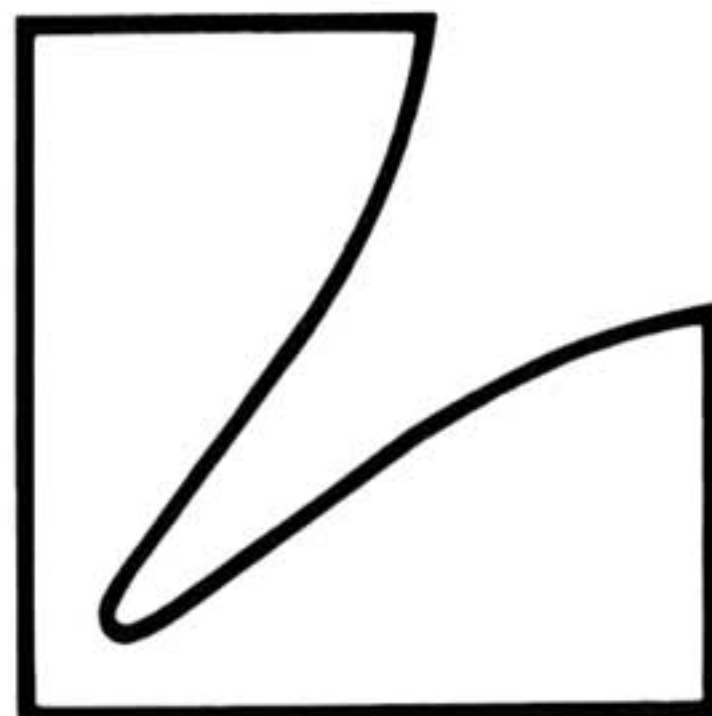


# SERVICE MANUAL

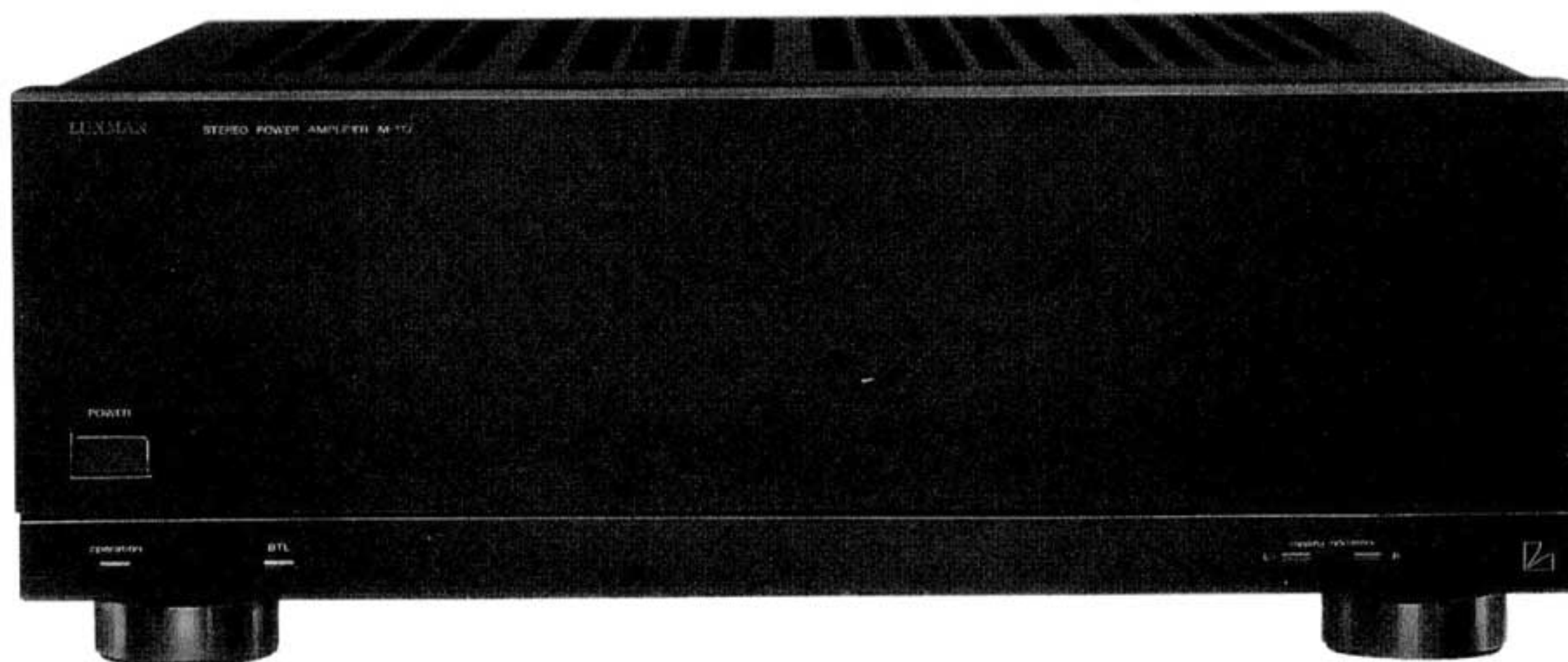


Stereo Integrated Amplifier

