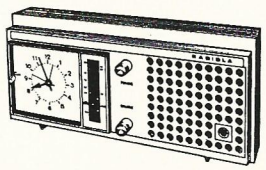
TECHNICAL INFORMATION AND SERVICE DATA

MANUFACTURERS AWA SUPERVISED SERVICE

Issued by Amalgamated Wireless (Australasia) Limited

AWA TRANSISTOR CLOCK RADIO

Model B78



GENERAL DESCRIPTION

The model B78 is a five transistor a.c. operated clock radio designed for the reception of the Medium Wave broadcasting band. The clock is a "Westclox" self starting, synchronous movement with simple controls.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

Frequency Range ..... 520-1650 kHz
Intermediate Frequency ..... 455 kHz
Power Supply Rating ..... 220-280 volts a.c. at 50 Hz

Power Consumption:
Clock ..... 3 watts
Radio ..... 3 watts

Loudspeaker:
4" 50258
V/C Impedance ..... 120 ohms at 400 Hz
Power Output ..... 100 mW

Dimensions:
Height ..... 5-9/32" (13.4 cms)
Width ..... 11-31/32" (30.3 cms)
Depth ..... 3-5/32" (8.0 cms)

Shipping Weight ..... 6 lb. (2.7 kgms)

Transistor and Diode Complement:
2N1639 ..... Converter
2N1638 ..... 1st I.F. Amplifier
2N1638 ..... 2nd I.F. Amplifier
2N408 ..... Driver
AS128 ..... Audio Output
1N87A/0A90 ..... Overload Diode
1N87A/0A90 ..... Detector Diode
AS25 ..... Rectifier

Connection to Power Supply:

The receiver should not be connected to any supply source other than AC in the range 220-280 volts and a frequency of 50 Hz.

For correct transformer tappings refer to the circuit diagram.

CLOCK RADIO OPERATION

Radio Manual:
Turn function switch to "ON" position then operate radio.

Radio Off:
Turn function switch on clock front to the "OFF" position.

To Set Time:
Pull rear knurled knob outwards and rotate to set the time hands.

Auto Setting:
Push the rear knurled knob inwards and rotate to adjust the AUTO (i.e. alarm) hand.

Auto Switch-On:
Set AUTO hand to the time that switch-on is desired. Turn the radio to the station desired at the time of switch-on and set volume. Turn function switch on the clock front to "AUTO" position.

