

DENON

Hi-Fi Pre-Main Amplifier

SERVICE MANUAL MODEL PMA-960

For EUROPEAN MODEL

SOLID STATE
PRE MAIN AMPLIFIER

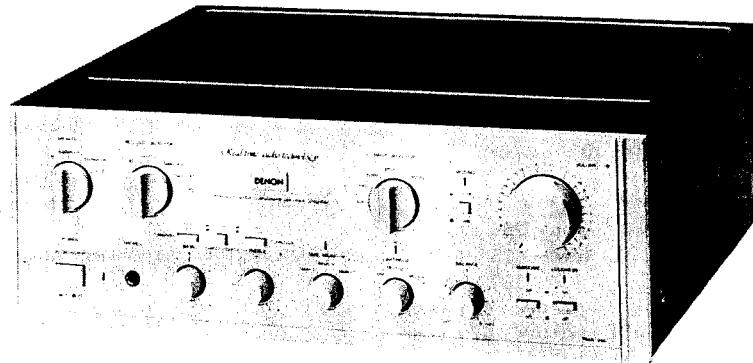


TABLE OF CONTENTS

SPECIFICATIONS	2
CONTROLS AND FUNCTIONS	2
CONNECTIONS	3
METHOD OF ADJUSTMENTS	4
BLOCK LEVEL DIAGRAM	6
SEMICONDUCTORS	7
PRINTED WIRING BOARD PATTERNS AND PARTS LIST	7
ETC0670D RECTIFIER UNIT	7
ETC0667D TONE & POWER UNIT	8
ETC0668D INPUT & EQ. UNIT	9
CONNECTION DIAGRAM	10
WIRING DIAGRAM	11
EXPLODED VIEW OF CHASSIS AND CABINET & PARTS LIST	12

NIPPON COLUMBIA CO., LTD.

OCT. 1984

SPECIFICATIONS

POWER AMPLIFIER SECTION

Rated Output Power: Both channel drives (TUNER → SP OUT)
 20 Hz to 20 kHz 140 W + 140 W
 (8 ohm Load)
 20 Hz to 20 kHz 170 W + 170 W
 (6 ohm Load)
 1 kHz 100 W + 100 W (Load 6 ohm,
 IEC-65 temperature-controlled output)

Total Harmonic Distortion: 0.003% (20 Hz — 20 kHz at -3 dB rated output 8 ohm Load)

Intermodulation Distortion: Below 7 kHz/60 Hz: 1/4 0.002% (at amplitude output equivalent to rate output 8 ohm Load)

Output Bandwidth: 5 Hz — 80 kHz (IHF T.H.D. 0.02% 8 ohm Load.)

Transmission Characteristics: 1 Hz — 250 kHz $+0$ dB (at 1 W output)
 -3 dB (at 1 W output)
Input Sensitivity: 150 mV
Input Impedance: 47 k ohm
Output Impedance: 0.1 ohm (1 kHz)
Output Terminals: Speaker: A or B Load 6 — 16 ohm
 A + B Load 12 — 16 ohm
 Headphone/Stereo headphone

EQUALIZER AMPLIFIER SECTION

Equalizer Amplifier Output: Maximum Output: 14.5 V (at 47 k ohm Load)
 Rated Output: 150 mV
 Total harmonic distortion: less than 0.001% (at 1 kHz, 10 V output)

Input Sensitivity/ Input Impedance:
 PHONO-1, 2 MM 2.5 mV 47 k ohm
 MC high 250 μ V,
 low 125 μ V
 100 ohm
 TUNER 150 mV 47 k ohm
 DAD, AUX, TAPE 150 mV 47 k ohm

RIAA Deviation: PHONO-1, 2 MM-MC within ± 0.2 dB (20 Hz — 100 kHz)

OVERALL CHARACTERISTICS

SN Ratio (IHFA Network): PHONO-1, 2
 MM 90 dB (input terminals short-circuited for 2.5 mV input)
 MC 75 dB (input terminals short-circuited for 250 μ V input)
 TUNER, TAPE, DAD, AUX: 110 dB (input terminals short-circuited)

Tone Control Adjustable Range: BASS 100 Hz ± 8 dB/50 Hz ± 8 dB
 TREBLE 10 kHz ± 8 dB/20 kHz ± 8 dB

Filtering Characteristics: SUBSONIC 18 Hz, 6 dB/oct
Loudness Characteristics: Low frequency 100 Hz + 7 dB
 High frequency 10 kHz + 6 dB

Muting Characteristics: -20 dB

POWER SOURCE: Germany and France AC 220 V, 50 Hz;
 U.K. and Australia AC 240 V, 50 Hz;
 U.S.A. and Canada AC 120 V, 60 Hz;
 Asia 110/120/220/240 V, 50/60 Hz (Multiple)

POWER CONSUMPTION: 280 W (U.S.A.); 660 VA (Canada); 310 W (IEC); 245 W (Multiple)
DIMENSIONS: 470 mm (18-1/2")W x 168 mm (6-39/64")H x 440 mm (17-21/64")D (including rubber feet, control knobs, and terminals.)

WEIGHT: 15 kg (33 lbs 1 oz)

Design and specifications are subject to change without prior notice.

NOTE: The following codes correspond to the appropriate models.
 E1 for Asia, E2 for Europe, E3 for U.S.A., EA for Australia, EC for Canada etc.
 This Service Manual is prepared based on E2.

CONTROL AND FUNCTIONS

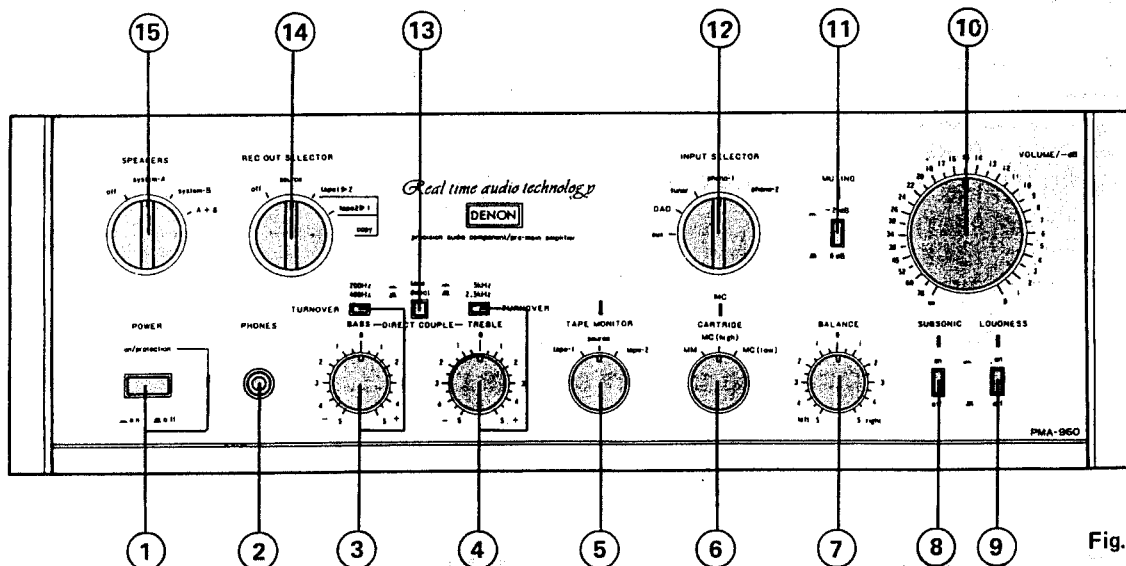


Fig. 1

CONNECTIONS

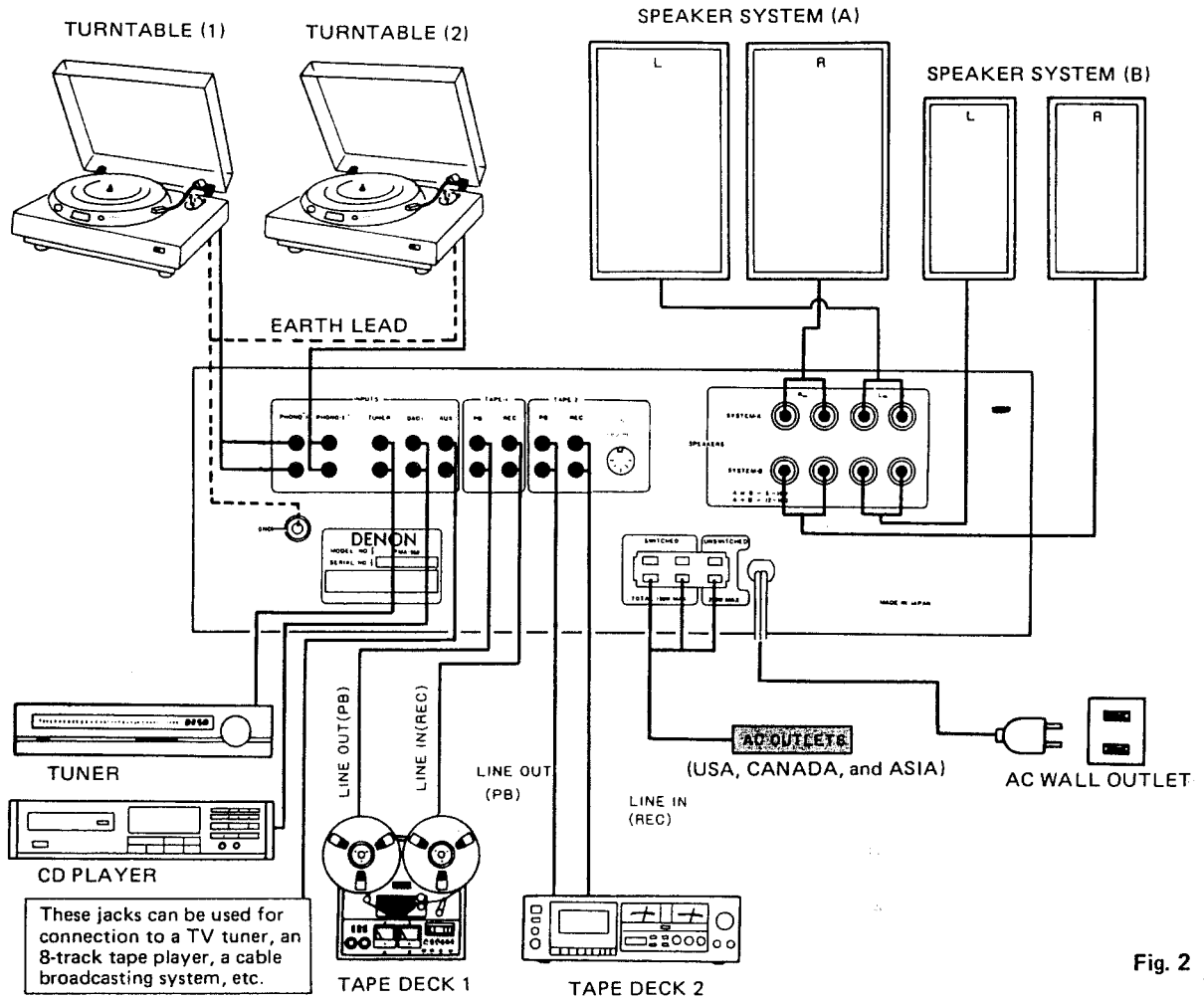


Fig. 2

- Do not plug the power source cord into an AC outlet until all the connections are completed.
- Connect the right (R) channel plug to the right (R) channel jack, and the left channel plug to the left channel jack.
- Insert the plugs firmly into the corresponding jacks. If a connection is incomplete, noise may be generated.
- Plug the power source cord for audio equipment into the AC OUTLET terminal. Do not use this terminal for other electric appliances such as hair dryer. (NOT INCLUDED IN SYSTEM FOR EUROPEAN USE)
- Do not bundle the pin plug cords with the power source cord and do not place the pin plug cords near the power transformer, or humming and other noise may be generated.
- Always connect the pin plug cord to the input terminal "PHONO" because this terminal is highly sensitive. If this terminal is not connected, induction hum may be generated.

