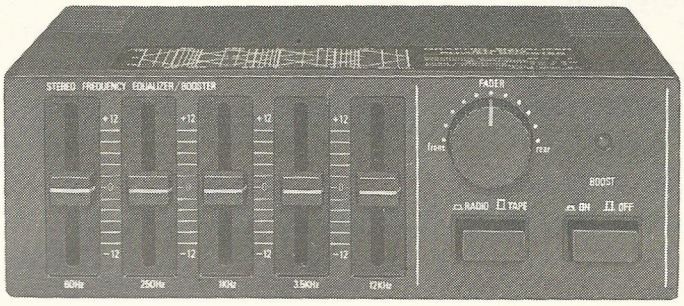
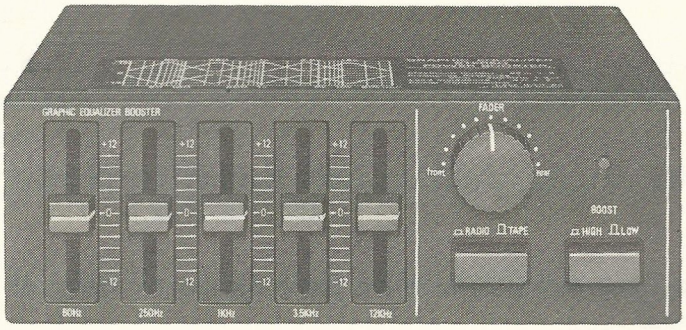
SERVICE MANUAL

GRAPHIC EQUALIZER STEREO POWER BOOSTER With FADER CONTROL, TAPE/RADIO SWITCH and AUTOMATIC ON/OFF



EQA-200



EQA-201

Printed in Japan Dec. '79 Modification Reserved

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This section is applicable to both Model EQA-200 and EQA-201.
But the words and numbers with the underline are only applicable to Model EQA-201.

SPECIFICATIONS

POWER SUPPLY VOLTAGE	DC. 13.8V (11 ~ 16V)
POLARITY	Negative (–) Ground
OUTPUT LOAD	4 ohm
FADER CONTROL	Rear position
TONE CONTROL	Center

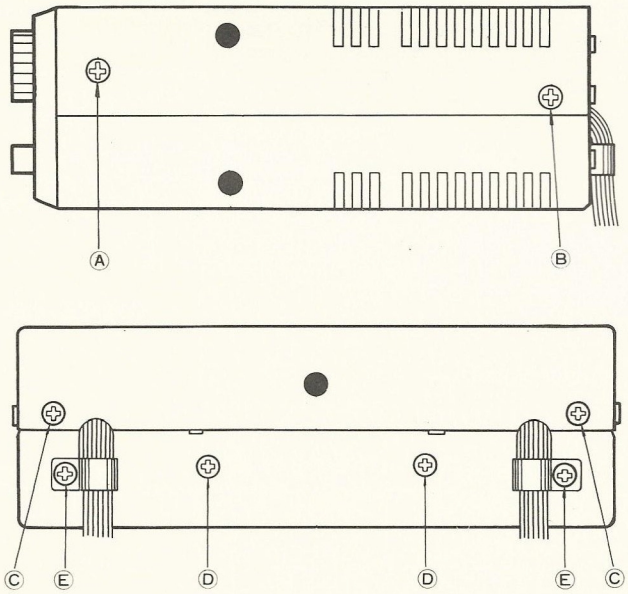
	NOMINAL	LIMIT	
MAX. OUTPUT POWER	21W	18W	per channel at 5V Input
10% THD OUTPUT POWER	15W	13.5W	per channel
VOLTAGE GAIN	10dB	9dB	
FREQUENCY RESPONSE	30 ~ 40000Hz	35 ~ 30000Hz	–3dB
SMALL SIGNAL THD	0.5%	1%	at 10% THD
NOISE LEVEL	3mV	5mV	Input open
SEPARATION	55dB	50dB	at 2W Output
TONE CONTROL CENTER FREQUENCIES	60, 250, 1k, 3.5k and 12kHz		
TONE CONTROL RANGE	±12dB	±10dB	
MUTING (High-Low)	-10dB	-8 ~ -12 dB	
INPUT IMPEDANCE		22 ohm	
SPEAKER IMPEDANCE		8 ohms	
CURRENT DRAIN		5A Maximum	
DIMENSIONS	50mm (H) x 150mm (W) x 130mm (D)		
WEIGHT	950g (2 lb. 2 oz.)		

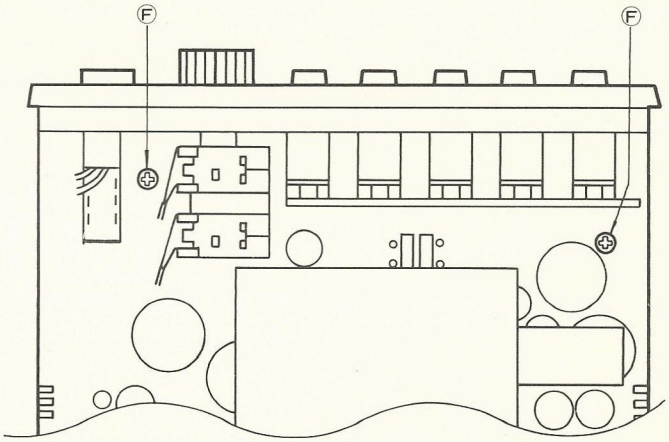
NOTE: Nominal Specifications represent the design specs; all units should be able to approximate these – some will exceed and some may drop slightly below these specs. Limit Specifications represent the absolute worst condition which still might be considered acceptable; in no case should a unit perform to less than within any Limit Specification.

DISASSEMBLY INSTRUCTIONS

Remove case cover as follows.

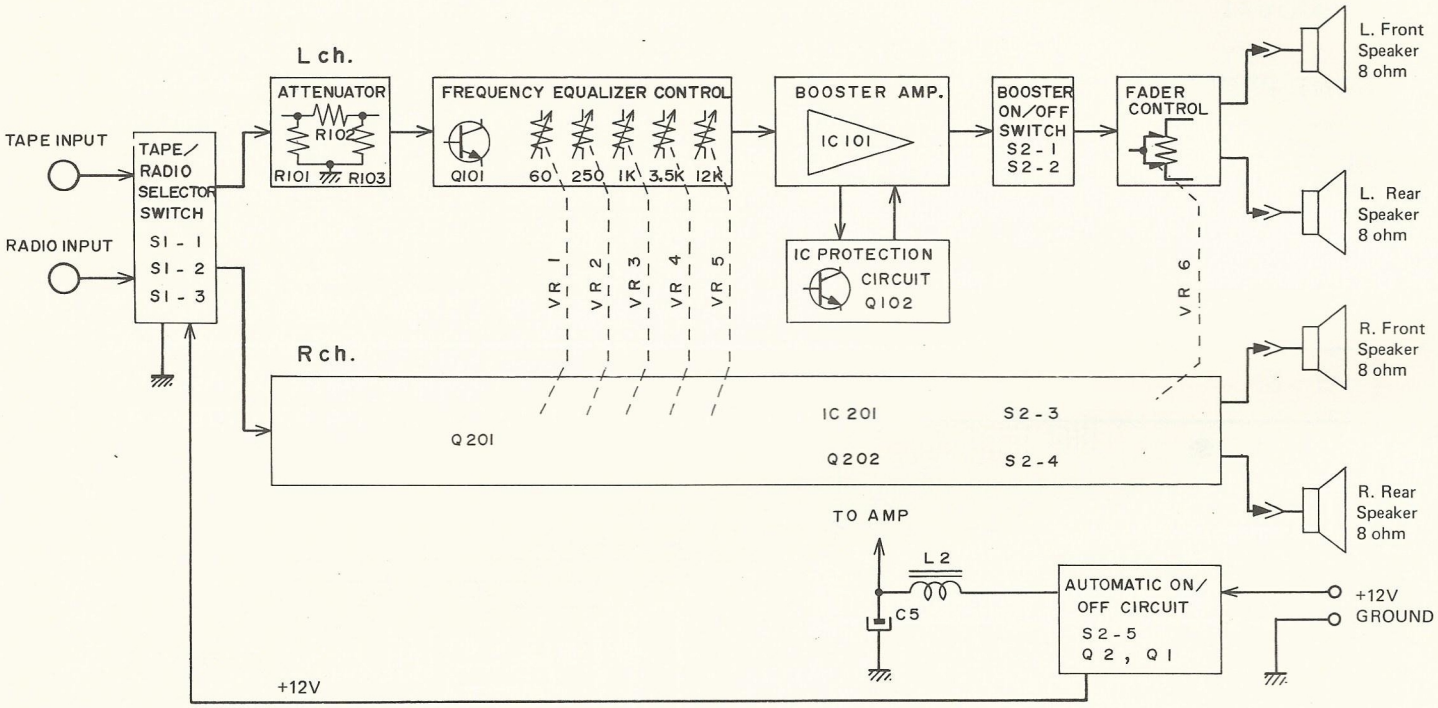
REMOVAL	TOTAL QUANTITY OF SCREWS	CODE & QUANTITY OF SCREWS	HOLDING
FRONT PANEL	2 pcs.	A 2 pcs.	Front panel
TOP CASE	4 pcs.	B 2 pcs. C 2 pcs.	Top case Top case
BOTTOM CASE	6 pcs.	D 2 pcs. E 2 pcs. F 2 pcs.	Amplifier Cord clamp Amplifier



