1946 SERIES

HOTPOINT-BANDMASTER

Models E64ME, F64ME, G64ME

TECHNICAL INFORMATION & SERVICE DATA

GENERAL DESCRIPTION.

The Hotpoint is a compact mantel receiver housed in an attractively designed moulded plastic cabinet which is produced in three colours—Ivory, Jade Green and Walnut.

Alternatively housed in wooden cabinets — Cream and Walnut.

Released in the immediate post-war period, this receiver embodies improved manufacturing methods resulting from experience gained in the production of radio equipment for the fighting services. It should be appreciated that during the war, radio equipment was called upon to operate under conditions which were undreamed of previously and the Company's laboratory staff was called upon to develop processes which would enable the equipment to continue functioning efficiently under the most trying climatic conditions.

The following features of design are a few of the many which place this receiver as the highest quality instrument at its price and give the dealer and purchaser a remarkable expectation of trouble-free service. All components are tropic-proofed to ensure satisfactory operation in any climate; ferrous metals are cadmium plated to resist corrosion; tuned circuits are designed to ensure permanence of factory alignment, air-dielectric tuning capacitors and permeability tuned I.F. transformers being used; the unique chassis layout cuts inter-connecting wiring to a minimum and makes all components accessible; the chassis is held in the cabinet by two screws enabling maintenance to be carried out as quickly as possible.

ELECTRICAL SPECIFICATIONS.

FREQUENCY RANGE ..... 550-1600 Kc. (545-187.5 M)

INTERMEDIATE FREQUENCY ..... 455 Kc.

POWER SUPPLY RATING ..... 200-260 volts, 50-60 C.P.S.

(Models are produced with other voltage and frequency ratings.)

POWER CONSUMPTION ..... 60 watts.

DIAL LAMP (1) ..... 6.3 volt, 0.25 amp. M.E.S.

VALVE COMPLEMENT

(1) 6A8G Converter.

(2) 6G8G I.F. Amp., Det., & A.V.C.

(3) 6V6GT Output.

(4) 6X5GT Rectifier.*

LOUDSPEAKER — 5 inch — Code No. AA16.

Transformer—XA2.

V.C. Impedance—3 ohms at 400 C.P.S.

Field ..... 1000 ohms.

Undistorted Output—3 watts.

CONTROLS ..... Volume (left) ..... Tuning (right)

* A 5Y3GT rectifier was used in some receivers.

MECHANICAL SPECIFICATIONS.

	Height.	Width.	Depth.
Chassis Base Dimensions (inches)	2	10½	5½
Over-all Chassis Height (inches)			6½

Weight (nett lbs.) ..... 13 approx.

