

# DENON

Hi-Fi Integrated Amplifier

## SERVICE MANUAL MODEL PMA-707 SOLID-STATE INTEGRATED AMPLIFIER



### TABLE OF CONTENTS

SPECIFICATIONS .....	2
BLOCK DIAGRAM .....	2
CONTROLS AND DESCRIPTIONS .....	3
CONNECTIONS .....	3
METHOD OF ADJUSTMENTS .....	4
REMOVAL EACH SECTION .....	5
PRINTED WIRING BOARD PATTERNS AND PARTS LIST	
ETC9002 POWER AMP. UNIT .....	6
WIRING DIAGRAM .....	8
SCHEMATIC DIAGRAM .....	9
SEMICONDUCTORS .....	9
EXPLODED VIEW OF CHASSIS AND CABINET & PARTS LIST .....	10

## NIPPON COLUMBIA CO., LTD.

## SPECIFICATIONS

### POWER AMPLIFIER SECTION

<b>Rated Output Power:</b>	Both channel driven (TUNER → SP OUT) 4 ohm 1 kHz DIN T.H.D. 1% : 40 W + 40 W 4 ohm 20 Hz — 20 kHz : 35 W + 35 W 8 ohm 20 Hz — 20 kHz : 25 W + 25 W
<b>Total Harmonic Distortion:</b>	0.05% (20 Hz — 20 kHz at -3 dB rated output 8 ohm Load)
<b>Intermodulation Distortion:</b>	Below 7 kHz / 60 Hz: 1/4 0.03% (at amplitude output equivalent to rated output)
<b>Power Band Width:</b>	10 Hz — 40 kHz (IHF T.H.D. 0.1%)
<b>Frequency Response:</b>	5 Hz — 150 kHz +0 dB -3 dB (at 1 W output)
<b>Output Impedance:</b>	0.18 ohm (1 kHz)
<b>Output Terminals:</b>	Speaker: A or B Load 4 — 16 ohm (IEC) A + B Load 8 — 16 ohm Headphone Stereo headphone

### PRE AMPLIFIER SECTION

<b>Pre Amplifier Output:</b>	Maximum Output: 10 V (at 47 k ohm Load) Rated Output: 150 mV
<b>Pre Amplifier Input:</b>	Maximum Input: 160 mV (1 kHz)
<b>Input Sensitivity/ Input Impedance:</b>	PHONO MM: 2.5 mV 47 k ohm CD/VIDEO, 150 mV 30 k ohm TUNER/AUX
<b>RIAA Deviation:</b>	PHONO MM: within ±0.5 dB (20 Hz — 20 kHz)

Design and specifications are subject to change without prior notice.

**NOTE:** The following codes correspond to the appropriate models.

E2 for Europe, EK for U.K., and E1 for Asia.

This Service Manual is prepared based on E2 and black version.

### GENERAL CHARACTERISTICS

<b>SN Ratio (IHFA Weight):</b>	PHONO MM: 72 dB (input terminals short-circuited for 2.5 mV input) CD/VIDEO, TUNER/AUX: 96 dB (input terminals short-circuited)
<b>Tone Enhancer:</b>	Low frequency 100 Hz ± 6 dB High frequency 10 kHz ± 6 dB
<b>EQ Subsonic Filter Characteristics:</b>	16 Hz (-12 dB/oct.)
<b>AC OUTLET: (For U.S.A., Canada and Asia)</b>	SWITCHED x 2, 100 W (Total) UNSWITCHED x 1, 250 W
<b>POWER SOURCE:</b>	Germany and France AC 220 V, 50 Hz; U.K. and Australia AC 240 V, 50 Hz; Asia AC 110/ 120/220/240 V, 50/60 Hz (Multiple)
<b>POWER CONSUMPTION:</b>	80 W (IEC) (Multiple)
<b>DIMENSIONS:</b>	434 mm (W) x 97.5 mm (H) x 270 mm (D) (including rubber feet, control knobs, and terminals)
<b>WEIGHT:</b>	5.2 kg

