

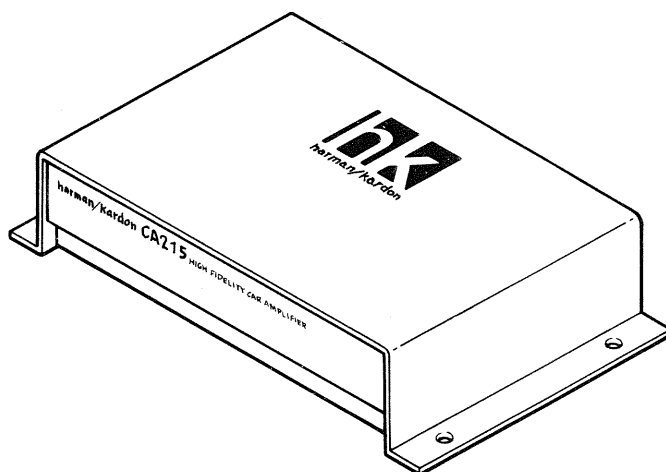
The Harman Kardon Model CA215

Manual 100A

HIGH FIDELITY CAR AMPLIFIER

Technical Manual

CA215



SPECIFICATIONS

Power Output, RMS	: 12 watts per channel into 4 Ohms, 20 ~ 20,000Hz	Power Supply	: DC +13.8V (11 ~ 16V usable), negative ground
HCC (High instantaneous Current Capability)	: 14A	Typical Input Current Requirements	
THD	: No more than 0.2% (4 Ohms)	At Idle	: 0.3A
Negative Feedback	: 25dB	Full Power Music Signal	: 1.2A (4 Ohms/ch.)
Power Bandwidth	: 10Hz to 100,000Hz	Full Power Sine Wave	: 3.6A (4 Ohms/ch.)
Frequency Response	: 10Hz to 100,000Hz +0, -3dB	Dimensions (W x H x D)	: 8-1/4" x 1-11/16" x 6-3/16" (208 x 42 x 156 mm)
Signal-to-Noise Ratio	: 84dB	Weight	: 2lbs. 3oz. (1kg)
Input Sensitivity/Impedance	: 0.1V/0.5V (Switchable)/ 22k Ohms		

Specifications and components subject to change without notice.
Overall performance will be maintained or improved.

harman/kardon

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DISASSEMBLY PROCEDURES (REFER TO THE FOLLOWING FIGURE)

1 CABINET (131) REMOVAL

Remove 5 screws **A** and then remove the Cabinet (131).