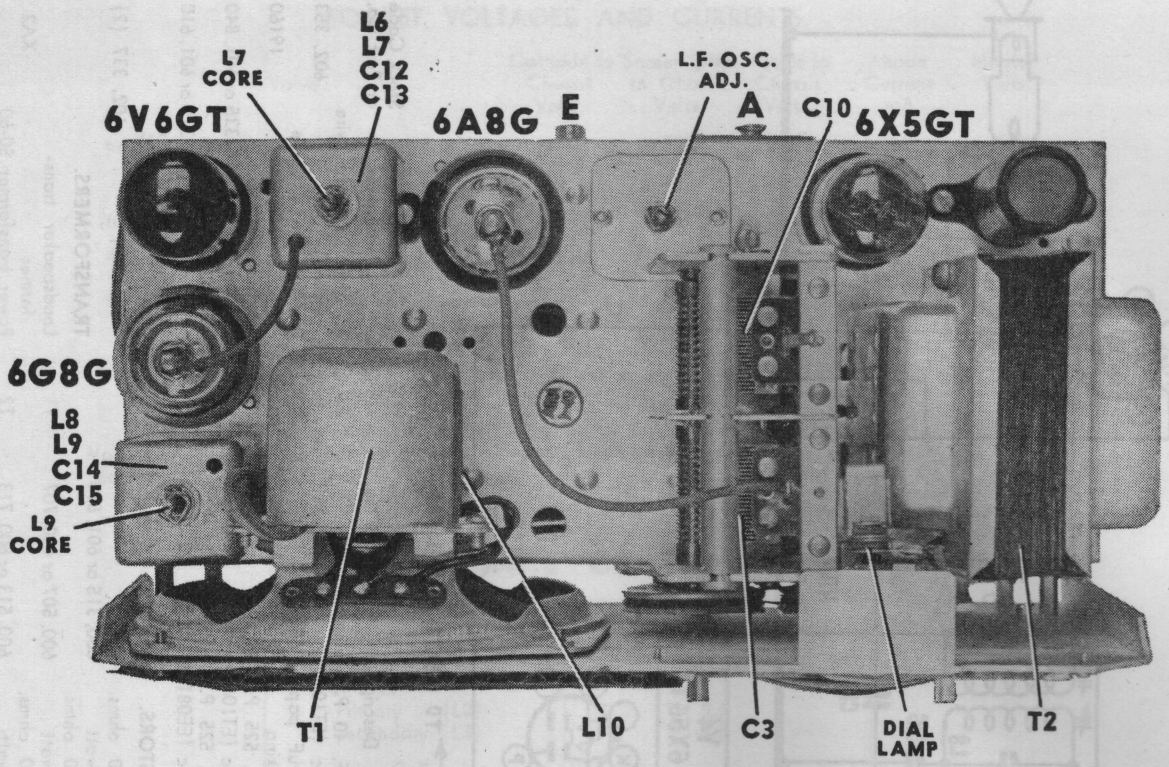
Cabinet Colours ..... Ivory ..... Jade Green ..... Walnut

CIRCUIT ARRANGEMENT.

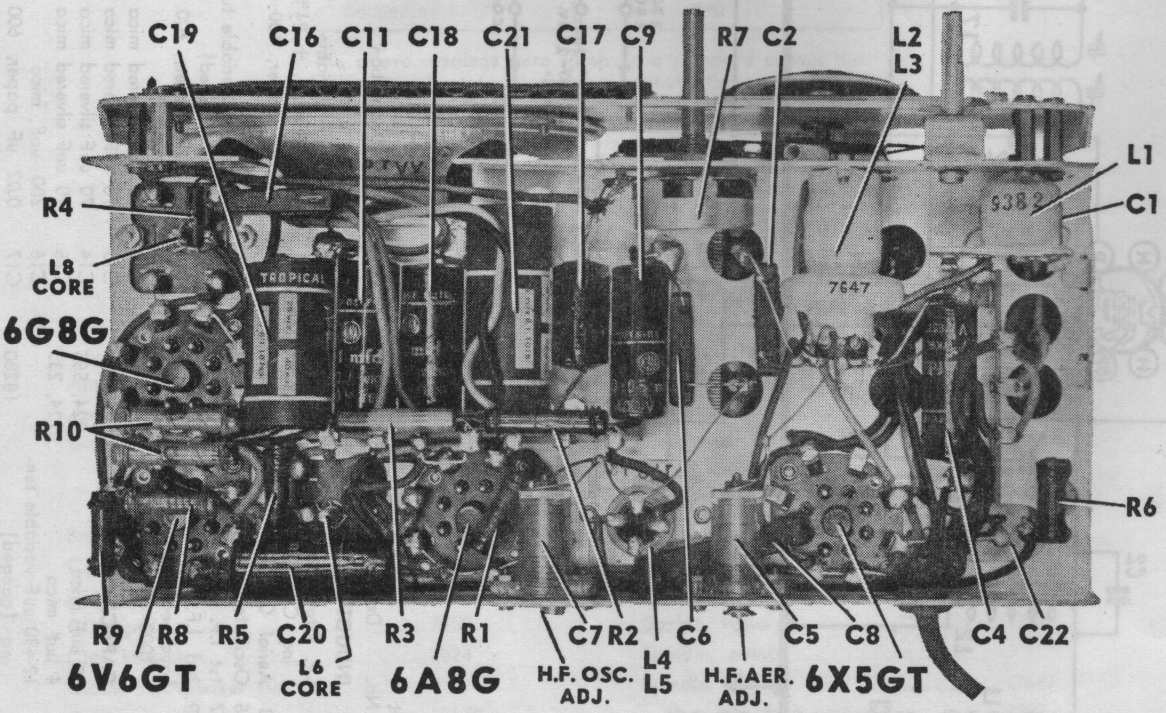
6A8G Frequency Converter.