NOTES FOR SHORTING PIN

Two shorting pins are inserted the PHONO-1 terminal on the rear panel of this unit. When a player connected to the PHONO-2 terminal, leave the shorting pins as they are. When connecting a player to the PHONO-1 terminal, remove the shorting pins and insert them into the PHONO-2 terminal. Do not attempt to insert the shorting pins into the REC terminal or this unit may not work properly.

In case of shorting pins are removed, insert them into the unused terminals (TUNER, DAD, AUX, PB-1 or PB-2) or save them for reuse.

METHOD OF ADJUSTMENTS

IDLE CURRENT ADJUSTMENT

Preparations

1. Place the unit in normal operating condition and avoid excessive ventilation or air circulation. Adjustment must be performed in the unit circumference temperature $15^{\circ} \sim 30^{\circ}\text{C}$.
2. Set the switches to the following positions.
 - POWER → off
 - VOLUME → $-\infty$ (↶ min.)
 - DIRECT COUPLE → DIRECT
 - SPEAKER → No load (Do not connect speaker or dummy)

Adjustment

1. Remove top cover and rotate VR401, VR402 on the ETC0667 (Power Amplifier Unit) extremely counterclockwise. Connect a DC voltmeter across the test points Rch TP1, 2 and Lch TP3, 4.
2. Plug in the power cord to AC power source (-5% to +5% allowable) and turn on () the power switch. Warm up the unit for one minute and adjust the VR401 and VR402 by means of rotating it clockwise and obtain the voltage:—
1mV \pm 0.2 mV DC (Pre-adjustment value)
3. 10 ~ 15 minutes later from the pre-adjustment, rotate the VR401, VR402 and adjust the voltage to:—
18mV \pm 2mV DC

DISTORTION FACTOR ADJUSTMENT

Adjustment of 20 kHz

1. Connect a 8-ohm loading resistor across the SP terminal.
2. Inject 20 kHz sine wave signal through the TUNER terminal. Operate both R and L channels and obtain 70 watts (23.7 Vrms) across the 8-ohm resistor.
3. Adjust VR403 (Rch) and VR404 (Lch) for minimum distortion.

NEUTRAL POTENTIAL ADJUSTMENT

Preparation

1. Insert the shorting pin into the PHONO input terminal.
2. Connect a digital voltmeter (feasible to measure within the range 0.01 mV ~ 1 mV DC) to the PHONO output terminal (Rch X, Y and Lch Y, Z).
3. For simplified adjustment connect a 100K-ohm (1/4 watt or so) resistor across the test points (Lch TP-1 and Rch TP-2) on the unit.
4. Set the unit's cartridge switch to MM position and the VOLUME to $-\infty$ (↶ min.) position.

Adjustment

1. Perform the following adjustment about two minutes after turning on () the POWER switch.
 - Rotate VR101 (100K-ohm semi-fixed resistor) and adjust the Lch meter reading for 0.5 mV DC or less value.
 - Rotate VR102 (100K-ohm semi-fixed resistor) and adjust the Rch meter reading for 0.5 mV DC or less value.