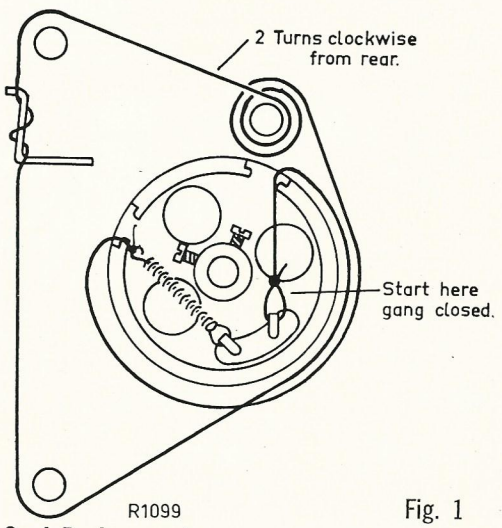
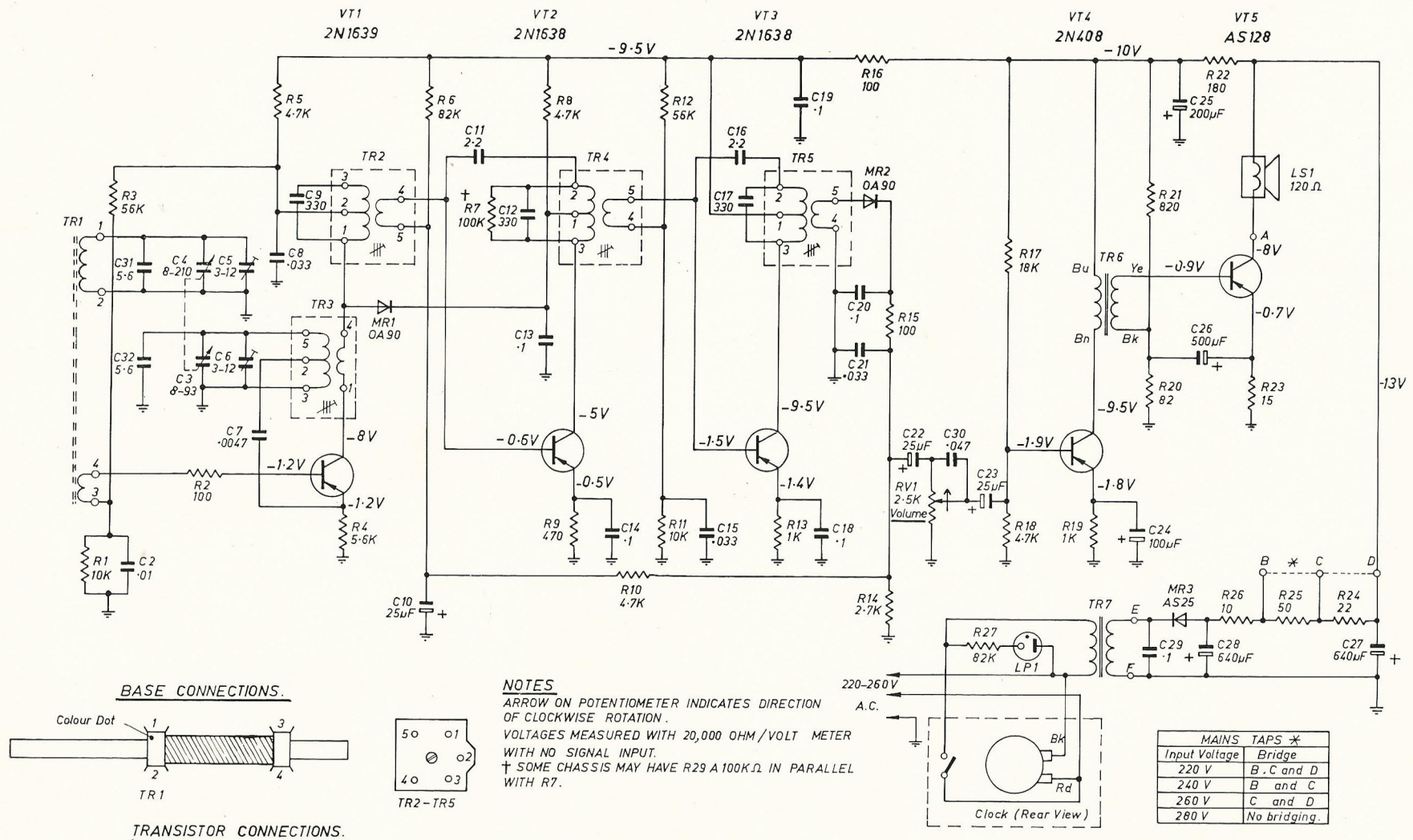


Fig. 1

Dial Cord Replacement:

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

AWA FIVE TRANSISTOR CLOCK RADIO — MODEL B78

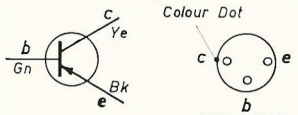


BASE CONNECTIONS.

TR1

TR2 – TR5

TRANSISTOR CONNECTIONS.



