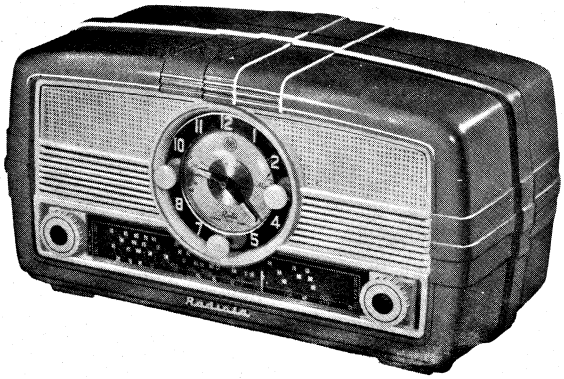
TECHNICAL INFORMATION
and
SERVICE DATA

A.W.A. Clock-Controlled-Radio
MODEL 461-MA

FOUR VALVE, BROADCAST,
A.C. OPERATED SUPERHETERODYNE.

Issued by
AMALGAMATED WIRELESS (AUSTRALASIA) LIMITED



ELECTRICAL SPECIFICATIONS

Frequency Range:—
540-1600 Kc/s (555-187.5 Metres).

Intermediate Frequency:—
455 Kc/s.

Power Supply Rating:—
200-260 volts.
50 C.P.S.

Power Consumption:—
Clock—2.5 watts.
Clock + Radio—37.5 watts.

Loudspeaker:—
4 inch permanent magnet.
Code No. BH5.
Transformer XA2.
V.C. Impedance—3 ohms at 400 C.P.S.

Undistorted Power Output:—
1.5 watts.

Valve Complement:—
(1) CBE6 Converter.
(2) 6AU6 I.F. Amplifier.
(3) 6BV7 Detector, A.V.C., High Gain Output.
(4) 6X4 Rectifier.

Chassis Removal:

(1) Remove the Radio and Clock control knobs by pulling them straight off their spindles. Also remove the "Hands-set" knob and spindle by pulling it from the back of the cabinet. In later models, unscrew the Alarm Knob clockwise.

(2) Remove two recessed nuts from the top of the cabinet back, two screws from underneath the cabinet back and withdraw it.

(3) The chassis is held to the cabinet front by two screws situated under it. Removal of these enables the chassis to be withdrawn from the cabinet.

Clock Removal:

(1) Remove the complete chassis from the cabinet.

(2) Remove two screws holding the cardboard clock cover to the bracket on the chassis. Remove the cardboard cover.

(3) Unscrew the two metal spacers holding the top of the clock to the front panel.

(4) Remove the clock plug from the socket on the receiver chassis.

The clock may now be lifted from the chassis.

When replacing the clock make sure that the bottom of the clock face engages in the clips on the receiver front panel. Replace the cardboard cover and metal spacers, but do not tighten. Place the chassis in the cabinet and adjust the clock position in the opening in the fret. Now tighten the metal spacers.

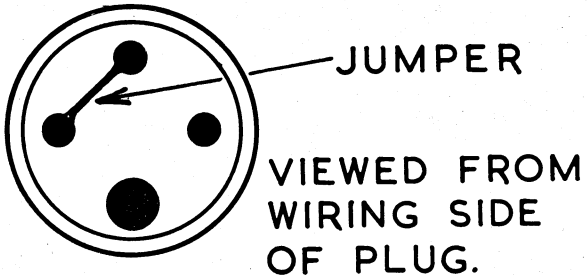
NOTE: In later models, the cardboard cover is replaced by a plastic shield which is held in position by two clips on the chassis bracket and two screws into the metal spacers. Removal of these enables the shield to be withdrawn.

IMPORTANT

As repairs to the clock will require the use of special equipment it is recommended that a spare be kept in stock and the faulty unit returned to the A.W.A. Service Department, 152 Parramatta Road, STANMORE, for repair.

Operation of Receiver Without Clock.

If it is desired to operate the receiver for either the Serviceman's or Client's use while a faulty clock is being repaired, Plug A.W.A. No. 29696 may be obtained from the A.W.A. Service Department and wired with a jumper as shown in the accompanying diagram. The plug is inserted in the socket on the receiver chassis.