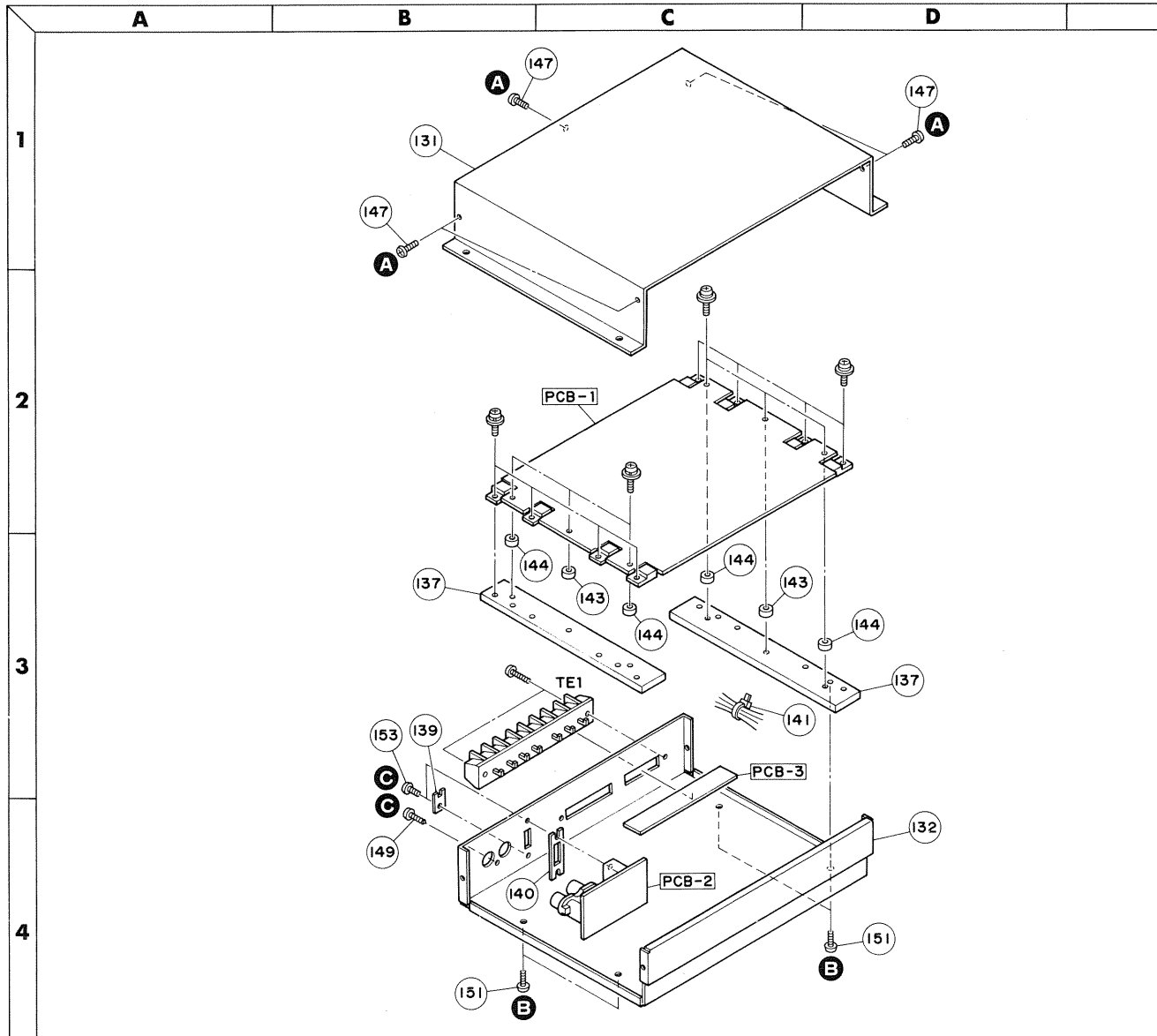
2 MAIN P. C. BOARD (PCB-1) REMOVAL

1. Remove the Cabinet (131), referring to the previous step **1**.
2. Remove 4 screws **B** and then remove the Main P. C. Board (PCB-1) with the Heat Sinks (137). If necessary, unsolder the lead wires.

3 INPUT JACK P. C. BOARD (PCB-2) REMOVAL

1. Remove the Main P. C. Board (PCB-1), referring to the previous step **2**.
2. Remove 3 screws **C** and then remove the Input Jack P. C. Board (PCB-2). If necessary, unsolder the lead wires.

GENERAL UNIT EXPLODED VIEW



PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
131	1414-06001	Cabinet			
132	1424-17001	Cabinet Bottom			
137	2222-7191	Heat Sink			
139	2240-7224	Holder			
140	2240-7225	Holder			
141	2240-7120	Holder			
143	2132-7141	Spacer			
144	2132-7119	Spacer			
147	2347-3006K7	Screw (3 × 6mm)			
149	2347-3010K1	Screw (3 × 10mm)			
151	2340-7003	Special Screw (3 × 8mm)			
153	2327-2605K9	Screw (2.6 × 5mm)			
	1111-J30227	Owner Guide U			
	1111-J30228	Owner Guide EW			
				2310-7034	Mounting Screws and Washers (1 Set) (Accessory)
				1221-717182	Packing Box
				1222-7285	Packing Cushion, Left
				1222-7286	Packing Cushion, Right

U : U.S.A. model

EW : General model

* The part with the above mark is used only in the model made for the particular market the mark indicates.

