# KOLSTER-BRANDES LIMITED

FOOTSCRAY SIDCUP KENT

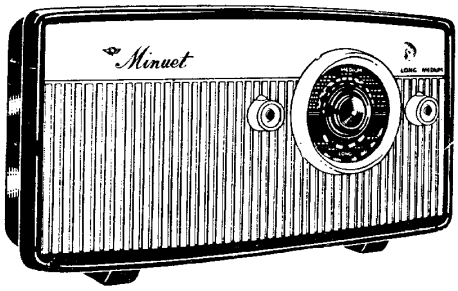


MODEL

# OB 10

## SERVICE DATA

ISSUED OCT., 1957




## SPECIFICATION

The OB.10 is a five-valve, two-waveband transportable receiver suitable for A.C. mains operation.

VOLTAGE RATING: 200–250 volts A.C. 40–100 c/s.

POWER CONSUMPTION: 36 watts.

WAVERANGES: Long waveband: 160–280 kc/s. (1,875–1,070 metres).
Medium waveband: 500–1,620 kc/s. (600–185 metres).

CONTROLS: Off/on and Volume.
Tuning.
Wavechange.

VALVE COMPLEMENT:

| | *Function.* |
|---|---|
| Brimar 6BE6 | Frequency Changer. |
| Brimar 6BJ6 | I.F. Amplifier. |
| Brimar 6AT6 | 2nd Detector and 1st Audio Amplifier. |
| Brimar 6AQ5 | Audio Output. |
| Brimar EZ80 | Rectifier. |

DIMENSIONS:

| | | |
|---|---|---|
| Width | 12·5 inches | (31·8 cms.) |
| Height | 6·5 inches | (16·5 cms.) |
| Depth | 4·5 inches | (11·4 cms.) |

WEIGHT: 5 lbs. approximately (2·3 kilos).

## GENERAL INFORMATION

This receiver is based on a printed circuit design and all components, other than the loudspeaker and output transformer, are mounted on a single flat plate printed board.

Aerial and earth terminals are not provided, as the design incorporates an 8-inch ferrite aerial unit with high-Q coils for long and medium wavebands.

## SETTING-UP PROCEDURE

1. Remove the three fixing screws holding the back moulding to the front panel. One of these is situated at the back in the carrying handle recess and two are underneath the base.
2. Set the mains voltage adjustment pin (situated on a panel attached to the mains transformer) to the correct position.
3. Check that all valves are firmly pressed into their sockets.
4. Replace back of cabinet and screw up.

## CIRCUIT DESCRIPTION

The aerial circuit consists of an 8-inch ferrite aerial unit with two windings. One is used for M.W. whilst the two in series give the L.W. inductance. $C_1$ (120 pF) is switched across the total inductance on L.W. to give aerial circuit tracking.



A single tapped oscillator coil circuit with cathode injection is used and on M.W. $C_5$ (390 pF) acts as padder and D.C. grid blocking condenser.

On L.W. $C_6$ (320 pF) is switched in parallel with the coil to give the correct coverage; i.e., after presetting the oscillator coil for M.W. no further adjustment is made for L.W.

The I.F. circuit is conventional with the detector circuit using $R_6$ (0·5 MΩ) as diode load and volume control. This is tapped and components $R_5$ and $C_{10}$ provide a bass compensation circuit giving bass lift at lower settings of the volume control.

A 6AQ5 is used as audio output with a tapped output transformer giving hum bucking with the use of $R_{12}$ (1·8 kΩ). $C_{15}$ (0·01 μF) gives fixed tone compensation.

The rectifier (EZ80) is fed from a separate heater winding to reduce heater cathode stress and the A.C. input to anode is via $R_{14}$ (75 Ω). This latter is a small wire wound type which will fuse under certain fault conditions.

$C_{17}$ (0·03 μF) removes modulation hum in conjunction with $R_{14}$.

