to 8 kV max
Typical Vg for visual cut off	.007 x Va
Beam Current	200 μA max
Negative Vg for visual cut-off of focused spot ..	50 volts
Average Modulator drive for 150-μA beam current ..	24 volts
Normal peak beam current ..	150 μA
Capacitance grid to other electrodes	10 μμF
Max Vb to cathode	100 volts
Screen colour	Bluish white
Semi-Scan angle	24 deg. approx.

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NOTE TO MIDLANDS READERS

With television generally available in the Midlands, the existence of a number of pockets of 25-cycle mains supply areas will undoubtedly lead to the temptation to use TV receivers actually designed for the more usual 40-60 cycle mains. Each piece of equipment involves certain problems of its own and, in many cases, the addition of extra smoothing, whilst yielding a tolerable performance, is not without hazard.

It is suggested that in each case the receiver manufacturer be consulted in advance to ensure that dependable information regarding the modifications required is obtained and carried out to reduce this hazard to a minimum.

BOAT-RACE TV BROADCAST

Once again, the BBC made a fine job of the TV showing of the Boat Race on April 1. We watched it on a standard receiver operating on what is said to be the fringe of the Sutton Coldfield area—nevertheless, the pictures were good all the time, and the camera work struck us as extremely competent. While the quality and entertainment value of run-of-the-mill programmes may be open to criticism, there cannot be the slightest doubt that it is in actuality broadcasts that TV is far ahead of any other type of entertainment.

Have you heard?

MARCH was such an active month, and such an interesting one, that it is a great shame that our Contest and SLP's fell in the one week-end when conditions were really poor! We have had very good luck in the past with "long shots" at SLP's and the like, but there is no doubt that the 14 mc band let us down very badly this time.

More of this later on, when we get round to the subject of the Contest. Meanwhile, suffice it to say that readers, in general, have been extracting much that is of interest out of all the bands; that there has again been a very heavy volume of mail, indicating a high level of activity; and that the Calls Heard section carries only about 50 per cent. of the total of lists we received.

The Four Band Table is fairly shooting ahead; the leader, R. S. Stott (Upminster) has increased his lead still further, but the general upward trend continues and some of the bottom-rungers are beginning to climb. The snag is that those who have not already established a good score on 28 mc will now find it very difficult to do so, from the way the band is behaving at present.

DX OF THE MONTH

Good stuff has been coming in on all four DX bands, but no one would pretend that conditions have made it easy. You certainly have to dig for it these days—which makes it all the more rewarding when you find it! So here is the usual résumé of the bands as extracted from a number of the regular logs. As usual, I am trying to summarise the DX band by band but only "super-DX" qualifies—for the rest see the Calls Heard section!

BEST DX—MARCH

28 mc CW:

AP5B/4, CT3AB EA6AF FE8AB, FF8JC, PK3JF, UA9CC, UL7BS, UD6AH, UN1AB, VQ3SS.

28 mc Phone:

AP2F, 2J, 2N, CP1AS, 5FB, CR4AC, HC1FG, 1JB, H16EC, HP1GR, HL1CD, KG61E/lwo, KL7AOZ, KP6AE, KR6AD, 6AM, 6AS, 6CO, 6DG, 6DW, OA4F,

OX3BD, 3GE, PK1CR, 3JF, 3JC, 3PH, 3SP, 3SQ, 4DA, 4KS, SV5UN, VK9GW, VP2GG, 5FR, VS6AM, 6BC, VS7GD, 7PW, 7RF, W7ABB/DU, XE1IQ, 2KW, XZ2KM, YN4VN, YV4AA, ZS8A, ZS9F.

14 mc CW:

CR4AC, 4AD, 4AE, 4AF, 5AM, 10AA, FB8XX, FK8AC, FM7WE, 8AB, 8AD, FN8AD, FY8AC, HP2RO, HSISS, HZ1HZ, KR6CA, KS4AC, 6AH, KV4AA, KX6BA, M1B, MD4AR, MS4FM, 4UU, PJ5RE, 5TR, PK1RI, 2JL, 2ZZ, 3JI, TG2RQ, UAØSJ, VP1AA, 1SJC, 5BF, 8AK, VQ3AK, 3SS, 5AI, VR4AA, 5PL, XZ2KW, ZS3Q, 3R, 9D.

14 mc Phone:

AP2N, CR4AC, 5UP, 9AG, EL5B, HH2ES, HP1LA, 1LL, 1MM, HR2RF, HZ1PC, 1KE, KG4AW, MD4AK, 4TH, OA4AI, 4M, PJ5RX, PZ1Z, TG9AS, TI2ES, 2HB, 2MS, 2OA, VP6SD, 7NK, 7NU, 9KK, 9XX, VQ3AA, 5AI, VS6BS, 7SV, XE3LH, XF1A, YI2BJ, YN4CB, YS1MS, YV5BQ, ZD1SS, ZS3F.

7 mc CW:

CT3AV, EA8AL, FM8AD, HE1HY, HZ1KE, LU7JN, PY2AJ, 2OB, 4FI, 8MG, ST2AN, UI8KAA, VE7EO, VK3MC, VP6SJ.

7 mc Phone:

CO8GH, 8GS, CR5UP, CT3AK, FA8BE, 9RZ, PY1AGR, 2AWO, 4QE, SP5AB, VP6SD, ZB1AJX.

3.5 mc CW:

EK1AO, FM8AD, KP4KD, KS4AC, KZ5DE, PY2AJ, XF1A, ZB1AB/P, 3V8AB.

3.5 mc Phone:

FA8JO, 8ZZ, 9HF, 9WU, TA3GVU, VP6SD, 7NN, TG9AD, XF1A, CV8AS.

NEWS AND VIEWS

Starting, as is right and proper, with R. S. Stott, the top scorer in the Four Band Table, we hear that with him March has been one of the best months ever; not so much for conditions as for the good luck he has had with new ones. Even on 3.5 mc, he found nine to add to his score (such as FM8AD, KS4AC, XF1A and 3V8AS). On 14 mc CW

" ZONES HEARD " LISTING (POST - WAR)

Listener	Zones	Countries	Listener	Zones	Countries
PHONE and CW			PHONE ONLY		
M. E. Bazley (Kidderminster)	40	225	D. L. McLean (Yeovil) ..	37	174
E. Trebilcock (Victoria, Australia) ..	40	212	A. Bannister (Manchester) ..	37	170
A. H. Edgar (Newcastle) ..	40	212	O. A. Good (Oswestry) ..	37	168
R. S. Stott (Upminster) ..	40	211	K. Parvin (Thornton Heath)	37	164
O. A. Good (Oswestry) ..	40	211	A. Levi (Belfast) ..	37	153
R. A. Hawley (Goostrey) ..	40	196	L. Tombs (Swindon) ..	37	148
D. W. Waddell (Hitchin) ..	40	189	J. M. Graham (Glasgow) ..	37	147
W. J. C. Pinnell (Sidcup) ..	40	189	J. P. Warren (South Croydon)	37	141
J. C. Beal (N. Wembley) ..	40	175	D. Vincent (Beckenham) ..	37	138
D. Rickers (Wrexham) ..	40	138	R. G. Goulding (Wrexham)	37	127
N. S. Beckett (Lowestoft) ..	39	172	E. J. Parish (Watford) ..	36	162
R. A. Fowler (Marlow) ..	39	162	J. C. Beal (N. Wembley) ..	36	146
B. Davies (Beckenham) ..	39	148	A. M. Norden (London, N.W.11) ..	36	136
M. Shortland (Sunderland) ..	39	146	M. S. Gotch (Saffron Walden)	36	134
L. M. Singletary (Bicester)	38	174	R. J. Line (Birmingham) ..	36	133
F. A. Herridge (London, S.W.12) ..	37	154	T. E. Botham (Walsall) ..	36	128
B. Hummerstone (Harrow) ..	37	132	B. W. Sutton (Liverpool) ..	36	120
K. Smeeton (Barnton) ..	36	154	D. J. Williams (Pontyberem)	36	105
C. J. Goddard (Coventry) ..	35	123	D. G. Martin (Cheltenham)	35	142
L. B. Bailey (Stockton-on-Tees) ..	34	117	R. A. Fowler (Marlow) ..	35	140
PHONE ONLY			H. M. Graham (Harefield) ..	35	139
E. J. Logan (Hertford) ..	40	194	K. M. Parry (Sandwich) ..	35	134
R. A. Hawley (Goostrey) ..	38	182	D. E. Hayes (Hoddesdon) ..	35	105
D. S. Kendall (Potters Bar)	38	166	A. L. Higgins (Aberkenfig) ..	34	121
R. G. Poppi (Beckenham) ..	38	159	L. B. Bailey (Stockton-on-Tees) ..	34	118
F. K. Earp (London, S.W.11)	38	161	C. J. Goddard (Coventry) ..	34	108
M. G. Whitaker (Halifax) ..	38	146	C. S. Pollington (Chichester)	33	127
			P. Bysh (London, N.8) ..	33	125
			W. C. Askew (Melton Mowbray) ..	33	114
			A. O. Frearson (Birmingham)	33	107
			D. K. Cocking (Farnborough)	33	100
			G. Musk (Blackpool) ..	31	109
			G. Murray (Newcastle) ..	31	100
			O. R. F. Mason (Prittlewell)	31	79

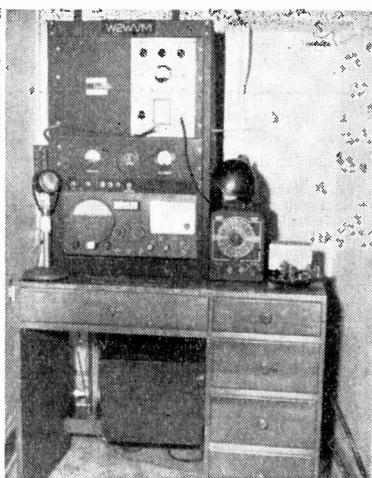
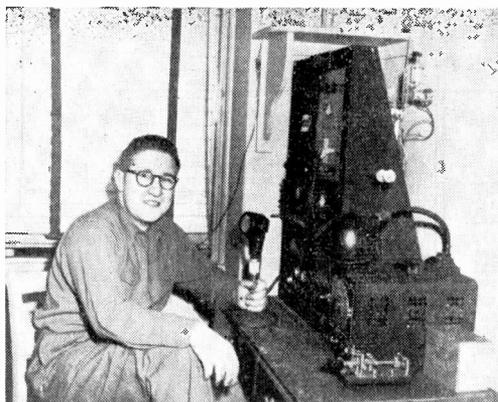
he heard VR5PL and KS6AH, to say nothing of HS1SS, FB8XX, FY8AC and VP1AA. R. S. S. asks for gen. on the VP8 stations; we can tell him from first-hand information that VP8AD is South Georgia, VP8AI Pebble Island (Falklands) and VP8AK Deception Island (Antarctica); these QTH's are direct off their cards.

R. W. Finch (Ilford) found 14 mc conditions "chaotic"—and didn't we all? He is intrigued by GR5ZL, heard at RST 574 and sounding rather like a "high-powered concrete mixer". J. Neal (Birmingham) has come back after a lapse of a few months, and says that anyone who thinks that 14 mc has been dead should start giving their receiver the once-over. During the month he heard 35 Zones and 105 Countries, 14 mc CW alone accounting for 34Z and 88C. The best of his new ones were KX6BA, FN8AD and VP1AA. He would like a word about FY7YA (calling FM8AD) and PX1B working W's. The

latter, I suspect, is phoney; the former might well be a new call scheme for French Guiana. Martinique is already using FM7, and FM7WE is the old F9QU/FM8.

E. J. Logan (Hertford) adds to his score but says he has nothing much to report except MN2AC, said to be on a British ship in the Med. Several of these MN prefixes have cropped up, and they are all pirates, but "genuine pirates," if you know what I mean.

D. S. Kendall (Potters Bar) seems to be getting his week-end passes from the RAF all right and reports some nice new ones, together with a colossal list of 28 mc Phones. The best prefixes on Ten are AP, CR4, EL, FF, HZ, JA, KG6, KR6, MP4, PK3 and 4, SV5, XZ, YV. He intended entering for the March Contest but conditions sounded so foul that he abandoned it and went to bed—like many others. On 3.5 mc Phone D. S. K. logged CM9AA, VP6SD and VP7NN for three new ones. J. P. Warren (Croydon)



General view of the station of W2WVM, New York City, who runs 25-50 watts to a modified TBS-50 transmitter. Arrangements here are unusual in that W2WVM is on 110-volt DC mains; hence, he has to grind his own AC, the motor-generator being in the box under the operating table. The aerial is a 120-ft. doublet, fed through 200-ft. of tuned ribbon, and W2WVM is operated exclusively on 3.7 and 28 mc phone. As the station is very close to the Great White Way, the Broadway cinemas, theatres and sky-signs produce enough hash to make DX almost an impossibility. Operator of W2WVM is ex-D4AOU.

has concentrated on 28 mc Phone as 14 mc has been so patchy.

H. M. Graham (Harefield) mentions OE13LL again, and wonders. Many others, however, pass on the information that OE13 has been assigned to U.S. Forces in Austria and is genuine enough. On 28 mc H. M. G. found an evening or two when the West Coast of U.S.A. was coming through in its old form—quite a rarity nowadays.

A new-comer in the person of G. Thomas (London, N.W.7) sends his first report, covering 28 mc and 7 mc phone. He has got together 15 countries on 7, and 59 on 28, with a total of 70 countries, which sounds like quite a nice start. F. A. Herridge (London, S.W.12) stands up staunchly for 28 mc CW, on which he has heard 30C and 17Z this year, using an 0-V-1 and indoor aerial. Referring to my recent remarks about the R.A.F., he sticks up for the Army, having served his time in R. Sigs.—hence his keenness for CW! And can someone tell him whether VE8SM is in Zone 1 or 2?

80-METRE DX

The 3.5 mc band still has a few faithful adherents. J. M. Graham (Glasgow) mentions TA3GVU, LX1JW, VP6SD and VP7NN (all phone). K. Parvin (Thornton Heath) has heard TG9AD, XF1A, KP4ES and SP1CM (also phone). J. L. Hall (Croydon) found several W's calling CE1AA on the band, but had no luck himself. But he did hear VP7NN!

I have a hunch that 3.5 mc is going to be marvellous for DX next winter, if only we can

persuade a few more countries to give it a turn. The way the ZL's have been coming in on the CW end this year has been a revelation—from last Christmas right up to the end of March they hardly missed a morning.

BUNCH OF QUERIES

Let's get some of these awkward questions out of the way. Who, or what, is U9ILR? And, likewise, EK9WF? And if VT1RF (28 mc phone) is genuinely in Kuwait, as he should be, then E. F. Dowsett (Rochester) will be mighty pleased. Does anyone else know about him? B. W. Sutton (Liverpool) asks about FN5CR and FN5NA—both queer-sounding fish. N. S. Beckett (Lowestoft) heard W7EJV/Portable but missed the suffix; it could, of course, have been "Portable-Mobile"—in a car.

Now what about UZ1TJ (14 mc CW)? W. J. C. Pinnell (Sidcup) would like to know. K. Parvin has an idea that CR5UP left St. Thomas Island and returned to Portuguese Guinea using the same call. If he did, this means two countries. Has anyone the gen. on this?

J. C. Beal (Wembley) would like to know how many of these are genuine? YU1CAG, MD4AR, PX1AA, CZ2AC, YU3FNE, FKS8AL, FY7YA, VQ3BNU and ZB1IH. I can personally vouch for the last two, but wouldn't swear to any of the others. He also wants the Zone (17 or 18) of UA9CC, 9KJA, 9KJH and 9KSB. R. G. Goulding (Wrexham) asks also about the UA9's; the trouble is that they are divided over those two Zones. Those in Sverdlovsk are in Zone 17 all right, but there

are quite a bunch further over, in Zone 18.

Now for some queries that I *can* answer. EI and GI *do* count as separate countries, of course. VP2's are divided into Leeward Islands and Windward Islands—not all the separate islands beloved of stamp-collectors. KG6I stations are on Iwojima, in the Bonin or Volcano Islands. The best time of the year for W's on 3.5 mc phone is, I should say, November to March. Finally, VK1RD is on Macquarie Island, not Heard Island.

BACK TO THE DX BANDS

J. C. Beal (Wembley) found many days on 28 mc when the rarer States were coming through as late as 2000 GMT, and completed his HAS. He found the Far East good on several mornings, too. Some 7 mc DX in his list shows that it's still there, even if you have to dig deeper these days. A. H. Edgar (Newcastle) has found good stuff on all bands (including W4NNN on the Top Band), but he admits that conditions are well down on last year. At the start of the contest on 14 mc he found the band rather like 7 mc on a Sunday morning, switched off and took the dog for a long walk.