CA215

CIRCUIT DESCRIPTION

● PRINCIPLE OF OPERATION

In order to obtain 12 watts per channel rated output power from a 13.8 volt power supply a bridge type of circuit is employed. Each channel consists of two power amplifiers and the loudspeaker is connected between the outputs of these two power amplifiers. Since the phase of power amplifiers 2 and 4 (see block diagram below) is inverted when compared to power amplifiers 1 and 3 the voltage between the output terminals 1 and 2 respectively 3 and 4 is doubled.

● CIRCUIT DESCRIPTION (FOR LEFT CHANNEL)

Q101, Q105 and Q103, Q107 form differential amplifier stages. Q117 and Q119 are unity gain stages. Q121, Q125 and Q127, Q123 are common emitter gain stages. Q133, Q141, Q137, Q145 and Q139, Q147, Q135, Q143 form push pull output stages in a compound darlington configuration. The input signal is applied to the base of Q101 and amplified in amplifier number 1. The output signal from amplifier number 1 is in phase with the input signal at the base of Q101. This

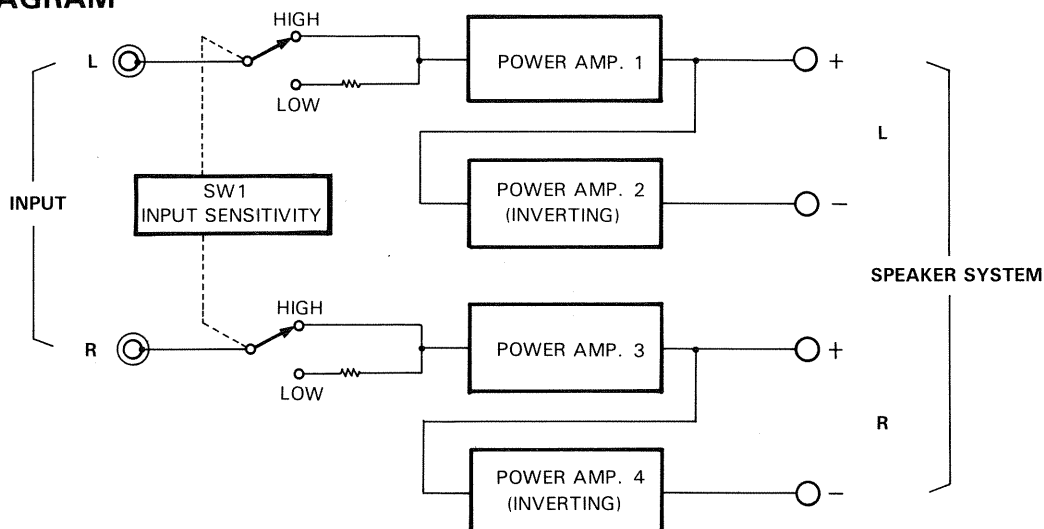
output signal is fed to the base of Q107 in amplifier number 2 through R215/R217 and C109.

When the base of Q107 is driven positive, the output voltage of power amplifier number 2 goes negative. The combination of resistors R215, R217 and R145 determines the gain of amplifier number 2. This gain is one. Therefore, the voltage between the output terminals of power amplifier number 1 and power amplifier number 2 is double the output voltage of the individual power amplifiers. The loudspeaker is connected between these two output terminals.

● REMOTE

When +12V is fed to the REMOTE terminal, Q1 and Q2 turn ON and thereby Q109-Q113, Q111-Q115 (L ch.) and Q110-Q114, Q112-Q116 (R ch.) are turned ON. Also, the differential input transistor of each channel from Q101 to Q108 is turned ON and thus the power stage becomes ON.