CIRCUIT CODE — MODEL 461-MA

Code No.	Description	Part No.	Fig. No.	Location
	INDUCTORS.			
L1	I.F. Filter (including C1)	9382	2	C12
L2, L3	Aerial Coil 540-1600 Kc/s.	30768	2	D14
L4	Oscillator Coil 540-1600 Kc/s.	32406	2	F12
L5, L6	1st I.F. Transformer	27351	1	H5
L7, L8	2nd I.F. Transformer	27351	1	H9
	RESISTORS.			
R1	180 ohms ½ watt		2	E13
R2	100 ohms ½ "		2	G15
R3	10,000 ohms 1 "		2	H15
R4	15,000 ohms ½ "		2	G14
R5	4,700 ohms ½ "		2	F13
R6	1.0 megohm ½ "		2	G13
R7	1.0 megohm ½ "		2	H11
R8	10,000 ohms ½ "		2	F11
R9	0.5 megohm Volume Control (Tapped at 0.1 megohm)	26890	2	D3
R10	10 megohms ½ watt		2	H11
R11	1.0 megohm ½ "		2	H10
R12	4,700 ohms ½ "		2	G8
R13	1.0 megohm ½ "		2	F9
R14	100 ohms ½ "		2	F9
R15	1,000 ohms 1 "		2	D5
	CAPACITORS.			
C1	47 μμF Silvered Mica.		2	C13
C2	6.8 μμF Ceramic.		2	F14
C3	12-445 μμF Tuning	18624	1	F4
C4	2-20 μμF Trimmer (on gang).		1	G4
C5	0.05 μF paper 200V working		2	D13
C6	0.005 μF paper 600 V working		2	H14
C7	440 μμF padder ± 2½%		2	F13
C8	2-20 μμF Trimmer (on gang)		1	G5
C9	12-445 μμF Tuning	18624	1	F5
C10	9 μμF mica		1	E6
C11	0.035 μF paper 600 V working		2	H12
C12	0.05 μF paper 400V working		2	J13
C13	100 μμF silvered mica (I.F. Ass'y)		2	H14
C14	100 μμF silvered mica (I.F. Ass'y)		2	H14
C15	10 μμF Ceramic		2	J11
C16	0.025 μF paper 400V working		2	F11
C17	0.1 μF paper 400V working		2	J8
C18	100 μμF silvered mica (I.F. Ass'y)		2	H10
C19	100 μμF silvered mica (I.F. Ass'y)		2	H10
C20	220 μμF Ceramic		2	H10
C21	0.05 μF paper 200V working		2	G9
C22	24 μF 350 P.V. Electrolytic		2	F3
C23	24 μF 350 P.V. Electrolytic		2	C6
C24	0.01 μF paper 600V working		2	H6
	TRANSFORMERS.			
T1	Loudspeaker Transformer	XA2	1	G9
T2	Power Transformer 50-60 c.p.s	25831	1	H15
	LOUDSPEAKER.			
	4" Permanent Magnet	BH5	1	C15
	SWITCHES.			
S1	Radio Contacts		1	D10
S2	Buzzer—Alarm Contacts.		1	D12

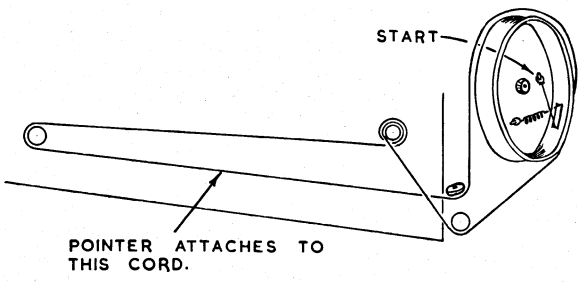
MECHANICAL REPLACEMENT PARTS

Cabinet Back	32466
Body and Fret	32464
Clock Assembly	31736
Dial Scale — N.S.W.	32207
VIC., TAS.	32208
QLD.	32209
S.A., W.A.	32210
Knob Radio	31984
Knobs Clock:	
Alarm (pull off type)	33133
Alarm (screw off type)	33134
Slumber	33135
Hands Set	33136
Radio Alarm, Off-On	33137
Lamp Holder	4194
Nameplate	27748
Pointer	31976
Valve Socket Assembly	19965

When ordering, always quote the above part numbers and, in the case of coloured parts, such as cabinets, knobs, etc., the colour plus the part number.