## REMOVAL OF PRINTED CIRCUIT ASSEMBLY FROM CABINET

1. Remove cabinet back moulding by means of three screws:
   1—in carrying handle recess.
   2 and 3—underneath at either end.
2. The front plate, complete with circuit and loudspeaker, may now be withdrawn.
3. Remove knobs: Tuning—pull off.
   Volume and Wavechange switch—Grub screws.
4. Unscrew four fixing screws holding printed circuit to front plate:
   (Three cheese head 4BA; one drive screw 4BA).
   Note that two of these also clamp speaker to front plate.
5. The printed circuit assembly may now be removed from the front plate, leaving the leads to output transformer still connected for servicing.

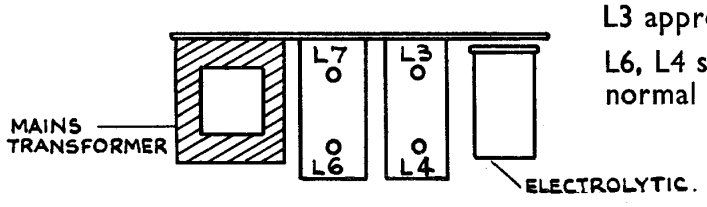
## ALIGNMENT INSTRUCTIONS

The following equipment will be required:

A. A.M. signal generator covering the range 140–1700 kc/s.

B. Power output meter.

1. Set the tuning pointer to datum with the gang condenser at maximum capacity.
2. Progressively reduce signal input as the sensitivity increases with alignment, maintaining approximately 50 mW output.
3. All measurements made with R.F. signal modulated 30% at 400 c/s.
4. The oscillator operates at a higher frequency than the input signal on both bands.
5. I.F. ALIGNMENT
   (*a*) Set generator to 422 kc/s and connect via 0·1 μF to the signal grid of $V_1$ 6BE6 (between gang condenser frame and aerial section).
   (*b*) Pre-set the I.F. transformer cores as follows:—




L3 approx normal position.

L6, L4 slightly unscrewed from normal position.

(*c*) Trim for maximum gain by adjusting cores in the following order: L7, L6, L3, L4.

(*d*) Readjust L6 for maximum.

No further adjustment should be made without complete re-alignment.



6. R.F. ALIGNMENT

(*a*) Connect the signal generator to a shielded test coil (twelve turns of P.V.C. insulated connecting wire on a 2-inch diameter former) situated axially in relation to the aerial coils on the ferrite rod. This is necessary as no aerial or earth terminals are provided.

(*b*) The following operations should be carried out in the order indicated, being repeated as necessary, until scale accuracy with maximum sensitivity is attained.

