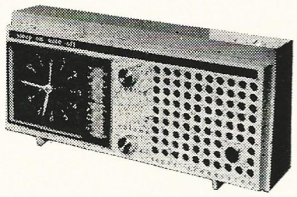
WESTINGHOUSE SERVICE MANUAL FOR MODEL W737CM

WESTINGHOUSE Factory Supervised Service

RADIO



ISSUED BY

EMAIL LIMITED

CONSUMER PRODUCTS DIVISION (SYDNEY)

Joynton Avenue, Waterloo. 69-0411

GENERAL DESCRIPTION

The model W737CM is a five transistor A.C. operated clock radio designed for the reception of the Medium Wave broadcasting band. The clock movement is a "Telechron", self-starting, synchronous type featuring press-button control of operations.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

Frequency Range ..... 525-1650 Kc/s.
Intermediate Frequency ..... 455 Kc/s.
Power Supply Rating .... 220-280 Volts A.C. at 50 c/s.

Power Consumption:

Clock ..... 3 watts
Radio ..... 3 watts

Loudspeaker:

4" 50258
V.C. Impedance ..... 120 ohms at 400 c.p.s.
Undistorted Power Output ..... 100 mW

Dimensions:

Height, 5¼"; Width, 12"; Depth, 3"; Weight, 4 lbs.

Transistor and Diode Complement:

AWV 2N1639 ..... Converter
AWV 2N1638 ..... 1st I.F. Amplifier
AWV 2N1638 ..... 2nd I.F. Amplifier
AWV 2N408 ..... Driver
AWV AS128 ..... Audio Output
AWV 1N87A ..... Overload Diode
AWV 1N87A ..... Detector Diode
AWV AS25 ..... Rectifier

Connection to Power Supply:

The receiver should not be connected to any circuit supplying other than 220-280 volts A.C. at a frequency of 50 c.p.s. For correct Mains Taps refer to the circuit diagram.

Dial Cord Replacement:

Fig. 1 shows the route of the dial cord and the method of attachment.

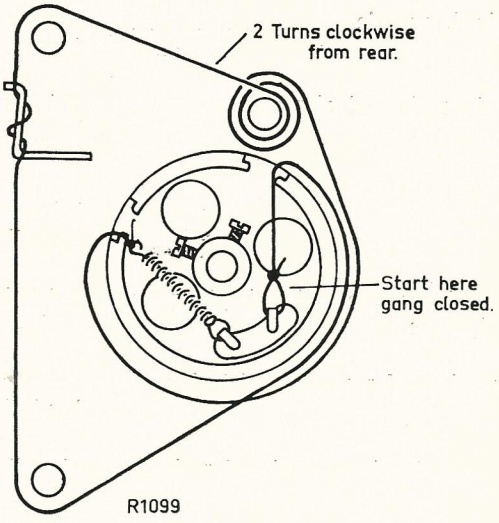


Fig. 1

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Chassis Removal:

Remove the front control knobs by pulling them straight off their spindles.

Unscrew the knurled nut from the clock Hand-set spindle.

Remove the moulded clip-on cover from the back of the cabinet to free the power cable.

Remove two screws from the base of the cabinet. The cabinet back may now be lifted clear of the front assembly.

Referring to Fig. 2, remove two screws marked "A", holding the clock cover to the cabinet front and remove the cover.

Disconnect the speaker leads and power transformer primary connections.

Remove four screws, marked "B", and lift the chassis from the cabinet front.

Replacement of the chassis is the reversal of the above procedure.

Clock Removal:

Remove 3 screws marked "C" and lift the clock assembly from the cabinet front.

Note: It is not intended that clock parts will be available as spares. Any clock requiring service will be handled by the existing service exchange arrangements.