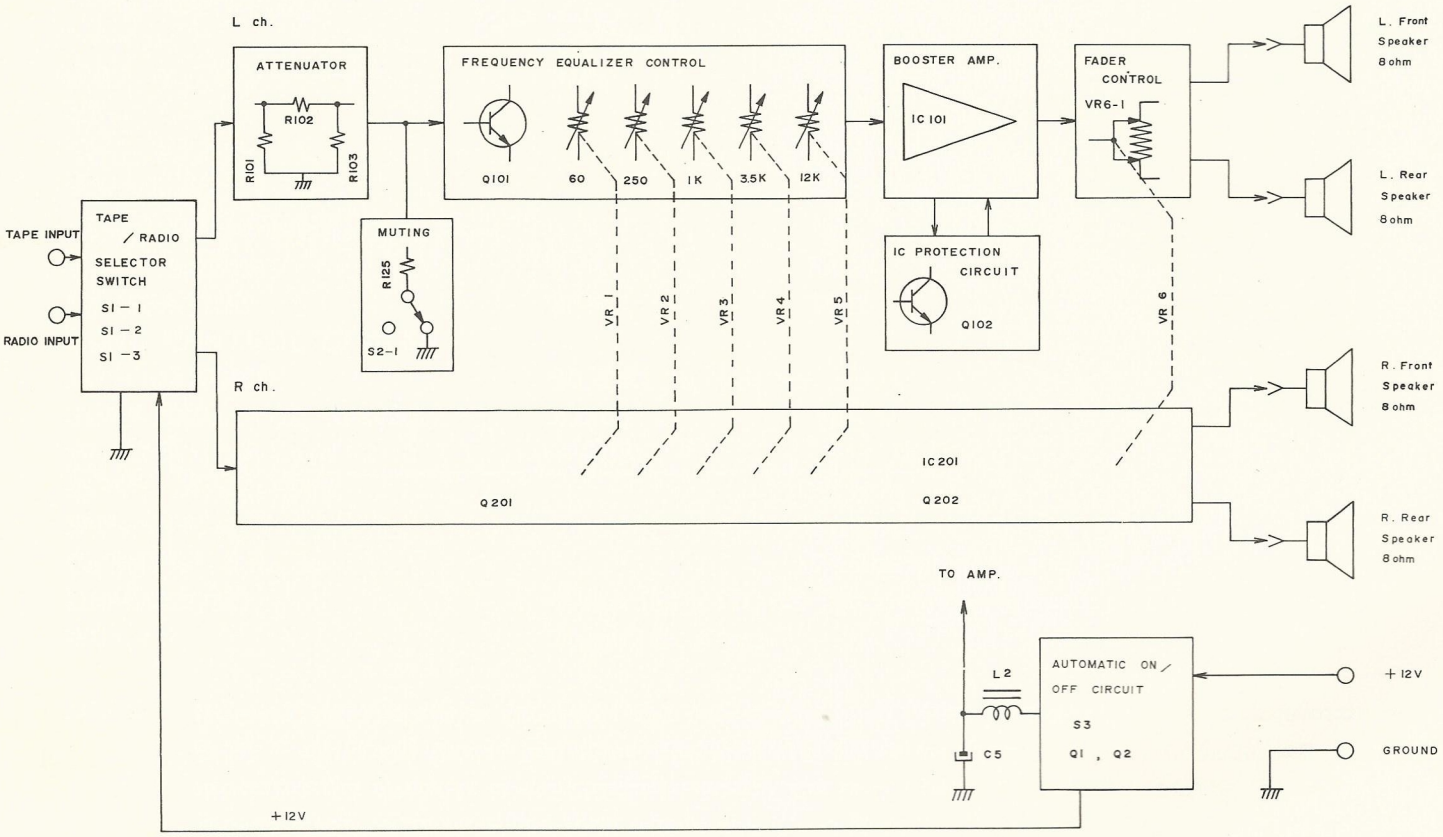


BLOCK DIAGRAM

EQA–200



EQA–201



TROUBLESHOOTING GUIDE

Booster switch is OFF position

This section is only applicable to Model EQA-200.

SYMPTOM	SPECIFIC PROBLEM	DEFECTIVE CIRCUIT	DEFECTIVE POINT AND CAUSE
NO SOUND	Tape Player and/or Radio is not on		Tape player or radio defective.
		Power Supply circuit	Fuse open. Faulty connection between power supply and power supply cord. Faulty connection between metal frame of vehicle and ground wire. Tape/Radio selector switch S1-3 defective.
		Automatic ON/OFF circuit	Diode D1 defective.
	Tape Player and/or Radio is on		Tape Player or radio defective.
		Input circuit	Tape/Radio selector switch S1-1 or S1-2 defective.
		Output circuit	Faulty connection between speaker and connecting cord. Speaker defective. Booster on/off switch S2-1, S2-2, S2-3 or S2-4 defective.

Booster switch is ON position

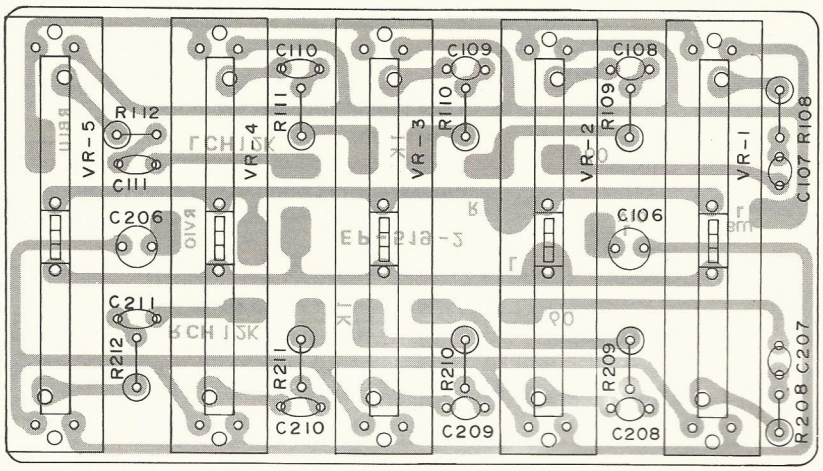
This section is applicable to both Model EQA-200 and EQA-201.
But the words and numbers with the underline are only applicable to Model EQA-200.

