

ONKYO® SERVICE MANUAL

Integrated Stereo Amplifier MODEL A-8470



Silver and Black models

UG

220V AC, 50Hz

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK \triangle ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

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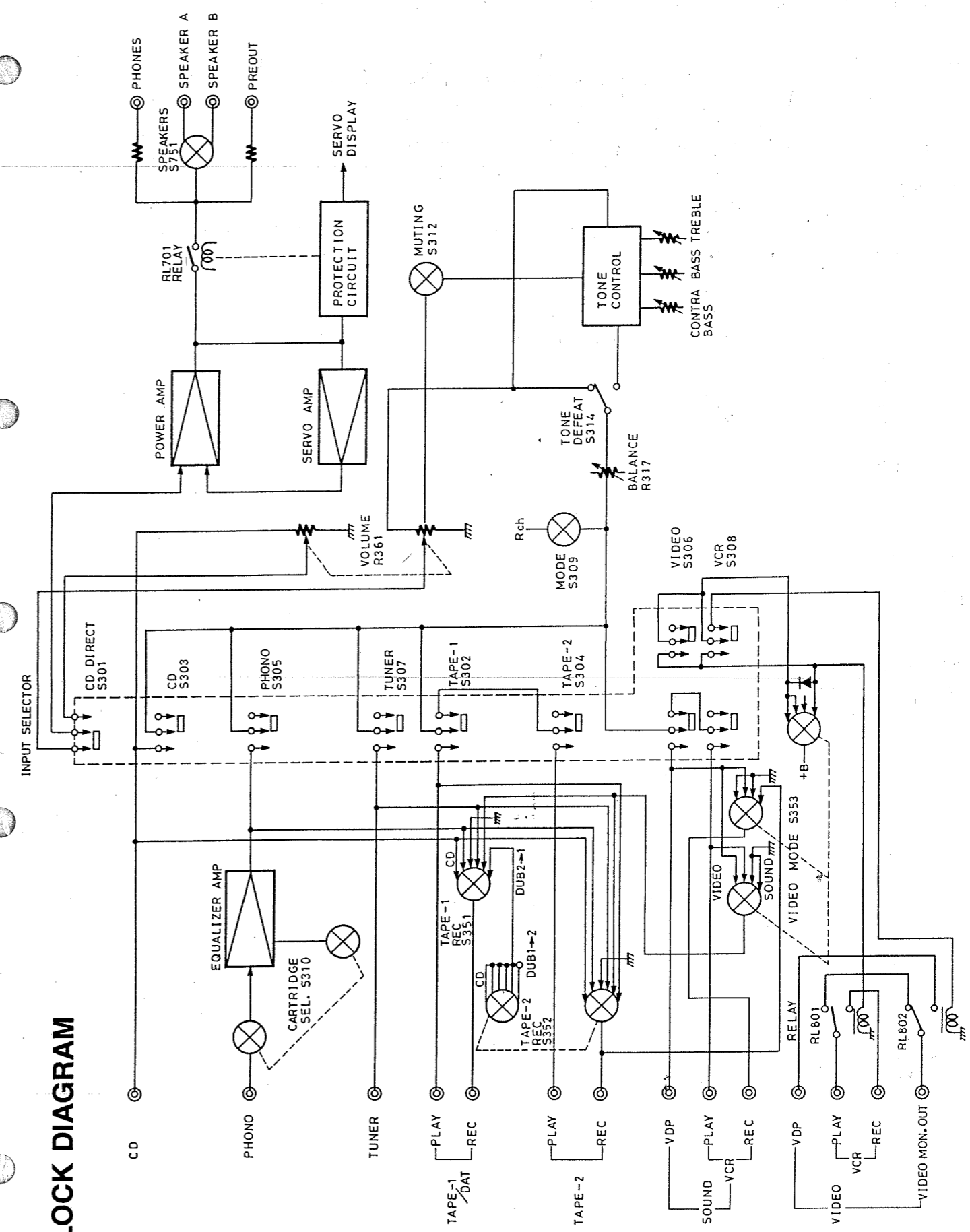
ONKYO