Tuning Drive Cord Replacement:

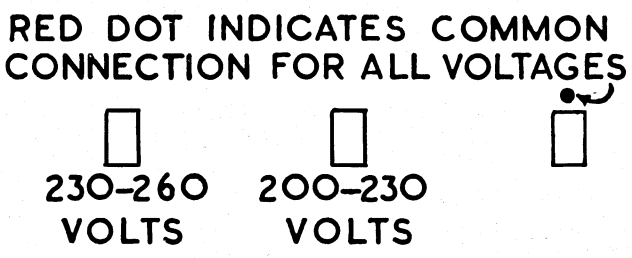
The accompanying diagram shows the route of the cord and the method of attachment.



Connection to Power Supply:

The receiver should not be connected to any circuit supplying other than alternating current from 200-260 volts and at a frequency of 50 C.P.S. only.

The power supply connections are shown in the accompanying diagram.



Alignment Procedure:

Manufacturer's Setting of Adjustments

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 especially 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 cannot be re-adjusted unless by skilled operators using special equipment.

For all alignment operations, connect the "low" side of the signal generator to the receiver chassis, and keep the generator output as low as possible to avoid A.V.C. action. Also, keep the volume control in the maximum clockwise position.

Testing Instruments:

(1) A.W.A. Junior Signal Generator, type 2R3911, or

(2) A.W.A. Modulated Oscillator, type J6726.
If the modulated oscillator is used, connect a 0.25 megohm non-inductive resistor across the output terminals.

(3) A.W.A. Output Meter, type 2M8832.

ALIGNMENT TABLE

Alignment Order	Connect "high" side of Generator to:	Tune Generator to:	Tune Receiver Dial to:	Adjust for Maximum Peak Output
1	Aerial Section of Gang (Drive End)	455 Kc/s.	540 Kc/s.	L8 Core
2	Aerial Section of Gang (Drive End)	455 Kc/s.	540 Kc/s.	L7 Core
3	Aerial Section of Gang (Drive End)	455 Kc/s.	540 Kc/s.	L6 Core
4	Aerial Section of Gang (Drive End)	455 Kc/s.	540 Kc/s.	L5 Core
	Repeat the above adjustments until the maximum output is obtained.			
5	Aerial Lead	600 Kc/s.	600 Kc/s.	L.F. Osc. Core Adj. (L4)*
6	Aerial Lead	1500 Kc/s.	1500 Kc/s.	H.F. Osc. Adj. (C8).
7	Aerial Lead	1500 Kc/s.	1500 Kc/s.	H.F. Aer. Adj. (C4).
	Repeat adjustments 5, 6 and 7.			