# M-117

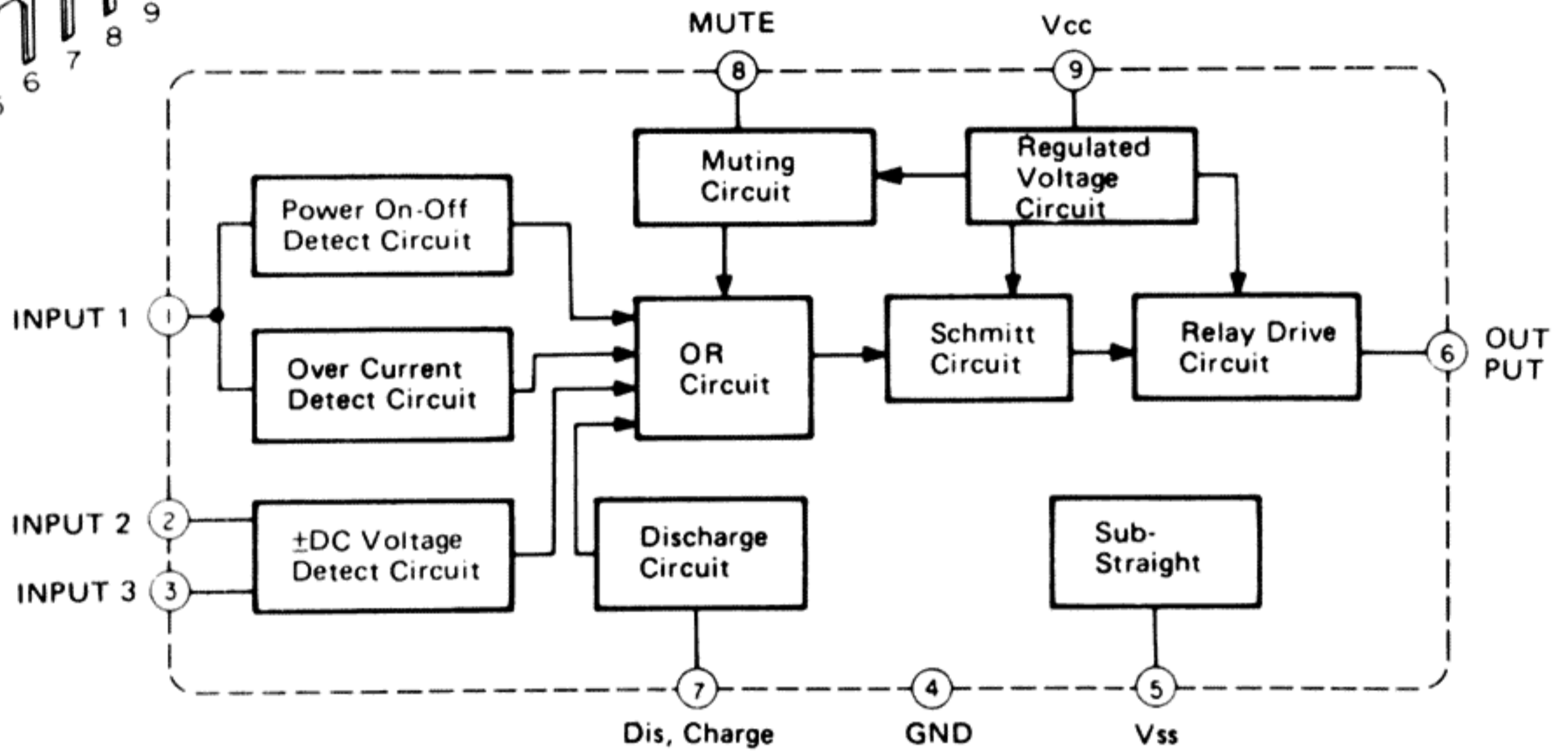
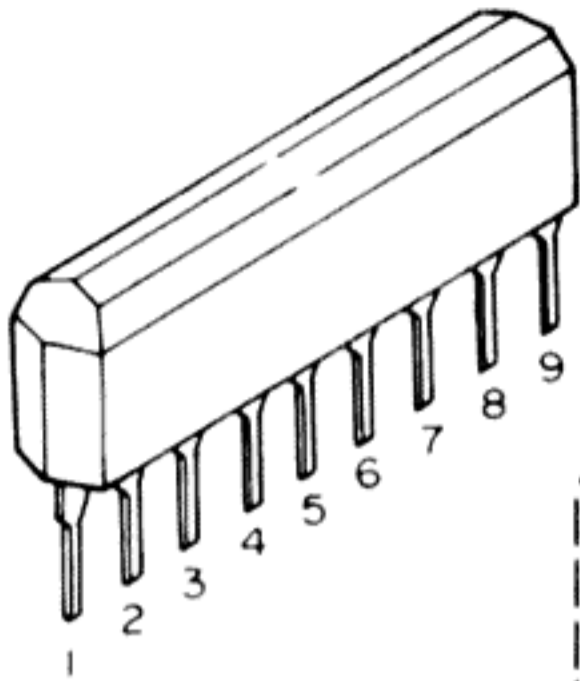
— **REVISED** —