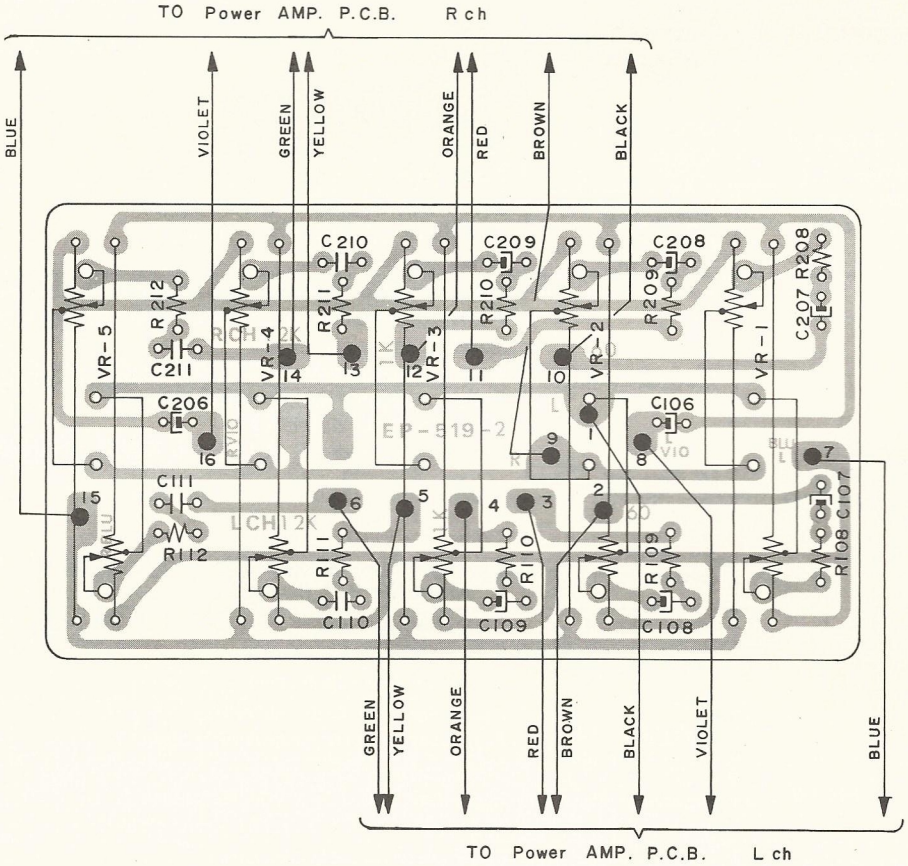
SYMPTOM	SPECIFIC PROBLEM	DEFECTIVE CIRCUIT	DEFECTIVE POINT AND CAUSE
NO SOUND	Power Supply is not on	Power Supply circuit	Faulty connection between power supply and power supply cord. Faulty connection between metal frame of vehicle and ground. Choke coil L1 or L2 defective. Tape/Radio selector switch S1-3 defective.
		Automatic ON/OFF circuit	Diode D1, D2, D3 or D4 defective. Transistor Q1 or Q2 defective. Relay S3 defective.
	Power Supply is on but no sound	Output circuit	Mis-connection between speaker and speaker connecting cord. Faulty connection between speaker and speaker connecting cord. Speaker voice coil open. Booster on/off switch S2-1, S2-2, S2-3 or S2-4 defective. Fader control VR6 has open circuit. Main amplifier defective. Check for power IC IC101 and IC201 or circuit.
		IC Protection circuit	Transistor Q102 or Q202 defective.
		Equalizer circuit	Transistor Q101 or Q201 defective. Disconnection between Equalizer P.C. Board and Main Amplifier P.C. Board.
		Input circuit	Tape/Radio selector switch S1-1 or S1-2 defective.
DISTORTED SOUND OR INSUFFICIENT SOUNR		Output circuit	Speaker defective. Main amplifier defective.
		Equalizer circuit	Equalizer Amplifier defective. Equalizer control circuit defective.
EQUALIZER CONTROL HAS NO EFFECT	"60 Hz" has no effect	Equalizer circuit	Slide control VR1 defective. Capacitor C107 or C207 defective. Choke coil L101 or L201 open circuit.
	"250 Hz" has no effect	Equalizer circuit	Slide control VR2 defective. Capacitor C108 or C208 defective. Choke coil L102 or L202 open circuit.
	"1 kHz" has no effect	Equalizer circuit	Slide control VR3 defective. Capacitor C109 or C209 defective. Choke coil L103 or L203 open circuit.
	"3.5" kHz" has no effect	Equalizer circuit	Slide control VR4 defective. Capacitor C110 or C210 defective. Choke coil L104 or L204 open circuit.
	"12 kHz" has no effect	Equalizer circuit	Slide control VR5 defective. Capacitor C111 or C211 defective. Choke coil L105 or L205 open circuit.
	All controls have no effect	Equalizer circuit	Capacitor C106 or C206 defective.

This section is applicable to Model EQA-201 only.

MUTING HAS NO EFFECT		Muting circuit	Muting ON/OFF switch S2-1 or S2-2 defective.

EQUALIZER CONTROL CIRCUIT BOARD LOCATION GUIDE



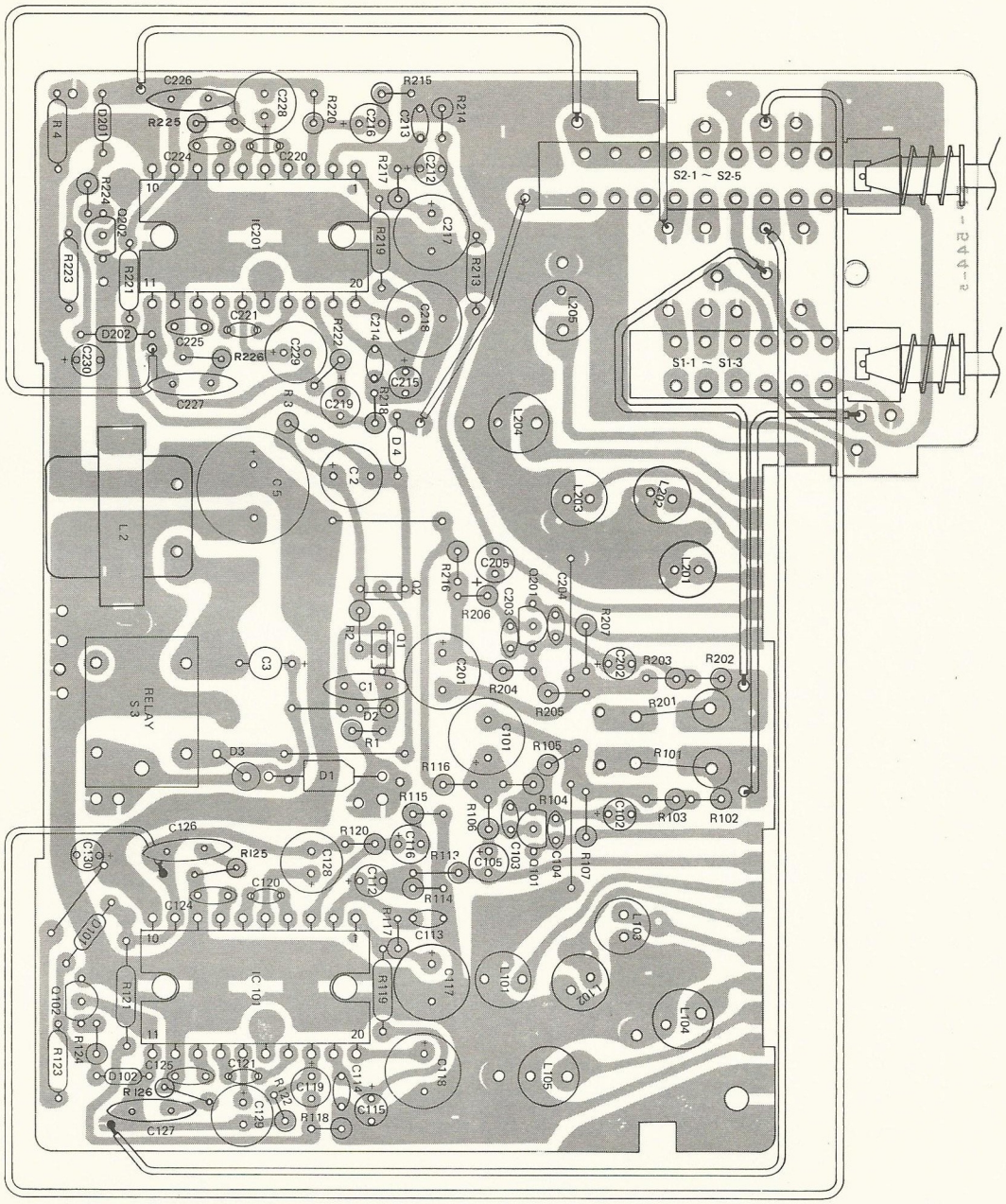


No. 15 APP-1 EQUALIZER CONTROL CIRCUIT BOARD ASSEMBLY PARTS LIST

Ref. No.	Description	Part No.
	Equalizer printed circuit board (Empty)	EP-519-2
C106, 206	Electrolytic capacitor 33 μF +50-10% 16V	ECC
C107, 207	Tantalum electrolytic capacitor 4.7 μF ±20% 10V	ECC
C108, 208	Tantalum electrolytic capacitor 0.68 μF ±20% 16V	ECC
C109, 209	Tantalum electrolytic capacitor 0.22 μF ±20% 16V	ECC
C110, 210	Polyester film capacitor 0.051 μF ±5% 50V	ECC
C111, 211	Polyester film capacitor 0.013 μF ±5% 50V	ECC
R108, 208	Carbon film resistor 150 ohm ±5% 1/4W	ECR
R109, 110, 209, 210	Carbon film resistor 330 ohm ±5% 1/4W	ECR
R111, 112, 211, 212	Carbon film resistor 390 ohm ±5% 1/4W	ECR
VR1, 2, 3, 4, 5	Slide control 50K ohm W	ECRV-209