### BLOCK DIAGRAM

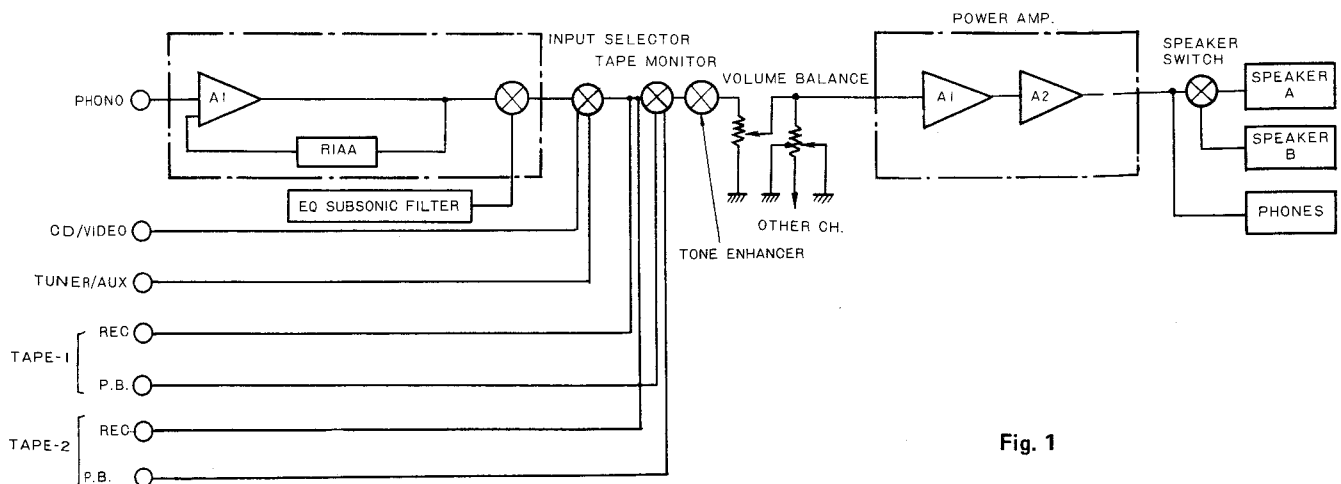


Fig. 1

CONTROLS AND DESCRIPTIONS

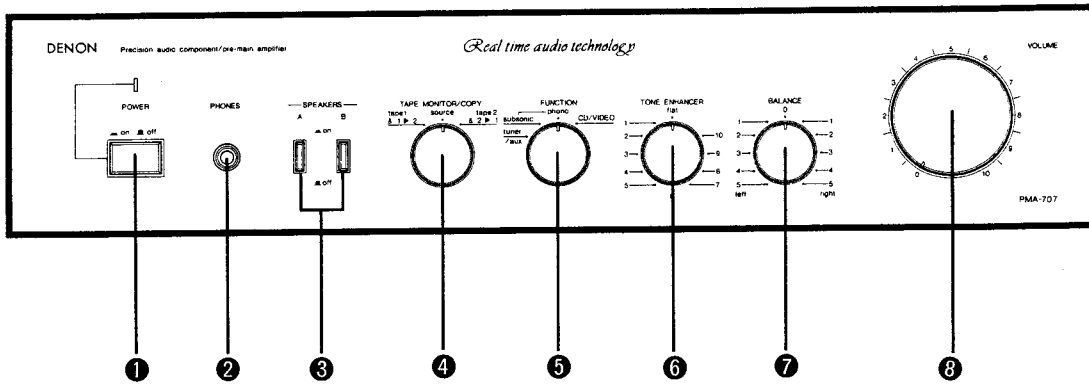


Fig. 2

- ① POWER (Power On-Off Switch)
- ② PHONES (Headphone Jack)
- ③ SPEAKERS (Speaker Changeover Switch)
- ④ TAPE MONITOR/COPY (Tape Monitor/Copy Switch)
- ⑤ FUNCTION (Input Selector Switch)
  - CD/VIDEO, ● Phono, ● subsonic, ● tuner/aux
- ⑥ TONE ENHANCER (Tone Enhancer Control)
- ⑦ BALANCE (Balance Control)
- ⑧ VOLUME (Volume Control)

