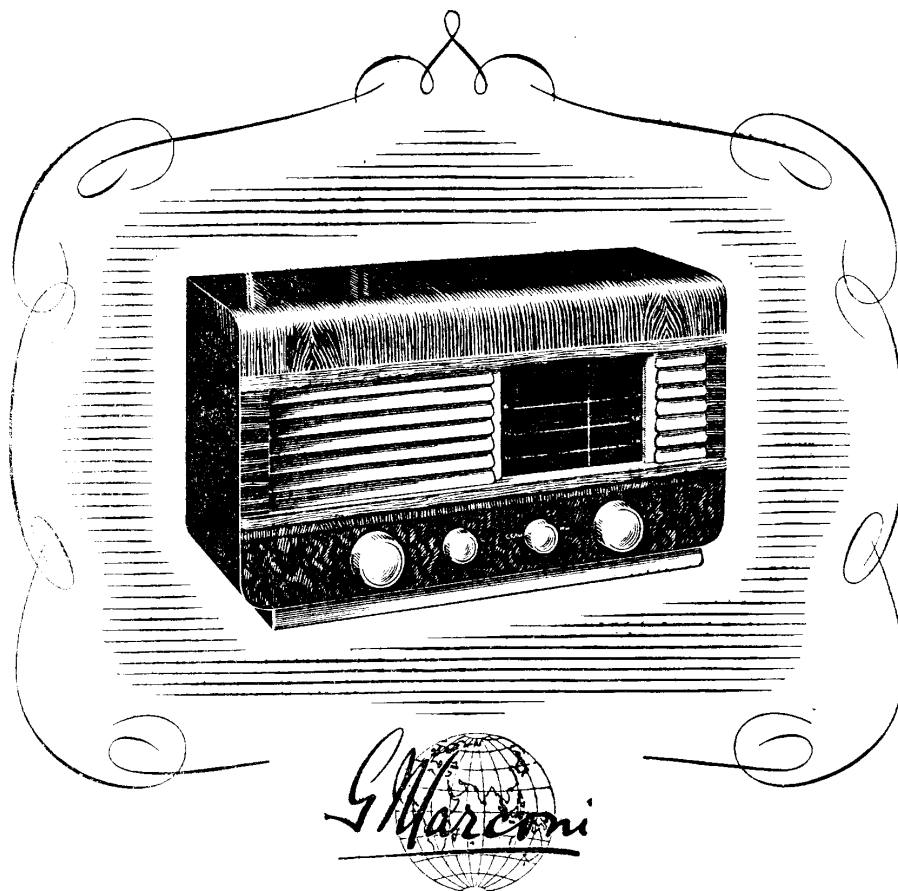


# MARCONIPHONE



## SERVICE MANUAL

Models 7207 and 7208 for A.C. Mains

5-valve Superhet Table Receiver

MADE IN ENGLAND

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# MODELS 7207 and 7208

In view of the similarities and for convenience of description, this Manual deals with the above two models. Unless otherwise stated, all details apply to both.

## SPECIFICATION

### Physical.

Height	.. ..	11 $\frac{3}{4}$ inches (29.8 cms.)	} Overall.
Width	.. ..	21 inches (53.4 cms.)	
Depth	.. ..	9 inches (22.9 cms.)	
Net Weight	.. ..	23 lbs. (10.43 kgs.)	

### Mains Supply and Consumption.

Both models have two alternative chassis. One operates between 100 and 130 volts and the other between 200 and 250 volts, 40 to 100 cycles A.C.

Consumption—40 watts.

### Wave Ranges.

#### Model 7207.

S.1.	.. ..	13.5–45 metres (22.22–6.67 Mc/s.).
S.2.	.. ..	45–150 metres (6.67–2.0 Mc/s.).
M.	.. ..	195–565 metres (1,539–531 kc/s.).

#### Model 7208.

S.	.. ..	16–50 metres (18.75–6.0 Mc/s.).
M.	.. ..	195–570 metres (1,539–526.3 kc/s.).
L.	.. ..	750–1,950 metres (400–153.9 kc/s.).

### Intermediate Frequency.

465 kc/s.

### Valves and Lamps.

#### Marconi:

X61M	V1	Frequency Changer.
KTW61	V2	I.F. Amplifier.
DH63	V3	Detector, A.V.C. and L.F. Amplifier.
KT61	V4	Output.
U50	V5	Rectifier.

Three Scale Lamps, 6.5 volts, 0.5 amps.

### Rated Output.

4.0 watts (approximately).

### Loudspeaker.

This is a 6 $\frac{1}{2}$ -inch permanent magnet, moving coil loudspeaker. The speech coil has a D.C. resistance of 2.5 ohms.