MAIN AMPLIFIER CIRCUIT BOARD LOCATION GUIDE

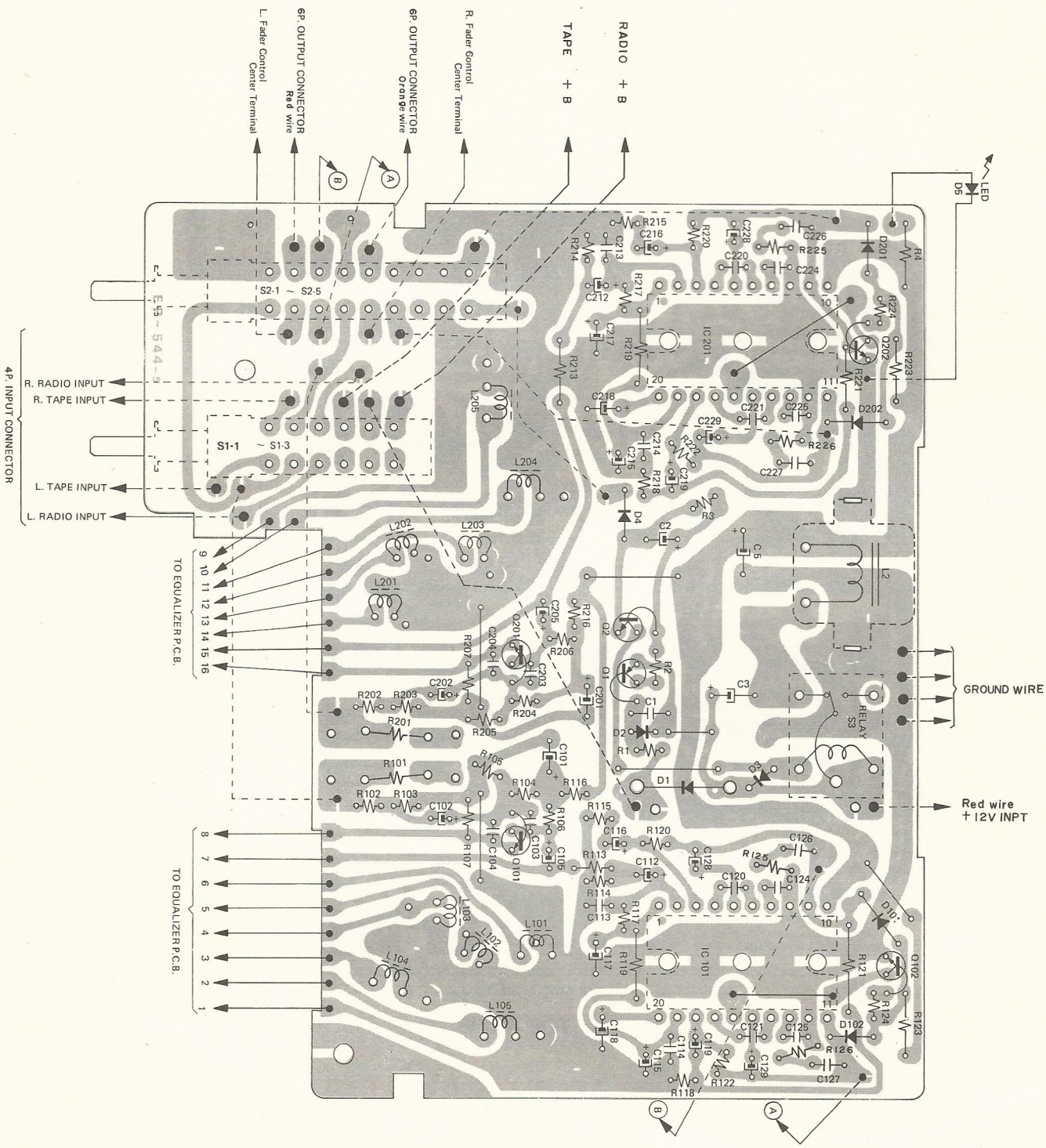
EQA–200



TOP VIEW

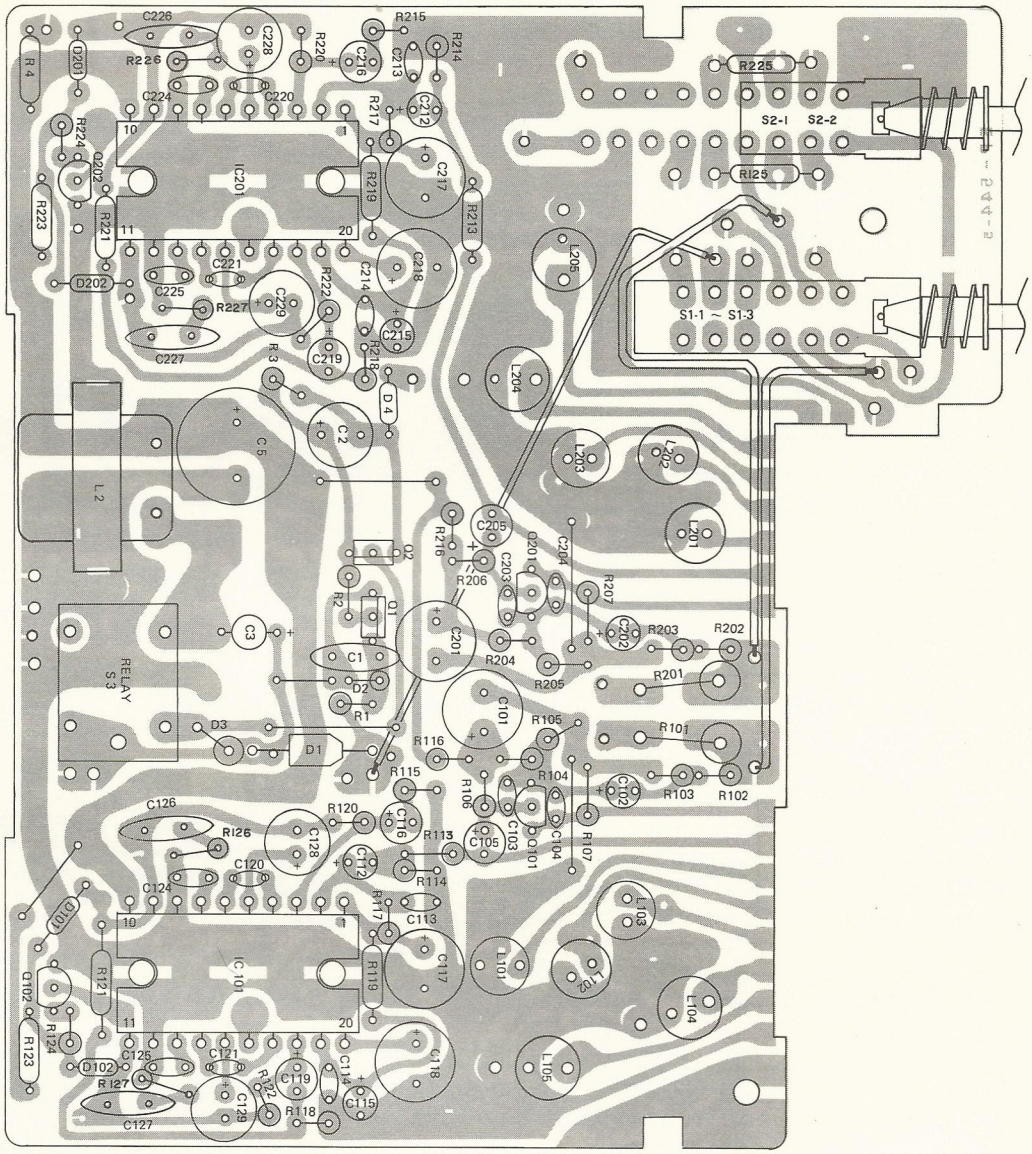
MAIN AMPLIFIER CIRCUIT BOARD LOCATION GUIDE

EQA–200



BOTTOM VIEW

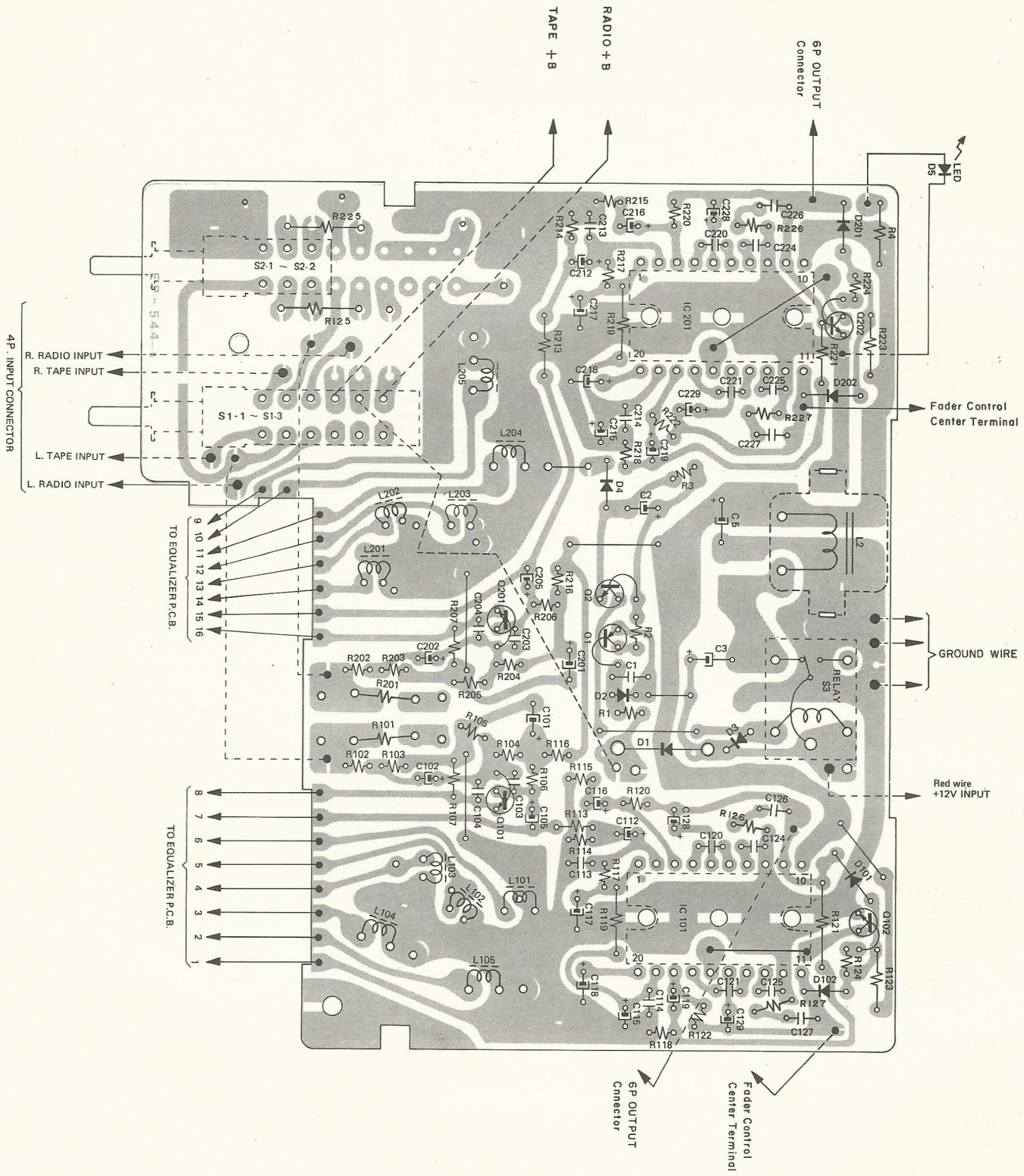
EQA–201



TOP VIEW

MAIN AMPLIFIER CIRCUIT BOARD

EQA–201