K. M. Parry (Sandwich) has not had much leave lately, but remarks, *re* 28 mc, that VS6AE must be the most consistent DX signal, with VS7GD a close second. K. Parvin is the *only* correspondent, apparently, who discovered the 27 mc band during the ARRL

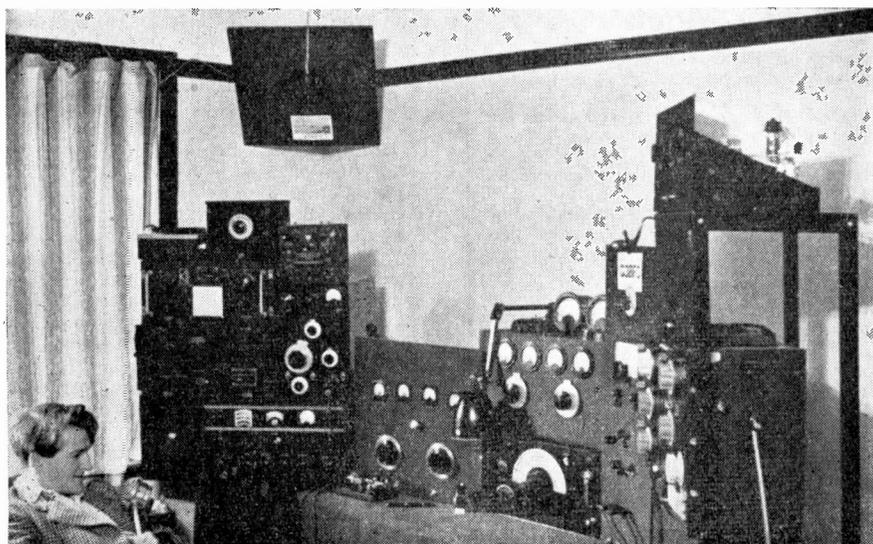
Contest—see his list of Calls Heard. K. P. adds that KH6 and KZ5 were known to be on the band, but he couldn't find them.

R. A. Hawley (Goostrey) says that 28 mc has been very erratic with a few good days and a lot of bad ones. One or two new MM's have shown up. D. K. Cocking (Farnborough) has also found Ten disappointing, although it has been open until 2030 several nights. On 14 mc he heard KH6AQ at S8-9 (phone) and also mentions VS7SV and YN4CB. For his information, the ban on some 20 nations from working other countries was rescinded some time ago; the only one I can think of remaining under a ban is the Philippine Islands. DU's are only allowed to work the U.S.A. and their possessions.

FROM OVERSEAS

Three listeners in Ramat-Gan (Israel) send a combined letter; they are 4X454, 4X493 and 4X4101. They all found winter conditions very poor out there, but their short Calls Heard lists for 14 mc CW and Phone look very much like our own, with nothing exotic about them. If any British SWL's wish to correspond, the address is O. Scheremer, 4X454, Ramat-Gan, Sch. Gefen, Israel.

A. Bannister (Manchester) says he has had several letters asking him about his BC1147 from listeners who do not seem to be getting satisfactory results. From perusal of them he suggests that an article on general operating,



G3BFC, Ferndown, Dorset, as the station appeared before the operator went overseas to become MT2BFC.

handling of the gain controls, use of dipoles, and so on, would be appreciated by the newcomers. This shall be done. A. B. has been active on 28 mc, as usual, and found a rare one in the shape of KL7AOZ (1155 on March 21); 14 mc, he says, varies between the sublime and the ridiculous. I couldn't agree more!

N. S. Beckett (Lowestoft) thought 14 mc was in "pretty good shape" most of the month, but he is a CW man. "Phone-only" specialists please note! He logged some quite nice new ones. M. G. Shortland (Sunderland) also did some 14 mc CW listening and found among others, FB8XX and HS1SS. He passes on the gen. from a ZL that VR5PL and VR5CA are active on phone at the high end of 14 mc.

OSL'S AND ALL THAT

J. L. Hall has received cards recently from VP5BF, HP1BR, ZS7C, FK8AC, and, some time back, from KM6AH, FO8AD and FY8AC. I mention these because some of them have the reputation of not "coughing up." You have to catch 'em early, before they get swamped and can no longer afford to QSL! O. A. Good (Oswestry) has a nice one from ZS9D. But please don't all speak at once because we haven't room for a QSL Corner in this feature.

THIS AND THAT

R. J. White (London, S.E.10) had a card back from a VE3, who passed his name and

DX QTH's

AR8PO	P.O. Box 682, Beirut, Lebanon.
EA6AF	Bartolome Pina, Casa de Espana 2, Palma, Majorca.
FF8JC	Box 209, Dakar, French West Africa.
FM7WE	Box 281, Fort de France, Martinique, F.W.I.
HP1EA	Box 828, Panama City, Republic of Panama.
HP1GR	Glickenhau, Box 135, Panama City.
HR1RL	H. R. Lagos, Fuerza Aerea Honduras, Tegucigalpa.
KR6AF } KR6DW }	APO 239, Unit 1, c/o PM, San Francisco.
OE 13 LL	APO 777A, US Forces in Austria.
PK1RI	c/o Factory Djakarta, Indonesia.
SV5UN	United Nations, Rhodes, Greece.
VQ5AI	82 (PR) Squadron, RAF Masindi, Uganda.
YU1AA } YU3FMG }	Box 48, Belgrade, Yugo-Slavia.
ZDZJHP	c/o Posts and Telegraphs, Lagos Airport, Ikeja, Nigeria.
ZD4AV	Capt. H. M. R. Mallock, Gold Coast Signal Squadron, Giffard Camp, Accra.
ZD6HJ	H. H. Jones, P.O. Dowa, Nyasaland.

PREFIX LIST REPRINT

Copies are still available of the Prefix List reprinted from that appearing in the March issue of the *Short Wave Listener*. This reprint is intended for wear-and-tear use at the operating position, and is on a stiff folding card. Price 6d., post free, of the Circulation Manager, Short Wave Magazine, Ltd., 53 Victoria Street, London, S.W.1.

address to a Canadian SWL. The latter has sent him a lot of news from the VE/SWL's point of view, and R.J.W. remarks that it is a very good thing to get in touch with other listeners in this way. More of it should be done.

D. L. McLean (Yeovil) also has an SWL correspondent (in New York) who sends him interesting dope from time to time. For instance: VR5GA, Tonga, is on 14394 kc; KS6VH is on 14210 kc round about noon GMT; HC8ME is on 7 mc phone from the Galapagos Is. at midnight to 0500 GMT; FS8FR (14170) is with an expedition on Clipperton Island. All this is very interesting. D.L.M. seems to have had quite a good month on 14 mc and 28 mc, although he does find the latter deteriorating now.

O. A. Good (Oswestry) was thrilled to hear Papua (as distinct from New Guinea) for the first time. VK9GW on 28 mc phone gave this to him—and at 18 dB over S9! He also found VP1SJC for his first VP1 (14 mc phone) and heard VK9JC (Admiralty Is.) on 14 mc CW. O.A.G. comments on the welter of VE8's on phone during the month.

M. E. Bazley (Kidderminster) comes in with a claim which shoots him straight to the top of the Zones Heard list—40 and 225! During a recent week-end leave he managed to catch KC6WC (Palau Is.), FK8AB and EA9BB for new ones.

R. Brooker (London, S.E.24) is among many who mention PILC, the Dutch Weather Ship in the North Atlantic. From the position given, she seems to be 200 miles S.E. of Newfoundland. R.B. also heard SV0AJ calling up as many G's as he could and telling them that he had had a sudden posting and was shortly bound for the U.K.

P. M. Crawford (Darlington) says that PK4KS is on Banka Island "and thus counts as a separate country." Oh, no he doesn't! We know all about Banka Island (he has been on the air for two years at least) and it counts as Sumatra; otherwise we should all be one further up the ladder! P.M.C. complains about the chaos resulting from the mixture of CW and phone on 3.5 and 7 mc. Of course

FOUR-BAND DX
(STARTING JANUARY 1, 1950)

Listener	28 mc	14 mc	7 mc	3.5 mc	Total Countries (5)	Total Score ★
	(1)	(2)	(3)	(4)		
R. S. Stott (Upminster)	112	161	85	41	171	399
J. C. Beal (N. Wembley)	96	133	70	25	153	324
D. W. Waddell (Hitchin)	92	129	66	22	151	309
W. J. C. Pinnell (Sidcup)	87	125	54	22	135	288
N. S. Beckett (Lowestoft)	59	122	66	24	126	271
L. Singletary (Bicester)	83	109	47	21	131	260
R. A. Hawley (Goostrey)	83	108	42	17	122	250
E. J. Logan (Hertford)	107	91	24	19	120 (P)	241
A. Bannister (Manchester)	91	104	26	17	124 (P)	238
P. H. Strudwick (London, N.3)	87	110	17	22	123 (P)	236
M. G. Whitaker (Halifax)	80	87	33	19	122	219
F. K. Earp (London, S.W.11)	68	88	26	16	116	198
E. J. Parish (Watford)	80	85	13	17	116 (P)	195
E. Cafley (Gt. Yarmouth)	73	101	8	11	120 (P)	193
A. M. Norden (London, N.W.11)	78	72	19	19	109 (P)	188
J. M. Graham (Glasgow)	64	69	29	24	97 (P)	186
L. Tombs (Swindon)	68	76	23	15	106 (P)	182
D. W. Bruce (Eltham)	67	74	27	14	90	182
H. M. Graham (Harefield)	55	84	24	14	107 (P)	177
M. S. Goch (Saffron Walden)	87	59	13	14	113 (P)	173
D. Shallcross (Derby)	72	74	14	12	105	172
W. Eyre (Whaley Bridge)	56	69	27	17	100	169
L. Corder (Hadleigh)	58	77	13	15	101 (P)	163
J. P. Warren (Croydon)	63	80	9	10	99 (P)	162
B. Hummerstone (Harrow)	60	63	19	17	99	159
R. A. Fowler (Marlow)	53	62	25	16	96	156
K. Smeeton (Barnton)	30	81	33	12	95	156
K. M. Parry (Sandwich)	79	62	4	8	104 (P)	153
D. E. Tomkinson (Brighton)	51	67	16	19	90 (P)	153
T. Spencer (Slimbridge)	62	60	8	11	94 (P)	141
P. Bysh (London, N.8)	47	55	20	17	82	139
F. A. Herridge (London, S.W.12)	30	55	38	15	72 (CW)	138
C. D. Zangerl (Dornbirn, Austria)	21	101	1	1	124 (P)	124
T. W. Jones (Birmingham)	30	55	26	12	74	123
G. Murray (Newcastle)	46	36	15	15	73 (P)	112
R. T. Gabriel (Derby)	39	44	13	15	84	111
A. L. Higgins (Aberkenfig)	24	53	15	16	68	108
R. J. Line (Birmingham)	46	26	19	14	73 (P)	105
E. A. Parkinson (Leeds)	43	36	7	9	62 (P)	95
G. Musk (Blackpool)	17	62	6	9	72 (P)	94
A. O. Frearson (Birmingham)	30	40	11	7	60	88
D. G. Martin (Cheltenham)	27	38	14	9	56 (P)	88
C. A. Naylor (Farnworth)	45	27	7	7	57 (P)	86
D. K. Cocking (Farnborough)	20	41	16	6	56 (P)	83
N. Roberts (Launceston)	3	49	4	8	49 (P)	64
A. W. Robertson (Cranford)	26	25	4	3	45	58
A. G. Scott (Liverpool)	5	23	22	2	35	52
D. E. Hayes (Hoddesdon)	25	13	3	4	28 (P)	45
O. R. F. Mason (Prittlewell)	4	21	9	11	28 (P)	45

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

they are both "shared bands" and commercial CW is perfectly within its rights if it drops bang on some of our phone frequencies.

H. J. Smith (Southampton) reports for the first time and confirms that FK88AA is "French Zone of Austria." He has also heard HP9FS/M many times; *he* is genuine, but should really sign "MM."

P. Short (Sundern, BAFO) started SWL work in December last and is now listening on 14 mc and the Top Band. Concerning 14, he asserts that CR5UP is now back in Portugal and has been heard several times. With regard to the American Consulate boys in Jerusalem and all their ZC6's, he asks why they don't use the 4X prefix. 4X is probably reserved for Israeli nationals, with ZC6 remaining as the prefix for Palestine.

TOP BAND NEWS

W. Eyre (Whaley Bridge) is justly proud of a card from HZ1KE confirming that his was the *first report* received on 1.7 mc signals out in Saudi Arabia. He heard HZ1KE on March 5. W.E. would like to know whether anyone has yet received a card from EK1AO for the same band.

K. Parvin says that the total countries "possible" on the Top Band seem to amount to 20; at least, 20 have been reported from various sources since the war. Funny thing is that his own list doesn't include DL or ZB1, so we must surely alter that to 22. Who will be first to claim twenty?

G. C. Allen (Thornton Heath) has continued his good work on the band, and he has heard ZB1AR several times. On March 12 he also logged WIPLO, W1EFN and WIBB calling KV4AA (but no luck with the latter). Another new appearance was that of HB1CM, who is probably more genuine than the "HB21W" that cropped up before. G.C.A. has heard 18 countries in four continents.

THE MARCH CONTEST

Now for the sad story of the Contest in which conditions refused to collaborate with us. Logs were so scrappy that I can't judge the contest strictly on a "points" basis. Suffice it to say that the best log, by far, came from G. C. Allen (*Thornton Heath*) who has thus proved that his prowess isn't confined to the Top Band. Others worthy of Honourable Mention were H. J. Smith (*Southampton*), P. H. Strudwick (*London, N.W.11*) and N. S. Beckett (*Lowestoft*).

Here is a summary of the DX that was heard during the six hours of the contest (although very little of it was heard by each individual listener):

First Half

CW:—CE2CC, CR4AC, 4AE, 4AF,

CX1BZ, 1VD, FF8MM, FM8AB, 8AD, FN8AD, HZ1HZ, KV4AA, KZ5WZ, OA4BG, PJ5RE, VP3CW, 6CDI, VR4AA, ZD2JHP.

Phone:—AR8PP, CO2JL, CO7PM, PJ5RX, TI2OB, YS1JR, YV5AB.

Second Half

CW:—AP2F, 2N, FB8XX, FF8MM, HZ1HZ, JA3AF, KC6WC, MP4BAO, OQ5DR, PK1RI, UG6AB, VQ3BNU, 3JTW, 4BB, VS5KEA (or 5CA), 3V8AB.

Phone:—CR6AI, HZ1PC, MP4BAO, OQ5DS, OY2RD, PK1RI, VQ3BNU, 4KTF, 3V8AB.

Perhaps some of you are surprised at the DX in among that lot? Certainly you wouldn't have thought, from the general run of conditions, that lists as good as those could have been compiled. If it shows anything, I suppose it is that Concentration Pays (or You Can't Take It With You).

THE APRIL CONTEST

This being what is known as the Silly Season, I have produced a Silly Idea for the next bout of our monthly Contest scheme. Instead of prefixes we are going to deal with the call-sign itself; so your homework for the last week in April is to produce the best list you can muster of calls ending in AA, AB, AC and AD. Suitable examples (and there are heaps of them): KV4AA, KP6AA, UNIAB, UL7AB FK8AC FO8AC, FM8AD, FN8AD. Remember, only AA to AD will count, and I shall, in the event of strenuous competition between two or more lists, judge them "on points."

You have one week to listen, starting at 0001 GMT on Monday, April 24, and ending at 2359 GMT on Sunday, April 30. All bands are allowed, CW or Phone. When sending your check list, give (a) Call-sign (b) CW or Phone; (c) RS or RST; (d) Frequency Band.

Both the SLP's come within this period, so you can use *them*, too. I suggest you keep your ears peeled for CR10AA, VR4AA and VP1AA if you want three good ones. And don't tell me the contest is a daft idea—I know that! But it might be fun.

SET LISTENING PERIODS

April 29, 2200-2300 GMT, 14 mc Phone.

April 30, 1000-1100 GMT, 28 mc Phone.

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

May 27, 2200-2300 GMT, 1.7 mc CW and Phone.