### Pick-Up.

A high resistance pick-up or record player may be connected to the sockets provided. The Volume and Tone Controls are operative on gramophone.

## CIRCUIT DESCRIPTION

### Frequency Changer.

The aerial input is taken via a series I.F. filter to the permeability tuned H.F. transformers, which have mica-dielectric trimmers across their secondary windings, these windings being tuned by one section (VC1) of the ganged condenser.

The triode section of the frequency changer, V1 (X61M), has a tuned grid circuit which is inductively coupled on the short wave and medium wave bands and capacity coupled on the long wave band (Model 7208). An inductively tuned I.F. transformer (IFT1) couples the hexode anode of this valve to the grid of V2.

### I.F. Amplifier.

This valve, V2 (KTW61), amplifies at the intermediate frequency of 465 kc/s. A second inductively tuned iron-dust cored I.F. transformer (IFT2) couples this valve to the detector.

### Detector, A.V.C. and L.F. Amplifier.

The double-diode-triode valve, V3 (DH63), has one diode used as detector and the other as A.V.C. rectifier. The volume control (VR1) forms the signal diode load and I.F. and R.F. filtering is effected by C16, R5.

The rectified voltage across R10 is applied as A.V.C. bias to the grids of V1 and V2, and is decoupled by R6 and C19. The L.F. signals from VR1 are applied to the grid of the triode section of this valve. The anode of the triode section is resistance-capacity coupled to the output valve V4.

### Output.

The output valve, V4 (KT61), feeds the loudspeaker via the output transformer (T1). The cathode of this valve is biased by R13, and a measure of negative feedback is introduced. Variable tone control is derived by VR2.

### H.T. and L.T. Supplies.

The H.T. supply is taken from the full-wave rectifier, V5 (U50), and is choke-capacity smoothed by CK, C25; the reservoir condenser being C26.

The L.T. supply is taken from a separate winding on the mains transformer (T2), the scale lamps being in parallel across this winding.

### Gramophone.

For gramophone operation, the waveband switch (S1) connects the record player sockets across VR1. In the "Gram" position of S1, the H.T. supply to V1 and V2 is disconnected.

## INSTALLATION

The model and serial number of the receiver can be found on the label fitted inside the cabinet on the right-hand side.

### *The Aerial and Earth.*

To obtain the maximum sensitivity from this receiver, erect a high outside aerial 60 to 80 feet total length, as far as possible away from walls, trees, gutters, etc. Point the aerial towards any potential source of interference, such as overhead trolley or power lines, or any roadway carrying heavy motor traffic. An adequate lightning switch should be fitted.

It is essential that an efficient earth is provided. A copper plate or rod, buried about three feet deep in moist ground provides a good earth, or alternatively, connection can be made to a rising water main pipe. Never use a telephone earth, or a hot water or gas pipe as an earth. Two plugs are provided for fitting to the aerial and earth leads.

### *Mains Supply.*

Before connecting to the supply, it is essential to ascertain that the receiver is of the correct voltage rating.

BOTH models 7207 and 7208 are available in two different ranges, one for operation on 100 to 130 volts, and the other for operation on 200 to 250 volts. The voltage ranges are marked on the Voltage Adjustment Panel, at the rear of the receiver.

The ranges are as follows:—

100–130 volts Model—100 to 110 volts, 110 to 120 volts, 120 to 130 volts.

200–250 volts Model—200 to 210 volts, 220 to 230 volts, 240 to 250 volts.

Remove the back panel (screw fixing), insert the Voltage Adjustment Screw in the socket with the voltage markings nearest to that of the supply.

**IMPORTANT.**—The mains voltage is best ascertained by direct measurement at the customer's premises. Do not connect mains supply until the remaining adjustments are completed.

### *Valves.*

Make certain that the Marconi valves are firmly inserted in their correct positions, and that the leads are properly connected.

When removing or refitting a valve, always use a vertical movement and never use force.

### *Final Connections.*

Replace the back panel, plug the aerial and earth leads into their appropriate sockets and connect the mains supply.

## DISMANTLING

### *Removal of Chassis.*

1. Disconnect the receiver entirely from the mains, remove the aerial and earth plugs.
2. Remove the back panel (seven screws).
3. Remove the four control knobs (screw fixing).
4. Remove the two wood screws from the tops of the wavescale supports.
5. Take out the four chassis fixing bolts from underneath the cabinet.
6. Withdraw the chassis.

### *Note:—*

1. For replacement of valves, etc., and for minor adjustments, the chassis need not be removed from the cabinet. To obtain access, carry out operations 1 and 2 above, then remove inspection panel from beneath the cabinet (three screws).
2. For replacement of scale lamps and ganging it is necessary to remove the chassis.
3. It is not normally necessary to remove the loudspeaker from the cabinet as sufficient length of lead is provided. If it is required to remove the loudspeaker, the four nuts securing it should be removed and the loudspeaker withdrawn.