VT1 — VT5

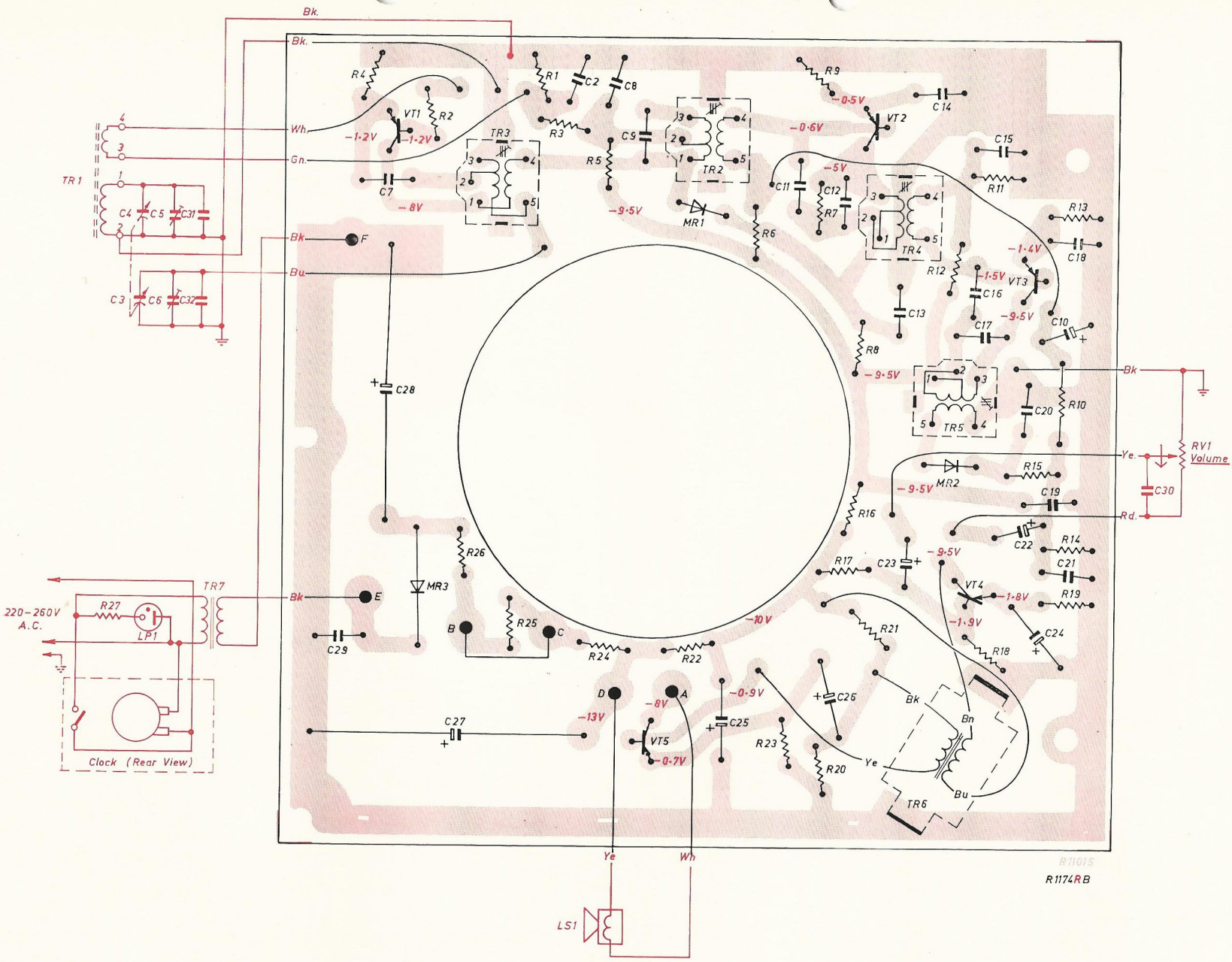
NOTES

ARROW ON POTENTIOMETER INDICATES DIRECTION OF CLOCKWISE ROTATION.

VOLTAGES MEASURED WITH 20,000 OHM/VOLT METER WITH NO SIGNAL INPUT.

† SOME CHASSIS MAY HAVE R29 A 100KΩ IN PARALLEL WITH R7.

MAINS TAPS *	
Input Voltage	Bridge
220 V	B, C and D
240 V	B and C
260 V	C and D
280 V	No bridging.



NOTES: The diagram represents the view from the wiring side of the printed board.
Stipple indicates the printed circuit.
Black indicates components mounted on remote side of board.
Red indicates components and leads mounted on wiring side or completely removed from the board.
All voltages shown are negative with respect to chassis earth and are measured with no signal input using 20,000 ohm/volt meter.

CODE No.	DESCRIPTION	PART No.

RESISTORS

All Resistors composition type unless otherwise stated.

R1	10K ohms	±10%	½ watt	
R2	100 ohms	±10%	½ watt	
R3	56K ohms	±10%	½ watt	
R4	5.6K ohms	±10%	½ watt	
R5	4.7K ohms	±10%	½ watt	
R6	82K ohms	±10%	½ watt	
R7	100K ohms	±10%	½ watt	
R8	4.7K ohms	±10%	½ watt	
R9	470 ohms	±10%	½ watt	
R10	4.7K ohms	±10%	½ watt	
R11	10K ohms	±10%	½ watt	
R12	56K ohms	±10%	½ watt	
R13	1K ohms	±10%	½ watt	
R14	2.7K ohms	±10%	½ watt	
R15	100 ohms	±10%	½ watt	
R16	100 ohms	±10%	½ watt	
R17	18K ohms	±10%	½ watt	
R18	4.7K ohms	±10%	½ watt	
R19	1K ohms	±10%	½ watt	
R20	82 ohms	±10%	½ watt	
R21	820 ohms	±10%	½ watt	
R22	180 ohms	±10%	½ watt	
R23	15 ohms	±10%	½ watt W.W.	
R24	22 ohms	±10%	½ watt W.W.	
R25	50 ohms	±10%	½ watt W.W.	
R26	10 ohms	±10%	½ watt W.W.	
R27	82K ohms	±10%	½ watt	
R28	Not used.			
R29	100K ohms	±10%	½ watt	
RV1	2.5K ohms curve S16, Volume			620805