The 6A8G is a frequency converter and is utilized as such. The incoming signal, which is tuned to signal frequency by the aerial section of the ganged tuning capacitor C3, is applied to the control grid of this valve and local oscillations are provided by the oscillator circuit at a frequency 455 Kc. higher than signal frequency.

The oscillator operates in a tuned grid feed-back circuit comprising oscillator coil L4, L5, padding capacitor C8, and the oscillator section of the ganged tuning capacitor C10. The circuit constants are so designed that the resultant heterodyne frequency, to which the output circuit of the valve is tuned, is 455 Kc.

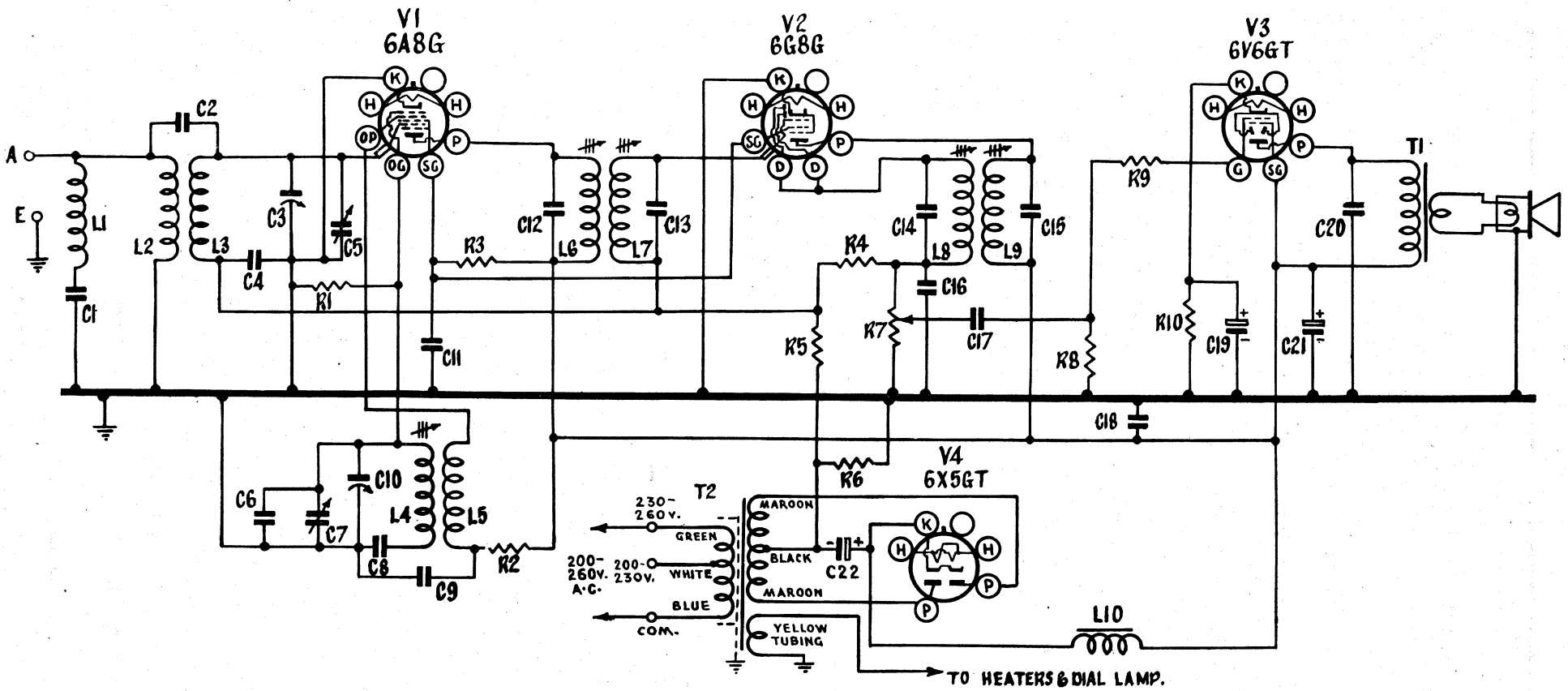


Chassis (top view)