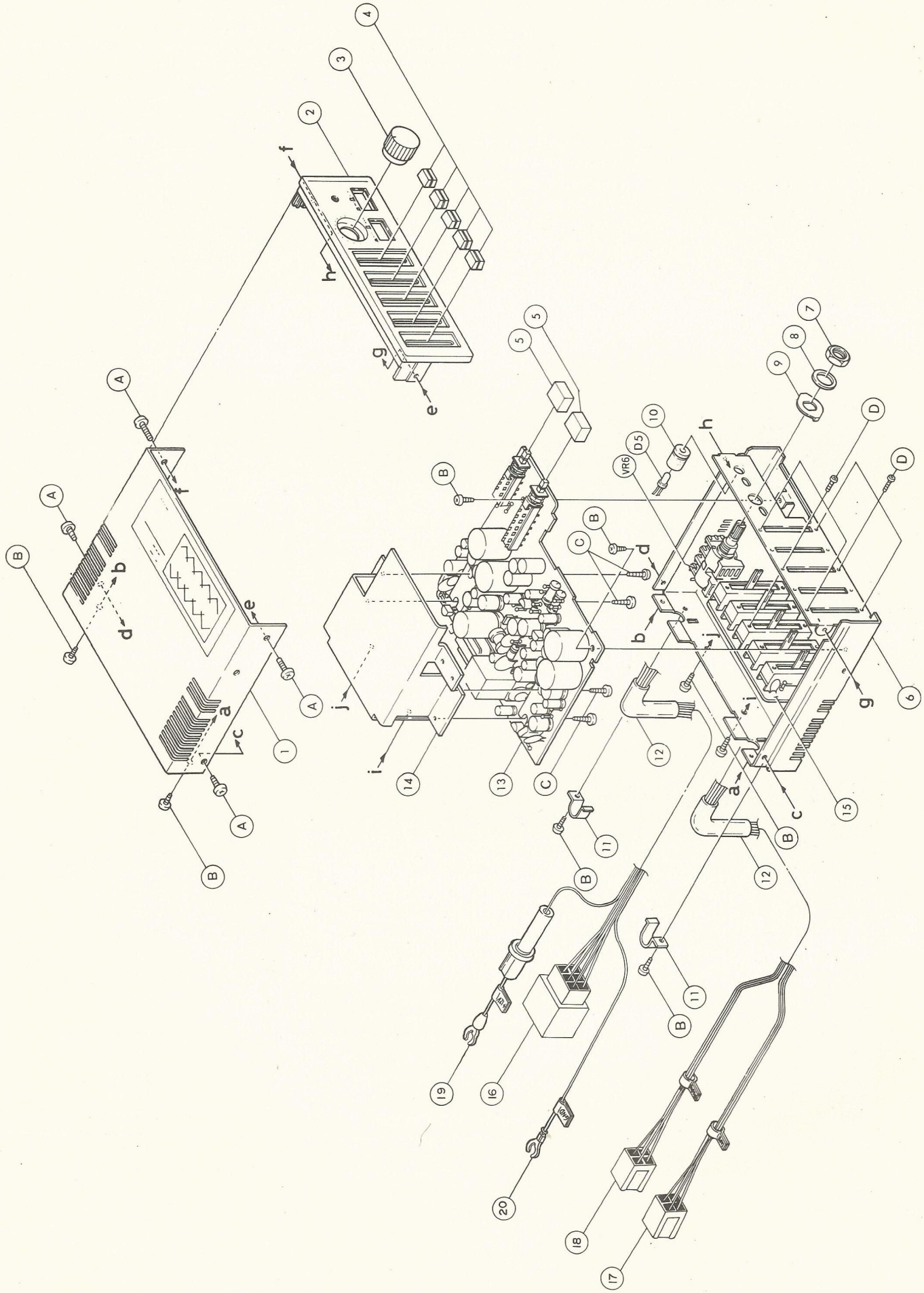
BOTTOM VIEW

Ref. No. 13 AAP-3 (EQA-200) AAP-15 (EQA-201) MAIN AMPLIFIER CIRCUIT BOARD ASSEMBLY PARTS LIST

This section is applicable to both Model EQA-200 and EQA-201.
But the words and numbers with the underline is only applicable to Model EQA-200, and the words and numbers in brackets are only for EQA-201.