CONNECTIONS

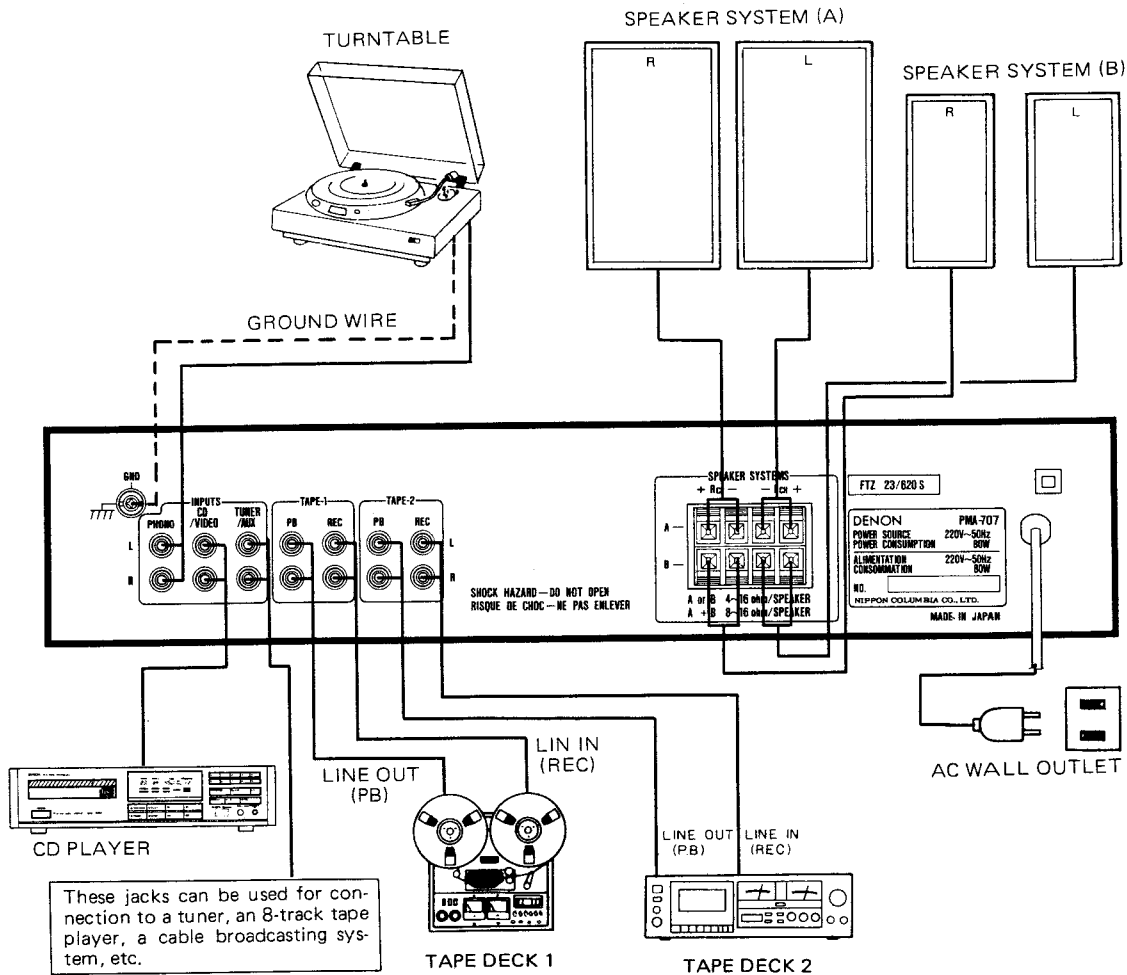


Fig. 3

## METHOD OF ADJUSTMENTS

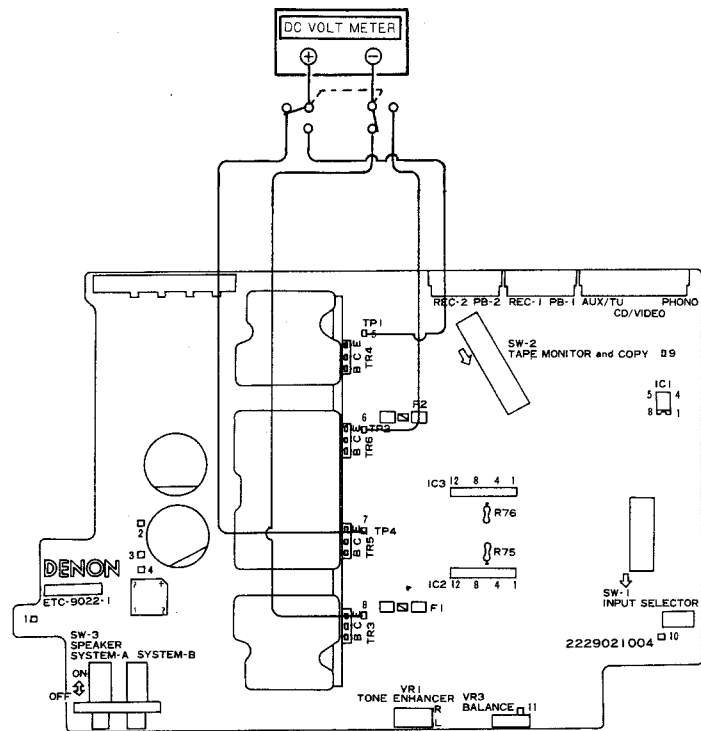


Fig. 4

**IDLE CURRENT ADJUSTMENT (Fig. 4)**

1. Keep the unit away from direct wind blown by an air-conditioner and an electric fan, and keep the unit under normal conditions. Adjust the range of ambient temperature to 15 – 30°C.
2. Set the following switches as follows:
  - POWER (power switch) to off
  - VOLUME (VOLUME CONTROL) to 0 (⊖)
  - SPEAKERS (speaker terminal) to no load (speakers disconnected)
3. Remove the top cover and connect a DC digital voltmeter to the test points of ETC9022 (Power Amp units) (between the positive terminal TP4 ⊕ and the negative terminal TP3 ⊖, and between the positive TP1 ⊕ and the negative terminal TP2 ⊖).
4. (1) Connect the power source cord to an AC outlet and turn on the power switch; read the measured value after 3 minutes or when the measured value is within a tolerance 2 mV ~ 20 mV (DC), adjust the idling current manually as follows.
  - (2) When the voltmeter reads 1 mV (DC) or less under the condition of item (1), disconnect the 47 ohm from resistors R75 and R76.

## REMOVAL OF EACH SECTION

### 1. How to remove top cover (Fig. 5)

- 1) Remove the six screws holding the top cover in place.
- 2) Pull out the sides of the cover to free it, then lift off the cover.

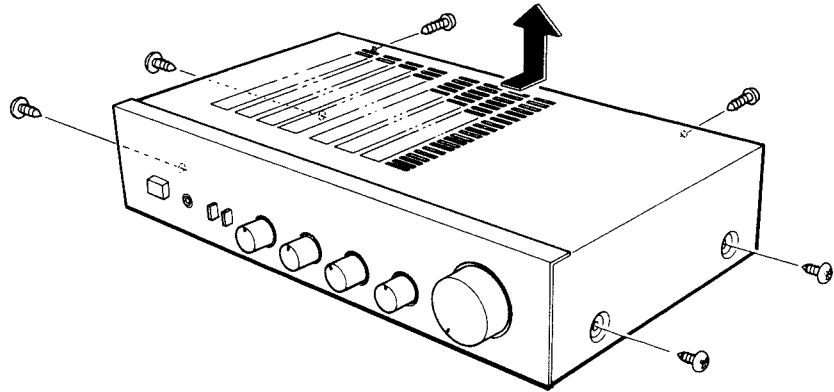


Fig. 5

### 2. How to remove the rear panel (Fig. 6)

- 1) Remove the twelve screws holding the rear panel in place.
- 2) Pull the rear panel toward you and remove it.

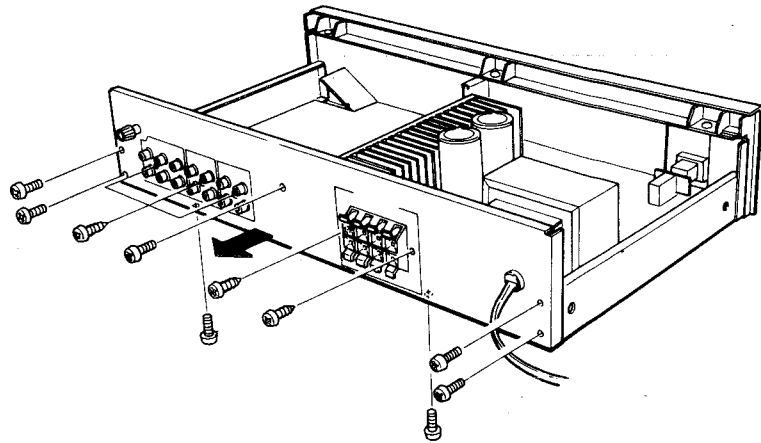


Fig. 6

### 3. How to remove the front panel (Fig. 7)

- 1) Pull off the five knobs.
- 2) Remove the six screws holding the front panel in place.
- 3) Pull the front panel toward you and remove it.