ETC0667
POWER AMP. UNIT ALIGNMENT POINTS & CONNECTIONS

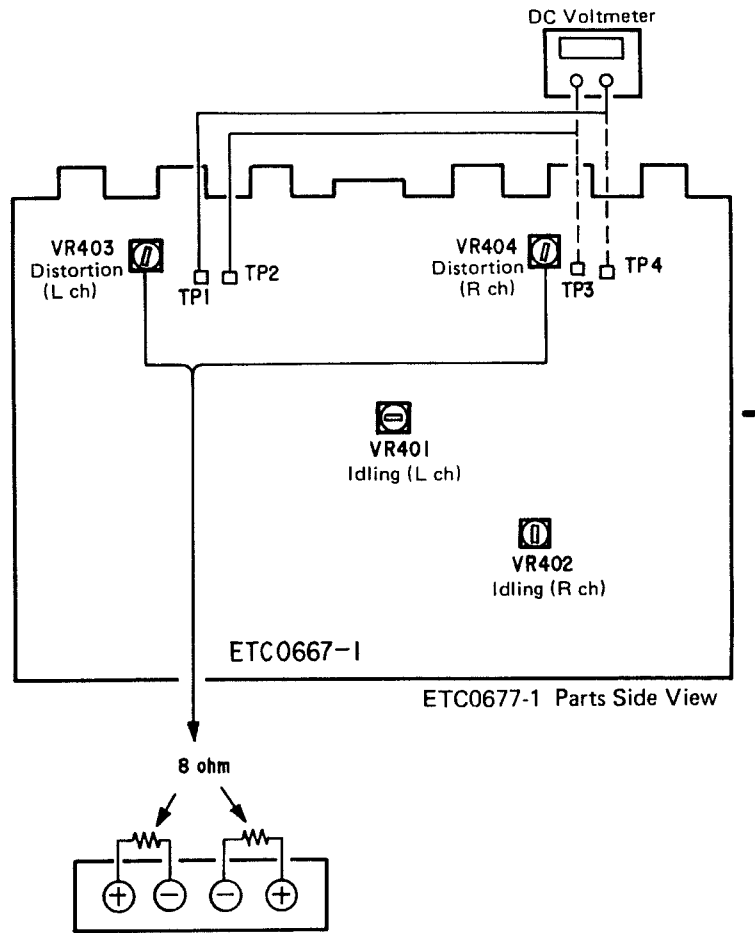


Fig. 3

ETC0668-1
INPUT & EQ. UNIT ALIGNMENT POINTS & CONNECTIONS

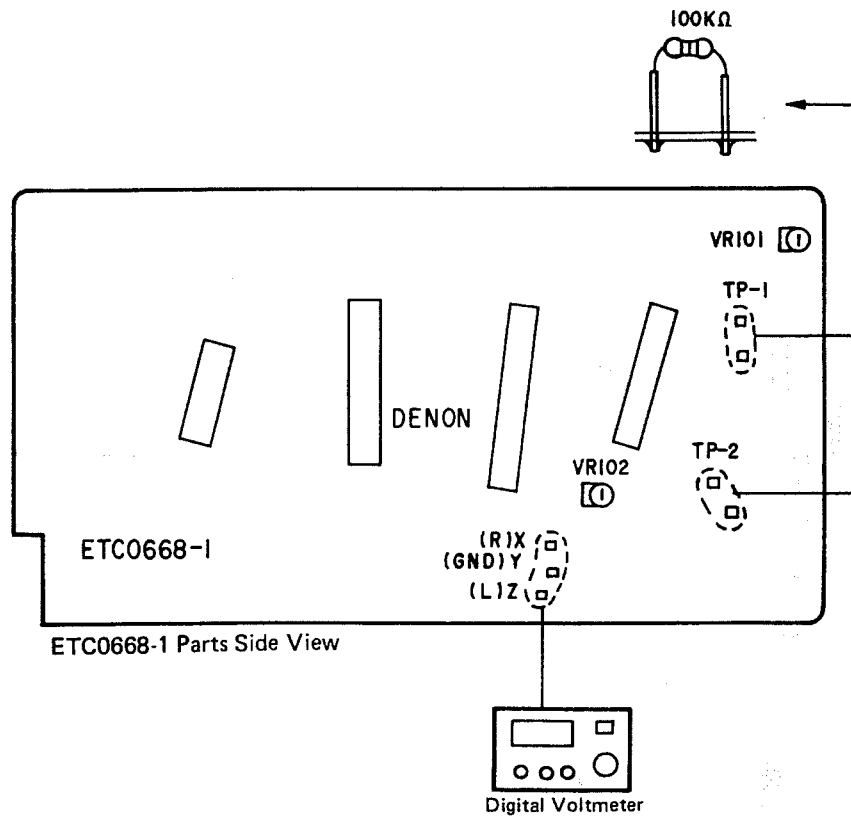


Fig. 4

BLOCK, LEVEL DIAGRAM

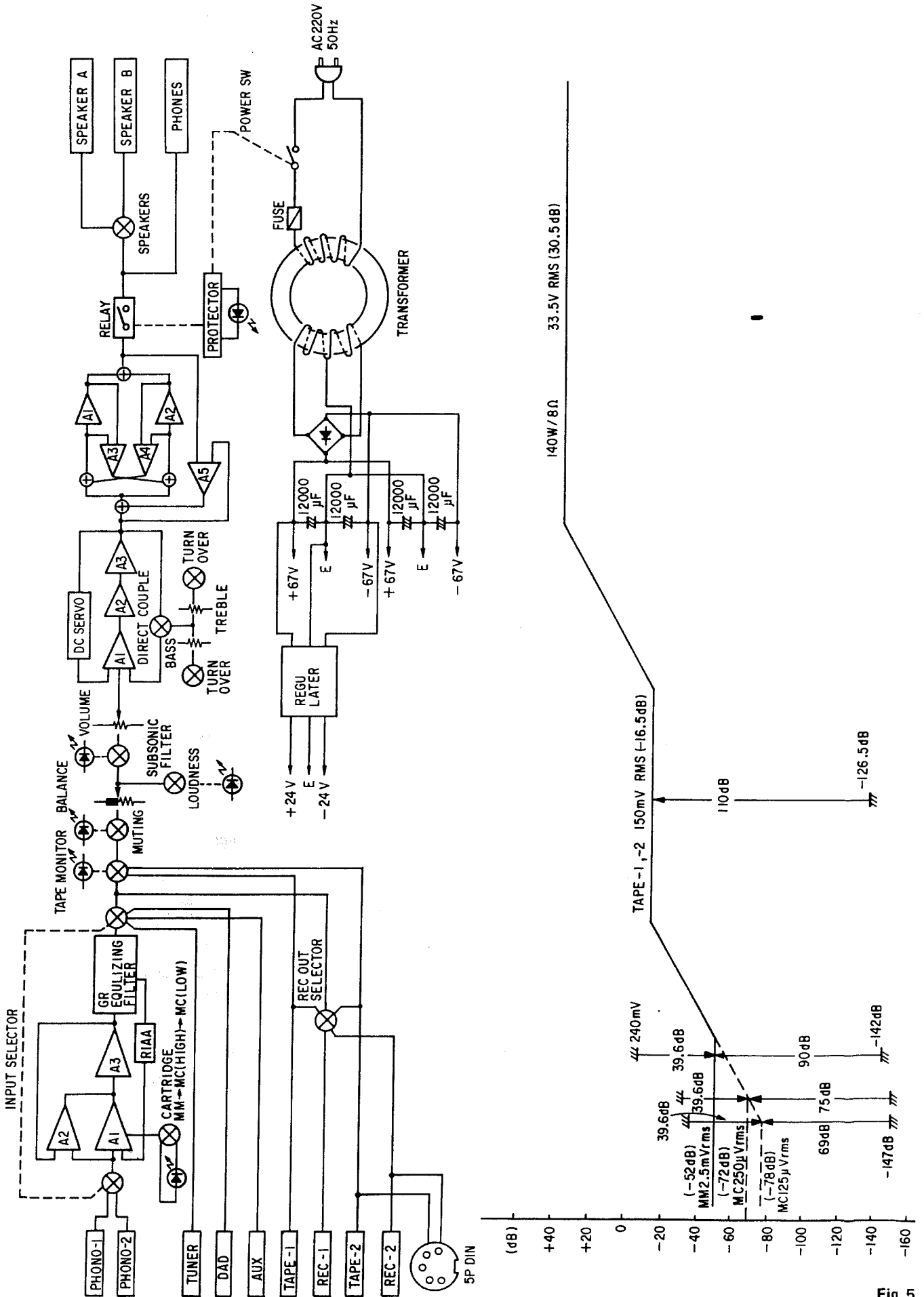
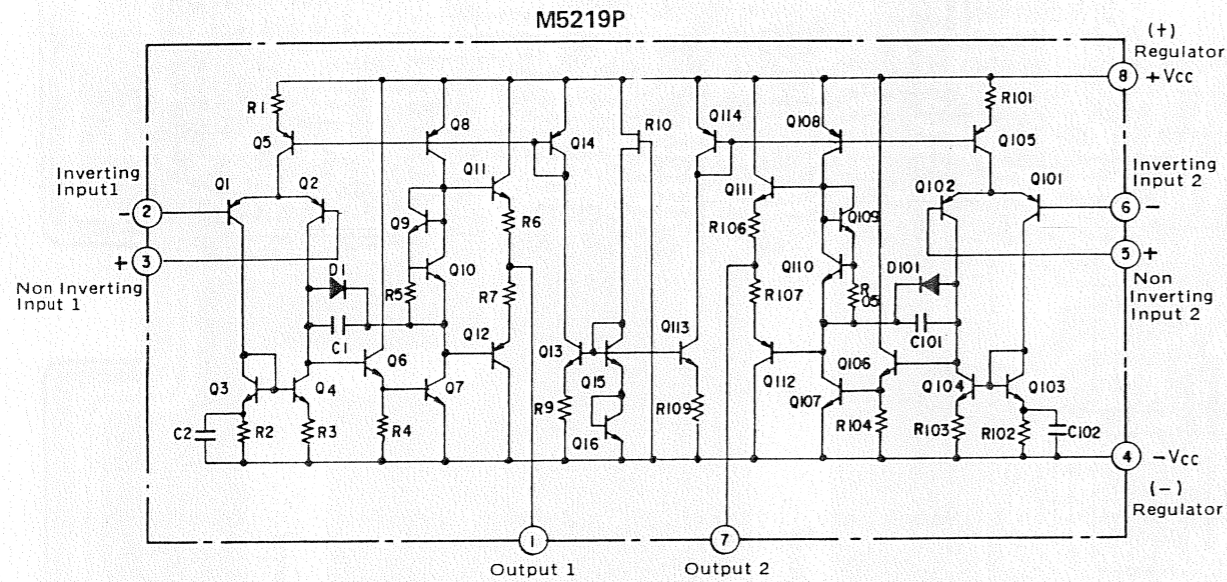
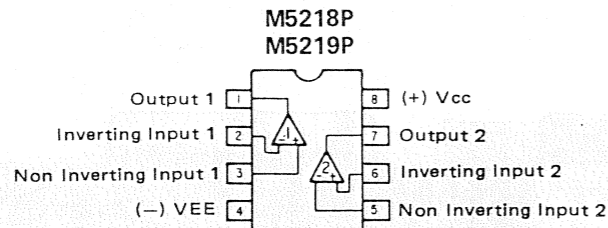
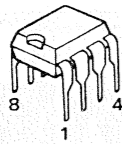


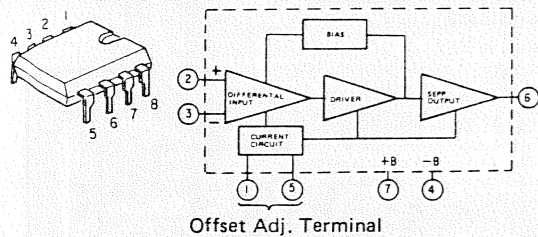
Fig. 5

SEMICONDUCTORS

M5218P
M5219P
(Mitsubishi)

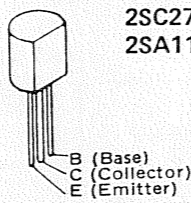


μPC741C (NEC)

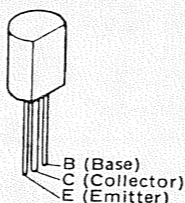


• TRANSISTORS (include FET)

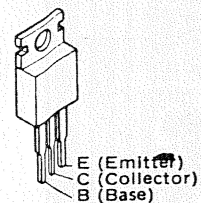
2SC1815(BL)
2SC1841(E/F)
2SA1015(Y)



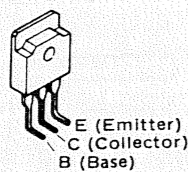
2SC2705(O/Y)
2SA1145(O/Y)



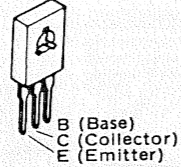
2SC2238(Y)
2SA968(Y)



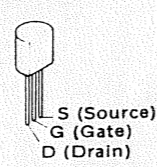
2SC2581 LB(O)/(Y)
2SA1106 LB(O)/(Y)



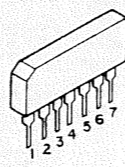
2SC2824(Y/O)
2SA1184(Y/O)



FET
2SK369(BL)/(GR)
2SK373(Y)

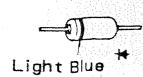


FET
2SK270A(BL)/(V)

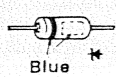


• DIODES (include LED)