Chassis (underneath view)

CIRCUIT DIAGRAM AND CODE



Circuit Code No.	Description	Stock Code or Part No.
	INDUCTORS.	
L1	I.F. filter choke (including C1)	9382
L2, L3	Aerial Coil	7647
L4, L5	Oscillator coil	7638
L6, L7	1st I.F. transformer	17638
L8, L9	2nd I.F. transformer	17643
L10	Loudspeaker field coil—1000 ohms	—
	CAPACITORS.	
C1	50 uuF mica	224, 555
C2	4 uuF mica	224, 233
C3	12-430 uuF variable tuning (ganged)	18280
C4	0.05 uF paper, 400 V. working	228, 115
C5	1-25 uuF variable	17659
C6	9 uuF mica	13211†
C7	1-25 uuF variable	17659
C8	440 uuF mica, + 2½%	13212†
C9	0.05 uF paper, 400 V. working	228, 115
C10	12-430 uuF variable tuning (ganged)	18280
C11	0.1 uF paper, 400 V working	228, 121
C12	70 uuF silvered mica	226, 460
C13	70 uuF silvered mica	226, 460
C14	70 uuF silvered mica	226, 460
C15	70 uuF silvered mica	226, 460
C16	200 uuF mica	224, 267
C17	0.02 uF paper, 600 V working	228, 307
C18	0.1 uF paper, 400 V working	228, 121
C19	25 uF, 40 P.V. electrolytic (ET10769)	222, 912
C20	0.02 uF paper, 600 V. working	228, 307
C21	8 uF, 525 P.V. electrolytic (ET1015)	222, 528
C22	8 uF, 525 P.V. electrolytic (EE0810)	222, 520
	RESISTORS.	
R1	50,000 ohms, ½ watt	600, 315 or 601, 610
R2	20,000 ohms, 1 watt	600, 507 or 600, 707
R3	40,000 ohms, 1 watt	600, 513 or 600, 713
R4	2 megohms, ½ watt	600, 347 or 601, 940
R5	1 megohm, ½ watt	600, 341
R6	40 ohms, 3 watt (wire wound)	602, 353
R7	0.5 megohm variable (volume control)	19160
R8	0.5 megohm, ½ watt	600, 335 or 601, 840
R9	50,000 ohms, ½ watt	600, 315 or 601, 610
R10	315 ohms, 6 watt (2 x 630 ohms, 3watt in parallel)	602, 337 (2)
	TRANSFORMERS.	
T1	Loudspeaker transformer	XA2
T2	Power transformer 50-60 C.P.S.	17851, 17855*
	Power transformer 40 C.P.S.	17853, 17857*

† Capacitance and tolerance (if shown) to be quoted

* Used on receivers employing 5Y3GT rectifier.

6G8G I.F. Amp., Det., and A.V.C.

The output voltage from the converter is applied to the control grid of the 6G8G via the first I.F. transformer which is adjusted by means of magnetite cores. The resultant amplified voltage from this stage is applied to the diodes via the second I.F. transformer which is also adjusted to 455 Kc.

The audio frequency voltage which is developed across the diode load resistor R7 (volume control) is applied to the control grid of the 6V6GT output valve via the moving arm of the control, the potential applied being dependent on the position of the arm, thus controlling the volume.

A.V.C. is employed. A minimum bias of 2.4 volts is applied to the grids of the 6A8G and 6G8G valves from a negative voltage developed across a 40 ohm resistor in the centre tap of the H.T. secondary of the power transformer. A portion of the rectified voltage developed across the diode lead resistor, which is proportional to the strength of the received carrier, is used to provide additional A.V.C. bias to the 6A8G and 6G8G valves.

Rectifier.

A conventional H.T. circuit is used employing a 6X5GT valve as a full-wave rectifier and a filter circuit comprising the loudspeaker field L10, and two electrolytic capacitors C21, and C22. A 5Y3GT rectifier was used in some receivers.