Ref. No.	Description		Part No.
	Main amplifier printed circuit board (Empty)		EP-544-5
C1	Ceramic capacitor	0.047 μF +80-20% 50V	ECC
C2, 128, 129, 228, 229	Electrolytic capacitor	100 μF +50-10% 10V	ECC
C3	Electrolytic capacitor	1 μF +50-10% 25V	ECC
C5	Electrolytic capacitor	2200 μF +50-10% 16V	ECC
C101, 118, 201, 218	Electrolytic capacitor	100 μF +50-10% 16V	ECC
C102, 112, 115, 202, 212, 215	Electrolytic capacitor	4.7 μF +50-10% 16V	ECC
C103, 203	Ceramic capacitor	56pF ±10% 50V	ECC
C104, 204	Ceramic capacitor	0.001 μF ±10% 50V	ECC
C105, 205	Electrolytic capacitor	33 μF +50-10% 16V	ECC
C113, 114, 213, 214	Ceramic capacitor	820pF ±10% 50V	ECC
C116, 119, 216, 219	Electrolytic capacitor	47 μF +50-10% 10V	ECC
C117, 217	Electrolytic capacitor	220 μF +50-10% 6.3V	ECC
C120, 121, 220, 221	Ceramic capacitor	22pF ±10% 50V	ECC
C124, 125, 224, 225	Ceramic capacitor	0.01 μF +80-20% 50V	ECC
C126, 127, 226, 227	Semi conductive ceramic capacitor	0.1 μF ±20% 25V	ECC
D1, 3	Silicon diode	ERB-12-01, DS-130T or equivalent	ETD
D2, 101, 102, 201, 202	Silicon diode	1S-2787, WG1010 or equivalent	ETD
D4	Silicon diode	1S-2076, 1S-2473 or equivalent	ETD
D5	Light emitting diode	SLD-30UR	ETD
IC101, 201	Integrated circuit	Power TA7214P	ETI-35
L2	Choke transformer		ELS-98
L101, 201	Inductor	1.4H	ELD-152
L102, 202	Inductor	600mH	ELD-153
L103, 203	Inductor	100mH	ELD-134C
L104, 204	Inductor	39mH	ELD-135C
L105, 205	Inductor	12mH	ELD-136C
Q1	Silicon transistor	2SA844, 2SA728 or equivalent	ETTA
Q2	Silicon transistor	2SC1213 or equivalent	ETTC
Q101, 102, 201, 202	Silicon transistor	2SC458, 2SC1311 or equivalent	ETTC
R1	Carbon film resistor	1.5K ohm ±5% 1/4W	ECR
R2	Carbon film resistor	2.2K ohm ±5% 1/4W	ECR
R3, 117, 119, 120, 121, 122, 217, 219, 220, 221, 222	Carbon film resistor	47K ohm ±5% 1/4W	ECR
R4, 103, 116, 203, 216	Carbon film resistor	1K ohm ±5% 1/4W	ECR
R101, 201	Metal film resistor	22 ohm ±5% 1/4W	ECR
R102, 202	Carbon film resistor	15K ohm ±5% 1/4W	ECR
R104, 204	Carbon film resistor	470K ohm ±5% 1/4W	ECR
R105, 205	Carbon film resistor	330K ohm ±5% 1/4W	ECR
R106, 107, 114, 206, 207, 214	Carbon film resistor	3.3K ohm ±5% 1/4W	ECR
R113, 213	Carbon film resistor	27K ohm ±5% 1/4W	ECR
R115, 118, 215, 218	Carbon film resistor	150 ohm ±5% 1/4W	ECR
R123, 223	Carbon film resistor	150K ohm ±5% 1/4W	ECR
R124, 224	Carbon film resistor	10K ohm ±5% 1/4W	ECR
R125, 126, 225, 226	Carbon film resistor	2.2 ohm ±5% 1/4W	ECR
S1-1, 2, 3	Push switch	TAPE/RADIO selector	ESS-184, 175
(S2-1, 2	Push switch	MUTING High—Low	ESS-177)
S2-1, 2, 3, 4, 5	Push switch BOOSTER power-on/off		ESS-168
S3	Relay		ESR-54B
VR6	Fader control	64 ohm x 4	ECRV-222

EXPLODED VIEW



EXPLODED VIEW PARTS LIST

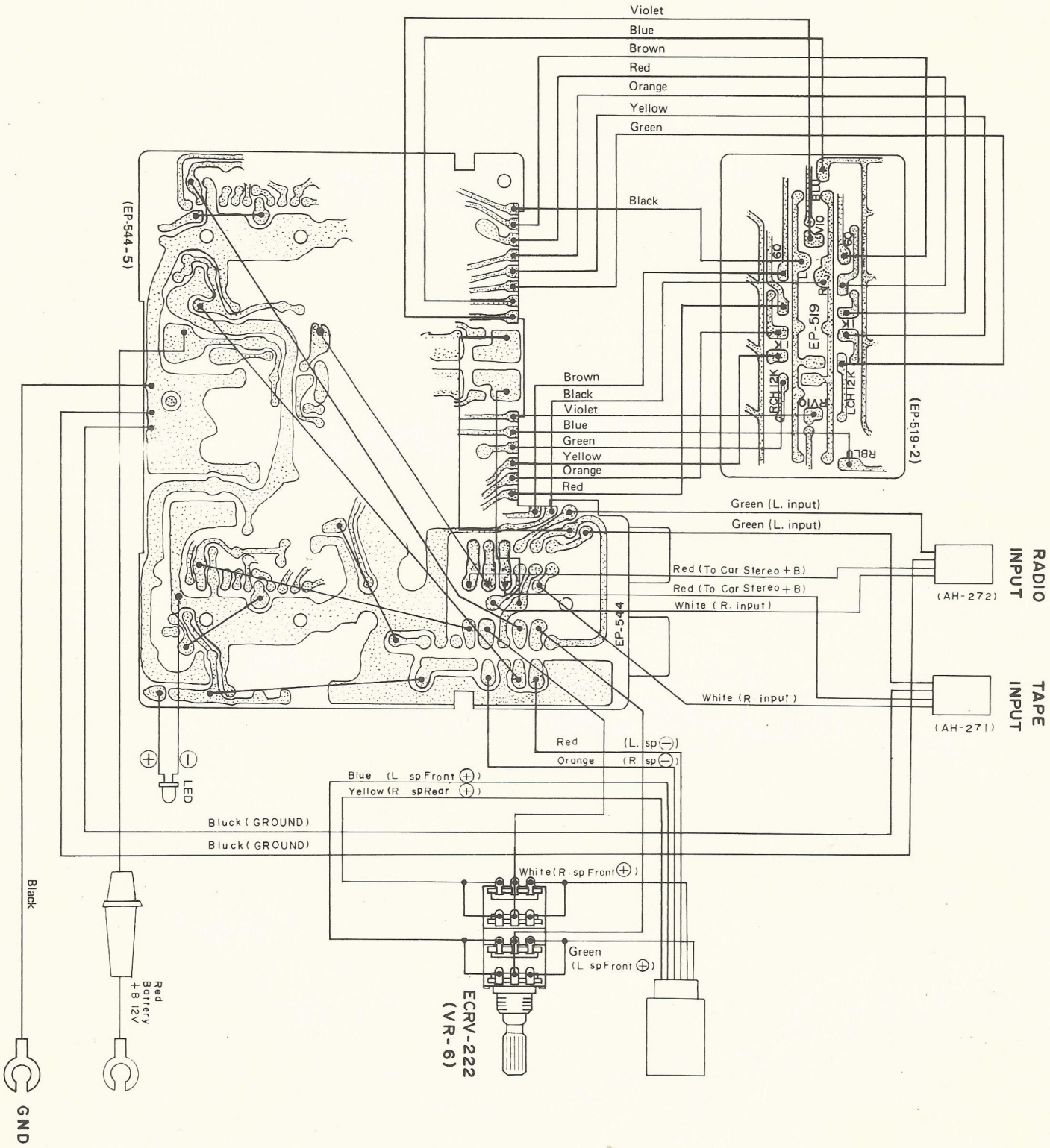
Ref. No.	Description		Part No.
1	Top case		PL-2229 x 2
2	Front panel assembly		—
3	Fader control knob		MP-1272 x 2
4	Tone control knob		MP-1273 x 3
5	Selector button		MP-1274
6	Bottom case		PL-2296
7	Nut	9ø	—
8	Plain washer	9ø	—
9	Dogleg locating washer		PL-2300
10	LED holder		MR-208
11	Cord clamp		PL-2297
12	Tube		WTB-8-50
13	Printed circuit board		EP-544-5
14	Heatsink plate		PL-2231
15	Printed circuit board		EP-519-2
16	6 Pin socket with wire — Output		AH-243
17	4 Pin socket with wire — Tape input		AH-271
18	4 Pin socket with wire — Radio input		AH-272
19	Power supply wire		AH-240
20	Ground wire		AH-241
A	Bind head tapping screw	3 x 6	0883062
B	Pan head tapping screw	3 x 6	0863062
C	Pan head tapping screw	3 x 12	0863122
D	Pan head screw	2 x 4	006204

