



RADIO CORPORATION PTY. LTD.

DIVISION OF ELECTRONIC INDUSTRIES LTD.

126-130 GRANT STREET, SOUTH MELBOURNE, S.C.4.

TECHNICAL BULLETIN

BULLETIN MP-1
File:-Receivers A/c.
Date: 1/11/46.
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SUBJECT- Type "MP" Phono-Radio Combination Model

5 Tube Dual Wave

Superheterodyne Receiver

For operation from:-

200-250 Volt 50 Cycle A/c. Mains.

This Bulletin Contains:-

1. Technical Specifications
2. General Description
3. Alignment Procedure
4. Circuit Diagram
5. Voltage Table.
6. Component Parts List
7. Coil and IF. Transformer Connections.

SUBJECT--Technical Specifications-Receiver Type "MP"

Tube Complement:-

Type 6J8G Converter
Type 6U7G IF. Amplifier
Type 6B6G Detector, AVC. and 1st Audio
Type 6V6GT Beam Power Output
Type 5Y3G Full Wave Rectifier

Intermediate Frequency:- 455 Kcs.

Tuning Range:-

Broadcast:- 540 Kcs. (Kilocycles) to 1640 Kcs.
555 M. (Meters) to 182.9 M.
Shortwave:- 5.8 Mcs. (Megacycles) to 18.5 Mcs.
50 M. (Meters) to 16 M.

Calibration:-

Straight Line Frequency

Power Consumption:-

Radio Operation:- 50 Watts (approx.)
Gramo. Operation: 75 Watts (approx.)

General Description:-

The Model "MP" is a 5 tube dual wave superheterodyne phono-radio combination receiver.

Radio Operation:- The circuit consists of a triode Heptode converter tube type 6J8G followed by an IF. amplifier using a type 6U7G tube, a type 6B6G tube for diode detection, AVC. and 1st audio which is resistance capacity coupled to a beam power output amplifier tube type 6V6GT. A type 5Y3G tube is used for full wave rectification.

Bias for the converter, IF. and output tubes is obtained from separate cathode bias circuits and for the 1st audio stage bias is obtained from the voltage drop across the 3 megohm resistor (circuit No. 33) in the 6B6G tube grid circuit.



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SUBJECT:-Technical Specifications-Receiver Type "MP"

General Description:-

AVC. voltage is obtained from the signal diode and applied to the converter and IF. tubes. Delay is obtained by connecting the AVC. line to the second diode in the 6B6G which has a small positive potential applied to it through resistor (circuit No. 32) causing it to conduct. No negative voltage is applied to the controlled tubes until the signal diode negative voltage is high enough to cut off the current through this diode.

Three distinct conditions of tone have been provided in the design of the circuit. The first position provides a condition of maximum intelligibility when receiving long distance stations. In this position no feedback is used. In the second position inverse feedback is applied to the grid of the 6B6G tube from the speaker voice coil via the volume control tap and bringing into operation circuit components 48, 12, 47, 46 and 4 providing bass and treble boost. This position is normally used for local reception. The third position switches out of circuit resistor 46 and condenser 4 producing bass cut. This position is used when greatest clarity of speech is required. On positions two and three the circuit operates from very low to maximum volume but the boost is progressively reduced as maximum is approached.

Short Wave operation:- The operation on shortwave is substantially the same as on broadcast except that no A.V.C. is applied to the converter stage.

Phono Operation:- The output voltage from the pick-up is applied via the volume control to the grid of the 6B6G tube and then passed to the 6V6GT tube.

The volume and tone controls both control the reproduction on Phono pick-up operation is exactly the same manner as on Radio. The pick-up used is a magnetic type and due to the higher output voltage at high frequencies than at low frequencies, which is a characteristic of this type of pick-up, an additional condenser (circuit No. 14) is switched into circuit on positions two and three of the tone control to reduce the treble response and thus provide a more satisfactory balance of high and low frequencies and also to reduce needle scratch.

The Phono-Radio switch when turned to Phono operation switches out of circuit a section of the converter stage which prevents the radio signals over riding the reproduction from the pick-up, and also reduces the load on the power supply causing an increase in voltage which allows a slightly increased power output.

SUBJECT:-Alignment Procedure-Receiver Type "MP"

EQUIPMENT:-

Signal Generator
Dummy Antennae
 .01MFD. Mica Capacitor
 200MMFD. Mica Capacitor
 400 Ohm Non Inductive Resistor
Output Meter
Alignment Tool

ALIGNMENT CONDITIONS:

Load Impedance - 5,000 Ohms
Output Level - 50 Milliwatts
Volume Control - Maximum Volume (Fully clockwise)
Tone Control - Fully Anti-clockwise

ALIGNMENT:

Intermediate Frequency--455 Kcs.

