

The

SHORT WAVE

Magazine

2/6

VOL. XV

JUNE, 1957

NUMBER 4



communication

world wide

FOR THE RADIO AMATEUR AND AMATEUR RADIO

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0-5 volts	0-25 "
0-25 "	0-100 "
0-100 "	0-250 "
0-250 "	0-500 "
0-500 "	
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0-5 "	0-20,000 "
0-25 "	0-100,000 "
0-100 "	0-500,000 "
0-500 "	0-2 megohms
	0-5 "
	0-10 "

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0- 30 "
0-120 "
VOLTAGE
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0-120 "
0-300 "
0-600 "
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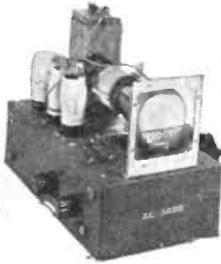
SHORT WAVE MAGAZINE

(PUBLICATIONS DEPARTMENT)

55 VICTORIA STREET · LONDON · S.W.1 · ABBEY 5341

INDICATOR UNIT

SLC No. 5



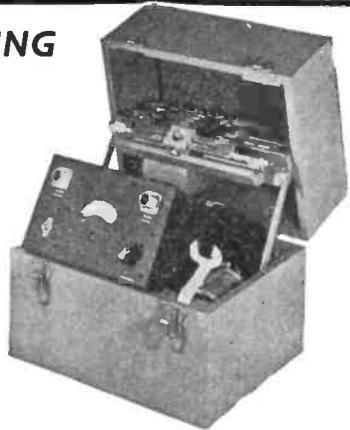
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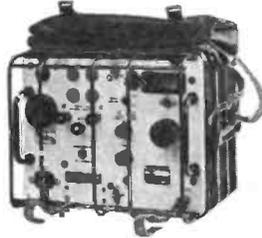
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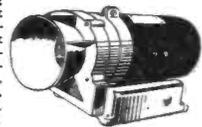
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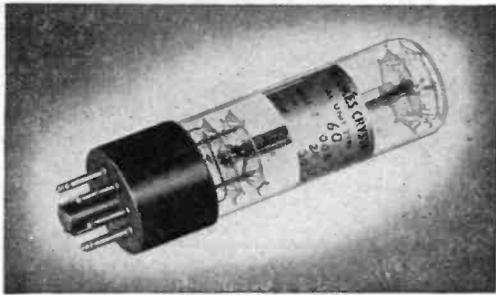


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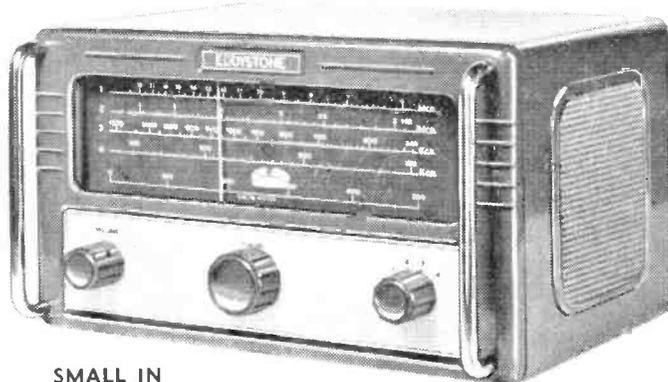
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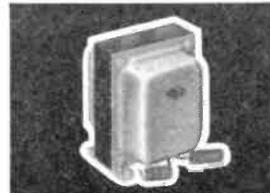
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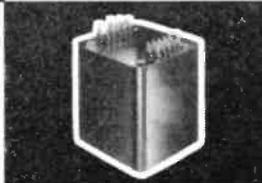


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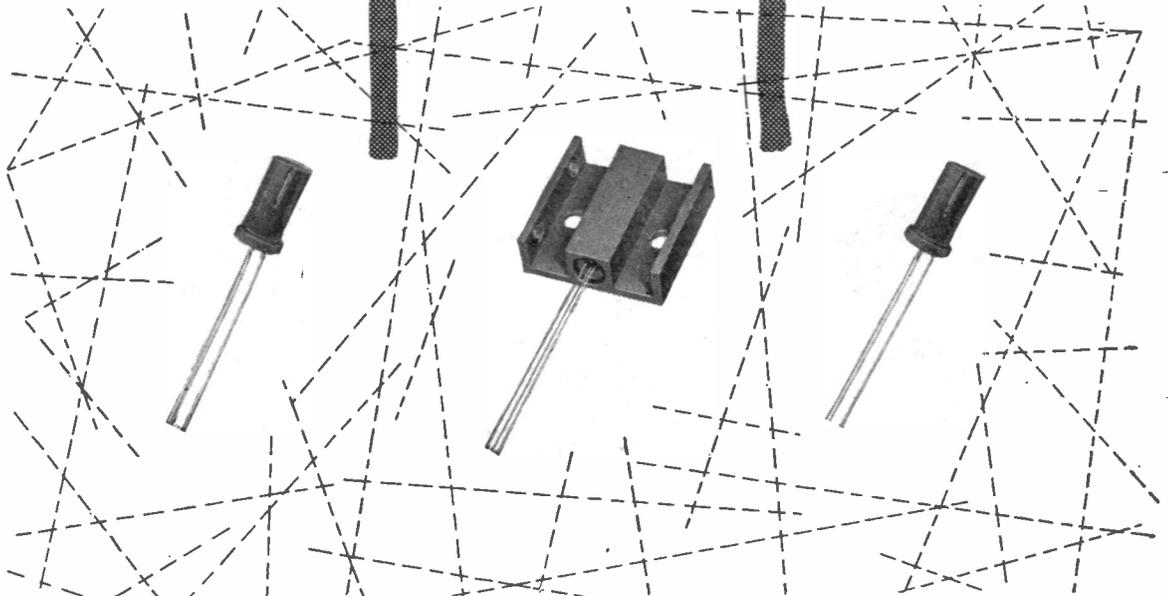
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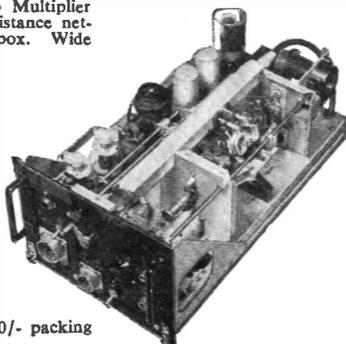
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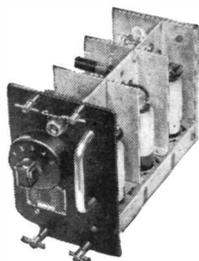
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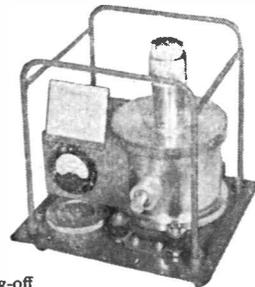
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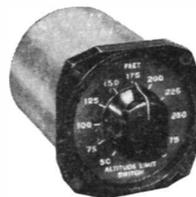
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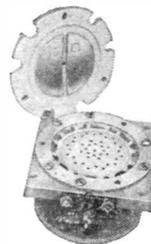
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FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT WAVE Magazine

E D I T O R I A L

Prudence *With the summer coming and motoring unrestricted, we are certain to see a big increase in mobile activity compared with previous years—indeed, that is already evident from the number of M calls to be heard about our bands now.*

Many of these installations—amateur designed and built—reflect a high degree of engineering skill and ingenuity, and in most cases proper regard has been paid to safety and the demands of good and careful driving.

In some instances, however, this is not so, in that the complications of operating and changing over take too much of the driver's attention—he is then no longer safe, because he has not got full control of the car at all times. Another hazard is a whip aerial of excessive length, mounted on the near instead of the off-side ; this inclines the driver to take avoiding action when he should be keeping to his near side.

The old precept for good and careful driving—" hands on the wheel and eyes on the road"—has never been bettered, and in effect it covers most of what is laid down in the Highway Code. Translating this rule fully into practice means that the mobile gear must be installed in such a way that change-over is by foot-control or, at the very least, by a flick-switch on the steering column, and that the microphone does not have to be picked up, held while speaking, and then put down again. Change-over is easily contrived, being only a matter of a little ingenuity with relays. As regards the microphone, it can either be a lapel type, or on a flexible extension arm.

What is certain is that all mobile operators must make driving safety their very first consideration. If ever there happens to be a bad smash involving an amateur operating mobile, and it can be suggested in court that the fact he was on the air had something, even remotely, to do with the accident, it will be headlined in every newspaper in the country. It should be remembered, too, that the law demands not only that a car be driven with safety, but also that it is capable of being so driven.

*Austin Fothergill
G6FO.*

Modulation Monitoring by Oscilloscope

CIRCUITRY, SETTING-UP
AND THE INTERPRETATION

D. M. GILL (4S7MG)

This article discusses first a CRT unit, easy to construct and suitable primarily for checking (one's own) modulation; then the actual application of the unit; and finally an ingenious limiting device developed by the author to prevent burning of the tube when on stand-by. That part of the article covering the method of modulation monitoring could, of course, be applied to any existing oscilloscope which itself already has the basic power and control circuits.

—Editor.

OF the poor phone signals on the air the writer is of opinion that some of the trouble is due to a non-linear modulation characteristic in the final. The departure from linear operation can be due to a number of things; chiefly, they are insufficient drive to the final, incorrect loading and regeneration within the stage. The way to test out a transmitter is *not* to connect up a modulator, call CQ and ask the fellow at the other end what the quality sounds like, and then to keep turning up the audio gain until the signal either sounds badly distorted or splutters over the band. With the best intentions in the world the man at the other end cannot tell you when your modulation approaches 100 per cent. He may think he can, but unless he is using an oscilloscope he can't.

The monitor to be described was incorporated in the writer's transmitter some 12 months ago, and despite an audio clipper holding the modulation just short of 100 per cent., many stations have remarked that the carrier was strong, but more modulation was required. Such comment, one feels, proves the point that the receiving station can only make a guess of the modulation depth—usually a bad guess.

This monitor arose as the result of reading the description of an American amateur transmitter which had built into it a small cathode ray tube for watching the modulation. For a long time a VCR-139A had been available in the "junk pile," and there was also an old

transformer that had a 4-volt winding (for the rectifier) and a 6.3 volt winding for the "normal" valves in the circuit. The HT winding was 280-0-280v., which seemed correct to give about 700 volts DC when used in a half-wave circuit. Would the 4 volt rectifier winding stand the 700 volts DC potential difference between itself and the rest of the transformer? Well, it had been built to withstand about 300 volts so it was decided to try it on 700 volts, to see if it would take it. During six months of operation it has been switched on and off scores of times—it is still functioning perfectly. This disposes of the two most expensive items and the design can now proceed. It is not essential to use either the VCR 139A tube or a receiver-type transformer. Use anything you have on hand, even a VCR97 would do. It would undoubtedly draw a very pretty picture, but it would cost more and take up more space.

Some cathode ray tubes are designed for assymetrical deflection, *i.e.*, signal applied to one deflection plate. Other tubes require symmetrical deflection, *i.e.*, opposite phased signal voltages to the pair of deflection plates associated with either the X or Y deflection system. Previous experience with the VCR139A using the cheap and easy assymetrical deflection had shown that there is a considerable loss of focus (of the spot) when the beam is deflected towards the edge of the tube face. On the score of a sharp spot symmetrical deflection was decided upon despite the increased complications.

Picture Shape

When monitoring a modulated carrier there are two methods of observing the modulation. One can use a fixed sweep frequency and open the carrier out into a horizontal ribbon and then watch the modulation increase and decrease the height of the strip. This is acceptable for setting up the transmitter on a steady tone, but is of little use on speech. Actually, it is not the best way even on a steady tone as with this method one cannot clearly observe the upward or positive peaks of modulation. It is not easy to tell when a sine wave departs from the true sine shape. The best way is undoubtedly the trapezoidal method. This compares the audio voltage with the RF voltage and draws a picture on the end of the tube which is a trapezium or wedge-shaped figure. A full description of this method of checking will be found in any of the amateur handbooks so there is no need to repeat the information here. The writer would like to say, however, that the trapezoidal presentation is superior to

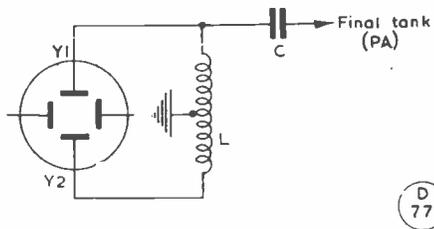


Fig. 1. The coil L consists of 50 turns of 22 SWG enam. sprung off a 1/4-in. former; this coil can be self-supporting and is soldered direct to the X-plate pins on the CRT valve-holder. Condenser C is actually the "stray capacity" between the PA tank circuit and the wire end brought up to it.

any other because for linear modulation the two edges of the wedge should be straight lines; any departure from a straight line is easily and quickly noticed by the eye. The only other point to remember is that the audio voltage *must* come from the secondary of the modulation transformer. To pick it off from an earlier point in the modulator will result in phase shift and this will spoil the trace on the cathode ray tube. It may be considered a nuisance to take it from the secondary of the modulation transformer on account of the high voltage blocking condenser that will have to be used. It is, nevertheless, worth the trouble. Do not forget that on the DC HT voltage there is superimposed the audio modulating voltage. To allow for this the working voltage (*not* the test voltage which is marked on some condensers) of the blocking condenser should be at least three times the HT voltage.

The requirements are then :

- (1) Symmetrical deflection.
- (2) RF voltage from the tank circuit of the final.
- (3) Audio voltage from the secondary of the modulation transformer.
- (4) Some method of controlling the voltages from (2) and (3) that are fed to the cathode ray tube in order to control the size of the image on the end of the tube.

If the final has a pair of valves in push-pull it is easy to obtain symmetrical deflection for the CRT. Push-pull finals are not so popular these days, however, so the design has to cater for single-ended stages. The most satisfactory way to solve this is to use an auto-transformer consisting of a coil, the centre of which is

earthed. The arrangement is shown in Fig. 1. The reason for using an aperiodic arrangement is that it does not have to be changed or re-tuned when changing from one band to another. The coupling condenser C does not actually exist in practice, but is the stray capacity that exists between the tank coil and the wire brought up from the cathode ray tube. This wire is put somewhere near the tank coil, but not actually allowed to touch it. The value of C and hence the deflection on the tube due to the RF depends on the proximity of the wire to the tank. The position should be so adjusted that a reasonable-sized image is obtained on all bands worked.

The Circuitry

The circuit is shown in two parts in order not to make the instrument look at all complicated. Fig. 2 shows the power circuit wiring.

The 4-volt secondary is connected to the cathode ray tube heater and the whole of the HT winding is used as the supply for the EHT rectifier. As mentioned earlier, this is a half-wave circuit. There is adequate smoothing and no sign of "spot modulation" due to hum. The metal rectifiers were picked up second-hand and consist of two stacks in series. Each stack consists of 35 elements which are about half-an-inch in diameter. There is very little current taken by the bleeder and a pencil EHT rectifier could be used if available. The smoothing resistance R2 has been made as small as possible in order to have the maximum

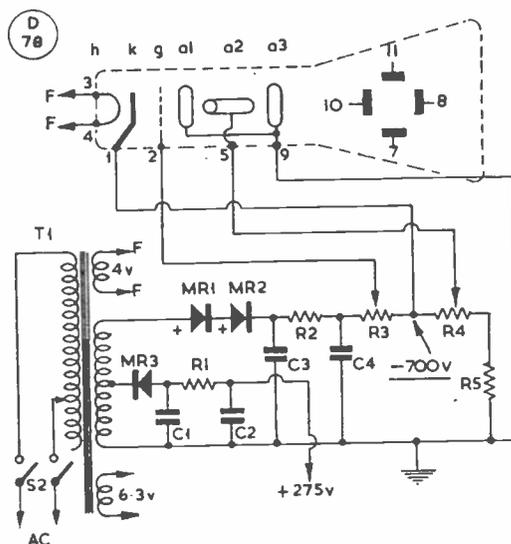


Fig. 2. Power circuit wiring for the cathode ray tube — using either a VCR-139A or a Cossor 23D — in the modulation monitor unit.

Table of Values

Fig. 2. Power circuit for VCR139A tube

- | | |
|--------------------------------|-----------------------------------|
| C1, C2 = 16 μ F, 450v. | R4 = 500,000 ohm |
| C3, C4 = 2 μ F, 1000v. | pot'meter (focus) |
| R1 = 3,900 ohms, 10w. | |
| R2 = 22,000 ohms, 1w. | R5 = 1 megohm |
| R3 = 50,000 ohm | MR1, MR2, MR3 = Metal rectifiers. |
| pot'meter (brightness control) | |

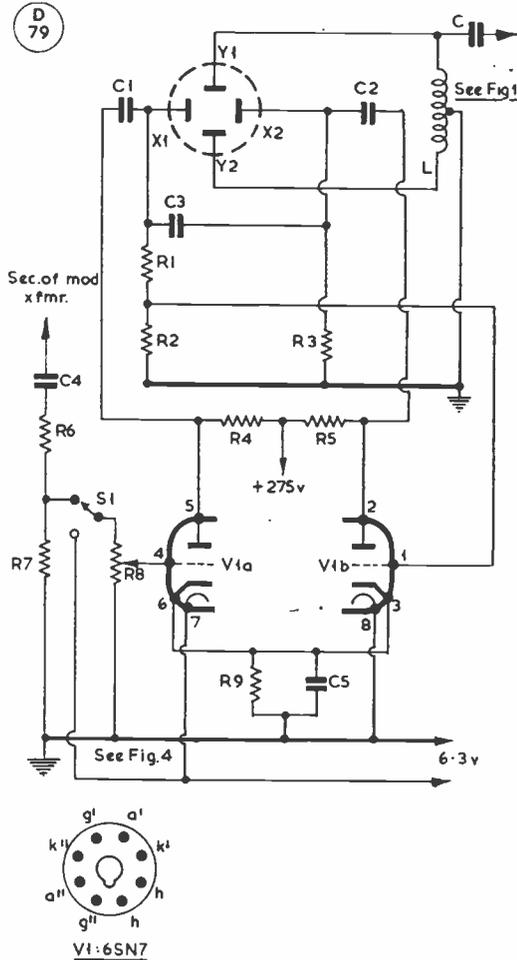


Fig. 3. Applying the audio to the X-plates; there is another way of doing this, as shown in Fig. 7.

EHT. Do not cut down on the value of the smoothing condensers, C3, C4. The "brightness" and "focus" controls are ordinary potentiometers. Remember, however, that they are at *high potential* with respect to earth and must therefore be insulated from the metal panel. Use sturdy knobs with a well recessed grub screw as an additional precaution.

Looking at Fig. 2, A2 is the focus anode and A1 and A3 are connected to earth. There is no need for any spot control and it would only complicate the circuitry. If the circuit is in order and the metal rectifiers in good condition the cathode should measure at least 700 volts negative with respect to earth using a high resistance Avometer. This is sufficient to give a small intense spot when the Brightness and Focus controls are properly adjusted. The other HT circuit, which is tapped at 280 volts from

Table of Values

Fig. 3. Audio circuitry for Modulation Monitor

C	= "Stray" (see text)	R4, R5	= 100,000 ohms, ½-w.
C1, C2	= 0.1 μF, 1000v.	R6	= 330,000 ohms, ½-w.
C3	= 63 μF or preferred, 450v.	R7	= 22,000 ohms, ½-w.
C4	= .001 μF, rated three times PA HT	R8	= 5,000 ohms
C5	= 100 μF, or near, 12v.	R9	= 1,000 ohms, ½-w.
R1, R3	= 220,000 ohms, ½-w.	L	= See Fig. 1.
R2	= 33,000 ohms, ½-w.	V1	= 6SN7, or similar double triode

the earthed end, is for supplying HT positive to the one valve that could not be avoided. There is nothing in the least critical about this smoothing circuit and any reasonable values can be used. The signal circuit is shown in Fig. 3. It was subsequently modified, as will be explained later.

In order to obtain a symmetrical voltage to the deflecting plates, X1 and X2, a transformer was considered, but rejected (for the very good reason that one was not available!). The phase splitting valve circuit was consequently adopted. This particular circuit was picked because it has higher gain than any of the other paraphase type of circuits. The 63 μF condenser, C3, across the X1 and X2 audio deflection plates is to short out some of the RF which inevitably leaks into the audio circuit. The switch S1 is for changing the horizontal deflection from the audio of the modulator to a 50-cycle time base sweep. This is useful for checking hum on the carrier and observing the keying characteristics of a CW transmitter. (It may also be useful for setting up a SSB transmitter, although this has not been tried.) Details of the RF section connected to the Y1 and Y2 plates are given in Fig. 1.

The circuit is not in the least complicated and will "go" first time provided you have made no (silly!) mistakes in the wiring. If you do make mistakes do not worry; it is only a matter of practice and experience to avoid them! The unit is such a simple arrangement it is a recommended exercise for beginners! Mechanically, most people lay out apparatus to please themselves, dictated by requirements and components available. This particular unit was made to mount on a standard 19-inch rack under the transmitter. There is nothing critical about the layout except that the mains transformer must be mounted at the back end of the CRT and as far away as possible. If this is done there will be no trouble due to the transformer field upsetting the spot. The mains transformer for the filament supply may broaden the spot. Fit a mu-metal shield by all means if the mu-metal is available, as

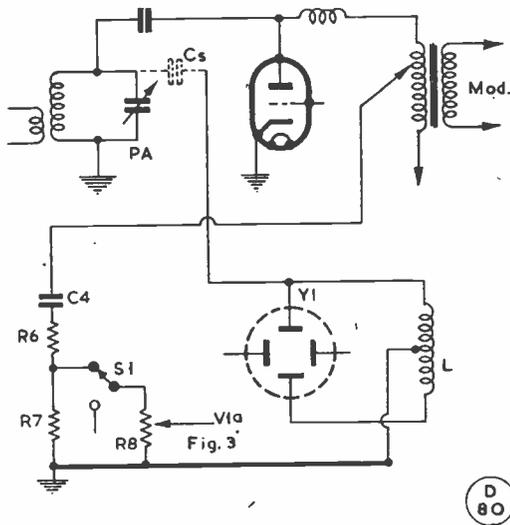


Fig. 4. Basic connections for the modulation monitor circuit — see text, and refer Fig. 7. Values here are as given for Fig. 3.

it will be a considerable advantage.

Test Values

Before the instrument is put into operation it may be as well just to test it out in order to see that it works correctly. Before plugging the CRT into the base check that the heater voltage is 4 volts. Mistakes *can* happen, and it is much too an expensive hobby to start off by burning out the heater of the VCR139A. Check the EHT voltages with respect to the cathode terminal. The grid should be about 9 volts negative ; the second anode, A2, about 120 volts positive, and the anodes A1 and A3 about 700 volts positive. Switch off, plug in the tube, switch on again and in a few seconds a spot should show in the centre of the screen ; adjust the brightness and focus controls for a sharp intense spot. To check the horizontal deflection circuits switch S1 over to the 6.3 volt 50-cycle supply and adjust R8. As the control is advanced the length of the horizontal line should increase. If it does so the unit is ready for putting into operation. Connect up as shown in Fig. 4. Adjust the wire from plate Y1 in relation to the tank circuit of the PA until the vertical deflection is about $\frac{3}{4}$ inch with carrier on, but no modulation. Flip S1 over to the audio side, modulate the transmitter and adjust potentiometer R8 until the horizontal deflection is about $\frac{3}{4}$ inch. If this movement should be too great the pattern will be as shown in Fig. 5A. Too little deflection is illustrated at Fig. 5B and just about the correct setting at Fig. 5C. These figures all

illustrate a transmitter which is modulating perfectly at 100 per cent. If you are *under*-modulating the trace is shown at Fig. 6A, while 6B shows over 100 per cent. modulation. Fig. 6C shows the pattern obtained when the transmitter is not modulating correctly on positive peaks. Further and fuller descriptions of testing by means of trapezoidal patterns can be found in any of the handbooks dealing with Amateur Radio equipment.

This almost concludes the story except for one small final modification. With the circuit described the spot remains stationary at the centre of the tube during periods of reception and this will soon start to burn a mark on the screen. Of course, the unit need not be left on after the transmitter has been adjusted, but the writer found it rather fascinating to watch the pattern, and so there was a considerable tendency to leave it switched on the whole time!

Stand-By Modification

It was decided, therefore, to fit some form of "talk-brightening circuit" which would increase the spot intensity during speech and automatically switch it out during periods of reception. This proved more difficult than anticipated. At first an attempt was made to use a small fraction of the audio horizontal deflection voltage, but this upset the balance of the symmetrical push-pull deflection. In the end another valve had to be employed, and this is why the type 955 triode is used. It was too much trouble to cut another hole in the chassis for a second valve holder so the 955 was soldered direct to the tags of the 6SN7GT valve holder. The talk-brightening circuit is very amusing and satisfying to watch so cut

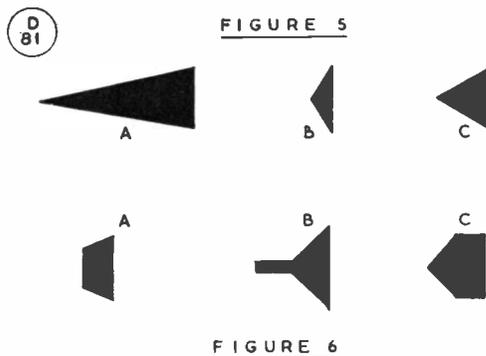


Fig. 5. Adjusting the horizontal deflection, R8 in Fig. 4, for correct patterning — 5C is the desired shape for a transmitter modulating 100%. Fig. 6. Showing the sort of patterns that may be obtained when the transmitter is not modulating correctly.

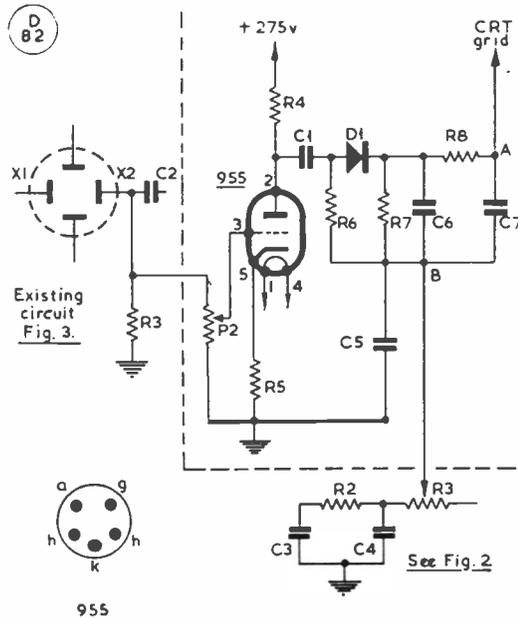


Fig. 7. The talk-brightening circuit devised by 4S7MG. When correctly set up, the trace disappears between words and on carrier only, thus guarding against burning of the tube by the stationary spot—see text for discussion. The only additional values involved are given in the table.

an extra hole in the chassis to allow for it. (A 6J5 valve should be substituted for the 955 used here.) The circuit is shown in Fig. 7. Part of the audio voltage from plate X2 is tapped off by means of P2 and applied to the grid of the 955 triode. This is amplified and passed on to the germanium diode GEX35, which is so arranged as to build up a DC potential, with positive to grid of the CRT. The only point to watch is the $.01 \mu\text{F}$ 2000-volt coupling condenser C1 from the 955 anode. Originally, an $0.1 \mu\text{F}$ 1000-volt tubular was used in this position, but after two developed an internal short the $.01 \mu\text{F}$ 2000-volt mica was substituted and there has been no subsequent trouble. The talk brightening circuit is quite simple to incorporate. The 2 megohm potentiometer, P2, is wired to the X2 deflection plate. This controls the voltage to the triode amplifier and hence the amount of positive DC bias developed. It is suggested that this portion of the unit be wired separately from the rest of the circuit and only incorporated after the simple circuit has been made to work. It will then only be necessary to break the lead going to the control grid and insert the talk-brightening circuit in series. (Refer to Fig. 2. Break the circuit at X and connect A to A in Fig. 7, and B in Fig. 2 to B in Fig. 7.)