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 specialized 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. The two R.F. alignment points, 600 Kc. and 1500 Kc. are marked on the right and left-hand edges of the glass dial scale.

Testing Instruments.

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

or

(ii) 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.

(iii) Output Meter.

The instrument recommended should have an output impedance of 7000 ohms and a range of 5-3000 milliwatts. The meter should be connected across the primary of the loudspeaker transformer with the voice coil of the loudspeaker open-circuit. The circuit may be broken by unsoldering one humbucking coil lead (red or black) from the panel at the top of the loudspeaker.

If the output meter used is one which does not impress a load on the anode circuit of the output valve, it will not be necessary to open-circuit the voice coil.

ALIGNMENT TABLE.

Order	Connect "high" side of Generator to:	Tune Generator to:	Tune Receiver Dial to:	Adjust for max. peak output.
1	6A8G Grid*	455 Kc.	550 Kc.†	L9 Core
2	6A8G Grid*	455 Kc.	550 Kc.†	L8 Core
3	6A8G Grid*	455 Kc.	550 Kc.†	L7 Core
4	6A8G Grid*	455 Kc.	550 Kc.†	L6 Core
	Repeat the above adjustments until maximum output is obtained.			
5	Aerial Term.	600 Kc.	.6 Mc. Mark	LF Osc. Adj.‡
6	Aerial Term.	1500 Kc.	1.5 Mc. Mark	HF Osc. Adj. (C7)
7	Aerial Term.	1500 Kc.	1.5 Mc. Mark	HF Aer. Adj. (C5)
	Repeat adjustments 5, 6 and 7.			

*With grid clip connected. A .001 uF capacitor should be connected in series with the "high" side of the test instrument.

†Ganged tuning capacitor fully closed.

‡Rock the tuning control back and forth through the signal and reset the dial pointer to 600 Kc., if necessary, by turning it in the desired direction while firmly holding the tuning control knob.

SOCKET VOLTAGES AND CURRENTS.

Valve	Cathode to Chassis Volts.	Screen Grid to Chassis Volts.	Anode to Chassis Volts.	Anode Current mA	Heater Volts.
6A8G Converter	—	85	250	3.8	6.3
Oscillator	—	—	185	3.3	—
6G8G I.F. Amp., Det., A.V.C.	—	85	250	6.75	6.3
6V6GT Output	12.5	250	235	35	6.3
6X5GT Rectifier	310	—	300 RMS A.C.	—	6.3

Voltage across back-bias resistor R6—2.4.

Total H.T. current—55 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.

D.C. RESISTANCE OF WINDINGS.

Winding	D.C. Resistance in ohms
Aerial Coil	
Primary (L2)	9.5
Secondary (L3)	3.5
Oscillator Coil	
Primary (L4)	2
Secondary (L5)	6.5
I.F. Transformer Windings	7.5
I.F. Filter (L1)	17*
Loudspeaker Input Transformer (T1)	
Primary	500
Secondary	†
Power Transformer	
Primary	38
Secondary	340

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.

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

† Less than 1 ohm.

MECHANICAL REPLACEMENT PARTS.

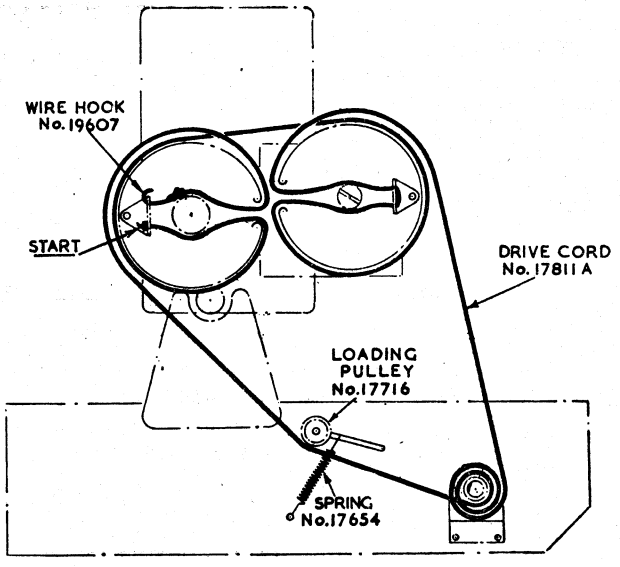
Item	Part No.
Arm, pulley	17719
Aerial Terminal Assembly	17717
Bracket, ganged capacitor mtg.	
Front	17619
Rear	17620
Bracket, tuning drive spindle	17648
Cabinet (quote colour)	
Clamp, dial scale	17720
Clip, grid	7459
Clip, horseshoe	2524
Cloth, loudspeaker fret	
Cone assembly, loudspeaker	10678
Drum, drive	17627
Drum, pointer	17626