Do not use a screwdriver or alignment tool with an iron point for aligning IF. transformers. A special tool part number PM581 is available from the factory, or failing this an insulated rod with a small brass blade may be used.

Tuning Range:-

Broadcast Band 540 - 1640 Kcs.
Shortwave Band 5.8 - 18.5 Mcs.

Set the dial pointer on the end of travel mark on the dial calibration near 550 Kcs.

(Condenser gang plates fully meshed)



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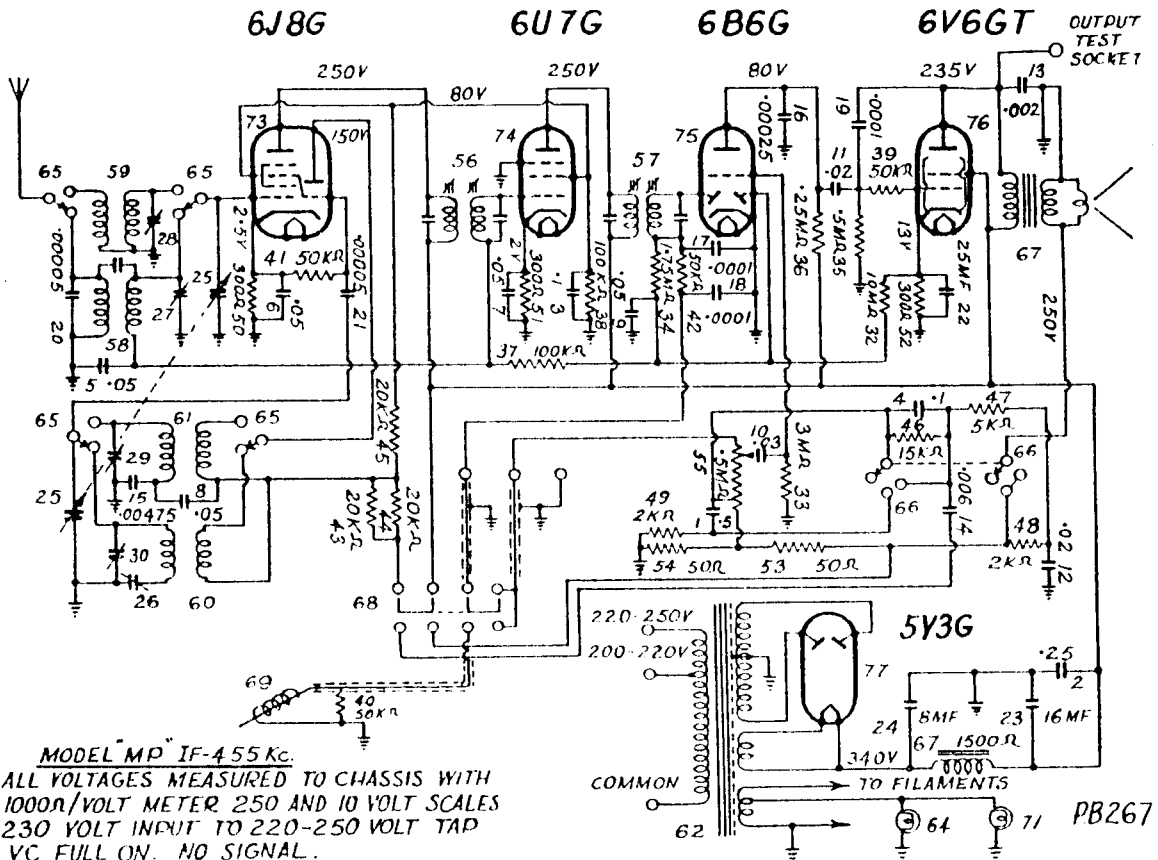
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SUBJECT-Alignment Procedure-Receiver Type "MP"