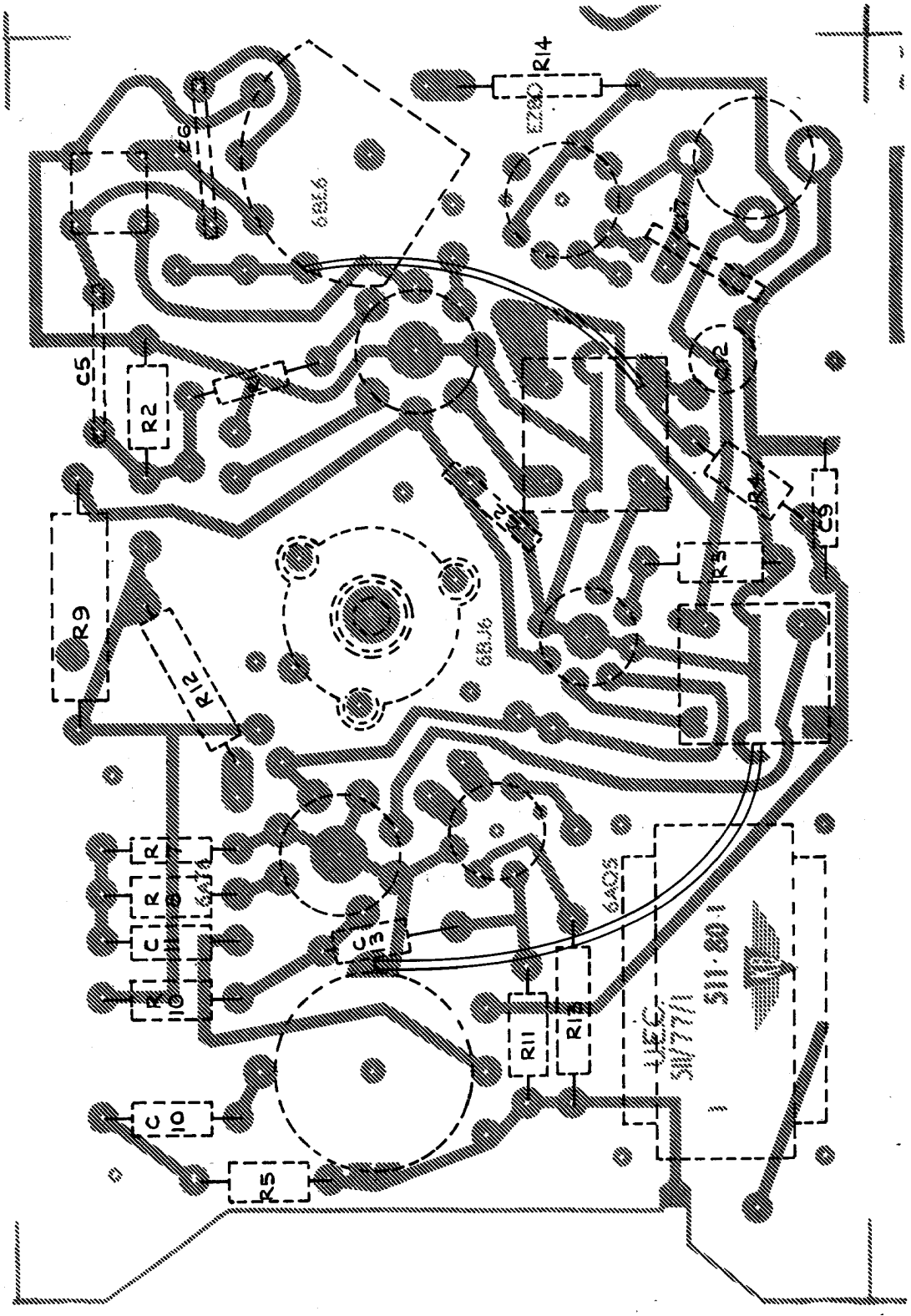
| Operation. | Input Frequency. | Waveband. | Pointer Position. | Adjustment. |
|---|---|---|---|---|
| 1 | 600 kc/s. | M.W. | 500 M. | Osc. core L5 and move M.W. aerial coil on ferrite rod to position of maximum gain. |
| 2 | 1400 kc/s. | M.W. | 214 M. | Osc. trimmer T2. Aerial trimmer T1. |
| 3. | Repeat operations 1 and 2. | | | |
| 4. | 225 kc/s. | L.W. | 1333 M. | Move L.W. aerial coil, on ferrite rod, to the position of maximum gain. |

The gang condenser should be rocked for maximum gain whilst adjusting the aerial trimmer.