CAPACITORS

C1	Not used.		
C2	0.01μF ±10% 100VW polyester		
C3	8-93pF Tuning Oscillator	Assembly	39263
C4	8-210 Tuning Aerial		
C5	3-12pF Trimmer Aerial		
C6	3-12pF Trimmer Oscillator		
C7	0.0047μF ±10% 100VW polyester		
C8	0.033μF +80% —20% 25VW Hi-K disc		
C9	330pF +10% —7½% N750 disc		
C10	25μF 3VW Electrolytic		229428
C11	2.2pF ±20% NPO disc		
C12	330pF +10% —7½% N750 disc		
C13	0.1μF +80% —20% 25VW Hi-K disc		
C14	0.1μF +80% —20% 25VW Hi-K disc		
C15	0.033μF +80% —20% 25VW Hi-K disc		
C16	2.2pF ±20% NPO disc		
C17	330pF +10% —7½% N750 disc		
C18	0.1μF +80% —20% 25VW Hi-K disc		
C19	0.1μF +80% —20% 25VW Hi-K disc		
C20	0.1μF +80% —20% 25VW Hi-K disc		
C21	0.033μF +80% —20% 25VW Hi-K disc		
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		
C30	0.047μF ±10% 100VW polyester		
C31	5.6pF ±10% NPO tubular		
C32	5.6pF ±10% N3300 disc		

TRANSISTORS AND DIODES

VT1	2N1639
VT2	2N1638
VT3	2N1638
VT4	2N408
VT5	AS128
MR1	1N87A/0A90
MR2	1N87A/0A90
MR3	AS25

TRANSFORMERS

TR1	Ferrite Rod Aerial Assembly	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	52640/001

MISCELLANEOUS

LS1	4" Speaker (120 ohms)	50258
LP1	Pilot Lamp	64685
	Printed Board Assembly, C/W Components	64733
	Printed Board Blank	64681

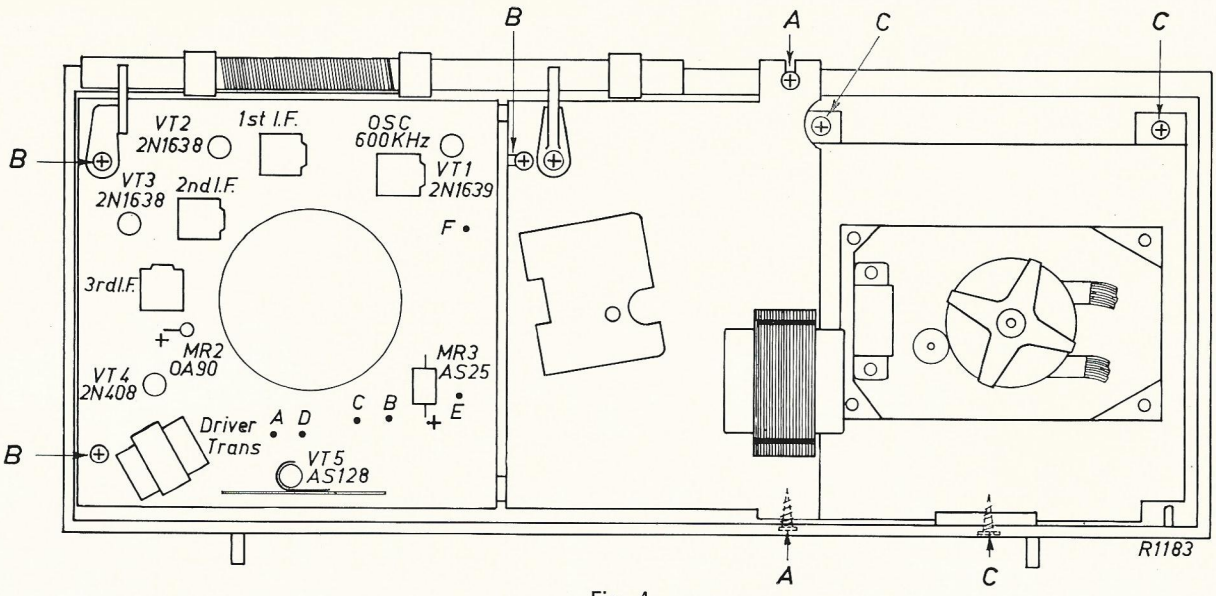


Fig. 4

Chassis Removal:

Remove the front control knobs by pulling them straight off their spindles and remove the felt washers behind the knobs.