- Serial Numbers after  
No.81210651 –A for M-117 (North American) model
- Concerning the contents not to be given in this manual,  
refer to the service manual (68P92578F02)

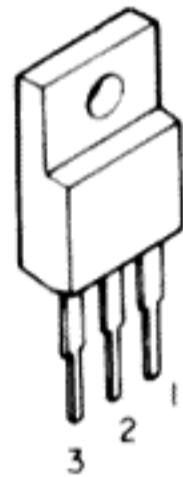


# Semi-Conductor Lead Identifications

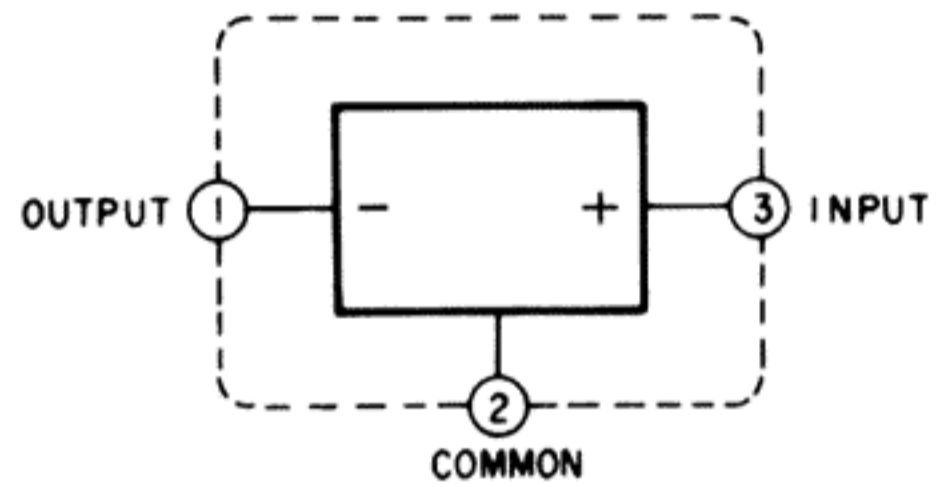
TA7317P: IC301



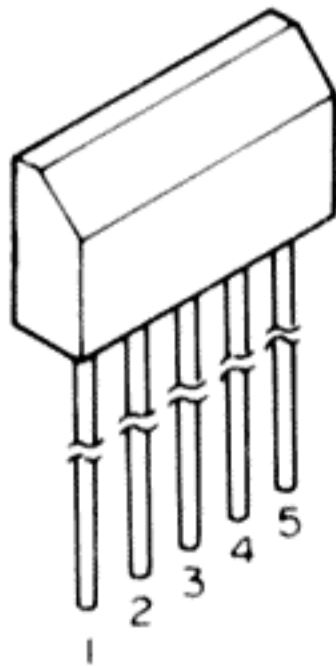
NJM78M12A: IC302



- 1. Output
- 2. Common
- 3. Input



2SA995 :Q101,201  
2SC2291:Q102,202



- 1. Emitter 1
- 2. Collector 1
- 3. Base (Common)
- 4. Collector 2
- 5. Emitter 2

2SA1208:Q103,104,203,204



- 1. Emitter
- 2. Collector
- 3. Base

#### 4. Removal of Main-Amp(R) P.C. Board

(1) After removal of Heatsink(R) remove twenty two screws marked " \* " as shown in Figure 6.