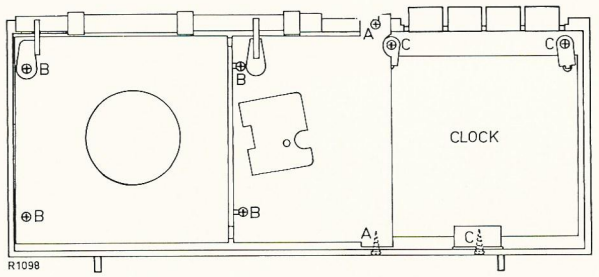


Fig. 2

READY REFERENCE CHART FOR CLOCK RADIO OPERATION

If you want to:	Then proceed as follows:
1. Use clock only	Plug into power point, set correct time with **Hand Set** spindle at rear. Press **Off** button.
2. Use as alarm clock only	Plug into power point, set correct time and alarm time with rear spindle. Turn **Volume** control to minimum and press **Auto** button.
3. Operate radio manually	Press **On** button, adjust **Tuning** and **Volume** controls. To switch off press **Off** button.
4. Use slumber music	Press **Off** button and depress **Sleep** button once (10 min.) twice ($\frac{1}{2}$ hour), three times ($\frac{3}{4}$ hour), four times (1 hour) for required music interval.
5. Wake to radio and alarm	Set **Volume** and **Tuning** controls. Set correct alarm time and press **Auto** button. When the alarm sounds, ten minutes after the radio switches on, it is stopped by pressing **On** or **Off** buttons, depending whether you wish to leave the radio on or not. Alternatively pressing **Sleep** button once, twice, etc., will silence the alarm for a further 10 minutes, $\frac{1}{2}$ hour, etc., while the radio remains on.
6. Use slumber music and wake to radio and alarm	Set **Volume** and **Tuning** controls. Set correct alarm time and press **Auto** button. Depress **Sleep** button as in 4 above.
7. Use earphone for personal listening	Operate radio as in 3 above and insert earphone into socket on right hand side of cabinet.

N.B.—If **Off** button is pressed and radio does not switch off press **Sleep** button until it does.

ALIGNMENT PROCEDURE

The receiver is tested by the manufacturer with precision instruments and all adjusting screws are sealed. Re-alignment should be necessary only when components in tuned circuits are repaired or replaced or when it is found that the seals over the adjusting screws have been broken. It is specially important that the adjustments should not be altered unless in association with the correct testing instruments listed below.

Under no circumstances should the plates of the ganged tuning capacitor be bent as the unit is accurately aligned during manufacture and can only be adjusted by skilled operators using special equipment.

For all alignment operations, keep the generator output as low as possible to avoid a.g.c. action and set the volume control in the maximum clockwise position.

Testing Instruments:

Signal Generator—modulated 400 c.p.s. or modulated oscillator.

If the modulated oscillator is used, connect a 0.22 megohm non-inductive resistor across the output terminals.