Operation	Generator Connection	Frequency	Dummy Antenna	Instructions
Wave Change Switch on B/cast Position				
1.	To grid of 6U7G Tube	455 Kcs.	.01MFD. Mica capacitor in series with generator	Leave grid cap on tube. Gang plates full out. Peak 2nd I.F. transformer primary and secondary.
2.	To grid of 6J8G Tube	455 Kcs.	.01MFD. Mica capacitor in series with generator	Leave grid cap on tube. Gang plates full out. Peak 1st I.F. transformer primary and secondary.
3.	To antenna lead	1400 Kcs.	200 MMFD. Mica capacitor in series with generator	Turn dial pointer to 1400 Kcs. Adjust B/cast oscillator trimmer for logging and peak B/cast aerial coil trimmer.
4.	To antenna lead	600 Kcs.	200 MMFD. Mica capacitor in series with generator	Turn dial pointer to 600 Kcs. Peak B/cast series padder, rocking gang to and fro while adjusting for maximum output.
Turn Wave Change Switch (Roll Dial) to S/Wave Position.				
5.	To antenna lead	16 Mcs.	400 ohm non-inductive resistor in series with generator	Turn dial pointer to 16 Mcs. Adjust S/wave oscillator trimmer for logging and peak S/wave aerial coil trimmer.

SUBJECT-Schematic Circuit Diagram-Receiver Type "MP"



MODEL "MP" IF-455 Kc.
 ALL VOLTAGES MEASURED TO CHASSIS WITH
 1000 Ω /VOLT METER. 250 AND 10 VOLT SCALES
 230 VOLT INPUT TO 220-250 VOLT TAP
 VC FULL ON. NO SIGNAL.

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SUBJECT-Voltage Table-Receiver Type "MP"

EQUIPMENT:

DC. Voltmeter - 1,000 ohm/volt meter with 0-10
0-250 and 0-500 volt scales.

AC. Voltmeter - 0-10, 0-250 and 0-500 volt scales

CONDITIONS OF TEST:

Heater voltages measured across filaments.

Tube voltages measured from socket contacts to chassis.

230 volts 50 cycle AC. input.

Receiver turned to 1,000 Kcs. volume control full on
(max. volume) no signal.

TUBE	FIL.	PLATE	SCREEN	CATHODE	OSCL. PLATE
6J8G	6.3V.	250V.	80V.	2.5V.	150V.
6U7G	6.3V.	250V.	80V.	2V.	
6B6G	6.3V.	80V.			
6V6GT	6.3V.	235V.	250V.	13V.	
5Y3G	5V.	330/330V. RMS. The initial surge voltage across the first electrolytic (circuit No. 24) is 430 volts dropping to normal operating value of 340 volts. DC voltage across field coil is 90 volts.			

POWER CONSUMPTION:- 50 watts (approx.)

VOLTAGE TABLE GRAMO. OPERATION

TUBE	FIL.	PLATE	SCREEN	CATHODE	OSCL. PLATE
6J8G	6.3V.	280V.			
6U7G	6.3V.	280V.			
6B6G	6.3V.	90V.			
6V6GT	6.3V.	255V.	280V.	14V.	
5Y3G	5V.				

DC voltage across field coil is 75 volts.

POWER CONSUMPTION:- 75 Watts (approx.)

SUBJECT--Component Parts List--Electrical--Receiver Type "MP"

Circuit No.	Part Name	Tol. ±	Rating	Part No.
1.	.5 MFD. Paper Condenser	20%	200V. DCW	PC121
2.	.25 MFD. Paper Condenser	20%	400V. DCW	PC128
3.	.1 MFD. Paper Condenser	20%	400V. DCW	PC103
4.	.1 MFD. Paper Condenser	20%	200V. DCW	PC218
5.	.05 MFD. Paper Condenser	20%	200V. DCW	PC102
6.	.05 MFD. Paper Condenser	20%	200V. DCW	PC102
7.	.05 MFD. Paper Condenser	20%	200V. DCW	PC102
8.	.05 MFD. Paper Condenser	20%	200V. DCW	PC102
9.	.05 MFD. Paper Condenser	20%	200V. DCW	PC102
10.	.03 MFD. Paper Condenser	20%	200V. DCW	PC303
11.	.02 MFD. Paper Condenser	20%	400V. DCW	PC111
12.	.02 MFD. Paper Condenser	20%	400V. DCW	PC111
13.	.002 MFD. Paper Condenser	20%	600V. DCW	PC112
14.	.006 MFD. Paper Condenser	20%	600V. DCW	PC217
15.	.00475 MFD. Mica Condenser	5%	1000VT.	PC682
16.	.00025 MFD. Mica Condenser	10%	1000VT.	PC126
17.	.0001 MFD. Mica Condenser	10%	1000VT.	PC110
18.	.0001 MFD. Mica Condenser	10%	1000VT.	PC110
19.	.0001 MFD. Mica Condenser	10%	1000VT.	PC110
20.	.00005 MFD. Mica Condenser	10%	1000VT.	PC141
21.	.00005 MFD. Mica Condenser	10%	1000VT.	PC141
22.	25 MFD. Electrolytic Condenser	20%	40VP.	PC660
23.	16 MFD. Electrolytic Condenser	20%	525VP.	PC300
24.	8 MFD. Electrolytic Condenser	20%	525VP.	PC313
25.	2 Gang Varb. Condenser (with gears)			PC679
26.	150-500 MMFD. Cond. B/cast. Series Pad			PC164
27.	1.5-18 MMFD. Trimmer	}	Double Trimmer Assembly	PC658
28.	3-55 MMFD. Trimmer			
29.	0-30 MMFD. Trimmer Condenser (Wire Wound)			PC663
30.	0-30 MMFD. Trimmer Condenser (Wire Wound)			PC663
31.				
32.	10 Megohm Carbon Resistor	10%	1 Watt	PR236
33.	3 Megohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR282
34.	1.75 Megohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR248
35.	.5 Megohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR245
36.	250,000 Ohm Carbon Resistor	10%	1 Watt	PR496
37.	100,000 Ohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR103
38.	100,000 Ohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR103