NOTE: Take care of handling each transistors when removing the Main-Amp(R) P.C. Board.

#### 5. Removal of Heatsink(L) and Main-Amp(L) P.C. Board

(1) Remove in the same way above mentioned.

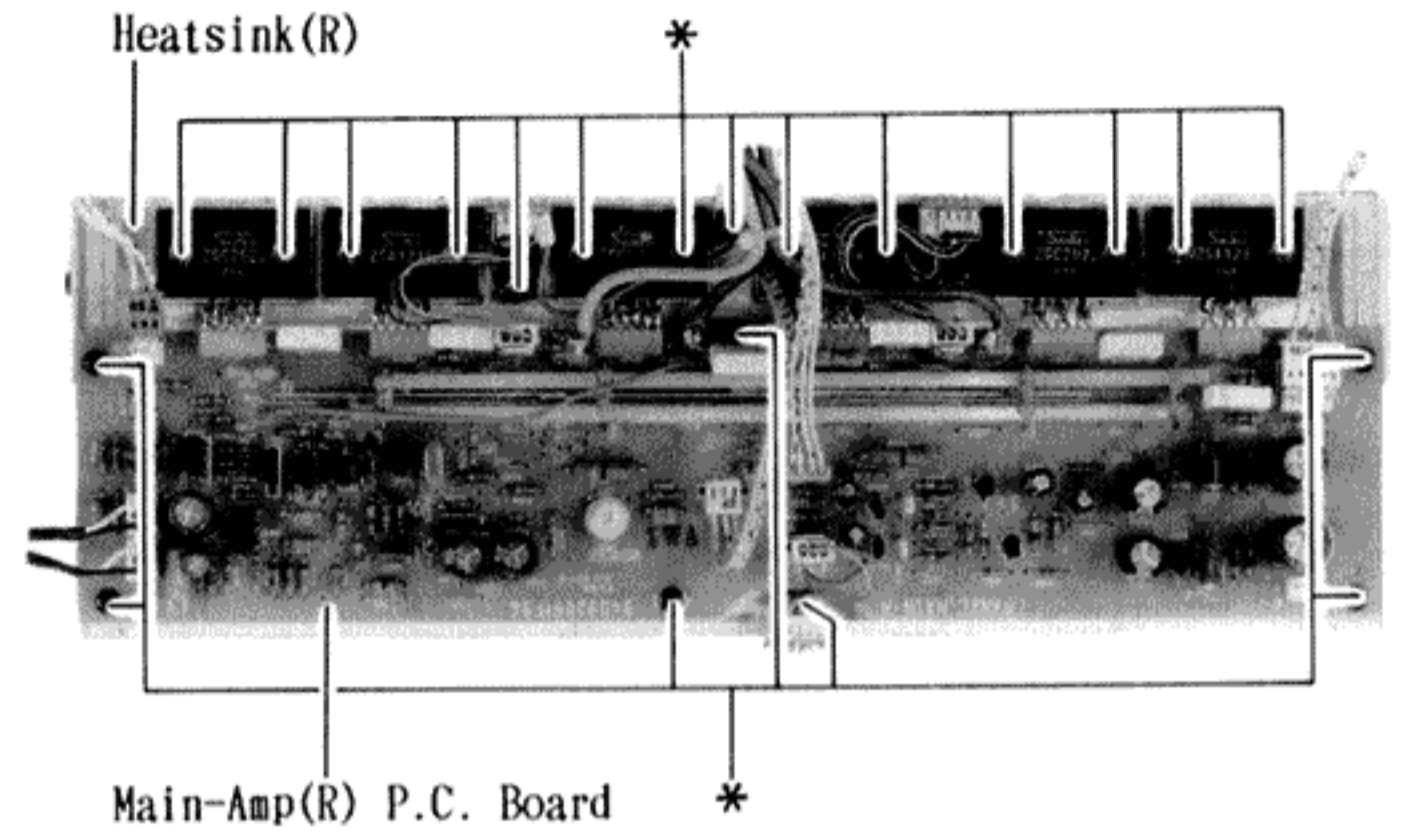


Figure 6

## Adjustment Procedures

### 1. Connection

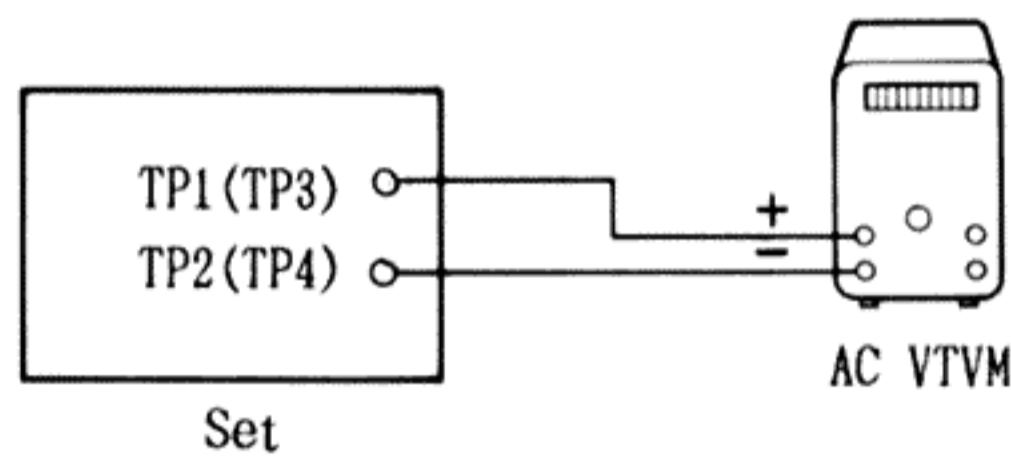


Figure 7