Pull the front control knob off the clock spindle.

Remove the large moulded button plug at the back of the cabinet and free the power cord.

Remove the two screws in the base of the cabinet.

Ease the back of the cabinet off the front assembly, taking care to clear the knurled hand-set knob of the clock.

Referring to Figure 4:

—remove the two Philips head screws (at "A") and remove the insulating cover;

—disconnect the speaker leads and add extension leads if necessary;

—remove the three Philips head screws (at "B").

Swing the P/C board and chassis away from the front assembly.

The receiver may now be set in a self supporting position and operated normally while providing access to all components.

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

Clock Removal:

Disconnect the power plug from the a.c. mains.

Remove the cabinet back.

Unsolder the mains lead to the clock.

Remove 3 Philips head screws (at "C") and remove the clock assembly from the cabinet front.

Reassembly is the reverse of the above procedure.

ALIGNMENT PROCEDURE

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

Testing Instruments:

Signal generator—modulated 400 Hz or modulated oscillator.

If the modulated oscillator is used, connect a 220K ohms non-inductive resistor across the output terminals.

Testing Note:

No output transformer is used in this receiver since the speaker has a 120 ohms voice coil and carries the collector current of the output transistor.

For output measurement, if an indication only is required, Output Meter 2M8832 switched to 5000 ohms and connected in parallel with the speaker should be adequate.

For correct reading of power output, on 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 50mW occurs when 2.5 volts is indicated on the a.c. voltmeter.

ALIGNMENT TABLE

ORDER	CONNECT GENERATOR TO	TUNE GENERATOR TO	TUNE RECEIVER TO	ADJUST FOR MAX. PEAK OUTPUT
1	Aerial section of Gang	455 kHz	Gang fully closed	Cores in TR5, TR4 and TR2
Repeat adjustment until maximum output is obtained.				
2	Inductively coupled to Rod Aerial*	600 kHz	600 kHz	L.F. Oscillator Core adjust (TR3)†
3	Inductively coupled to Rod Aerial*	1650 kHz	Gang fully open	H.F. Oscillator Adj. (C6)
4	Inductively coupled to Rod Aerial*	1500 kHz	1500 kHz	H.F. Aerial Adjust. (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.

MECHANICAL REPLACEMENT PARTS

Item	Part No.
Back, Cabinet	64701/001
Clamp, Power Cable SCO 2028/17/0	208083
Clock Assembly	69984
Comprising:	
Hand, Auto 69990	395923
Hand, Hour 69987	395920
Hand, Minute 69988	395921
Hand, Sweep Second 69989	395922
Knob, Front 69994	423213
Knob, Rear 69995	423214
Plate, Dial, Printed	69983
Timer, Westclox TS11 (stripped) 69993	211905
Dial Area:	
Dial Scale (Eastern States)	65060/003
Dial Scale (Southern States)	65060/004
Panel, Light Diffusion	64712
Pointer	69996
Retainer Assembly, Dial Lamp	64680
Drum Assembly, Dial Drive	64732
Comprising:	
Drum, Die Cast	64700
Screw, Locking (2)	32816/001

Item	Part No.
Front Assembly, Cabinet	69997
Comprising:	
Badge, AWA, Metal-Cal	69875
Fret, Speaker, Screen Printed	64726/001
Front, Moulded	69998
Nameplate, Metal-Cal	69986
Window, Hot Stamped	69998
Gang Mounting:	
Grommet 38826/002 (3)	389262
Spacer (3)	35923
Screw, 4BA x 5/16″ Ch/Hd (3)	714010
Washer, 4BA Flat (3)	13156
Washer, 4BA I.T.L. (3)	921204
Insulator, Clock Cover 64682	255283
Insulator, Volume Control	65176
Knob Assembly, Control (2)	46747/001
Plug, Button, Power Cable	64723
Post, Pulley (2)	64711
Spring, Dial Cord 44189	798159
Spring, Speaker Retaining (2)	798142
Support, Moulded, Ferrite Rod (Long)	64709
Support, Moulded, Ferrite Rod (Short)	64708

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

MANUFACTURERS
AWA
SUPERVISED SERVICE

CLOISTER PRESS PTY. LTD., 6 BEACONSFIELD ST., ALEXANDRIA