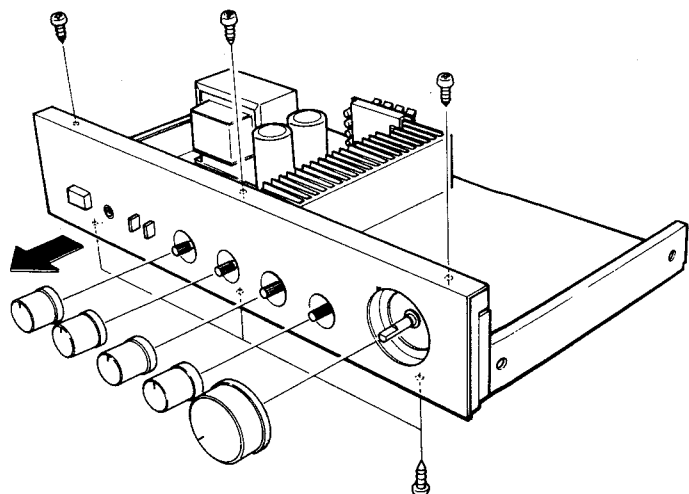


Fig. 7

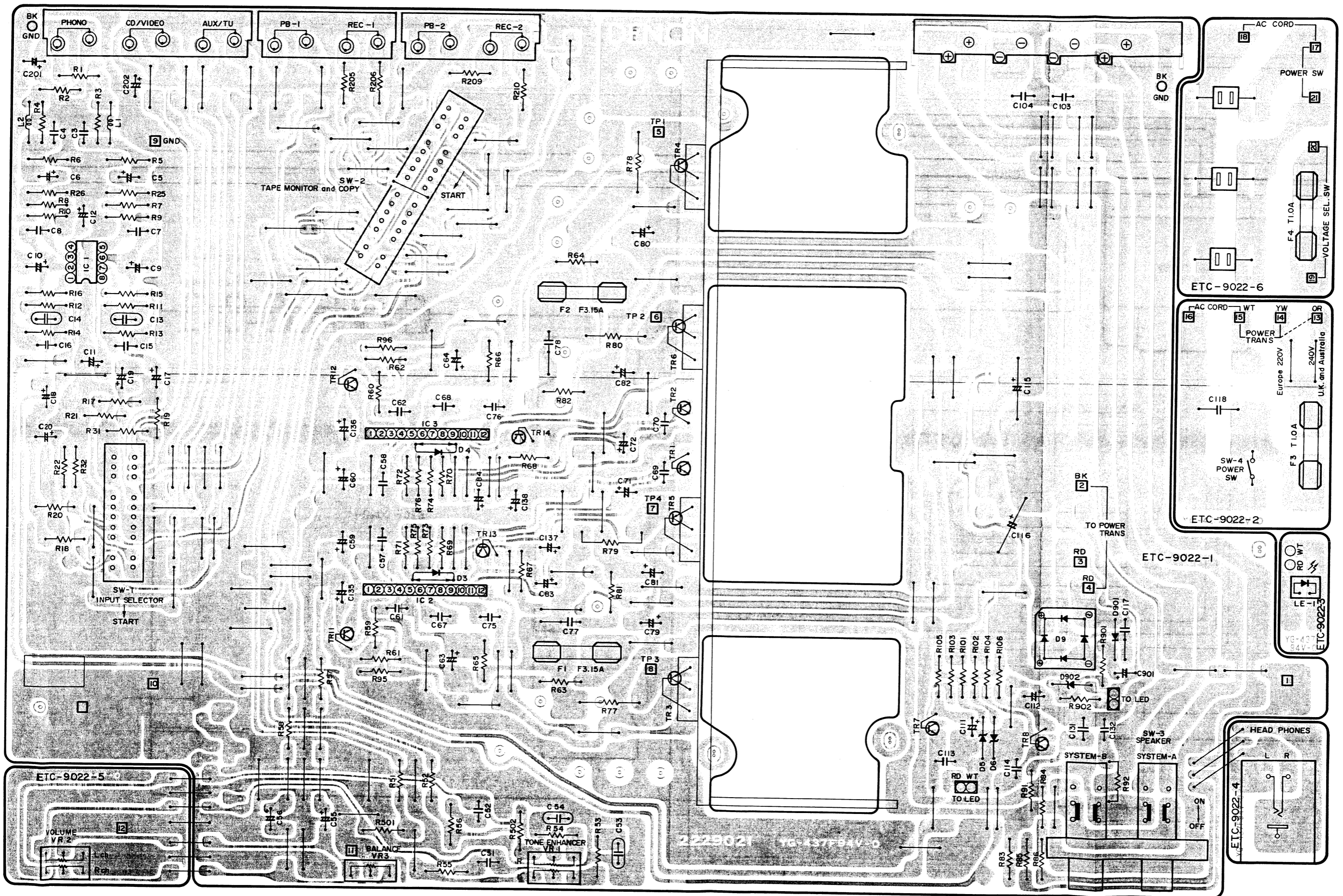
**PRINTED WIRING BOARD PATTERNS AND PARTS LIST**  
**ETC9002 POWER AMP UNIT PARTS LIST For E2, EK, EA**

Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions
<b>SEMICONDUCTORS</b>					
IC001	2630257001	M-5218P (MITSUBISHI) IC	C059	2544146004	1μF 50V ELECTROLYTIC
IC002	2630206007	μPC1225H (NEC) IC	C061	2533627000	100PF ±5% 50V CERAMIC
TR001	2730198015	2SC1815 (BL) TRANSISTOR	C063	2544133004	22μF 16V ELECTROLYTIC
TR003	2730237031	2SC2577 (O/Y) TRANSISTOR	C067	2533603008	10PF ±0.5PF 50V CERAMIC
TR005	2710136039	2SA1102 (O/Y) TRANSISTOR	C069	2531024003	0.01μF +80% -20% 50V CERAMIC
TR007	2730198015	2SC1815 (BL) TRANSISTOR	C071	2544132005	10μF 16V ELECTROLYTIC
TR008	2710102005	2SA1015 (Y) TRANSISTOR	C072	2544132005	10μF 16V ELECTROLYTIC
TR011	2730198015	2SC1815 (BL) TRANSISTOR	C075	2533631009	150PF ±5% 50V CERAMIC
TR013	2710102005	2SA1015 (Y) TRANSISTOR	C077	2531027000	0.1μF +80% -20% 50V CERAMIC
D003	2760049011	1S2076A DIODE	C079	2544146004	1μF 50V ELECTROLYTIC
D005	2760249002	HZ18-2 ZENER	C103	2531007004	3300PF ±10% 50V CERAMIC
D009	2760305001	S4VB20 DIODE	C111	2544164031	220μF 25V ELECTROLYTIC
D901	2760049011	1S2076A DIODE	C112	2531024003	0.01μF +80% -20% 50V CERAMIC
D902	2760236031	HZ5C-1 ZENER	C113	2531024003	0.01μF +80% -20% 50V CERAMIC
LE001	3939165013	SEL1123R (RED) LED	C115	2544212006	10000μF 45V ELECTROLYTIC
<b>RESISTORS (not included Carbon Film ±5%, 1/4W Type)</b>					
△ R067	2412314023	470 ohm ±5% 1/4W CARBON (NB)	C116	2544212006	10000μF 45V ELECTROLYTIC
△ R077	2442013080	0.22 ohm ±5% 1W METAL OXIDE (NB)	C117	2531151002	4700PF +100% -0% 500V CERAMIC
△ R081	2412322002	10 ohm ±5% 1/4W CARBON (NB)	△ C118	2538003014	4700PF ±20% 400V (AC) CERAMIC
△ R091	2412322002	10 ohm ±5% 1/4W CARBON (NB)	C131	2531025002	0.022μF +80% -20% 50V CERAMIC
△ R095	2412314023	470 ohm ±5% 1/4W CARBON (NB)	C135	2544089022	100μF 50V ELECTROLYTIC
△ R103	2412314023	470 ohm ±5% 1/4W CARBON (NB)	C201	2544146004	1μF 50V ELECTROLYTIC
VR001	2119008001	VARIABLE RESISTOR 100 kohm LOUD VR	<b>SWITCHES FUSE INDUCTORS</b>		
VR002	2119006100	VARIABLE RESISTOR 100 kohm MAIN VR	SW001	2124509003	SLIDE SW (4-4) REMOTE INPUT
VR003	2110198004	VARIABLE RESISTOR 250 kohm BAL. VR	SW002	2124254002	SLIDE SW (REMOTE) TAPE MONI.
<b>CAPACITORS</b>					
C003	2533627000	100PF ±5% 50V CERAMIC	SW003	2129513007	2P PUSH SW SP. SW
C005	2544132005	10μF 16V ELECTROLYTIC	△ SW004	2124409006	POWER SWITCH POWER
C007	2531004007	1000PF ±10% 50V CERAMIC	△ F001	2061040010	FUSE 3.15A (F) POWER OUT
C009	2544127007	220μF 6.3V ELECTROLYTIC	△ F002	2061015029	FUSE 1.0A AC LINE
C011	2544146004	1μF 50V ELECTROLYTIC	L001	2359002003	INDUCTOR (390μH) PHONO-IN
C013	2554178004	0.024μF ±5% 50V PLASTIC FILM	<b>OTHER PARTS</b>		
C015	2531009002	6800PF ±10% 50V CERAMIC	2229021004	P.W. BOARD	
C017	2544147003	2.2μF 50V ELECTROLYTIC	2090008120	JUMPER WIRE P=10 mm	USED 135
C019	2544146004	1μF 50V ELECTROLYTIC	2090051009	0 ohm JUMPER TAPE	
C051	2531062007	3900PF ±10% 50V CERAMIC	EP-5667H1	TERMINAL PIN	USED 15
C053	2551076002	0.022μF ±10% 50V PLASTIC FILM	FEP-1261	JUMPER WIRE	USED 3
C055	2544133004	22μF 16V ELECTROLYTIC	2020022008	FUSE HOLDER	USED 6
C057	2533627000	100PF ±5% 50V CERAMIC	2030241057	1P CONTACT ASS'Y	USED 2
C058			2050190023	2P NH CONNECTOR BASE	
			4179002100	POWER RADIATOR	
			4129016104	BRACKET	USED 2
			4737002005	TAPPING SCREW(S) 3x6	USED 4
			4700012022	PAN SCREW WITH SW, W 3x12	USED 4
			2048167000	HEAD PHONE JACK	
			2050151004	8P PUSH TERMINAL	FOR SP
			2050150005	4P CONNECTOR BASE	USED 2
			2050152003	6P CONNECTOR BASE	
			2032115000	2P CONNECTOR CORD	

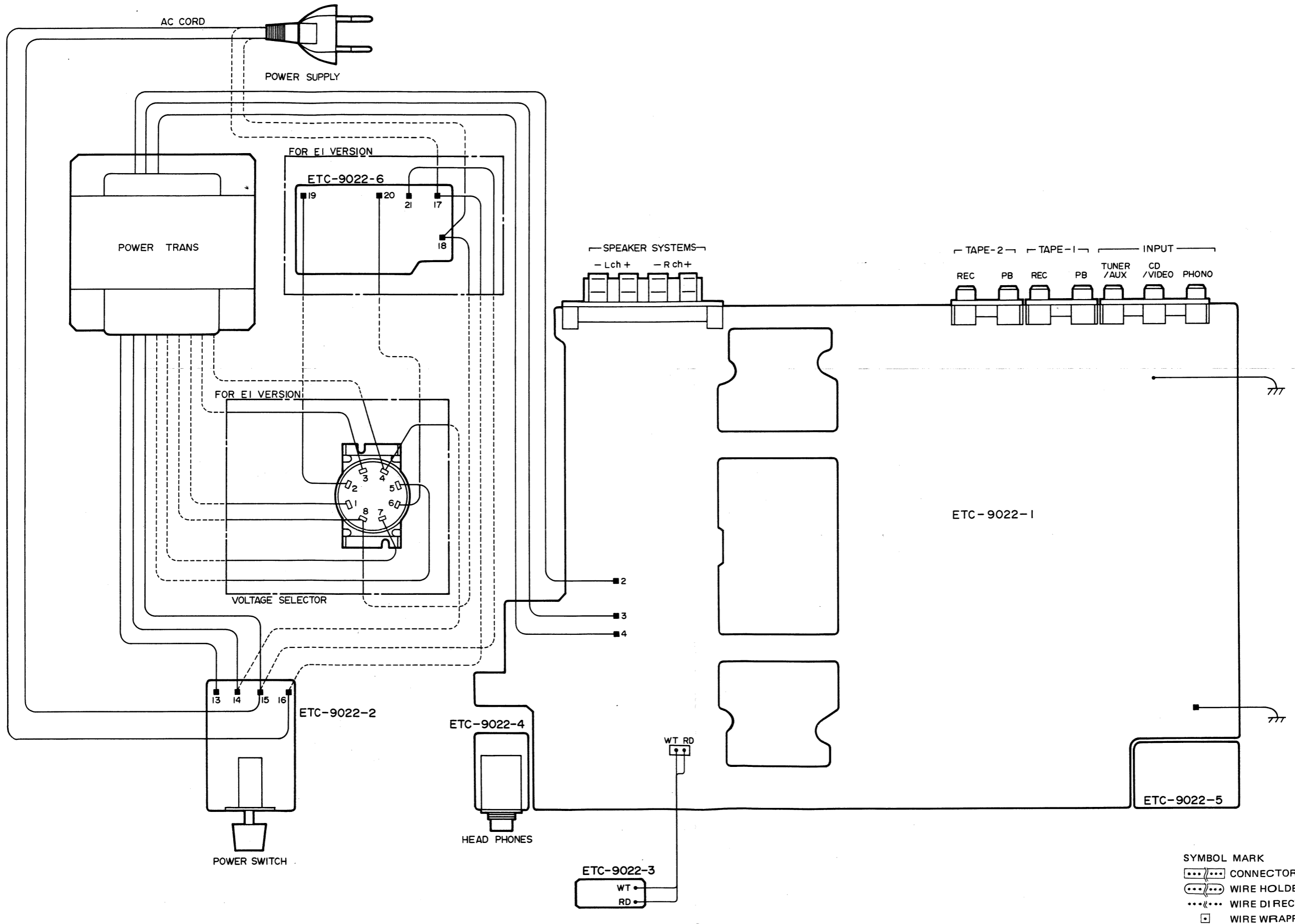
**ETC9022B POWER AMP UNIT P/LIST For E1**  
 (Same as ETC9022 except the followings)

Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions
<b>CAPACITORS</b>					
△ C118	2568003000	0.01μF ±20% 250V METALIZED (CHANGE)	<b>OTHER PARTS</b>		
<b>FUSE</b>					
△ F003	2061039063	FUSE 2A (CHANGE)	2090008120	JUMPER WIRE P=10mm	USED 113 (CHANGE)
△	2061039034	FUSE 1.0A (ADD)	5130886005	FUSE LABEL (T. 2A)	(ADD)
			2020022008	FUSE HOLDER	USED 8 (CHANGE)
			△ 2033922001	AC OUTLET (3P)	(ADD)

ETC9022 POWER AMP UNIT

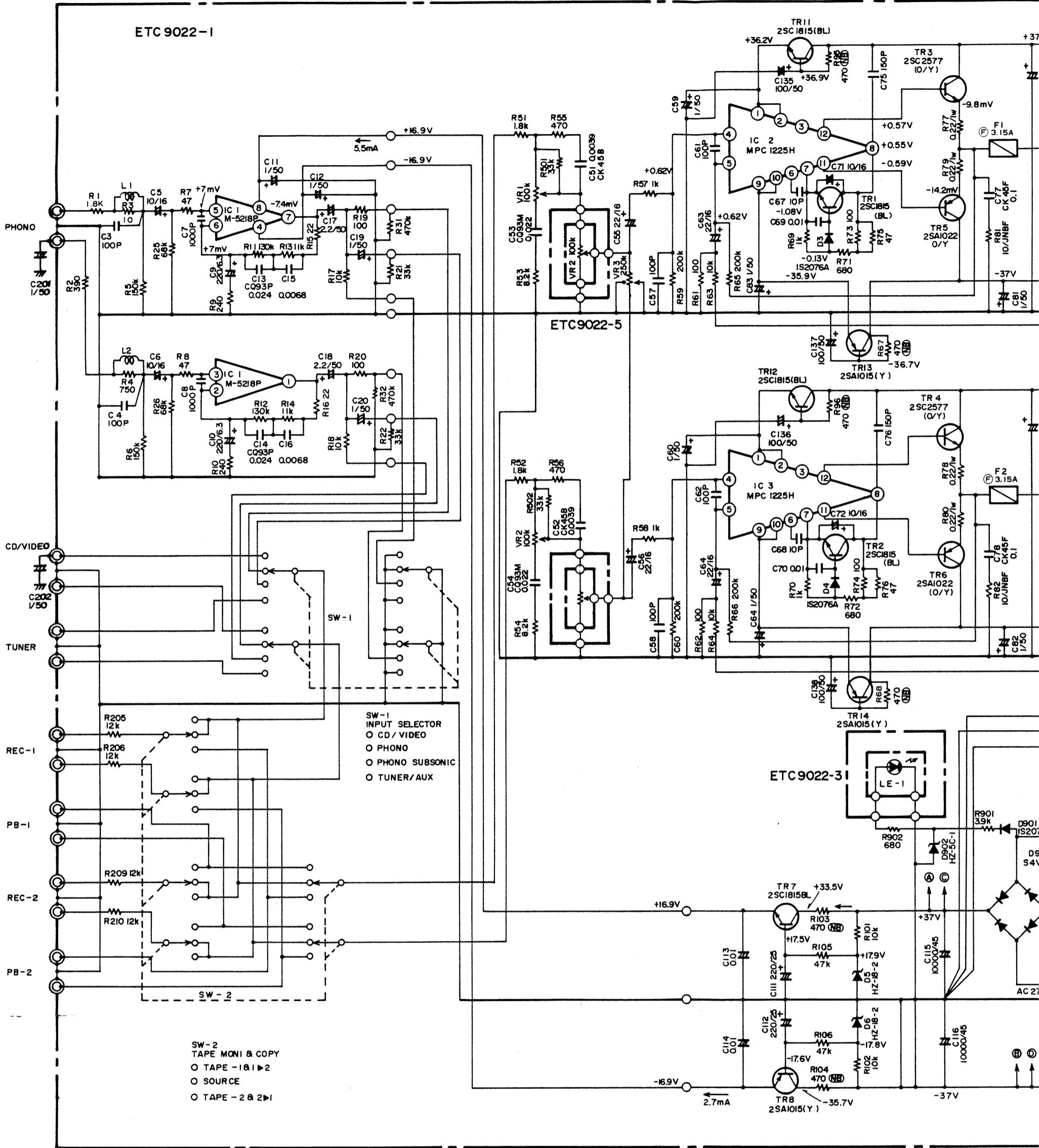


**WIRING DIAGRAM**  
(This figure is the specifications of E2)



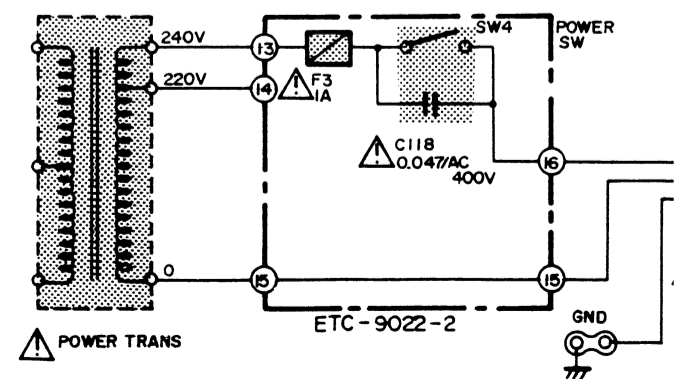