Table of Values

Fig. 7. Talk-brightening circuit for the Monitor

C1 = $.01 \mu\text{F}$, 2000v.	R4, R6
C5 = $0.1 \mu\text{F}$, 1000v.	R8 = 100,000 ohms, $\frac{1}{2}$ -w.
C6, C7 = $0.1 \mu\text{F}$, 250v.	R5 = 1,000 ohms
P2 = 2 megohm, talk brightness control	R7 = 1 megohm
	D1 = GEX-35, or similar

To set up the unit, adjust the brightness control until there is no spot on the screen when the transmitter is switched off. Switch on the transmitter, speak into the microphone and advance the "talk-brighten" control, P2, until the trace becomes visible. When thus correctly adjusted the trace will illuminate the end of the CRT when speaking and disappear completely in between words and when not transmitting. The result is very impressive—apart from the valuable information it gives!

FO8AP/MM IN TROUBLE

Readers will recollect that from time to time we have published snippets of information about FO8AP/MM, operated from the bamboo sailing raft *Tahiti-Nui*, attempting the eastward passage from Tahiti to Santiago de Chile, the opposite direction to that taken by the famous *Kon-Tiki* expedition. On May 19, the *Tahiti-Nui*, having covered some 4,000 miles across the South Pacific in about six months, was on the last stage of her voyage. Then, in very heavy weather, she lost her mast, and had to send out SOS signals; a sailing raft of her type is quite safe in the worst weather provided she can run before the wind, and steer. Without her mast, however, she would be uncontrollable. The Chilean frigate *Basquedano* was sent to the rescue of the *Tahiti-Nui*, and by May 23 had her in tow, heading for the Juan Fernandez Is., where the raft is to be refitted to continue her voyage. FO8AP/MM has been regularly on the air and, since this is a French expedition, continuous watch has been kept by radio amateurs in France for the *Tahiti-Nui*. During the perilous four days until the raft was taken in tow, signals from FO8AP/MM were being received direct by operators in the Paris area. If the *Tahiti-Nui* gets to South America, the plan is to sail her back to Tahiti on approximately the route taken by the *Kon-Tiki*—so FO8AP/MM may be on the air again if de Bisschop is able to bring his great adventure to a successful conclusion.

THE 1957 R.A.E.

Having seen the question paper set for the Radio Amateurs' Examination on May 10 last, we would say that once again it was very fair, strictly Amateur Radio in scope, and well within the capacity of anyone who is taking a serious interest in the subject. We hope to be able to discuss the results of this year's R.A.E. in an early issue of SHORT WAVE MAGAZINE. Every effort is being made by the City & Guilds of London Institute to expedite publication of the Examiner's Report.

Some Notes on the Ex-Army DST-100

DOUBLE-SUPERHET
COVERING ALL AMATEUR
COMMUNICATION BANDS

B. POOLE

Many readers have been asking for information on the "surplus" DST-100. This article, while not covering the receiver in great detail, discusses the more important points of user interest, affecting the operation and alignment of the set.—Editor.

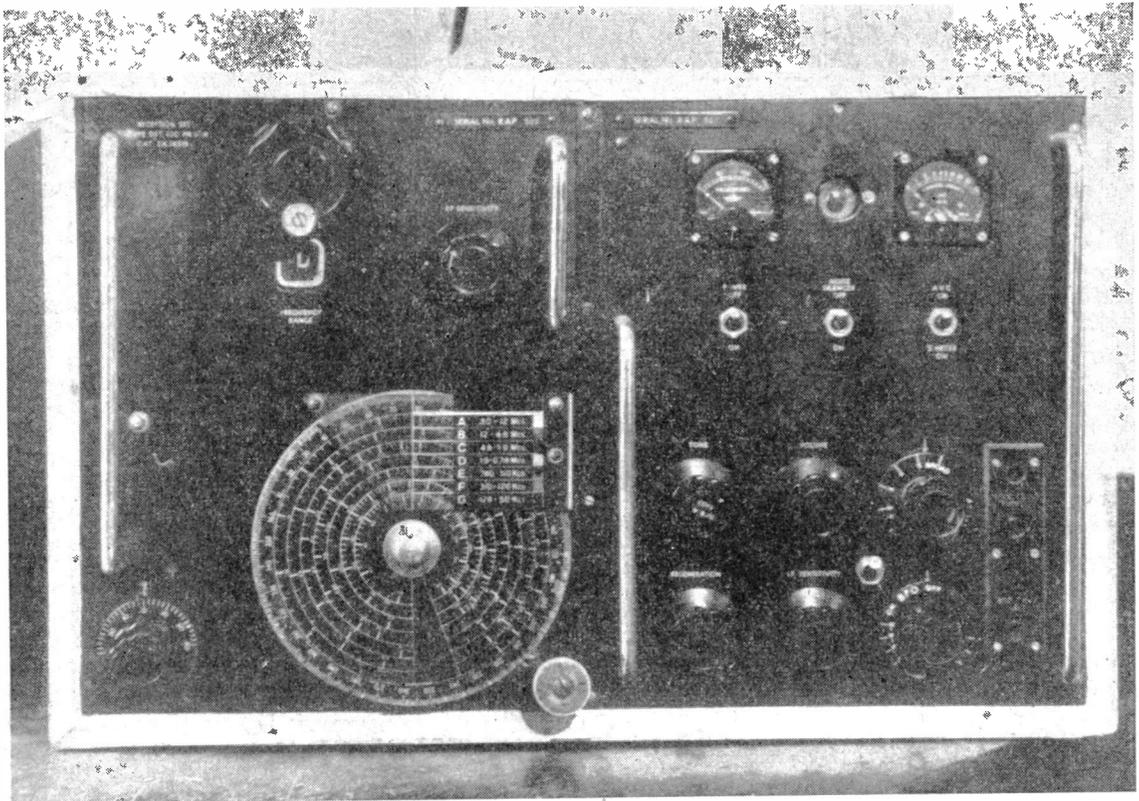
THIS is one of the good "surplus" receivers and has been on sale at a very low price; but as it is more complicated than most communication receivers, and official information on it has been unobtainable, the following notes, found out "the hard way," are offered

in the hope that they may be useful to readers who possess one of these sets.

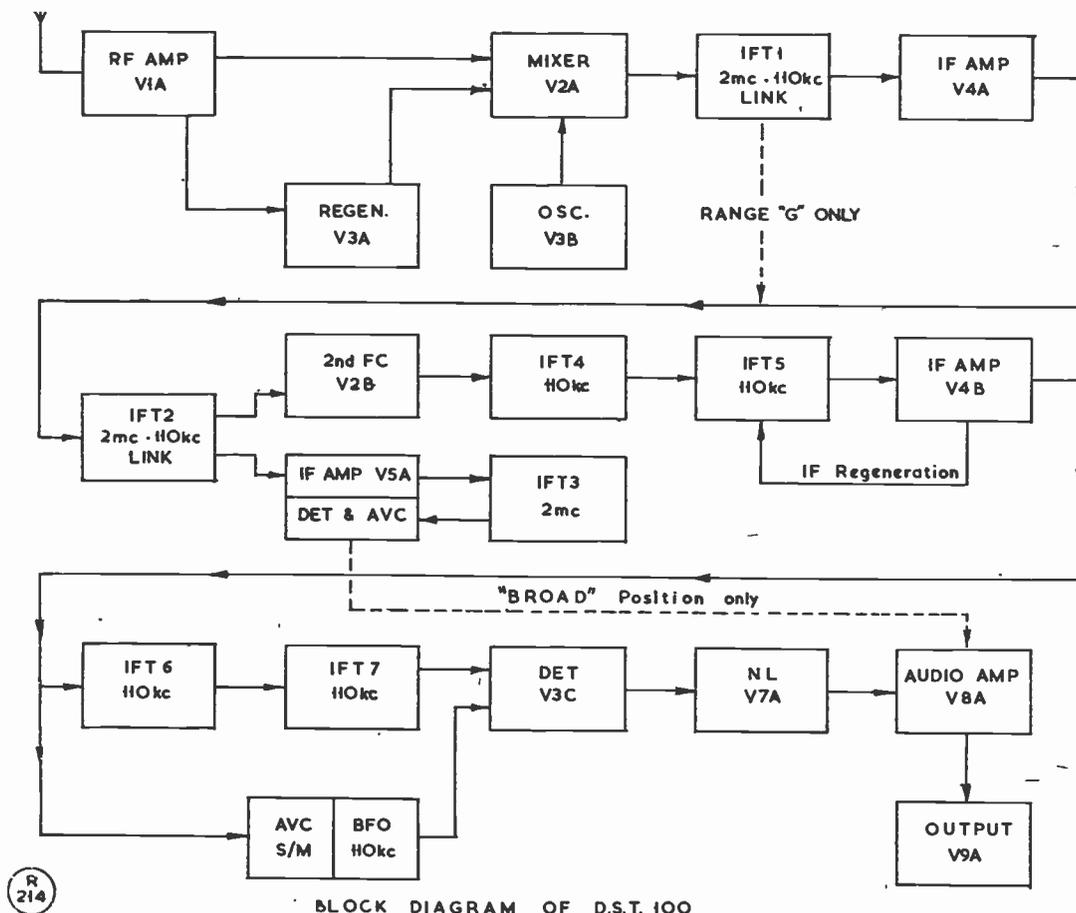
General Description

The circuit is a double-superhet involving 13 valves. The set is built on two large chassis set side by side in a metal rack, the left-hand one containing the wave-change turret and associated valves, the right-hand one the IF and audio sections. A separate power-supply is needed and should deliver 6.3 volts at 5 amps and 250 volts at 100 mA—and the latter should be smoothed, despite the presence of a massive smoothing filter in the set, because the output valve and second oscillator take their HT from the "rough" side of the internal filter. The power-pack can be built into the set, but as the latter is already quite heavy enough, a separate power-pack will probably be preferred.

The bottom panel has a circuit diagram pasted inside, so it has not been thought necessary to reproduce one here; but a block diagram is offered as a help to making sense



Front view of the DST-100, which is a very useful general-coverage receiver, with several refinements, such as a BFO, noise limiter, and S-meter (which is, however, inoperative on AVC). All six amateur bands are covered in the four ranges 750-1900 kc, 1.9-4.8 mc, 4.8-12 mc and 12-30 mc. The tuning mechanism is so arranged that 12 revolutions of the control knob sweep each band, which means that there is a reasonable degree of "mechanical band-spread," though tuning on the higher amateur ranges becomes fairly critical. The meter on the left reads total plate current; on the right is the S-meter, scaled in terms of microvolts input.



BLOCK DIAGRAM OF D.S.T. 100

Block schematic of the ex-Army DST-100 receiver, which is a double-superhet (2mc/110 kc IF's) with a very wide tuning range — 50 kc to 30 mc, in seven switched bands. Thus, all six amateur bands in the HF range 1.8 to 28 mc are covered. A good specimen of the DST-100 is capable of a very adequate performance up to about 20 mc. The receiver is not self-powered.

of the full diagram. The RF stage is a CV21, which is the Mazda VP41 vari- μ pentode with 4v. heater; there is no apparent change in performance if an SP41 is substituted. This heater is fed through a series resistor, so a 6-3 type of valve should *not* be substituted unless this resistor is identified and shorted out. The RF stage feeds directly into the mixer grid circuit and also by a 100 $\mu\mu\text{F}$ condenser to the grid of the 6J5 "regeneration" valve; this acts as a cathode follower, its output being fed by a "reaction winding" to the mixer grid. The anode voltage of the 6J5 is varied by means of the "regeneration" control, and it provides a useful means of increasing gain towards the LF ends of the bands. Since regeneration makes the mixer grid tuning very critical, a trimmer on the front panel provides means of peaking this circuit exactly after a signal is tuned in.

The mixer and oscillator use an ECH-35 and 6J5 respectively and are conventional, but the tuning dial calls for comment. This is of the rotary type and is driven by split gears from an outer ring graduated in degrees. Twelve revolutions of this ring cover the swing of the condenser, so that there are "4320 degrees" to a waveband, and bandwidth is adequate except perhaps on 10 metres.

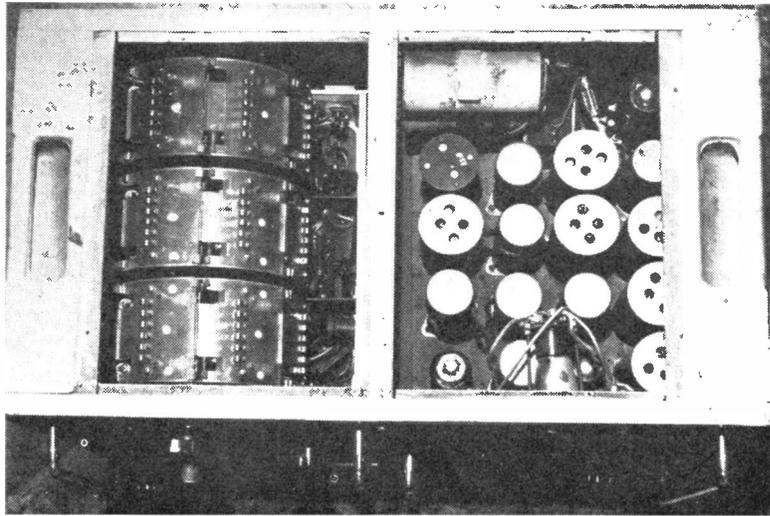
Table II shows that the IF may be either 2 mc or 110 kc, or "both in series," according to the position of the turret switch and the variable selectivity control. In the "broad" selectivity position the output of the 110 kc amplifier is earthed down and the normal infinite impedance detector (6J5) gets no input; instead, the first IF valve feeds the grid of a 6B8 serving as second (2 mc) IF amplifier, AVC and detector. In all other positions of the selectivity switch the 110 kc amplifier is in opera-

tion, and as it has two IF transformers in tandem for both input and output (eight tuned circuits, one with regeneration up to critical if desired) the selectivity can be extremely sharp! However, on range "G" the first IF amplifier is by-passed, and the output of the first mixer, which is now at 110 kc, is fed by link windings on the first two IFT's to the grid of the second frequency-changer, and so into the 110 kc amplifier.

Alignment Procedure

The lining-up routine follows from what has been said in the previous paragraph, but an outline of the sequence of operations may none the less be helpful.

First set the controls as follows: RF gain minimum, regeneration minimum, selectivity position 4, IF gain maximum, AF gain maximum, noise limiter off, AVC off. Plug some form of output meter into the phone sockets and feed a modulated 110 kc signal into the grid of the last IF valve (EF39). Adjust trimmers of IFT7 and IFT6 for maximum output. Reduce signal input and transfer to grid of second frequency-



General appearance inside the DST-100, with the massive seven-band coil turret on the left. The compartment on the right is the IF chassis, the receiver being a double super-het with a total of no less than seven IF circuits. In this particular receiver, our contributor has fitted a "magic eye" tuning indicator (shown at centre of the right-hand compartment) in place of the panel light.

changer, then adjust trimmers of IFT5 and IFT4. Without changing position of input change its frequency to 2 mc and adjust trimmer of second oscillator (reached through a hole in right-hand side of rack) until signal appears at output. Now transfer input to grid of first IF and adjust IFT2 and IFT1 for maximum output; switch selectivity to "broad" and adjust IFT3. If range "G" is required, switch to it and feed in 110 kc signal, adjusting large ceramic trimmers below IFT1 and IFT2.

The above procedure will have brought all the IF section roughly into line, and from now on a fixed signal of 2 mc should be used, fed into the first IF grid, while the 110 kc transformers are gradually brought into precise line, using progressively sharper selectivity positions. The IF regeneration control is a pre-set potentiometer on the right-hand side of the chassis; it should be advanced, with selectivity in "sharp" position, until the set just breaks into oscillation, then backed off a little and the last four IFT's touched up very carefully again.

Points to Watch

The S-meter is driven from the screen of the last IF valve, so cannot be used for lining up IFT's 6 and 7, but it can be brought in for the other alignment operations if desired. Two snags are commonly met with in the IF section:

- (a) Set breaks into violent oscillation

TABLE I

Valve Sequence		
Chassis Valve No	Type	Circuit Function
V1A	CV21(VP41)	RF amplifier
V2A	ECH-35	Mixer
V3A	6J5	RF regeneration (cathode follower)
V3B	6J5	1st oscillator (2 mc IF)
V4A	EF-39	First IF (2 mc)
V4B	EF-39	Second IF (110 kc)
V5A	6B8G	Second IF (2 mc), alternative detector and AVC
V2B	ECH-35	Second mixer and oscillator (110 kc IF)
V3C	6J5	Infinite impedance detector
V6A	6R7	BFO, AVC, S-meter diode
V7A	6H6	Noise limiter
V8A	6Q7	First AF stage
V9A	6V6	AF Output

NOTE: The DST-100 requires an external power supply

which can be controlled only by drastic use of IF gain control. This is because the 2 mc IF's can be tuned to 1890 kc, the second oscillator frequency, by their trimmers. The cure is to tune them correctly; the effect will be noticed if the *quality* of the output is monitored by means of a pair of phones plugged partly into one of the extra outlet sockets, so that only one pole of the plug makes contact.

(b) Output small, sometimes increasing violently if chassis is tapped. The cause here is an open-circuit in the last IFT, caused by attempts (during Service maintenance) to remove its can without first taking chassis out of rack. It is easily cured by soldering the broken wire, since this is of about 18 gauge! Incidentally, the very first time the chassis has to be removed, do away with the 8-way tag-board joining the two chassis, and replace it by a suitable plug and socket—and don't miss the other two inter-chassis connections, which are made direct by wires and *not* by the tag-boards, and as they are RF "hot" must be left that way.

The lining-up of the RF and oscillator stages calls for little comment. It is done by means of Philips trimmers, two per coil except on the mixer grid where there is only one. On the oscillator stage, one is a trimmer and the other a padder except on the HF range "A," where they are both trimmers, and the coil must be pulled about if the LF end will not come into line. When properly adjusted the dial calibrations will be found very accurate.

An item which may cause some puzzlement is a high-speed relay under the chassis in the

TABLE II

Frequency Ranges and IF Switching				
R'nge	Coverage	Amateur Band (s) Covered	IF in Use, Sel. "Broad"	IF in Use, other Settings
A	30-12 mc	14, 21, 28	2 mc	2 mc/110 kc
B	12-4.8 mc	7	2 mc	2 mc/110 kc
C	4.8-1.9 mc	3.5, part 1.8	2 mc	2 mc/110 kc
D	1.9-0.78 mc	part 1.8	2 mc	2 mc/110 kc
E	780-310 kc	—	2 mc	2 mc/110 kc
F	310-126 kc	—	2 mc	2 mc/110 kc
G	126-50 kc	—	110 kc	110 kc

middle of the set. This is arranged to short-circuit the first IFT in the stand-by position, but is not required for amateur purposes unless it is proposed to use a kilowatt or more bang on two megacycles! It may be removed or left, as desired.

The details discussed here show that this "surplus" Army receiver represents a thorough exploitation of the double-superhet principle, and it is capable of correspondingly excellent performance. The author wishes to emphasise that the information given is based on his own investigations, and someone with more skill or better test equipment, or with access to official sources, may be able to produce more detailed information; but it is hoped that this article will at least provide a starting-point for further comment.

TAKE NO NOTICE!

Recently, we have done extensive circularising by leaflet drawing attention to what (we hope) are the merits of SHORT WAVE MAGAZINE. Inevitably, this circular will have gone to a great many readers who already take the *Magazine*, either as direct subscribers or through a newsagent. As we cannot know the latter, and the former are constantly being added to (or changing their addresses), and the circularisation scheme covers many countries outside the U.K., it was not practicable to try to separate the known from the unknown. Of course, because you see this notice, you will already be a reader, so we thank you for your support—and ask you to ignore that circular! We are not after you! It is those who for some unaccountable reason are not taking SHORT WAVE MAGAZINE that we want to find.

AMERICAN SUBSCRIPTION RATE

We are sometimes asked how SHORT WAVE MAGAZINE can be obtained in the United States. Though it is on sale on bookstalls in some of the big cities, the easiest and most certain way is to send us a cheque (check), or an international money order, for \$4.00, with name, callsign and address.

We can accept subscriptions, in any convertible currency based on 30s. sterling or four American dollars, from any part of the world. Half-rates can be taken for six months. Unconvertible currencies include stamps, IRC's and cowrie shells.

CARDS IN THE BOX

If your call is in this list, it is because we hold card(s) for you in the QSL Bureau, but have no forwarding address. Please send a large, stamped addressed envelope, with name and callsign, to: BCM/QSL, London, W.C.1, and the cards will be despatched with the next fortnightly G clearance. If you would like your callsign/address to appear in our "New QTH" feature, and in the *Radio Amateur Call Book* (the only directory to the radio amateurs of the world), that should be mentioned when sending the s.a.e. for your cards.

G3BCH, 3IEB, 3IPP, 3JUN, 3KXY, 3LEI
3LHN, 3LLJ, 3LNB, 3LNL, 3LPC, 8XI,
GD2FWV, GI3IVY, GM3JTN, 3KYI,
GW3KPG.

Transistors in o-V-2

POCKET PORTABLE BC RECEIVER

E. JOHNSON (G2HR)

THOUGH there are those who can still find a use for it, the days of the reacting detector valve (*plus* one or more audio stages) are long past. With the advent of the transistor, however, a simple circuit based on early broadcast receiver technique can give surprising results.

There are a number of transistors on the market at reasonable prices suitable for audio stages, but the RF types, essential as a regenerative detector for medium frequencies, are considerably more expensive. It was for this reason that the writer resolved to see what results were obtainable from the "surplus" transistors advertised in *Short Wave Magazine*. The RF (blue-spot) and the AF (red-spot) are available at the modest price of 15s. and 10s. respectively.

It was decided from the outset that the receiver must be a "personal portable," entirely self-contained, of a size that could be slipped into a raincoat pocket and powered by a 4½-volt battery. This voltage is within the 5-volt limit of these particular transistors. Maximum pick-up is ensured by the use of a Ferrite rod aerial, L1, and it was found desirable to employ the 6 in. type in the interests of sensitivity. This does, of course, fix the minimum length of the case, and although the receiver could be made much more compact with a smaller rod, overall sensitivity will suffer. Of course, the case

must be non-metallic to avoid shielding of the Ferrite rod.

After some weeks of experiment the final circuit adopted is as shown. It will be noticed that stabilisation is not used. No difficulty was experienced on this score with the exception of the first stage, of which more anon. Transistor characteristics vary considerably with temperature. Comparatively large changes in the ambient temperature, however, did not appear to affect the audio stages appreciably.

Circuit Layout

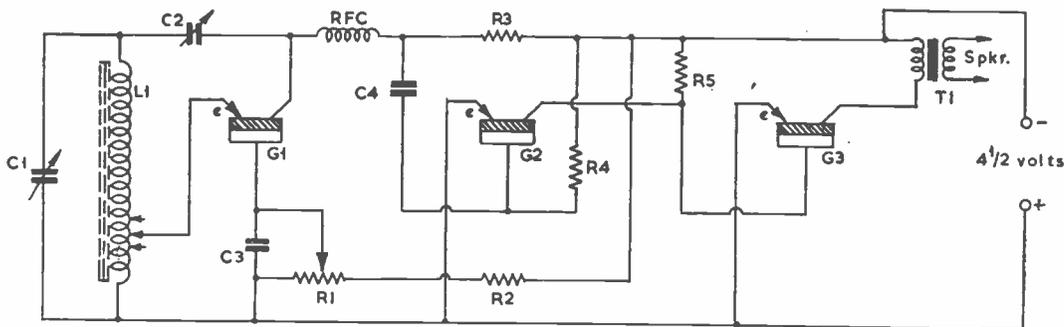
The detector stage is used in the common-base mode which gives the maximum operating frequency, the cut-off being approximately 1.6 mc with the blue-spot transistor. "Production spread" may cause some variation in this frequency, but it should not be difficult to obtain effective regeneration over the entire medium-wave band. The inherently high *Q* of a Ferrite rod coil is an important factor in this connection.

The coil itself is *loosely* wound along the entire length of the rod. This is an important point, as the pick-up is optimum when the maxi-

Table of Values

The Transistor O-V-2

C1 = 500 μF, tuning	L1 = 50 turns 26g. enam. loosely wound on 6-in. Ferrite rod, tapped 5th, 10, 15th turn.
C2 = 50 μF, regen.	G1 = "Blue-spot" transistor (Henry's Radio)
C3 = .05 μF	G2, G3 = "Red-spot" transistors (Henry's Radio)
C4 = 2 μF (min.)	
R1 = 10,000-ohm pot'meter	
R2 = 470,000 ohms	
R3 = 22,000 ohms	
R4 = 100,000 ohms	
R5 = 3,300 ohms (see text)	
T1 = Min. speaker o/p xformer	



TRANSISTOR "O-V-2" — 600kc to 1500kc

X
68

This is a "local-station no-aerial" transistor receiver, in which G1 is the regenerative detector stage, and G2,G3 audio amplifiers. The tuned circuit L1, C1 constitutes the pick-up, as L1 is wound on a Ferrite rod about six inches long. C2 is the feed-back, or "reaction," condenser, adjusted in conjunction with the bias control R1. In this circuit, R5 serves both as load for G2, and bias resistor for G3. With headphones instead of the small speaker, Continental BC stations might be found if the set is orientated in such a way as to take full advantage of the directional properties of the Ferrite rod.

imum cross-section of rod is enclosed within the coil. With an earthed base circuit the input impedance is very low, and for this reason the emitter is tapped well down the coil. The best tapping point may vary from transistor to transistor, and it is suggested that the coil be tapped at intervals. (In the writer's case it was found that the 10th turn gave the best results.) Regeneration is controlled by the condenser C2, connected from collector to the "hot" end of the coil. It should be possible to achieve oscillation over the entire medium-wave band, although there will be a rapid falling off at the higher-frequency end. Nevertheless, oscillation should be obtainable at or near the maximum setting of the regeneration control.

It will be observed that the base potential is maintained slightly negative with respect to the emitter by means of the potentiometer, R1, or conversely, it follows that the emitter voltage can be varied from slightly positive to zero. The potential divider is split, the 470,000-ohm section R2 being connected from base to negative line, with the 10,000-ohm potentiometer, R1, giving a fine control. It will be found that the setting of this control depends as much as anything on the prevailing temperature, and the optimum point will give good gain and effective regeneration. Maladjustment will be revealed by low gain, ineffective regeneration, or "squegging." With the collector load of 22,000 ohms, R3, a collector current of around 100 μ A will be a usual figure — although, again, there will be variation from transistor to transistor.

The first AF stage, G2, calls for no special comment, being used in the conventional common emitter configuration which gives maximum gain. Here also the input impedance is low, although higher than the grounded base arrangement. It is for this reason that the coupling condenser, C4, of 2 μ F should be considered a minimum in order to give adequate audio frequency coverage.