### 2. Control Setting

Attenuator(Left)..... Minimum	Power Switch ..... ON
Attenuator(Right) ..... Minimum	Others ..... OFF

### 3. Adjustment Procedure

(1) Idling Adjustment(Figure 7.8 and 9)

Adjust VR101(VR201) so that voltage between TP1(TP3) and TP2(TP4) reaches  $4 \pm 0.5\text{mV}$

# Adjustment Locations

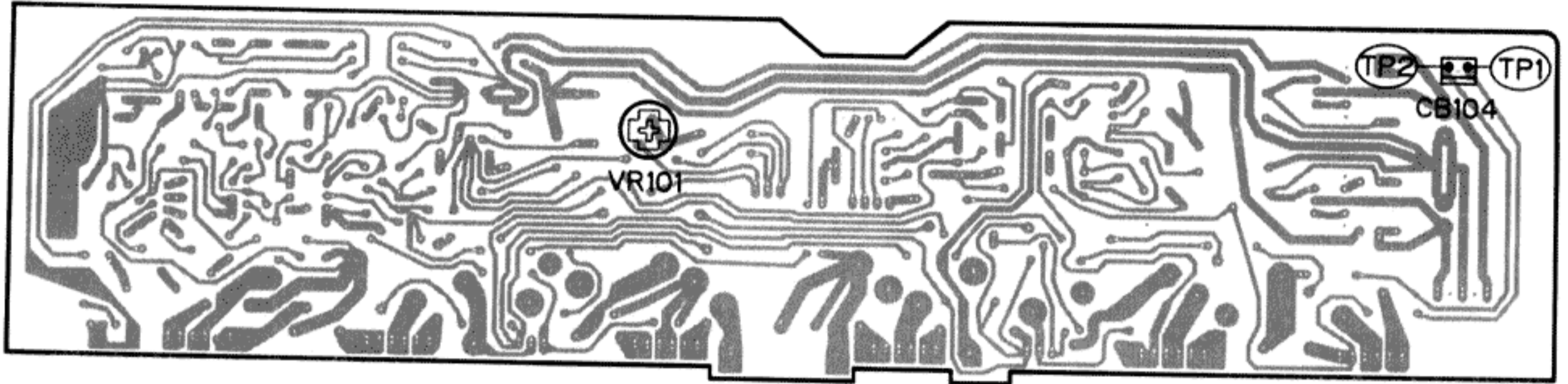


Figure 8 Main-Amp(L) P.C. Board(Component Side)