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

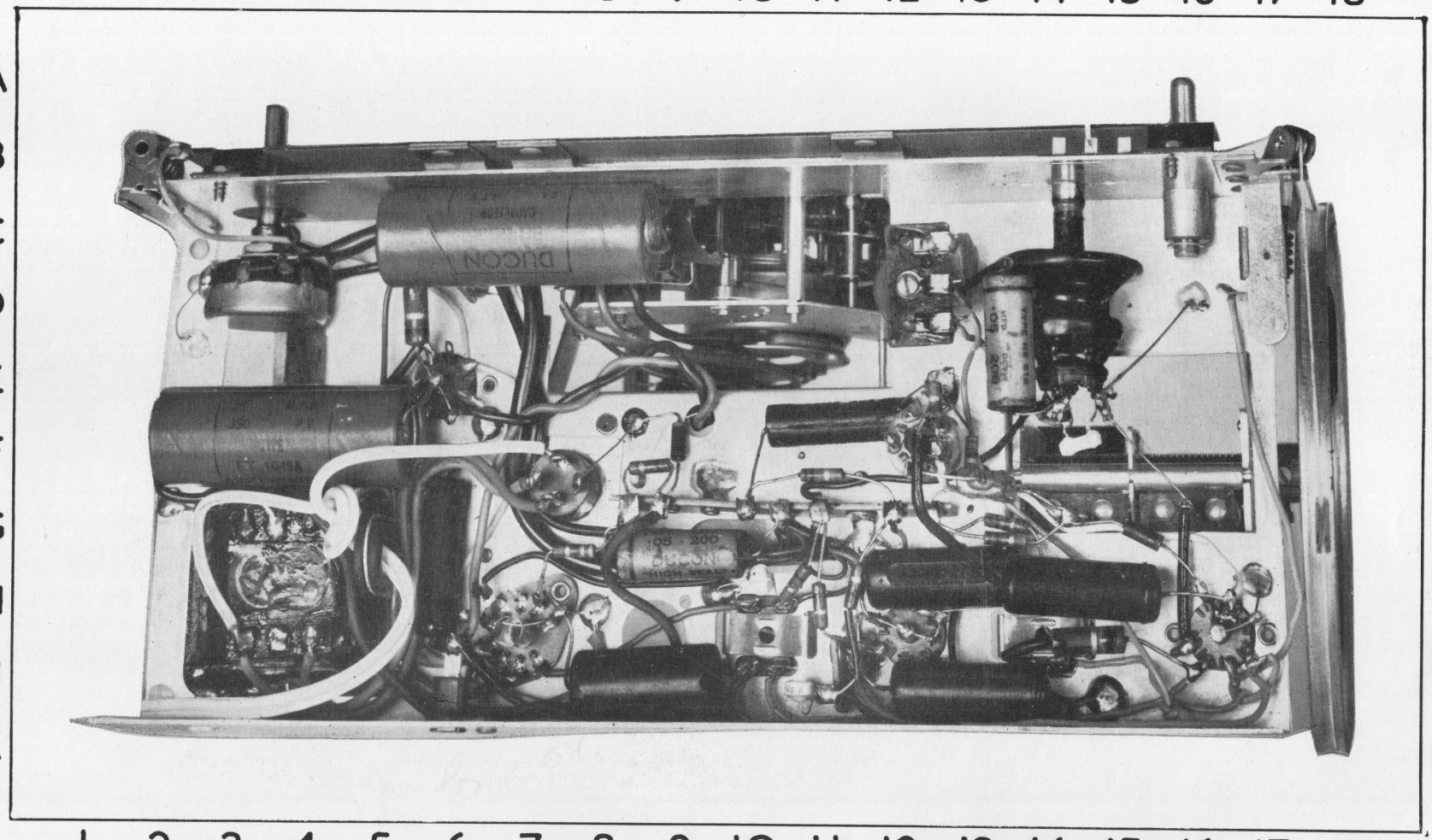


Fig. 2

D.C. RESISTANCE OF WINDINGS

Winding	D.C. Resistance in Ohms.
Aerial Coil:	
Primary (L2)	3
Secondary (L3)	2
Oscillator Coil (L4)	5
I.F. Filter (L1)	17.5*
I.F. Transformer Windings	15
Power Transformer (T2):	
Primary	50
Secondary	300
Loudspeaker Input Transformer (T1):	
Primary	525 or 430
Secondary	±

± Less than 1 ohm.

* In some receivers this reading may be as high as 60 ohms.

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.

SOCKET VOLTAGES

Valves	Cathode to Chassis Volts	Screen Grid to Chassis Volts	Anode to Chassis Volts	Anode Current mA	Heater Volts
6BE6 Converter	1.8	90	170	2.3	6.3
6AU6 I.F. Amp.	—	90	170	5	6.3
6BV7 Det., A.V.C., Output	--	170	210	28	6.3
6X4 Rectifier	210	—	190/190 A.C. R.M.S.	—	6.3

Volts across Back-bias resistor R.14, 4V.

Total H.T. Current = 42 mA.

Measured at 240 volts A.C. Supply. No signal input.

Volume Control Maximum clockwise. Voltmeter 1000 ohms per volt; measurements taken on highest scale giving accurate readable deflection.