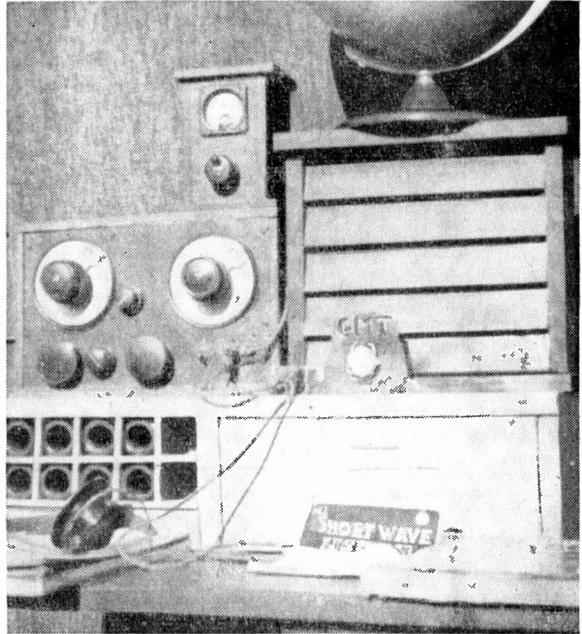
Your next deadline is **first post on May 2**, which comes pretty smartly after the April

SLP's, I'm afraid ; but there it is, and it's fixed by the calendar, just like the eclipses of the sun. Please keep your letters a bit shorter (some of them were pretty rambling this month !) and show your Contest logs, Four-Band Claims, and so on, separate from the

letters, otherwise they will probably be overlooked until too late.

Address the whole bunch to DX Scribe, *Short Wave Listener*, 53 Victoria Street, London, S.W.1. Until then, Good Hunting, 73 and BCNU.

SWL Stations NO. 32



THIS time we describe a SWL station down in the West Country—that operated by J. Tozer at Highfield, Porton, near Salisbury, Wilts.

His receiver is a home-brewed 1-V-2, using valves in the following sequence : VP23-VP23-HL210-PM2A, with independent tuning of HF and detector stages, screen-controlled reaction, auto bias and variable coupling between HF and detector circuits. The frequency range is 1.5-33 mc in five steps, and the receiver is driven from a home-built power supply unit. Other equipment includes a globe, an S-meter for comparative checks, and 8-in. speaker and moving-coil headphones with a special matching arrangement into the receiver.

Apart from the Rx, J.T. has also designed his station for its purpose, in that it is laid out and arranged for convenience and comfort during long sessions of listening. Using a 66-ft. aerial 24-ft. high and running N/S, activity is on the 10, 20, 80 and 160 metre

bands—though so far results have been rather disappointing on the Top Band, thought to be due to the aerial.

J.T. himself is no beginner in the field of SWL activity, as he started as long ago as 1927, and has been right through the 0-V-0 to superhet stages on the constructional side, and is now back to his 1-V-2 as he finds it the most useful and effective for all-round work—at least, he says that on the basis of the logs published in the *Short Wave Listener* he appears to be holding his own with the majority of others using commercial equipment of the communications type. Of course, in a matter of this kind, operating experience is an important factor, and it is understandable that J.T., with 20 years' SWL activity behind him, can do things with a 1-V-2 which would not be approached by an inexperienced operator using a commercial superhet. Which all goes to show that nobody need be ashamed of being unable to run anything more elaborate than a straight TRF.

CALLS HEARD

GENERAL

28 mc

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

PHONE: AP2J, CE3CZ, CO2EH, CX2CN, FF8FP, HH2PAS, 2W, H16EC, HZ1AB, MP4BAB, 4BAO, OQ5AB, PK3LC, VK5EL, VS6AE, 6AM, W2JHP/MM, 2NLK/MM, 2ZBA/MM, 2ZGE/MM, 5AX1/MM, 6DYT/MM, ØDAT/MM, ZD2JHP, 4AC, 4AU, 4AX. (Rx: AR-88 and S.504.)

O. A. Good, 1 Western Drive, Oswestry, Shropshire.

PHONE: CPIAS, 5FB, CR4AC, 5UP, EQ3SAM, H16EC, KG6IE, 6SC, MP4BAB, 4BAO, PK1PH, 3JF, 3LC, 3SP, 4DA, 4KS, PZ1QM, VK5AE, 5AS, 5EM, 6HL, 6LL, 9GW, VP3CW, 3MCB, VQ5ALT, VS6AM, 6BC, W7FTV (Montana), 7KMF (Wyoming), 7LYD (Arizona), 5OCN/MM, (800 m. S.E. of Okinawa), XE1IQ, 1KE, 1PO, 1PY, 2KW.

CW: UA9CR, UL7BS. (Rx: S.640.)

R. A. Fowler, 1 Dedmere Road, Marlow, Bucks.

PHONE: AR8AB, CR5UP, FD4AD, H16EC, KG6FM, 6GD, M13GH, OQ5AB, OX3BD, PK4DA, PY6CN, PZ1WM, TA3GVU, VK5ZR, VQ4HK, VU2GJ, 2SD, XZ2SY, ZD4AH, 4AX, ZE1JB, ZS6JF, 3V8AP, 4X4AL. (Rx: S.640.)

R. J. Brooker, 77 Cottages, Rosendale Road, Herne Hill, London, S.E.24.

CN8AJ, 8BA, CO2EH, 2JL, EK1BC, HC1KX, 1OY, HH2W, KG6GU, KP4AJ, 4BY, KR6AD, KZ5PC, MD2AC, 7HV, MP4BAB, 4BAO, PY7QT, ST2AM, 2KR, SV5UN, ØWB, TA3GVU, VE5LY, 6EL, 6VE, 7AAD, 7UN, VP5FR, 6SD, VSP7W, W6AOR, 6VIH, 6WSX, 7KJX, 7KSA, YØ7WL, ZB1FK, ZD4AB, 4X4CZ. (Rx: 0-V-1.)

A. O. Frearson, 66 Wheelwright Road, Erdington, Birmingham, 24.

PHONE: CE3CZ, CM9AA, CO2EA, LU4DP, 5CP, 8PW, MD2AC, M13SC, MP4BAB, 4BAO, MT2E, OQ5AO, PY2BEN, 7BN, ST2AM, SV5UN, VK6KW, VQ4ERR, 4ASC, VS9AH,

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, 4EJL, 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.

ZD2JHP, ZS6IH, 6OJ, 6OY, 6TH. (Rx: S.640.)

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

PHONE: AP2N, AR8PO, CE3AB, 3CZ, CR4AC, CX4CS, 5AP, FE8AB, FF8AH, 8FP, 8PG, HK4JB, JA2CL, KG6FAA, 6IE, 6SH, 6USA, KL7ACZ, KR6AD, 6AS, 6CF, 6CO, 6DW, KZ5AU, M13GH, OQ5AB, 5AO, 5LL, PK4DA, SV5UN, TI2SA, VP6JC, VQ4CRM, VS6AE, 9AH, XE2KW, 2W, ZD1PW, 2JHP.

CW: FF8JC, LU6CK, OQ5NK, PZ1QM, VS6JH, ZD4AE. (Rx: Hambander and 0-V-1.)

E. J. Logan, Linten Cottage, Fanshawe Street, Bengoe, Heris.

PHONE: AR8PO, CE3CZ, CO7GM, CR5UP, CR7IL, EQ3SAM, FA9OW, FF3CN, 9GP, HH2X, H16EC, HK4AM, HP1GR, HZ1AB, KR6DL, M1B, MD7HV, MP4BAB, 4BAE, 4BAO, MS4A, OX3GD, PK1CR, 1DH, 3SP, 4KS, PV7RD, ST2AM, 2ET, TG9RB, VP4TO, 5JR, 6SD, VQ2HC, 2WP, 4ASC, 4CRM, 4ERR, 4HK, 4RF, VS6AE, 6AN, 6UR, 9AH, VU2GB, 2LJ, 2MX, 2SD, W7ACD, 7KTB, 7LBN, 7NYO, XE2KW, YK1AC, YV4AA, ZD2GP, 2JHP, 4AC, 4AX, ZE2KM, 3V8AP, 4X4AD, 4AS. (Rx: BC342-J/RFU32.)

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

PHONE: AP2F, CE3CZ, CO7RO, CR4AC, 5UP, FF3CN, HC2OK, HP1AP, KG6FZ, 6GG, 6SC, 6SF, WØHBY/KG6, KR6AD, 6CF, 6DW, KZ5CP, MD2GC, MP4BAB, 4BAO, OQ5HL, ST2KR, SV5UN, TI2FG, UA3BU, VK6LL, VP5FR, 6SD, VQ4AC, 4RF, VS6BE, W6DYT/MM, ZC6UNJ. (Rx: 1-V-1.)

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

PHONE: AP2J, FF3CN, KG6IE (Iwo), 6SC, 6USA, KR6AD, 6DN, 6DW, MP4BAB, 4BAO, OX3BD, 3GE, PK3JF, SV5UN, VK5AE, 5EM, VP4TO, 5FR, 6SD, VQ2PL, 2WP, VS6AE, 7PW, 9AH, XE2W. (Rx: R208.)

R. Baldwin, 32 Helen Avenue, Feltham, Middx.

PHONE: AR8MR, CE2CC, 3CZ, CO7GM, CR4AC, EL5B, FF8AH, 8FP, 8PM, HC1OY, HP1GR, HZ1AB, KG6FZ, 6SC (Saipan), 6USA, KP4CU, 4DN, 4ES, 4HN, KR6DW, LU3DH, 4AY, 4BC, 4CD, 5DC, 8CW, MP4BAB, 4BAO, OA4BR, OQ5AB, 5AO, OX3BD, PK4MW, PY1FR, 1SA, 2AK, 2AMT, 2CK, 2J, 4RB, 5DX, 6QM, 7BN, 7OT, ST2AM, TA3FAS, 3GVU, VBSBV, VE6EL, 6LA, 6VE, 7PW, VP6SD, VQ2PL, 2WP, VT1RF (Kuwait), VU2CQ, 2GB, W2ZBA/MM, 5AXI/MM, 6ITY, 6RIA, 6YME, 7DMZ, 7MBX, 7MGA, XE2KW, XZ2PM, YV4AN, ZC6UNJ, ZE2E, 2KH, ZD2JHP, 4AB, 4AH, 4AU, 4AX, ZS1EZ, 1JD, 6CV, 6DW, 6TA, 6TC, 6TP, 6Z. (Rx: Home built 0-V-1.)

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

PHONE: AP2J, H16EC, HZ1AB, KG6FX, 6FZ, 6SC, 6USA, KR6CM, KV4AS, KZ5GM, PK3LF, 4KS, SV5UN, VS6AE, 7GD, VU2GJ, 2LJ, XFIA, XZ2EM, 2KN, YK1AC, ZD4AB, 4AH, ZE2KH, 3JD. (Rx: RF24 and Ultra U.434.)

L. Garland, 89 Strode Road, Clevedon, Somerset.

PHONE: CE1AB, 3CZ, FF8AH, H16EC, HK4JO, KG6SH, KR6AD, 6DW, KZ5AU, 5GM, PK3PH, 3SP, 4KS, ST2AM, VP3MCB, 4TO, 6SD, VSTRF, 9AH, ZD1PW, 4AU, 4AX, ZE1JO, ZSSU. (Rx: S.640.)

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

PHONE: AR8AB, 8MR, 8PO, 8PP, 8UN, CR4C, EQ3SAM, FF3CN, 8AH, 8FP, 8PG, 8PM, HH2PAS, 2W, HPIGR, HZ1AB, 1KE, JA2CL, KG6EZ, 6FZ, 6IE, 6SH, KR6AD, 6AF, 6CW, 6DW, MD7DC, 7HV, MP4BAB, 4BAO, MK1PH, 3IF, 4DA, 4KS, PZ1QM, SV5UN, VS6AM, 7GD, 7PW, 7RF, 9AH, VU2ARCI, 2GB, 2LJ, 2SD, XE2KW, YK1AC, YN4BM, 4SDA, ZD1SW, 2FAR, 2JHP. (Rx: AR88LF and SX28.)

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

PHONE: CE3AD, 3CZ, FM7WE, HC1KVE, 1KW, 1KX, 1KY, 1KZ, HH3D, HIGEC, HP1FG, KG6SC, OQ4AA, PK4KS, TG9AX, TI2IG, 2SA, VP3LF, 3MCB, VQ5ALT, VTIRF, VS6AM, XE2KW, 2W, YS1MS, ZC8UN. (Rx: S.640.)

G. Thomas, 13 Maxwellton Avenue, N.W.7.

PHONE: AP2JI, AR8BO, CO7RO, CR4HT, KZ5GM, LU4CD, OA1F, 4AO, OQ5AO, OX3BK, PK4EA, PY2IU, PZ1KM, UBS5V, 5BVX, VP6SD, VK6MU, VU2CJ, 2SD, XE2KW, XZ2KN, ZD4AH, 4X4AB.

J. W. Cave, 12 Hilda Road, Parkstone, Dorset.

PHONE: AP2N, AR8AB, CN8EI, CR4AC, 7AH, CX4CS, EK1WR, EL5A, FA8KC, FF3CN, HC1FG, HI6EC, HZ1AB, KG6FZ, 6GU, 6SI, KR6AS, 6CF, 6CO, LU8CW, MD2GC, MI3NC, MP4BAO, OQ5AB, OX3GG, PK4DA, PY3NS, ST2KR, SV5UN, TA3FAS, TF7SF, TI2RC, UB5BV, VESCI, 6NQ, 7PW, VK5RZ, VP9F, VQ2WP, 4RF, VS6AM, 9AH, VU2LJ, W6TIR, 7IHE, 7KJX, XE1AC, XZ2GM, YK1AC, ZB1AJX, ZC6UNJ, ZD2JHP, 4AU, ZE2JE, LZ3DS, ZS1JD, 2CI, 5AW, 6DW, 4X4CZ1 (Rx: Home built 0-V-1.)

14 mc

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

PHONE: CN8DX, CO7VP, FA3DS, HP1TS, JA5AL, KR6CR, MD7WE, OESYL, PY1RC, 2BN, 3BI, 4AJ, 5DH, 6CO, 7RI, SP5SG, SV0AJ, ØWY, TA3FAS, TI2HB, 2OE, VO1DX, VP5AR, YV5VQ, ZC6DO. (Rx: S.5 valve superhet.)

D. J. Williams, Cwmillethryd, Pontyberem, Carmar.

PHONE: FF8MH, KP4AJ, KR6CH, LU4BC, MD7HV, 7WV, OQ5DZ, VP7NK, VO3AA, 4AQ, YV5AY, ZC6JM, ZD1SS, ZE3JJ, ZL2JB, 3CV, 4HP. (Rx: S.5-valve superhet.)

R. A. Fowler, 1 Dedmere Road, Marlow, Bucks.

PHONE: CE3CZ, CO7AA, CN8EO, EA8CA, PF3CU, KH6AQ, VP4TH, 6SD, VQ4SC, VS7SV, ZC6DO, ZD1SS, ZE3JF, 4X4AK. CW: MD7BW, VK6KX, VS7BC, UF6AAF, ZL2FI. (Rx: S.640.)

L. Garland, 89 Strode Road, Clevedon, Somerset.

PHONE: AR8BC, CE2BQ, CO7AA, 8MP, CR7AH, HK1DZ, OA4M, PZ1Z, TI2OA, VK2AGU, 2NG, 2WT, 3ASD, 3EE, 3HW, 3XW, 4KS, VQ4VO, VS2BS, 6BS, YN4CB, YV5BQ, ZL1LA, 2FA, 4AC.

CW: CT3AA, PK1RI, 3JT. (Rx: S.640.)

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

PHONE: CR6AI, 7AH, 9AG, HR2RF, JA5AL, KL7UM, MD4AK, PZ1Z, TF3EA, UA9CL, UP2KBC, VP2DB, VQ3AA, 5AI, XZ2KN, YI3BJ, YS1MS, ZD1SS, ZP5AR, ZS3D. (Rx: S.640.)

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

PHONE: AR8BC, CR6AI, FF8QM, HH3DL, HK3DA, HP1LL, HZ1AB, KG4AK, OA4M, OQ5DZ, SV5UN, TI2OE, VP3HAG, 3MCB, 4LS, 4TB, 4TK, 6TR, 7NK, 9KK, 9S, VS7SV, YN4CB, YS1MS, 2AG, XE1HC, XZ2KN.

CW: CR7RF, FF8MM, FM8AD, HP1LO, KX6BA (1930), KZ5AP, MS4FM (1955) OQ5DR, PK1RI, 2ZZ, TF5TP, UO5KAA, U18KAA, VE8MF, 8SM, VK6DX, VQ2PL, 3BNU, 3JTW, VU2WR, W7JEQ/KL7, ZD4AE. (Rx: Hambander and 0-V-1.)

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

PHONE: CN8AI, 8EI, 8EL, EA8XN, EK1AR, 1MB, KP4AZ, MD7WE, PY1ACO, 2BN, 2CK, 4RJ, TI2OE, UA6SF, UO2AB, VK3WL, VP4TB, 4TK, 9KK, W6FTU, YQ3RI, ZB1BA, ZC6UND, 4X4AD. (Rx: H.M.V. 1120.)