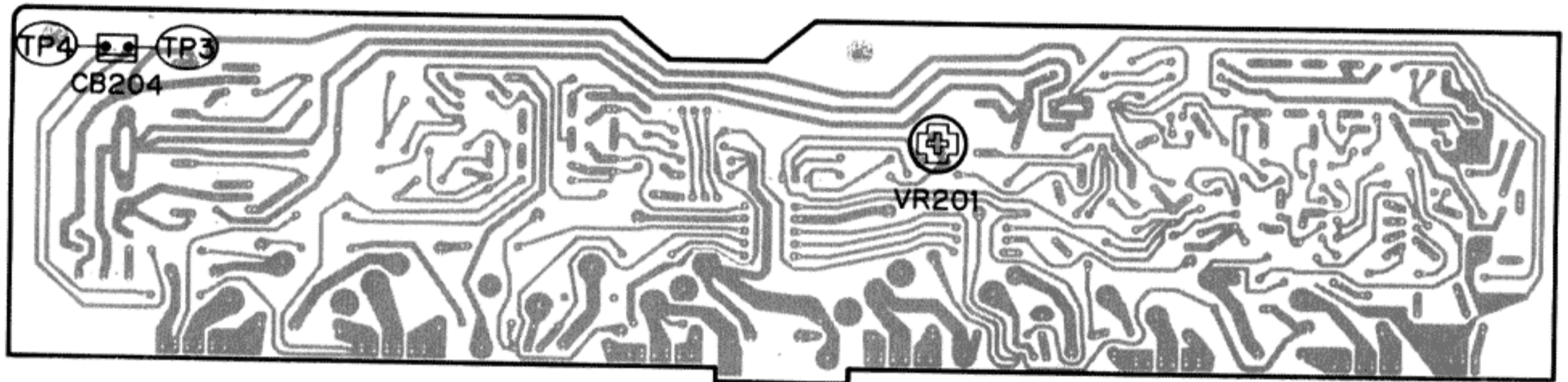
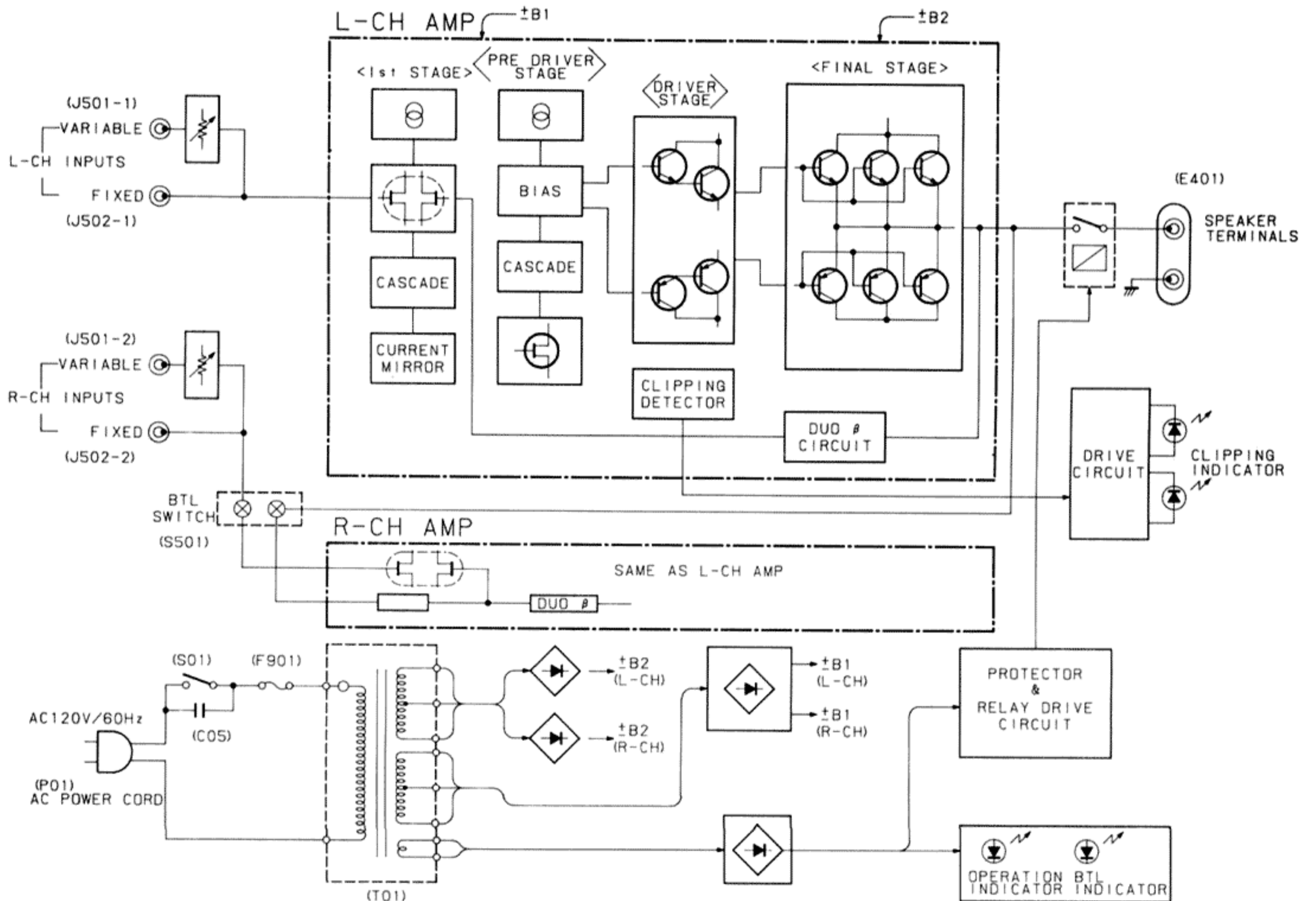