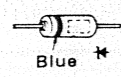
1S2076



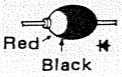
HZ7B-3
HZ15-2
HZ16-2
HZ24-2
HZ-30



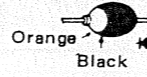
MZ-303A



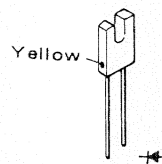
KB-265



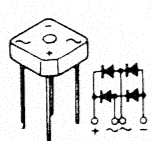
KB-462



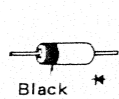
STV-1H



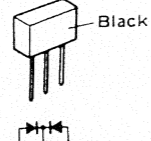
RB-602UFR



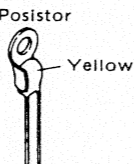
W03C



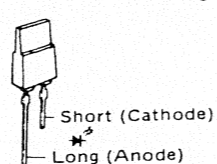
1D2C-1



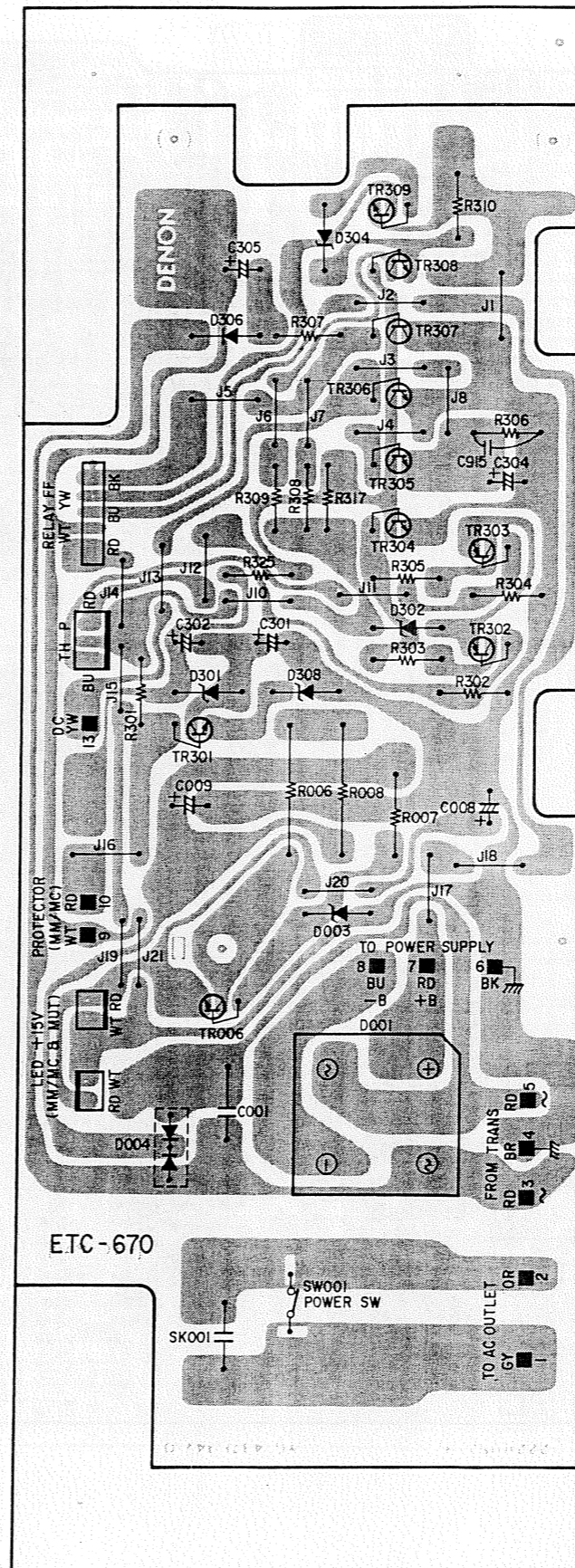
PTH487A01BD222TS



PR5552K-1 Red
AY5552K-1 Orange



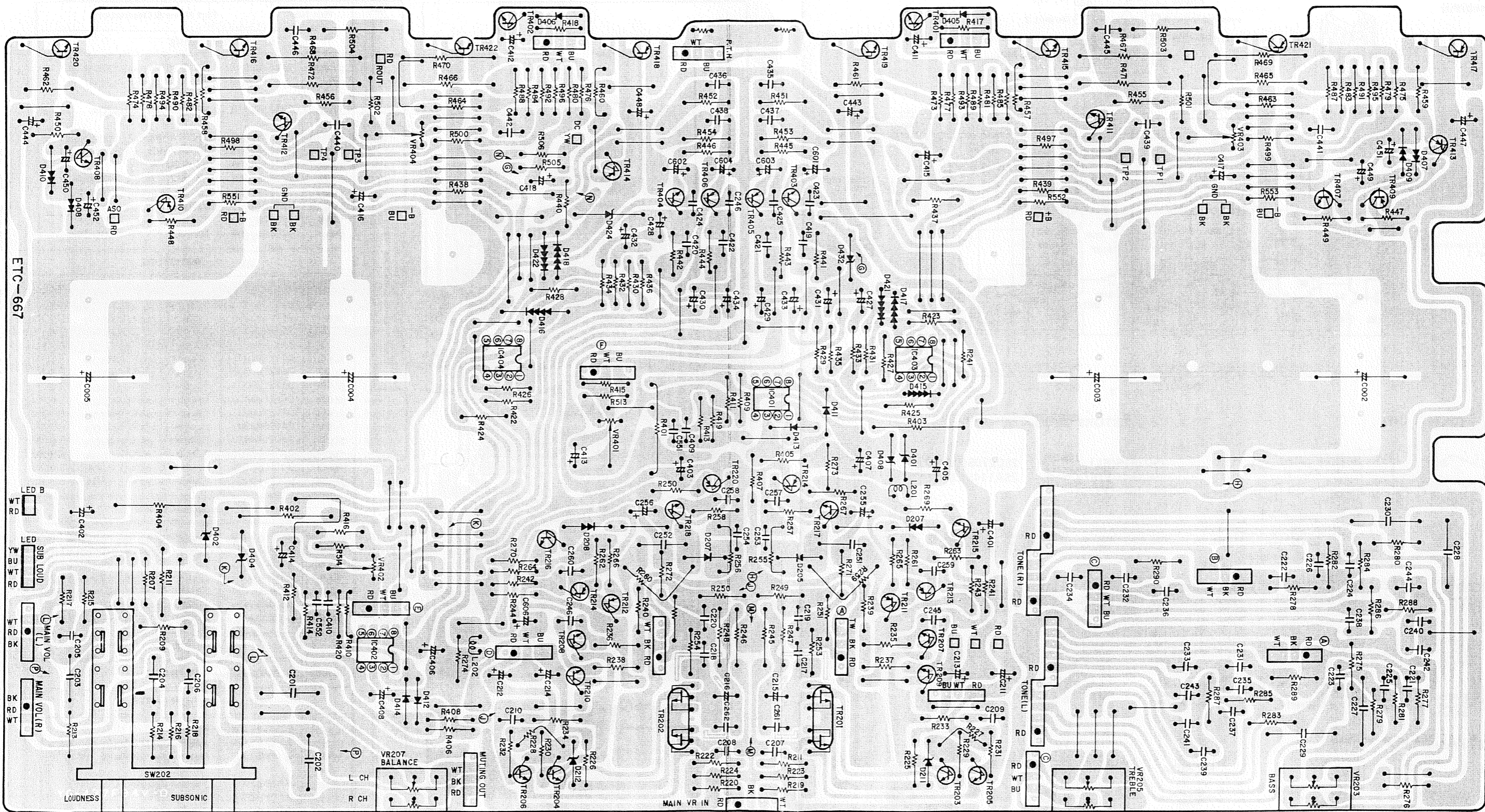
PRINTED WIRING BOARD PATTERNS AND PARTS LIST
ETC0670D RECTIFIER UNIT



ETC0670D RECTIFIER UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions	
SEMICONDUCTORS			
TR006	2730199001	2SC2238(Y)	TRANSISTOR
TR302, 303	2710102005	2SA1015(Y)	TRANSISTOR
TR304 ~306	2730198015	2SC1815(BL)	TRANSISTOR
TR308	2730198015	2SC1815(BL)	TRANSISTOR
TR309	2740060007	2SD667A(C)	TRANSISTOR
D001	2760335000	RB-602UFR	DIODE
D003	2760256008	HZ-16-2	ZENER
D004	2760151006	1D2C-1	DIODE
D302	2760244007	MZ303A	ZENER
D304	2760254000	HZ7B-3	ZENER
D311	2760049008	1S2076	DIODE
RESISTORS			
ΔR006	2440090021	220 ohm ±5% 2W	METAL OXIDE (NB)
R007	2410212004	13k ohm ±5% 1/2W	CARBON
ΔR008	2440090021	220 ohm ±5% 2W	METAL OXIDE (NB)
R302	2412129001	36k ohm ±5% 1/4W	CARBON
R303	2412120000	15k ohm ±5% 1/4W	CARBON
R304	2412129001	36k ohm ±5% 1/4W	CARBON
R305	2412120000	15k ohm ±5% 1/4W	CARBON
R306	2412116001	10k ohm ±5% 1/4W	CARBON
R309	2412092002	1k ohm ±5% 1/4W	CARBON
R310	2412144002	150k ohm ±5% 1/4W	CARBON
R317	2412150009	270k ohm ±5% 1/4W	CARBON
R325	2412056006	33 ohm ±5% 1/4W	CARBON
R326	2412140006	100k ohm ±5% 1/4W	CARBON
CAPACITORS			
C001	2561017019	0.01μF ±10% 630V	METALIZED
C008	2544089006	1μF ±20% 50V	ELECTROLYTIC
C009	2544063035	100μF ±20% 80V	ELECTROLYTIC
C301	2549015004	22μF ±10% 10V	ELECTROLYTIC
C304	2544161034	330μF ±20% 6.3V	ELECTROLYTIC
C915	2533643000	470pF ±5% 50V	CERAMIC
SK001	2538003014	4700pF ±20% 400V	CERAMIC
SWITCH			
SW001	2124405013	PUSH SWITCH	
OTHER PARTS			
R554, 555	2221015306	P.W. BOARD	
	2090008120	JUMPER WIRE P=10mm USED 15	
	2090051009	0 ohm JUMPER TAPE USED 2	
	EP-5667H1	TERMINAL PIN USED 12	
	4170140207	RADIATOR	
	4730354019	TAPPING SCREW (2) 3x8 USED 2	
	2038123009	5P CONNECTOR CORD	
	2050185054	5P WIRE HOLDER	
	2050190023	2PNH CONNECTOR BASE USED 2	
	2050190036	3PNH CONNECTOR BASE	

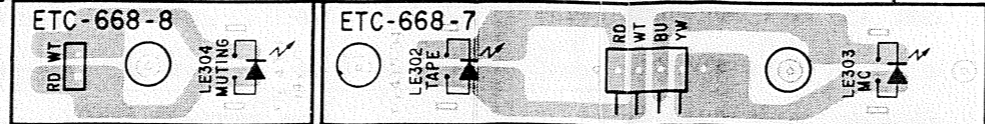
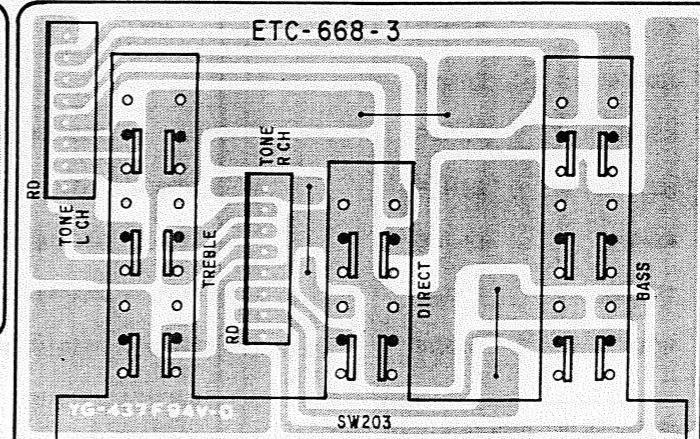
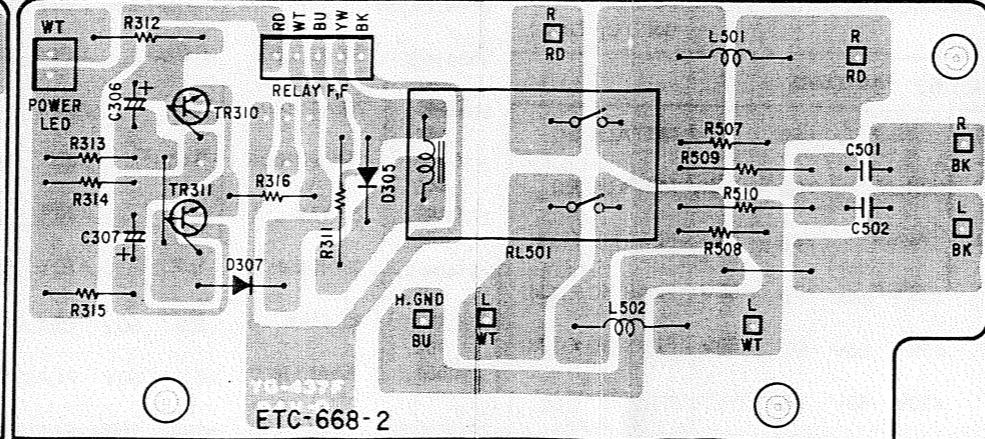
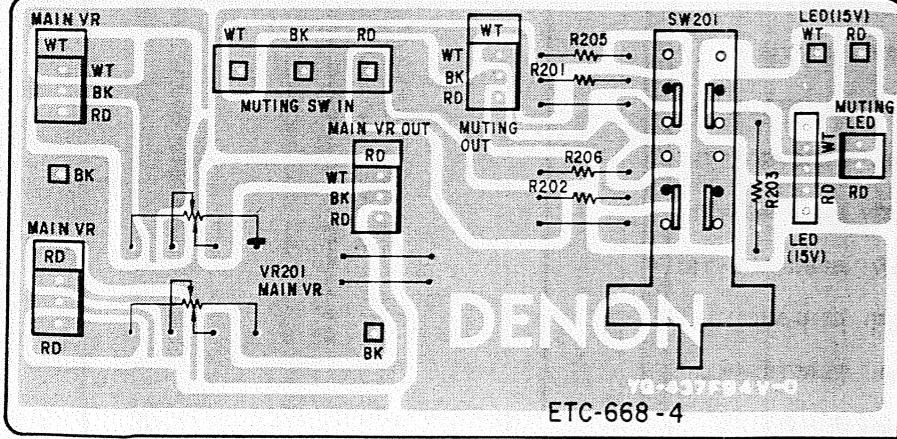
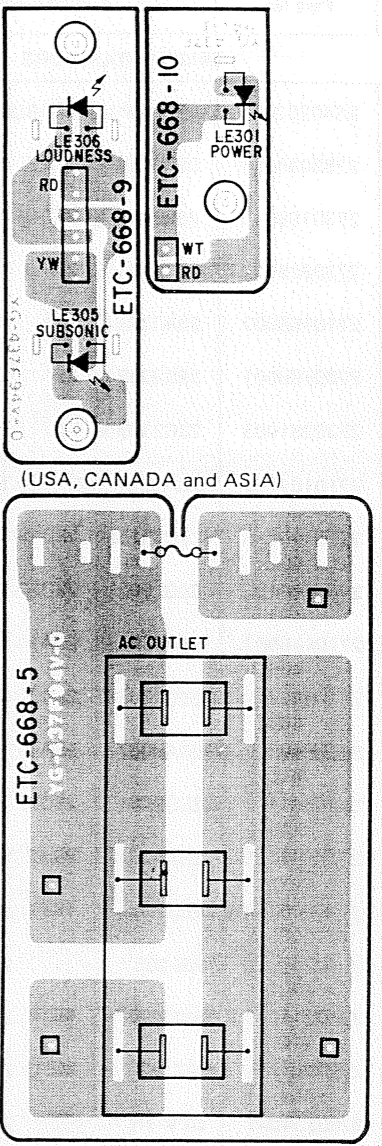
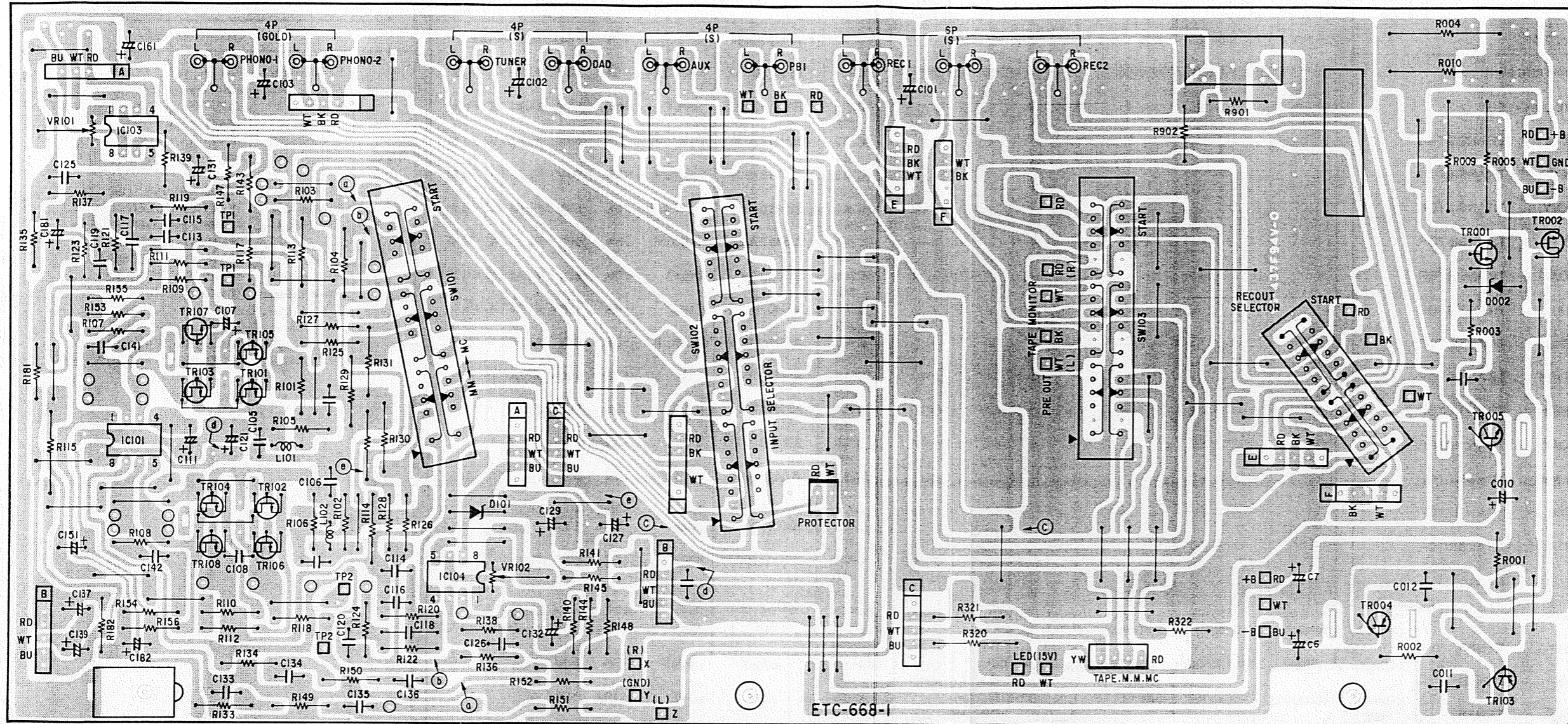
ETC0667 TONE & POWER UNIT