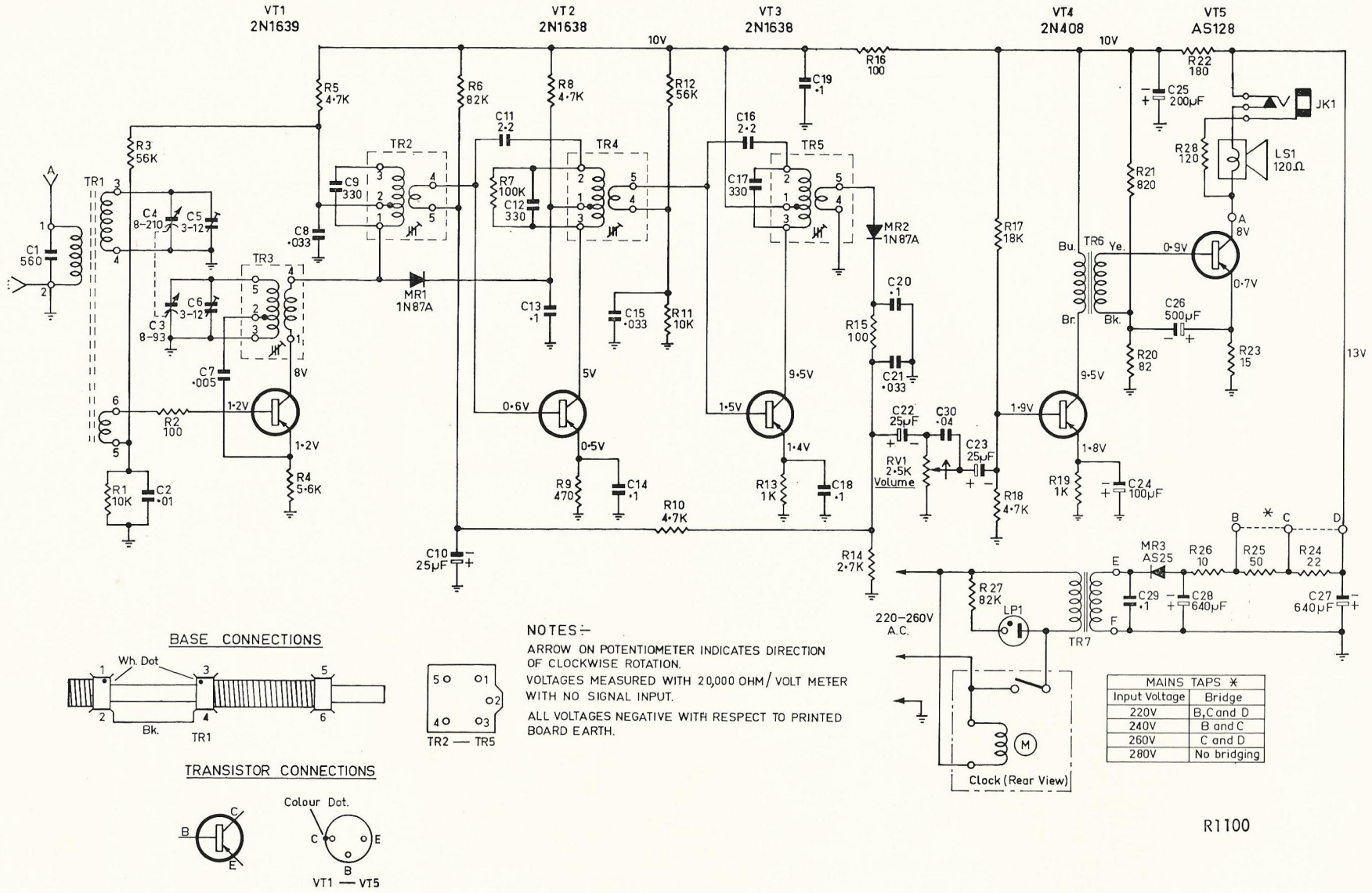
No output transformer is used in this receiver since the speaker has a 120 ohms voice coil and is connected directly to the collector of the output transistor. For output measurement, if an indication only is required, Output Meter type 2M8832, switched to 5000 ohms and connected to the output collector should be adequate. For correct reading of power output, an A.C. meter with neither probes earthed, connected to the output collector will measure the voltage across the 120 ohms load. The normal alignment level of 50 mW occurs when 2.5 volts is indicated on the A.C. voltmeter.