## H.F. ADJUSTMENTS

### *General.*

If the I.F. circuits have been disturbed, complete I.F. and R.F. alignment must follow. All wavebands may be reganged without affecting the other bands.

The oscillator tracks at a higher frequency than the signal on all wavebands.

Whilst ganging, the input to the receiver must be progressively reduced as the circuits are brought into line so that the output does not exceed 500 mW (1.4 volts across speech coil).

An A.C. voltmeter (rectifier type), connected across the loudspeaker speech coil, may be used as an output meter.

### *Intermediate Frequency.*

Set Waveband Switch to M., the Volume and Tone Controls fully clockwise and gang condenser at maximum capacity (plates fully interleaved).

1. Inject a modulated signal at 465 kc/s, via a 0.01 mfd.

condenser, into the grid of V2 and chassis (leaving grid connection made).

2. Adjust cores L11, L10 in that order for maximum output.

3. Inject a modulated signal at 465 kc/s, via a 0.01 mfd. condenser, into the grid of V1 and chassis (leaving grid connection made).

4. Adjust cores L9, L8 for maximum output in that order.

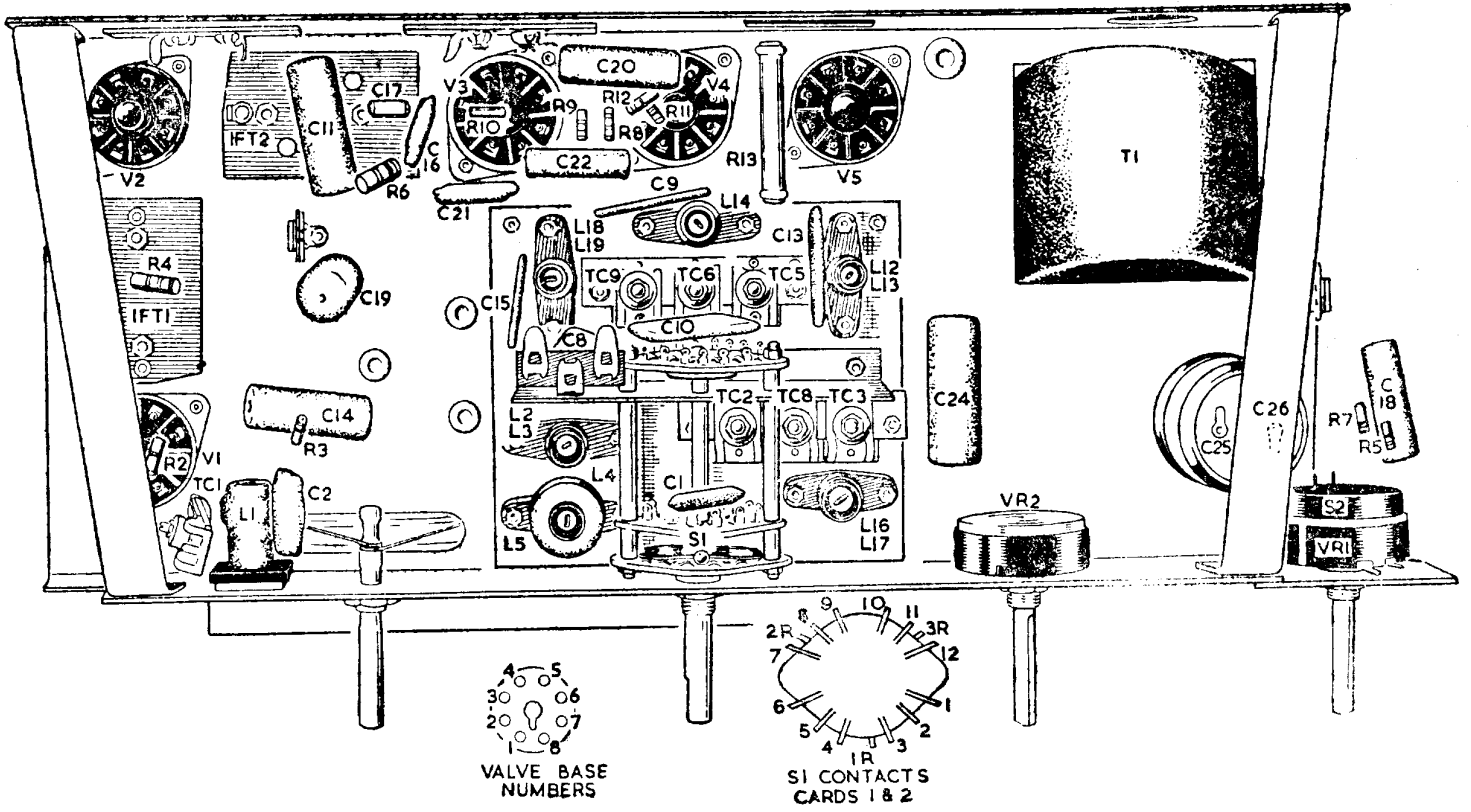
5. Inject a signal at 465 kc/s, via a M.W. dummy aerial, into the aerial and earth sockets.