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

PHONE: CE1AR, 3CZ, CO2JJ, CT2AB, CR5UP, HH2PB, HP1JS, HR2RF, KZ5AU, 5WG, MD7WE, ST2GE, SV5UN, TI2OE, VK4WJ, 5RN, VP4TK, 5AR, 9F, 9KK, XE2GZ, YN4CB, YV4AA, 5AY, ZC6JY. (Rx: S.504 and AR-88.)

P. Short, Gutersloh, Germany.

PHONE: EK1SA, 1FC, FA3FB, 3KC, 8CF, 8JO, KP4AZ, MD2AC, OQ5CF, OY2RD, 3RD, PY1LC, 7CJ, SV0AG, ØAJ, ØWB, ØWL, TA3FAS, 3GVU, VK2AGU, 3HW, 3MM, VS7SV, YO7WL, ZC6JM, 6DO, 6UNJ, ZL1LA, 2GX, 3AM, 3FL, ZS6UT, 3V8AT, 4X4AD, 4AG, 4AK, 4BL. (Rx: 0-V-1.)

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

PHONE: AR8BC, CO2SG, 8MP, CR4AC, CT2AE, EA8AE, 8AV, 9AI, EK1AD, 1DI, 1MD, F9QV (Corsica)HZ1KE, IS1AHK, LU4BH, 4CN, 5DJ, 8CW, MD2AM, OA4M, OX3BF, 3GE, PI1LC, PY1ACQ, 1DC, 1TT, 2ADI, 2AK, 2AR, 2ARK, 2CK, 2HV, 2JU, 2XS, 4AC, 4AHD, 4BU, 4OR, 4PI, 4RJ, 4SP, 4VX, 5DH, 6CO, 7EZ, 7RX, 7VA, 7XC, 8RJ, PZ1Z, SVØUN, ØWL, ØWY, 5UN, TA3FAS, VK3EE, 3HG, 3HO, 3HW, 3QL, 5RN, VO1DX, VP3MCB, 4LS, YN4CB, YO3RF, 5LC, 7WL, YV5AC, ZB1AJX, ZC6DO, 6JM, ZL2JB. (Rx: McMichael Battery Model No. 484.)

G. Ayton, 76 St. Bernard Road, Stockton-on-Tees.

PHONE: UB5BV, VK3JG, VQ4VL, VS6BS, YO5LC, ZL3JD, ZS1V. (Rx: S.640.)

M. Shortland, 54 Stratford Avenue, Sunderland.

CW: AP2N, 2F, CR4AC, 9AG, CT3AB, FB8XX, FF8MM, FM7WE, 8AB, 8AD, FK8AB, HC3OT, HK6JH, HSI5S, HZ1HZ, JA2CK, 2HB, 3AF, KG6GM, KH6J, KR6CL, KV4AA, KX6BA, MP4BO, OA4BG, OQ5HL, PJ5RE, PK1RI, 2ZZ, 4DA, 4ZZ, 4OO, TI2AP, UL7BS, KV6PW, VU2AZ, YI2UW, ZD2FAR, ZL2FA. (Rx: Mains 0-V-1.)

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

PHONE: CO7EA, CR7AH, CT3AC, JA2CF, KG6AND, 6FS, VP3LO, ZD1SS, ZE2JR, ZS1DH.

CW: CR7RF, 10AA, HR1IO, JA2EU, KG6AD, 6CX, KP6AA, KX6BA, MP4BAO, PK2JL, TG2RO, UAØSI, UL7BS, VS5BK, 7SV. (Rx: S.640.)

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

PHONE: CE3CZ, CN8AZ, CO2SG, CT3AK, FF8OM, KP4AZ, PZ1Z, SV5UN, TA3FAS, TI2FG, VE5GU, 6TM, VK3HW, 5RN, VP7NU, 9L, W7AJS, YV5CE, ZC6JM. (Rx: B.2 Modified.)

D. Rickers, 97 Ruabon Road, Wrexham, N. Wales.

PHONE: SV5UN, UO2AB, VS7GR, 7VS, W3ICW/Airmobile, ZD1SS.

CW: FM8AD, FY8YA, HP2RO, KG6GM, KV4AA, OY5WS, UF6KAF, U18KAA, VQ3SS, VS6BC, 9AL, VP8AK.

P. M. Crawford, 9 Hewitson Road, Dartington.

PHONE: AC2AG, AR8BC, CT7Y, CR5UP, 7AH, CX1CG, JA5AL, 7AH, KP4AZ, LU6AJ, PK4KS, SP5AP, SVØAJ, ØWV, ØWL, TA3FAS, VP4TB, VS7BW,

7SV, VK2ANC, 2KS, 2OO, 2XG, 3HW, 3MM, 3PY, ZL2GG, 4HP. (Rx: *Hambander*).

H. Froggatt, 28 Lea Street, New-Mills, nr. Stockport, Cheshire.

PHONE: AK2CO, 2DZ, 2PI, 2ARG, CN8BA, 8AZ, EK1MD, PY2CK, 5DH, 6CO, TA3FAS, VL5NS, 5RN, VQ45C, 3V8VB.

CW: CN8MI, 8BF, CR4AC, 4AF, FA9VN, 9YU, HZ1HZ, LU2DS, 4BH, 7CD, PY7LN, 6AV, QO5AV, SV0WH, VK5RN, VO1VI, VP6CDI, VS7KR, ZB1KQ, ZS6FN, 3V8AY. (Rx: R1155A).

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

KR7AH, 9AG, KG4AK, 6OR, KH6AO, 6GG, 6LA, 6IJ, 6OA, 6OR, 6YL, PK4DG, UA9CL, VP15JC, VS2BS, 6BI, 6BS, 7EV, 7SV, VU2CU, 2DH, 2DY, 2FA, ZP8AA. (Rx: S.640).

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

PHONE: AP2N, CE3AT, CR7AH, HC1KW, HH2XE, HK1DZ, 4AM, HP1LA, HR2RF, JA2BL, 4AC, 5AL, KG6ER, 6FA, KH6DY, KL7ZM, OA4M, OX3RC, PJ5RX, PK4DA, PZ1PZ, TG9AS, T12ES, 2OE, VP15JC, 3HAG, 4LS, 5AK, 5AR, 6TR, 7NK, 7NU, 9II, 9KK, VQ3AA, 5AI, VS2BS, VU2DH, YN1LB, 4CB, YS1MS. (Rx: BC1147A).

T. Ward, 45 Summervale, Ilminster, Somerset.

PHONE: AK2CO, 2COR, 2RG, CO7PM, EP1A, FA3FB, 9WD, HK3ME, LU4CN, 7CD, MD2HN, OX3BF, 3GE, PH1LC, PY5DH, 6CO, 7VA, T12OB, VO1AH, VP4FL, 9KK, VQ5AI, VS75V, YN4CB, YV5AI, ZC6JM, 3V8AI, 8BB, 4X4CC, 4AG. (Rx: R.1155).

D. K. Cocking, Old Meadow, Farnborough Park, Kent.

PHONE: CE2CC, 3CZ, CR5UP, EA8CA, HZ1KE, KH6AQ, MD7WE, VE8MI, VK2ACX, 2AGU, 2BW, 2QR, 3AFA, 3HG, 3HW, 3JD, 3JE, 5MS, 5RN, VS75V, YN4CB, YV5AB. (Rx: S.640).

D. Dadswell, Hills Farm, Ashurst, Steyning, Sussex.

PHONE: CR4AC, 5UP, 7AH, EL5B, EP1A, FF3CW, FM7WE, HK1CR, ICL, IFQ, 3AO, HP1BR, 1EA, I1Y, 1LA, 1LL, HZ1AB, JA2BL, KG6UAC, KP4AZ, 4CI, 4ES, OA4M, PZ1M, ST2GE, SV5UN, T12OEC, UG6AB, VP3HAG, 3SB, 4LF, 4TB, 5AR, 5AZ, 5FR, 6SD, 6TL, 7NU, 9KK, VS6BS, Y12BJ, YN4CB, YS1A, 1MS, 2AG, 2D1SS. (Rx: *Cossor 3-valve All-wave battery*).

P. Fry, 95 Hursley Road, Chandlers Ford, Hants.

PHONE: CN8BB, 8EL, 8ET, EP1AA, FA3DS, 3FB, HC1QL,

H12RS, HZ1HZ, KP4AZ, PY5DH, 6CO, 6DZ, VE5CJ, VK3JD, VP6SD, 9F, VQ4RS, VS75B, ZC6DH, 6JM, 4X4BC. (Rx: *Marconi* phone T14A).

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

CW: CR4AE, 4AF, EA6AM, 9AI, FE8AB, FF8MM, FM8AD, FN8AD, HC7KD, HP2RO, HZ1HZ, KL7AAF, KV4AA, KX6BA, OA4BG, PJ5TR, PZ1QM, UA9KCA, UF6KAF, UG6KAA, UL7BS, VP1AA, 3FJ, 4LT, VQ2AB, 3BNU, VS2CP, 6AX, ZD2FAR, 4AE, ZE2JN. (Rx: S.680).

K. Everest, 44 Salcombe Drive, Chadwell Heath, Romford, Essex.

PHONE: AK2CO, CF2CC, EA8CA, EK1FC, FM5LL, FT4AP, LU2BL, MD2AC, PY1BH, 1FT, 1IK, 2BN, 2CK, 4OR, 4VX, 5DH, 6CO, 8RJ, TI2OA, VK2KS, 4UL, 5MF, 5RN, YV5AB, ZC6DO, 6JM, 4X4AS, 4AT, 4CZ. (Rx: R.107).

E. J. Logan, Linten Cottage, Fanshawe Street, Bengoe, Herts.

PHONE: AR8AN, 8BB, 8PO, CE2CC, 2SG, 5PM, CR5UP, 6AI, 7AH, 9AG, CX1CG, FF3CN, HC2JR, HK1DZ, HP1LA, HZ1AB, KZ5WG, JA5AL, MF2AA, PJ5RX, PY7AY, 7VA, T12ES, 2OH, UQ2AB, VK5AE, VP3HAG, 3MCB, 4TK, 6TR, VQ4SC, VS7GR, 7SV, XZ2KN, YK1AB, 1AC, 1AD, YN4CB, ZD1KO, 1SS, 4AV, ZE2JK, ZL4AO, 4BE, ZS6UA, 4X4AD, 4AK, 4AN, 4AT, 4CA, 4CC. (Rx: BC342-J).

T. E. Botham, 4 Victoria Terrace, Walsall, Staffs.

PHONE: FF8PJ, HP1LA, HZ1PC, JA2BL, KP4ES, KL7Y, KZ5AA, LU1OD, M13AB, 3LV, PZ1Z, SV5UN, T12OE, 2OEC, VE8AV, VP4TB, 6SD, 9F, 9KK, VQ2JD, 4VL, 5AI, VS2BS, VU2DH, XE1AC, XF1A, Y12BJ, YN4CB, ZD1SS. (Rx: *5-valve S.H.*)

27 mc

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

PHONE: CM9AA, 9AB, HC2OL, 2OS, HR2RF, KP4ES, TA3GVU, TG9AD, VE4XO, 5FY, VO2N, 3A, W6BPD, 6RM, 7NMD, 7QC, XE2W, XF1A. (Rx: S.640. *A.R.R.L. Phone Contest Week-end*.)

7 mc

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

CW: CO2DG, 7JR, KP4KF, KZ5BE, 5DE, 5IP, PY8GD, VE4RO, W5FNA, 5TAE, 6RM, 6SZY, 4X4DF, 3V8AB. (Rx: 0-V-0.)

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

PHONE: PY2AWO.

CW: CN8BJ, CT3AV, EK1AO, HE1HY, K9AIR, KP4HF, 4HU, LU7JN, PY1AG, 2APB, SDY, 7WS, 8MG, SV0WJ, UA9KCA, UF6AB, 6KAF, UO5KAA, VE3ALA, 7EO, VK2ZC, 3MC, 6DJ, VO6VB, W5BRS, 8ELL, 9SMY, 0SO, ZL4GA, 4JP, ZS6QA, 4X4DF. (Rx: BC.224-B.)

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

CW: CO7JR, FM8AD (0215), HH2LD, HK5CR, KP4KF, KZ5BE, 5FA, SV0WJ, UQ2KAB, UL7AA (0055), VP6CDI, 9S.

PHONE: HK3BJ. (Rx: 0-V-1.)

3.5 mc

J. L. Hall, 2 Coombe Court, St. Peter's Road, Croydon.

PHONE: LX1JW, TA3GVU, VP6SD, 7NN.

CW: CT1BV, 1SQ, EK1AO, FM8AD, KP4KD, KV4AA, KZ5PA, VP5BF, 6SJ, XF1A, ZL1BY, 1MB, 3GQ, 3JT, 3NE, 3OX, 4IE.

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

PHONE: CM9AA, VE1IE, 1VF, VP6SD, 7NN, W1JYH, 3BES, 3IE, 4CYN, 4DCQ, 4GHO, 4KWY, 4LR, 4NC, 8DOC, 9BOC. (Rx: *Modified R.1155A*.)

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

PHONE: CT1QM, KP4AM, 4EL, 4EW, W4MPG, 4QZE, 4YG, 5PDZ. (Rx: S.640.)

D. K. Cocking, Old Meadow, Farnborough Park, Kent.

PHONE: W1RGK, 3CIC, 4DCQ, 4GHO, 8UKS. (Rx: S.640.)

J. M. Graham, 20 Chesterfield Avenue, Glasgow, W.2.

PHONE: TA3GVU, VO2BL, VP6SD, 7NN, W1AAH, 1ATE, 1EJN, 3BES, 3LOE, 4CLN, 4CPG, 4DCQ, 4FUM, 4KWY, 4LR, 4NC. (Rx: AR.88.)

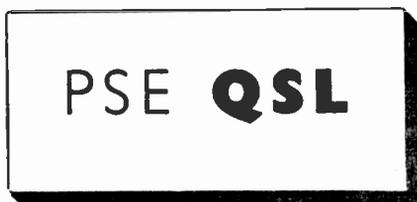
G. Ayton, 76 St. Bernard Road, Stockton-on-Tees.

PHONE: DL1FK, 3EA, 4LN, OK1MB, 4SO, OZ3Y, 5PS, PA0YX, SM5UM, VE1CR, 1DW, VP6SD, WIATE, 1KYG, 1PEA. (Rx: S.640.)

1.7 mc

N. G. Robson, 69 Granville Road, North Gosforth, Newcastle-on-Tyne, 3.

PHONE: G2AYN, 2CZH, 2FGS, 2GS, 3A1A, 3EAZ, 3ERM, 3IW, 5QU, 6AB, GW2CUT. (Rx: S.640.)



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.