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SUBJECT--Component Parts List--Receiver Type "MP"

Circuit No.	Part Name	Tol. ±	Rating	Part No.
39.	50,000 Ohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR160
40.	50,000 Ohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR160
41.	50,000 Ohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR160
42.	50,000 Ohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR160
43.	20,000 Ohm Carbon Resistor	10%	1 Watt	PR171
44.	20,000 Ohm Carbon Resistor	10%	1 Watt	PR171
45.	20,000 Ohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR166
46.	15,000 Ohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR500
47.	5,000 Ohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR250
48.	2,000 Ohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR253
49.	2,000 Ohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR253
50.	300 Ohm Wire Wound Resistor	10%	$\frac{1}{2}$ Watt	PR258
51.	300 Ohm Wire Wound Resistor	10%	$\frac{1}{2}$ Watt	PR258
52.	300 Ohm Wire Wound Resistor	10%	1 Watt	PR122
53.	50 Ohm Wire Wound Resistor	10%	$\frac{1}{2}$ Watt	PR280
54.	50 Ohm Wire Wound Resistor	10%	$\frac{1}{2}$ Watt	PR280
55.	.5 Megohm Carbon Potentiometer tapped at 40K. Ohms			PR605
56.	Transformer 1st IF.			PT461
57.	Transformer 2nd IF.			PT462
58.	Transformer Antenna B/cast.			PT381
59.	Transformer Antenna S/wave.			PT463
60.	Coil, Oscillator B/cast.			PT383
61.	Coil, Oscillator S/wave.			PT464
62.	{ Transformer Power 200-250 Volt 50 cycle			PT770
	{ Transformer Power 200-260 Volt 40 cycle			PT771
63.	Socket 8 pin			PM532
64.	Lamp, Single Contact, Bayonet Base 6 Volt 3CP.			PM450
65.	Switch, Wave Change			S120
66.	Switch, Tone Control			S121
67.	Speaker, 5,000 Ohm Input 1,500 Ohm Field			K110
68.	Switch DP.DT. Toggle $\frac{3}{8}$ " Neck			PM546
69.	{ Motor/Pick-up Unit Complete (Garrard Type "E")			M123
	{ Motor/Pick-up Unit Complete (Collaro, Type AC37 Motor)			M124
70.	Terminals, Aerial and Earth			PM306
71.	Lamp. Min. Screw Base T3 $\frac{1}{4}$ Bulb 6V. .25A			PM678
72.				
73.	Tube Type 6J8G			
74.	Tube Type 6U7G			
75.	Tube Type 6B6G			
76.	Tube Type 6V6GT			
77.	Tube Type 5Y3G			

SUBJECT-Component Parts List-Mechanical-Receiver Type "MP"