The output stage is also a common emitter circuit, but is directly coupled to the preceding transistor. It will be apparent that no coupling condenser is employed, and the normal second stage collector load resistor appears to be missing. However, resistor R5 acts in the dual capacity of load and bias resistor for the output stage. It is somewhat critical in value, and is dependent upon the output collector load. The easiest method of determining the value is probably by trial and error using a variable resistor, adjusting for optimum gain and lowest distortion, and then replacing with the nearest

fixed preferred value. In the writer's case, with speaker transformer primary DC resistance of 200 ohms, R5 was selected as 3,300 ohms. The overall consumption of the receiver is around 4 mA, most of which is consumed by the final stage.

Results

Performance in NE London, some ten miles from the B.B.C. transmitters, is such that an external 5 in. loudspeaker is worked very adequately with tolerable distortion. A built-in miniature speaker (say, a 3½ in. "Elac") will give all the output one requires, and provision can easily be made for 'phones at greater distances from the transmitters. This was found necessary within a large steel and concrete building in central London.

As with the old type reacting valve receivers a certain amount of skill is necessary in adjusting the external controls for regeneration and bias to the first stage. It should also be remembered that the set is strongly directional and gives maximum response when the Ferrite rod aerial is broadside-on to the desired station. This orientation is broad in the maximum direction, but the minimum is very sharp when the aerial is "end-on." It is then possible to obtain quite an accurate DF bearing, once again remembering that the Ferrite rod is pointing directly to the received station.

By careful adjustment of the controls, and with proper orientation, it is even possible to receive on headphones some of the stronger Continental stations. The detector bias should be so adjusted that regeneration is smooth, with G1 going into oscillation without any sign of "plop."

Construction

The actual form of construction and the layout are best left to individual ideas, but a few words of advice may be helpful. The transistors generally available in this country are the *p-n-p*, that is, the collector or "HT" voltage is negative, contrary to valve technique. Reversal of polarity will destroy the transistor. When soldering them into position it is very desirable to use a heat-shunt to avoid damage, and it should be emphasised that an iron which has not been allowed to reach full heat is *not* a safeguard, as a really hot iron gets the job done quickly before the heat has time to travel.

It will be generally known that Ferrite rods are extremely brittle, and even a drop of a few inches on to a hard surface may fracture them. It is therefore very desirable that the aerial should be cushioned in its mounting against

any possible shocks. Grommets pushed on each end with suitable mounting brackets will usually take care of this.

If it is necessary to measure resistors when

in circuit *disconnect the transistors first*. One is apt to forget the polarity of the internal meter battery, with possible disastrous results to the transistors.

Simple CO-PA Transmitter

SUITABLE FOR THE BEGINNER, OR AS A STANDBY

R. H. WRIGHT (G3IBX)

IN a recent article on crystal grinding (April, 1957, *Short Wave Magazine*) it was suggested that crystal control of the transmitter is a good thing for the newcomer to Amateur Radio, at least until he has gained some experience on the amateur bands. This transmitter, therefore, is offered as a simple but very effective set. It might be called a "two-by-two-by-two" — two valves, two stages, and, if the advertisements in the *Magazine* are carefully studied, costing under two pounds to build.

This particular transmitter has been used as a standby for almost two years, and, as is to be expected with crystal control, a T9 report is invariably received.

The Circuit

This consists of a Pierce oscillator followed by an RF power amplifier. The Pierce was chosen in preference to one of the harmonic crystal oscillators since almost "any sort or

condition" of crystal will go off readily in this circuit. Although a 6J5 (or British L63) type valve is specified, an EF50, triode connected (screen, suppressor and anode strapped together) will drive the 6V6 PA valve equally well.

Suitable crystals are frequently offered in Readers' Small Advertisements in the *Magazine* or, alternatively, they can be obtained from some of the trade advertisers at very reasonable cost—but some may then require re-grinding before being right for the amateur bands.

The tank, or output, circuit of the PA stage can be tuned to the crystal frequency, giving

Table of Values

The CO-PA Transmitter

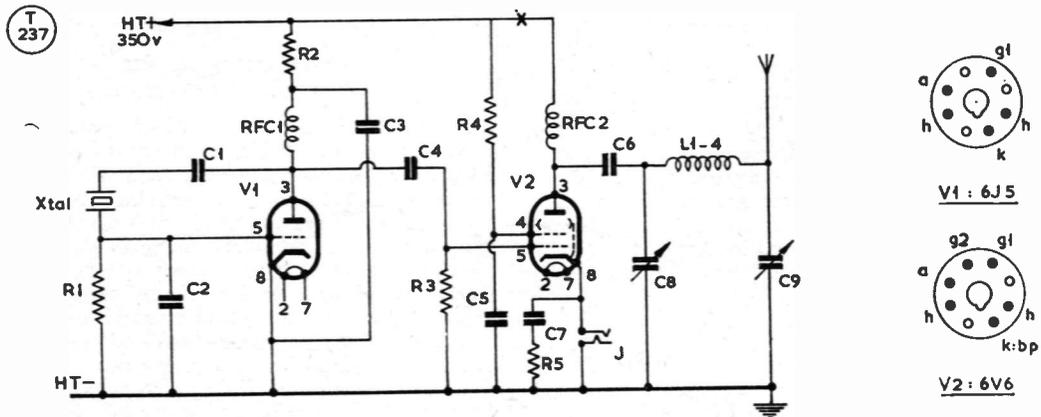
C1, C2 = .0003 μ F, mica	R3 = 47,000 ohms, 1-w.
C3, C5 = 0.1 μ F, paper	R4 = 22,000 ohms, 1-w.
C4 = .002 μ F, mica	(see text)
C6 = .01 μ F, mica	R5 = 250-300 ohms, 1-w.
C7 = 0.5 μ F, paper	RFC1, RFC2 = 2.5 mH RF
C8, C9 = 500 μ F (for 160 metres)	chokes
	V1 = 6J5 (L63), or EF50
R1 = 100,000 ohms, 1-w.	(see text)
R2 = 25,000 ohms, 1-w.	V2 = 6V6

(Also Required: 0-100 mA *mc* meter, valveholders, crystal holder, coil formers).

COIL DATA

- L1 = 1.8 mc band (160 metres) 48 turns, close-wound.
- L2 = 3.5 mc band (80 metres) 32 turns, close-wound.
- L3 = 7.0 mc band (40 metres) 20 turns, over 1½ ins.
- L4 = 14 mc band (20 metres) 10 turns, over 1½ ins.

All coils are of 22 SWG enam. on Eddystone 1½-in. diameter formers, plug-in Type 538.



Circuit of the Crystal Controlled Power Amplifier (CO-PA) low power transmitter described in the text. The CO is a Pierce, which will "go off" with almost any crystal, giving ample drive into V2, the PA, which can be a 6V6; drive current could be measured by putting an 0-5 mA meter in on the earthy side of R3. The point marked X shows where a dropper resistor should be inserted if it is desired to reduce PA input to 10 watts or below for Top Band working (see text). The transmitter is keyed in the cathode of V2, C7/R5 comprising the key-thump filter, to ensure a clean note. Values in the table, and the coil data, cover operation on the four amateur bands 1.8 to 14 mc.

transmission on the fundamental frequency, or it can be tuned to the second harmonic of the crystal frequency, thus being used as a doubler with reasonable efficiency. In this way the 1.8, 3.5, 7 and 14 megacycle amateur bands can be covered with suitable inductance and crystal combinations, as shown in the Table.

The pi-coupling into the aerial will permit any normal length of aerial to be matched to the set on any band.

Tuning

Test that the crystal oscillator is functioning by listening for the beat in the station receiver; it should be very loud and unmistakable, and on the correct frequency. Then with the appropriate coil plugged in, put C9 to full capacity, plug in a 0-100 mA meter into the jack socket in the cathode of V2, and rotate C8 until a dip is observed in the meter reading. Decrease C9 and readjust C8 for the dip; continue this process until the meter reads 40 to 45 milliamps at the dip. The transmitter is then ready for

BAND COVERAGE		
Band	Crystal	Inductance
1.8 mc	1.8 mc	L1
3.5 mc	3.5 mc	L2
7.0 mc	3.5 or 7.0 mc	L3
14 mc	7.0 mc	L4

use and the meter can be replaced by the key. C7 and R5 will reduce the effects of any sparking at the key contacts and so contribute to a cleaner note.

If the set is to be used on 3.5, 7 or 14 mc, the HT supply may be 350 volts, but if the transmitter is intended for Top Band working (1.8 to 2.0 mc), where the DC input power to V2 is limited to 10 watts, either a 250 volt HT supply should be used (and in which case R4 can be 5,000 ohms), or a resistor of 2,500 ohms should be included at point "X" in the diagram. This resistor should be rated at 4 or 5 watts.

PLEASE NOTE—FOR BLIND AMATEURS

In this country, the *doyen* of radio amateurs who are sightless is G6KJ (Buckingham), who was licensed as long ago as 1924. As it is known that there are now quite a number of G's who are similarly handicapped, it is proposed to compile a complete and up-to-date register of the sightless in the U.K. who are licensed. The idea is to bring them together, by correspondence and over the air, so that their particular problems and common interests can be ventilated. To this end, G6KJ has undertaken to do the secretarial work involved, and we now ask that readers who know of a blind amateur should put him (or her) in touch with us. In the first instance, letters should be addressed to SHORT WAVE MAGAZINE, c/o The Editor, who is in direct contact with G6KJ.

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On time, every month, take out a direct subscription. This costs 30s. for a year of twelve issues (or 15s. for six months), starting any month, and also entitles you to free both-way use of the QSL Bureau operated by us. Subscription remittances should be sent to: The Circulation Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1, stating with what month the subscription is to begin.

ECHO FROM THE PAST

It was in 1901 that Marconi worked his first DX, when signals from St. Catherine's Point, Isle of Wight, were clearly heard at the Lizard, Cornwall, a distance of 198 miles; this was the first experimental proof that the range of radio signals could be beyond the optical, and was a body-blow for the theoretical pundits of the time, who had been confidently arguing the exact contrary. Marconi's original

masts at St. Catherine's still stand, and more recently the site has been used by G5TZ for his /A VHF station, again involving, indirectly, the theory of propagation, in that some years ago many theorists held that VHF signals could not be received beyond the horizon—an idea which was also proved (by amateurs) to be entirely wrong. Now it is reported that a permanent VHF R/T station has been established at St. Catherine's by Trinity House for communication with the Needles Lighthouse, 14 miles away. This is, of course, strictly a line-of-sight path.

MOBILE RALLY

Sunday, June 16, from 12.00 noon

at

STONE CROSS AERODROME
NEAR SOUTHAMPTON

This is 7½ miles west of Southampton, on the A.31 (NGR 41/250118). Talk-in stations will be operating from 10.30 a.m., with G3GYK/P on Top Band (1860 kc or nearest clear channel), and G2HIF/P on one of three available frequencies on two metres. Mobiles coming to the Rally are asked to contact the relevant talk-in station as soon as possible, and thereafter to report progress. There are cafés within reach, for those not wishing to bring a picnic lunch and/or tea. There is no charge and no set programme is planned, as the event is intended simply to be a get-together of mobile enthusiasts.

Organised by the Bournemouth Amateur Radio Society

Hon. Sec.: J. Ashford, G3KYU, 119 Petersfield Road, Boscombe East, Bournemouth. (Southbourne 44569).

DX COMMENTARY

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

ANOTHER excellent month has passed, with the sunspot cycle right at its peak. But—there is always a *but*—the DX fraternity are discovering once more that the peak of the cycle is not the best time for reliable communication. At times the sunspots have been so numerous that very disturbed conditions have prevailed. In general, Ten has not been as good as it was a few months back. Fifteen and Twenty have varied from dull to brilliant.

One or two readers have queried "What is happening? The bands are nothing like they were in 1946 and 1947." Quite true, put like that; but they *are* rather as they were in the spring of 1946, when Ten used to fold up completely for long periods. Our prediction is that the really good conditions will return during this summer or autumn, and that next winter will possibly be better than anything we have experienced so far.

If you want to make your own sunspot checks, it is quite easy. They are visible through binoculars (with a really *dark* filter if you value your retina!), or quite a small telescope can be used to project an image of the sun on a piece of white cardboard held some two feet from the eyepiece. Quite a large image is obtained in this way, and the individual spots in each group can be counted in comfort.

So that you can check with the prevailing conditions, here are our own observations for a few days recently: From May 8 to May 10 two biggish groups were crossing the sun; on the 11th a third appeared, and on the 12th a fourth. By the 15th there were five separate groups, each of many



MP4KDS

CALLS HEARD, WORKED and QSL'd

spots. By the 18th all but two of these had vanished "round the corner" and conditions were very much *better* than they had been for the previous week.

And so on to our faithful correspondents and their own accounts of the month's work . . .

Round the DX Bands

G3JZK (Cambridge) collected PZ1AP, KV4AA, ZB2R and FY7YF in a single excursion on Twenty CW, but missed VKØPK. He found Fifteen the best band and worked KG4AN and KH6KD on CW; KL7, VS2DB, HS1B, OQ5HP, VP4MM and FF8AP on phone. Escapes were VS4JT, VS5KP and the JZØ's. G3JZK says the band sounds, at midnight, like Twenty did last summer, with all sorts of things arriving. Ten was not as good as last month, but he did raise VS1 and 2, CR9AK, CR6, HP1RB, CT2 and ZD4CH. Two HH's were heard working each other, regardless of the inevitable pile-up. The Far Eastern stations seem to turn in early, which is a pity, as the path is good around 1400 GMT.

G3JKF (London, W.5) raised

three new Zones and ten new countries on Ten and Twenty. CW on the latter band brought in CE3ZO, CR7AF, KR6AE, UH8KAA, YI2RM, CE9AS and UO5AA. YI2RM told him that his own rig is also operated by YI2DX and YI3AA, and that YI2OT is on the air independently. Ten phone yielded VP5DS (Turks Is.) and G3FYR/V89. G3JKF worked 38 States and 308 stations in the ARRL Contest, giving a score of 28,000 odd—nice going. G3INR (Hereford) was told by 3W8AA that XW8AA and possibly also XW8AB are now off the air. XW8AB may be chased for QSL's at Box 165, Vientiane, Laos. Also that KH6AIK/KG6 urgently requires contacts with GC, GD and GM . . . he is on 14095 kc at 1900 GMT. G3INR collected several new ones, including 3W8AA and a KG6 on Ten, a VP2 and 3W8AA on Fifteen, OHØ, VQ1JO and KG6 on Twenty, and a UQ2 on Eighty. Finally, he says that RAEM is in Moscow despite his exotic call, which was specially issued to him when he was radio operator of the ice-breaker *Chelyuskin* in 1934.

(We can confirm this from his QSL of 1947.) RAEM is also believed to have been awarded the distinction of "Hero of the Soviet Union."

G3BHW (Margate) remarks on the wonderful signals from the Caribbean area on Fifteen, late evenings. New ones for him, with phone on that band, were KG6, VP7 and VP5 (two of each!). Others included VP2AD and 2KD, VS4JT, VS9AI, BV1US, HP1GD, VP4's, VK9HO and many more nice ones on phone, including G5RV/PJ2. G3BHW was less active on Twenty but did winkle out UG6AG and KH6AIK/KG6, the latter giving him his 39th Zone for the Marathon. Ten rewarded him with ZC6UNJ, ET's, VP8's, ZD8SC, HH2W, ZD2's, VS2, ZP and OD, all on phone.

G3WL (Plymouth) stuck mostly to Fifteen, with VK's around as late as 2200 GMT, but he is dismayed at the absence of CW on Ten. This goes for several of the regular 'chasers—Ten is a wonderful band for CW, when the activity is forthcoming. In the years 1946-49 your commentator worked over 130 countries on Ten, CW only—but what a hope these days!

G6VC (Northfleet) put up a new

ten-metre beam, whereat the band promptly folded up. But at least he got HH2I for a new one. On Twenty he worked G5RV/PJ2 and FY7YF, and new ones on Fifteen were VS1GX and JA1CO.

GW3HFG (Pembroke Dock) has been working with a much-modified B2, and a continuous sked has been maintained with VP8CO on Ten; the latter runs 300 watts and always comes in at S8 or 9, phone or CW, and '3HFG, with his input of between 10 and 20 watts, gets S7 or 8. On Twenty CW he worked VP8AO.

GC6FQ (Jersey) tells us that since he started up there in January, 1956, he has worked 166 countries in 36 Zones, all on phone on Twenty and Fifteen.

Specialists

G3GZJ (London, S.E.23) has been a one-band man (Fifteen) and reports that a W9 he worked was pretty confident about HS1B; also that he has worked TA3KW three times recently. Best QSO of the month was VK9AJ (Cocos Keeling); others were G3FYR/VS9, OD5AW, VO2AA, VS1, JA's and the like.

GM3BCL (Aberdeen) stuck to Ten only, and his phone raised

CR9AL, CX's, FY7YE, HC1TK, HZ, KP4's, OA4AI, OQ5, PY's, UA9, VK's, VP4, 6 and 8, VQ2 and 4, VU, ZD2WAF, ZD8SC, ZE, ZS, ZP's and 4S7MG... a nice bag for one band, and (just now) a difficult one at that.

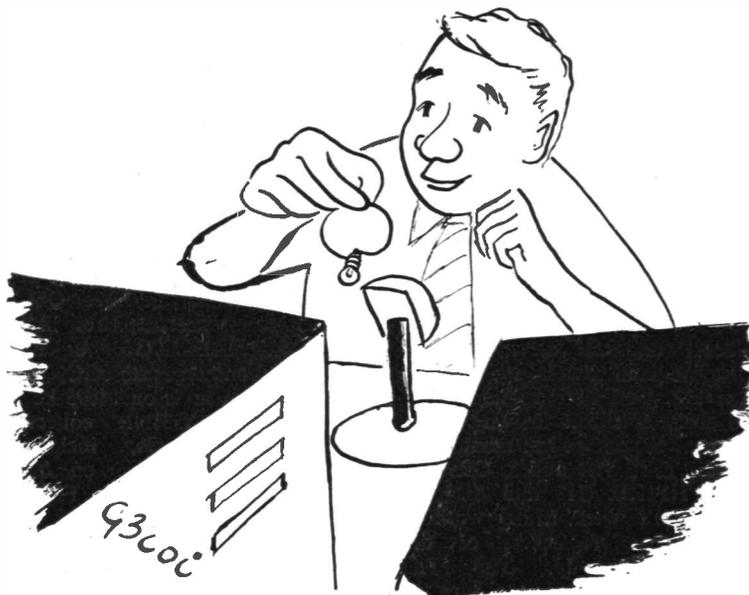
Multi-Banders

G5FA (London, N.11) mentions TA3KW, CO, CE, UP2AS, 5A5TH, YV5DE and KL7CDF on Fifteen; CR6AI, KH6AIK/KG6, CE, UF6, UJ8, UL7, JA2NX, 3W8AA, CT3AB and VQ4FM on Twenty CW, with 3A2BF on phone; and, on Forty, UP2KBE as a new one. He worked XW8AB on Forty some time back, but no card yet. G5FA came across "ZY2AA" on Twenty, and went after him with a few dozen others. This gent. gave his QTH as "Russian satolite around the world" and his name as Grisha (probably Russian for "Gertcha"). He will sure QSL when he returns to earth... Wherever he is, he was getting out, as a JA called him next. By the way, G5FA says he has not used his final for about twelve months, and gets more fun working with 50 watts and a dipole.

G3FXB (Southwick) has raised some new ones despite the arrival of a further harmonic and the usual pressure of work. On Fifteen he mentions CO, ET, FB8ZZ, HS1B, OA, UNI, VK9AJ (Cocos), VK9HO (New Guinea), VP2GW, VP5CM and VS4JT—all phone. On CW there were VS9, KG6, ZC5DA and 5JM, ZL5AA and 3W8AA. Ten gave him CR5SP, CT3, EL, HH3TJ, VK9DB, VP8AQ, VS9AI, VU2BK and ZD4BV on the phone side, with UAØSK on CW.

Twenty was responsible for TA3US on phone, plus VP8BR and various rare Russian districts on CW. Forty gave him one new one—UNIAB on CW.

G2BLA (Morden) raised VS9AI on Ten; Fifteen gave him CE, CP1AF, CX2FD, UO5AA, LU, VK, lots of W's, and WL7BYW (Novice licence in KL7). On Twenty he worked OA4ED, ZD3A, VK, ZL and U.S.A. West Coasters. Forty also came into the picture with CN8, W's, PY8YP,



"... Transmitter here is the new Globewarbler and receiver the latest DX Inhaler but of course the rest of the gear is entirely home-built, OM...."

YO and EA8BC. And on Eighty he raised VE1ADQ for his "first across" on that band.

G5BZ (Croydon) covered the usual three bands and raised VP8AQ on Ten phone, with ZD2, VU, OD and CE3ZO on CW; on Fifteen the list includes LU8ZC, VS9AI, PJ2AV, VP3YG, OA4AU, PJ2ME, VQ5, VK's, JA's, VS1 and VS6 by both paths. Twenty brought in LU7ZC, LU1ZS, FM7WR, VK9XK, KG6, OY, UL7, VK's and many others. G5BZ missed the 700-score in the Five-Band Table by just one point.

G3DO (Sutton Coldfield) had a good month and brought himself to the top of the WAZ Marathon ladder with 39 Zones. It may even be 40, because he worked a character signing "AC4A" and claiming to be in Lhasa with 100 watts and a rhombic. Signals came from the right direction, and if a QSL follows, all will be joy... Twenty CW gave him this one, BV1US and VP8BO; phone accounted for SV0WN (Crete), and F9SC/FC. Fifteen CW pulled in VS9AI; phone was better with HH2DB, VP5DX, HS1B, VP8AQ, VP7NB, VP3YG and DU1GF. Twenty CW also yielded UA0KAD, UA0KJA and FB8ZA, for Zones 18, 19 and 39 respectively.

G3BDQ (St. Leonards) thinks Twenty is now falling off and Fifteen improving. Fifteen CW gave him a nice little list, including 3W8AA, UJ8AF, VK9AJ, TA3KW, XE1PJ, YI, VS1 and VS6, KL7 and ZD2; phone brought in VP6WR, VQ2DC, W7 and ZS4. On Twenty he stuck to the key and raised KG6 (2000 GMT), DU7SV (1600), DU9JO (1630), KH6's, FL8AC, VK0AB (1745), FB8BX/NB, VP8BO, UM8KAA, KR6AE and a couple of OY's. Ten phone gave him CR7DS, VS9AI, VQ4, ZL and ZS; CW caught VQ2GW and VS9. G3BDQ doesn't see much sense in publishing "gotaways" and asks what is a near miss, anyway? How can one tell whether the other fellow "nearly" heard one? We rather agree, but sometimes the list of gotaways produces such mouth-watering call-signs that we can hardly resist quoting them.

G3DNR (Broadstairs) had to



GM2DBX of Methilhill, Fife, is strictly phone only, 3.5 to 28 mc, and has accounted for a total of 172 countries in 32 zones. He is holder of many DX achievement and operating certificates, including our WNACA, endorsed No. 1 for telephony operation. The transmitter is a Panda PR-120-V, with appropriate ATU, the receiver a Radiovision Commander, and aerials are dipoles for 14 and 21 mc, with a 131-ft. wire for the other bands. "For amusement only," GM2DBX offers a year's free subscription to the Magazine to any reader who can list correctly all the QSL cards visible in the photograph (and a ten years' subscription to anyone who can produce duplicates of all these QSL's!)

shift all his gear to the local Hobbies Exhibition, so DX suffered. He remarks on the terrific QRM on Fifteen after TV hours; on that band he raised CE, VK's and W's. Ten was better (no TVI for him!) and accounted for ZC4, 4X4, VQ2, CX, KP4, ZS, PY and W.

DX Mobile

G6UC/M reports from Berwick-upon-Tweed that he worked VS1 and VS6, VU, MP4, ZB1, KP4, EL, LU, all W districts, seven Canadian districts, many VK's, ZE's and ZS's; these were on phone and CW, on the three HF bands. The rig is all enclosed and pre-tuned, with an 832 PA and 807 modulator, and a whip on the car bumper, loaded on the 20 to 160 metre bands, but unloaded on Ten and Fifteen.

G6UC/M has worked five continents on Phone, and five on

CW, all on Ten and Fifteen. One of his most interesting QSO's was with W3HTF/Mobile (Philadelphia) while G6UC/M was travelling six miles South of Berwick; this was a CW contact.

Piracy ?

G3JLX (Cheshire) says he has not been active at all for a year, and has never been on as GM3JLX (for whom there are "Cards in the Box"). So it seems that GM3JLX is Not Good.

Here we might mention that we frequently notice the most flagrant and unnecessary mis-reading of calls on the air, and often reflect that half the cases of suspected piracy may be due to just this. We have had DL's being called as ZL's; LU's as DU's; OK's as OX's; and (recently) a UR2 as a VR2. Just imagine VR2KAA!

GW3AHN (Cardiff) is not on

the ladder, but has worked 38Z and 118C this year. On Fifteen he can claim 180 worked and 156 confirmed. He thinks HS1B is genuine enough—in fact HS1A has now vouched for him. '3AHN mentions VP8AQ on Ten and VP8BO on Fifteen as very consistent; also VP5CM (who is ex-GW3CMK) on both bands. From a long list of DX we select CR4AS, 9AK and 9AL, HH2PR and 3TI, JZØPC, VP1EE, 2GC and 5CM on Ten phone; CR9AH, W5DIJ/KG6, UAØSK, VP5BH, VP7NZ and YA1AM on Ten CW; CR4AP, FS7RT, PJ2CE, TG9AZ, VS4JT and ZD8SC on Fifteen phone; HH2DX, KW6CA, PJ2ME, VK9AJ, VP2VG, YA1AM and ZL5AA on Fifteen CW; and CR6FC, HI8BE on Twenty CW.

G2FUU (Waltham Abbey) ran 50 watts of phone on Fifteen and raised VP2AD, CE, VK, ZL and KL7PIV, the last at 0730 and very solid.

G3BST (Bletchley) stuck mostly to Forty, and landed PY's, FA8BL, CN8BI, 4X4, UA9, UN1, ZS's and

W's. An odd one was TI1WS/MM, around the Spanish coast area, who promised a QSL. G3BST remarks that all sorts of nice stations show up on 40 metres during a Contest; they are never on the air in the ordinary way, and he thinks we ought to suggest that they should make more use of Forty as a normal communications band. (Trouble is that when they are on for Contests they are usually not interested in G's, anyway.)

G3BST also wants us to do all we can to discourage FSK on the amateur bands (by amateurs, that is!). As he says, most people who use it simply don't know the real purpose of it, and regard it as an alternative method of keying or a means of dodging BCI. They double the QRM by their misuse of it. YU's and DL's have been heard perpetrating this horror. Refuse to work them!

GW3DNF (Chirk) flung his 12 watts around and raised LU1ZS and ZBI on Fifteen; ZS, FB8AX and FO8XE on Twenty (is he

OK?); UC2AO on Forty; and two new Europeans on Eighty.

G3BID (London, N.W.3) worked mostly Fifteen-metre phone and fetched in HS1B, VS4JT, KR6QN, ZD1FG, K6UVV/MM (near Aleutian Is.), KH6, HI7LMQ and some SV's. Twenty phone collected XE1OS.

G3ABG (Cannock) stayed on Ten phone, but after recent TVI-proofing efforts he promises feverish activity on all bands from now on. Ten phone produced CR6AU, VP8AQ, FB8BP, VP6HR, KZ5DG and many ZS's, VQ's and the like. G3ABG tells us that VQ4RF is back on the air.

The latter item is confirmed by G3LKZ (Sunderland), who was not very active but worked LU8KEP and KV4AA on Twenty. G3LKZ says he is "flabbergasted" at reading what some of the other fellows have worked. (So are we all, sometimes!)