ETC0667D TONE & POWER UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions
SEMICONDUCTORS			R247, 248	2410204009	6.2k ohm ±5% 1/2W CARBON COMPOSIT	C227	2561030041	0.27µF ±5% 100V METALIZED	OTHER PARTS		
IC401 ~404	2630257001	M5218P (MITSUBISHI) IC	AR255 ~258	2412370009	180 ohm ±5% 1/4W CARBON (NB)	~230	2554159007	0.0039µF ±5% 50V PLASTIC FILM	2221014307 P.W. BOARD 2090008146 JUMPER WIRE P=5mm USED 1 2090008120 JUMPER WIRE P=10mm USED 99 2090008104 JUMPER WIRE P=15mm USED 6 2090008162 JUMPER WIRE P=20mm USED 1 2090051009 0 ohm JUMPER TAPE USED 2 EP-5667H1 TERMINAL PIN USED 20 2050185038 3P WIRE HOLDER USED 17 2050185041 4P WIRE HOLDER USED 4 2050190023 2PNH CONNECTOR BASE 2050190049 4PNH CONNECTOR BASE 2034203059 3P CONNECTOR CORD 2034215005 3P CONNECTOR CORD 2034215018 3P CONNECTOR CORD 2034215021 3P CONNECTOR CORD 2034215034 3P CONNECTOR CORD 2042048031 8P CONNECTOR CORD USED 2		
TR201, 202	2750036021	2SK270A(BL)/(V) FET	AR259, 260	2440053026	10k ohm ±5% 1W METAL OXIDE (NB)	C235, 236	2554127000	180pF ±5% 50V PLASTIC FILM			
TR203 ~206	2730198015	2SC1815(BL) TRANSISTOR	AR263, 264	2412321045	220 ohm ±5% 1/4W CARBON (NB)	C237, 238	2554147006	0.0012µF ±5% 50V PLASTIC FILM			
TR207 ~210	2730235020	2SC1841(E/F) TRANSISTOR	AR267 ~270	2412321016	22 ohm ±5% 1/4W CARBON (NB)	C239, 240	2554181004	0.033µF ±5% 50V PLASTIC FILM			
TR211 ~214	2710168007	2SA1145(O/Y) TRANSISTOR	AR401 ~404	2440106025	4.7k ohm ±5% 2W METAL OXIDE (NB)	C241, 242	2554157009	0.0033µF ±5% 50V PLASTIC FILM			
TR215, 216	2730199001	2SC2238(Y) TRANSISTOR	AR405, 406	2412314007	100 ohm ±5% 1/4W CARBON (NB)	C243, 244	2554177005	0.022µF ±5% 50V PLASTIC FILM			
TR217, 218	2730281003	2SC2705(O/Y) TRANSISTOR	AR409 ~414	2412369078	4.7k ohm ±5% 1/4W CARBON (NB)	C245, 246	2554127000	180pF ±5% 50V PLASTIC FILM			
TR219, 220	2710104003	2SA968(Y) TRANSISTOR	AR419, 420	2412369078	4.7k ohm ±5% 1/4W CARBON (NB)	C251, 252	2554079048	0.01µF ±5% 100V PLASTIC FILM			
TR401, 402	2730198015	2SC1815(BL) TRANSISTOR	AR441 ~446	2412321003	1k ohm ±5% 1/4W CARBON (NB)	C253, 254	2554145008	0.001µF ±5% 50V PLASTIC FILM			
TR403, 404	2730281003	2SC2705(O/Y) TRANSISTOR	AR451 ~456	2412314007	100 ohm ±5% 1/4W CARBON (NB)	C255, 256	2544181001	1µF ±20% 100V ELECTROLYTIC			
TR405, 406	2710168007	2SA1145(O/Y) TRANSISTOR	AR457 ~464	2412321032	4.7 ohm ±5% 1/4W CARBON (NB)	C257, 258	2554137003	470pF ±5% 50V PLASTIC FILM			
TR407, 408	2730281003	2SC2705(O/Y) TRANSISTOR	AR465 ~472	2442029003	0.22 ohm ±5% 2W METAL OXIDE (NB)	C259, 260	2521081027	3pF ±0.5pF 500V MICA			
TR409, 410	2710168007	2SA1145(O/Y) TRANSISTOR	AR473 ~496	2412321016	22 ohm ±5% 1/4W CARBON (NB)	C261, 262	2554121006	100pF ±5% 50V PLASTIC FILM			
TR411, 412	2730199001	2SC2238(Y) TRANSISTOR	AR501, 502	2412314007	100 ohm ±5% 1/4W CARBON (NB)	C401	2544181001	1µF ±20% 100V ELECTROLYTIC			
TR413, 414	2710104003	2SA968(Y) TRANSISTOR	AR503, 504	2440025025	47 ohm ±5% 1W METAL OXIDE (NB)	C405	2544089002	100µF ±20% 50V ELECTROLYTIC			
D205, 206	2760049008	1S2076 DIODE	AR521, 522	2412369052	2.2k ohm ±5% 1/4W CARBON (NB)	C409, 410, 411	2554137000	470pF ±5% 50V PLASTIC FILM			
D207, 208	2760216019	KB-265 DIODE	VR203	2110309110	VARIABLE RESISTOR 100k ohm (BASS)	C411	2544181001	1µF ±20% 100V ELECTROLYTIC			
D211, 212	2760244007	MZ303A ZENER	VR205	2110309107	VARIABLE RESISTOR 50k ohm (TREBLE)	C415	2544089006	1µF ±20% 50V ELECTROLYTIC			
D401 ~404	2760253001	MZ15-2 ZENER	VR207	2110406000	VARIABLE RESISTOR 100k ohm (BALANCE)	~418	2554137003	470pF ±5% 50V PLASTIC FILM			
D405, 406	2760334001	STV-1H ZENER	VR401, 402	2116025058	SEMI FIXED RESISTOR 10k ohm (IDLING)	~422	2521079084	33pF ±10% 500V MICA			
D407 ~410	2760216019	KB-265 ZENER	VR403, 404	2116025016	SEMI FIXED RESISTOR 100 ohm (DISTORTION)	~426	2544181001	1µF ±20% 50V ELECTROLYTIC			
D411 ~414	2760049008	1S2076 ZENER	CAPACITORS			~434	2554169000	0.01µF ±5% 50V PLASTIC FILM			
D415 ~422	2760337008	KB462 ZENER	C201, 202	2561030067	0.18µF ±5% 100V METALIZED	C435	2554169000	0.01µF ±5% 50V ELECTROLYTIC			
D423 ~426	2760254000	HZ7B-3 ZENER	C203, 204	2561030070	0.1µF ±5% 100V METALIZED	~442	2554181001	1µF ±20% 100V ELECTROLYTIC			
D427, 428	2760337008	KB-462 DIODE	C205, 206	2554142001	750pF ±5% 50V PLASTIC FILM	C443, 444	2554181001	1µF ±20% 100V ELECTROLYTIC			
D429, 430	2760049008	1S2076 DIODE	C207, 208	2554131009	270pF ±5% 50V PLASTIC FILM	C445, 446	2554169000	0.01µF ±5% 50V ELECTROLYTIC			
D431 ~434	2760057003	V06B DIODE	C209, 210	2554145008	0.001µF ±5% 50V PLASTIC FILM	C447, 448	2544181001	1µF ±20% 100V ELECTROLYTIC			
RESISTORS (not included Carbon Film ±5%, 1/4W Type)			C211 ~214	2544181001	1µF ±20% 50V ELECTROLYTIC	C449	2544089006	1µF ±20% 50V ELECTROLYTIC			
R215, 216	2420203003	10M ohm ±10% 1/4W CARBON COMPOSIT	C215, 216	2543016083	22µF ±20% 50V ELECTROLYTIC (B.P)	~452	2533619005	47pF ±5% 50V CERAMIC			
AR229 ~232	2412370025	7.5k ohm ±5% 1/4W CARBON (NB)	C217, 218	2521003005	3pF ±0.25pF 50V MICA	C461, 462	2554137003	470pF ±5% 50V PLASTIC FILM			
AR239, 240	2412321029	1.5k ohm ±5% 1/4W CARBON (NB)	C219, 220	2521008000	8pF ±0.5pF 50V MICA	C551, 552	2544181001	1µF ±20% 100V ELECTROLYTIC			
AR241 ~244	2412321003	1k ohm ±5% 1/4W CARBON (NB)	C221, 222	2554131009	270pF ±5% 50V PLASTIC FILM	C601, 604	2544181001	1µF ±20% 100V ELECTROLYTIC			
R245, 246	2410169005	220 ohm ±5% 1/2W CARBON COMPOSIT	C223 ~226	2554183002	0.039µF ±5% 50V PLASTIC FILM	C606	2544181001	1µF ±20% 100V ELECTROLYTIC			
						COIL, SWITCH					
						L201, 202	2350008006	INDUCTOR 22µH			
						SW202	2124461002	2P PUSH SWITCH			