Part Name	Part Number
<u>Chassis viewed from rear</u>	
Chassis Mt. Bracket (right hand)	7/614-1
Chassis Mt. Bracket (left hand)	7/614-2
Bracing strip (right hand)	12/614-1
Bracing Strip (left hand)	12/614-2
Terminal Strip Assy.	A103/509
Dial Idler Pulley	13/613
Bracket-Jockey Pulley	9/589
Spring Clip-Jockey Pulley	176/250
Dial Pulley Stud (15/64")	18/87
Dial Pulley Stud (1/16")	18/87-1
Spring-Jockey Pulley	8/613
Dial Track (Brass wire)	7/589-5
Straining Screw-Dial Track	8/589
Condenser Mt. Bracket (left hand)	45/409-1
Condenser Mt. Bracket (right hand)	45/409-2
Single Pin Socket Top	19/96
Single Pin Socket Bottom	18/96
Single Pin Socket Contact	15/58-2
Coil Mounting Piece	94/30C
Power Contact Strip Assy.	A105/E243
Grid Clips	873/495
Earth Clips-Valve Shields	22/30C
Valve Band.	1/564-8
Valve Shield Clamp	161/30A
Valve Shield	162/30A
Bearing Plate-Drive Spindle	2/613
Tuning Spindle	8/614
Collar-Tuning Spindle	13/609
Condenser, Coupling 5"	11/609-3
Dial Pointer Assy.	A102/614
Balls-Roller Bracket Mtg.	5/563
Roller Shield Assy.	A105/614
Lamp Holder Assy. (large)	A107/614
Bayco. Pea Lamp Holder Spring	55/245
Shield-Light	21/614
Flywheel	86/87
Packer-Speaker	20/251
Spring-Switch Link	50/71
Roller Bracket Assy. (left hand)	A104/614-1
Roller Mt. Bracket Assy. (right hand)	A104/614-2



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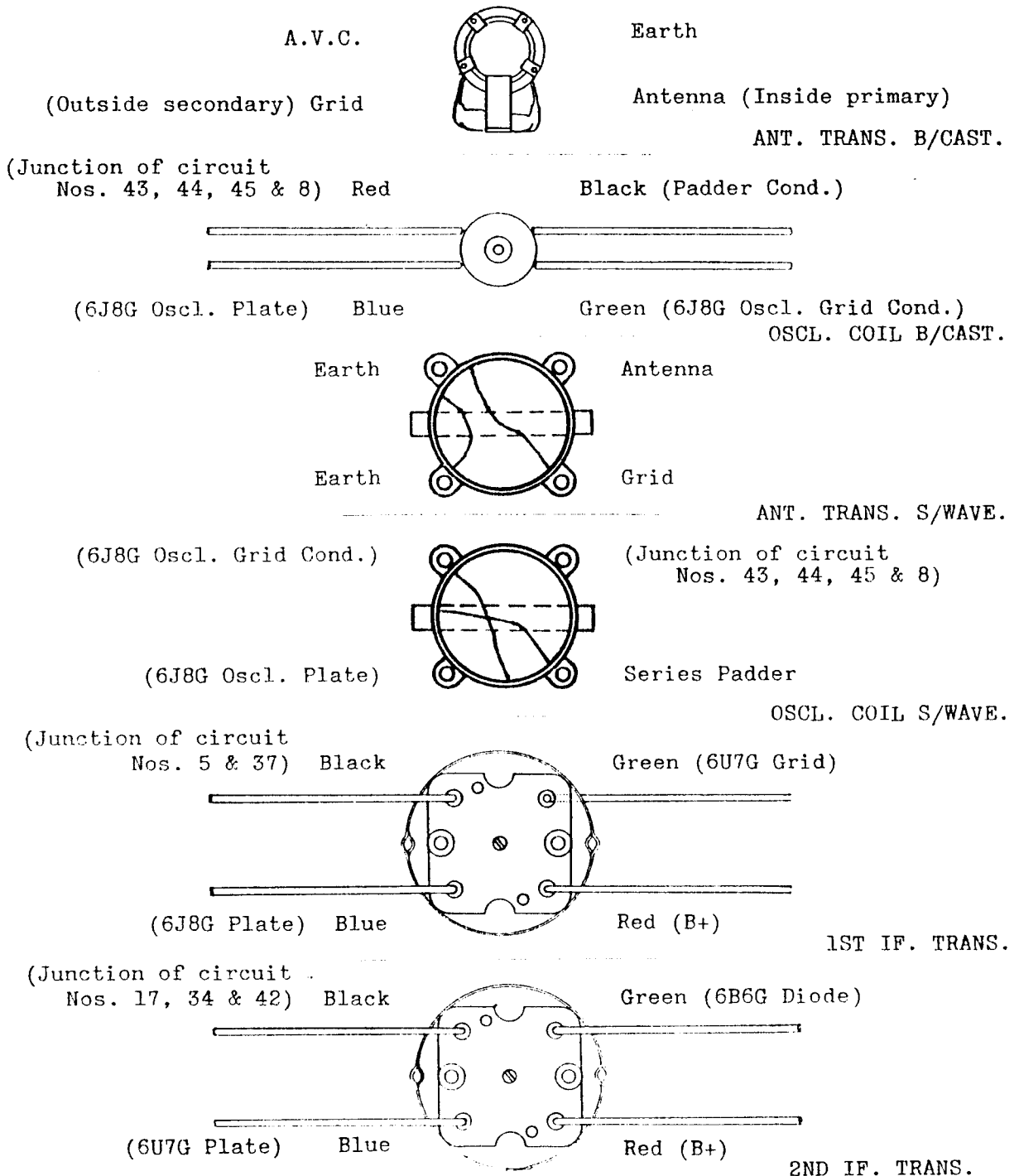
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SUBJECT-Component Parts List-Mechanical-Receiver Type "MP"