G3KMA (London, N.W.11) is filling up the gaps in the "rare States" and also booked in UL7, UA9's and Ø's, UI8, 3W8AA, CE's, PJ2AV, OY2H, OX's and VK's. But he finds it very difficult to raise South Americans—and finds a shortage of South Africans on Twenty. (He also asks us to pass the word to G9BF that many of his pals are active).

Top Band Topics

Just too late for note in last month's "Commentary," GC2HNO appeared on the air from Alderney, filling the last remaining gap in the list of British Counties (as used for WABC). The two top scorers, G2NJ (Peterborough) and G5JM (Buckhurst Hill) both worked him and collected their cards, so they both figure at the head of the ladder with scores of 98/98—the maximum.

G5JM is now chasing them all over again on Phone and will appear in the ladder from next month with his Phone-only score. Will all others who aspire to a Phone WABC please send in their scores, too, so that we may have a strong Phone section from now on?

G2NJ also remarks that recently he made his 18,000th QSO, with OK1KKR; that he heard GW3LJP

FIVE BAND DX TABLE
(POST-WAR)

Station	Points	Countries					Station	Points	Countries						
		3.5 mc	7 mc	14 mc	21 mc	28 mc			3.5 mc	7 mc	14 mc	21 mc	28 mc		
DL7AA	808	109	166	224	165	144	236	GM3EDU	310	44	60	115	51	40	137
W8KIA	704	68	148	265	113	110	265	G3GZJ	264	18	52	72	80	42	114
G5BZ	699	64	118	239	164	114	245	G3JWZ	252	49	61	68	41	33	97
G3FXB	691	71	127	203	169	121	223	G3IUW	245	31	38	67	60	49	114
G3FPQ	609	65	86	187	158	113	205	G3IGW	245	42	61	75	50	17	104
G2DC	595	70	92	193	117	123	205	GM3EFS	243	26	46	98	42	29	113
G3DO	592	24	46	225	145	152	243	G3JLB	240	40	41	62	52	45	101
W1VG	562	25	117	192	122	106	200	G3JZK	213	15	44	42	76	36	113
K2BZT	511	66	71	203	104	67	208	ZB1HKO	212	18	32	74	57	31	90
W6AM	502	30	58	271	86	57	271	G3DNR	168	10	21	69	35	33	85
G2YS	445	65	84	145	97	54	163	G3HQX	165	9	37	46	36	37	79
G3WL	436	38	75	138	112	73	171	G2BLA	153	18	39	44	43	9	72
G3ABG	416	45	83	159	67	62	173	GW3DNF	136	21	30	50	27	6	57
GM2DBX (Phone)	411	34	31	158	97	91	172	G8TJ	109	12	30	39	19	9	50
G3BHW	373	15	32	139	102	85	176	G3KKM	80	16	29	24	10	1	41
W6AM (Phone)	343	13	32	238	39	21	238	G3IDG	75	11	14	12	12	26	39
G3INR	330	46	57	124	60	33	135	G3JSN	75	16	17	22	13	7	33
G6VC	327	30	43	136	64	54	145								

(Failure to report for three months entails removal from this Table. New claims can be made at any time).

(Radnor) during the early afternoon; and that G5PP, of portable fame, is thinking of two weeks in either GI or GW, starting on July 6.

G6VC managed to collect Alderney, but is still short of Perth and Sutherland. G3AKX (Sale) boosted his score with Alderney and Banff and comments that Radnor is no longer "rare," with GW3LJN and '3LJP both very active.

**TOP BAND COUNTIES
LADDER**

(Starting Jan. 1, 1952)

Station	Confirmed	Worked
G2NJ	98	98
G5JM	98	98
GM3EFS	96	96
G3JEQ	95	96
G6VC	94	95
G3HEK	92	94
G3GGS	91	92
G3JHH	89	89
G3FNV	88	91
G2AYG	88	88
G3AKX	85	87
G3KEP	84	85
G13JEX	84	85
G3BRL	84	84
G3ABG	79	81
G3DO	75	75
G3KOG	73	78
G2CZU	70	70
G3HGY	68	68
GM3KLA	66	68
G2HDR	62	65
G3KYU	62	62
G3EJF	60	65
GM3COV	49	62
G2HPF	48	65
G3HKF	47	61
GW3HFG	46	63
G3KEP (Phone)	43	58
G3KXT	39	43
G3JSN	35	52
G3JZP	35	45
G3LEV (Phone)	26	35
G3LBQ	16	41
G3IUW (Phone)	12	25
GM2BUD	12	25
ZB1HKO	10	14

G3GLV (Liverpool) has received a card from YU1GO confirming a QSO on March 16. He is apparently ex-YU1AHI, and sends out the old cards overprinted. G3GLV uses only three watts to a 132-ft. aerial which apparently shoots off the end, as Belgrade is about 1,200 miles SE.

GW3HFG has cleared his backlog of cards and hopes to claim his own WABC before long. He will arrange skeds on request.

G3LBQ (Brentford) who, to quote his own words, "made a rather shaky start on Top Band CW last August," is now caught up with county-chasing and scores 41 to date. He finds the cards don't come easily, even with SAE's—too bad. G3LBQ was on Alderney in 1949, when GC2BMU was holding the fort, so he was very glad to work GC2HNO recently.

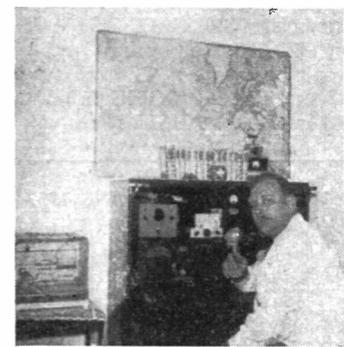
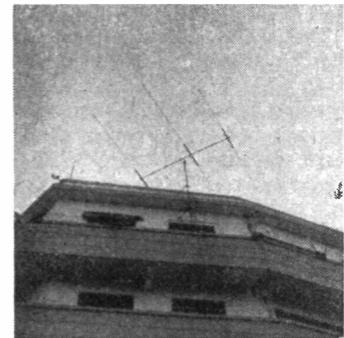
G3LNS (Birmingham) is one of the most recently-licensed operators to join these columns, and is going out after WABC with a total, so far, of 29. GM3KHH (May 11) is his best DX to date, although he had a nice listener report from an SM6, who gave him better RST than the station in Essex that he was working at the time. G3LNS is another who puts but three watts into a 132-footer.

G3JHH (Hounslow) raised GC2HNO and his card, and is now gunning for Brecon, Merioneth, Berwick, Dumfries, Kincardine, Sutherland, Orkney and the Scillies (and, of course, Sark!). We publish this list as a hint to Expeditionaries . . . No doubt many Top Banders are similarly interested.

G3LNR (Nottingham) raised six new counties, despite his 67-ft. aerial. His home county is Glamorgan, which he can't work! And he will be there on holiday, but without a portable.

G3LEV (London, S.W.16) is after a WABC on Phone, and scores 26/35 at present, but he hopes to be on the HF bands shortly with 40 watts. This will undoubtedly slow down his Top-Band progress!

GW3LQE (Penarth, Glam.) is our latest recruit, call-sign-wise,



Station and beam at VS6CY, Hong-Kong, now back in the U.K. as G3JJK, Southsea.

and tells us that he and GW3LEW are hoping to go "on safari" around mid-June. They will probably cover Radnor, Brecon, Carmarthen and Hereford. Both calls will be used—CW only—and the expedition will depend somewhat on weather conditions.

G3KYU (Bournemouth) now tells us that he was not the first G to work GC2HNO—that distinction apparently went to G3ISQ of Wimborne. G3KYU has claimed his WABC, which he just made during his first year on the band.

Old Timers on Top Band will be very grieved to hear of the death of Laurie Fuller, G6LB, of Chelmsford. During 33 years on the air he was nearly always active on One-Sixty, and regularly took part in the Trans-Atlantic tests despite a most unpromising QTH for the purpose. Not one to write much about his activities, he kept us supplied with drily humorous comments on current practice. We, and many others, will sadly miss him, both over the air and in personal contacts.

DX Gossip

That ZD9AF character may by now be definitely written off as a pirate . . . C3MH, also suspect by some, is as good as the previous one was bad . . . Another alleged pirate is FB8CD, but FB8CC is good; *not* on Comoro Is., though, to which no call has been assigned. . . FB8BX/NB is where he claims to be, on Nossi Bé Island, but does not count separately (as yet). Keep him on the file.

AC5PN says he operates on Sundays, 1200 GMT, 14100 kc; his BC-610 isn't going yet, but won't be long . . . JZØPC is now off the air . . . KG6IG is on the Bonin Is. . . HS1B's status is

still doubtful, but it seems likely that he is genuine despite last month's chilly note! It even seems feasible that there are two people using this call, one good and one bad. G5VT (Bishops Stortford) worked him recently and noticed nothing suspicious; other G's have already had a QSL direct.

A ZDØAA, claiming to be on Mafia Island, was worked by W's and came from the right direction . . . G5RV has been operating from PJ2CE (Curacao) and hopes to have a PJ2C call of his own soon . . . From ZL2LB we hear that he is getting a pile of cards for "ZM1BL" addressed to a Box No. in Wellington; at that address they are marked "not known" and forwarded to him, ZL2LB, as the QSL manager. ZK2AB is also being pirated, and if he gives his name as "Bill" he is a wrong 'un. The former ZK2AA is now ZK1BS. Possibly the pirate ZK2AB and ZM1BL are one and the same.

Strange rumours are going round that some of the Eastern European DX-chasers have been taken off the air. Among the calls mentioned are OK1MB, UC2AA, UP2AS, UQ2AN and UA's 3BJ, 6AI, 9PL and 9OH. One reason given is that messages, both by post and over the air, have been "politically embarrassing" to them. They are said to have been forced to QRT for technical violations of regulations and "obscure retaliatory reasons." It's a pity if unguarded chatter from stations enjoying complete political freedom has resulted in this closing down of some of the better-known and better-operated stations.

FL8AB continues to work CW on Twenty, but hopes to start up on phone shortly. He says that his friend FL8AC is not very active as yet but hopes to be before long.

Study in Technique

We are always saying that the rare DX man has the whip-hand—and so he has, quite obviously. Note the difference, though, in the way different DX stations take advantage of it. We have had two or three pointed out to us. VS1GX

"VITAL STATISTICS"

GW3HFG:	10/20 watts and 132 ft. on all bands.
G3HLY:	120 watts; ground plane for Twenty, and terminated folded dipole for all bands.
G3JZK:	150 watts; 67-ft. dipole with 33 ft. open wire feeder.
G6QB:	120/150 watts; either of two 275-ft. wires, end fed.
G3BDQ:	150 watts; 132-ft. E/W, sloping E.; 44-ft. doublet E/W, sloping E.; 28 mc rotary dipole; 28 mc fixed 3-cl. beam, indoors, headed on W/VE. Z-match all round.
G3BST:	130 watts; 33-ft. vertical for Forty.
G3LKZ:	120 watts; 20-metre tilted dipole, NW/SE.
G3ABG:	150 watts; 132-ft. and 33-ft. tuned doublets, ground planes for 14 and 21 mc, 3-cl. rotary Quad for 28 mc.
G3BID:	150 watts; "Minibeam" on 28 and 21 mc; "ZL Special" on 14 mc.

peels off the stations he wants with faultless procedure and simply ignores butters-in; 3W8AA is equally good, but tells the queue-jumpers what he thinks of them; others, middle-Europeans in particular, call "CQ DX" and go back to the first local that replies to them. (Which doubtless explains why they always come back to *our* CQ DX!) The fact is that "DX" is, for many of them, a completely meaningless but inseparable adjunct to a CQ call.

Too often, lately, we have gone back to someone who has already replied to us, and then found him working someone else—an obvious intruder. As long as these butting-in tactics show a dividend, then we shall have the butters-in. If everyone ignored them, the practice would die out—in ten years or so!

Another foible, observed when operating as an SWL, as we often do: Stations who say their final piece and go over with a "K," not a "VA," and allow the other chap to labour through his long-winded final while they immediately get busy working someone else. Agreed that many of these finals

W A Z MARATHON, 1957

All Bands

Station	Zones	Countries
G3DO	39	146
G5BZ	39	140
G3BHW	39	128
G3FKM	39	128
G3FXB	38	120
G3BDQ	38	120
G3HCU	36	98
G2DC	35	102
GM3EOJ	33	93
G2HPF	32	65
G3GGS	31	83
G3GZJ	31	73
G3JKF	31	65
G6PJ	30	68
GM3BCL	28	60
G5FA	27	67
G3JWZ	26	61
G3HQX	25	61
G2BLA	25	58
G3DNR	25	57
ZL3CP	22	34
G3KMA	21	55
GM2DBX	21	52
GM3EFS	19	33
ZB1BF	18	39
G8TF	16	40
G3INR	10	10

are much too long-winded, but wouldn't it be kindness to animals to sign off with 73 and VA, immediately followed by QRZ, instead of allowing the other fellow to think you are deeply engrossed in all his closing platitudes? To the listener there is something infinitely touching about F8 . . . saying "Mni mni tks for nice QSO dear Bill and will sure QSL and . . . and . . . and . . ." while dear Bill, a W6, is snappily working a G and has already exchanged RST's with him.

G2FUU mentions the reverse of this procedure, usually on phone, when a station gives the "off and clear" and others call him; then, when they listen, he's still working the original contact! We don't know which way round is worse. . . And G2FUU remembers losing his first ZL on Fifteen to one of these high-pressure merchants who said, in the QSO, that he had worked over 100 of them on the band.

Another Sheepskin

If you want the Michigan Wolverine Award, all you have to do is to work W8's in 25 of the 83 counties of Michigan! QSL's not required in the first instance—simply a log sheet and four IRC's. W's have to work 60 counties to claim the same award. Manager is W8DLZ, Box 333, Grand Rapids, Michigan.

Consistency

Hearing ZL4CK on Twenty one night, it occurred to us that he was nearly always on the band around that time. We remarked on this to him, whereat he explained that he had been on every morning (his time) since September, 1946! And we should imagine that he was at least audible in this country on most of them. In the mornings (evenings in ZL) we hear quite a different bunch of them, coming round the other way, of course.

More Strays

VR3G (Christmas Island) showed up around 0745 GMT on May 18 (14060 kc) and of course the pile-up was monumental. When first heard he was working a W6, and two or three Mittel-Europeans

were busy calling the said W6 on the frequency (he was S9 and VR3G was S4!) We didn't hear him come back to anyone but W's, who were all giving him S8 at least. Perhaps we shall discover the optimum time for G-land if he stays on for a bit.

G3FXB passes on the following items: G3FYR/VS9 is now VS9AI. . . ET3LF is on Ten phone (Box 114, Addis Ababa). . . ZC5DA and ZC5JM are both c/o RAAF, Labuan. . . MP4BCC is ex-MF2AA. . . VK9AJ (Cocos) is the one who used to sign VK1RW. . . UP2AS is talking about the Tannu-Tuva trip, has the rig ready and is waiting for Moscow (but see earlier paragraph about stations taken off the air).

W6AM was in Japan for a while, and worked 25 U.S.A. stations in an hour or so from JA3BB; from JA1MP he had phone patches to three of his juniors, and worked 15 W's on phone; and at JA1CR, who is "the Japanese champ," he had a good ragchew, for the aerials had been blown down that day!

G2DHV, who operated as DJ0AA last year, was on recently as ON4IE/2, and during short afternoon sessions eleven countries were worked.

DL2WY (BAOR 19) says he was told by an Israeli station that the 4X4's (of all people!) are not allowed to work DL2's. This came as a shock, since he didn't know that DL2's were "tainted" in any way and couldn't get any explanation. Can anyone help?

JA1EF is a specialist on 40-metre DX, and has recently been working W's, VK, ZL, KL7, KH6, VK9, FK8, VS6, UA0, KX6, HL and DU on that band. Admittedly all these are easier from Japan than from here, but it does at least show that they are on. It would only take one solitary G to work them to stir up some real activity on Forty.

SWL Corner

M. V. Bond (Ruddington) remarks on the excellence of Fifteen phone in the evenings, quoting HI7LMQ, TI2CKV, three HC's, VP2, 4 and 6, KG4AM, CR4's, CR5SP and the VS's. One

morning as early as 0720 GMT he heard KH6BGE in among the "horrible noises."

J. W. Bluff (Birmingham), also on Fifteen, heard VK's and ZL's, both paths, from early morning to late evening, as well as FY7YC, CR9AJ, VS4JT, VK9HO and other good stuff. He thinks more could be done with DX phone on Forty, judging by conditions up there.

W. E. Thompson (St. Leonards) had a long late session on Twenty

Short Wave Magazine

DX CERTIFICATES

The following have been awarded since the publication of our last list, in the March 1957 issue:

FBA
No. 79 GI3AXI (Belfast)
80 G3EUK (Bath)
81 PA0TV (Waddinxveen)
82 G3JEQ (Great Bookham)
83 G3US (Ackworth)
84 EA2CR (Pamplona)
85 W2SAW (Webster, N.Y.)
86 G5CG (Nottingham)

WNACA
No. 129 G3HLY (Godalming)
130 F9MS (Suresnes)
131 LA5IC (Askim)
132 G2HUK (Sheerness)
133 SM5ARR (Nykoping)
134 SP5AR (Warsaw)
135 GC2FZC (Guernsey)
136 F8PI (Azille)
137 G3US (Ackworth)
138 G3FJU (Welling)
139 GI3IVJ (Belfast)
140 ON4LB (Ciply-les-Mons)
141 VK3CX (Canterbury)
142 G2UZ (Leeds)
143 JA8AA (Sapporo)
144 G3JEQ (Great Bookham)
145 ON4KT (Brussels)
146 SM5CCE (Bromma)
147 OH3OD (Parola)

WABC
No. 147 G3HHT (Henlow)
148 G2NS (Southbourne)
149 GM3KHJ (Bunchrew)
150 G3JLO (Chichester)
151 G3KYU (Bournemouth)

WBC
No. 69 SM4AEE (Nyhammar)
70 ZB1EB (Malta)
71 W4HYW (Atlanta, Ga.)
72 HB9KC (Berne)

Details of MAGAZINE DX AWARDS and CERTIFICATES, and the claims required for them, appeared in full on p. 246 of the July 1956 issue.

Overseas claimants (only) are asked *not* to send the QSL cards with the application, but to submit instead a full check list, or a certified claim. From this we shall be liable to ask for any or all QSL's to be produced, but please *do not* send them with the original application. No cards will be asked for the if claim is certified.

A complete list of the U.K. Counties was given on p. 20 of the March 1956 issue.

and logged HH1HB, VP9AK and 9DC, HR1EZ, CO2BK and YV5VJ, all phone.

P. Day (Sheffield) reports that HS1A, HS1B and HS1MQ are all active on Fifteen phone, together with VS4JT, JZ0PC, VK9AJ, VK9HO, CR4AP and OA6M. On Twenty he heard HL2AJ (1915) at S9 plus—he is the genuine article; a Korean, 19 years old, running 120 watts from Seoul National University.

R. Bennett (Bristol) suggests a good way of finding whether Eighty will be DX-worthy at night: listen to Rugby, MSF, on 5 mc. and see whether WWV is audible underneath him, preferably around 2000 GMT.

A. R. Dexter (Bedford) heard ZC6UNJ say he was a United Nations station—QSL via U.N. (New York). So he did, and received a reply saying that they had not operated since 1950! E. N. Cheadle (London, N.W.7) mentions HS1A on Fifteen, ET3LF on Ten and VP2KB on Twenty as best of the month.

VE8OM (Repulse Bay, N.W.T.)

will welcome and QSL all reports on his phone and CW, all bands Eighty to Ten. (QTH Hudson's Bay Co., Repulse Bay, via Churchill, Man.). On the other hand, HC8GI (Galapagos Is.) says he will *not* QSL SWL's unless they make out the card for him to sign, enclose self-addressed envelope and two IRC's—all of which makes it hardy worthwhile!

Late Flashes

Remember the talk about the Spratley Islands in the South China Sea, and the possibility of a DX-pedition? W6YY forwards a news item describing the landing of Filipino civilians on Irinea, one of these islands, already occupied by Chinese Nationalists. Apparently a Filipino is claiming ownership of these islands "by virtue of discovery and/or occupation." Similar claims have already been made by South Viet Nam, France and Communist China. Looks as though we might eventually get a QSO with four different prefixes at once. . .

KX6BP and KW6CE are both

on Twenty CW. . . VR2DB and KC6RK on Twenty phone. . . FB8BR, 8BX, 8CC, 8CE, 8YY and 8ZZ all reported active at present. . . Among the "rare Russians" are UJ8KAA, UL7KAA and 7KBA, UI8KBA, UA0KFG and 0CN and UG6KAA, all heard recently on Twenty CW. . . Though HL2AJ is genuine, HL3AP is believed to be a phoney. . . G3HTF that was is now licensed as VP8CR and is on from Halley Bay, Coates Land, Antarctica.

And so we round off this month's offering with the usual admonitions. Please make sure of catching the deadline, which, next month, will be **first post on Friday, June 14**. Overseas readers please note that the following one will be **July 19**. Address everything to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Please include in your report your "vital statistics," if you have not already done so! See the new Table introduced this month. Until then, 73. Good Hunting, and BCNU.

MOUNTING A CRYSTAL INSERT

THE well-known crystal microphone cells, or inserts—either ex-deaf aid or "surplus"—are freely available at a few shillings, but there is always the complicating factor of how to mount them.

In fact, the parts to make a mounting stand are obtainable from any electrical shop, and the assembly can be done very easily and quickly. The drawings herewith are just about self-explanatory! The items required are: A standard pendant plate (or "ceiling rose"); a terminal box with back cover (into which the crystal insert is fitted); a length of screwed conduit, 10in. or so (see sketch); and a small quantity of lead (to make the base weight).

Construction

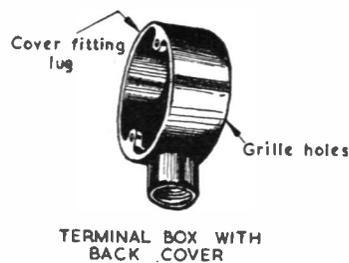
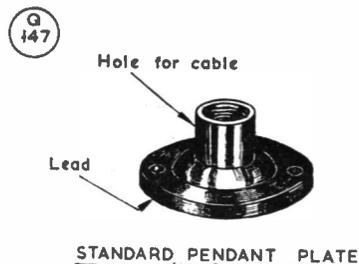
Drill out a series of small holes in the terminal box to form a grille, in the approved fashion. Run

a hole of suitable size in the pendant plate to take the microphone cable. Back up the pendant with a wooden block, having worked sufficient lead into the space to prevent the whole thing toppling over; the object here is to make the microphone stand (as it has now become) base heavy.

The assembly of the parts is obvious from the sketches—with the exception, perhaps, of the point that before screwing the back cover on to the terminal box, the microphone insert should be packed in with cotton wool. The shielding lead of the cable should be connected to the stand.

These inserts give very good quality, and the result is a microphone which, though cheap, is good-looking, and will help to impart a finished appearance to the station.

G3IDW.



ALDERNEY EXPEDITION, 1957

TOP BAND, APRIL 17-30

L. J. J. MORGAN (G2HNO)

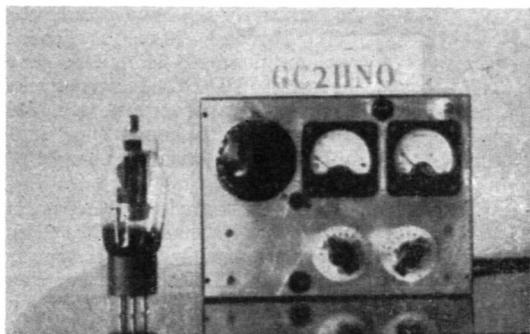
THOSE who know and love Alderney are inclined to keep quiet about it. It is the forgotten Channel Island, off the beaten tourist track, a peaceful and friendly place with great attractions for a quiet holiday. Alderney is the most northerly Channel Island, situated eight miles west of the Cap de la Hague, on the French coast. The island is about four miles long and one mile wide and the population of 1,500 is engaged in agriculture and one or two minor industries.

Alderney suffered greatly in the war; it was the only part of the British Isles to be evacuated completely in the face of the German invasion, and it was heavily fortified by the German garrison. Ten years of great effort by the returning Islanders have restored this pleasant place.

The writer has made several visits to Alderney and decided that the occasion of a family holiday there in April should, as announced in the April issue, be enlivened by some Top Band activity. The particular fascination was that at least two well-known 160-metre operators — G2NJ and G5JM — needed only an Alderney contact to complete QSO's with all 98 U.K. counties.

Plans were laid to take appropriate gear and the weight problem was important. Travel by air (there are excellent services from Southampton and London) is almost essential, as the only boat service runs twice weekly from Guernsey.

Fortunately the home station transmitter is in miniature form, comprising a 6AM6 Clapp VFO and a 5763 PA, and the whole, including aerial tuning, is included in a box measuring 8in. x 6in. x 4in. G5PP, who has unrivalled experience of Top Band expedition work, provided a "spy"-type



G2HNO's miniature portable Top Band CW/Phone transmitter — with an 807 alongside for size comparison. Actual dimensions overall are 8ins. by 6ins. by 4ins. and the circuit arrangement is VFO 6AM6, VR150/30 stabiliser, and PA 5763, with a 12AX7-6V6 Clapp modulator. The meters are for plate current and RF loading. Some 190 contacts were made with this transmitter when signing GC2HNO from the Island of Alderney recently.

power supply, and G3KYU lent a Command receiver and a power pack for it. (Warmest thanks are due to them for their co-operation.) The electricity supply in Alderney is 240 volts AC and gave no difficulty, although the regulation was poor at times.

On April 16 G2HNO arrived at St. Anne in Alderney and was soon surveying the garden of the holiday flat. Through the trees and across two gardens could be seen the scaffolding for a new church. The opportunity was too good to be missed and with the willing consent of the parish priest the aerial was hauled across to the scaffolding and fastened there. The result was a run of about 140ft. of wire due N-S. which, although low and relatively screened, was considerably better than could have been expected.

THE RESULTS

The G.P.O. had given permission for the use of the call sign GC2HNO and the rig was fired up on the evening of April 17. Within a few minutes the main object of the exercise had been achieved and G2NJ and G5JM could at last claim to have Worked All Counties. GC2HNO was active for 14 evenings, but there were no lengthy periods at the key nor any all-night sessions.

In spite of a spell of very poor conditions and low activity during the second week, the final score for GC2HNO was 190 contacts with 150 stations. Seven countries and about 45 counties were worked and the best DX was HB9T. QSL cards, specially minted for the occasion, have been sent to all stations but anyone who has not received one through the bureau should send an s.a.e. to 52 Seafield Road, Southbourne, Bournemouth.

This little expedition was certainly the writer's most pleasant experience in Amateur Radio and he hopes to be active again from Alderney next year.

THE LANGUAGE OF SCIENCE

At least 75 per cent. of the scientific literature of today is in the English language—though that certainly does not mean that it is written in English. Appreciating the need for much greater competence in this field, the City & Guilds of London Institute has under consideration a syllabus and regulations for an examination in Technical Authorship — a proposal much to be commended. There is a shortage, and a growing demand for, competent technical writers with the ability not only to express themselves clearly and concisely, but also having specialist knowledge in the processes of preparing material for print.

LUXEMBOURG LICENCES

From correspondence that we have seen recently, it now appears that—contrary to the statement on p.646 of the February issue — the Luxembourg authorities do *not* grant amateur licences to foreign nationals unless they are (a) Domiciled in the Duchy, and (b) There are reciprocal arrangements with the applicant's own country. (*American papers, please copy.*)

MOBILE ON TWO BANDS

SINCE about October 1955, mobile in-motion contacts have been made on the 160 and 80-metre bands from Consul NJU-888, using the installation shown in the photographs, signing G3ATL/M—home QTH: G3ATL, Hugglescote, Leics.