ETC0668 INPUT & EQ. UNIT



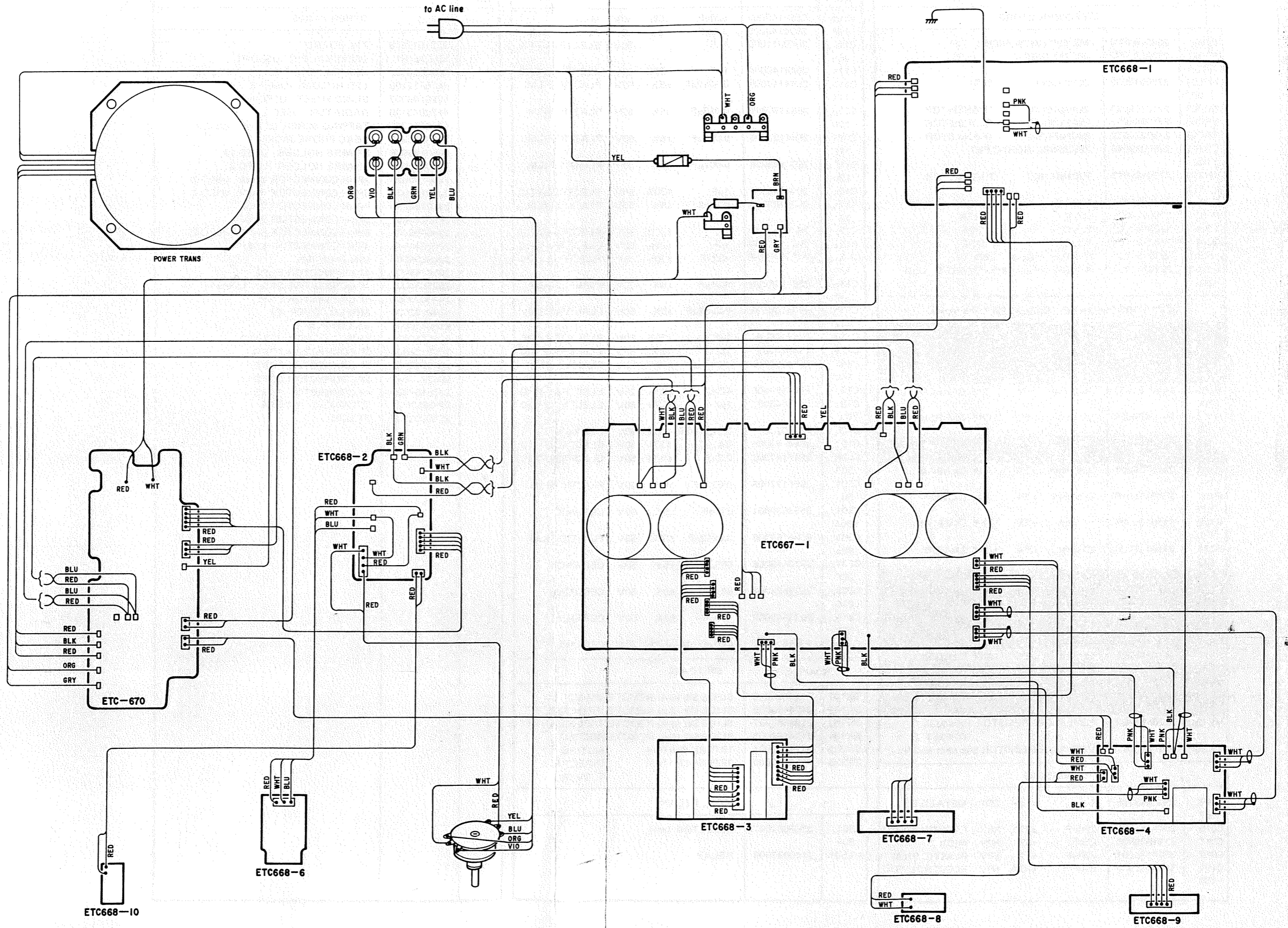
ETC0668D INPUT & EQ. UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions
SEMICONDUCTORS		
IC101	2630284003	M5219P (MITSUBISHI) IC
IC103, 104	2630133002	μPC741 (NEC) IC
TR001, 002	2750042002	2SK373(Y) FET
TR003	2710102005	2SA1015(Y) TRANSISTOR
TR004	2710135027	2SA1184(Y/O) TRANSISTOR
TR005	2730236029	2SC2824(Y/O) TRANSISTOR
TR101 ~108	2750038045	2SK369(BL)/(GR)-C FET
TR310, 311	2730198015	2SC1815(BL) TRANSISTOR
D002	2760220034	HZ24-3 ZENER
D101	2760224001	HZ-30 ZENER
D305	2760191008	W03C DIODE
D307	2760191008	W03C DIODE
LE301	3939154008	PR5552K-1 RED LED
LE302 ~306	3939262000	AY5552K-1M(A/M/Y) ORANGE LED
RESISTORS (not included Carbon ±5%, 1/4W Type)		
R004, 005	2440098023	1k ohm ±5% 2W METAL OXIDE (NB)
R009, 010	2440098023	1k ohm ±5% 2W METAL OXIDE (NB)
R103, 104	2410161003	100 ohm ±5% 1/2W CARBON
R113, 114	2410160004	91 ohm ±5% 1/2W CARBON
R115	2440037026	470 ohm ±5% 1W METAL OXIDE (NB)
R119, 120	2412318003	3.9k ohm ±2% 1/4W CARBON
R121, 122	2412318016	47k ohm ±2% 1/4W CARBON
R129, 130	2410129003	4.7 ohm ±5% 1/2W CARBON
R131, 132	2410137008	10 ohm ±5% 1/2W CARBON
R141	2412321090	680 ohm ±5% 1/4W CARBON (NB)
R145	2412321090	680 ohm ±5% 1/4W CARBON (NB)
R153 ~156	2412321003	1k ohm ±5% 1/4W CARBON (NB)
R311	2440041025	1k ohm ±5% 1W METAL OXIDE (NB)
R312	2410185005	1k ohm ±5% 1/2W CARBON
R509, 510	2440021029	22 ohm ±5% 1W METAL OXIDE (NB)
R511, 512	2440087021	120 ohm ±5% 2W METAL OXIDE (NB)
VR101, 102	2116025032	SEMI FIXED RESISTOR 100k ohm OFFSET
VR201	2110405001	VARIABLE RESISTOR 55k ohm MAIN
CAPACITORS		
C006, 007	2561018005	1μF ±10% 250V METALIZED
C010	2544166000	220μF ±20% 50V ELECTROLYTIC
C011	2521026008	47pF ±5% 50V MICA
C012	2554133007	330pF ±5% 50V PLASTIC FILM
C101 ~103	2544145005	0.47μF ±20% 50V ELECTROLYTIC