6. Adjust TC1 for minimum output.

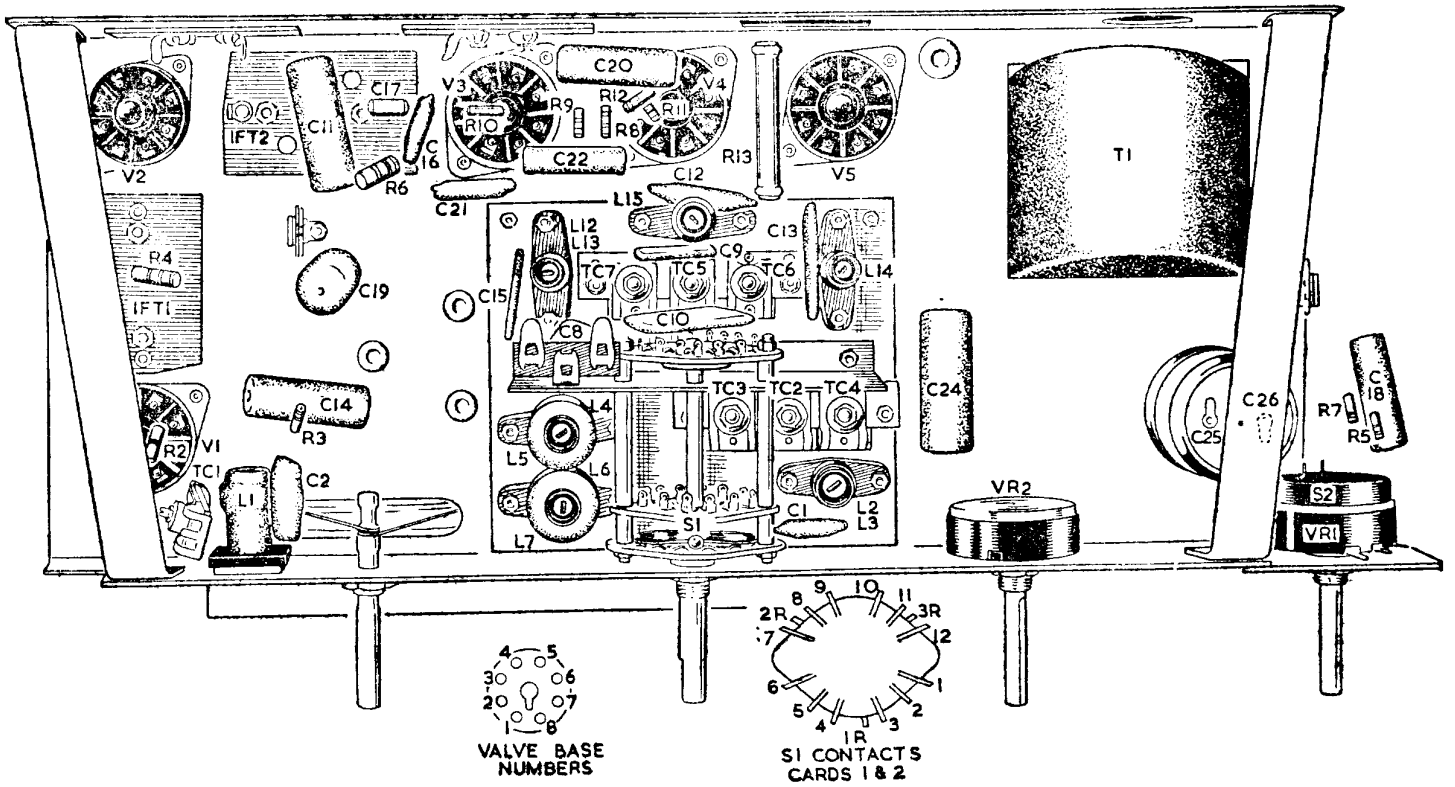
### *Pointer Calibration.*

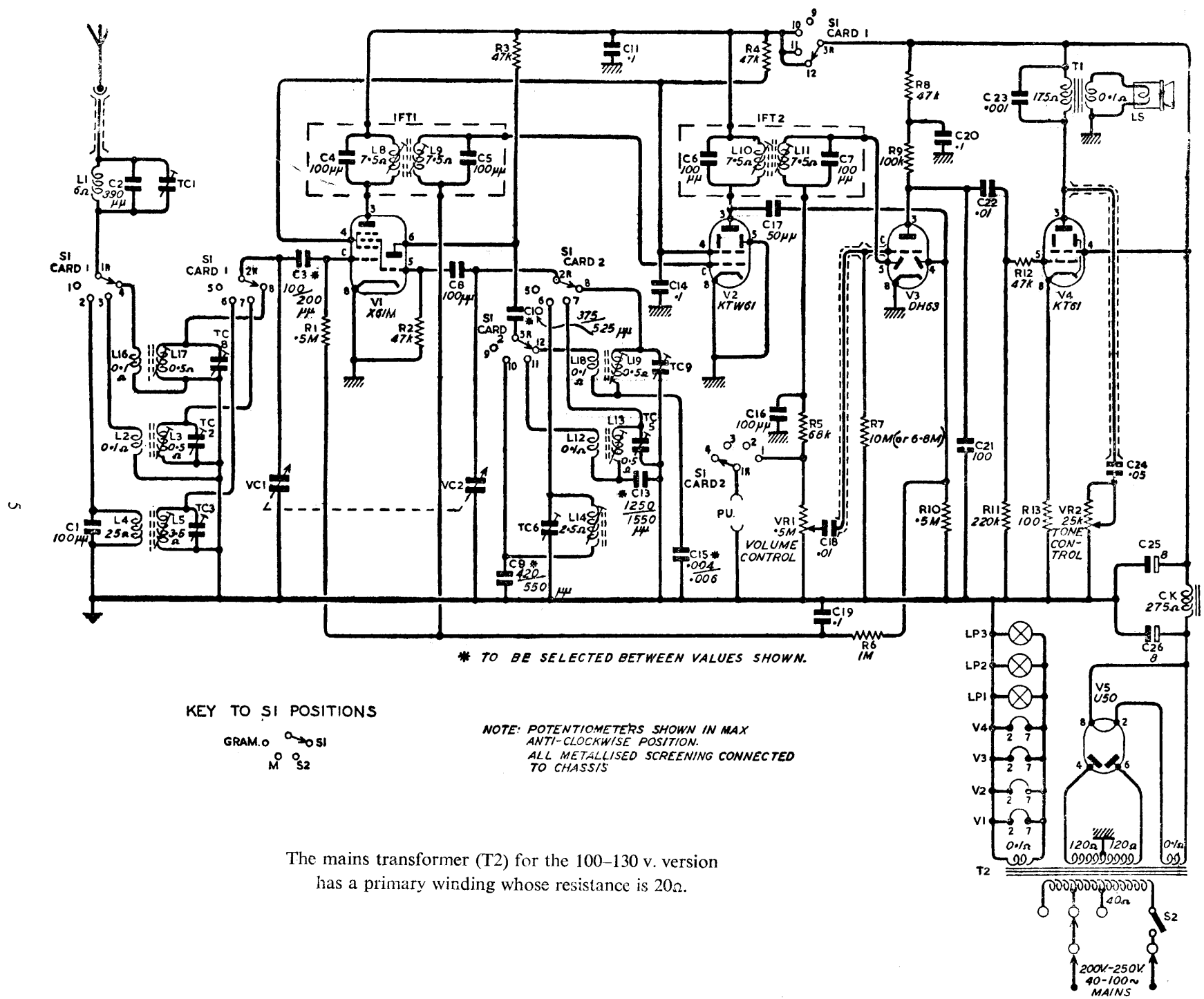
Set gang condenser to minimum capacity. Check that right-hand edge of pointer is at left-hand end of scale markings. If adjustment is necessary, slacken the screw securing the drive wire to cursor and adjust. Tighten screw securely.

### Model 7207



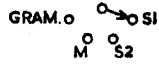
### Model 7208





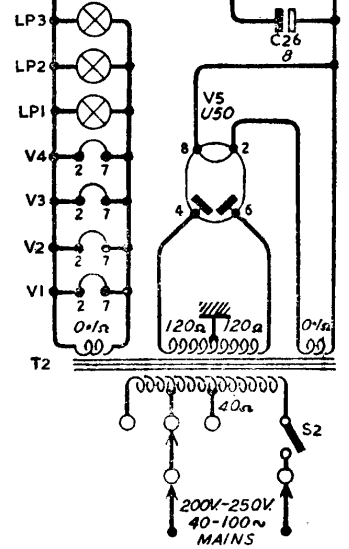
\* TO BE SELECTED BETWEEN VALUES SHOWN.