The transmitter section is based on the SCR-247N equipment modified to switch from 80 to 160 metres, whilst the modulator— together with the meters, stabiliser and power distribution circuits— are built into a completely stripped SCR-247N case. The power unit (on the right in the boot) supplies 700v. at 250 mA to the two 1625 PA valves and, via a resistor network, HT to the BR150/30 for the 12J5 oscillator and screen modulator; the latter runs 12SJ7-12J5-1625.

From the boot, the equipment can be operated into the 8ft. base-loaded whip aerial. Additional duplicate control circuits, including a Bowden-drive cable for the VFO tuning, run under the car to a

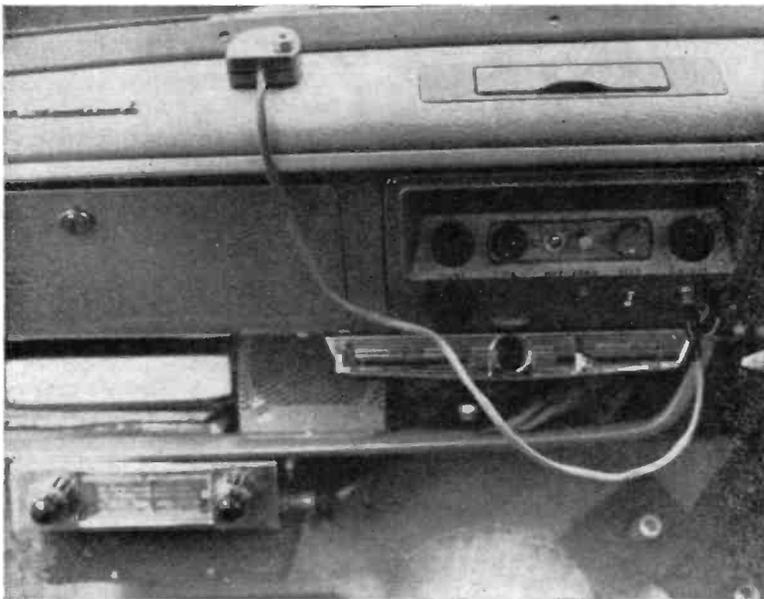


Equipment assembly for mobile working, fitted in the boot of G3ATL's car. Many hundreds of /M contacts have been made on Top Band and Eighty.

panel mounted in the centre of the fascia board. Change-over and control are arranged in such a way that by using either the push-button on the crystal microphone or a dipper-type foot switch on the floor (with a lapel microphone), the receiver is muted and the transmitter brought into operation while running, even to changing frequency without having to leave the driving seat.

The receiver is a Pye P59CR, which has itself been modified to cover, with bandspread, the 160, 80 and 20-metre bands; the original 19-25 metre and 31-metre SW/BC tuning packs were stripped out and replaced by coils and condensers suitable for the amateur bands.

Many hundreds of contacts have been made with this equipment, with signal reports up to RS-59; some over considerable U.K. distances on the 80-metre band.



The fascia board layout in Consul NJU-888, signing G3ATL/M. The receiver is a Pye P59CR modified to cover 160, 80 and 20 metres.

G3ATL.

Short Wave Magazine publishes the most authoritative Activity Features appearing in print

SSB Topics •

TECHNICALIA, ACTIVITY & OPERATING RESULTS

Conducted by R. L. GLAISHER, G6LX

MANY readers have asked for information on the double-sideband-suppressed-carrier system of transmission that has recently appeared on the amateur bands. Often mistaken for SSB, the DSSC system is causing quite a controversy in amateur circles, particularly in the States, where many DSSC stations are operating in the 75-metre band. The AM diehards think it sounds too much like SSB, the "in-betweens" who work both AM and Sideband say they find the stuff difficult to resolve, while the Sideband fraternity complain that it takes up twice the channel space of SSB. In fact, the only people who really like the system are those who have tried it and they are all highly enthusiastic!

The DSSC system is not at all new, as for many years the advantages of carrier-less AM transmission have been appreciated by communications engineers. Generation of this type of signal has never been a problem (standard balanced-modulator technique is used, as for SSB), but the difficulty has been to develop suitable receiving equipment so that both sidebands are properly utilised and the overall system-gain is fully realised. This requires that the carrier be reinserted at the receiver, not only exactly at the correct frequency, but also in the right phase.

The present sponsors of DSSC are the General Electric Company of Syracuse, New York; and the man who has done most to "sell" both the commercial and amateur aspects is designer John Costas (W2CRR). G.E. are offering DSSC as an alternative for all types of Mobile communications. They have overcome the reception difficulties by the use of a special two-phase detection circuit which makes use of the phase information contained in the two-sidebands to control the phase of the locally inserted carrier. No specific details of the "Synchronous" receiver have been released, but it appears that the basic detection circuit is somewhat similar to the Synchronodyne method of reception which aroused so much interest a few years back—see SHORT WAVE MAGAZINE, May and December, 1947. Phase-splitting is achieved by utilising 90° RF and AF phase-shift networks in a similar manner to the phasing type of receiver adaptor. Fig. 1 shows the block diagram of the basic two-phase Synchronous receiver.

Single-Sideband reception of DSSC is possible, and nearly all the DSSC amateur contacts have so far been made using SSB receiving techniques. A number of sidebanders have, however, complained that DSSC is not compatible with SSB and they find difficulty in tuning. This may be due to the basic requirement that only one sideband must reach the detector. If any part of the unused sideband is within the detector pass-band it will be impossible to "clear-up" the signal either by tuning or BFO adjustment. The same requirement, of course, also

exists for SSB reception, but unless the transmitter's unwanted sideband rejection is very poor, no difficulty is experienced even with receivers having a wide selectivity characteristic. For this reason, W2CRR recommends that a phasing type "Slicer" be used for the SSB method of DSSC reception.

For those wishing to know more about DSSC, the references given at the end of this article will be of interest—see p.205.

Unusual Linear Amplifier Circuits

This subject continues to arouse considerable interest. Following the GW2DUR circuit described in the April "SSB Topics," G2MA (Rotherham) has sent in details of another very interesting "controlled" linear amplifier arrangement (Fig. 2). Known in the Sheffield area as the "Scotsman's Dream Amplifier," the circuit is very popular and is now in use at a number of sideband stations to which G2MA has given the details.

The amplifier requires practically no drive for full output, has high efficiency and does *not* need bias or a stabilised screen supply. An 813 is shown in the diagram, but the circuit is applicable to any tetrode and has been used with 807's, 829B and a 4-125A. As will be seen, the control valves operate as a "clamp" and hold the screen voltage near zero under static conditions. The incoming signal opens the "clamp" (part of the RF signal is rectified, filtered and applied as cut-off bias to the control valves). The potentiometer R1 and screen voltmeter are included to facilitate the initial setting-up procedure. With the valves specified (zero-bias and 1500 volts HT), the static anode current is 25 mA, the control grid is at earth and the screen is at 20 volts positive. Under signal conditions (5 mA of drive is ample with an 813), the screen voltage is 400v.

G2MA emphasizes that it is most important not to overdrive the amplifier, otherwise the rated screen current will be exceeded; he recommends that the screen voltmeter be left in circuit for monitoring purposes. Under optimum drive, with the working conditions as specified in the diagram, the 813 screen current does not exceed 10 mA.

Two control valves are used in parallel, simply to give additional protection for the amplifier screen and to reduce the IR drop across the valves.

The linearity is excellent and the efficiency of the amplifier is nearly 70%—which compares very favourably with a triode-connected 813 operating under Class-B conditions.

Query Department

Several questions have been received about the use of the type 6AG7 valve in SSB equipment. A

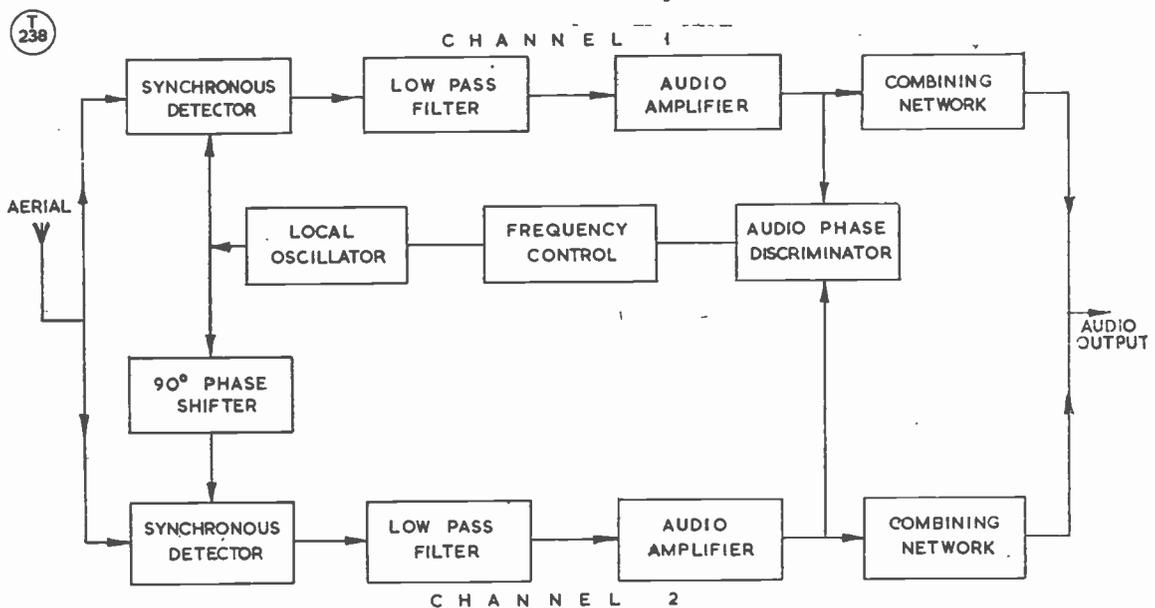


Fig. 1. Block schematic of a basic two-phase synchronous receiver, as suggested by the G.E. Co. of America for double-sideband suppressed carrier reception. It can be assumed that in this method of transmission, which presents no particular difficulty as regards the transmitter itself, the complication lies on the receiving side — carrier reinsertion is not possible in the same way that it is for single-sideband. The difference between the two modes can be broadly stated as being that, in SSB the complications are with the transmitter, while in DSB they are with the receiver.

reader in Sutton (Surrey), who is converting to SSB, asks why this valve is specified in so many of the published SSB circuits. He says that he has experienced great difficulty in eliminating parasites and asks for help in taming this "little firecracker." A similar query has originated from another budding sidebander, SWL Littlewood, of Manchester, who passed the 1956 R.A.E. and is at present awaiting his licence (congratulations, OM). SWL Littlewood has built a copy of Multiphase 10A exciter. When tested at the station of a nearby amateur friend, the 6AG7 buffer stage "went crazy," burning up the anode RF choke and screen feed resistor. Another related question, raised by G3IRP, queries possible alternative types to the 6AG7 for buffer amplifier use.

Well, the 6AG7 can certainly be called the work-horse of SSB and, as rightly stated by our correspondent, this type, or the miniature equivalent, the 6CL6, is specified for most of the home-built or commercial SSB exciters in current use. The reason for this choice is not hard to give: Most SSB generators work at low level and require considerable voltage amplification in order to drive a high-power linear amplifier; the 6AG7 type, having a high slope and sufficient anode dissipation, fits ideally into most SSB exciter line-ups, and a single valve of this type operated in Class-A will more than drive a pair of 807's in Class-AB2, a single 813 in Class-AB1 or other similar valves in the same type of circuit.

It is essential that all the valves in an SSB amplifier chain should operate in a *strictly linear condition*, otherwise the final output signal may be

degraded in respect of sideband rejection and other intermodulation products. It is, therefore, most important that the output from the buffer stage be clean and free from parasites or any form of feedback. The 6AG7 type is very prone to both these troubles, but with a little care and forethought during the constructional stage, it is fairly easy to tame these fiery pentodes.

First, feedback: The 6AG7 can usually be held down by careful screening of the anode and grid tuned-circuit components. Additional decoupling and by-passing may be required and, if necessary, a cut-away screen should be installed across the bottom of the valve base to isolate the grid and anode connections. In special cases it may be necessary to provide some form of neutralisation, and the bridge type, as used in the 6CL6 driver circuit of the KWS-1 transmitter (SHORT WAVE MAGAZINE, May 1957) is very suitable.

The handbooks cover the subject of parasitic elimination in great detail, and the 6AG7 is quite amenable to treatment by any of the usual methods. A trick which the writer has found most useful in curing VHF parasitic oscillations is to connect a small inductance in series with the anode tuned circuit. Although, theoretically, this is the same as connecting the stopper directly in the anode lead, in practice it has been found more effective and positive. The circuit is shown in Fig 3.

Regarding suitable replacement types, many people have tried to use alternative valves, and, although a few have been successful, in the main it usually means two separate cascaded buffer stages.

Some years ago W4AWS, writing in *QST*, described a cascode-connected 6SN7 as a direct replacement for a 6AG7 buffer stage. Although it is quite effective on 80 metres, it is not too good as a driver on the higher frequencies. G2NH used a QV04-7 buffer in his half-lattice filter exciter and found that he had ample drive for a pair of 807's in AB2, though others have tried this type without such success. The miniature Brimar 6CH6 RF pentode has been specified in several circuits (usually well above ratings), and in the States the 2E26 is often used. One of the British manufacturers is now making a series of special high-gain high-dissipation amplifier valves, intended specially for the electronics instrument field, and several of these types should be very suitable as Class-A buffer stages. An equivalent of the 6CL6 will shortly become available in this country and will assure continuity when the stock of "surplus" 6AG7's finally runs out.

New York SSB Dinner

It was indeed a pleasurable experience to have been able to attend the very fine dinner meeting arranged by the New York SSB group. Some 275 sidebanders from all parts of the U.S.A. and Canada were present, with the DX interest provided by HR2WC. Tickets were at a premium, as over 600 persons applied for the 250 places, and it was only through the kindness of K2DW (*CQ* SSB editor) that the writer was squeezed in along with about 20 more latecomers.

The highspot of the evening was an informal talk by Major-General F. H. Griswold, KØDWC, on "Single-Sideband and the Strategic Air Command." Following this talk, the meeting was thrown open for a short but sharp question session, when "every-

thing in the book" was thrown at KØDWC.

There were so many well-known sidebanders present that it is impossible to list them by name or call; suffice it to say that it was a wonderful evening which was enjoyed by everybody there, and not least by your present scribe.

News and Views

Welcome to G3INF, who recently returned from New Zealand; he has a W2EWL transmitter and is planning 80-metre mobile operation.

YU1AD has rebuilt his linear amplifier and has cleared his previous distortion troubles; he now has a new receiver under construction which sounds as if it is going to be the receiver to end all receivers. G8WS (Croydon) has completed his new receiver but still has to build the necessary converters so that he can listen on the HF bands.

G3CWB (Hampstead) has been testing the

Table of Values

Fig. 2. Linear RF Amplifier Circuit by G2MA

- | | |
|---|--|
| C1 = 400 μ F | that 40 mA is bled under static conditions |
| C2, L1 = Normal grid tank | |
| C3, C4, C5 = 500 μ F | D1, D2 = Crystal diodes |
| C6 = .002 μ F, screen decoupling | M1 = Grid meter, 0-10 mA |
| C7 = 500 μ F to .005 μ F, anode blocking | M2 = Screen meter, 0-25 mA |
| C8 = .001 μ F | M3 = Screen voltmeter 0-500v. |
| C9-C10, L2 = Normal output network | RFC1, RFC2, RFC3, RFC5 = 2.5 mH RF chokes |
| R1 = 200,000-ohm pot'meter (screen voltage control) | RFC4 = As normally rated for this position |
| R2 = 100 ohms, 1-w. | V1 = 813 |
| R3 = Screen dropper, value selected so | V2, V3 = 6Y6, 6L6, or KT66 |

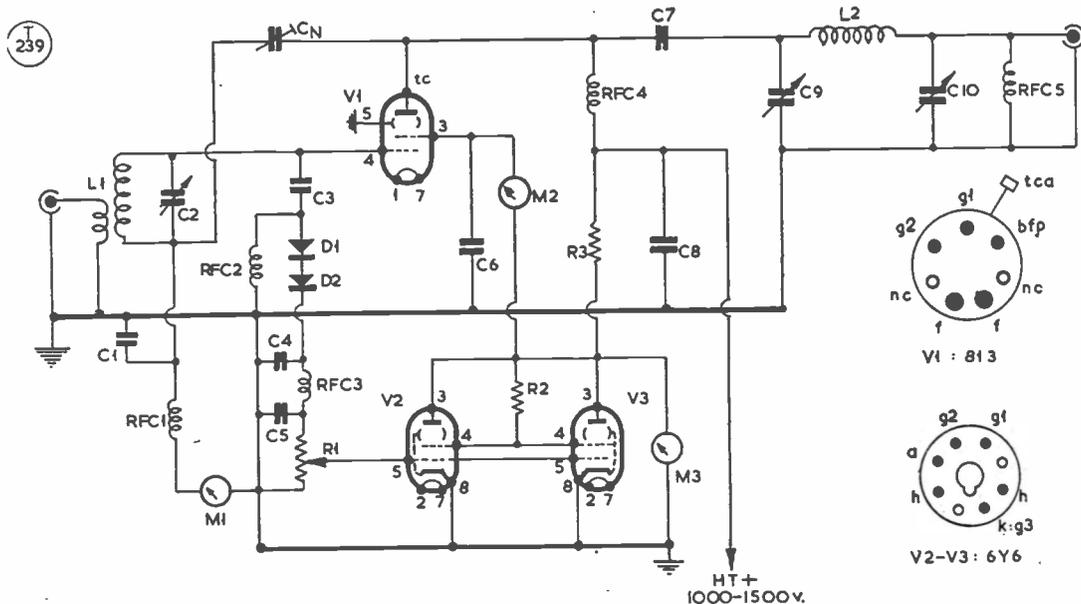


Fig. 2. The linear RF amplifier arrangement suggested by G2MA, and discussed this month. It is found to give very good results, with high efficiency. The action of the circuit is explained in the text, and values are shown in the table.

GW2DUR PA circuit described in April "SSB Topics"; using parallel 807's, his results have not been too successful. Try the G2MA circuit, OM.

With summer conditions already making 80-metre inter-G contacts difficult, a number of regulars are planning to move to 7 mc. G3BWH (Accrington) and GW3ELM (Llandudno), who sked twice daily, report that Eighty is now impossible for their daylight contact; although they are thinking of 40 metres. One-Sixty is a possibility.

G31RP (Morden) is building a phasing rig for home operation and is also planning further mobile sideband operation this summer. (Did someone mention double-sideband suppressed carrier?!).

G3GKF (Purley) has completed a new phasing adaptor for use with his S.640 receiver. He is using two product detectors in place of the usual diodes, and reports that results are excellent, without any of the usual cross-modulation troubles which are so common with this type of slicer.

A new sideband call heard on 14 mc recently was G5US, an old timer who is, perhaps, better known on VHF. G3MY (Sheffield) is back on 14 mc after a short holiday in Southern England; he is now up to 73 countries and has a new 14 mc linear using 4 parallel 807's in the G2MA clamp-controlled circuit.

G3GKG has been installing a range of test equipment in preparation for a transmitter rebuild; it seems that he had some bad luck with a 200 microamp. testmeter and now needs expert advice on how to re-wind such meter movements. Can anyone help? G3GKG has sent in details of a very useful rectifier protection circuit, which will be described in a future "SSB Topics."

In a joint letter, GW2DUR and GW3LLU mention that they are using modified G3GEN excitors. By careful choice of the RF phase-shift components and by keeping the audio response well within the range of the audio-phase shift network, 35 dB sideband suppression can be obtained.

Two stations expected on SSB soon are GW3DIZ and GW3LPR; both are building G3GEN excitors. Also from South Wales, GW3EHN is still collecting the DX. Being on shift-work, his operating hours are sometimes a little unusual. He is planning to build a new linear amplifier to replace the present 805.

G3COJ (Maidenhead) was "brought on again by the January SSB Contest" and is now active mainly on 80 and 20 metres (looking for early-morning DX on the latter band), though he is also operational on Forty and Top Band, too; on these bands, only AM stations have so far been worked—G3COJ would like to encounter some other SSB operators on 40 and 160 metres.

DL4SV is now in the States, on leave; he thinks that it is unlikely that he will go to Greece, and future plans are a little uncertain.

SSB Contest

At the time of going to press, the hoped-for report on the recent contest had not been received from CQ. However, a short note from K2DW says that log checking has been completed and the cup winner was

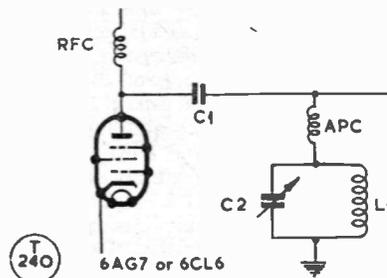


Fig. 3. An effective parasitic-suppression circuit, with the suppressor inductance on the tank instead of at the anode of the valve. APC is 5 turns of 14g., 1/4-in. diam. by 1-in. long; C1 is .001 μ F; C2, L1 is the normal tuned circuit; and RFC a 2.5 mH RF choke.

CN8MM with 1456 points and 491 stations worked. Congratulations, Eva!

In second place was CN8JD, 1416 points; third, SV0WA, 1247 points; and fourth, HR2WC, 1118 points. G6LX sent in a check log, and for some reason CQ have accepted it as an entry and are listing him in fifth place. This is obviously a misunderstanding, which no doubt will be cleared when the final report is received.

DX Notes

At the top of the SSB Countries-Worked Ladder this month is W2KR. With 86 countries accounted for on two-way SSB within the last two years, this is surely a pointer to an early all-SSB DXCC.

A new country appeared on 14 mc Sideband during the week-end of April 6-7 with the expedition of HB9FU to Leichtenstein. Using a W2EWL type transmitter, he was in great demand, especially in the U.S.A. Further visits to HE are planned during the summer months.

News of another expedition has come in from OH2OJ, who intends to spend his summer holiday on the Island of Aarland. He expects to start operation on July 20 and will be active for several weeks. The call will be OH2OJ/OH0, and he says it scores as a separate country. The transmitter will be a W2EWL and the receiver a BC-453 with converters for 14 and 21 mc.

G3GKG (Macclesfield) has sent in his revised country score, which is included in the Ladder. He has been joining in the now-regular Saturday morning WAC round-tables which, under the leadership of OH2OJ, are scheduled for 0600 GMT on 14305 kc. OD5BZ and OH2OJ act as joint net control and welcome break-in stations. They do ask, however, for the "breaker" to announce his call and wait, as it is often very difficult to bring new stations into the net immediately.

ZB1CZ has moved to 21 and 28 mc; being the only SSB station on Malta and a ragchewer at heart, he has become very discouraged by the large number of break-in stations that ruin his 14 mc QSO's. EA4DY is back on 14 mc and should be more active now that he has cleared "a multitude of troubles" with his KWS-1.

KP4DP has been on SSB for two years, but did



This photograph of a tightly-packed gathering was taken at the very successful SSB dinner-meeting held in New York on March 19 last, to coincide with the I.R.E. Exhibition, reported in our May issue. Sole U.K. representative was G6LX, of "SSB Topics," who can be seen second from the right in the 5th row, from the first row facing. Principal speaker was Gen. Griswold, U.S.A.F., KÖDWC, who is in the middle of the 2nd row from the top table.

not realise that it was possible to work DX with low power; he has now discovered his mistake and collected 46 countries two-way SSB in three weeks of operation.

New converts to SSB include PY2CK, PY4APE, DJ1VD, OA4CK, OA4CX and HH2W. CO5LF and OA3L have returned to the fold and can be worked on the high end of 20 metres. There are now so many SSB stations operating from Antarctica that it is difficult to keep track of the various call-signs! The latest to appear are KC4USK and KC4USW.

During his recent visit to the States the writer had the chance to work a number of British SSB stations on both 14 and 21 mc. Among the many very fine signals raised via W2KR, K2DW, W2DPZ, W3EOZ and W9RUK were G2MA, G2MF and G3BXI—thanks for the QSO's!

K2DW has ceased operation from Long Island prior to a move to the Washington area. He expects to be re-allocated W4SW, a call he held for many years.

ZS6KD is now back in South Africa after his European tour. Having been away for a few weeks he is striving to regain his place on the country-worked ladder. (I know exactly what you mean, OM!). ZS6OY is in Europe for a spell of leave and can be contacted via G6LX; he expects to spend at least two months in the London area.

GW3LLU collected CP5EK, KV4AA, OA4CX, PY4APE and KC4USW to bring his 14 mc score up to 45 countries. K2GMO, sending in his latest score, reports that K4LIB/FQ8, ZD4BF, HB1FU/HE, CP5EK and YV5FL were new to him.

Information for this column has been provided by K2DW (CQ SSB Section), DL4SV, G3COJ, G3GKG, G3MY, GW2DUR, GW3LLU, OH2OJ,

W2KR and SWL Amie.

The next "SSB Topics" will appear in the August issue of *Short Wave Magazine*, for which your news and views are requested by June 29, addressed c/o The Editor, *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. All correspondents are particularly asked to get their reports in on time—it helps a lot! So, thanks a lot, and 73—de G6LX.

- "Synchronous Communications" by J. P. Costas.
Proceedings of the I.R.E. December, 1956.
- "SSB, Is It really better than AM?" by J. P. Costas, W2CRR.
CQ Magazine January, 1957.
- "A DSB adaptor for the DX-100," by D. L. Stoner, W6TNS.
CQ Magazine April, 1957.
- "DSB versus SSB," by J. P. Costas.
Proceedings of the I.R.E. April, 1957.

It is much regretted that the SSB "Countries-Worked Ladder" has had to be omitted this month due to pressure on space.

"FULLY-RELIABLE" VALVES

The Ministry of Supply has placed a contract valued at approximately £25,000 with The General Electric Co., Ltd., for the supply of a number of special-quality valves. Following an open tender for the manufacture, to the strictest Government specification, of a number of "fully-reliable" Government versions of the widely used Z77, the contract was placed entirely with the G.E.C.

"Fully-reliable" is a term used for valves that are specially manufactured to operate under arduous conditions of mechanical shock and vibration in various types of Service equipment. The Z77 is a screened pentode that is commonly used in the RF stages of television receivers. It also has many amateur applications.

WITH one exception, all our correspondents this month report poor conditions on the VHF bands, and a generally low level of activity. Even for the field day on May 5, with a number of stations very favourably located for GDX, contacts were in the main over local distances only. The day started sunny, but a cold northerly wind brought on a dull and chilly afternoon—in fact, some of the portables up north reported slight falls of snow!

That cold wind from the north and north-east seems to have persisted for most of the month, and even though the glass has been high, the two-metre band has never really opened up, and in effect we have been having "typical winter conditions." Even on May 5, about the only northerly portable to be heard, called or reported from the south was G8SB/P. Another portable call "heard mentioned" was GW3GWA/P in North Wales, but he was not a workable signal much further south than the Midlands.

During the field-day period, the southerly portables were kept reasonably busy working stations in the London and Home Counties area, and there were several scores of between 60 and 80 being quoted by the more active /P operators. For instance, by within about an hour of the close G3KEQ/P, 4 miles east of Guildford, had got to 73 stations worked. But, even at that, scoring was slow during mid-afternoon, simply because there was nothing much coming through from distances over 100 miles or so.

As usual, within their "areas of local influence" all portables to be heard were at colossal strength, and it was interesting to notice that, with some of them, their beam heading did not seem to make a great deal of difference to their signal strength!