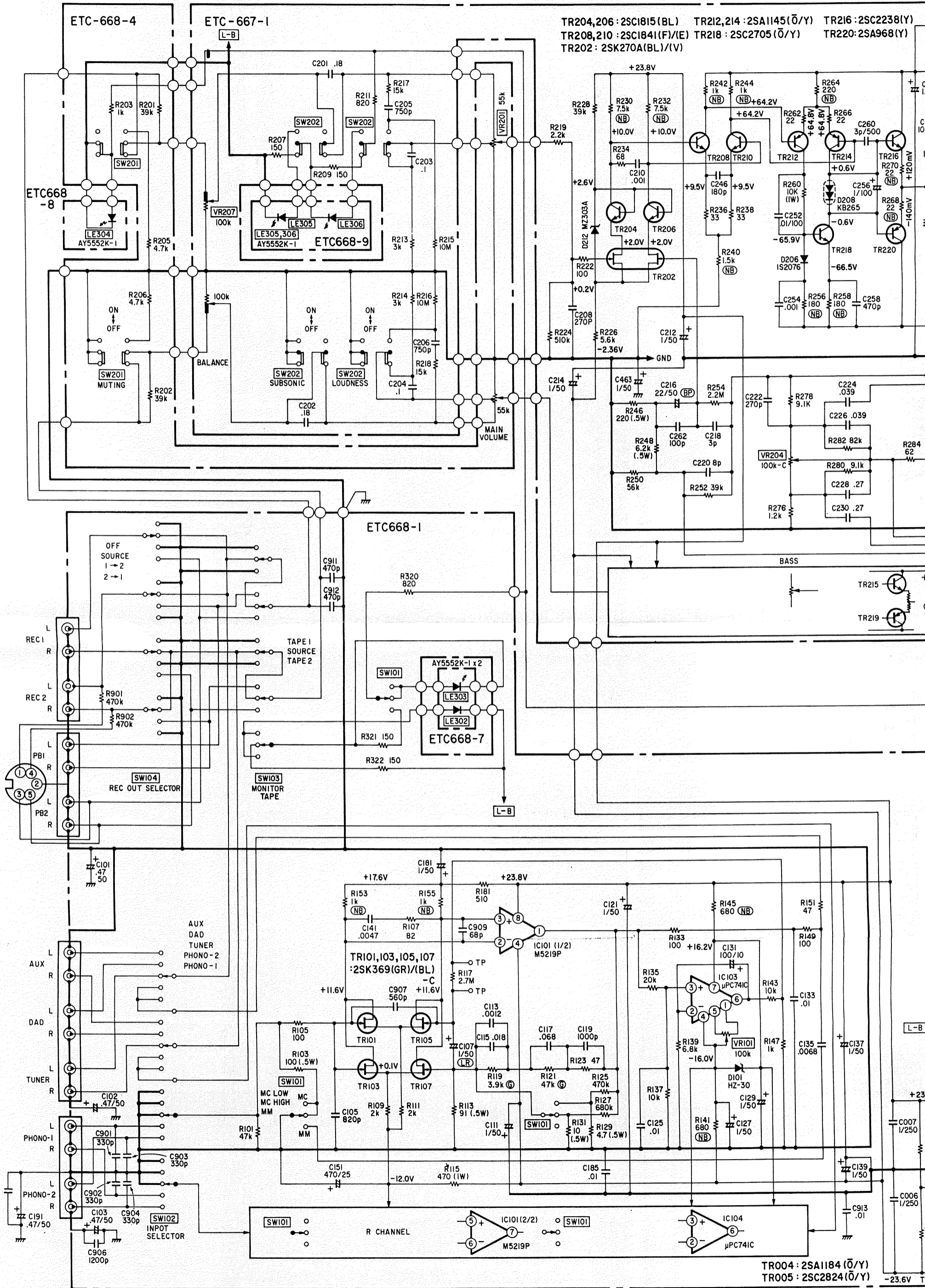
Ref. No.	Part No.	Part Name & Descriptions
C105	2554143000	820pF ±5% 50V MICA
C106	2554143000	820pF ±5% 50V PLASTIC FILM
C107, 108	2549011008	1μF 50V ELECTROLYTIC
C111	2544146004	1μF ±20% 50V ELECTROLYTIC
C113, 114	2544147006	0.0012μF ±5% 50V PLASTIC FILM
C115, 116	2554175007	0.018μF ±5% 50V PLASTIC FILM
C117, 118	2554189006	0.068μF ±5% 50V PLASTIC FILM
C119, 120	2554145008	0.001μF ±5% 50V PLASTIC FILM
C121	2544146004	1μF ±20% 50V ELECTROLYTIC
C125, 126	2554169000	0.01μF ±5% 50V PLASTIC FILM
C127	2544146004	1μF ±20% 50V ELECTROLYTIC
C129	2544146004	1μF ±20% 50V ELECTROLYTIC
C131, 132	2544130007	100μF ±20% 10V ELECTROLYTIC
C133, 134	2554169000	0.01μF ±5% 50V PLASTIC FILM
C135, 136	2554165004	0.0068μF ±5% 50V PLASTIC FILM
C137	2544146004	1μF ±20% 50V ELECTROLYTIC
C139	2544146004	1μF ±20% 50V ELECTROLYTIC
C141, 142	2554161008	0.0047μF ±5% 50V PLASTIC FILM
C151	2544157006	470μF ±20% 25V ELECTROLYTIC
C181, 182	2544146004	1μF ±20% 50V ELECTROLYTIC
C185	2531024003	0.01μF +80,-20% 50V CERAMIC
C191	2544145005	0.47μF ±20% 50V ELECTROLYTIC
C306, 307	2544147003	2.2μF ±20% 50V ELECTROLYTIC
C501, 502	2554177005	0.022μF ±5% 50V PLASTIC FILM
C901 ~904	2533639001	330pF ±5% 50V CERAMIC
C905, 906	2554147006	0.0012μF ±5% 50V PLASTIC FILM
C907, 908	2533645008	560pF ±5% 50V CERAMIC
C909, 910	2533623004	68pF ±5% 50V CERAMIC
C911, 912	2533643000	470pF ±5% 50V CERAMIC
C913	2531024003	0.01μF +80,-20% 50V CERAMIC
SWITCHES		
SW101	2124465008	SLIDE SW (6-4) REMOTE MM-MC
SW102	2124496006	SLIDE SW (6-6) REMOTE INPUT SEL
SW103	2124466007	SLIDE SW (6-4) REMOTE TAPE MONI
SW104	2124187001	SLIDE SW (4-4) REMOTE REC OUT
SW201	2124462001	1P PUSH SWITCH MUTING
SW203	2124463000	3P PUSH SWITCH DIRECT & T. OVER
COIL, RELAY		
L501, 502	2350007007	INDUCTOR 1mH
RL501	2140037009	RELAY

Ref. No.	Part No.	Part Name & Descriptions
OTHER PARTS		
	2221013308	P.W. BOARD
	EP-5667H1	TERMINAL PIN USED 41
	2090008120	JUMPER WIRE P=10mm USED 79
	4410412200	LED HOLDER USED 6
	1220109007	BLIND SHEET USED 6
	4170043100	RADIATOR USED 2
	4730354019	TAPPING SCREW (2) 3x8 USED 2
	2048100009	HEAD PHONE JACK
	2050185038	3P WIRE HOLDER USED 13
	2050185041	4P WIRE HOLDER USED 2
	2050190023	2PNH CONNECTOR BASE USED 2
	2050190036	3PNH CONNECTOR BASE USED 4
	2050190049	4PNH CONNECTOR BASE
	2050190052	5PNH CONNECTOR BASE
	2050190081	8PNH CONNECTOR BASE USED 2
	2050154043	4PNH CONNECTOR BASE
	2048059008	DIN JACK (5P)
	2050145007	4P CONNECTOR BASE
	2036084001	4P CONNECTOR BASE USED 2
	2040079002	6P CONNECTOR BASE
	4140292004	SHIELD COVER (C)
	4140240001	EARTH PLATE
	4140116106	SHIELD COVER USED 2
	2032136034	2P CONNECTOR CORD
	2032115042	2P CONNECTOR CORD
	2032136047	2P CONNECTOR CORD
	2036105090	4P CONNECTOR CORD
	EP-5667H2	TERMINAL USED 4
	2050003107	3T LUG

CONNECTION DIAGRAM



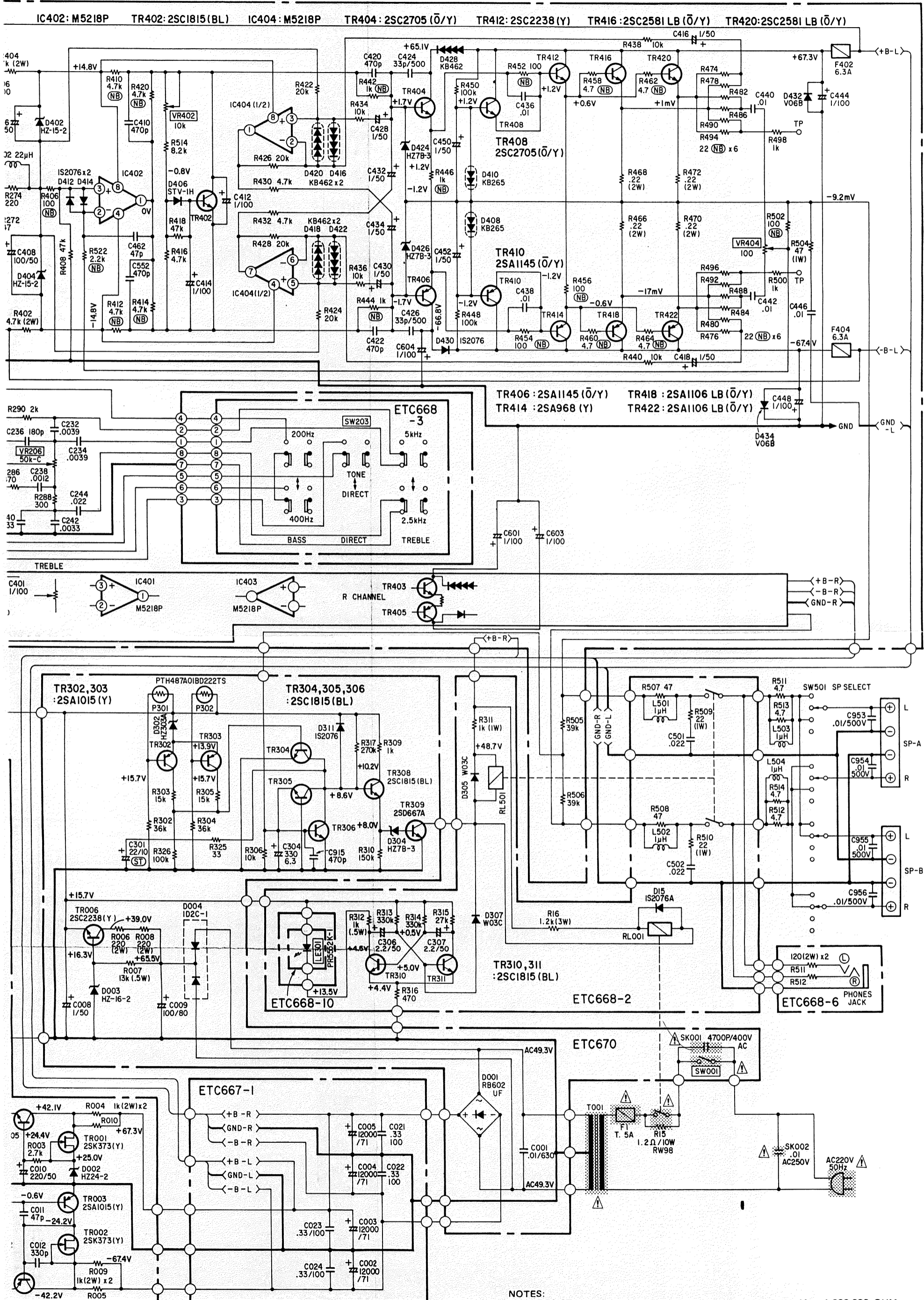
WIRING DIAGRAM



TR204,206 : 2SC1815 (BL) TR212,214 : 2SA1145 (O/Y) TR216 : 2SC2238 (Y)
 TR208,210 : 2SC1841 (F)/(E) TR218 : 2SC2705 (O/Y) TR220 : 2SA968 (Y)
 TR202 : 2SK270A (BL)/(V)