- CO2HO Soledad 205, Apt. 205, Habana, Cuba. Reports on 7, 14 and 28 mc phone.
- CO2SG Ave. 3a. No. 66, entre 12 y 13, Am. de Almerdares, Marianao, Cuba. 14 mc phone, 1700-0600 GMT.
- DLIEE J. Falster, b|Hohenstadt Nr. 1, Grossviehberg, Mittelfranken, Germany. 3-5, 7, 14, 28 and 144 mc phone and CW, evenings and weekends.
- DLIIP D. Missfeld, Hauptstr, Hochdönn-Dithmarschen, Germany. 7 and 14 mc CW, 0300-0500 GMT.
- DLITP Alte Poststr, 12, Thiede, Braunsch, Germany. 1-8, 3-5, 7, 14 and 28 mc phone and CW.
- DLIXA Bussestr 23, Bremerhaven, Germany. 3-5, 7, 14 and 28 mc phone and CW, 2000-2300 GMT and Sundays. Frequency check and any chirp.
- DLIXE Körnerstr 10, Bremerhaven, Germany. 7 and 14 mc CW, 1700-2300 GMT.
- DL2NT 7th Arm'd. Bde, Sig. Sdn., B.A.O.R. 16, 7 and 14 mc phone and CW, 0900-1700 and 2000-0100 GMT. QRM, QRN, QSB, Condx, Wx and humidity.
- DL3HG Untere Parkstr. 26, Haar b. Munchen, Germany. 3-5, 7, 14, 28 and 145 mc phone, evenings.
- DL3KI H. Schulte, Bredenborn 155, uber Hoxter, Germany. 3-5, 7, 14 and 28 mc phone.
- DL3QA Aachenerstr 10, Alsdorf, Kr. Aachen, Germany. 3-5, 7, 14 and 28 mc CW: 3-5 and 28 mc phone.
- DL4DO } Echterdingen Air Base, APO, 46, c/o P.M.
DL4DQ } N.Y.C., U.S.A. 14 mc phone and CW.
DL4DP } 1700-0600 GMT. Modulation, keying and stability.
- EA3RK Federico Aragones Xiol Sastre 6-1º, Granollers, Barcelona, Spain. 7, 14 and 28 mc phone, 1300-1700 and 2000-2359 GMT.
- E14A D. McCrossan, Curragh-Camp P.O., Co. Kildare, Ire. Operating 7013 and 7026 kc CW.
- F9DI 74 rue Victor-Gallard, Moreuil, S. France. 144-27 mc phone and CW, 1930-2330 GMT.
- FA9WC 35 Ave. Gustave-Jobert, Mostaganem, Algeria. 7200 and 14380 kc phone, 1200-2000 GMT.
- G2FCI Little Pleasance, Western Road, Ashburton, S. Devon. 7 and 14 mc phone, 2015-2200 GMT, Sundays 1000-1300 GMT. No European reports.
- G3DBE 2/35 Grove Lane, Handsworth, Birmingham. VFO-controlled 3-5, 7, 14 and 28 mc phone, 1930-0130 GMT. Reports from Overseas only.
- G3FPV 12 Knowle Road, Maidstone, Kent. 1-7 mc and 7025 kc CW, after 1930 GMT, and Sundays.
- G3GGG The Garage, East Hagbourne, Didcot, Berks. 1762 kc and 3-5, 7, 14 mc CW, after 1900 GMT.
- G3GMC 46 Holcombe Avenue, Elton, Bury, Lancs. Reports on CW transmissions, all bands.
- G3GMI 3 Hungerford Avenue, Slough, Bucks. CW, all bands, after 1900 GMT, and weekends.
- G3MT 28 Coburg Road, Dorchester, Dorset. Reports on 1-8 and 28 mc phone.
- HB9KC Allmendstr 27, Baden, Aargau, Switzerland. 3-5 and 7 mc CW, 0800-1300 and 1600-1800 GMT.
- I1AYX P.O. Box 73, Siresa, Lake Maggiore, Italy. 14 mc CW, 0600-0700 and 1200-1245 GMT.
- LUSCK Galvan 3074, Buenos Aires, Argentina. 50106 kc phone, 0001-0400 and 1700-2000 GMT.
- MF2AB RAF Signals, Command Post, HQ, B.E.T.FOR., F.T. Trieste. Detailed reports on 3-5 and 14 mc CW, 1000-1200 and 1700-2200 GMT.
- MP4BAB c/o I.A.L., Sharjah Airport, Trucial Oman Coast, Persian Gulf. 28240 kc phone, 1000-1700 GMT. Details of modulation.
- OH2VU Stenbackink 22, Helsinki, Finland. 14 and 28 mc phone, 0800-1100 and 1730-2000 GMT.
- PY1AQT P.O. Box 528, Rio de Janeiro, Brazil. Phone, 14 mc 0700-0800 GMT: 28 mc 1530-1800 GMT.
- SVØVF Maj. J. M. Moss, Sig. Corps U.S. Army, c/o 17a Bucharest Street, Athens, Greece. 14 and 28 mc phone. Quality, modulation and stability.
- VE2ACM 163 Kings Road, Valois 33, Quebec, Canada. 3-75-4-0, 14 and 28 mc NBFM phone. Quality.
- VE2NU 74 rue Ste-Marie, Rimouski, Quebec, Canada. 14130-14150 kc CW, at 1700 and 2300 GMT.
- VE3ARS Box 799, Paris, Ontario, Canada. 14 mc phone and CW, 0001-0300 GMT, and weekends.
- VE3AYN 369 Elliott Street East, Windsor, Ontario, Canada. 28 mc phone, 1400-1900 GMT. Comparative reports with W8 stations.
- VE3BNY 325 Cooper Street, Ottawa, Ontario, Canada. 7 and 14 mc CW, 0430-0630 and 2230-2359 GMT.
- VE7AX 702 Miller Road, Sea Island, Vancouver, B.C., Canada. 7150 and 7290 kc CW, 0400-0800 GMT.
- VK3ADF 24 Ormond Street, Mordialloc, Victoria, Australia. 14 and 28 mc phone and CW, 0500-1400 GMT. Comparative reports and quality.
- VK5ZR 55 Crozier Avenue, Mitcham Park, Adelaide, South Australia. 28 mc phone, 0700-1500 GMT. Comparative reports.
- V02BV G. D. Parsons, Harbour Grace, Newfoundland. 1-8, 3-5 and 7 mc phone and CW.
- VU2MQ 1182 Bhaw's Pole, Raipur, Ahmedabad, India. 14 mc CW, daily 1400-1700 GMT: 28056 kc CW, Sundays at 1100 GMT.
- W1AVY 39 Windsor, New Bedford, Mass., U.S.A. 3-5, 7, 14 and 28 mc CW and 'phone. Modulation.
- W2UZP 103 Woodland Avenue, S. Merchantville, N.J., U.S.A. 14-2-14-3 and 29-29-7 mc phone.
- W2ZYN 48 Matthews Street, Binghamton, N.Y., U.S.A. 29 mc phone, 1300-1430 and 1700-1830 GMT.
- W3PVK Box 113, Stockdale, Pa., U.S.A. 3-5, 7 and 14 mc CW, 0400-0700 and 2000-2359 GMT.
- W3PWI 7010 Exeter Road, Bethesda 14, Md., U.S.A. 28-3 mc phone, weekdays 1800-2300 GMT.
- WSZAB 978 East Main Street, Houma, La., U.S.A. 28-5-28-7 mc phone, 1400-0300 GMT.
- W6IDS 704 Norwood Drive, Pasadena 2, Calif., U.S.A. 14090-14150 kc CW, at 1800 GMT.
- W7AUS 5342 S. 160th, Seattle 88, Wash., U.S.A. Reports on 28580, 28600 and 28650 kc phone.
- W7HAH Box 246, Heyburn, Idaho, U.S.A. 14-14-1 and 28-28-1 mc CW, 1600-0500 GMT.
- W9EPC 553 W. Paris Street, Frankfort, Ind., U.S.A. 29-2 mc phone, VFO, 1400-1600 GMT.
- W9KJC 4211 N. Monticello Avenue, Chicago 18, Ill., U.S.A. VFO-controlled 7, 14 and 28 mc CW.
- W9LRT J. Morgan, Borders Hatchery, Bourbon, Ind., U.S.A. 28 mc phone, 1430-1830 GMT.
- W9ZSY 1621 Smith Street, Wisconsin Rapids, Wis., U.S.A. 28035 kc CW, also 28639 and 28666 kc phone, 1300-1600 and 1800-2000 GMT.
- WØDBC 3306 Aldrich Avenue N., Minneapolis, Minn., U.S.A. 28-5-29-7 mc phone, 1430-1900 GMT.
- WØHEL 2135 Rosebud, Normandy, Mo., U.S.A. 7010-7030 kc CW, weekends 2100-0600 GMT.
- WØLEJ 205 East 28th Street, Des Moines, Iowa, U.S.A. 3-5, 14, 28 and 144 mc CW and phone.
- WØSIT J. F. Egli, RFD.5, St. Joseph, Mo., U.S.A. 14100 and 28896 kc phone and CW, 0900-1100 and 1600-1800 GMT.
- ZL3IA S. Langrope, Lavaud Street, Akaroa, N. Zealand. Comparative reports on VFO-controlled 28 mc phone and CW, 2000-2200 GMT.
- ZS5IA 72 Venice Road, Durham, Natal, S. Africa. 28 mc CW, VFO, at 1200 and 1800 GMT.
- ZS5JR P.O. Box 4, Pietermaritzburg, Natal, S. Africa. Quality of modulation of 28300 and 28350 kc phone, 1400-1700 GMT.

THE V H I F END

by A. A. MAWSE

Seventy Centimetre Results— New Activity on 70 cm.— More About Beam Aerials— Station Reports and Results— Conditions Better on Two

LAST month news of the reception of 70 cm. signals over the 119-mile path between Bolt Tail and Southampton arrived just in time to receive a brief mention in this column. Judging by the conversations overheard on two metres during the past few weeks, this achievement by G3EJL and G5BY has acted as a spur to others to get going on the 430 mc band. Amongst those known to be either active, or preparing for serious activity, on 70 cm. are G2BMZ (Torquay), G2XC (Portsmouth), G3ABH (Poole), G3AVF (Torquay), G3CGE (Southampton), G3EJL (Southampton), G3RI (Southampton), G5BY (Bolt Tail), G5TP (Henley), G6LK (Cranleigh), and G6NB (Aylesbury). An actual two-way contact between G3EJL and G5BY was made on March 28 at 1910 GMT, when CW signals were RST 559 for 30 minutes, and there have been several contacts since. G3EJL now has a crystal controlled converter which is 6 dB better than the one on which he originally received G5BY's signals. It covers 430 to 438 mc by using two crystals. This means sweeping 4 mc on the receiver being used as 1F amplifier, then changing crystal and tuning the same 4 mc again.

It would appear that any listeners in the South of the country, from London down to Devon, have a reasonable chance of hearing signals in the 70 cm. band.

It is believed one or two of our more experienced correspondents are already preparing converters suitable for receiving CW signals. One thing is certain, namely, that reception reports will be welcomed by the Tx men from almost any distance, and that there will be no doubt of the value of such reports. As things are at present, indiscriminate searching on 70 cm. is not likely to be a profitable procedure. Best method is to listen on two metres, eavesdropping on the conversations especially when there is mention of 70 cm. Most of the 70 cm. tests are being

prearranged on the two-metre band, and listening there is the best method of keeping in touch with what is going on.

Two Metre Conditions

The occasional spells of fine weather during March provided a welcome improvement in conditions, and although there were still many days when little or nothing was to be heard of the DX, on other evenings good strength signals were logged from 150 miles or more.

Activity still appears to be low in some parts of the country, but in East Anglia, and the Southern Counties there are more than a few regular stations. G3BW (Whitehaven) has been reported logged in Dorset, and G2OI (Manchester) and GW2ADZ (Llanymynech) have frequently been heard working stations in London and the South.

Aerials

Last month it was suggested that it would not be fair to judge the merits of the wide-spaced 4-element beam described in these pages in September 1949, on the basis of results obtained with modified versions. G3EHY, in a letter to G2XC, comments on his experiences with this beam, built to the original dimensions. He says, "Comparing it with several of the others I have, with more elements, I do find it exceptionally efficient. I have just made a Balun match at the receiver end to feed the 300-ohm line into a 72-ohm input and the results are quite interesting and most successful." Others have had similar experiences, and it can confidently be recommended as being extremely simple to construct and efficient in operation—but it must be emphasised again that changes in element length and spacing should not be made unless you have adequate facilities for measuring its performance.

If more gain is required than that given by the four elements, it is better to stack another set of four elements a half-wave above or below the first set, than to add more directors. Tests made with the original beam showed that the addition of a third director, unless very carefully positioned and adjusted, *reduced* the forward gain. This serves to illustrate the point that as the number of elements in a beam is increased *so the gain per additional element becomes less.* A

2-element Yagi gives around 5 dB gain over a dipole, a 3-element 8 dB, 4 elements 10 dB, and five elements 11 dB. Thus, the gain achieved by adding the first parasitic element was 5 dB, the second element added another 3 dB, the third added 2 dB, and the fourth only 1 dB. In general, doubling the number of elements in an array gives about 3 dB gain, assuming of course, that all adjustments and dimensions are correct. Stacking two beams, as recommended above, will give this 3 dB gain. But it must also be remembered that the more elaborate an aerial becomes the more intricate is the feeder system and therefore the chances of loss on the feeder cable due to mismatching increase. If we are not careful that 3 dB gain we hoped to achieve will be lost in the feeder, and our 8 elements will be no better than four! An easy method of feeding a 4-over-4 beam was described in *Short Wave Magazine* in December 1949 (page 770) and as several enquiries have come from readers on the subject, it is proposed to give a diagram showing all the dimensions in next month's "VHF End." The beam requires two four-element Yagis each to the dimensions given in *Short Wave Listener* last September, and some 300 ohm ribbon feeder.

Station News

E. A. Lomax (Bolton) has found things much better this month. March 5 and 6 were excellent days with him, with G3BLP, G3EHY and G5TP all S9 plus signals. There was a poor period around the 13th and 14th, but things looked up again and there was another

BEST TEN OF THE MONTH

Operator	Location	Total Miles	Best DX (Miles)
E. A. LOMAX	Bolton	1,708	184
A. L. MYNETT	Wembley	1,645	181
P. J. TOWGOOD	Bournemouth	1,130	189

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.

peak in conditions between March 24 and 28. On March 26, he heard the Norfolk stations G2XS and G5UD for the first time. The G3EHY-GW2ADZ schedule was checked on 27 evenings, the former providing a signal on 18 occasions, while GW2ADZ was only missing twice, namely, on March 15 and 31. E. A. L. comments that despite the improved conditions from the South he is hearing nothing from the North and wonders if there is any one active in GM or GI.

R. L. Bastin (Coventry) records March 6 and 7 as being good with him, a number of South London stations being heard, on a simple dipole in the roof space. Unfortunately he missed the good opening on March 25, when he was told the local stations G3ABA, G5SK and G6C1 worked much DX.

A. L. Mynett (Wembley) also experienced better conditions than for some months past, and gives March 5 as particularly outstanding, G5BY being S7 on phone. March 25 was

TWO-METRE CALLS HEARD

R. L. Bastin, 83 Guphill Avenue, Coventry, Warwick.

PHONE and CW: G2FWW, 2MV, 3BLP, 4HT, 4RK, 6NB. (Rx: Modified 26 Unit (EF54-EF54-955) into BC342-N on 9.7 mc. Aerial: 2½ dipoles in a roof.)

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

PHONE and CW: 25-50 miles: G2NM, 2XC.

50-100 miles: G2AHP, 2BMI, 2BMZ, 3AZJ, 3CGO, 3FD, 3FXG, 3GBO, 3GHS, 3GSE, 4DC, 4HT, 5BY, 5IB, 5MA, 5PY, 5TP, 6JK, 6LK, 6NB, 6UH, 6WT, 8KZ, 8QC, GW3EJM.

100-150 miles: G2CIW, 2WJ, 4RK,

150-200 miles: G2OI, 2XS, 3VM, GW2ADZ. (March 3-April 3. Rx: 6J6 P/P. R.F., 6J6 mixer, 2x6C4 osc., into xtal-controlled converter at 9 mc., into 1.6 mc IF/AF amp. Aerial: 4-ele. c.s. beam, 108 ft. a.s.l.)

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

G2MV, 2OI, 2XS, 2ATK, G3DA, 3ABA, 3AHT, 3BLP, 3CXD, 3EHY, 3ELT, 3ENS, G4LU, G5CP, 5RW, 5TP, 5UD, 5VN, 5VN/P, G6NB, 6VX(?), G8SB, GW2ADZ. (Rx: 6J6 (G2IO) AR88 on 10 mc. Aerial: 10 m. folded dipole 38' E/W 300 ohm ribbon feeder QTH 650' a.s.l.)

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

50 to 75 miles: G2AIO, 2DSW, 2NM, 2XC, 2XV, 3ANB, 3BHS, 3EJL, 3FAN, 3FIJ, 4MW, 5MI, 8IL, 8LY, 8SY.

75 to 100 miles: G2ATK, 2FNW, 2XS, 3ABA, 3ABH, 3ENS, 5SK, 5UD, 6CI.

100 to 150 miles: G2IQ, 3EHY, 3FMO, GW3EJM.

150 miles and over: G2BMZ, G2OI, G3AHT, G5BY, GW2ADZ. (Rx: 6J6 converter. Aerial: 3-ele. beam. March 2-26.)

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

G2AIO, 2AJ, 2CIW, 2CPL, 2FZR, 2IQ, 2MV, 2UJ, 2XS, 2WJ, 3BLP, 3CGO, 3FXA, 3FXG, 3WW, 3FD, 3GBO, 4HT, 4MW, 5MI, 5UD, 6NB, 6LL, 6LO, 6LR, 6VX, 6WU, 8KZ, 8QC, 8SK, 8WV, F8GH, 8LO, 8OL, 9FT. (March 2-April 5. Rx: 6J6 converter into HQ120X on 7.4 mc.)

A. E. Wright, 92 Druid Street, Hinckley, Leicester.

G2ATK, 2FNW, 2FWW, 2IQ, 3ABA, 3BLP, 3CXD, 3EHY, 4RK, 5RW, 5SK, 5JU, 6NB. (RF-27 into CR-100, 3-ele. close-spaced beam.)

another good day and produced a signal from G2OI for the first time. He also heard G2FNW (Melton Mowbray) using an indoor beam on the same date, and G2XS was RST 599. G3EHY has been heard on 18 different days during the month, while G3ABH in Dorset has been a consistent signal with A.L.M.

P. J. Towgood (Bournemouth) is seriously considering getting started on 430 mc. On two metres, like others, he found March 5 outstanding, but March 30 was the only night that provided signals from the North, and then only G2OI.