The camp of G3FD/P near Dunstable deserves special mention; at different times, 15 call-signs were present, and, more or less, they worked all bands from 160 metres to 23 centimetres; sorting out the harmonics on two metres became a bit-of-a-thing

VHF BANDS

A. J. DEVON

Poor Conditions, Low Activity—
Sporadic-E on Four Metres—
Comment, and Station Reports—

before the end. In spite of the hazards, G3FD/P had made more than 50 two-metre contacts by a quarter past six; in the next hour, ten more were put on.

Sunspot Phenomenon

A little earlier, it was implied that we had had one exceptional report this month. It is from G3EHY (Banwell, Som.), who is always there on four metres—nowadays, his only VHF band. His report is of particular interest because he is able to quote specific instances of the occurrence of Sporadic-E on the 70 mc band. The probability of this has already been suggested in this space, and it is extremely interesting to have, so soon, the experimental result.

The first manifestation was observed by G3EHY during the afternoon of May 14, 1330-1420 GMT, when Continental broadcast and TV sound signals could be heard up to about 90 mc. The next was on May 18, around 1600 GMT, when a number of very strong European BC stations were audible in the 72 mc area, for a period of more than half an hour. The next day, Sunday, 19th, an opening began to develop at about 1740 GMT and continued for more than an hour; on 75 mc, Eastern

European BC stations were louder than the BBC's FM/VHF transmissions at the same period.

During these openings, G3EHY called and listened constantly on four metres—but failed to hear a single amateur signal among the large number of commercials that were coming through. This was a great disappointment and evidently some opportunities were lost, particularly on the Sunday evening. Irrespective of what the mode of propagation might be, it follows that if European signals are coming over—either as harmonics or fundamentals—on frequencies up to about 75 mc, the four-metre band must be open for two-way working over the same sort of distance.

Those who follow this piece and also read colleague L.H.T.'s "DX Commentary" will notice that he

TWO METRES

COUNTIES WORKED SINCE

SEPTEMBER 1, 1956

Starting Figure, 14

From Home QTH only

Worked	Station
47	G3GPT
44	G5MA
41	G3KEQ
40	G3GHO
37	G3DKF
36	G3LHA
35	G5ML
34	G2CIW
33	G3IOO, G3JQN, G3JWQ
32	G2DVD
30	G3CKQ, GC3EBK
26	G3KHA
25	G3DLU, G3KUH
23	G3FUR, G3KEF, G3KPT
22	G5MR
19	G3FIH
17	G2AHY
15	G3IER

This Annual Counties Worked Table opened on September 1st, 1956, and will run till August 31st, 1957. All operators who work 14 or more Counties on Two Metres in the year are eligible for entry in the Table. The first claim should show a list of counties with stations, which can be added to thereafter as more counties are worked.

mentions the appearance of sunspots during May 8-18, with the greatest concentration visible by May 15; it usually takes about two days for a strong sunspot appearance to make itself felt in the ionosphere, at normal HF's. With an exceptionally high concentration, stray low-level layers or patches are formed which are of sufficient intensity to reflect signals at frequencies much higher than usual; this is the "Sporadic-E" effect, so well known on the old five-metre band, and so called because it occurs in the E-layers. It is very much a random manifestation, quite unpredictable, and seldom lasts more than an hour or two; the patch may be large or small in area, and is also liable to move; all that can be said for certain about sporadic-E is that it may follow high sunspot activity, and if it does occur, the patch might be sufficiently intense, and so placed, as to be capable of reflecting 70 mc signals over European distances.

It would seem that this was the condition encountered by G3EHY on four metres on May 14, 18 and 19. The sad thing is that he was apparently alone on the band on all three occasions. The fact is, of course, that there is very little European activity on 4 metres. The DL's are not licensed at all for the band, nor as yet are the I's; the F's have 72.0-72.8 mc, also opened recently to the YU's; the OH's have 70.2-70.3 mc, CW only. The SP's hope to be on four metres and six metres in due course, but permits were not through at the time of writing. What it comes to, therefore, is that only from France, on 72 mc, can we expect any current 4-metre activity.

As regard G3EHY's own results, he and EI2W are now on regular schedule, and they have had a number of contacts—just recently, EI2W has been away, but the schedule will probably have been resumed by the time this appears.

Notes and News

G5MA (Gt. Bookham, Sy.) is hoping to register Merioneth, Carns. and Pembs. when G3JQN/G3KEQ go touring in those parts during July, signing GW3KEQ/P;

TWO-METRE ACTIVITY REPORT

(Lists of stations heard and worked are requested for this section, set out in the form shown below, with call signs in strict alphabetical and numerical order).

G3JGY, Malvern, Worcs.

WORKED: G2CVD, 2CFVDM, 2FNW, 2FQP, 2NV, 2YB, 3BA, 3CKQ, 3COD, 3CVK, 3DCI, 3DFK, 3DFK/P, 3DLU, 3EJO, 3ENY, 3ENY/M, 3FUW, 3GGR/P, 3HZK/M, 3JGY/M (Worcs), 3JGY/M (Hereford), 3JWQ, 3JWQ/P, 3LGI, 3LHA, 6SN/M, 6XM/P, 8SB/P.
HEARD: G2FNW, 2FNW/P, 3KQF, 3LAY, 3LGI, 3LHA, 3NL, 4DC, 4MK, 5BM, 5DF, 5DW, 5MA, 5ML, 5ML/M, 6AG, 6JK, 6NB, 6XA, 8MZ/M, 8RW, 8SB/M, 8VZ, GW2HCJ, 3GWA, 3INV, 8UH, 8UH/P. (April 1st to May 4).

SWL Stokes, Ruislip, Middlesex.

HEARD: G2AHP, 2AII, 2ANT, 2ANT/P, 2BDP, 2CPX, 2DDD, 2DVD, 2FCA, 2GG, 2HDJ, 2HDY, 2IF, 2LK/P, 2MV, 2NR, 2QY/P, 2XV, 2YB, 3BFP/A, 3CNF, 3CO, 3CZY, 3DVO, 3EVV, 3EVV/P, 3FCQ, 3FD, 3FMP, 3FP, 3FQS, 3GFN, 3GFK/A, 3GHI, 3GHO, 3GOZ, 3HBW, 3HDC, 3HRH, 3HWJ, 3HXS, 3IAM, 3IAM/P, 3IUL, 3IWA/P, 3JN, 3JR, 3KEQ, 3KEQ/P, 3KFX, 3LCK/A, 3LIA, 3MI, 4DC, 4HQ, 4KD, 4PS/P, 5BC, 5KG, 5KW, 5LK/P, 5MA, 5NF, 5RD, 5YH, 6JF, 6NB, 6NF, 6OX, 6OX/M, 6YP, 8AL, 8KW, 8LN, 8RW, 8SK, 8UQ/P. (April 16 to May 12).

G3CKQ, Rugby, Warks.

WORKED: G2ANT/P, 2BVW, 2HIF/P, 3FD/P, 3FW, 3NL/P, 3DKF, 3DKF/P, 3EJO, 3ENY/M, 3FUW, 3GGR/P, 3HZK/M, 3JGY/M (Worcs), 3JGY/M (Hereford), 3JWQ, 3JWQ/P, 3LGI, 3LHA, 6SN/M, 6XM/P, 8SB/P.
HEARD: G2FNW, 2FNW/P, 3BA, 3BA/M, 3GHO, 5YV, 6YU.

SWL Smith, Nr. Diss, N'flk.

HEARD: G2JF, 3KFX, 4PB (?), 5BD, 5KW, 5MO, 6XX, 8ML. (March 31-April 29).

G3DLU, Sheffield.

WORKED: G2CRL, 2DCI, 2FMO, 2FNW, 2HQ, 2YB, 3ATM/P (Huddersfield), 3AZU, 3BA, 3DBM, 3DVK/P, 3EHK, 3EHK/M, 3EKX, 3FAN, 3FUR, 3GFD, 3GHO, 3GSO, 3HAZ, 3HBW, 3HZK/M (Coalville), 3IJB, 3IWI, 3JGY, 3JWQ, 3JWQ/P, 3JZN, 3KEQ, 3KFD, 3KPT, 3KQF, 3KUH, 3LGE, 3LHA, 3OZ, 4MK, 5YK, 6BX, 8OK, GW2HCJ/P (Denbigh).

HEARD: G2ATK, 2BM, 2BVW, 2DM, 2FJR, 2XV, 3A0O, 3ARX, 3AYT/M, 3CCH, 3DKF, 3DVK, 3ELG, 3HA, 3IIT, 3IRA, 3JWQ/A, 3KJM/P, 4DC, 5BD, 5CP, 5KG, 5MA, 6NB, 6QD, 6XM,

6XM/P (Notts), 6XX, 8SB/P (Lancs.). (April 16 to May 21).

SWL Tomlin, Malvern, Worcs.

HEARD: G2AUD, 2CVD, 2DCI, 2DVD, 2FNW, 2HGR, 2NV, 2NY, 2OI, 2XV, 2YB, 3ABA, 3AVE, 3AZT, 3BA, 3CKQ, 3DJO, 3DLU, 3ENY, 3ENY/M, 3FMI, 3FTN, 3GHI, 3GHO, 3HAZ, 3HHY, 3IER, 3IIT, 3IOO, 3IRA, 3IUD, 3JGY, 3JGY/M, 3JWQ, 3JXN, 3JYZ/A, 3JZG, 3JZN, 3KBA, 3KEQ, 3KFD, 3KHA, 3KPT, 3KUH, 3LAY, 3LDW, 3LGI, 3LHA, 3NL, 3PV, 4AP, 4DC, 4HQ, 5BD, 5DW, 5KW, 5MA, 5ML, 6AG, 6AG/M, 6JK, 6NB, 6OX/M, 6XA, 6XM, 6YU, 8SK, 8VZ, GW3GWA, 8UH, PE1PL. (April 1st to April 30).

G3FUR, Stamford, Lincs.

WORKED: G2ANT, 2CIW, 2DDD, 2FJR, 2FNW, 2IF, 2XV, 3ALC, 3BA, 3BA/P, 3CGQ, 3DBM, 3DLU, 3DOR, 3DVK, 3EJO, 3FAN, 3FD, 3FW, 3GHO, 3GSO, 3HA, 3HAN/P, 3HAZ, 3HBW, 3HES, 3HRH, 3HZF, 3IIT, 3IIB, 3IOO, 3JWQ, 3JXN, 3JZN, 3JZW/P, 3KBS/P, 3KFX, 3KHA, 3KUH, 3LAY, 3LHA, 4DC, 5BD, 5BD/M, 5KG, 5MA, 5YV, 6LL, 6RH, 6XM, 6XM/P, 6XU, 6YU, 8MW, 8SB/P, 8VZ, GW8UH, PE1PL/M.

the point is that though Bob, as GW5MA/P, has given these and other "rare" Welsh counties to many two-metre operators, he has never yet worked them himself! However, he did get GW8UH/P for Monmouthshire during the recent field day. The G3JQN/G3KEQ expedition will start out about July 12, and they will be looking for mid-evening contacts.

A first report from G3FUR (Stamford, Lincs.) who has been on two metres only since the end of March, and expresses himself as being well satisfied with his results and experiences so far; at any rate, he turns in a good calls-worked list and makes a useful claim for Annual Counties, at 23C. The gear at G3FUR consists of an 832 PA, a 6-over-6 slotted beam, and a converter arranged 6AJ4 GGT into 6BQ7A cascade, with a 6AK5 mixer followed by an ECC84 amplifier, into an S.640 tuning 24-26 mc.

From the direction of Hereford-

shire, G3JGY reports that he is /M after 5.00 p.m. three or four times a week, and at week-ends, and says he is "amazed how stations go QRT without checking the band." The stations he shows as worked in the Activity Report were mainly when he was operating mobile. After a long absence, G3CKQ (Rugby) writes in again, to claim new positions in the Tables—and also to point out a "slight confusion" between himself and G3BKQ in their All-Time placings. G3CKQ now has a total of 162 different stations worked; collecting the cards still remains his main difficulty! G2CIW (Cambridge) moves a little but remarks that "conditions have been 'way below normal for the time of year," with only locals and semi-locals worked. G5MR (Hythe, Kent) says that he is now logging far fewer stations (identified) than three or four years ago, and puts this down mainly to (a) Gabbled signing on phone, and

(b) The low level of CW activity nowadays. G6FO (Maids Moreton, Bucks.) says he often calls CQ on the key, giving his beam heading, but usually nothing happens—of course, this *might* be because those who may hear him have a little difficulty with his Morse . . . (Noted. *Ed.*).

G3DLU (Sheffield) says "no particular high spots" but, nevertheless, shows a total of some 70 calls heard/worked for the period, which seems to your A.J.D. to be pretty good going. We might also add that the G3DLU *ménage* has been enlarged by the addition of a third harmonic. (And we are sure they will not mind if we also say here that both G3CGQ and G3WW have recently achieved the distinction of becoming grandfathers. Good show!).

G3JGJ (Plympton) has been running a schedule with GC2FZC (Guernsey) for over a year now, and is on every evening during 1800-1900 BST; he suggests that those who may be coming to Devon or Cornwall on holiday might like to send him a card if they want /P or /M contacts. G3AGS has moved to a better QTH in the Manchester district, is on most evenings, and says that

activity up his way is "quite good"; he gives G5MA as his most consistent GDX signal, with G3BA from Sutton Coldfield coming in like a local, irrespective of conditions. During the field day, G3KQF (Derby) says that with him very little could be heard from the south, most of the stations he worked being from the north-west—which is interesting, because activity south of the line Norwich-Gloucester was quite good, with considerable QRM at times around 145 mc. It simply shows how flat conditions were.

Though he is one of the most consistent of VHF operators, we do not often hear from G3FAN (Ryde, I.o.W.)—so we are glad to note an All-Time claim of 637 different stations worked in 58 counties and 12 countries. Tony has given up four metres, but is starting again shortly on 70 centimetres. He suggests some new ways of encouraging activity—a special certificate to those who can show 500 VHF cards, with free subscriptions and "such-like inducements" for each 100 cards over the five hundred. Well, the Editor authorises your A.J.D. to say that we are quite prepared to play on these terms (so long as actual cash is not involved!—*Ed.*) and in the interests of all concerned will gladly mint a special parchment for those who like to make a claim. But as 500 cards would be a large bundle, it would be better to write in first.

Listener Reports

These are always welcome for "VHF Bands," and we are glad to see a few more this month, listed in the Activity Report. In due course, we shall have another recruit, from Frome, Som., in SWL Button, who is at present in ZC4.

The G3FUL Cavity

This, described in our April issue, is a particularly effective device; one of the latest versions of it is discussed by G3EOH (Enfield) in the "Lea Valley Reflector." Using a 1-lb. tobacco tin and a 50 μ F condenser instead of the discs, he reduced the Wrotham BBC harmonic on his receiver from S9+ to less than S1, and on the transmitting side found

SEVENTY CENTIMETRES ALL-TIME COUNTIES WORKED

Starting Figure, 4

Worked	Station
29	G2XV
26	GW2ADZ
23	G3BKQ, G6NB
20	G3HBW
19	G3KEQ
18	G3IOO
16	G6NF
15	G2CIW, G4RO, G5YV
14	G2HDZ
10	G2OI, G3IRW
9	G5DS
7	G2DDD, G2HDY
6	G3FAN, G3JHM, G3JMA, G3KHA, G3WW
5	G3FUL, G3IRA, G3IUD, G5ML
4	G3JGY

On working four Counties or more on the 70-Centimetre band, a list showing stations and counties should be sent in for this Table, and thereafter new counties worked notified as they accrue

that his signals went up by one S-point!

Trans-Atlantic Prospect

During July, ex-MP4BCA will be starting on a big (commercial) radio navaid installation job in Newfoundland, based, at almost the nearest point to the U.K. on the American continent; he will "have access to" a 600-ft. tower about 2,000 ft. a.s.l. clear across the Atlantic; and as he will be there for three years or so, he hopes to be able to make some real progress towards Trans-Atlantic VHF working. More details in due course!

In Conclusion

Our next appearance is due on July 5, for which we shall want your reports and comments by June 19—address it all to: A. J. Devon, "VHF Bands," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Have a good Whitsun! And may we get an EDX break before we meet again.

TWO METRES

COUNTRIES WORKED

Starting Figure, 8

- | | |
|----|---|
| 16 | ON4BZ (DL, EL, F, G, GC, GI, GM, GW, HB, LA, LX, ON, OZ, PA, SM, 9S4) |
| 15 | G3GHO, G4MW, G5YV, G6NB (DL, EL, F, G, GC, GD, GI, GM, GW, HB, LA, ON, OZ, PA, SM) |
| 14 | G2FJR, G2HDZ, G3IOO, G5BD, G8OU |
| 13 | G2XV, G3BLP, G3CCH, G3DMU, G3GPT, G5DS, G6XM, G6XX |
| 12 | G2HIF, G3FAN, G3WW, G5MA, G6LI, G6RH |
| 11 | EI2W, G2AJ, G3ABA, G3DVK, G3HAZ, G4RO, G4SA, G5UD |
| 10 | G2FOP, G2HOP, G3BK, G3BNC, G3EHY, G3GHI, G3GSE, G3WS, G5MR, G8IC, GM3EGW, GWSMQ, PA0FB |
| 9 | G2AHP, G2CZS, G2DVD, G3FIJ, G3IUD, G5ML, GC3EBK |
| 8 | G2CIW, G2DDD, G2XC, G3AEP, G3AGS, G3DKF, G3GBO, G3HCU, G3HWJ, G3JWQ, G3VM, G5BM, G5BY, G8SB, GC2FZC |

High Performance Converter for the 23-Centimetre Band

THE IF HEAD AMPLIFIER—
NEUTRALISING—VOLTAGE/
CURRENT CHECK TABLE—
SETTING UP—OPERATION
AND RESULTS

Part III

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

The first two parts of this important and interesting article appeared in our issues dated February and April. Here, our contributor discusses the final points on a design which will give about the best results possible until valves capable of RF gain at 1,300 mc become more generally available.—Editor.

THE head-amplifier is fairly conventional, using three stages altogether. An earthed-cathode, triode-connected 6AK5, with bridge-neutralisation, feeds into a grounded-grid EC91 stage, the pair forming a partially matched cascode. The final stage is another grounded-grid EC91, to allow of additional gain and bandwidth being obtained (Fig. 12).

The bridge-neutralising circuit (Fig. 13), for which no originality is claimed, is used, rather than the more usual resonant-neutralising arrangement, for the following reasons:—

1. It gives better neutralisation over a fairly wide band than the resonant system, because of the balancing action of the bridge.
2. It requires one coil less, though apparently needing one more condenser.
3. The circuit can easily be arranged to operate satisfactorily as a matching transformer between the crystal mixer and the grid of the first IF valve.
4. It is easier to neutralise.

The principle of operation is that signal energy can return to the grid of the IF valve

from the anode *via* two paths—that is to say, through C_{ag} and also through C_n and L. (The grid blocking condenser can be ignored.) Now,

if $\frac{C_n}{C_n^1}$ is made equal to $\frac{C_{ag}}{C_{gk}}$, the input circuit

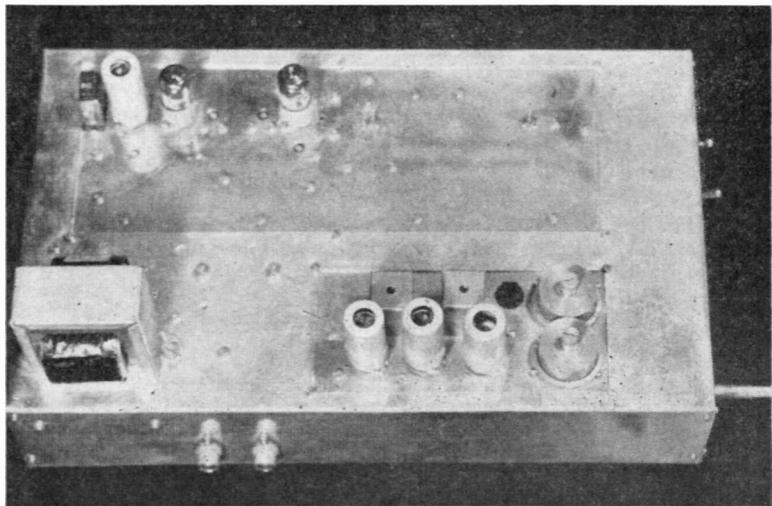
becomes a balanced Wheatstone bridge, there being an earthy point somewhere on the coil, and no net energy reaches the grid from the anode. Consequently, the stage is neutralised and will remain so for all frequencies at which the tuned circuit is a reasonably effective phase-inverter.

In addition, if the source impedance (crystal) is connected between point I and earth (K), the input circuit will obviously act as a pi-coupler. As the circuit is balanced if $\frac{C_n}{C_n^1} = \frac{C_{ag}}{C_{gk}}$, the actual values of C_n and C_n^1 can be changed, without upsetting the neutralisation, provided that their *ratio* is kept the same, thus changing the ratio of the pi-transformer.

For this converter, the values come out as follows:—

$R_{xt} = 350$ ohms, $R_{tm} = 2,500$ ohms, $C_{ag} = 1.5 \mu\mu\text{F}$, $C_{gk} = 8.0 \mu\mu\text{F}$. So the ratio of the transformer should be 2.7 to 1.

This makes $C_n = 4 \mu\mu\text{F}$ and $C_n^1 = 22 \mu\mu\text{F}$. Then C_n can very conveniently be a 2 to 8 $\mu\mu\text{F}$ Philips trimmer. C_n^1 is the capacity between the crystal diode outer connection and earth and it has been arranged that the RF by-pass condenser formed by the crystal outer tube,



General view of the completed 23-centimetre converter designed and built by G3HBW, and fully described in the February, April and current issues of "Short Wave Magazine."

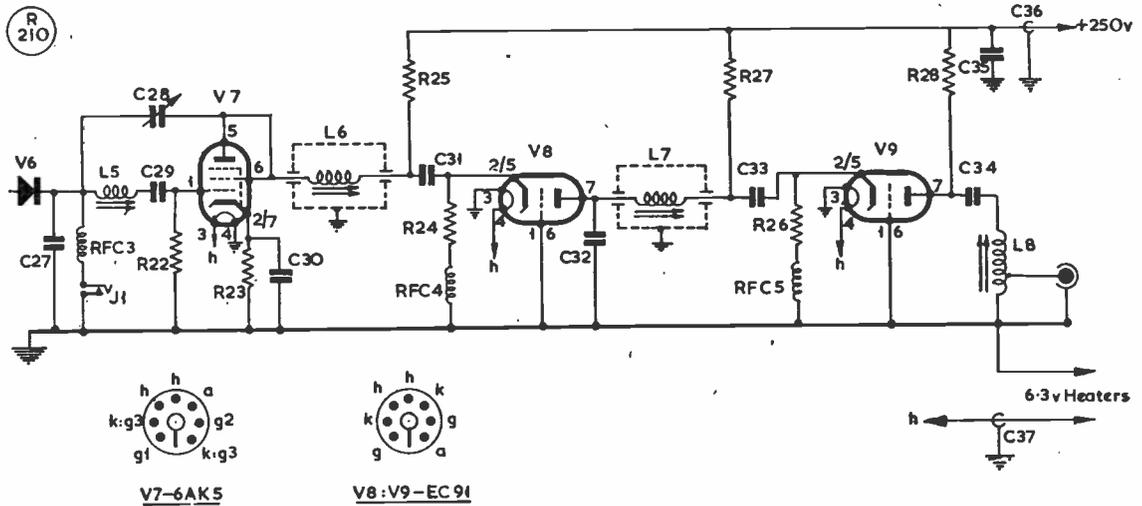


FIG. 12

Fig. 12. The IF head-amplifier developed by G3HBW for his 23-centimetre converter; C36 and C37 are feed-through type condensers. Circuit values and coil data are given in the tables.

its support and the polythene sheet has approximately this value. Hence, the design of support tube used should not be altered too much from that shown unless the capacitance is kept close to the same value, otherwise the neutralising balance may be upset.

The disadvantage of this neutralising circuit is that the output capacity of the stage is increased somewhat, in this case by 4 or 5 μF . In order that the bandwidth of the first stage output circuit should be sufficient, an ordinary parallel-tuned circuit has not been used. Instead, another pi-coupler is employed, because the increased output capacity produces a smaller step-down transformer ratio and actually increases the bandwidth, due to the very low input resistance of the next grounded-grid stage.

A DC path to earth must be provided for the crystal current. For this purpose a choke is connected to point I and through a metering jack to earth. The resistance of the choke then gives a small (desirable) negative bias to the crystal and the choke specified has the correct resistance, namely, 25 ohms, for optimum operation of the CV2154.

The grid of the third stage, another EC91 grounded-grid triode, is also pi-coupled to the anode of the second, and the output circuit is a tapped transformer, feeding 72 ohm co-ax. In order to get the highest stability, the two cathode coils of the grounded-grid stages are mounted in small brass screening cans, details of the construction of which can be found from

Table of Values

Fig. 12. The IF Head Amplifier Section

C27 = RF by-pass, see text	R25, R27 = 12,000 ohms, $\frac{1}{2}$ w.
C28 = 2 to 8 μF Philips trimmer	R28 = 10,000 ohms, $\frac{1}{2}$ w.
C29 = 47 μF ceramic, mounted on L5 former	J1 = Igranic P.73 insulated c/c jack socket
C30, C35 = .01 μF Dubilier Minicap 350v. working	RFC3 = Eddystone type 1010
C31, C33, C34 = 100 μF ceramic	RFC4, RFC5 = Small pie wound choke 200 to 1,000 μH .
C32 = 6.8 μF ceramic	
C36, C37 = .001 μF feed-through	V6 = Mixer crystal, CV2154, CV364, CV102 or similar
R22 = 470,000 ohms, $\frac{1}{2}$ w.	V7 = 6AK5
R23, R24, R26 = 220 ohms, $\frac{1}{2}$ w.	V8, V9 = EC91

TABLE II

COIL DATA

(The IF Head Amplifier)

L5 = 22 turns, 30 SWG DCC, close wound on $\frac{1}{2}$ -in. polystyrene former, slugged.
L6 = 11 turns, 30 SWG DCC, close wound on $\frac{1}{2}$ -in. polystyrene former, slugged, in can.
L7 = 12 turns, 30 SWG DCC, close wound on $\frac{1}{2}$ -in. polystyrene former, slugged, in can.
L8 = 28 turns, 30 SWG DCC, close wound on $\frac{1}{2}$ -in. polystyrene former, tapped 8 turns up, slugged, in can.

Fig. 14. Leads enter the cans through $\frac{1}{4}$ in. rubber grommets.

The IF amplifier, of course, occupies the rest of the space in the sub-chassis not taken up by the mixer and oscillator lines. A tagboard bolted to the side of the chassis, inside it, serves to anchor the HT and heater leads; from

thence they go to two feed-through condensers on the end of the chassis. The IF output is taken through $\frac{1}{4}$ in., 72 ohm coaxial cable, which passes through a bush in the end of the sub-chassis, to the Belling-Lee connector on the side of the main chassis.

The layout shown in Fig. 1 (see p.658, February issue) should be followed as far as possible as it will result in excellent stability and noise-factor being obtained.