Figure 9 Main-Amp(R) P.C. Board(Component Side)

# Block Diagram

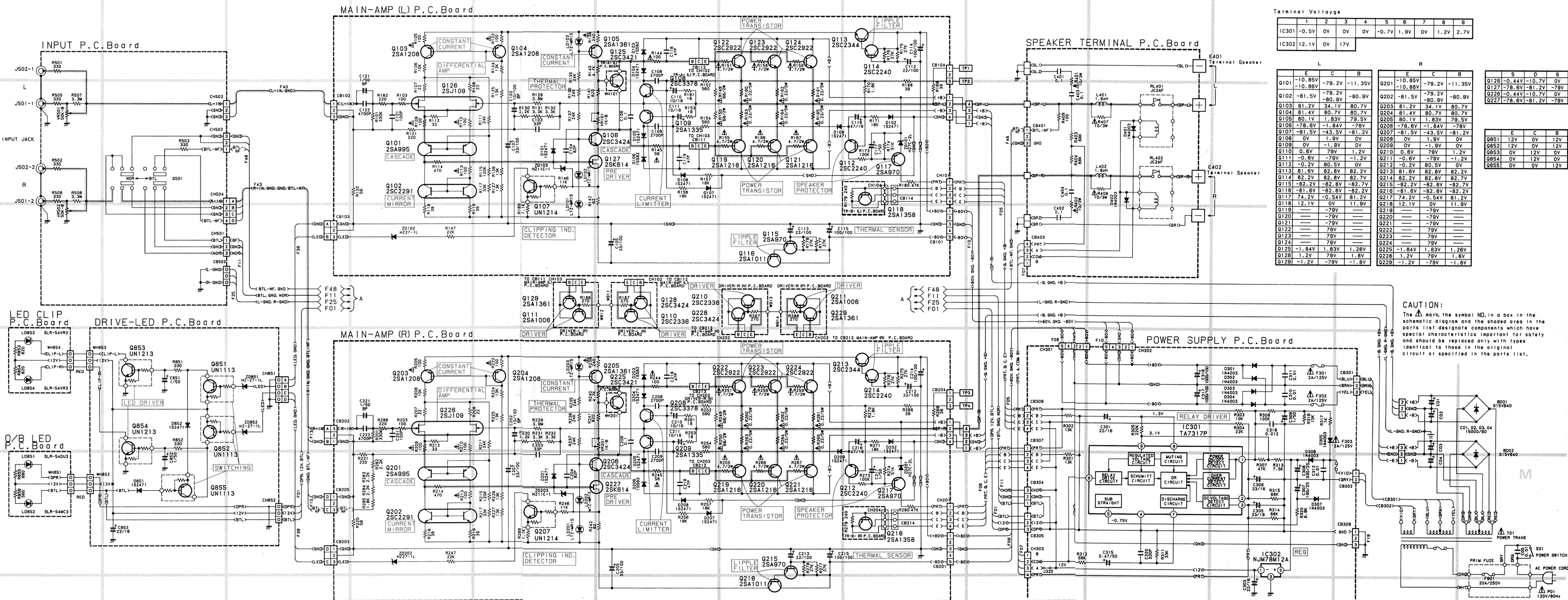


# Schematic Diagram

IC																					IC301	IC302																		
Transistors (Q)	Q103	Q101	Q102	Q203	Q201	Q202	Q126	Q104	Q107	Q129	Q111	Q105	Q106	Q125	Q208	Q209	Q128	Q110	Q210	Q228	Q122	Q123	Q119	Q116	Q115	Q124	Q121	Q211	Q112	Q118	Q117	Q229	Q213	Q214	Q212	Q218	Q215	Q221		
	Q853	Q854	Q855	Q851	Q852																																			

NOTES:  
 1. All resistance values are in ohms, K=1,000  
 2. All capacitance values are in microfarads, P= 1/1,000,000

Voltage Measuring Conditions:  
 • Power Supply Voltage: AC 120V  
 • Measuring Meter: Digital Volt Meter  
 • Measuring point reference: Between Ground  
 • Measuring conditions: No Signal Input