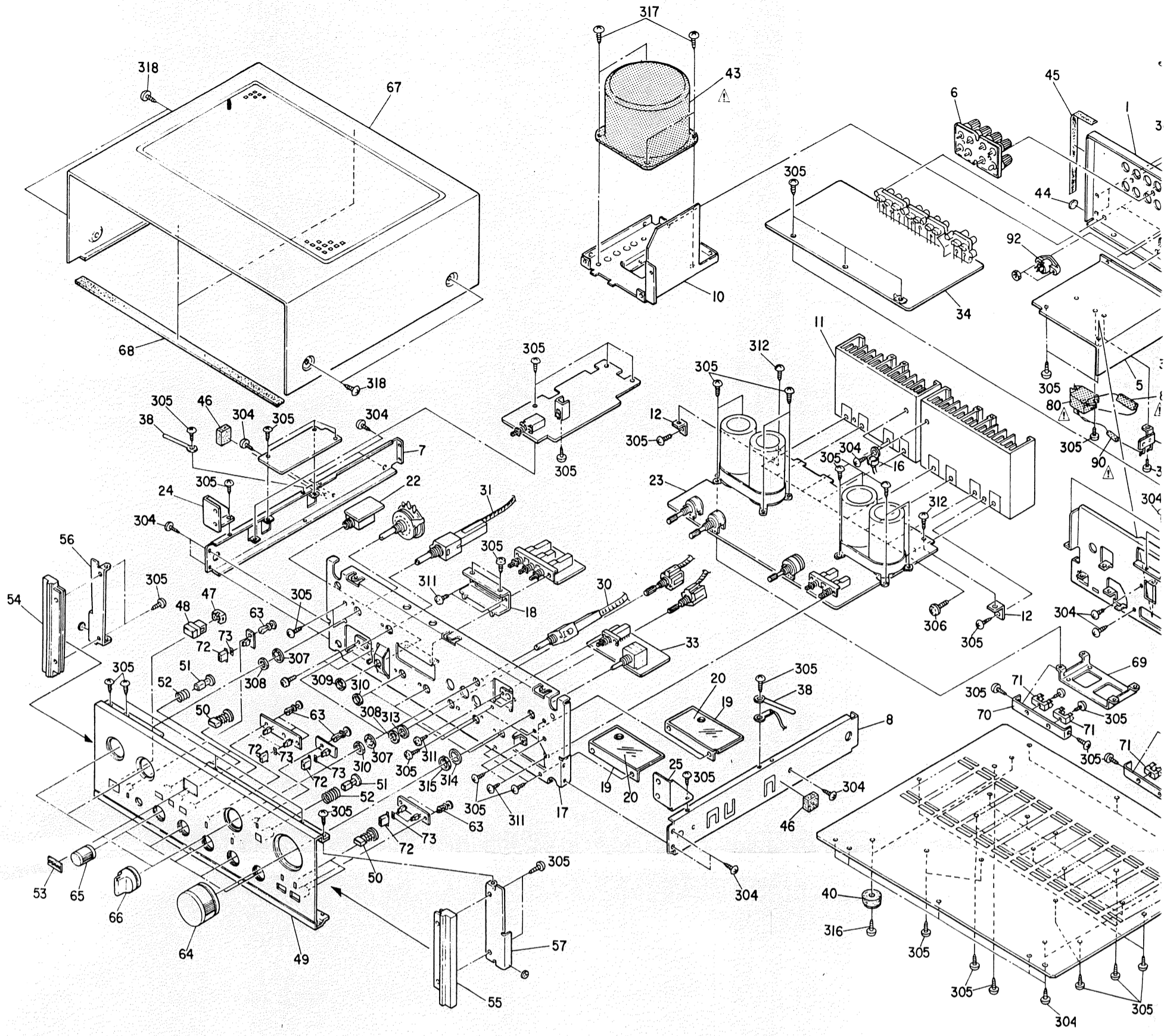
TR004 : 2SA1184 (O/Y)
 TR005 : 2SC2824 (O/Y)

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



NOTES:
 ALL RESISTANCE VALUES IN OHM, K = 1,000 OHM, M = 1,000,000 OHM.
 ALL CAPACITANCE VALUES IN MICROFARAD, P = MICRO-MICRO FARAD.
 EVERY VOLTAGES AND CURRENTS IS MEASURED AT NO SIGNAL INPUT CONDITION.
 CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

EXPLODED VIEW OF CHASSIS AND CABINET

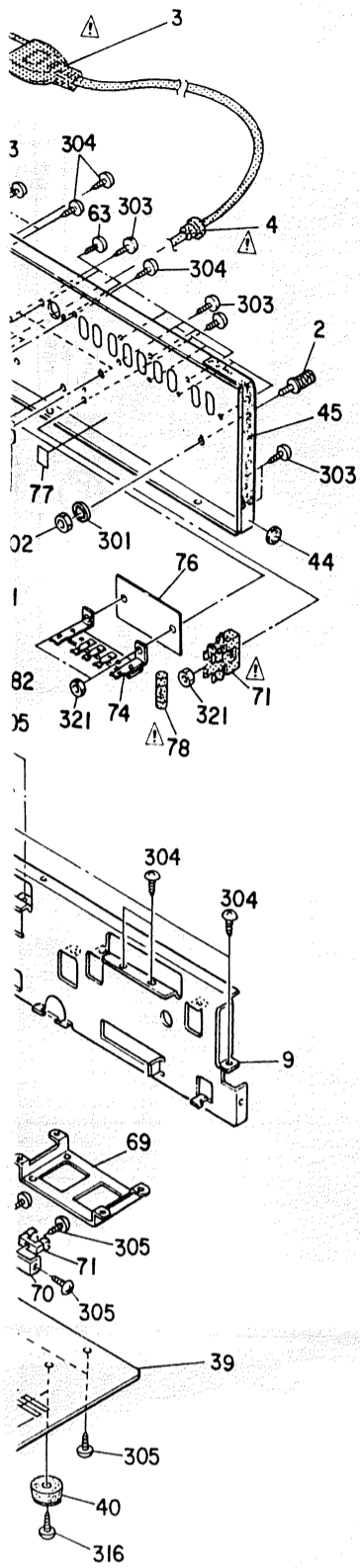


EXPLODED VIEW OF PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions	Ref. No.
1	1059014004	BACK PANEL	38	EP-6214	CORD HOLDER USED 3	75	2668023006	METALIZED CAP 0.01UF/250V	30
2	2050043109	GND TERMINAL	39	1050577100	BOTTOM COVER	76	4150088004	INSULATING SHEET	30
3	2062002004	AC CORD	40	1040027107	FOOT	*77	5130654020	FUSE LABEL (T5.0A)	30
4	4450026305	CORD BUSH	41	2032095188	2P CONNECTOR CORD USED 2	78	2061013090	FUSE (T5A)	30
5	4140332100	SHIELD PLATE	42	2030241031	1P CONTACT ASS'Y	*79	5130716023	FTZ LABEL	30
6	2050144008	8P TERMINAL	43	2334504005	POWER TRANS	80	2149002006	RELAY (DC-24V)	30
7	4110400208	SIDE CHASSIS (L)	44	1040034006	STOPPER USED 4	81	2432051007	WIRE WOUND RESISTOR 2 ohm 10W	30
8	4110400211	SIDE CHASSIS (R)	45	1220089088	SPACER USED 2	82	EP-6549	1PW TERMINAL	30
9	4110399306	MAIN CHASSIS	46	4610136014	RUBBER SHEET USED 2	83	2531050004	DELAYING CAP 100UF/500V	30
10	4110402002	TRANS CHASSIS ASS'Y	47	1140056007	FLEXIBLE RING	84	EP-6079007	CHEMICON CAP 20UF/50V	30
11	4170212009	POWER RADIATOR	48	1130515134	PUSH KNOB (A)	85	2031013096	FUSE (T5.0A) (T5.0A)	31
12	4410411104	PCB BRACKET	49	1441166201	FRONT PANEL ASS'Y	*86	5139119003	FUSE LABEL	31
13	2730273024	TRANSISTOR 2SC2581LB(O)/(Y)	50	1130513233	PUSH KNOB (B) ASS'Y USED 4	87	4410423008	EARTH BRACKET	31
14	2710160021	TRANSISTOR 2SA1106LB(O)/(Y)	51	1130514119	PUSH KNOB (C) ASS'Y USED 2	88	2050205002	2P W TERMINAL	31
15	4150234007	INSULATING SHEET	52	4630367106	COIL SPRING USED 2	89	2050069002	5P W TERMINAL	31
16	2760289004	POSISTOR PTH487A01BD222TS	53	1310113000	DENON MARK	90	2440154006	1/2 ohm 3W METAL OXIDE (NB)	31
17	4110398307	FRONT CHASSIS	54	1441155005	SIDE ESC. BAR (L)	91	2760049011	1S2076A DIODE	31
18	4410404001	SWITCH BRACKET	55	1441156004	SIDE ESC. BAR (R)	92	2048059008	DIN JACK (5P)	31
19	4140349009	SHIELD BRACKET	56	4410406009	SIDE BRACKET (L)	93			31
20	4150270003	INSULATING SHEET	57	4410407008	SIDE BRACKET (R)	94			31
21	2120243004	ROTARY SWITCH	58	ETC0667D2	LED UNIT	95			32
22	ETC0668D6	H.P JACK UNIT	59	2036115006	4P CONNECTOR ASS'Y	96			32
23	ETC0667D	tone & power unit	60	ETC0667D3	LED UNIT	97			32
24	4410419009	CORNER BRACKET (L)	61	ETC0667D4	LED UNIT	98			31
25	4410420001	CORNER BRACKET (R)	62	ETC0667D5	LED UNIT	99			31
26	2120239005	ROTARY REMOTE SW (INPUT SEL)	63	4770096007	PUSH RIVET USED 9	100			31
27	2120242005	ROTARY REMOTE SW (REC OUT)	64	1120436100	KNOB (A)	PACKING & ACCESSORIES (not included EXPLODED VIEW)			
28	2120241006	ROTARY REMOTE SW (TAPE MONITOR)	65	1120435004	KNOB (B) USED 5				
29	2120240007	ROTARY REMOTE SW (MM-MC)	66	1120437002	KNOB (C) USED 3	a.	5040055007	CABINET SHEET	
30	4350085001	FLEXIBLE SLIDER (INPUT)	67	1020172302	TOP COVER	b.	5030447007	CUSHION (L,R)	
31	4350089007	FLEXIBLE SLIDER (REC OUT)	68	1220064045	SPACER USED 2	c.	5019114005	CARTON CASE	
32	ETC0668D3	tone unit	69	4121498209	CONDENSER BRACKET	d.	5119117009	INST. MANUAL	
33	ETC0668D4	M. VOL & MUT SW UNIT	70	4410426005	FUSE BRACKET	e.	5138295009	CONTROL CARD	
34	ETC0668D	INPUT & EQ. UNIT	*71	2020013101	FUSE HOLDER	f.	2090012006	SHORT PIN USED 2	
35	ETC0670D	RECTIFIER UNIT	72	4410412200	LED HOLDER USED 6	g.			
36	ETC0668D2	RELAY UNIT	73	1220109007	BLIND SHEET USED 6	h.			
*37	4450033005	WIRE CLAMP BAND USED 23	74	2050089008	7PW TERMINAL				

important safety item, which must be replaced,
by a part specified or meeting the specification
ref.

DENON



NIPPON COLUMBIA CO., LTD.

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CABLE: NIPPONCOLUMBIA TOKYO

Printed in Japan

Part No.	Part Name & Descriptions	Q'ty
SCREWS AND OTHERS		
1	4753100004 TOOTH WASHER φ4	1
2	4770006000 NUT M4	1
3	4770064107 FIXING SCREW	8
4	4730354035 TAPPING SCREW (2) 3x8 (BLACK)	35
5	4730354019 TAPPING SCREW (2) 3x8	64
6	4700012022 PAN SCREW WITH W. SP 3x12	8
7	— TOOTH WASHER φ7	2
8	— NUT M9	3
9	— NUT M12	1
0	— NUT M7	5
1	4711303018 PAN SCREW	8
2	SC-06272 FIX. SCREW	2
3	— WASHER φ9	2
4	— TOOTH WASHER φ8	1
5	— NUT M8	1
6	4730459011 TAPPING SCREW (2) 4x16	4
7	4700030017 TAPPING SCREW (2) 4x8	4
8	4734801005 TAPPING SCREW (TRUS) 4x8	4
9	4770088002 WASHER φ4.1	1
0	4700042005 PAN SCREW WITH SW 3x8 (BLACK)	3
1	4756006008 NUT M3	3
2	— TOOTH WASHER φ9	1

ADDENDUM LIST

Ref. No.	Part Name & Descriptions	Part No.		
		EA for Australia	EK for U.K.	
1	BACK PANEL			
3	AC CORD			
4	CORD BUSH			
43	POWER TRANS			

★ Marked not included EXPLODED VIEW.