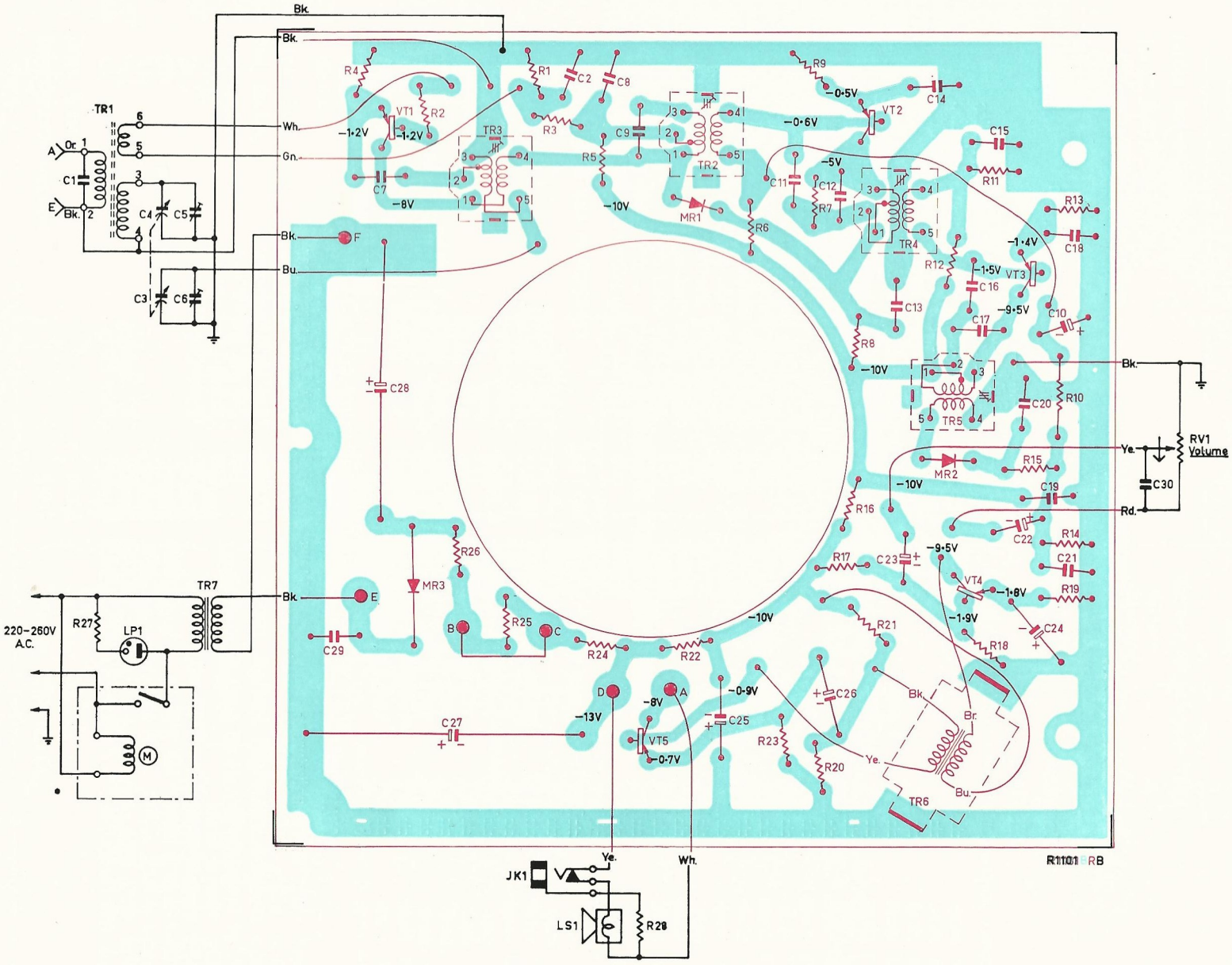
ALIGNMENT TABLE

ORDER	Connect "High" Side of Generator to:	Tune Generator to:	Tune Receiver to:	Adjust for Maximum Peak Output:
1	Aerial section of Gang.	455 Kc/s	Gang fully closed	Cores in TR5, TR4 and TR2
	Repeat adjustment until maximum output is obtained.			
2	Inductively coupled to Rod Aerial*	600 Kc/s	600 Kc/s	L.F. Osc. Core Adj. (TR3)‡
3	Inductively coupled to Rod Aerial*	1650 Kc/s	Gang fully open	H.F. Osc. Adj. (C6)
4	Inductively coupled to Rod Aerial*	1500 Kc/s	1500 Kc/s	H.F. Aer. Adj. (C5)
	Repeat adjustments 2, 3 and 4.			

* A coil comprising 3 turns of 16 gauge wire, about 12″ in diameter should be connected between the output terminals of the test instrument, placed concentric with the rod aerial and distant not less than 1 foot from it.

‡ Rock the tuning control back and forth through the signal.