## COIL AND TRANSFORMER DATA

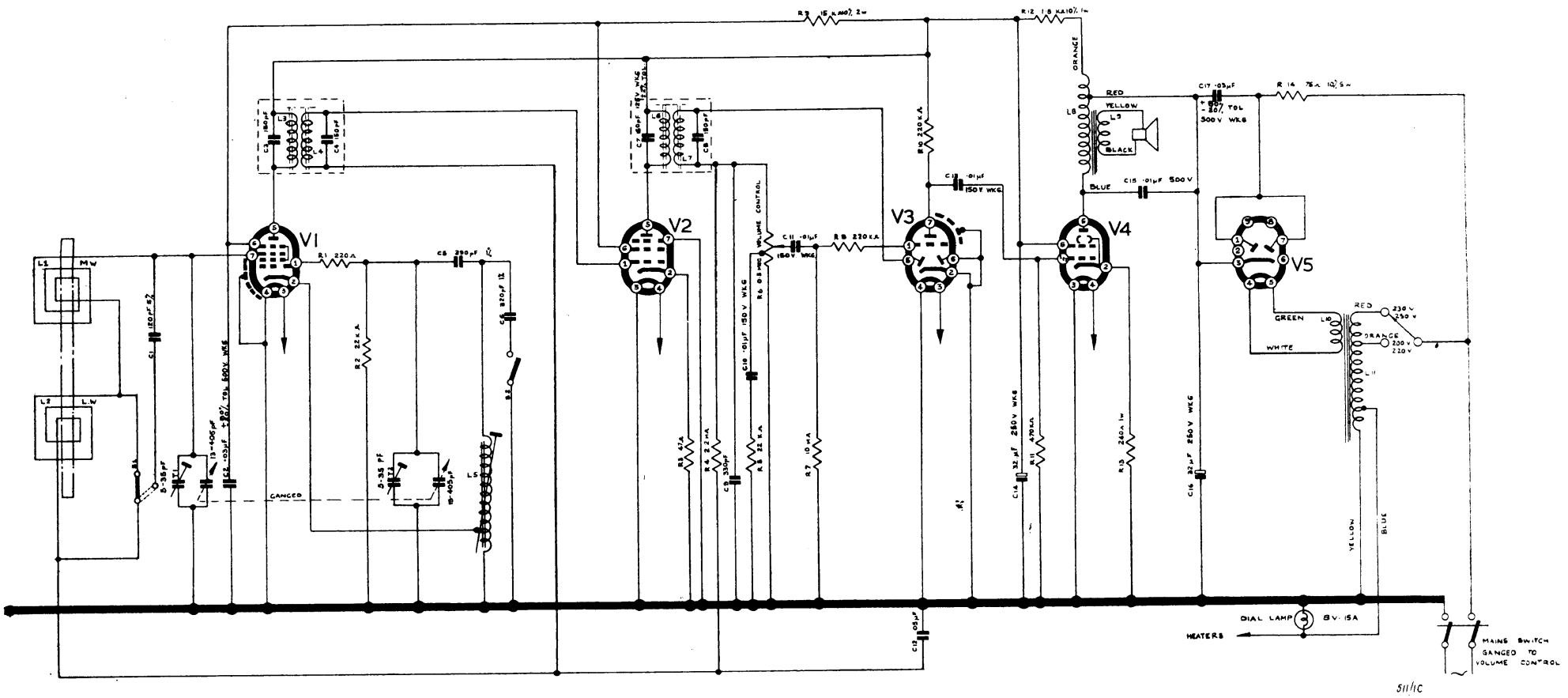
| Circuit Ref. No. | Function | Approximate Resistance in ohms. |
|---|---|---|
| L.1 | M.W. Aerial ... ... ... ... ... ... ... ... ... ... ... | 1·2 |
| L.2 | L.W. Aerial ... ... ... ... ... ... ... ... ... ... ... | 3·4 |
| L.3, 4, 6, 7 | I.F. Coil 1 and 2. Both windings ... ... ... ... ... ... ... ... | 8·5 |
| L.5 | Oscillator Coil ... ... ... ... ... ... ... ... ... ... ... | 6·0 |
| L.10, 11 | Mains Transformer—Primary (Total) ... ... ... ... ... ... ... | 180 |
| | L.T.1 ... ... ... ... ... ... ... ... ... ... ... ... | Less than 1 |
| | L.T.2 ... ... ... ... ... ... ... ... ... ... ... ... | 1·3 |