Setting-Up the Converter

First, the local oscillator chain should be linked up. Plug in the valves and connect up the supply voltages; check that the heaters have 6.3 volts across them and that the HT is 250 volts. Tune C3 (Fig. 4, p.662, February) until the first stage oscillates. Make sure that the oscillation is absolutely crystal-controlled, and, if not, alter the coil accordingly, in the usual way with the Squier circuit. This may be necessary as the activities of FT243 crystals on their fifth overtones vary quite considerably, from one to another. If no receiver for 35 mc is available, listen to the fourth harmonic, 140 mc, on a 2-metre receiver tuned 4 mc below the bottom of the two-metre band. If the grid currents of V1 and V2 are sufficient (see Table I) the 105 mc circuit can be aligned. With C9 halfway engaged, tune C8 until V3 shows grid current at resonance. Match the anode of V2 into the grid of V3 by varying C9 and readjusting C8 to obtain the maximum drive to V3, as usual when dealing with pi-couplers. Then adjust C14 and C15 for maximum grid drive to the first 446A. Absorption wavemeters may be used, if available, to check the frequency of the RF produced at each stage; this is not essential because, with the exception of L2, the coils shown cannot be tuned to the wrong harmonics. The RF power outputs of V1, V2 and V3 each should be sufficient to light a 6.3v., 0.3a. loop lamp coupled to their

TABLE III
MEASURED VOLTAGES AND CURRENTS

Valve	Va	Vs	Ig
V1	6C4	75v.	120 μ A
V2	Z77	230v.	150 μ A
V3	Z77	215v.	270 μ A
V4	446A	55v.	50 μ A
V5	446A	85v.	90 μ A
V7	6AK5	130v.	—
V8	EC91	190v.	—
V9	EC91	200v.	—

respective tuned-circuits.

Now, tune the anode line of V4 to resonate at 630 mc, obtaining grid current in V5, with the output loop tightly coupled to the line.

Resonating the circuits at final oscillator frequency may prove a little tricky as there are three circuits to be aligned before crystal current can be obtained. The following stage-by-stage procedure should eliminate the difficulty:—

Connect a crystal-diode and meter to the output Belling-Lee socket on the side of the oscillator sub-chassis, removing the cable intended for coupling oscillator power into the high-Q filter. With the loop tightly coupled into the anode circuit of V5, this may then be brought into resonance. It is not advisable to use the crystal mixer itself for the purpose as it may well be burned out by this treatment! Reconnect the oscillator coupling line to the high-Q filter and screw the threaded probe into the mixer line for a distance of about $\frac{3}{16}$ in. (The aerial coupling loop should be removed from the mixer line.) Now plug the test crystal-diode into the mixer socket and connect the meter to the crystal current jack. With both lines tuned to oscillator frequency, 7 to 8 mA of crystal current should flow, with a CV2154 crystal. The threaded probe is withdrawn from the mixer line until this current has fallen to about one milliamp. with all circuits tuned to resonance at oscillator frequency. The mixer crystal itself may then safely be substituted for the test crystal.

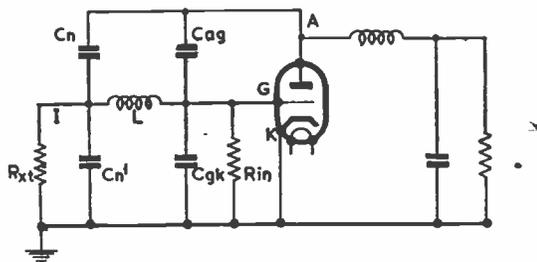
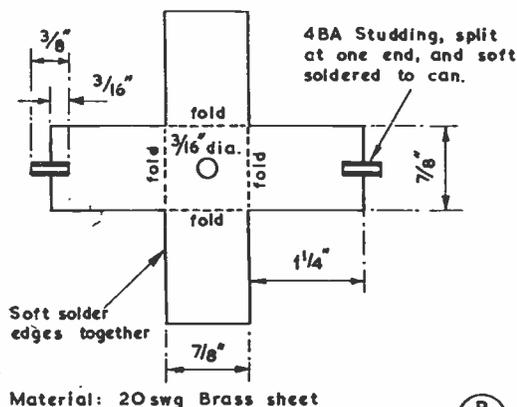


FIG. 13

Fig. 13. Circuit arrangement for the bridge-neutralised IF stage in G3HBW's 23-centimetre converter.

Aligning the IF Amplifier

The only problem associated with the head amplifier is that of neutralising the first stage.



Material: 20 swg Brass sheet

FIG. 14.

R
212

Fig. 14. Fabrication for the IF screening cans — see text.

This should be done with the supplies on, but HT disconnected from the 6AK5, the converter IF output being coupled into the main receiver. The mixer crystal and its by-pass capacitor must also be in position and connected up. Wind a couple of turns of 30 SWG DSC wire round the centre of L5, connecting one side of this link to earth and the other to the output terminal of a signal generator, tuned to the centre of the required IF pass-band. Then, simply adjust the neutralising condenser, C28, until the signal disappears. The position of neutralising will be found to be very sharp and almost independent of frequency.

Other methods of neutralising, effected with HT on the first stage, may endanger the crystal.

The coil dimensions given in Table II are for an IF of 27 to 31 mc.; the head amplifier will cover this band easily.

Final Adjustments to the Mixer

Replace the aerial coupling loop in the mixer line. Tuning the high-Q filter should result in a sharp and pronounced noise-peak in the receiver. The mixer line gives a noise peak also, but resonance is much broader. Tuning the aerial stub gives rise to a reduction in noise. The correct position is usually quite near to this dip, but, nevertheless, final adjustments should be made on a received signal. This applies also to the adjustment of the depth of penetration of the aerial loop.

It is best to arrange that the oscillator probe protrudes only just sufficiently far into the mixer line to obtain the required 500 to 700 μ A of crystal current, when using a CV2154—or whatever the correct value is for the particular crystal employed.

Results and Conclusions

The converter has been in use for some time, at the writer's location, in conjunction with an AR77 as IF unit and a corner-reflector aerial. It has shown itself to be most reliable and easily handled, as CC converters usually are! Stations are tuned in with the same ease as those on Top Band and always, of course, appear at the same place on the receiver dial. It has, in fact, been practice at G3HBW to tune the receiver to G3GDR's 23-centimetre frequency and wait for him to come up.

The signals from G3GDR, 6 miles away over a fairly good (but not optical) path are always received at tremendous strength, even though the radiated power is no more than one watt. Other stations heard many times at G3HBW are G5CD, RS-55 over a poor 7-mile path, with an aerial in the operating room at G5CD; and also G5DT, RS-55 to 57 at 22 miles, in spite of screening at the receiving end.

During listening tests at G3GDR's location, using the converter, G5CD (12 miles) was received at RST-439 on CW and G5DT (27 miles) at RS-44, on 'phone. When using the converter at G5DT, signals from G3GDR (27 miles) were taken at RST-549 and from G3HBW (22 miles) at RS-57/8, on 'phone.

ADDITIONAL COMPONENTS

Item	Qty.
Cable mounting RF plugs, Belling-Lee type L.604/P	— 8
Panel mounting RF sockets, Belling-Lee type L.604/S	— 2
Panel mounting RF sockets, twin line coupling, Belling-Lee type L.617	— 4
Mains plug and socket, 2-pin, Bulgin	— 1
B7G valveholders, (PTFE for V2, V3, V7 at least)	— 6
Crystal holder, FT243	— 1
Polystyrene bobbins, 1/4-in., Salford	— 5
Iron-dust cores, for above, Salford, type S34	— 4
Ceramic stand-off pillars, Jackson Bros., type C	— 6
Fibre wiring posts	— 4
Bakelite tagstrips, 5 tags	— 1
" " 4 tags	— 1
" " 3 tags	— 1
Bakelite tagboard	— As reqd.
Ebonite bushes, with nut, 1/4-in. bore, Norman Rayne, Ltd.	— 1
Lion "O" Rings, neoprene, 1/4-in. i/d, BSI.0S5, James Walker & Co. Ltd.	— 2
PVC covered wire, I/.028, I/.036	— As reqd.

Table of Values

Fig. 15. Power Supply Unit for the G3HBW 23-Cm Converter

C38, C39 = 8 μ F electrolytic, 450v. working	S1 = Toggle switch, 250v, 3A, DPDT, NSF type 8373K8
LFC1 = Choke, 100 mA, 5H	S2 = Toggle switch, 250v, 3A, SPST
MR1, MR2 = $\frac{1}{2}$ -wave metal rectifiers, contact cooled Westalite type 18RA	T1 = Standard small mains transformer, 230-0-230v, 50 mA, 6.3v, 3A

The stations mentioned have always been heard when listened for, in spite of the appalling weather conditions during which many of the tests have been carried out. This work has all been done between what can be called normal amateur locations. No portable excursions to hilltops have been found necessary.

To get the best results from such a receiving system, it is most important, as it is also on the lower frequency bands, that a good aerial, outdoors if at all possible, and a low-loss, accurately matched feeder should be used. Either $\frac{1}{2}$ in. solid polythene co-ax. ("Uniradio 1"), or the $\frac{5}{16}$ in. dia. "Super-Aeraxial" cable already mentioned are quite suitable for short runs, up to 20 feet or so; for longer

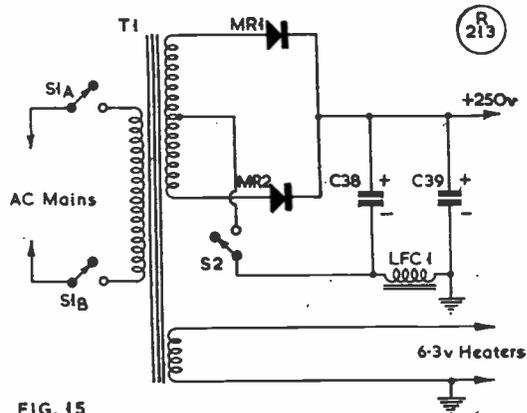


FIG. 15

Fig. 15. A suitable power supply unit for the G3HBW converter — see table for values.

feeders, a better disc or membrane-spaced cable should be employed.

Wherever a fairly straight and open path exists between aerial and receiver, the surface-wave transmission line (G-string feeder) is well worth considering, on the grounds of low cost and transfer efficiency.

1957 WORLD SCOUT JAMBOREE

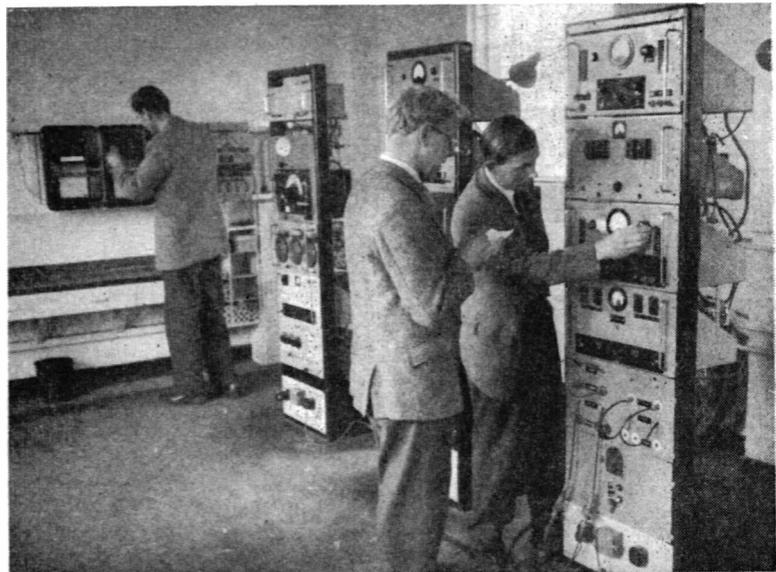
At Sutton Park, near Birmingham, during August, some 37,000 Scouts from 86 countries will assemble for the Jamboree to celebrate the golden jubilee of the Scout movement. Naturally, plans with an Amateur Radio flavour and interest figure largely in the preparations, and the Slade Radio Society (Birmingham) has undertaken to set up an amateur station for world-wide communication. A special call-sign will be issued, and it is hoped to have the station, which will be equipped with no less than eight transmitters, on the air round-the-clock for the duration of the Jamboree.

EI IMPORT LEVY CUT

We are informed that the Eire Government has removed the levy on radio equipment imported under licence. This means that EI amateurs can now buy radio gear from the U.K. free of all import duty, though a permit is still required to secure free passage through the Customs.

COLLINS AMATEUR PERSONNEL

It is an interesting sidelight on the Collins organization that among its personnel are no less than 3,800 licensed amateurs. The one and only holder of a U.K. licence is G2HKJ. Needless to say, he will soon be on the air with a KWS-1 transmitter and 75A-4 receiver, signing G2HKJ/A.



The receiving equipment for the Radio Telescope in operation near Cambridge. One of the items in the far rack is an R.1155. (From "Mirror in the Sky").

NEW QTH's

This space is available for the publication of the addresses of all holders of new U.K. call signs, as issued, or changes of address of transmitters already licensed. All addresses published here are reprinted in the quarterly issue of the "RADIO AMATEUR CALL BOOK" in preparation. QTH's are inserted as they are received, up to the limit of the space allowance each month. Please write clearly and address on a separate slip to QTH Section.

DL2BG, J. H. Edwards, Australian Military Mission, Olympic Stadium, Berlin, Germany, B.F.P.O. 45.

G2AGR, W. A. Rice, 49 Colebrook Road, Shirley, Solihull, Warks.

GW3CDP, W. D. Evans, Bank House, Resolven, nr. Neath, Glam.

G3COD, E. Morgan, Linden, Chantry Road, Stourton, Stourbridge, Worcs.

G3GKQ/A, A. Roberts, Millthorne House, Clitheroe, Lancs.

G3JJK, A. J. Nichols (*ex-VS6CY*), 19 Hellyer Road, Southsea, Hants. (*temporary*).

G3KOY, J. Clarke, 133 Grange Road, Bearley, Stratford-on-Avon, Warks.

G3KPI, J. L. Wiseman, Sycamore House, Messingham, nr. Scunthorpe, Lincs.

G3KQW, Dr. R. F. Williams, 3 Chyngton Road, Seaford, Sussex.

G3KTA, P. G. Munt, 9 Glanville House, Atkins Road, Balham, London, S.W.12.

G3KXO, R. E. Dewhurst, 3/5 Mill Street, Coppull, nr. Chorley, Lancs.

GM3LAL, I. J. Allen, 241 Drumry Road, Glasgow, W.5.

G3LCX, K. H. Lander, 16 Rodney Place, New Kent Road, London, S.E.17.

G3LEA, K. F. Storey, 77 Lime-tree Avenue, Goole, Yorkshire.

G3LEB, B. R. Johnson, 82 Kent House Road, Beckenham, Kent.

G3LFL, G. A. Western, 118 Salisbury Avenue, Barton, Torquay, Devon.

G3LHD, J. D. Shanks, 5 Norland Avenue, Barrow-in-Furness, Lancs.

G3LFF, G. Cochrane, 5 Barnfield Road, Welwyn Garden City, Herts.

G3LLL, H. Leeming, 419 Haslingden Road, Guide, Blackburn, Lancs.

G3LLM, C. A. Coles, 106 Lower Oldfield Park, Bath, Somerset.

G3LLN, M. C. Richardson, 82 Fixby Road, Huddersfield, Yorkshire. (*Tel.: Brighouse 1825*).

G3LOE, W. Roberts, B.Sc.(Hons.), 23 Mytton View, Clitheroe, Lancs.

G3LOL, K. Livermore, 32 Chestnut Avenue, R.A.F. Station, Topcliffe, Thirsk, Yorkshire.

G3LPL, P. Sherdley, Parker's Close, Pilling, Preston, Lancs.

G3LQD, G. R. Kay, 6 Westbrook Park Road, Woodston, Peterborough, Northants.

G3LQJ, R. V. Cox, 12 Randall Place, Heaton, Bradford 9, Yorkshire.

GW3LQP, R. Brown, Tirpentwys House, Osborne Road, Pontypool, Mon.

G3LQS, R.A.F. Coningsby Radio Club, R.A.F. Station, Coningsby, Lincs.

G3LQW, K. Wallace, 88 Oxendon Street, Leicester, Leics.

GM3LQZ, D. Phillips, Sgts.' Mess, R.A.F. Kinloss, nr. Forres, Morayshire.

GM3LRG, J. F. Gray, 36 South Street, Greenock, Renfrewshire.

G3LRH, G. A. Frampton, 6 Springwell Close, Streatham, London, S.W.16.

G3LRJ, B. J. Dix, 20 Riverside Walk, Isleworth, Middlesex.

G3LRQ, M. J. Humphries, 158 Abbotts Drive, North Wembley, Middlesex.

GM3LRZ, S. P. Gillespie, 86 Abbotseat, Kelso, Roxburghshire.

G3LSC, D. T. Wyatt, 4 Norman Avenue, Branksome, Poole, Dorset.

G3LSR, D. Rumble, 15 Albany Road, Sittingbourne, Kent.

G4KO, H. Staff, 59 Charles Avenue, Thorpe St. Andrew, Norwich, Norfolk.

CHANGE OF ADDRESS

G2CTC, S. R. Cooke, 20 Tredgold Avenue, Bramhope, Leeds, Yorkshire.

G2DC, Maj. J. M. Drudge-Coates, Morseden, Hightown Hill, Ringwood, Hants.

G3AJX, G. Stanton (*ex-ZBIAJX*), 54 Lynford Way, Winchester, Hants.

G3CWZ, D. R. Layzell, A.M.Brit.-I.R.E., c/o Doble and Shire, The Garage, Trull, Taunton, Somerset. (*Tel.: Taunton 2491*).

G3DMN, L. E. Flint, 187 Humber Doucy Lane, Ipswich, Suffolk.

G3GKQ, A. Roberts, 23 Mytton View, Clitheroe, Lancs. (*QSL to G3GKQ/A*).

G3GWX, L. P. Jones, 11 Botteville Road, Acocks Green, Birmingham, 27.

G3INU, R. J. Appleby, 108 Holly Leys, Longmeadow, Stevenage, Herts.

G3IVB, L. R. Beeson, 5a Franklin Avenue, Skegness, Lincs.

G3JPN, P. West, 24 Bloomfield Road, Moseley, Birmingham, 13.

G3JYF, B. Bellringer (*ex-ZL1A10/VK6JY*), 5 Harrison Terrace, Truro, Cornwall.

G3JZV, T. R. Mortimer, 26 Hampshire Terrace, Southsea, Hants.

G3KAT, R. L. Poulter, 80 Endors Street, Moss Side, Manchester, 16.

G3KBE, W. Hazelden, 65 Bretby Lane, Bretby, nr. Burton-on-Trent, Staffs.

G3KLO, E. P. Barlow, 61 Coniston Crescent, Breadsall, Derby, Derbyshire.

G3LJQ, C. Leader, 19 Mansfield Road, Ilford, Essex.

G5OW, W. O. Wigg, 40 Cromwell Road, Beeston, Nottingham, Notts. (*Tel.: Beeston 25-6287*).

G5PW, H. Wright, 98 Swinnow Road, Bramley, Leeds, 13, Yorkshire.

G8UQ, J. C. Aldred, Min-y-Coed, Perks Lane, Prestwood, Bucks.

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for July Issue : JUNE 14)

WE are very glad to note an upward trend in the number of Clubs reporting their activities each month. New ones appear from time to time, and old friends, absent for months or even years, come back and report again, often with a new secretary.

It seems that the older and well-established Clubs, in general, run with the same set of officials for many years, while the newcomers, particularly the smaller ones, undergo very frequent changes of personnel.

In our card-index system this shows up well, and while we have a small collection of cards with a single secretary's name on each (dating in some cases from as far back as 1948), there are many more on which we are running out of space because of five or six changes in a few years.

There may be a moral in this somewhere, but we should hesitate to draw rash conclusions. But we repeat what we have said before, more than once—happy the Club with a good secretary who can be persuaded to stay on the job.

Aldershot report the election of new officers and committee members at their recent AGM. They are now running a class for the younger members, and also for RAE aspirants, with Morse practice in full swing. A "Super Junk Sale" was recently held, with gear of all kinds going at knock-down prices, and the Club Tx is nearing completion. Next meeting is on June 12, and every Wednesday thereafter, at The Cannon, Aldershot.

Bailleul have built new transmitters for the DX bands and Top Band; other activities are flourishing, and two more members are ready for the Morse test. A recent visitor was G5HB, who is forming another REME Club at Old Dalby, Leics. Note new secretary (QTH in panel).

Bradford are booked for Informal Meetings on June 18 and July 16, both at Cambridge House, Little Horton Lane.

The *British Two-Call Club* continues to welcome members who have held at least one overseas call-sign in addition to their G call. Recent additions were G3IU/ZB1EB, G3KWW/ZC1AF, G3KXI/ZB1DK, and G3JHZ/VO6AE/VO1Q.

Cray Valley meet at the Station Hotel, Sidcup, at 8 p.m. on June 25 for a Mullard lecture, illustrated by films, including "Made for Life" and "Ultrasonics in Industry." Meetings are held on every fourth Tuesday, and non-members cordially invited to come along.

Crystal Palace will be holding a Junk Sale on June 15, at their Headquarters, Windemere House, Westow Street, London, S.E.19.

Derby also have a Junk Sale for their next meeting (June 12), and on the following Wednesday, the 19th, there will be a Film Show. On June 26 there is to be a recorded Tape Lecture, and on July 3 another Junk Sale, officially described as "Sale of Members' Surplus Items"! On Sunday, June 30, they will be running a Top-Band D/F Contest, the hidden transmitter operating within six miles of Derby Market Place and using the call G3ERD/A. Further details from the Hon. Sec.

Liverpool ask us to say that if any other Club would like to exchange news-sheets with them, they will gladly co-operate. A useful interchange of ideas

NAMES AND ADDRESSES OF CLUB SECRETARIES REPORTING IN THIS ISSUE:

ALDERSHOT: S. E. Hume, 25 Kingsway, Aldershot.
 BAILLEUL: G. Seeney, G3HDD, B.R.S., Bailleul Camp, Arborfield, Berks.
 BOURNEMOUTH: J. Ashford, G3KYU, 119 Petersfield Road, Boscombe East, Bournemouth.
 BRADFORD: F. J. Davies, 39 Pullan Avenue, Bradford 2.
 BRITISH TWO-CALL CLUB: G. V. Haylock, G2DHV, 63 Lewisham Hill, London, S.E.13.
 BURY: L. Robinson, 56 Avondale Avenue, Bury.
 CRAY VALLEY: S. W. Coursey, G3JJC, 49 Dulverton Road, London, S.E.9.
 CRYSTAL PALACE: G. M. C. Stone, G3FZL, 10 Liphook Crescent, London, S.E.23.
 DEAL: G. E. Nobbs, G3KFR, 47 St. Martins Road, Deal, Kent.
 DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby.
 FLINTSHIRE: J. Thornton Lawrence, G3JGA, Perranporth, East Avenue, Bryn Newydd, Prestatyn.
 GRAFTON: A. W. H. Wennell, G2CJN, 145 Uxendon Hill, Wembley Park, Middx.
 ISLE OF MAN: R. A. Davis, 13 Castle Street, Douglas, I.O.M.
 LANCASTER: A. R. Thompson, G2FCL, 51 Princes Crescent, Bare, Morcambe.
 LIVERPOOL: W. D. Wardle, G3EWZ, 16 Mendip Road, Liverpool 15.
 MIDLAND: C. J. Haycock, G3JDJ, 360 Portland Road, Birmingham 17.
 MITCHAM: D. Tilcock, G3JYV, 67 Fleming Mead, Mitcham.
 NOTTINGHAM (Amateur Radio Club): F. V. Farnsworth, 32 Harrow Road, West Bridgford, Nottingham.
 NOTTINGHAM (Amateur Radio Society): H. H. Pickering, G3DUL, 43 Plains Road, Mapperley, Nottingham.
 PLYMOUTH: C. Teale, G3JYB, 3 Berrow Park Road, Peverell, Plymouth.
 PURLEY: E. R. Honeywood, G3GKF, 105 Whytecliffe Road, Purley.
 RAVENSBOROUGH: J. H. F. Wishaw, 4 Station Road, Bromley, Kent.
 SCARBOROUGH: P. Briscoe, G8KU, Roseacre, Irton, Scarborough.
 SLADE: C. N. Smart, 110 Woolmore Road, Birmingham 23.
 SOUTH SHIELDS: W. Dennell, G3ATA, 12 South Frederick Street, South Shields.
 STOCKPORT: G. Phillips, G3FYE, 7 Germans Buildings, Buxton Road, Stockport.
 STOKE ON TRENT: W. Luscott, 36 Rothsay Avenue, Sneyd Green, Hanley.
 SURREY (Croydon): S. A. Morley, G3FWR, 22 Old Farleigh Road, Selsdon, South Croydon.
 SUTTON AND CHEAM: F. J. Harris, G2BOF, 143 Collingwood Road, Sutton.
 WANSTEAD AND WOODFORD: C. Stevenson, 25 Boundary Road, Barking.
 WORTHING: J. R. Tootill, 113 Kings Road, Lancing.
 WREXHAM: T. F. Corcoran, 3 Lea Road, Wrexham.

is almost bound to result. Their own 5 & 9 already gets as far as Detroit.

Midland have booked June 18 for the Mullard Film and talk on CRT Manufacture, and on July 16 for a talk by G2HCG on Slot Aerials, with a demonstration of model beams. Both meetings at the Midland Institute, Paradise Street, Birmingham, at 7.30 p.m.

Nottingham (Amateur Radio Club) meet at 7.15 p.m. every Tuesday at Woodthorpe House, Mansfield Road, where activities include the building of transmitters and receivers under expert guidance. Slow Morse practice is provided both in the Clubroom and over the air. New members will be cordially welcomed.

Purley held a successful Junk Sale on April 26, and the May meeting was the AGM.

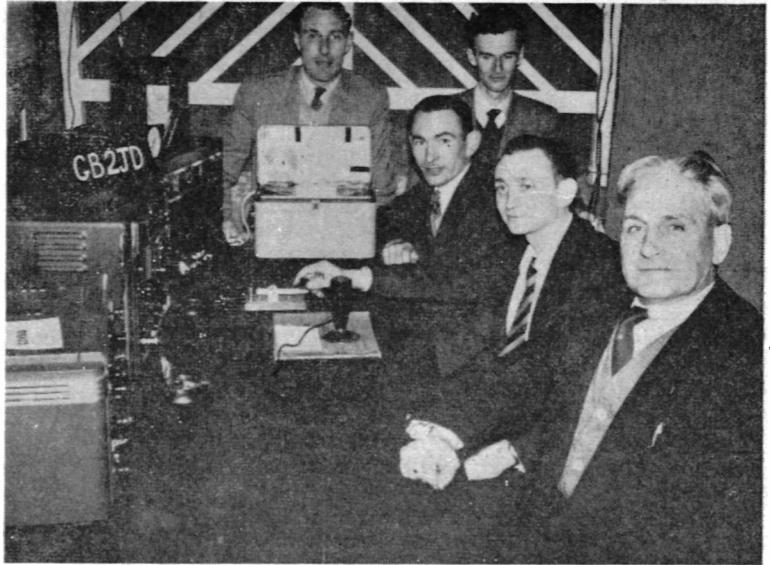
Ravensbourne have several members interested in amateur TV, including G3LNT/T. The Club Tx is operating on the HF bands. If sufficient enrolments are forthcoming, there will be a new beginners' course, starting next September. Meetings are at 8 p.m. on Wednesdays, Durham Hill School, Downham, Kent.

Slade met on June 7 to elect their general secretary, after which Dr. R. S. Donogh will give a talk on the fascinating topic of Radio Astronomy. The subject for the June 21 meeting is RF Coil Design, by Mr. Reynolds of Repanco, Ltd.