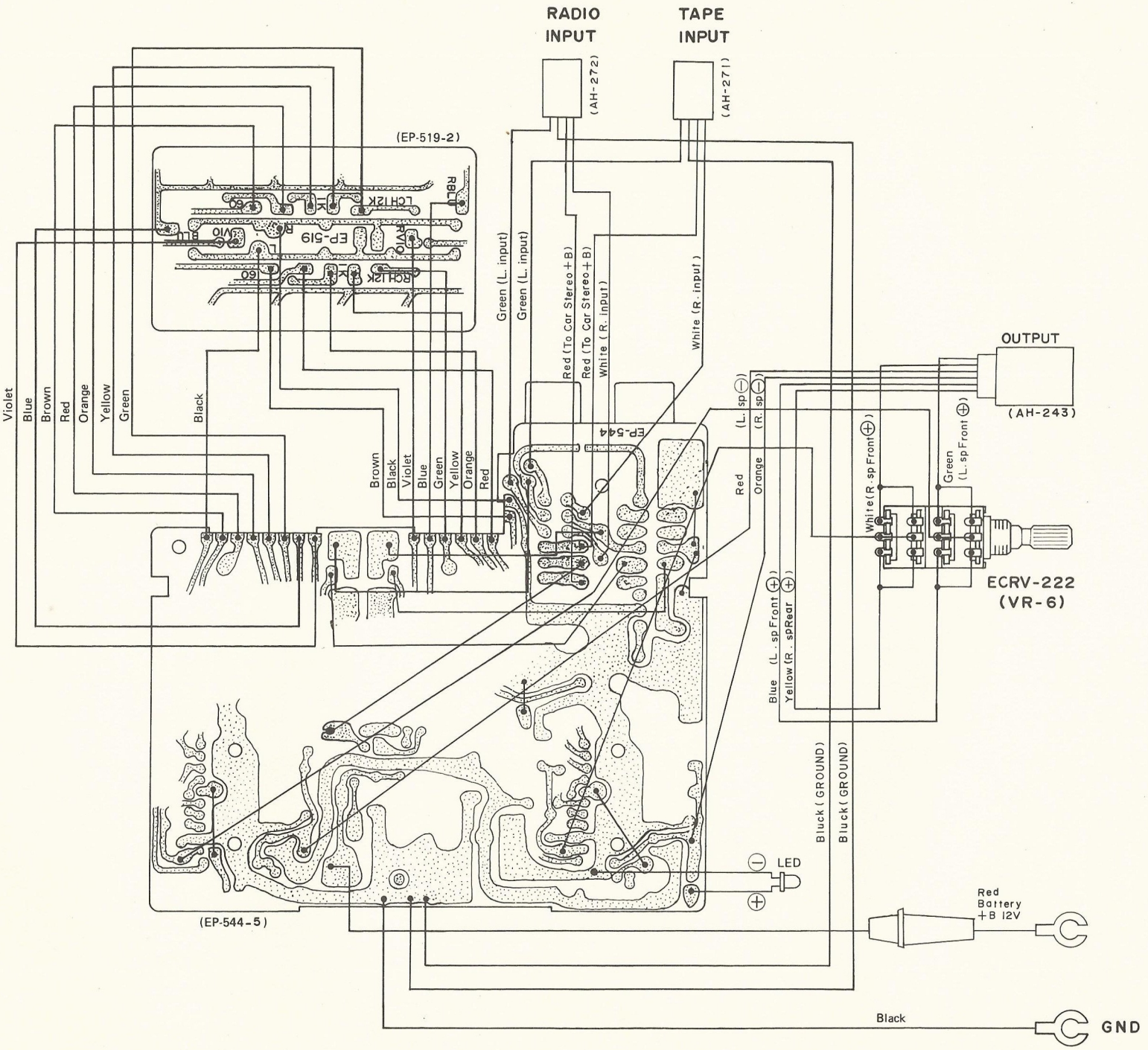
OTHER PARTS LIST

Ref. No.	Description		Part No.
	Mounting bracket	Left	PL-1220
	Mounting bracket	Right	PL-1221
	Plain washer	4 x 12	PP-154
	Plain washer	5ø	010508
	Spring washer	5ø	0115210
	Nut	5ø	020540
	Hexagon head bolt	5 x 16	0705016
	Hexagon head tapping screw	4 x 6	0884062
	6 Pin plug with wire — Front/Rear speaker		AH-244