## PRINTED CIRCUIT

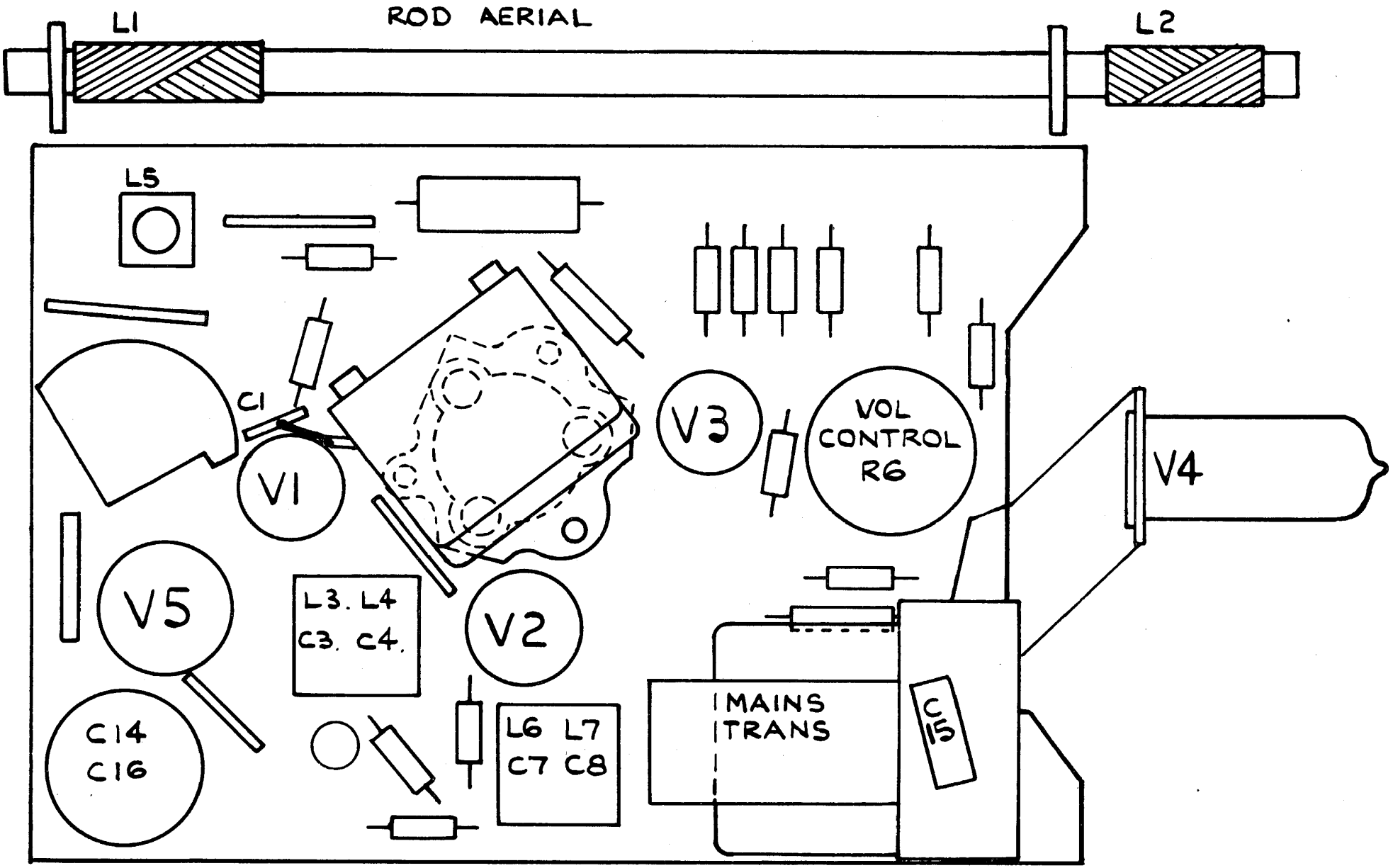


# CIRCUIT DIAGRAM

V1 6BE6 V2 6BJ6 V3 6AT6 V4 6AQ5 V5 EZ 80



# TOP VIEW OF CHASSIS



# VOLTAGE CHART

Valve Pin Voltages measured with a Voltmeter having 1,000 Ohms/Volt Impedance

| VALVE | CIRCUIT REFERENCE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 6BE6 | Frequency Changer | SN | 0 | 6·3 A.C. | 0 | 224 | 82 | SN | — | — |
| 6BJ6 | I.F. Amplifier ... | SN | 0·5 | 0 | 6·3 A.C. | 224 | 82 | 0 | — | — |
| 6AT6 | Detector and Audio Amp. | SN | 0 | 6·3 A.C. | 0 | SN | 0 | 65 | — | — |
| 6AQ5 | Output ... ... | 0 | 10 | 0 | 6·3 A.C. | 248 | 224 | 0 | — | — |
| EZ80 | Rectifier ... ... | 228 A.C. | — | 263 | * | * | — | 228 A.C. | — | — |

E—Denotes Chassis connection.