Terminal Voltages

	1	2	3	4	5	6	7	8	9
IC301	-0.5V	0V	0V	0V	-0.7V	1.9V	0V	1.2V	2.7V
IC302	12.1V	0V	17V						

	L			R													
	E	C	B	E	C	B											
Q101	-10.85V	-10.86V	-79.2V	-11.35V	Q201	-10.85V	-10.86V	-79.2V	-11.35V	Q126	-0.44V	-10.7V	0V				
Q102	-81.5V	-79.2V	-80.9V	Q202	-81.5V	-79.2V	-80.9V	Q103	81.2V	34.1V	80.7V	Q203	81.2V	34.1V	80.7V		
Q103	81.2V	34.1V	80.7V	Q204	81.4V	80.7V	80.7V	Q104	81.4V	80.7V	80.7V	Q205	80.1V	1.83V	79.5V		
Q104	81.4V	80.7V	80.7V	Q206	-78.6V	-1.84V	-78.6V	Q105	80.1V	1.83V	79.5V	Q207	-78.6V	-1.84V	-78.6V		
Q105	80.1V	1.83V	79.5V	Q207	-81.5V	-43.5V	-81.2V	Q106	0V	1.9V	0V	Q208	-78.6V	-1.84V	-78.6V		
Q106	0V	1.9V	0V	Q208	-78.6V	-1.84V	-78.6V	Q107	-81.5V	-43.5V	-81.2V	Q209	0V	1.9V	0V		
Q107	-81.5V	-43.5V	-81.2V	Q209	0V	1.9V	0V	Q108	0V	1.9V	0V	Q210	0.6V	79V	1.2V		
Q108	0V	1.9V	0V	Q210	0.6V	79V	1.2V	Q109	0V	-1.9V	0V	Q211	-0.6V	-79V	-1.2V		
Q109	0V	-1.9V	0V	Q211	-0.6V	-79V	-1.2V	Q110	0.6V	79V	1.2V	Q212	-0.2V	80.5V	0V		
Q110	0.6V	79V	1.2V	Q212	-0.2V	80.5V	0V	Q111	-0.6V	-79V	-1.2V	Q213	81.6V	82.8V	82.2V		
Q111	-0.6V	-79V	-1.2V	Q213	81.6V	82.8V	82.2V	Q112	-0.2V	80.5V	0V	Q214	82.2V	82.8V	82.7V		
Q112	-0.2V	80.5V	0V	Q214	82.2V	82.8V	82.7V	Q113	81.6V	82.8V	82.2V	Q215	-82.2V	-82.8V	-82.7V		
Q113	81.6V	82.8V	82.2V	Q215	-82.2V	-82.8V	-82.7V	Q114	82.2V	82.8V	82.7V	Q216	-81.6V	-82.8V	-82.2V		
Q114	82.2V	82.8V	82.7V	Q216	-81.6V	-82.8V	-82.2V	Q115	-82.2V	-82.8V	-82.7V	Q217	74.2V	-0.54V	81.2V		
Q115	-82.2V	-82.8V	-82.7V	Q217	74.2V	-0.54V	81.2V	Q116	-81.6V	-82.8V	-82.2V	Q218	12.1V	0V	11.9V		
Q116	-81.6V	-82.8V	-82.2V	Q218	12.1V	0V	11.9V	Q117	74.2V	-0.54V	81.2V	Q219		-79V			
Q117	74.2V	-0.54V	81.2V	Q219		-79V		Q118	12.1V	0V	11.9V	Q220		-79V			
Q118	12.1V	0V	11.9V	Q220		-79V		Q119		-79V		Q221		-79V			
Q119		-79V		Q221		-79V		Q120		-79V		Q222		79V			
Q120		-79V		Q222		79V		Q121		-79V		Q223		79V			
Q121		-79V		Q223		79V		Q122		79V		Q224		79V			
Q122		79V		Q224		79V		Q123		79V		Q225		-1.84V	1.83V	1.26V	
Q123		79V		Q225		-1.84V	1.83V	1.26V	Q124		79V		Q226		1.2V	79V	1.8V
Q124		79V		Q226		1.2V	79V	1.8V	Q125	-1.84V	1.83V	1.26V	Q227	-1.2V	-79V	-1.8V	
Q125	-1.84V	1.83V	1.26V	Q227	-1.2V	-79V	-1.8V	Q126	1.2V	79V	1.8V	Q228					
Q126	1.2V	79V	1.8V	Q228				Q127	-1.2V	-79V	-1.8V	Q229					
Q127	-1.2V	-79V	-1.8V	Q229				Q128				Q230					

CAUTION:  
 The  $\Delta$  mark, the symbol NO, in a box in the schematic diagram and the shaded area in the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list.