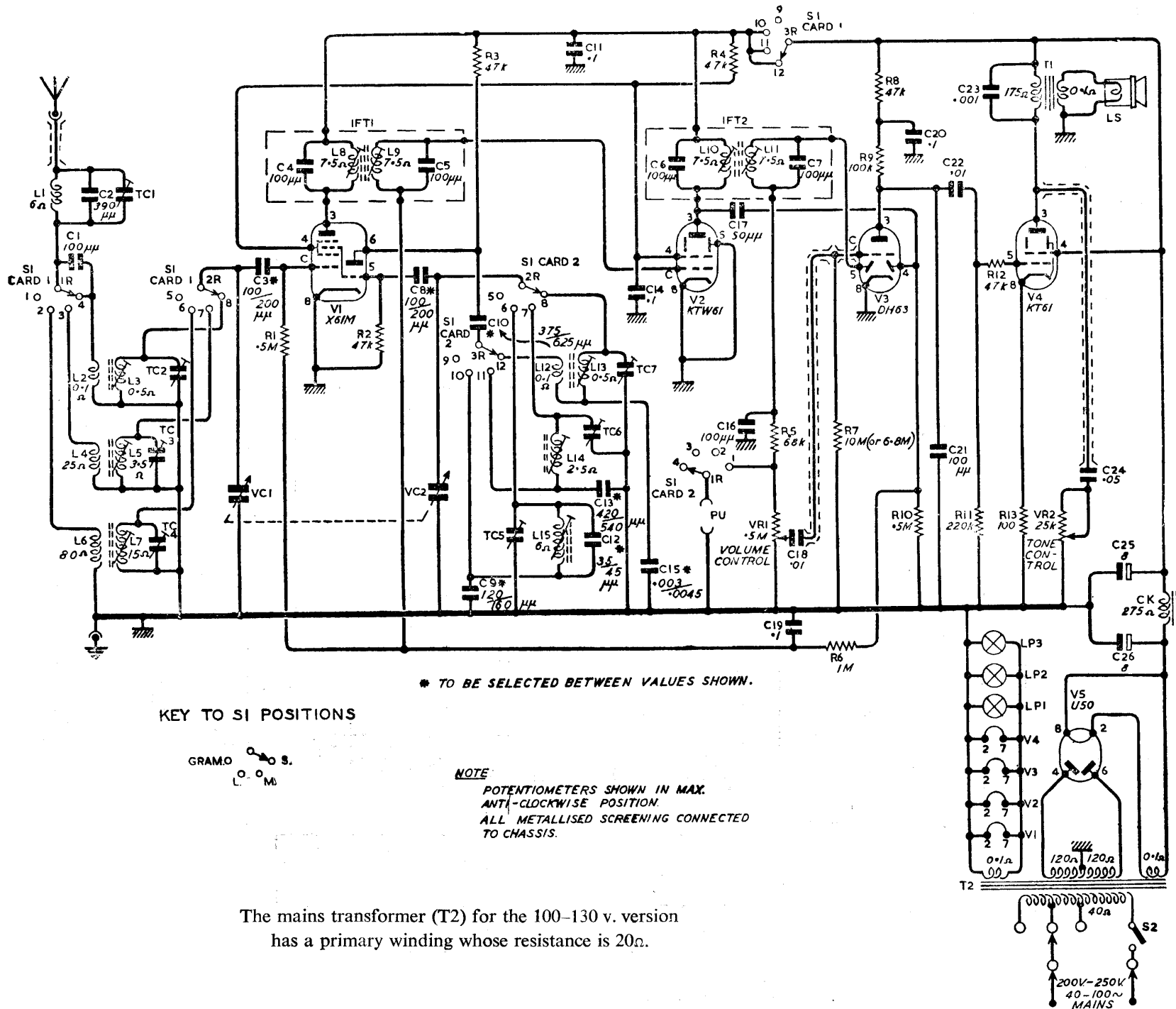
KEY TO SI POSITIONS



NOTE: POTENTIOMETERS SHOWN IN MAX ANTI-CLOCKWISE POSITION. ALL METALLISED SCREENING CONNECTED TO CHASSIS

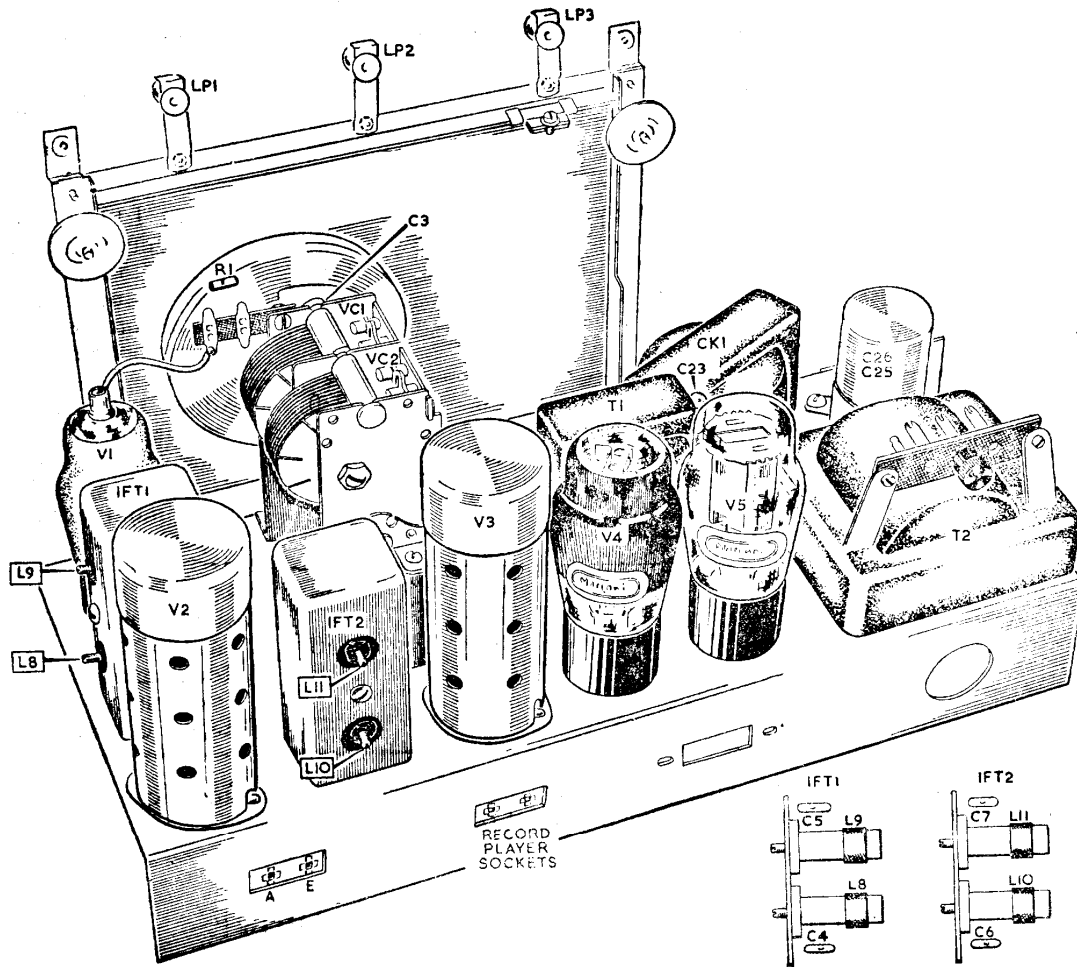
The mains transformer (T2) for the 100-130 v. version has a primary winding whose resistance is 20Ω.





Model 7208

# Models 7207 and 7208



## Radio Frequency.

Long Waves (Model 7208 only).

Set Volume and Tone Controls fully clockwise and Waveband Switch to L. Inject test signal into aerial and earth sockets via a L.W. dummy aerial.

Op. No.	Pointer Setting.	Tune Test Oscillator to		Operation.
		m.	kc/s.	
1	1,500 metres	1,500	200	Adjust L15, L7 in that order for maximum output. Tune TC5, TC4 in that order for maximum output. Repeat operations 1 and 2.
2	1,200 metres	1,200	250	
3	—	—	—	

## Medium Waves.

Controls as before, but with Waveband Switch set to M. M.W. dummy aerial to be used.

Op. No.	Pointer Setting.		Tune Test Oscillator to		Operation.
	m.	kc/s.	m.	kc/s.	
1	500	600	500	600	Adjust L14, L5 in that order for maximum output. Tune TC6, TC3 in that order for maximum output. Repeat operations 1 and 2.
2	200	1,500	200	1,500	
3	—	—	—	—	

### Short Waves.

Controls as before, but with Waveband Switch set as required. S.W. dummy aerial to be used.