Down in Eastbourne, J. E. Harman has temporarily discarded the stacked array and has the *Short Wave Listener* wide-spaced beam in operation, at a height of 25 ft. J.E.H. reports "brighter conditions and more activity" and has come to the conclusion that the Downs, apparently hilling in his location, do not affect reception from the North as much as he had thought—or is it that beam? At any rate, his Calls Heard list is interesting and impressive. J.E.H. is now beginning to find unidentifiable phone carriers a nuisance, and we must again ask G2XC of the *Short Wave Magazine* to campaign for more signing on CW.

An interesting report from A. W. Blandford (Mitcham, Surrey) discloses that in addition to finding the band much better lately—he has heard some new stations on Two—he has got going on 70 cm. with a modified 1294 receiver. This gave him a great thrill on the new band when it produced 430 mc signals from G5PY (South London) as the first station heard on Seventycems. As A. W. B. puts it, "Though G5PY is not far away, it is a start and I hope to have more to report next month"—good show!

The Best Ten

Favourable comment has come in on the new "Best Ten of the Month" contest. E. A. Lomax welcomes it and thinks it will act as a much-needed spur as well as being a fairer scheme than the counties table. The latter competition shows such slow progress for those near the top that interest is likely to wane whereas, he says, the "Best Ten" will keep everyone on their toes! A. L. Mynett also thinks it a good idea, but believes E. A. L. will be the regular winner if he can keep up his last month's achievements! Well, it begins to look like it from this first month's entry.

E. A. L.'s log shows reception of G2MV (184 miles), G3BLP (180) and G3EHY (155) each on several occasions. A. L. M. managed to receive G5BY (181), G2BMZ

(160), G2OI (161), G3AHT and GW2ADZ (150), while P. J. Towgood, although third, scored the longest distances with 189 miles to G2OI and 185 to G3VM (Norwich). P. J. T. was unfortunately down with 'flu for part of the month, so he should climb higher next time.

It is hoped others will be encouraged to enter their results next month, and just to even thing up, please send in your results to cover one *calendar* month, i.e. April 1 to 30.

Seventycems—Late Flash

Just as this feature was going to the printer, it was reported that G5BY (Bolt Tail, S. Devon) and G3EJL (Southampton) had again (April 7) achieved contact on 430 mc over their 119-mile path, QTH-QTH. But note the details: Signals R5,S9 both ways for one hour from 1923 GMT. What an achievement! All SWL's will join us in congratulating the operators concerned on pioneer work of the utmost importance, and we can now look forward to developments on 70 cm. as exciting as the early exploration of the five and two-metre bands.

And that is not the end of it. G3EJL has heard on various dates from April 6 onwards the following stations on 430 mc: G2BMZ (Torquay), G3ABH (Sandbanks, Dorset), G3BHS (Eastleigh), G3CFR (Bournemouth) and G3RI (local). G2BMZ has also heard G3EJL, so a QSO is in prospect there before very long, if indeed it has not already taken place.

It is much to be hoped that SWL's will play their full part in this development. An effective converter design for 70 cm. has appeared in the *Short Wave Magazine* (November 1949); G5BY's successful modified version of it will be described in the May issue of the *Magazine*; and in June an article is promised on the new G3EJL 70 cm. converter, giving full details.

In Conclusion

With conditions really looking up, it is hoped enthusiasm will reawaken in those who migrated to the DX bands for the winter, and some excellent logs should be forthcoming this coming month and throughout the summer. The latest date for next month's reports is May 4, and the address is, of course, A. A. Mawse, *The Short Wave Listener*, 53 Victoria Street, London, S.W.1. With you again on May 18.

Become a Direct Subscriber

WORLD WIDE RECEPTION OF SHORT WAVE PROGRAMMES

DX *broadcast*

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

Radio Australia continues to be well heard even for broadcasts not intended for the United Kingdom. VLC4, 15320 kc; VLA6, 15200 kc and VLB4, 11850 kc were all logged with Bach music recently at 1150 by H. W. J. Lucas (Upper Weston, Bath). C. P. Turner (Crewe) in the Mail Bag programme at 2100 on February 19 received verbal confirmation of his most recent report. For very young children there is a 10-minute session each Saturday at 0800—listen to VLA4, 11850 kc.

Radio New Zealand over ZL3, 11780 kc, was coming in at 0800 on March 1; the announcement read: "The time in Wellington is 8 p.m. This is Radio New Zealand broadcasting to Australia and the Islands." On March 4 at 0425 we heard a cricket commentary on one of the matches of the Australian tour over ZL4, 15280 kc.

Radio Tahiti, FZP8, 12080 kc, was good at 0450 on March 8 at the conclusion of its French News; the next day's transmission was announced for "dix-huit heures quinze" (6.15 p.m. local time), then came an interval signal made on an instrument sounding not unlike the Brazzaville "Sanzi." The News in Tahitian was concluded at 0507, and after a male-voice anthem, the playing of the Marseillaise brought the transmission to a close.

Africa

EA9AA, Tangier, 7060 kc, has again been heard, this time by D. G. Cull (London, W.12) at 2100; the directors of Radio Africa have also sent him a letter verification in French and a card with a view of Tangier. J. C. Catch (South Shields) noticed that when this station closed at 2300 on March 19, it gave announcements in English, French, Spanish and Arabic requesting listeners' reports. He also mentions an Angola station between 1800 and 1945 on 11925 kc and suspects that it is "Radio Clube de Huambo" on a new frequency; the station call was: "Aqui Nova Lisboa, Angola—Radio Clube de Huambo," and there was a further announcement which appeared to read: "The Voice of Portugal in Mid-Africa." The

schedule is: Sundays: 1100-1245, 1600-1700; Weekdays: 1800-2200. R. Iball (Langold, Notts) has spotted an Angola station on 7560 kc at 2138 with two chimes and the direction: "Radio Clube de Bie"; this is CR6RO, officially on the air until 2030 only.

J. C. Catch gives CR4AA, Praia, 5900 kc (checked), audible from 2030 until 2200 when it closes with the Portuguese Anthem; the call is given every quarter-hour as follows: "Radio Clube de Cabo Verde." J.C.C. has yet another Portuguese colony heard between 2300 and midnight on 8013 kc with guitar music and the like, and closing with a March and a call which appeared to read: "Radio Clube de Marca." Is this a station at Macao (Portuguese China) or is it CQM4, Bissau, Guinea on a new channel?

R. Patrick (Finsbury Park, N.4) tells us that in French West Africa a new Government station, by name Radio Bekamo is now operating on 15030 kc with a power of 2 kW; daily broadcasts consist of weather reports, news and occasional musical items; he has lately received OTC2's new card which is a most attractive affair. J. C. Catch has logged OTC3, Leopoldville, 11645 kc, working in parallel with OTC2 up to 2345, when the former closes down. C. Makin (Liverpool, 20) has received the City of Nairobi's (4885 kc) latest schedule, and has spotted Radio Dakar on 15345 kc concluding a session of dance music at 1930. C.M. also has a verification from Radio International, Tangier (6110 kc)—a card depicting a view of Tangier taken from the Casbah.

J. C. Catch has their verification and one from V3USE, Mauritius, 15075 kc, an air-mail letter specially printed for verification purposes.

D. G. Cull gives us the news that he has logged CR7BG, Radio Mozambique, Lourenco Marques on 15196 kc with dance music at 2000. It is supposed to be testing 2000-2030 on Thursdays only, but R. Iball has heard it daily from 1800 to 2000 with popular music. Johannesburg, 4895 kc was a strong signal at 1755 on March 3 according to J. M. Simpson

ALL TIMES GIVEN IN THIS ARTICLE ARE GMT EXCEPT WHERE STATED

TABULATED SCHEDULES

I. Mauritius Broadcasting Service, Station V3USE, Forest Side, Island of Mauritius.

Frequency : 15075 kc. Output : 1.5 kw.
 Schedule : 0300-0415, 0800-0930, 1430-1700.

II. Forces Broadcasting Service, Malta.

4965 kc : 0400-0700, 1330-2200.
 7270 kc : 0400-0700, 1400-2200.
 11895 kc : 0930-1300.

III. Cable and Wireless Station, Nairobi, Kenya.

Address : Cable and Wireless, Ltd., P.O. Box No. 777,
 Nairobi, Kenya.

Frequency : 4885 kc.

Schedule : Monday, Tuesday, Thursday, Friday : 1000-1100, 1500-1900,
 Wednesday : 1000-1100, 1500-2000.
 Saturday : 1000-1115, 1500-2000.
 Sunday : 1500-1900.

IV. Radio Club of Mozambique, P.O. Box 594, Lourenco Marques, Mozambique, Portuguese East Africa.

English Language
 0400-0700 (Monday to Saturday). CR7AA, 6137 kc ; CR7BU, 4932 kc.
 0700-1700 (Daily). CR7BG, 9766 kc. ; CR7AA, 6137 kc.
 1700-2100 (Daily). CR7BU, 4932 kc ; CR7AB, 3490 kc.
 CR7BJ, 9766 kc has also been testing from 0400 onwards.

Portuguese Language

0500-0600, 0930-1130 (Monday to Saturday). CR7BE, 9671 kc.
 0500-0600, 0900-1100 (Sundays). CR7BE, 9671 kc.
 1600-2000 (Daily). CR7BV, 4819 kc ; CR7BG, 15196 kc
 (1800-2000).
 2000-2030 (Thursday). CR7BG, 15196 kc. (Test.)

Another transmitter on 11764 kc has also been testing from 0500.

V. Radio Denmark.

To South America : 0000-0100 (Monday, Wednesday, Friday)—9520 kc.
 To North America : 0200-0330 (Weekdays), 0200-0300 (Sunday)—9520 kc.
 To Far East : 1000-1200 (Tuesday, Thursday, Saturday)—15165 kc.
 Home Service Relay : 1740-2230 (Daily)—7260 kc.

VI. Taiwan Broadcasting Station, Taipeh, Formosa (Taiwan), China.**"Voice of Free China" Programme**

Part i. 0400-0600. BED3, 15235 kc.
 Part ii. 1000-1630. BED4, 11800 kc.

It is now reported that BED4 has now changed to 7260 kc.

Other transmitters in use : BED29, 7215 kc ; BED2, 670 kc.

VII. Radio Republik Indonesia Serikat, Jakarta.

Address : Gambir Selatan No. 17, Djakarta.

English

1100-1200. YDC, 15150 kc ; YDB2, 4910 kc.
 1400-1500. YDC, 15150 kc ; YDB2, 4910 kc.
 1500-1600. YDF, 6045 kc.
 1900-2000. YDF2, 11785 kc.

Other Languages

1200-1300. Chinese. YDC, 15150 kc ; YDB2, 4910 kc.
 1300-1400. Arabic. YDC, 15150 kc ; YDB2, 4910 kc.
 1500-1600. French. YDC, 15150 kc ; YDE, 11770 kc ; YDB3,
 7270 kc.
 1600-1700. Hindu/Urdu. YDC, YDE, YDB3, YDB2.
 1400-1500. Indonesian. YDF, 6045 kc.
 1615-1700. Arabic. YDF2, 11785 kc.
 1700-1800. French. YDF2, 11785 kc.
 1800-1900. Dutch. YDF2, 11785 kc.

(Hayes, Middsx.); at this time he heard its Sunday evening religious service.

We ourselves have had two interesting stations in the bag this month. The first is ZRB, 9110 kc, the South African Air Force station at Waterkloof, heard on four different mornings between 0445 and 0520; signal strength is initially low but increases to S7 by 0500, after which there is a gradual fade to complete silence at 0530.

The programme is mostly physical exercises to a piano-forte accompaniment, but at 0500 there is a pips time-signal, a clock striking seven, and the direction : "This is the South African Broadcasting Corporation," followed by the news headlines in English. On March 15, however, the announcement ran : "This is the South African Post Office," and a police SOS concerning a recent robbery with violence was given. After the news we heard another voice (presumably from the Air Force Station) which reads barometric pressures in millibars and surface wind and visibility reports. The gymnastics programme is continued from 0505 until 0520 when there is a broadcast of musical recordings.

The other station is ZNB, Mafeking, Bechuanaland, which has been logged regularly on a new frequency of 8230 kc between 1730 and 1930, at which time it closes with "God Save The King." The programme consists of recorded musical items, and on March 1 there was a session of Regimental Marches from 1750 until 1820. Though announcements are in English, the heavy static makes identification extremely difficult.

Asia

J. C. Catch has just received his verification for JKI, 4910 kc for a programme



The 50 kW equipment of Radio Australia, V.L.C., at Shepparton, operating on various frequencies from 6 to 22 mc. There are 19 different directional aerial systems at this station, giving adequate coverage of all parts of the world at any time of the day.

which included Japanese "Koto" music at 2130, from the Broadcasting Corporation of Japan, Radio Tokyo Building, Tokyo Central P.O. Area. His correspondent, Isamu Yamazaki, Chief of the International Broadcast Section, writes: "Japan's shortwave transmission is not meant for foreign countries and therefore it is very low-powered, airing the programs for home service as they are. In spite of this, listeners of some North European countries are kind enough to report to us their reception of this transmission." The complete schedules will be given next month. J.C.C. has again logged Ulan-Bator-Hoto, Urga, Mongolia, this time on 5256 kc at 2300. The 8400 kc transmitter signs on nightly at this hour, according to J. M. Simpson—but around 1430 will probably be a more convenient time for some, especially at the week-ends.

HLKA, Seoul, Korea, now on 7935 kc, was logged by J. M. Simpson and your commentator simultaneously at 2115 on March 10, when we heard brass band recordings of "Hearts of Oak" and "British Grenadiers." Ascending vibraphone notes were radiated at 2130. Whilst Peking on 10258 kc is not often too clear, its native music at 1320 on March 11 was good and the direction at 1330: "This is

the Free China Broadcasting Station in Peking. Here is the News" was well audible. On March 12, however, at the same time, we logged the same broadcast on a frequency of 15060 kc; there was mention of the building in Manchuria of numerous winter schools which are being set up for the purpose of catering for the needs of its new settlers. J. M. Simpson has heard a station on 8351 kc between 1200 and 1330 on two successive Sundays with announcements in French (Marseillaise at 1210); the direction appears to be: "Radiodiffusion Francaise pour les Pays Occidentales."

A number of our readers have logged YDF2, 11780 kc, with its English session daily at 1900; programme includes News at 1901 and 1950, interspersed with musical recordings (B. P. Middleton, Clapham, S.W.11).

Other listeners have found YDF, 6045 kc, with its English broadcast between 1500 and 1600 daily; they are: J. H. Simpson, R. Iball, J. C. Catch, and D. H. Smith (Hatch End, Middsx.): on March 12 at 1530 we had an interesting talk about the island of Sumatra with its mountains and waterfalls in the West and wide open spaces with placid lakes in the

East. YDQ3, Makassar, with its English dance music, has been consistent on 11084 kc around 1445. In the Philippines, DZ13, The Republic Broadcasting Station, is a new one on 6110 kc between 1100 and 1700.

Coming west, Radio Ceylon, Colombo, 15120 kc, has been heard by P. E. Woolmer (Grantham) with a programme summary just before closing time at 1700. VUD11, 9630 kc, was a very powerful signal when opening up at 2345, according to R. Iball. G. F. Q. Brooks (Writtle, nr. Chelmsford) informs us that Srinigar, Kashmir, is reported as being on 4865 kc with a relay of news from the A.I.R. at 0230, 1230 and 1530.

C. Costello (Wellington, N.Z.) sends us details of Pakistan's transmitters which are: APK1 and APK2 (both 50 kW), Karachi, operating on 11885 kc, 11810 kc, 9645 kc, 7270 kc, 7265 kc and 17835 kc, 15335 kc, 11570 kc respectively; APD1, Dacca (7.5 kW), 7140 kc; and APL1, Lahore (7.5 kW) on 6075 kc. D. G. Cull has heard APK1 and APK2 on 11885 kc and 11570 kc at excellent strength at 1900 and 1515 respectively. J. H. Simpson says their English direction at 1800 can be received at S9.

Further west, Beirut, 8036 kc, was heard with a French News bulletin at 1900 (D. G. Cull), and we noted Damascus' with English News at 2030 on 6910 kc. P. E. Woolmer mentions Turkey's Mail Bag, now given over TAQ, 15195 kc Sunday evenings at 2030, and EQC, Iran, 9680 kc, heard at 2000 with its daily English broadcast. C. P. Turner has received his verification for EQC, and R. A. Savill's (Sevenoaks, Kent) letter from ZJM7, Limassol, Cyprus, gives the normal frequencies as 6135 kc, 6170 kc, 6790 kc, 9650 kc and 11720 kc.