VT1
2N1639
VT2
2N1638
VT3
2N1638
VT4
2N408
VT5
AS128
10V
10V
R16
100
R22
180
C25
200µF
JK1
R28
120
LS1
120Ω
R21
820
A
8V
0·9V
0·7V
TR6
Bu.
Ye.
Br.
Bk.
C26
500µF
R20
82
R23
15
13V
R17
18K
9·5V
1·9V
1·8V
R19
1K
C24
100µF
R5
4·7K
R6
82K
R8
4·7K
R12
56K
C19
·1
R3
56K
TR1
TR2
TR4
TR5
C11
2·2
C16
2·2
C9
330
C17
330
R7
100K
C12
330
MR2
1N87A
C4
8–210
C5
3–12
C6
3–12
C3
8–93
TR3
C8
·033
MR1
1N87A
C13
·1
C15
·033
R11
10K
C20
·1
R15
100
C21
·033
C22
25µF
C30
·04
C23
25µF
RV1
2·5K
Volume
R18
4·7K
C1
560
C7
·005
8V
1·2V
R2
100
1·2V
R4
5·6K
R1
10K
C2
·01
5V
0·6V
0·5V
R9
470
C14
·1
9·5V
1·5V
1·4V
R13
1K
C18
·1
R10
4·7K
C10
25µF
R14
2·7K
B
C
D
E
F
MR3
AS25
R26
10
R25
50
R24
22
R27
82K
LP1
C29
·1
C28
640µF
C27
640µF
220–260V
A.C.
TR7
M
Clock (Rear View)
BASE CONNECTIONS
Wh. Dot
1
2
3
4
5
6
Bk.
TR1
TR2 — TR5
TRANSISTOR CONNECTIONS
B
C
E
Colour Dot.
VT1 — VT5
NOTES:-
ARROW ON POTENTIOMETER INDICATES DIRECTION OF CLOCKWISE ROTATION.
VOLTAGES MEASURED WITH 20,000 OHM/VOLT METER WITH NO SIGNAL INPUT.
ALL VOLTAGES NEGATIVE WITH RESPECT TO PRINTED BOARD EARTH.
MAINS TAPS *
Input Voltage
Bridge
220V
B, C and D
240V
B and C
260V
C and D
280V
No bridging
R1100



Notes: The diagram represents the view from the wiring side of the printed board.
Red indicates components and leads mounted on the remote side of the board.
Black indicates those components and leads mounted on the wiring side or completely removed from the board.
All voltages shown are negative with respect to the board earth (positive terminal of the battery) and measured with no signal input and volume maximum clockwise using a 20,000 ohm/volt meter.
Blue indicates the printed wiring.

CIRCUIT CODE.

Code No.	Description	Part No.
	RESISTORS	
	All Resistors composition type unless otherwise stated	
R1	10K ohms ±10% ½ watt	612025
R2	100 ohms ±10% ½ watt	604031
R3	56K ohms ±10% ½ watt	615161
R4	5.6K ohms ±10% ½ watt	611293
R5	4.7K ohms ±10% ½ watt	610932
R6	82K ohms ±10% ½ watt	615795
R7	100K ohms ±10% ½ watt	616017
R8	4.7K ohms ±10% ½ watt	610932
R9	470 ohms ±10% ½ watt	606588
R10	4.7K ohms ±10% ½ watt	610932
R11	10K ohms ±10% ½ watt	612025
R12	56K ohms ±10% ½ watt	615161
R13	1K ohms ±10% ½ watt	608025
R14	2.7K ohms ±10% ½ watt	609862
R15	100 ohms ±10% ½ watt	604031
R16	100 ohms ±10% ½ watt	604031
R17	18K ohms ±10% ½ watt	613306
R18	4.7K ohms ±10% ½ watt	610932
R19	1K ohms ±10% ½ watt	608025
R20	82 ohms ±10% ½ watt	603810
R21	820 ohms ±10% ½ watt	607665
R22	180 ohms ±10% ½ watt	604915
R23	15 ohms ±10% ½ watt W.W.	602008
R24	22 ohms ±10% ½ watt W.W.	602318
R25	50 ohms ±10% ½ watt W.W.	602056
R26	10 ohms ±10% ½ watt W.W.	601106
R27	82K ohms ±10% ½ watt	615795
R28	120 ohms ±10% 1 watt	604366
RV1	2.5K ohms Curve S16 Volume	620779
	CAPACITORS	
C1	560pf ±5% 125VW polystyrene	224485
C2	0.01μf ±20% 200VW AEE W99	228609
C3	8-93pf tuning Oscillator)	
C4	8-210pf tuning Aerial) Assembly	39263
C5	3-12pf trimmer Aerial)	
C6	3-12pf trimmer Oscillator)	
C7	0.005μf ±20% 200VW AEE W99	226005
C8	0.033μf +80% —20% 25VW Hi-K disc	226741
C9	330pf ±5% N750 disc	223726
C10	25μf 3VW Electrolytic	229428
C11	2.2pf ±20% NPO disc	221494
C12	330pf ±5% N750 disc	223726
C13	0.1μf +80% —20% 25VW Hi-K disc	227074
C14	0.1μf +80% —20% 25VW Hi-K disc	227074
C15	0.033μf +80% —20% 25VW Hi-K disc	226741
C16	2.2pf ±20% NPO disc	221494
C17	330pf ±5% N750 disc	223726
C18	0.1μf +80% —20% 25VW Hi-K disc	227074
C19	0.1μf +80% —20% 25VW Hi-K disc	227074
C20	0.1μf +80% —20% 25VW Hi-K disc	227074
C21	0.033μf +80% —20% 25VW Hi-K disc	226741
C22	25μf 3VW Electrolytic	229428
C23	25μf 3VW Electrolytic	229428
C24	100μf 3VW electrolytic	229706
C25	200μf 12VW Electrolytic	229764
C26	500μf 2.5VW Electrolytic	229865
C27	640μf 16VW Electrolytic	229880
C28	640μf 16VW Electrolytic	229880
C29	0.1μf +80% —20% 25VW Hi-K disc	227074
C30	0.04μf ±20% 200VW AEE W99	228750
	TRANSISTORS AND DIODES	
VT1	AWV 2N1639	
VT2	AWV 2N1638	
VT3	AWV 2N1638	
VT4	AWV 2N408	
VT5	AWV AS128	
MR1	AWV 1N87A	
MR2	AWV 1N87A	
MR3	AWV 1N2858	
	TRANSFORMERS	
TR1	Ferrite Rod Aerial	52732
TR2	1st I.F. Transformer	52728
TR3	Oscillator Transformer	51636
TR4	2nd I.F. Transformer	51268
TR5	3rd I.F. Transformer	51270
TR6	Driver Transformer	52642
TR7	Power Transformer	52640
	MISCELLANEOUS	
LS1	4″ Speaker	50258
LP1	Pilot Lamp	64685