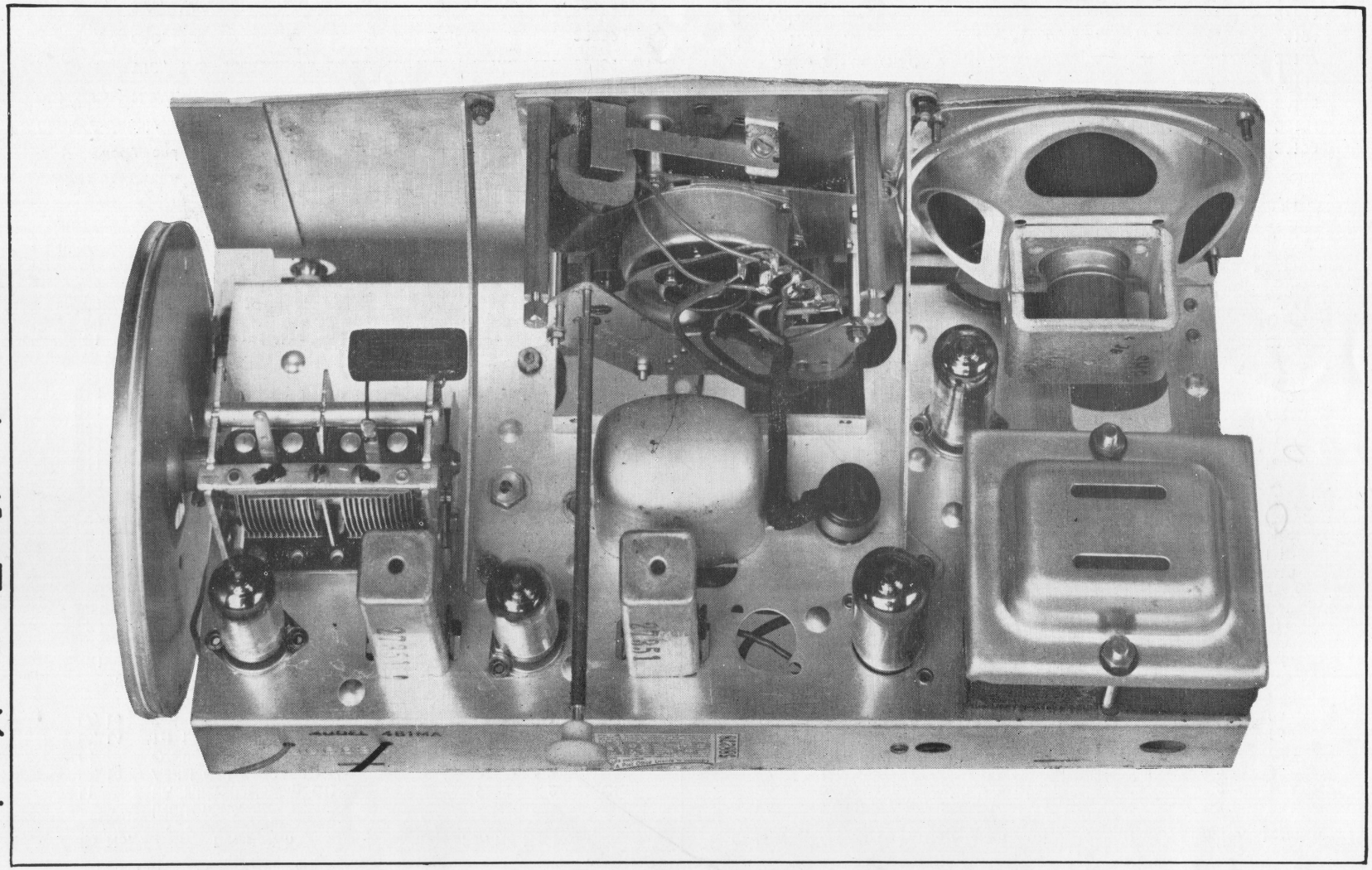
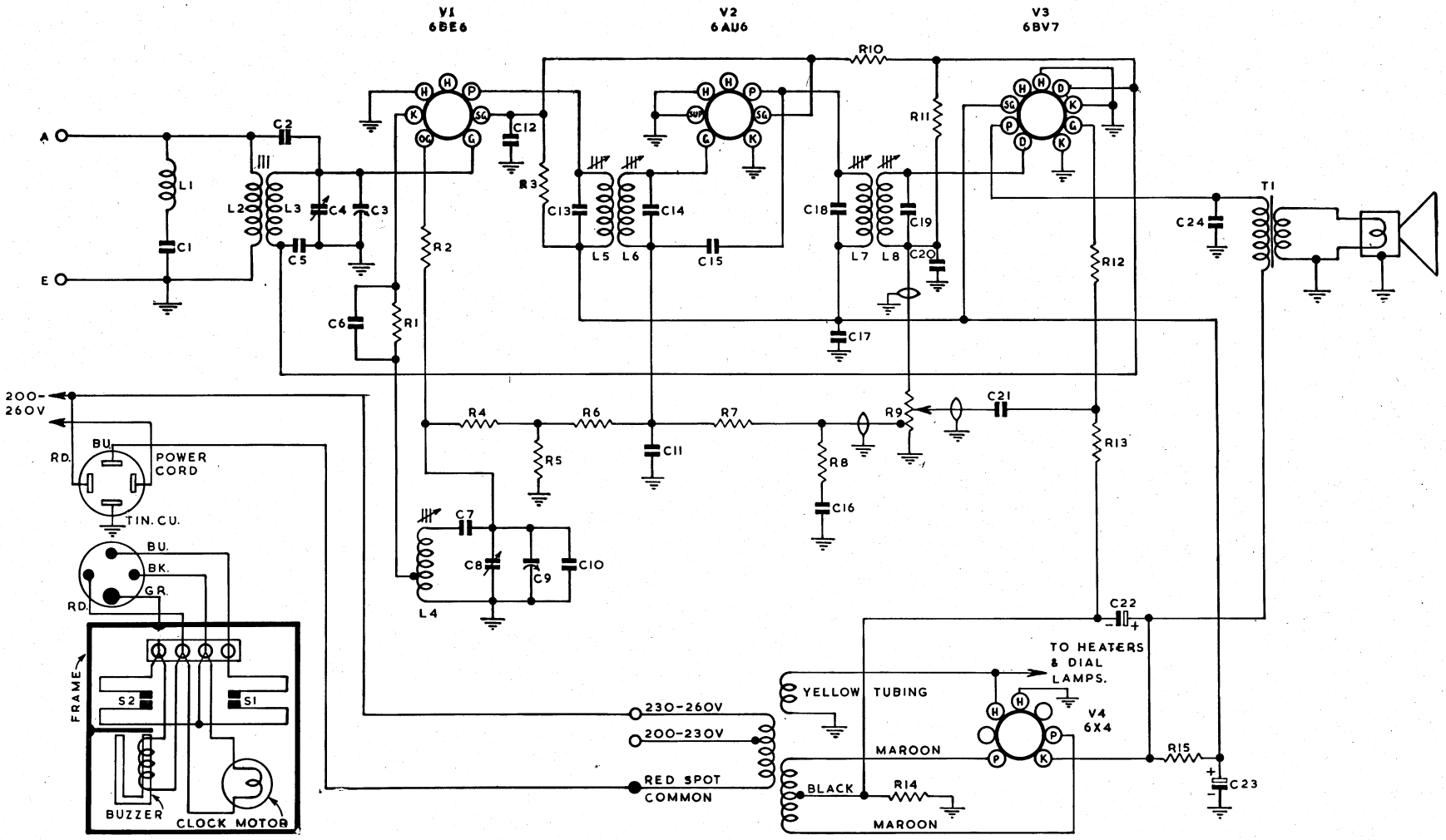


Fig. 1


V1
6BE6
V2
6AU6
V3
6BV7
A
E
L1
C1
C2
L2
L3
C4
C3
C5
C6
R1
R2
C12
R3
C13
L5
L6
C14
C15
R10
R11
C18
L7
L8
C19
C20
C17
R12
T1
C24
200-
260V
BU.
RD.
POWER
CORD
TIN. CU.
BU.
BK.
GR.
RD.
FRAME
S2
S1
BUZZER
CLOCK MOTOR
R4
R6
R7
R9
C21
R13
R5
C11
R8
C16
C7
C8
C9
C10
L4
C22
TO HEATERS
& DIAL
LAMPS.
230-260V
200-230V
RED SPOT
COMMON
YELLOW TUBING
MAROON
BLACK
R14
MAROON
V4
6X4
R15
C23