Item	Part No.
Dial Scale	
Drive Cord	17811A.
Dust cover, loudspeaker	7848
Hook, drive cord	19607
Knob	17603
Plate, tuning drive mounting	17621
Pointer, dial	
Pulley, loading	17716
Socket, valve	4704
Spindle, pointer	
Spindle, tuning drive	17647
Spring, iron core locking	3091
Spring, loading, drive cord	17654
Strap, chassis mounting	17634

Tuning Drive Cord Replacement.

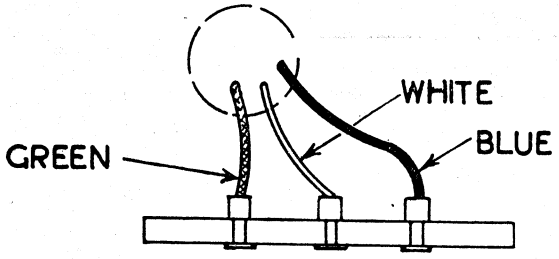
To replace the drive cord it is first necessary to remove the front panel assembly by removing the dial pointer (it pulls straight off) and then the four mounting screws.

Disconnect the spring from the loading pulley. The diagram shows the route of the cord and the method of attachment. The cord is made from a $27\frac{1}{4}$ inch cut length which allows for the knot at each end. When fitting, apply tension to the cord during the operation and use a pair of round nose pliers to bend the hook round the anchor plate to take up any slack. Place the loading pulley on the drive cord and replace the spring.



Connection to Power Supply.

The accompanying diagram shows the power supply connection panel. The receiver is supplied ready for operation on mains supplying voltages between 230 and 260 inclusive. It will be seen that in order to operate the receiver on voltages below 230 it is necessary to shift one wire of the power cable from the green to the white lead.



POWER SUPPLY CONNECTION PANEL

FOR 230-260V. OPERATION CONNECT POWER CABLE TO BLUE & GREEN LEADS. FOR VOLTAGES BELOW 230 CON--NECT TO THE BLUE AND WHITE LEADS.

Chassis Removal.

First remove the control knobs and felt washers. Each knob is held by a set screw. Then, remove two screws from underneath the cabinet and withdraw the chassis.

Loudspeaker Service.

To remove the loudspeaker, first unsolder the connecting leads. Peel back the fret material backing to reveal the four mounting screws and unscrew these to remove the unit.

It is inadvisable to attempt loudspeaker repairs other than adjustment of the voice coil and replacement of the transformer. The fitting of a new cone or the replacement of a field winding should be done only by Service Departments suitably equipped to do the work.

To centre the voice coil, first remove the front dust cover by carefully cutting around the inside of the voice coil former with a sharp knife. Loosen the suspension screws, insert three narrow paper "feelers" in the gap and re-tighten the suspension screws. The "feelers" should be approximately 3/16 inch wide and 0.006 inch thick. Fasten a replacement dust cover, part number 7848, in place with latex rubber cement. A substitute dust cover may be made by cutting a $1\frac{1}{8}$ inch diameter disc of organdie or voile material.

Resetting the Dial Pointer.

Should the pointer become displaced it can be reset as follows:

(1) Loosen the grub screw fastening the pointer to the Spindle.

(2) Disregarding the pointer, turn the Tuning Control knob (right hand knob) until the receiver is tuned by ear to a known station.

(3) Holding the Tuning Control knob firmly and without disturbing the pointer spindle, turn the pointer to indicate the tuned station.

(4) Tighten the grub screw.

(5) Recheck the setting.