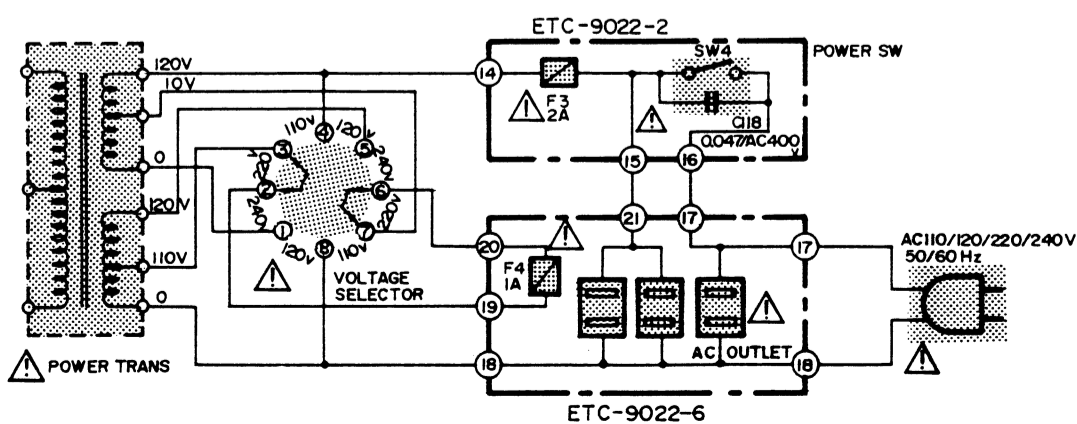


SCHEMATIC DIAGRAM

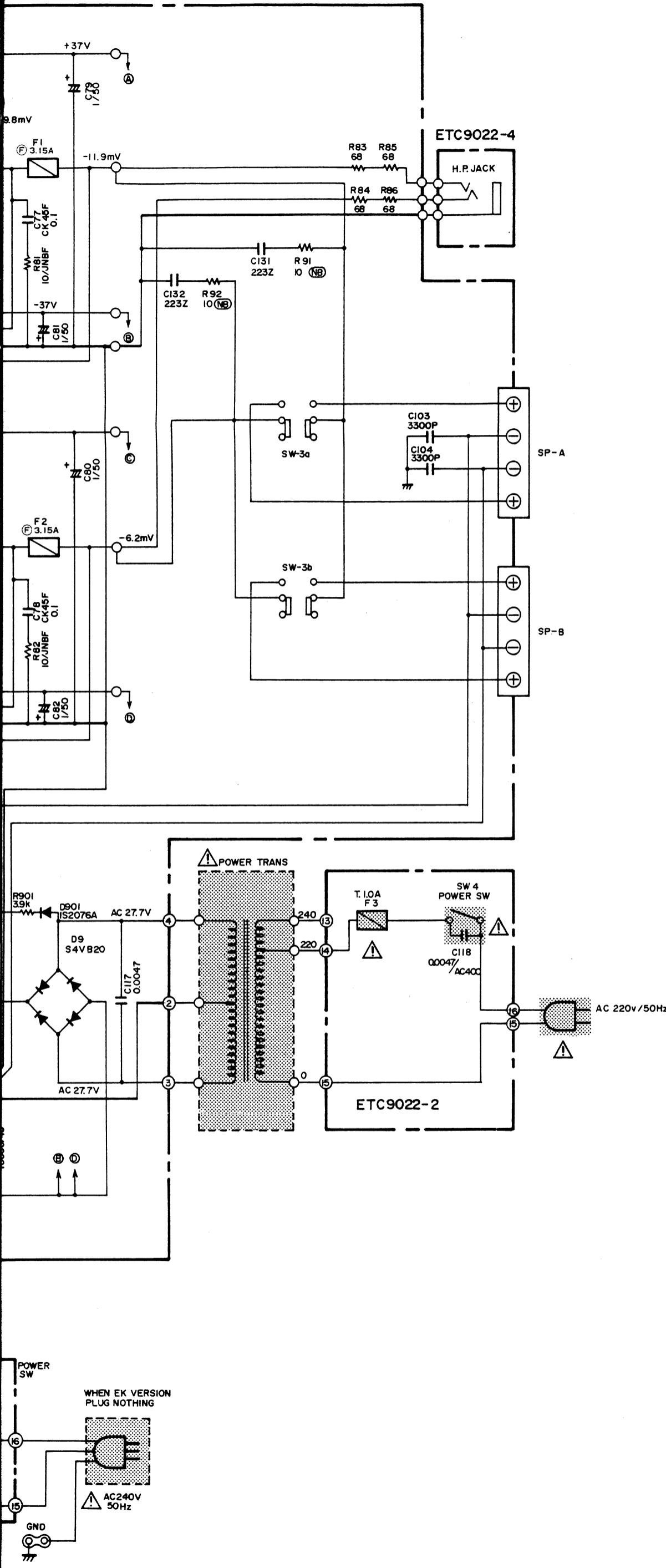


(E1)

(EK/EA)



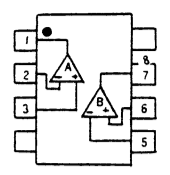
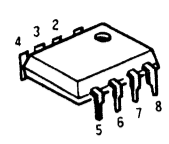
⚠ Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.



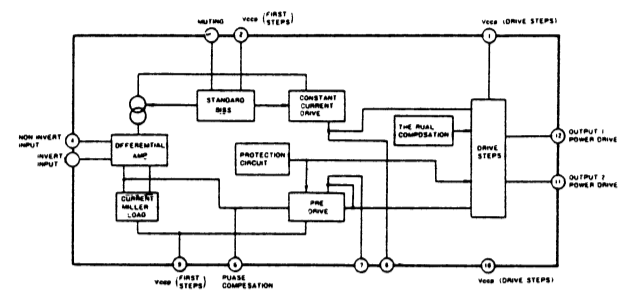
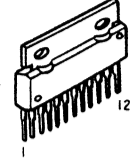
**SEMICONDUCTORS**

● IC's

M-5218P (JRC)



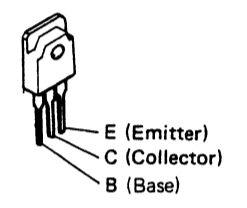
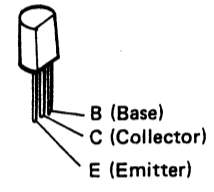
μPC1225H(NEC)



● TRANSISTORS

2SA1015(Y)  
2SC1815(BL)

2SA1102(O/Y)  
2SC2577(O/Y)