BLOCK DIAGRAM



ALIGNMENT PROCEDURES

■ IDLING ADJUSTMENT

Conditions:

- Connect a 13.8V power supply to the 12V BATTERY POWER IN terminal.
- After the power on, wait for 15 minutes before measuring to be sure of the most stable operation.
- Connect a DC voltmeter each of between a and b, c and d, e and f, g and h on the Main P. C. Board (PCB-1). (Refer to Fig.1.)

Inspection:

1. Check if the voltage between each of the following is 5 to 20mV.
a-b, c-d, e-f, g-h
2. If not, connect one of the following carbon resistors between A and B, C and D, E and F or G and H, whichever corresponds to the one where a proper voltage is not obtained in the above check and adjust so that a voltage between 5 and 20mV is obtained.
(The resistor should be wound to the terminal and then soldered.)

● 6.8kΩ, 1/4W	● 8.2kΩ, 1/4W
● 10kΩ, 1/4W	● 12kΩ, 1/4W
● 15kΩ, 1/4W	
3. After the above adjustment, wait for 15 minutes and recheck the voltage.

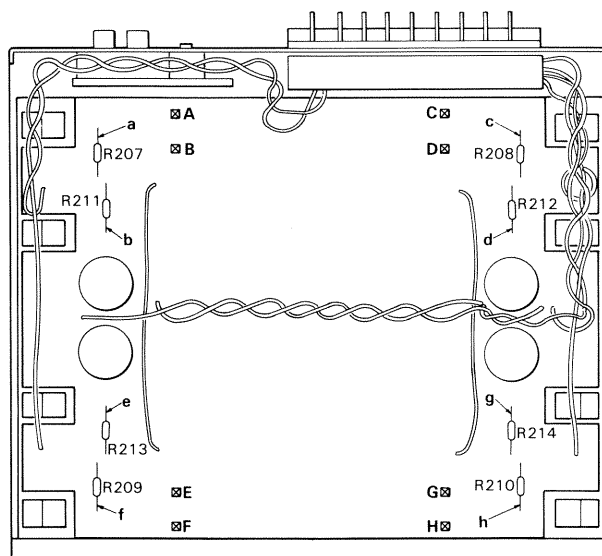
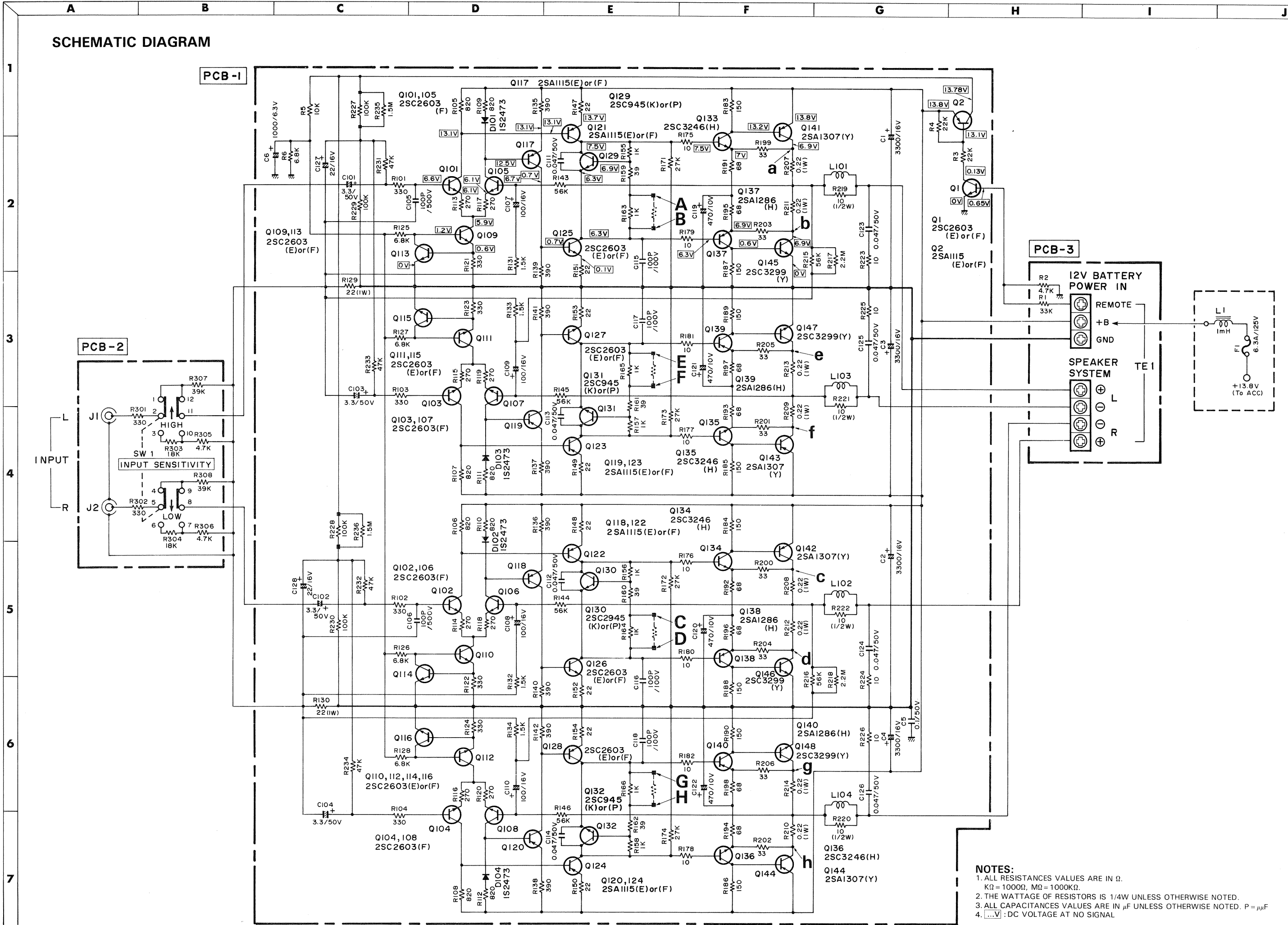