Part Name	Part Number
<u>Chassis viewed from rear</u>	
Control Knobs	77/81
Washer-Tuning Knob	6/633
Knob Springs	17/81
Switch Link	3/627
Stud-Switch Mtg. Link	18/87
Stop Assembly	A104/277
Escutcheon	16/277
Needle Cup	42/245
Sub. Mounting Board	4/633
Tone Switch Bracket	5/633
Chassis Base	18/614
Roller Assembly	A103/627
Roller End Cheek	4/614
Dial Celluloid	17/614
Lamp Holder (small)	1/245
Cabinet	172/221
Baffle	171/221
Speaker Mt. Board	170/221
Mt. Strip-Spkr. Board (12" length)	1/633
Mt. Strip-Spkr. Board (10" length)	1/633-1
Anchor Plate Assy. Right	A102/277
Anchor Plate Assy. Left	A103/277
Arm Lift Assy.	A101/277
Tension Spring	14/277
Adjusting Stud	5/277
Pad Stop	10/277
Washer-Rubber, Large, Speaker Mt. Board	6/221
Washer-Rubber, Small, Speaker Mt. Board	7/221
Spacer-Speaker Mount Board Screw	29/215-1
Washer-Metal, Large, Speaker Mt. Board	10/221

SUBJECT-Coil and IF. Transformer Connections-Receiver Type "MP"





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BULLETIN MP-2.

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SUBJECT—Circuit Component Changes—Model "MP".

- A. The 5000 ohm $\frac{1}{2}$ watt carbon resistor circuit No. 47 has been changed to a 7000 ohm $\frac{1}{2}$ watt carbon resistor (part No. PR247) tol. $\pm 10\%$. The change has been incorporated in the first production run and is to reduce the base response on positions two and three of the tone control.
- B. The tone control switch part No. S121 has been changed to a switch of the same type with a shorter shaft. Part No. of new switch is PM597.
- C. The phono/radio toggle switch Part No. PM546 has been changed to a different type switch part No. S128 as the toggle type switch is in short supply.

Parts required for mounting new switch part No. S128 are:

1 off mount bracket	Part No. 5/633
1 " knob	" " 77/81
1 " knob spring	" " 17/81
1 " felt washer	" " 6/622
2 " screws $\frac{1}{2}$ " x 5/32"	" " 16/560-38
1 " indicator plate	" " 11/633-1



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SUBJECT—Model "MP" Circuit Modifications.

1. To prevent oscillation at 16 Mcs. when using type 6J8GA tubes 200 ohm $\frac{1}{2}$ watt resistor part No. PR176 has been inserted in the oscillator plate lead. The 200 ohm resistor (Circuit No. 78) is connected between pin No. 6 and a moving contact of the wave change switch as shown below on the revised circuit.

2. The following alterations have been made to the inverse feedback circuit to improve the tone on positions two and three of the tone control:

- (a) Circuit No. 47: 7000 ohm resistor is changed to a 3000 ohm $\frac{1}{2}$ watt resistor part No. PR185.
- (b) Circuit No. 46: 15,000 ohm resistor is changed to a 30,000 ohm $\frac{1}{2}$ watt resistor part No. PR151.
- (c) Circuit No. 1: .5MFD. condenser is deleted and the 2000 ohm resistor circuit No. 49 is connected to the volume control tap.
- (d) The lead from the volume control tap to the centre lug of the switch circuit No. 66 is deleted. Between this switch lug and the junction of circuit numbers 48 and 53 connect a .005MFD. condenser part No. PC252 (Circuit No. 79).

The above changes are included on the revised circuit shown below.