A letter from Geoffrey D. Goldstein of the Zionist Information Office, 77 Great Russell Street, London, W.C.1, informs us that the Israel Broadcasting Service has now started direct transmissions in English to this country from Jerusalem on 9000 kc between 2200 and 2245 every night, and that he will be pleased to supply any further information on the subject to interested readers.

We logged the initial broadcast on March 11—a special programme inaugurating the service, in which we heard the voice of Dr. Weissmann.

North America

We have some official information about Canadian short wave stations. A letter from F. P. Johnson, Senior Engineer of the Canadian International Service, informs us that the two stations using 6160 kc are CHAC, Montreal and CBRX, Vancouver. For the benefit of H. W. J. Lucas, the frequency of

CKLO is 9630 kc. R. Iball has heard CBNX, Newfoundland, 5970 kc, with news headlines and direction: "CBN and CBNX, Saint Johns" at 2130. R. A. Savill says that CHNX, Halifax, 6130 kc, was really excellent (S8-9) at 0030 on February 14. B. P. Middleton considers that all the Sackville transmitters put in good signals, particularly CKNC, CKCX and CHOL. The last-named with "Women in the New World" was S9 on March 18. J. C. Catch logged CBFX, Vercheres, 9610 kc, with news in French at 0200 on February 26, and we found VED, Edmonton, 8266 kc, S9 with a play at 0450 on March 4.

From the U.S., the General Electric Company at Schenectady has obliged B. P. Middleton with their card for WGEA. Verifications can be obtained for most American stations, but some devoted entirely to AFRS broadcasts may not reply. "Birthday Programme" in the AFRS broadcast at 0535 on March 11 was heard here over KNBX, 15250 kc; KCBF, 15310 kc; and KGEI, 9670 kc; and KGEX, 11730 kc, had joined the band by 0605.

South America

CE960, Santiago, Chile, 9595 kc, with a lady announcer and call "Radio La Americana" at 0001 is mentioned by J. C. Catch, who also gives us CXA13, Montevideo, Uruguay, 6155 kc, heard at 0030 with the direction: "Transmite Radio Carve, Montevideo." CE920, Punta Arenas, 9200 kc, has been logged by J.C.C. with guitar music followed at 0035 by the clear slogan: "Militar Austral" (Southern Military). Punta Arenas, at the extreme tip of Chile's long and narrow strip, is in fact the most southerly city in the world. D. G. Cull heard CXA19, Montevideo, with call in English at 2200: "Short Wave Station El Espectador, Montevideo, Uruguay, operating on a frequency of 11835 kc."

Station LRT, Tucuman, Argentina, 11840 kc, with call: "Ellay-Erray-Tay, Radio Independencia, Tucuman" was S9 at 2230 on March 11, and C. Makin comments on the excellence of the S.R.I. Argentina broadcasts between 2230 and 2330; such programmes as "Buenos Aires on the Air" and "Historical Days of the Americas" are of high entertainment value.

ZPA3, Asuncion, Paraguay, 11850 kc, has been clearly heard by D. H. Smith at 2225.

Brazilians are as numerous as ever. R. A. Savill sends an up-to-date list of stations: *Rio de Janeiro*: PRL7, 9720 kc; PRL8, 11720 kc; PRL9, 6175 kc; PRL4, 9770 kc; ZYC8, 9610 kc; ZYC9, 15366 kc; PY22 9296 kc. *Para*: PRC5 4865 kc. *Sao Paulo*: ZYB7, 6095 kc, ZYB8, 11765 kc; ZYB9, 15155 kc;

PST2, 7410 kc. *Minas Gerais*: PRK5, 6000 kc; PRK9, 15190 kc; PRI3, 5998 kc. *Parnaiba*: ZYE7, 4825 kc. *Pernambuco*: PRA8, 6015 kc; ZYK2, 6085 kc; ZYK3, 9565 kc; ZYK3, 11825 kc; ZYK2, 15145 kc. *Amazonas*: PRF6, 4895 kc; ZYS8, 4805 kc. *Ceara*: ZYN6, 6105 kc; ZYN7, 15165 kc. We understand from C. Costello that there are other lower powered stations in the 60-metre band, and that Radio Record, Rua Quintilo Doclauga 22, Sao Paulo, is a new one on 9590 kc (PRB9 is medium-wave call) testing from 1100 to 0200 daily. ZYK3, 9568 kc can be heard at 2215 (H. W. J. Lucas); PRL7 has verified with a card depicting the seaside resort of Praia de Copacabana (C. P. Turner), and another card is forthcoming from ZYN6 (P. E. Woolmer).

HC2AK, Guayaquil, Ecuador, 4650 kc, was heard by J. C. Catch at 0015; the writer found it with Latin-American music as late as 0510 on March 12. R. Iball discovered ZFY, Georgetown, British Guiana, 5980 kc, giving programme details for the following day at 2310; H. W. J. Lucas says ZFY is a very consistent signal for its 500 watts and C. P. Turner is very proud of his cream card with green, blue and red lettering recently received from ZFY. The address is: The Voice of Guiana, 30-32, North Road, Bourda, Georgetown.

Paramaribo, Dutch Guiana, has PZH5, 5750 kc, logged in the late evening by R. Patrick. J. C. Catch has found their transmission over PZC, 15405 kc, with English dance music from 2215 to 2230, followed by call in English and Dutch; a news summary in Dutch is given at 0125 and it closes five minutes later with the Netherlands Anthem. J.C.C. logged YVQN, Ondas del Puerto, Puerto Cruz, Venezuela, with electric organ music at 0120 and call at 0130; his picture card of the Hotel Avila, Caracas, from R. H. Axtell of Radio Continente reads: "Your shortwave log of Feb. 4th reception of Radio Continente YVKM on 5040 kc is correct. We are using 7 kW power with an East/West antenna system here. You are quite to one side of our beam; hence we are surprised that you got us." D. H. Smith has recently logged YVKC, Caracas, 10080 kc, at 2300, and R. Patrick heard YVLD, Radio Valencia, 3460 kc, at 0030. J. M. Simpson logged YVKD, Radio Cultura, Caracas, on 5048 kc.

West Indies

An unusual station in Barbados was heard by J. M. Simpson on 7547 kc recently. On March 9, 2100-2200, he listened to musical recordings followed by a commentary on the Barbados Sports Club Handicap. A similar broadcast was made on March 11; when it closed at 2147 it was announced that this

station only operates during race meetings by courtesy of Radiodiffusion and that the broadcast was the final one in the present series. PJC2, Curacao, 5010 kc, with recordings of American music, has been logged a number of times at 0100 by R. Patrick; 4V2S, Haiti, 5957 kc, was a fair signal at 0020 according to R. A. Savill, and he logged HI2T, Dominicana, 5970 kc at similar strength at 2345. D. G. Cull heard COHI, Cuba, 6450 kc, at 0030 with two light-toned bells and direction: "Erray-Atchay-Say, Cadena Azul, Habana." COCH, 9437 kc, is on the air daily: 1130-1500, 1730-2030, 2230-0230, and the address is: Union Radio S.A., Prado 107, Havana, Cuba.

YNZZ, Managua, Nicaragua, 6464 kc, was noted by D. G. Cull with four vibraphone notes and direction: "Emisora Radio Mundial, Managua, Nicaragua, Centro America" at 0305. D.G.C. gives us another Managua station on 6700 kc; at 0200 he heard three ascending bell notes and the direction: "Radio Pax, Managua." Perhaps this is YNMA which at one time operated on 6680 kc. J. C. Catch heard a station on 5750 kc at 2330; it was operating just below PZH5 with Latin-American music and may have been YNJAT in Leon, which is on the air 2300-0230 daily.

From El Salvador, J. C. Catch has received a verification from YSUA; it is a card depicting the "Plazuela Morazan" in San Salvador, with aerial masts in the background. D. G. Cull logged YSUA, 6255 kc, at 0205 with call: "YSUA, Radio Mil Cincuenta, San Salvador, Centro America." In Guatemala, D. G. Cull found TGLA, 6295 kc, with direction: "La Voz de Centro America" at 0030, and TGZA, 6660 kc with dance music and direction "Radio Oriental de Zacapa" at 0230.

Honduras has HRA, 5920 kc, with clear call heard by J. C. Catch at 0130: "Atchay-Erray-Ah, La Voz de Lempira, Tegucigalpa, Honduras America Centrale" (lady announcer). HRD2, La Ceiba, 6235 kc, was D. H. Smith's find at 0215 on March 12. C. Costello has lately received Costa Rica's latest official list which we will present next month. Panama is represented by HOLA, 9505 kc, with cinema organ and announcements in English heard by J. M. Simpson at 2250. Then there is HOHN, 6040 kc, a new station logged by R. Iball; at 0500, after four chimes, the direction read: "Radio Programma Continental; Atchay-Oh-Atchay-Ennay, Radio Continental y Radiodifusora Atchay-Pay-Sinkwo-Ah, Cuidad Panama, Republica Panama." HP5A, Radio Continental, operates on 11700 kc, and is an old-timer!

Europe

B. P. Middleton says that FET, 7930 kc, is

a consistent S7 signal from 1830 to 1900; the address is Radio Falange de Alicante, Estacion de Onda Corta, Alicante, Spain. D. G. Cull has received a letter-verification from EAJ3, Valencia, 7035 kc; their identification is: "Radio Mediterraneo, Valencia," audible at 2130. C. Sheppard (Worcester) had an interesting card from Radio Nacional de Espana, Madrid, on 9369 kc; it shows the aerial system and contains greetings from E. Thomas de Carranza, station director. R. A. Savill gives us a correction for Portugal—the address of Emissora Nacional is Rua do Quelhas, Lisbon. P. E. Woolmer says their card (*i.e.* for CS2MA, 6374 kc) is very fine indeed!

R. Patrick found the Italian IAZ, 16395 kc, testing on several afternoons; a letter from the station states that this is a commercial telephone service and that transmission of programmes from Italy to the American networks is made with a power of 20 kW. B. P. Middleton observes that the Swiss programmes in English to this country each evening at 1845 on 9665 kc and 11865 kc are "fine business." We have just received their summer schedule in an illustrated booklet entitled: "Switzerland Calling;" they state: "We really enjoy letters from listeners. Write to Swiss Shortwave Service, 23 Neungasse, Berne, Switzerland."

From Greece there are several items. J. C. Catch has logged the Forces Broadcasting Station, Athens I, on a measured frequency of 6339 kc between 1800 and 1930. C. Makin heard Radio Athens, 15345 kc, concluding its English transmission on Friday at 2245 with the words: "You have been listening to a broadcast in English beamed to North-West Europe and North America." The Armed Forces (Central Greece) Broadcasting Station, Larissa, 6745 kc, has an English programme on Thursdays at 2000 (or is it later?) and verifies by card according to P. E. Woolmer. In reply to a question by G. F. Q. Brooks we would like to mention that the official frequency of Radio Nederland in the 16-metre band is 17775 kc, this being the figure given on their latest programme sheet. R. A. Savill says that Paris International on 6200 kc is a consistent signal with really excellent programmes. He also logged the new Deutschlandsender, Germany, on 6115 kc from 1445 onwards.

Lastly, have you sent your report for MSF, Rugby, England, 5000 kc (0544-0615) and 10000 kc (0629-0700) which is on the air daily? Our reply from the National Physical Laboratory, Teddington, Middlesex, includes the following remark: "Thank you for your full and informative letter. We are very dependent on such reports in assessing the utility of the Standard Frequency Trans-

missions, and we shall be grateful for any further information that you are able to provide."

Comment on matters of short wave broadcasting interest from all parts of the world will be welcomed. Please send it all to: R. H. Greenland, *The Short Wave Listener*, 53 Victoria Street, London, S.W.1, to reach us not later than May 16.

DIRECT SUBSCRIPTIONS

Readers can obtain the enlarged *Short Wave Listener & Television Review* from us by direct subscription for 16s. a year of 12 issues. Despatch is post free on the day of publication (the third Thursday in the month). Order now to ensure regular delivery. Single copies can be obtained through any bookstall at 1s. 3d. Subscription orders should be placed, enclosing remittance, with the Circulation Manager, *Short Wave Magazine*, Ltd. 53 Victoria Street, London, S.W.1.

PHOTOGRAPHS

We are always glad to see good, clear photographs of radio interest for possible publication in the *Short Wave Listener*. All prints used are paid for on appearance at good rates, and can be returned if required, as the block-making process involves no damage to the face of the photograph. Please note, however, that normally we may have to have hold prints for some time before they are actually used, and that it is no use sending us those that are not sharp and clean.

AMATEUR TRANSMISSION

A large number of SWL's aspire to a transmitting licence in due course; indeed, the great majority of amateurs new on the air each month are drawn from the ranks of SWL's. Nobody interested in Amateur Radio, whether or not as a potential transmitter, can afford to be without a regular monthly copy of our *Short Wave Magazine*, now recognised as one of the world's leading periodicals on its subject. Covering the whole field of Amateur Radio, it is devoted entirely to the interests of the transmitter; running to 80 pages, each issue is packed with practical information and technical articles designed to appeal to the owner-operator of an active amateur station. The cover price is 2s. and the *Short Wave Magazine* can be ordered through any bookstall, or direct from us by post (2s. 2d. single copy; 20s. for a year of twelve issues, post free). Write: The Circulation Manager, *Short Wave Magazine*, Ltd., 53 Victoria Street, London, S.W.1.

SWL STATION DESCRIPTIONS

Readers sending us story-and-picture for our "SWL Stations" series are asked to note these points: The photograph itself must be a good one, clear and sharp; the gear should be fully described; an up-to-date summary of results obtained should be included; any points of particular interest, such as home-built apparatus, should be enlarged upon; and the whole thing explained in your own words. We write the story from the information you give—and payment for it is made at good rates immediately upon appearance.

SHORT WAVE BROADCAST STATIONS

Revision 19-58-25-35

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.

Fre- quency	Wave- Length	Callsign	Location	Fre- quency	Wave- Length	Callsign	Location
15320	19-58	RW97 HEI7 CKCS OLR5B VLC4 VLG6 GSP	Moscow. Berne. Sackville, Canada. Prague. Shepparton. Lyndhurst. London. Moscow.	15120	19-84		Rome. Colombo, Ceylon. Quito, Ecuador. London. Lisbon.
15310	19-60			15105	19-85	HCBJ GWW CS2MR	London. Lisbon.
15305	19-60	HER6	Berne.	15105	19-86	BEA3	Nanking, China.
15300	19-61	GWR	London.	15100	19-87	EPB	Teheran, Iran. Paris.
15290	19-62	VUD3 VUD10 WRUL LRX1 WNRE	Singapore. Delhi, India. Boston. Buenos Aires. New York	15095	19-87	HVJ	Vatican City.
15285	19-63	ZL4	Wellington, N.Z.	15090	19-88	CBLX	Montreal, Canada.
15280	19-63	RW98	Moscow. Munich.	15085	19-88	CKLX	Sackville, Canada.
15270	19-65	WCBN RW96	New York. Moscow.	15075	19-90	V3USE	Forest Side, M'tius.
15260	19-66	GS1	London.	15070	19-91	GWC	London.
15250	19-67	WLR1 KNBX KRHX	Cincinnati. San Francisco. Honolulu.	15050	19-93	ETA	Addis Ababa, Ethiopia.
15240	19-69	KNBX VLG6	San Francisco. Lyndhurst.	14850	19-96		Bekamo, W. Africa.
15235	19-70	JBD4	Kawachi, Japan.	14850	20-20	LPS	Ushuaia, Argentina.
15230	19-70	VLH5 RW109	Melbourne. Moscow.	14690	20-33	PSF	Rio de Janeiro.
15225	19-70	JBD3	Kawachi, Japan.	14278	21-01		Tangier.
15220	19-71	PCJ	Hilversum.	13710	21-88		Moscow.
15210	19-72	GWU WBOS WRUA WRCA KGEI GWD	London. Boston. Boston. New York. San Francisco. London.	13020	23-04		Moscow.
15200	19-74	VLA6 VLB6 VLC TAQ	Shepparton. Shepparton. Shepparton. Ankara, Turkey.	12875	23-30	CS2W1	Paredo, Portugal.
15195	19-74	OIX4	Bjorneborg, Finland.	12749	23-53	CS2WI	Lisbon.
15190	19-75	CKCX VUD5 VUD11	Sackville. Delhi, India. Delhi, India.	12455	24-08	HCBJ	Quito, Ecuador.
15180	19-76	GSO	London.	12175	24-64	TFJ	Reykjavik, Iceland.
15175	19-77	BEF8	Chungking.	12095	24-80	GRF	London.
15170	19-78	LKV TGWA OQ2AA RW100	Oslo. Guatemala City. Leopoldville. Moscow	12080	24-83	FZP8	Papeete, Tahiti.
15165	19-78	OZH ZYN7 VUD5 VUD7 VUD10 CS2MQ	Copenhagen. Fortaleza, Brazil. Delhi, India. Delhi, India. Delhi, India. Lisbon. Moscow.	12040	24-92	GRV	London.
15160	19-79			12000	25-00	CE1180	Santiago, Chile.
15155	19-80	SBT	Stockholm, Sweden.	11970	25-06	FZI	Brazzaville.
19150	19-80	ZYB9 YDC WRCA KCBF	Sao Paulo. Djakarta, Indonesia. New York. Los Angeles.	11950	25-10	ZPA5	Encarnacion. Mecca, Saudi Arabia.
15145	19-81	ZYK2	Pernambuco.	11930	25-15	GVX	London.
15140	19-82	GSF	London.	11925	25-16		Nova Lisbon, Angola.
15130	19-83	WOOC KNB1 VUD11 HED7	New York. San Francisco. Delhi. Berne.	11915	25-17	LRA	Buenos Aires.
				11900	25-21	RIF KWID CXA10 CE1190 OQ2AB	Moscow. San Francisco. Montevideo. Valdivia, Chile. Leopoldville.
				11896	25-22		Bucharest.
				11890	25-23	GWW WNRX RHX	Dakar, Senegal. London. New York. Moscow.
				11885	25-24	APK1	Manila, P.I. Karachi, Pakistan. Paris.
				11880	25-25	LRS2 VLH4 XEHH	Moscow. Buenos Aires. Melbourne. Mexico City
				11875	25-26	RW111	Singapore.
				11870	25-27	WGEA VUD8	Moscow. Schenectady. Delhi.
				11865	25-28	HER5	Munich, Germany.
				11860	25-30	GSE	Berne. London.
				11855	25-31	KWIX DZH8	San Francisco. Manila, P.I.
				11850	25-32	CE1185 ZPA3 VUD4 VUD7 VLA4 VLB4	Santiago, Chile. Asuncion, Paraguay. Delhi. Shepparton. Shepparton. Paris.
				11845	25-33		
				11840	25-34	OLR4A GWQ LRT	Prague. London. Tucuman, Argentina. Moscow.
				11835	25-35	CXA19	Montevideo.