WIRING DIAGRAM

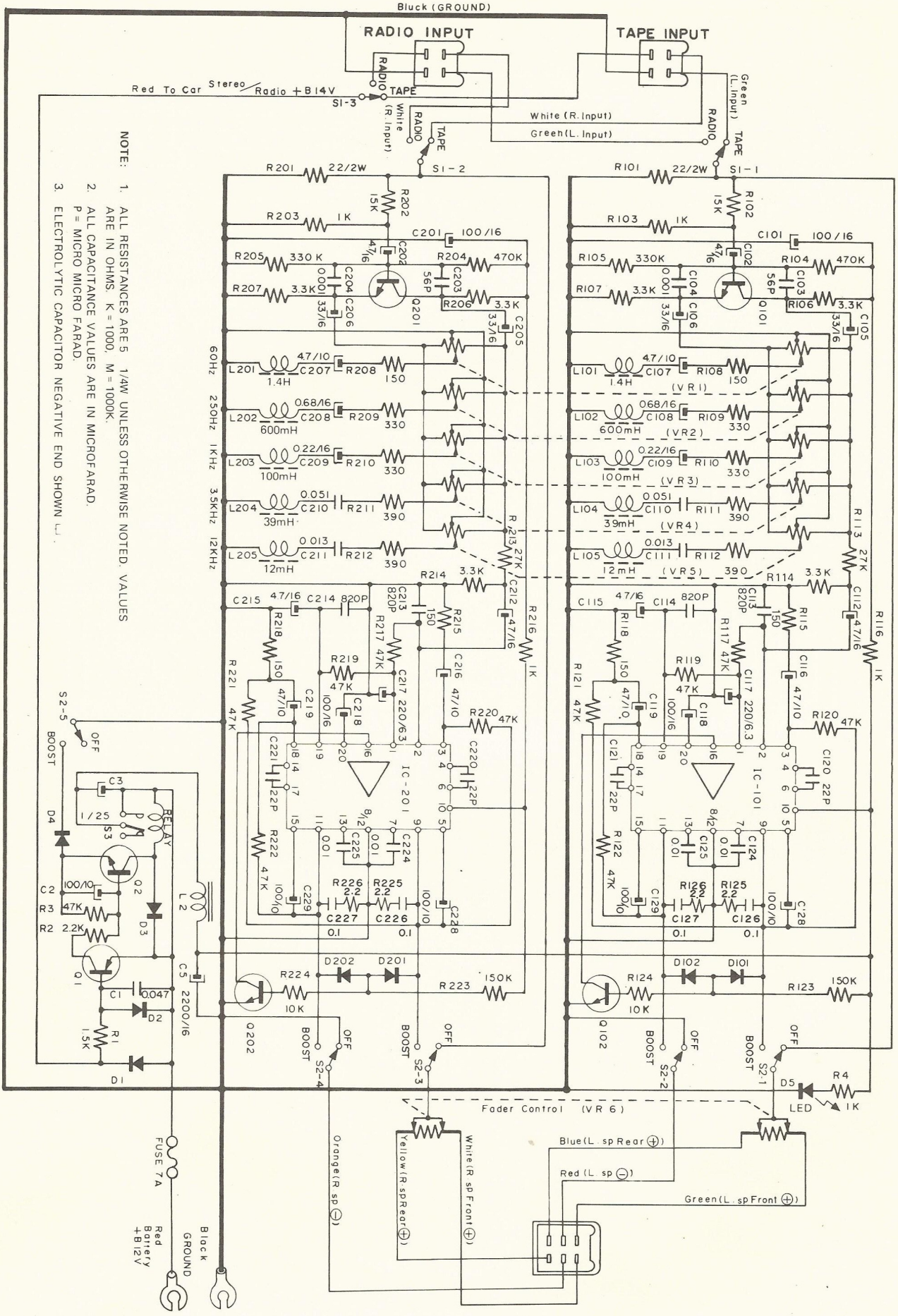
EQA–200

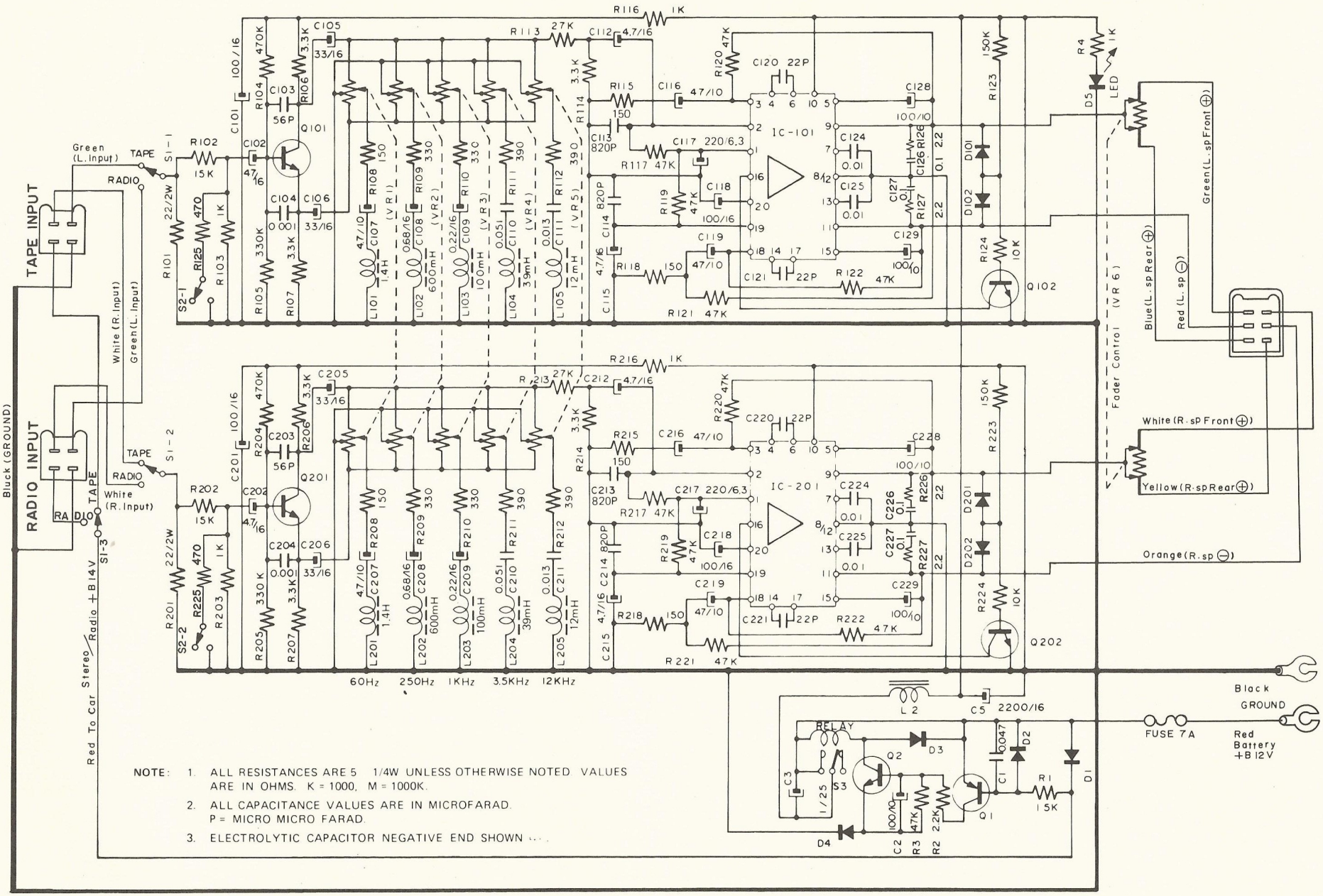



RADIO INPUT
(AH-272)
TAPE INPUT
(AH-271)
(EP-519-2)
EP-519
LCH12K
RCH12K
RBL
BLUE
Violet
Blue
Brown
Red
Orange
Yellow
Green
Black
Green (L. input)
Green (L. input)
Red (To Car Stereo + B)
Red (To Car Stereo + B)
White (R. input)
White (R. input)
EP-544
(L. sp ⊖)
(R. sp ⊖)
Red
Orange
Blue (L. sp Front ⊕)
Yellow (R. spRear ⊕)
White (R. sp Front ⊕)
Green (L. sp Front ⊕)
OUTPUT
(AH-243)
ECRV-222
(VR-6)
Bluck (GROUND)
Bluck (GROUND)
LED
Red
Battery
+B 12V
(EP-544-5)
Black
GND

SCHEMATIC DIAGRAM

EQA–200

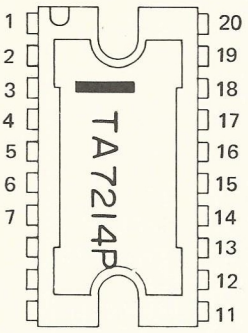


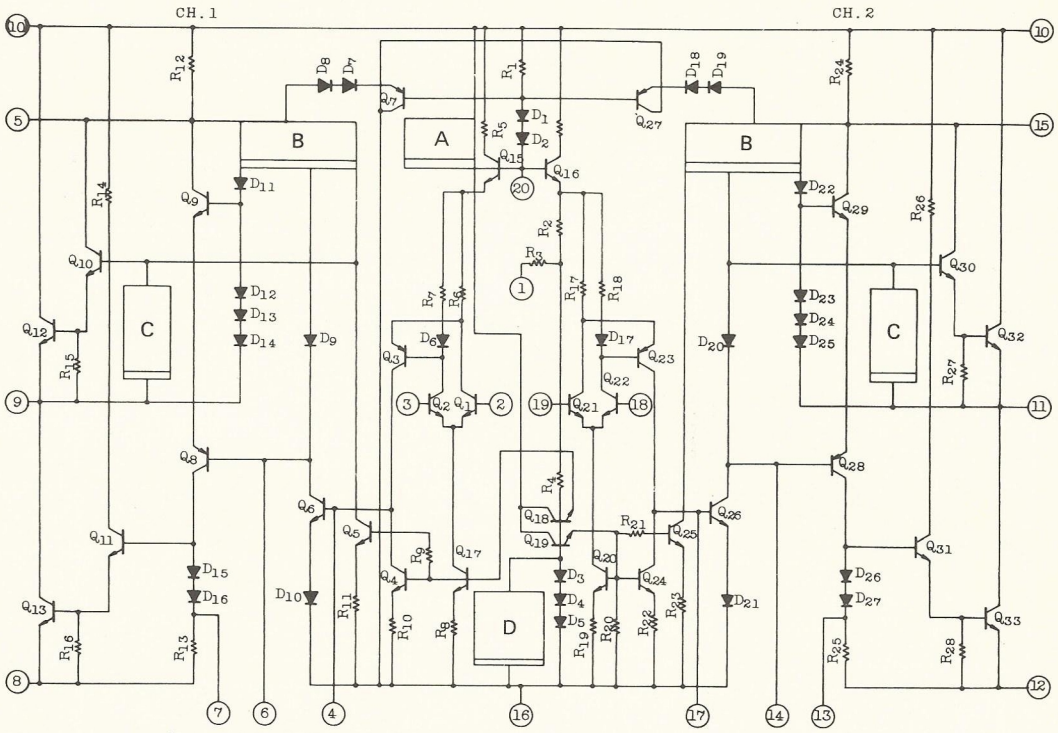


NOTE:
1. ALL RESISTANCES ARE 5 1/4W UNLESS OTHERWISE NOTED. VALUES ARE IN OHMS. K = 1000, M = 1000K.
2. ALL CAPACITANCE VALUES ARE IN MICROFARAD. P = MICRO MICRO FARAD.
3. ELECTROLYTIC CAPACITOR NEGATIVE END SHOWN ⊖.

TRANSISTORS AND IC IDENTIFICATION WITH IC INTERNAL DIAGRAM

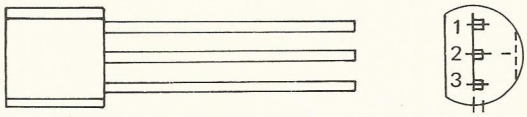
TA7214P





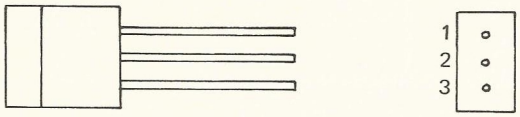
A : Audio Muting
B : Constant Current Regulated Circuit
C : Current Limiter
D : Over Voltage Protector
Thermal Shut-down Circuit

2SC458



1 Base
2 Collecter
3 Emiter

2SA844, 2SC1213



1 Emitter
2 Collector
3 Base