Fig. 1

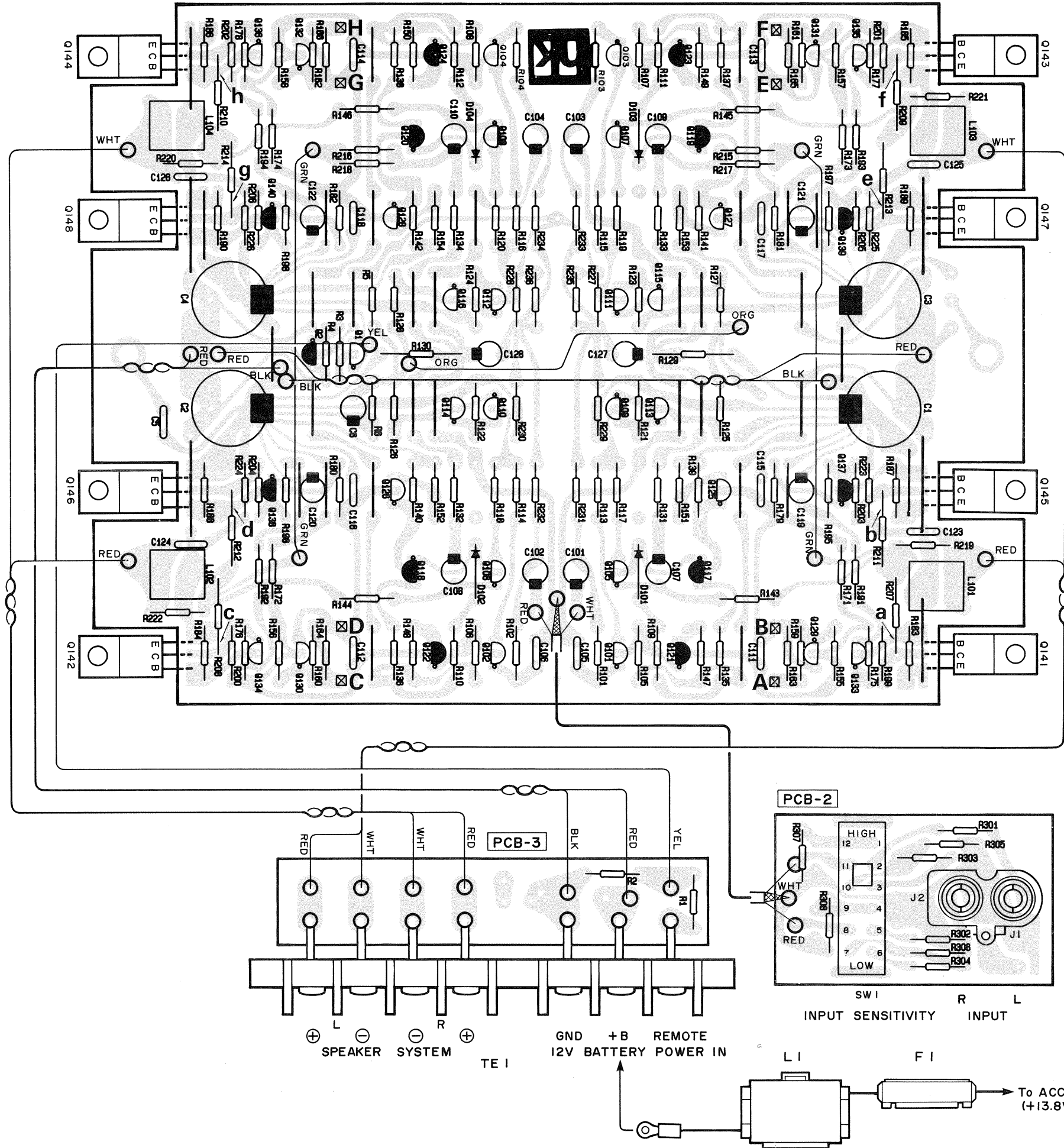
SCHEMATIC DIAGRAM



- NOTES:**
1. ALL RESISTANCES VALUES ARE IN Ω .
K Ω = 1000 Ω , M Ω = 1000K Ω .
 2. THE WATTAGE OF RESISTORS IS 1/4W UNLESS OTHERWISE NOTED.
 3. ALL CAPACITANCES VALUES ARE IN μ F UNLESS OTHERWISE NOTED. P = μ F.
 4. [V]: DC VOLTAGE AT NO SIGNAL

WIRING DIAGRAM

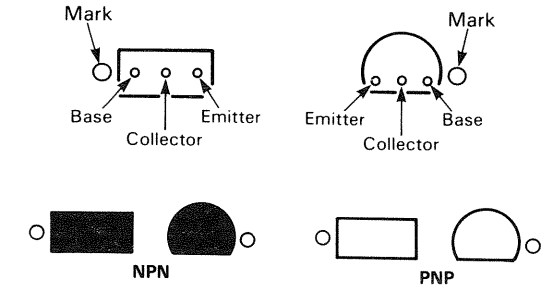
PCB-1



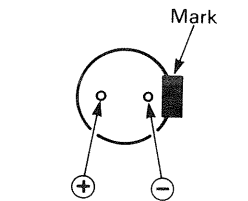
NOTES

In the figures of the P. C. Boards, a mark is provided on the base side of the transistor.

Transistors



Electrolytic Capacitors



WIRE COLOR ABBREVIATIONS

- RED : Red
- ORG : Orange
- BLU : Blue
- WHT : White
- GRN : Green
- BLK : Black
- YEL : Yellow
- PUP : Purple
- PIK : Pink
- BRN : Brown

PIN CONNECTION DIAGRAM OF TRANSISTORS AND DIODES.