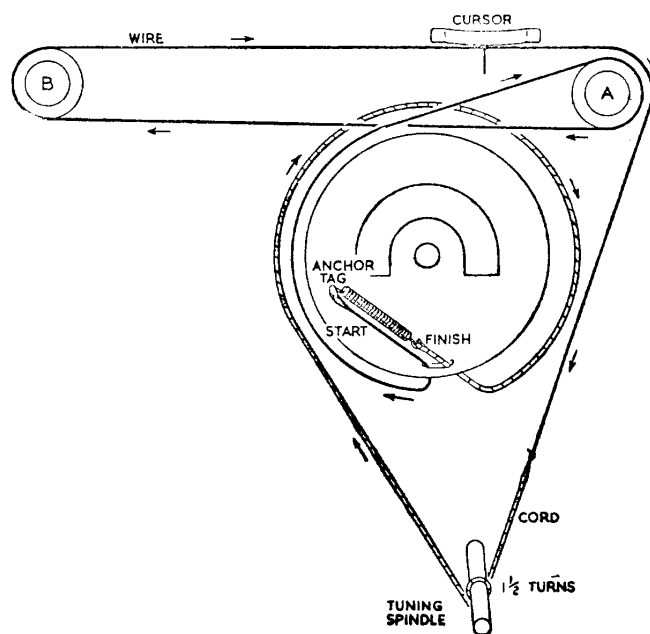
Waveband Switch Position.	Op. No.	Pointer Setting.		Tune Test Oscillator to		Operation.
		m.	Mc/s.	m.	Mc/s.	
S.2. (Model 7207 only)	1	—	7.0	42.87	7.0	Adjust L13, L3 in that order for maximum output. Tune TC5 for maximum output. Rock gang and tune TC2 for maximum output. Repeat operations 1, 2 and 3.
	2	—	22.0	13.64	22.0	
	3	—	22.0	13.64	22.0	
	4	—	—	—	—	
S.1. (Model 7207 only)	1	—	2.0	150	2.0	Adjust L19, L17 in that order for maximum output. Tune TC9 for maximum output. Rock gang and tune TC8 for maximum output. Repeat operations 1, 2 and 3.
	2	—	6.0	50	6.0	
	3	—	6.0	50	6.0	
	4	—	—	—	—	
S. (Model 7208 only)	1	50	6.0	50	6.0	Adjust L13, L3 in that order for maximum output. Tune TC7 for maximum output. Rock gang and tune TC2 for maximum output. Repeat operations 1, 2 and 3.
	2	16.6	18.0	16.6	18.0	
	3	16.6	18.0	16.6	18.0	
	4	—	—	—	—	

Note.—When adjusting S.W. oscillator trimmer condensers, set trimmer first to maximum capacity and unscrew to the second output peak. Then adjust for maximum output on this peak.

## CONDENSER AND POINTER DRIVE

Approximately 36 inches of wire and 20 inches of cord are used.

1. Remove the chassis from the cabinet (see page 3).
2. Remove the four screws securing the scale glass and backing plate to their supports, and slide glass and plate clear of pointer.
3. Form a loop in one end of the wire, approximately  $\frac{1}{8}$ -inch in diameter. (It will be found that the twisted part of the wire may readily be soldered).
4. Pass loop end of wire through hole in periphery of drum and fix on anchor tag as shown.
5. Take wire partly round drum and clockwise round pulley "A".
6. Take wire clockwise round pulley "B", back and over pulley "A".
7. Attach one end of cord to loose end of wire; form a loop in end of wire and solder, tie a knot in end of cord and fix with shellac.
8. Take cord one and a half turns clockwise round tuning spindle and almost a complete turn round drum.
9. Pass cord through hole in periphery of drum and assemble to anchor spring as shown; secure the knot with shellac.
10. Fix other end of spring to anchor tag.





## VALVE TABLE

The following table indicates the approximate voltage and current readings obtained on each valve when the receiver (200 to 250 volt Model) is connected to a 220 volt 50 cycle mains supply and is operating at a point of no reception on the M.W. band. Variations of  $\pm 15$  per cent. may be anticipated between models. Higher or lower mains voltage will naturally produce a corresponding variation in meter readings in approximate proportion to the change in mains supply.

A high resistance voltmeter should be used to measure voltages. Values stated below were obtained using a meter with a resistance of 500 ohms per volt.

Valve.	Anode.		Screen.		Cathode.	
	Volts to Chassis.	Current mA.	Volts to Chassis.	Current mA.	Volts to Chassis.	Current mA.
V1 (X61M) .. .. .	Mx.   Osc. 220   67	Mx.   Osc. 0·9   3·2	45	1·7	0	5·8
V2 (KTW61) .. .. .	220	6·1	45	1·5	0	7·6
V3 (DH63) .. .. .	73	0·7	—	—	0	0·7
V4 (KT61) .. .. .	214	34·0	220	5·0	3·7	39·0
V5 (U50) .. .. .	225 A.C.	—	—	—	235	—

Total H.T. volts (smoothed) 220 volts (D.C.)  
Total H.T. current 53·5 mA (D.C.)

Total A.C. current at mains lead 235 mA.  
Voltage across Choke (CK) 15 volts (D.C.)

Values given above will also apply to the 100 to 130 volt Model, when operating on a 110 volt 50 cycle mains supply, with the exception of the total A.C. current at mains lead which is 470 mA.

## SPARE PARTS LIST

A comprehensive Spare Parts List will be issued later.