South Shields will be holding official business meetings on June 26, July 31 and August 28, all 7.30 p.m. at Trinity House Social Centre, 134 Laygate Lane. The Club Shack is open every Friday evening, and G3DDI is active on 80 metres. June activities include competitions both for SWL and transmitting members, and several visits to local undertakings have also been arranged. During the Corporation Flower Show in August the Club will display a station, for which the special call GB3SFS has been allotted, as in previous years.

Sutton & Cheam meet at the Harrow Inn, Cheam Village, on June 18 (Power System Networks and Analysers) and on July 16 (Tape Recorder Electronics). The Club Net is active on Monday evenings at 2200 BST, 1995 kc—all stations welcomed.

Worthing will be discussing VHF Converters on June 17 at 8 p.m., and on July 8 they have organised



Operators on GB2JD, Deal & District Amateur Radio Club, when they put on a stand at a recent local exhibition. As is usual on these occasions, the Amateur Radio demonstration was a great success and the focus of public interest. From near right to far left, those shown in our photograph are: G3HWO, G3KFR (keying), G3LCW, G3KUK, and SWL Bourner. The mayor of Deal, N. J. spoke over K2LIU to the mayor of Deal, Kent, visiting GB2JD—an interesting example of a Trans-Atlantic hook-up by Amateur Radio (see story p.218.)

a visit to the local Fire Station. On July 14 they will hold the now famous "Bucket and Spade Party," beginning at 1100 at the West Kiosk, near Beach House and Denton Gardens. This affair is an informal Family Seaside Party, with *no* raffles, prize draws or other fund-raisers designed to extract money from visitors! Stations will be on 160, 80 and 2 metres to guide visitors in.

Wrexham held their AGM on May 3 and elected Mr. W. Jones chairman, GW3HEU vice-chairman and Mr. T. F. Corcoran honorary secretary. It has been decided to make a drive for more members, and visitors will be welcomed at the monthly meetings. Lectures are held, following Society business, from 8 p.m. on the first Friday of the month, at Bodhyfryd, Chester Street, Wrexham.

Bury will be meeting at the George Hotel, Kay Gardens, on June 11 for a Junk Sale, and an July 9 for their "Noggin and Natter Night"—both at 8 p.m. A Hamfest is to be organised for September 14, of which details will follow later.

Isle of Man held their AGM and Dinner at the Manor Guest House, Victoria Road, Douglas, on May 1. They do not meet at all during the summer months, but will be resuming full activities in the autumn.

Lancaster also held their AGM, at which new officers were elected (see panel for new Hon. Sec.). Visitors will be welcome during the holiday season, and new members are wanted.

Scarborough continues weekly meetings throughout the summer, and holiday visitors are cordially

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

invited to attend, any Thursday at 7.30. The York Club won the recent inter-Club contest, which was enjoyed by both sides. Interesting lectures are planned now for some weeks ahead, and the Club station, G4BP, is on the air with a Panda Cub; contacts and reports welcomed.

Stoke-on-Trent continues to meet every Thursday at 8 p.m., and several new members have been enrolled. Their programme is strong in films, and preparations are also under way for Club Field Days at Whitsun, when G3GBU/P will be on at least four bands from a high site eight miles from the Potteries.

Bournemouth report a steadily increasing membership, now totalling 45 with 19 "licencees." They meet each Friday at the Cricketers' Arms, Windham Road, and will be pleased to welcome holiday visitors. They are organising the New Forest Mobile

Rally on June 16 (see separate announcement elsewhere in this issue).

Flintshire, reporting for the first time, inform us that they meet on the first Monday, 7.30 p.m. at The Railway Hotel, High Street, Prestatyn. On July 1 they will visit Prestatyn Telephone Exchange; on August 5 there is no meeting.

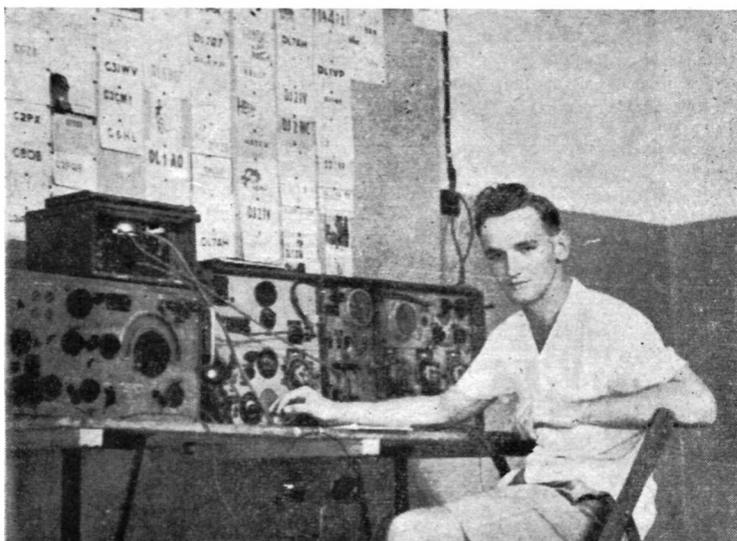
Grafton will again hold their annual Field Day on Hampstead Heath, June 15/16, when G3AFT/P and G2CJN/P will be operating on all bands. Both contacts and personal visitors will be welcomed.

Mitcham recently had a lecture from G4ZU on his Minibeam, and he was the guest of honour at their annual dinner on the following day, when Sutton and Cheam were also represented. Meetings are held on alternate Fridays at "The Canons," Madeira Road, Mitcham.

(over)

THE OTHER MAN'S STATION

5A4TZ



5A4TZ is the Amateur Radio Club station of the Royal Signals in Tripoli, and is operated by various members of the R. Sigs. out there who hold amateur licences.

The equipment shown in the photograph consists of a Canadian Marconi 52 Set, which is a ground-station transmitter/receiver assembly. The left-hand portion is a 13-valve superhet with a built-in crystal calibrator; receiver and calibrator cover a frequency range of 1.75 to 16 mc, in three switched bands. The central unit is the power supply, taking 12v. DC input from accumulator batteries. Receiver HT is given by a vibrator pack, and the transmitter is run from two dynamotors. On the right is the transmitter, arranged for either crystal control or VFO working, and using 6V6's in all early stages, and for modulation; the PA is a single 813, running 100 watts on CW and 75w. on phone. The modulator is designed for either a moving-coil or carbon microphone, and on CW (or MCW) full break-in facilities can be used.

A second receiver, the well-known Army type

R.107, is also available, while the unit visible above the 52 Set itself is a remote control "box" which enables the whole station to be operated from a distance of two or three miles, if required.

For an aerial, at 5A4TZ they are now using a single 20-metre dipole for transmission and reception, placed to favour the U.K. direction, since the main interest of the operators on the station is working G's on 14 mc, CW and phone. A turn is sometimes taken on 7 mc, and from 5A4TZ all continents have been worked.

An interesting side-line is activity as 5A4TZ/M. For this, the gear is fitted in an Army vehicle, with a 16ft. whip aerial, and operated in the Libyan Desert or along the Tripoli-Benghazi road—and not so very many years ago, it could hardly have been foreseen or imagined by anybody that British amateur operation would one day be possible from these places. The operator in our photograph is ex-DL2VM (now posted back to Germany, and signing DL2BC), others "on the roster" being ex-DL2RX, 5A4TD and ex-G3KJW.

Nottingham (Amateur Radio Society) held their AGM and elected new officials. Their next meeting will be on June 21 at Basford Hall, Nuthall Road, Cinderhill, but they are hoping to find accommodation nearer to the town centre and to attract more members.

Plymouth also held their AGM. G5ZT, the president, has given the Club a cup, to be awarded annually to the winner of a home-construction competition.

Stockport are very active and recently visited the Granada TV Studios. Portable activities have taken up much time, and a station was operated on a local Field Day. New officers were elected at the AGM.

Surrey (Croydon) meet on June 11, 7.30 p.m. at the Blacksmiths Arms, South End, Croydon, for G3IIE's talk on Constructional Practices. He has for the last two years judged their Constructional Contest and will now answer a few queries about how it should be done.

Wanstead report lectures in full swing, and they hope to be back on the air in a week or two. Meetings every Tuesday, 8 p.m. at Wanstead House, The Green, London, E.11.

GOOD SHOW AT DEAL

A very successful "Citizens at Leisure" exhibition, sponsored by the Rotary Club of Deal and opened by the Mayor, was held during April 25-27, at Deal. Among the many exhibitors was the Deal

and District Amateur Radio Club, with a working station signing GB2JD.

From the point of view of the Club, the whole three days turned out to be a tremendous success; the general public, intensely interested, as is usual on these occasions, crowded round the station all the time, and many new members were enlisted. Numerous questions were asked about Amateur Radio, including requests for such information as "Can I get a set to talk to my son in New Zealand?", and a suggestion from another local society that GB2JD should "broadcast their play for the benefit of the people of Deal!"

As regards contacts, one of the highlights was the two-way working, on the 21 mc band, with Deal, New Jersey, U.S.A. During the first two days of the exhibition, three contacts were successfully achieved; though pre-arranged, they were made under great difficulty owing to the very high local noise-level generated by the apparatus of other exhibitors; G3KUK did his best to suppress this by running round with chokes and condensers.

From Deal, N.J., splendid co-operation was given by K2LIU and his XYL, K2LIW, which made contact 100 per cent. certain. At their end, they had an N.B.C. representative, who wanted the story for one of the "Voice of America" programmes, and the Mayor of Deal, N.J.; a court case was actually interrupted so that he could be present at K2LIU when the Mayor of Deal, Kent, was at GB2JD.

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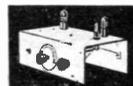
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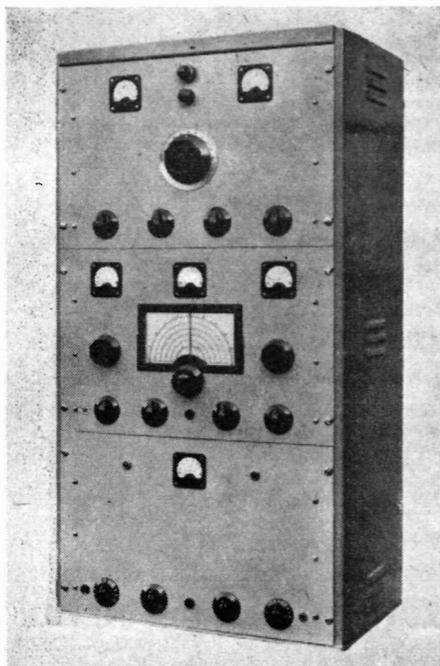
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WANTED: Dynamotors all DC in and out. Type D102 or similar 13.5v. 3.5 amps. in 285v. .075 amps. out; Type D101 or similar 27v. 1.75 amps. in 285v. .075 amps. out; Type unknown or similar 14v. 10 amps. in 575v. .16 amps. out; Type DM33A or similar 28v. 5 amps. in 575v. .16 amps. out; Type 29 or similar 24v. 16 amps. in 1230v. .2 amps. out; also 2in. square m/ammeter 100m/a FSD, marked "0-300 MAG FEED." Quotes required for quantities over 24; will take up to 200 of each item, if price is right.—Box No. 1871, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

TELEVISION INTERFERENCE. — Receiver Filters: High Pass E.5037, 30/-; Low-pass E.5031, 30/-; Composite Band I/III, 49/6. Transmitter Filter E.5034, 80 dB, 1 kW, £6. — Labgear (Cambridge), Ltd., Willow Place, Cambridge.

QSL's and Logs by Minerva. The best there are.—Samples from Minerva Press, 2 New Road, Brentwood, Essex.

WANTED: BC610 Hallicrafters, ET-4336 Transmitters. BC-312 Receivers, BC-221 Frequency Meters and spare parts for all above. Best cash prices.—P.C.A. Radio, Beaver Lane, Hammersmith, W.6.

QSL CARDS AND LOG BOOKS, G.P.O. APPROVED. CHEAPEST, BEST. PROMPT DELIVERY. SAMPLES. — ATKINSON BROS. PRINTERS, LOOE, CORNWALL.

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3d. per word, min. charge 5/-. payable with order. Please write clearly, using full punctuation and recognized abbreviations. No responsibility accepted for transcription errors. Box Numbers 1/6 extra. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, S.W.1.

RADIOVISION Commander Double - Superhet Receiver, full dial bandspread, new condition, with manual, £35.—R. Poulter, 80 Endsor Street, Manchester 16, Lancs.

FOR SALE: Tx BC338A, £5. Canadian 58 Mk. 1, £4. Rx BC453, modified medium wave, £3. — Box No. 1868, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

HELP WANTED. Amateur band coils for 358X (B.34) Rx, must have perfect pins. Also manual. Write or call first, please.—G3LLL, 419 Haslingden Road, Guide, Blackburn, Lancs.

SELL AR88LF mint condition, unmodified, date manufacture stamped on receiver, original packing case, also speaker and manual. Also National NC183, excellent condition, slight damage to dials, otherwise as new, also speaker and manual. RME VHF152A, brand new mint condition, with manual. Cash offers, view by appointment.—H. Barrett, 71 Lichfield Avenue, Evesham, Worcs.

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URGENTLY WANTED, cash waiting: Mullard Electronic High-Speed Valve Tester, Avo Model 7 or 8, Avo Valve Characteristic Meter Mk. 11 or 111, Eddystone 840A. For sale or exchange for any of the above: Eddystone S.750, as new, £40. Hallcrafters SX25, excellent, £16. Panadaptor for S.27 or S.36, £15. Cossor Signal Generator/Wobbulator, £4 10s. BC453 £1 10s.—Peter Seymour, 291 Beverley Road, Hull.

R1224A. Mint condition, complete with P/Pack, recently re-aligned, perfect, £6 10s. Buyer collects.—G3LGX, 49 Larch Hill, Odsal, Bradford 6, Yorks.

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AR 88D, first-class condition, £45. Eddystone 750 with S-meter, just overhauled by makers, £45. "Advance" constant voltage transformer, 230-volt input, £2. Complete Two-metre station 1540 Tx and Rx with power supplies, xtl, mike and spare valves, £16. Buyer collects. — D. T. Ownley, 52 Queens Road, Accrington, Lancs.

OFFERS for unmodified BC221-T? Wanted: HRO with B/S coils. Please state price and condition.—W. A. Stonehouse, Albert Cottage, Station Road, Plympton, Nr. Plymouth, Devon.

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WANTED: Copy March 1957 issue of *Short Wave Magazine*.—Box No. 1870, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

LAATEST Teletron Band 3 Converter with P/Pack, £2. Free lists of cheap gear, books.—G2HKU, 4A Clyde Avenue, Sheerness, Kent.

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WANTED: Service Manual T.1154 / R.1155. State Price. — Dyer, Hardley Farm, Hythe, Southampton.

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FOR SALE: Eddystone S.640 receiver, S-meter, no mods., as new, £22.—J. E. Cronk, 93 Thurlow Street, London, S.E.17. (Tel.: *New Cross 0199*).

BRT.400 Rx, little used, loss at £55. Six Band 50w. rig, complete mod., etc., £8. Grundig 700L Tape Recorder, £45. Complete VHF Tx/Rx working 70 to 85 mc, £7. Other equipment, enquiries invited. — Box No. 1875, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

RCAR88D, in beautiful condition, tuning meter, tools, £60. Wanted urgently: Collins 75A1/2/3, also 10-metre mobile gear.—R. Poulter, 80 Endsor Street, Moss Side, Manchester 16.

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FOR SALE: CR/100/2, £25. Realigned to maker's specification, black crackle, S-meter. Immaculate condition. — G3CQK, 21 Vancouver Road, Forest Hill, London, S.E.23. (Tel.: *FOR 4449*).

WANTED: HRO or CR100. Would collect from Northern Ireland address; price and condition, please?—Howard, Inis, Marino, Co. Down.

WANTED: Commercial Table-Topper. Gear for sale/exchange. No Govt. Surplus rubbish. — G3DRR, 65 Woodstock Gardens, Blackpool, Lancs.

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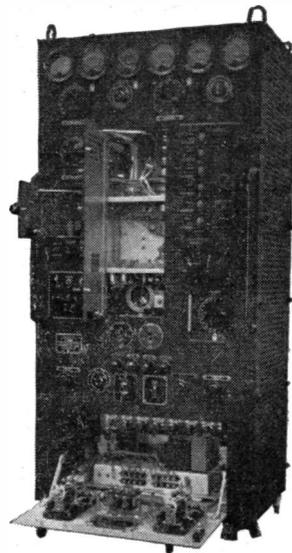
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VALVES. New 6AM6 (20), 12AT7 (15), 6BE6 (1), 6BA6 (5), 6J6 (2), 5/- each.—Box No. 1872, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

100 WATTS Phone/CW Compact Four-Deck 42-inch bandswitched 3.5-28 mc Transmitter, separate VFO, £28.—H. Collins, 42 Temple Fortune Hill, London, N.W.11. (SPE 4902).

WANTED: *Short Wave Magazine*, March and April 1954, February, March and April 1955 and May 1956.—Box No. 1873, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Collins TCS 15 Tx/Rx, control unit, cables, AT unit and original Power Pack, £35. BC-312, external Power Pack, £10. Two Jefferson-Travis Tranceivers, 50 to 80 mc., £8 10s. pair. Two hand-size Tranceivers, Type 159B/URC4, 121/240 mc, £25 pair. Rx 103 Mk. II, 1.5 to 16 mc, 12 volt, £7 10s. Rx 1392, 12-valve, 90 to 150 mc, £4 10s. Pan-Adaptor (Spectroscope), less tube, £10. Rx 107, complete, unmod., £7 10s. Crystal Multiplier TP MI-19468, 25/- Test Meter Type 856G, 20,000 o.p.v., £12. Advance Sig. Gen., £10. Taylor 65c., £8. 500-volt Megger, £7. HRO coils, various, (*s.a.e. for coverage*), 7/6 each, plus 1/6 p.p. HRO 80-mtr. band spread coils, 30/-. Valves: 832, 25/- each. 3E29B, 30/- each. R.C.A. 807's, 5/6 each, new boxed. B2 Tx/Rx, power pack, coils, crystals and all spares, £15. BC639 Rx, 100-150 mc, with P/pack and manual, £14 10s. BC638 Sig. Gen., with crystal check, P/pack, manual, £9.—K. Lee, 331 Brixton Road, London, S.W.9. (Brixton 0852).

GRUNDIG TK5 Tape-Recorder, in mint condition, with tape and microphone, used 3 hours, £50 o.n.o.—Box No. 1874, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

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WANTED: TA-12B, ART-13, B46 Rx, SCR-506. Manuals. Buy or loan for payment, *QST's* 1950/54, or part.—Offers please: G. Bloor, 30 Deyne Avenue, Manchester, 14.

WANTED: Eddystone 750 or similar, good cond. essential. Sale: 145 VFO with 392 P/pack, 60/-; loads other gear, s.a.e. list: Colley, G3AGX, 24 Skirbeck Road, Hull.

AR 88 LF, perfect condition, no mods., £40. Buyer collects, Nottingham.—Box No. 1878, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Five American Midget Relays, DPST, 10,000-ohm coils (write full specification), with five 12AU7's, etc., £4 o.n.o.—Box No. 1865, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

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WANTED: March and April 1957 issues of *Short Wave Magazine*.—Box No. 1879, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

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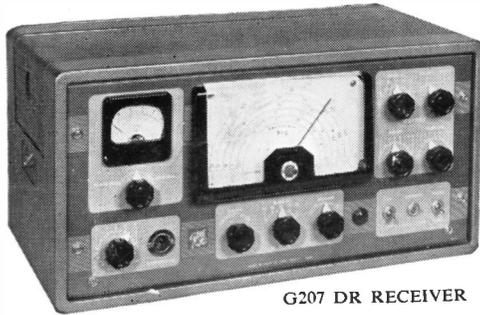
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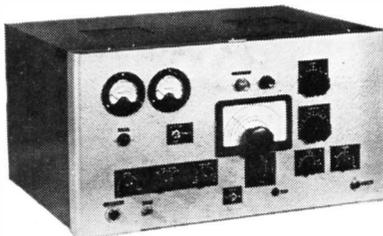
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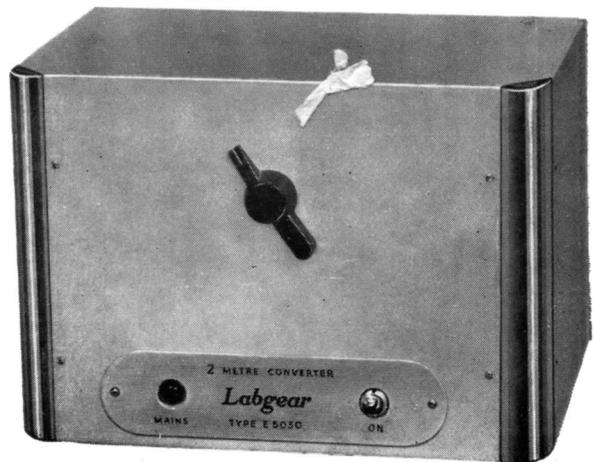
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Frequency Range 44.0 to 61 Mc/s.
Range Approximately 3 to 8 miles.
Power requirements Standard 120v. H.T. and 2v. L.T.

Ideal for Civil Defence and communications.

BRAND NEW **59/6**

Calibrated Wavemeter for same 10/- extra.

QUARTZ CRYSTALS



TYPE FT243 fundamental frequencies. 2 pin $\frac{1}{4}$ in. spacing.
120 TYPES. 5675 Kc/s. to 8650 (in steps of 25 Kc/s.).
80 TYPES. 5706 Kc/s. to 8340 Kc/s. (in steps of 33.333 Kc/s.).

ALL BRAND NEW, 10/- Each

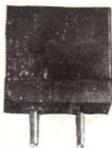
Set of 120 £15
Set of 80 £10

TYPE FT241A 54th harmonic Crystals. 2 pin $\frac{1}{2}$ in. spacing.
80 TYPES AVAILABLE 20 Mc/s.—27.9 Mc/s. (in steps of 100 Kc/s.). Set of 80, £10.

Also 32.5 Mc/s., 36.3 Mc/s., 36.6 Mc/s.; 32.6 Mc/s., 36.4 Mc/s., 36.7 Mc/s.; 32.7 Mc/s., 36.5 Mc/s.

ALL BRAND NEW, 7/6 Each

FT241A 200 kc/s. 10/- each.
Crystal Holders for both Types 1/3 each.



CATHODE RAY TUBES

VCR139A	Mu-Metal	£1 15 0
VCR139A	Mu-Metal Screen	£ 5 6
VCR97	Full T.V. picture (carr. 2/-)	£2 0 0
VCR517C	Full T.V. picture	£1 15 0
MU-METAL SCREENS for VCR97 or 517		£ 10 0
VCR97	Slight-cut-off Carr. 2/-	£ 15 0
3PB1	Brand new	£1 10 0

62A INDICATOR UNIT

Containing VCR97 with Mu-Metal Screen. 21 valves: 12-EF50, 4-SP61, 3-EA50, 2-EB34. Plus Pots, Switches, H.V. Cond., Resistors, Muirhead S/M Dial, Double Deck Chassis and Crystal. BRAND NEW. ORIGINAL CASES. 67/6. Carr. free.

TRANSMITTER/RECEIVER SCR 522

Comprising the well-known BC625 and BC624A. Units complete with 17 valves types 2-832, 3-12A6, 3-12SG7, 3-9003, 9002, 6G6G, 12J5GT, 12AH7GT, 12C8, 6SS7. The complete unit is in very good condition having very useful parts including Relays, Transformers, Condensers, etc. Less valves 45/- carr. 5/- With valves £5/15/- carr. paid.

TRANSISTORS

JUNCTION TYPE P-N-P.
British Manufactured.

RED-SPOT 800 kc/s Audio Frequency	10/-
BLUE-SPOT 1.6 Mc/s Mixer and Frequency Changer	15/-
WHITE-SPOT 2.5 Mc/s R.F. and I.F. Amp	20/-

All Transistors are Tested and Guaranteed
N.B. The Red-Spot is similar to Mullard OC71

SPECIAL TRANSISTOR OFFER

THREE RED-SPOT AND ONE BLUE-SPOT	42/6
FIVE RED-SPOT AND ONE BLUE-SPOT	60/-

Also discount for quantities.

Over 300 different types of B.V.A. and American valves in stock. Send for Lists.

SUPERSEDING THE POPULAR "PRE-SELECTED TRANSISTOR-SEVEN"

The New "TRANSISTOR-8"

Push-Pull Portable Superhet
CAN BE BUILT FOR £11 10 0

This Portable 8 Transistor Superhet is tunable for both Medium and Long Waves and is comparable in performance to any equivalent Commercial Transistor Set.

Simplified construction enables this set to be built easily and quickly into an attractive lightweight cabinet supplied.

TEN STAR FEATURES

- ★ 8 Specially Selected Transistors
- ★ 250 Milliwatts Output Push-Pull
- ★ Medium and Long Waves
- ★ Internal Ferrite Rod Aerial
- ★ 7 x 4 Elliptical High Resistance Speaker
- ★ Drilled Plastic Chassis $8\frac{1}{2} \times 2\frac{1}{2}$ in.
- ★ Point to Point wiring and practical layout
- ★ Economical. Powered by $7\frac{1}{2}$ v. battery
- ★ Highly sensitive
- ★ Attractive lightweight contemporary case

We can supply all these items including Cabinet for £11/10/0
All parts sold separately

Send for circuit diagrams, assembly data, illustrations and instructions, and full shopping list 1/6.

Call and hear demonstration model.

"EAVESDROPPER"

3-TRANSISTOR POCKET RADIO

No Aerial or Earth Required. Pre-selected 2-Station Receiver.

We can supply all the components for building the above set as per "Radio Constructor." With plastic case, 77/6.

With Acos Mike, 90/- Single Headphone, 4/6. With Miniature Hearing Aid, 92/6.

TRANSISTOR PUSH-PULL AUDIO AMPLIFIER (200 Milliwatts Output)

Build this Push-Pull Amplifier which is ideal for Crystal or Magnetic Pick-up Amplification, Baby Alarm, Microphone Amplifier, etc.

Powered by 6-volt Dry Battery lasting for months.

Complete Kit of Parts including 4 Transistors and all Components with Circuit (less Speaker), £4/10/-.

COLLARO RC456

4-speed auto-changer. Latest type with crystal turnover pick-up. £9/15

TRANSISTOR SIGNAL TRACER

Complete Kit with 2 Transistors, Components, Plastic Case, and Phones with Circuit. 42/6.

TRANSISTOR SQUARE WAVE GENERATOR

Complete Kit with 2 Transistors, Components, Plastic Case, and Circuit. 25/-.

DIODES

B.T.H. GERMANIUM	1/6
MULLARD OA74	2/6
IN21	3/6
IN22, IN23, IN21A	5/-

MODEL-MAKERS MOTORS

Two types available 12 or 24 v. with $\frac{1}{4}$ in. spindle ... 10/- each

6 v. VIBRATOR PACKS

Output 180 v. 40 m/a., 15/- Brand new.

"HOMELIGHT"

One Transistor Receiver

Build this pre-selected set which is powered by No. 8 battery. Total cost including Transistor, Coils, Diode, Plastic Case and H/R single phone. 32/6.

"HOMELIGHT"

2 Transistor Personal Portable No Aerial or Earth Required Pre-selected 2 Stations Receiver

We can supply all components including 2 Transistors, Diode, Resistors, Condensers and Miniature Hearing Aid and Plastic Case size $4\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2}$ and 1 $\frac{1}{2}$ v. Battery. FOR 55/-
All items sold separately.

R.F.24 10/-, R.F.25 12/6, R.F.26 25/-, Brand new with valves, carr. 2/6.

COLLARO RC/3554

3-speed single player with crystal turnover pick-up type "T." £6/19/6 carr. 3/6. Brand new in original carton.