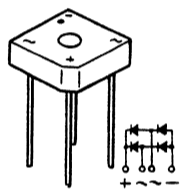
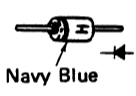


● DIODES

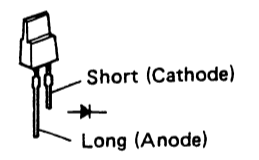
1S2076A

HZ5C-1  
HZ18-2

S4VB20



SEL1123R (Red)



	R1, R2	L1, L2	R3, R4	C7, C8
E2	1.8K	Yes	750	1000P
EK/EA	1.8K	Yes	750	1000P
E1	390	No	Jumper	No

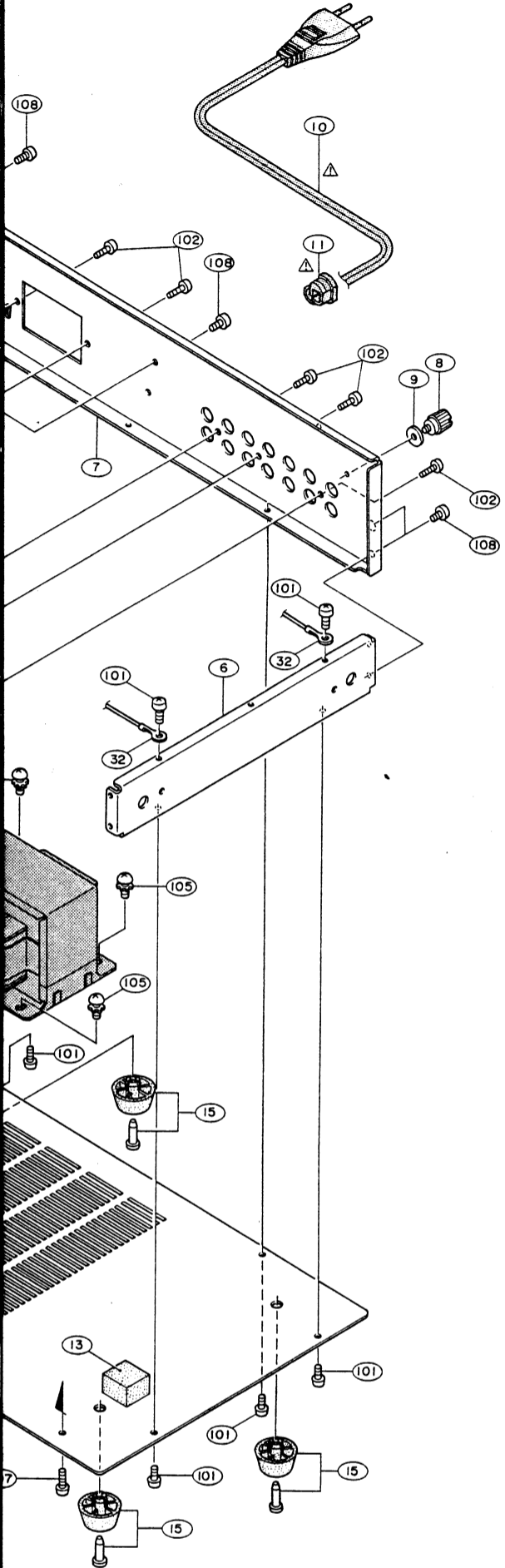
NOTES  
ALL RESISTANCE VALUES IN OHM K = 1,000 OHM M = 1,000,000 OHM  
ALL CAPACITANCE VALUES IN MICRO FARAD P = MICRO-MICRO FARAD  
EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITIO  
CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.



⚠  Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.

# DENON

## ADDENDUM LIST



Ref. No.	Part Name & Descriptions	Part No.		
		EK for U.K.	EA for Australia	E1 for Asia
4	Power Amp Unit Assy	ETC9022-1	ETC9022-1	ETC9022B-1
5	Power SW Unit	ETC9022-2	ETC9022-2	ETC9022B-2
7	Back Panel	1059027101	1059027101	1059033001
⚠ 10	AC Cord	2062020000	2062012018	2006031026
⚠ 11	Cord Bush	4450053001	MD-2982H	4450028007
⚠ 16	Power Trans	2339522008	2339522008	2339527003
21	LED Unit	ETC9022-3	ETC9022-3	ETC9022B-3
⚠ 31	Volume Unit	ETC9022-5	ETC9022-5	ETC9022B-5
⚠ 50	Voltage Sel. Switch	-	-	2120186006
⚠ 51	AC Outlet Unit	-	-	ETC9022B-6
52	Notice Sheet	-	5130209006	-
53	Earth Label	5130140000	5130140000	-
54	Caution Sheet	5130364006	-	-
55	Voltage Label	5130362008	5130362008	-
56	Blind Sheet	5230348006	5130348006	-
57	Notice Sheet	-	5130210008	-
58				
103	Tapping Screw 4x8 For Power/Trans	4700030017	47300030017	4737004003
110	Tooth Washer φ3	4753001051 (4)	4753001051 (4)	-
111	Tooth Washer φ4	4753100004 (2)	4753100004 (2)	-
112	Pan Screw 3x6	-	-	4737002005
205	Control Card	-	-	-

### NIPPON COLUMBIA CO., LTD.

No. 14-14, 4-CHOME AKASAKA,  
MINATO-KU, TOKYO 107, JAPAN  
TEL: 03-584-8111  
TLX: JAPANOLA J22591  
CABLE: NIPPONCOLUMBIA TOKYO

Printed in Japan

Q'ty	Ref. No.	Part No.	Part Name & Descriptions	Q'ty
15 2	104	4700026005	TAPPING SCREW WITH W.(S) 3x8	7
	105	4700030017	TAPPING SCREW WITH W.(S) 4x8 TWB	4
	106	4700012022	PAN SCREW WITH S.W.W 3x12	4
	107	4737002021	TAPPING SCREW(S) 3x8 (B)	3
	108	4737002034	TAPPING SCREW(S) 3x6 (B)	7
<b>PACKING &amp; ACCESSORIES (not included EXPLODED VIEW)</b>				
20 5 4	201	5050075006	CABINET COVER	1
	202	5039112003	CUSHION	2
	•203	5019102020	CARTON CASE	1
	204	5119134008	INST. MANUAL	1
	•205	5138295009	CONTROL CARD	1
	206	5040079012	STYLEN PAPER	1
	207			