D.C. RESISTANCE OF WINDINGS

Item	D.C. Resistance in ohms
Ferrite Rod Assembly (TR1)	*
1st I.F. Transformer (TR2):	
Primary	1.5
Secondary	*
2nd I.F. Transformer (TR4):	
Primary	1.5
Secondary	*
3rd I.F. Transformer (TR5):	
Primary	1.5
Secondary	*
Oscillator Transformer (TR3):	
Primary	1.5
Secondary	*
Driver Transformer (TR6):	
Primary	180
Secondary	20
Power Transformer (TR7):	
Primary	1300
Secondary	14

* Less than 1 ohm.

The above readings were taken on a standard chassis, but substitution of materials during manufacture may cause variations and it should not be assumed that a component is faulty if a slightly different reading is obtained.

MECHANICAL REPLACEMENT PARTS

ITEM	PART No.
Cabinet, Back	64701
Cabinet Front, Assembly	64683/2
This contains:—	
Badge	65195
Cabinet, Front	64703
Fret, Cloth	64721
Gasket (6)	64730
Grille	64726
Nameplate	64087
Window	64704
Cover, Clock, Rear	64682
Dial, Backing	64712
Dial, Scale:—	
N.S.W.	37994A
Vic.	37994B
Qld.	37994C
S.A.	37994D
W.A.	37994E
Tas.	37994F
Drive, Drum	64700
Drive, Spindle Assembly	64717
Knob Assembly (2)	44538
Lamp, Retainer Assembly	64680
Plug, Button	64723
Pointer	64728
Press Button (4)	64722
Pulley, Post (2)	64711
Screw, Drive Drum	32816/1
Spring, Dial Cord	1741
Spring, Speaker Mounting (2)	44172
Support, Moulded, Ferrite Rod (Long)	64709
Support, Moulded, Ferrite Rod (Short)	64708
Variable Capacitor Mounting comprising:—	
Gang	39263
Grommet (3)	36826/2
Screw, 4BA x 5/16" Ch. Hd. (3)	714010
Spacer (3)	35923
Washer, 4BA I.T.L. (3)	921204
Washer, 4BA Plain (3)	13156

NOTE: When ordering spares, always quote the above Part Numbers, and in the case of coloured parts such as knobs, etc., also quote colour.