SMALL ADVERTISEMENTS

CHARGES : *Readers'*, 2d. per word, minimum charge 3s. **Box Nos.** 1s. 6d. extra. *Trade*, 6d. per word, minimum charge 7s. All advertisements must be of radio interest only. Add 25% extra for Bold Face (heavy type) announcements. Copy date for next issue, May 8, addressed Advertisement Manager, *Short Wave Listener*, 53 Victoria Street, London, S.W.1.

QSL CARDS AND LOG BOOKS, APPROVED G.P.O. SAMPLES FREE. ATKINSON BROS., PRINTERS, ELLAND, YORKS.

FOR Sale.—New 1155 modified with 6V6 output. Separate power pack with speaker. Working, needs realigning. £7/10/-.—Phone Rayner, *Abbey 1577* between 10-5.

FOR Sale. Canadian Marconi No. 52 receiver, 13 valves, 1.75 to 16 mc, xtal calibrator, N.L., variable selectivity, built-in L.S., combined volts and S-meter. Panel rebuilt with large dial, etc. Also RF26 unit, two 0-500 microammeters. 12 Rx valves. All as new. £12, carriage paid.—Lewis, 46 Clydesdale Road, Romford, Essex.

R.1224A, excellent performance, built-in valves, 1.75 to 16 mc, xtal calibrator, N.L., variable selectivity, tapped for screen, detector, HT and trickle charger. £6/10/-.—Box No. 029.

FOR Sale. R107, excellent condition, £10.—GM3CCK, Herald, Kirkwall.

BC.342, converted AC, S-Meter, speaker, 13 valves, phones, in excellent order. Offers to Ford, 135a Greenway Road, Taunton, Somerset.

CANADIAN Marconi Rx, 13 valves, range 1.7 to 16 mc, bandspread, AVC, BFO, N.L., sensitivity control, meter, CW filter, xtal check every 1000, 100, 10 kc, frequency adjuster, speaker, super power pack (enough tapings for Tx, converters, etc.), FB condition. Seen London, bargain £16.—Box No. 030.

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(REGD) IN MINIATURE
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Become a short-wave Radio Amateur. The world's greatest hobby! Send stamp together with your name and address for free superb illustrated Catalogue and price list. Complete equipment for world-wide reception, costs only 49/6d.

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TRANSFORMERS 230v AC Mains, shrouded. 150.0-150v at 100 Mills, size $3\frac{1}{2}'' \times 3\frac{3}{4}'' \times 4\frac{1}{2}''$. Fitted with ceramic terminals, 4/- plus 1/- post.

TRANSFORMERS, 230v AC Mains, similar 150.0-150v, 0, 10, 20, 30 and 40v all at 70 Mills, size $2\frac{1}{2}'' \times 3\frac{3}{4}'' \times 3\frac{3}{4}''$, 4/- ea., plus 1/- post. No heaters.

PRE-AMPLIFIERS, 10 Metres, London or Sutton Television, with EF54, dust core wide band tuning, co-ax input and output sockets, size $3\frac{1}{2}'' \times 4'' \times 4\frac{1}{2}''$ (any number can be linked together), 15/- ea. plus 1/- post. Please state frequency.

FIELDS

435-437 STRATFORD ROAD, SPARKHILL, BIRMINGHAM, 11

SALE. Eddystone 640. Perfect. Original packing. S Handbook. Nearest £22, including carriage.—Metcalf, 68 Grosvenor Avenue, Oakhill, Stoke-on-Trent.

BRAND new and unused R.1116, £8; Canadian 58 B Walkie Talkie complete with 'phones, microphone, aerials, power pack, etc.. £7/10/-. BC348 converted AC Mains, speaker, power pack, £17. All are in new condition and perfect with manuals and carriage paid. Exchanges considered. Enion, Pendref, Bangor Street, Caernarvon, N. Wales. Phone 35.

SALE or exchange—new T1154B and power unit 45—output 1,200 volts, 200 mA. Wanted, new receiver preferably BC348. Nottingham area. Offers.—Box No. 730.

RADIOVISION Hambander, as new, £12 or offer. *Wireless World* 30-watt output transformer, new, £2. 813, new, £1, 550v 200 mA, 6.3v, 5v, transformer £2. Other surplus.—Clouter, 39 Clare Gardens, Barking.

WANTED: Communication receiver 10 to 160 metres. Bandsread necessary. Ex-W.D. unmodified considered.—McKiernan, 47 Cabra Road, Dublin.

JOIN THE LEAGUE !

The steady increase in the membership of our British Short Wave League is a sure sign that SWL's generally recognise not only the value of the work the BSWL is doing for them, but also the advantages of membership. One of these is the *BSWL Review*, incorporated with the *Short Wave Listener & Television Review*, the subscription thus covering the combined journal of 52 pages, free to all League members.

For Further Information and Form of Application write :

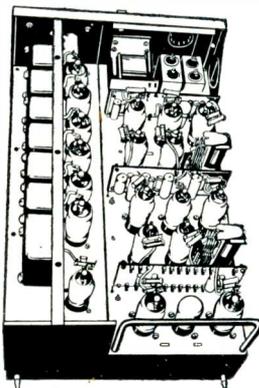
The Manager,
British Short Wave League,
53 Victoria Street,
London, S.W.1.

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12 Pipers Row, Wolverhampton (Central)
New telephone selectors, 3 banks, 25-way on each, continuous running contacts (optional), 12/24v, 15/-; S.130 stabiliser neon valves, 11/- pair; television chassis, 15" x 14 1/2" x 3", 12/6 (new, grey); the R.1116, battery double "superhet" all-wave 8-valves communications receiver, is still the best available, £11, tested and delivered (special leaflet, 3d.); new control boxes with switches, etc., and 5 m/a and 40v M.C. meters, 2", only 12/6; R.1355 for television (only a few left), 50/- in case, delivered; 6-pin Jones plugs for R.F.26, etc., with cover, 2/-; all other types Jones available; K.T.44 valves, 10/6; miniature HL2K, 5/-; switched jacks and sockets (fully insulated), 3/6 pair; 1/2" stand-off insulators, 4/6 doz.; floating torches with perspex cover, 2/-; special bargain of distribution boxes, 4-way, 15 amp, and neutral in metal case, 17/6. See "S.W." Mag. for other offers.

M.O.S. MAIL ORDER SUPPLY CO. THE RADIO CENTRE

33 TOTTENHAM COURT ROAD, LONDON, W.1 Telephone: Museum 6667-8-9



R3515 RECEIVERS

As will be seen from the text of this issue of the *S.W.L.*, the R3515 is an extremely useful piece of surplus equipment. It is a 21-valve radar unit with a six-stage I.F. strip on 14 Mc. The valves are one EA50, ten SP61, five EF36, three EBC33, one EB34 and one EF39. In addition, it contains a wealth of components.

The chassis is of sufficient size to accommodate a complete TV receiver, excluding E.H.T. supplies. The units which we offer are BRAND NEW in original TRANSIT CASES.

£3-10-0 Carriage paid.

RF27 UNITS

These units are complete converters, having an output on a frequency of between 7 and 8 Mcs. They consist of an EF54 RF Stage, EF54 Mixer and EC52 Local Oscillator.

The RF27 is constructed on a silverplated brass chassis and each stage is thoroughly screened. Tuning is effected by a three gang condenser, coupled to a Muirhead illuminated dial.

The unit is easily converted to an efficient 2-meter converter—see text.

25/- each (Carr., Pkg., 3 6). Condition as new.

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For a limited period we are offering the already famous **BURGOYNE INSTANT HEAT SOLDERING GUN**

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We are setting a standard for value which you will find hard to beat. This offer has been possible only by an ACCIDENT—a blocked export shipment that missed the last boat to South Africa!

SAVE TIME ON SOLDERING!

Just press the button, count seven, and solder, and the bit will remain at soldering heat until you release the pressure, when it cools off instantly.

No waiting to warm up or cool down—no element to burn out—no mica to crack or splinter—no risk of shock.

Few tools possess so many advantages as the "Seven-Second" Solder Gun; and certainly no engineer can consider himself up-to-date without one. For AC mains, 200-250v.

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Type RL18. Brand New. Boxed and guaranteed.

Each **5/6** (Post, Pkg., 9d.) OR 3 for **15/-**

1/8 H.P. AC MOTORS

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These Motors are fitted with a 2" pulley ready for use with a small belt drive, need NO ADAPTATION whatever. In addition the motor is fitted with a 3 ft. 3 way mains lead. The Motor is far superior to those we have offered previously as it has been modified for AC mains only

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Convert those Low Resistance phones to High Resistance by means of this adaptor. Contains matching transformer. AS NEW

2/- each

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A brand new tropicalised receiver covering 13-46, 46-150, 190-560 metres on 3 bands. Complete with valves, built-in speaker and power supply for AC mains. In light walnut cabinet. Unrepeatable offer carrying full maker's guarantee.

£15 inc. P.T. (10/- carr., packing)

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These Radar Modulators represent one of the best bargains we have offered. They contain nine valves, the types being 1, VU120; 2, VR65; 1, 6V6; 1, 807; 3, CV57; 1, VU508; a 24-volt Blower motor suitable for conversion for use on AC mains; 18 assorted condensers including -01 mfd. 5 Kv. types; 30 assorted resistors from 50 watts to 1/2-watt types; 3 high-voltage variable resistors, valve bases, relay, transformers, etc., etc. The whole contained in a case measuring 19" x 12" x 9".

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A real "GIVE AWAY" at **17/11** Callers preferred. Sent by rail only at customer's risk. (10/- carr., pkg.)

SPECIAL METER OFFER!

A brand new 0-100 M/A instrument as illustrated. Made by E. Turner and fitted with push button shunting switch.

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ALTITUDE LIMIT SWITCH

Consists of a two-bank Yaxley Switch, each bank being single-pole eleven-way, and the two banks separated by 2 in. Contains also 11 2,700 ohm 1 watt resistors. Complete with dial and knob in aluminium case. Will make ideal multi-range meter selector switch.

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The famous wartime "Cats-eye" tube used in "Tabby" for night sniping and observations. Provides a silver caesium oxide screen for the conversion of infra-red rays to visible rays, using an infra-red light source. Data provided.

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H.61. 5-way, 14 mm. screened and rubber covered, with cotton and rubber insulation at 1/- per yard.

Special Offer

H61X. Carton containing a 250-ft. (83-yd.) coil of above 5-way cable for **49 6**, carriage paid.

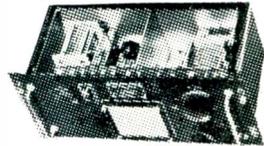
Brand New in maker's original carton TRANSMITTER TUNING UNITS

Each having Vernier tuning dial; variable capacitors. Tank coil unit on ceramic former; ceramic switch; R.F. chokes, etc. In metal cabinet $17\frac{1}{2} \times 7\frac{1}{2} \times 8$ ". Finish black.

TU5B. 1,500-3,000 kcs.
Clydesdale's Price only **22/6** each Carriage paid

TU6B. 3,000-4,500 kcs. TU7B. 4,500-6,200 kcs. TU8B. 6,200-7,700 kcs.
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12-FOOT SECTIONAL AERIAL WITH BASE

Comprising 3 lengths copper tubing, tapering from $\frac{3}{8}$ " to $\frac{1}{4}$ ", each section sleeved into the other with insulated base.

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Brand New in original wood case

EX-CDN. ARMY, SUPPLY UNIT RECTIFIER, FOR NO. 43 TRANSMITTER

Inputs: 110v A.C. 50/60 c/s, 1-7 K.V.A.

Outputs: 2,100v H.T. 375 ma., 500v H.T. 400 ma., 385v regulated; 450v H.T. line; 275v H.T. line; 415v neg. bias; 250v neg. bias; 150v neg. bias; 80v neg. bias.

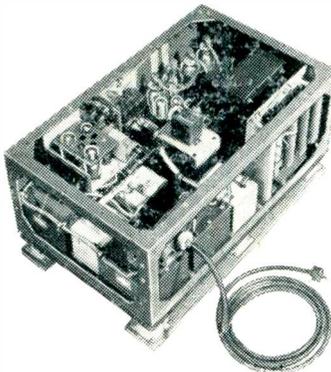
The unit consists of 3 complete power supplies, one of which provides various stabilized L.V. supplies. All are fed via double choke, condenser input circuits.

8 Valves: 4 866-866A's, 5Z3, 6SJ7, 2/6A3's, plus 1v time delay and VR150/30 stabilizer.

Other components include: Power trans. 2,100-500-0-500-2,100v. Power trans. 450-0-450-13v ct., 6.3v ct., 6.3v. Fil. trans. 2.5v ct., twice, fil. trans. 6.3v (thermal starter). Chokes, 2.15H. 375 ma., 15H. 450 ma., 2/15H. 110 ma., 20H. 162 ma., plus various H.V. condensers, resistors, etc.

The complete unit mounted in metal case with lid $2'6" \times 1'6" \times 1'$, finish olive-drab crackle with shock-absorbing feet. Wgt. 420 lbs.

Clydesdale's Price only **£16** Carriage paid



Ex-Royal Navy SOUND POWERED TELEPHONE

NO batteries required, gives long service without attention. Complete, with warning indicator lamp and generator, giving a high-pitched note, which can be heard through any noise. Where a number of units are used the lamp would indicate which one is being called. Dim.: $7\frac{3}{4} \times 9 \times 7\frac{1}{2}$ " overall, for wall mounting. Designed for ships' use, but suitable for the home, office and factory.

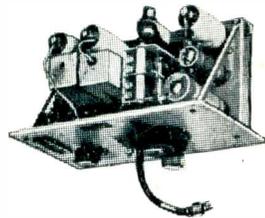
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EX-ARMY. WS-18 RECEIVER UNIT

A 4-valve superhet chassis. Range 6-9 mcs. (50-33.3 metres), with ARPI2 (VP25), F.C. 2/ARPI2's L.F. and RA8 (HL23DD) audio loc. osc., 2nd det. and A.V.C. slug-tuned I.F. trans. 465 kcs., etc. The complete receiver mounted on a chassis $8\frac{1}{2} \times 5 \times 1\frac{1}{2}$ " all control front panel $9\frac{1}{2} \times 5\frac{1}{2}$ ". Unused, good condition. Power requirements approx.: 3v 0-2A. L.T., 120v 15 ma. H.T., 1.5v bias.

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Circuits for WS-18 Rcvrs.: Mk.I., II and III available at 2/3 post paid. Circuits for WS-18 R/T: Mk. II and III available at 4/6 post paid.



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