SN—Denotes Slightly Negative.

All measurements taken with controls set for minimum gain and no applied signal.

Power Input 240V. into 230/250 tap.

Pointer at datum on M.W.

| | | |
|---|---|---|
| Smoothing Electrolytics ... | C 16, 32 mF. | C 14, 32 mF. |
| D.C. Voltage ... ... ... | 263 | 224 |
| Hum Voltage ... ... ... | 9·5 | 0·5 |
| Smoothing Resistors ... ... | R. 12, 1·8 K. | R. 9, 15 K. |
| Voltage Drop ... ... ... | 37 | 134 |

Mains Input Current 150 mA.

Total H.T. Current 60 mA.

Filament Current —

Power Output 2 Watts for 10% Distortion.

Power Supply Range 200-250V. 40-100 c/s.

Power Consumption 36 Watts.

* 6·3 Volts A.C. between Pins 4 and 5.

N.B.—Printed Circuit Receiver and hence all measurements between H.T.—ve and relevant Valve Pins.

## IMPORTANT

This Receiver uses BRIMAR Valves and was specifically designed around them.

Its performance may be impaired unless BRIMAR Valves of the correct types are used when replacements are needed.

MODEL OB10

# SPARES LIST

**Prices are subject to alteration without notice.**

| Component | Colour Code | Circuit Ref. | Part No. | Price |
|---|---|---|---|---|
| Cabinet Front Assy. | | | 511/12 | 11/6 |
| Cabinet Back | | | 511/222 | 12/6 |
| **COILS :—** | | | | |
| Rod Aerial Assy. | | L1, L2 | 511/130 | 10/6 |
| Oscillator Coil Assy. | | L5 | 511/23 | 2/3 |
| I.F. Coil Assy. | | L3, L4, L6, L7 | 511/50 | 6/– |
| **CONDENSERS :—** | | | | |
| Elec. 32+32 μF. 250V. | | C16, 14 | KEM 112 | 4/9 |
| 120 pF. ± 5% 350V. | | C1 | KST 88 | 1/– |
| 320 pF. ± 1% 350V. | | C6 | KST 240 | 1/– |
| 330 pF. 500V. | | C9 | KC 21 | 1/– |
| 390 pF. ± 10% 350V. | | C5 | KST 239 | 1/– |
| ·01 μF. 150V. | | C13, 11, 10, 15 | KPM 19/B | 1/– |
| ·03 μF. + 80% — 20% 500V. | | C2, C17 | KC 113 | 1/– |
| ·05 μF. 350V. | | C12 | KT 47/A | 1/– |
| Dial Assy. | | | 511/152 | 5/3 |
| Dial Lamp 8V. ·15 Amp. | | | 511/205 | 1/6 |
| Ganged Condenser | | | 511/210 | 12/– |
| Knob Assy. | | | 511/151 | 2/– |
| **POTENTIOMETER** | | | | |
| ½ MΩ Lin. | | R6 | P504S17F | 6/– |
| **RESISTORS :—** | | | | |
| 47 Ω ½W. | | R3, 8 | R470HE | 1/– |
| 220 Ω ½W. | | R1 | R221HE | 1/– |
| 240 Ω 1W. | | R13 | R241HFT | 1/– |
| 1·8 KΩ ± 10% 1W. | | R12 | R182FF/T | 1/– |
| 15K Ω ± 10% 2W. | | R9 | R153FHT | 1/– |
| 22 KΩ ½W. | | R2, 5 | R223HE | 1/– |
| 220 KΩ ½W. | | R10 | R224HE | 1/– |
| 470 KΩ ½W. | | R11 | R474HE | 1/– |
| 2·2 MΩ ½W. | | R4 | R225HE | 1/– |
| 10 MΩ ½W. | | R7 | R106HE | 1/– |
| 75 Ω W.W. | | R14 | 511/211 | 1/– |
| Switch Wavechange | | | 511/203 | 4/4 |
| Speaker Assy. | | L8, L9 | 511/250 | 25/– |
| **TRANSFORMER:—** | | | | |
| Mains | | L10, L11 | 511/85 | 18/– |