AUDIO COMPONENTS

SPECIFICATIONS

Continuous Power Output:	2 x 150 watts at 4 ohms, 1 kHz (DIN) 2 x 115 watts at 8 ohms, 1 kHz (DIN) 100 watts per channel, min. RMS, at 8 ohms, both channels driven from 20 Hz to 20 kHz, with no more than 0.008% Total harmonic distortion.
Dynamic Power:	2 x 303 watts at 2 ohms, 2 x 235 watts at 4 ohms
Total Harmonic Distortion	0.008% at rated power 0.008% at 1 watt output
Intermodulation Distortion:	0.005% at rated power
Damping Factor:	50 at 8 ohms
Input Sensitivity/ Impedance	Phono (MM): 2.5 mV/50 kohms Phono (MC): 160 μV/220 ohms CD, DIRECT: 150 mV/50 kohms TUNER: 150 mV/50 kohms Tape Play: 150 mV/50 kohms VCR Play: 150 mV/50 kohms VDP Play: 150 mV/50 kohms
Output Level/Impedance:	Tape Rec: 150 mV/1.5 kohms (Phono) Pre Out: 1 V/600 ohms
Phono Overload:	Phono (MM): 200 mV RMS. at 1 kHz, 0.012% THD.
Tone Control (Vol -20 dB):	CONTRABASS: +10/+20 dB (Muting: OFF/ON) at 20 Hz BASS: ±10 dB at 70 Hz TREBLE: ±8 dB at 20 kHz
High Cut: Frequency Response:	6 kHz (6 dB/Octave) (TREBLE min.) CD, Tuner: 2 Hz-50 kHz (+0, -1 dB)
RIAA Deviation:	Phono (MM): ±0.3 dB, 20 Hz -20 kHz
Signal to Noise Ratio (IHF-A):	Phono (MM): 94 dB (5 mV input) Phono (MC): 75 dB (0.5 mV input) CD DIRECT: 107 dB
Muting (Vol -20 dB):	-15 dB
Power Supply:	European models: AC220V, 50 Hz
Dimensions (W x H x D):	435 x 157 x 396 mm 17-1/8" x 6-3/16" x 15-9/16"
Weight:	13.2 kg, 29.1 lbs.

BLOCK DIAGRAM



ADJUSTMENT PROCEDURES

1. Preparations

- 1) Leave the machine in a normal condition parallel to the work bench, maintaining a clearance of 15mm from the bottom for air circulation.
- 2) Set the level to minimum with no load and no signal.
- 3) When making the adjustment, there must be no breeze blowing from the outside.

2. Adjustment of idling current

- 1) Turn ON the power switch, and leave the unit as is for about 5 minutes.
- 2) Adjust the semi-fixed resistor R531 (R532) so that the voltage between the terminals V_{CT} and I_{ID} of the printed circuit board NAAF-2969 is 7.5mV.

3. Operating check of protection circuit

- 1) When the power switch is turned ON.
 - After about 6 second, relay RL701 of the NAAF-2969 printed circuit board go ON.
 - Operation indicator lights.
- 2) When the power is turned OFF.
 - Immediately a relay go OFF.
- 3) With no load, when $\pm 200\text{mV}$ DC is CD input, the speaker relay go OFF.

Caution: During this test, there should be absolutely no load connected and the load terminals must not be shorted.

PRECAUTIONS

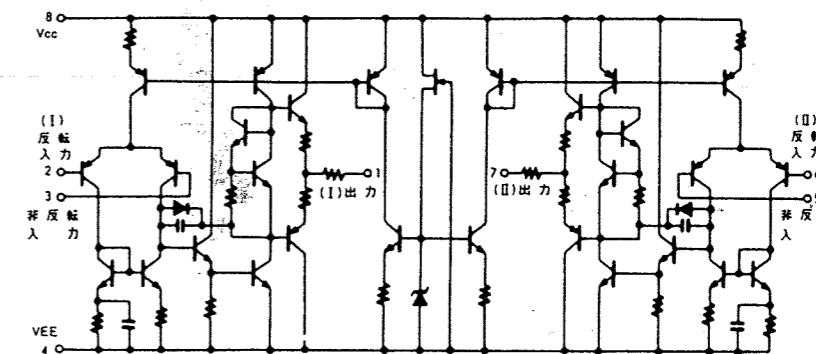
1. Replacing the fuses

For continued protection against risk fire, replace only with same type and same rating fuse.

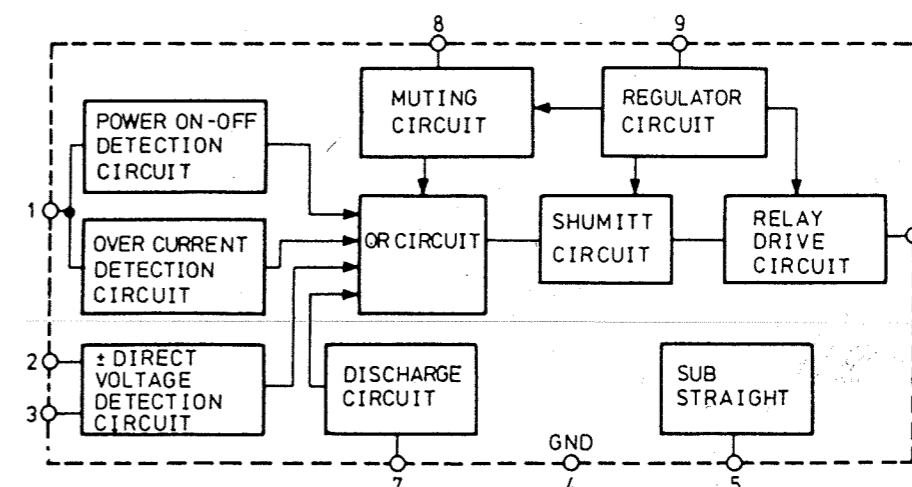
CIRCUIT NO.	PART NO.	DESCRIPTION
F902	252077 or 252077CC	4 A-SE-EAK Primary fuse
		4 A-SE-EAK Primary fuse

IC BLOCK DIAGRAM

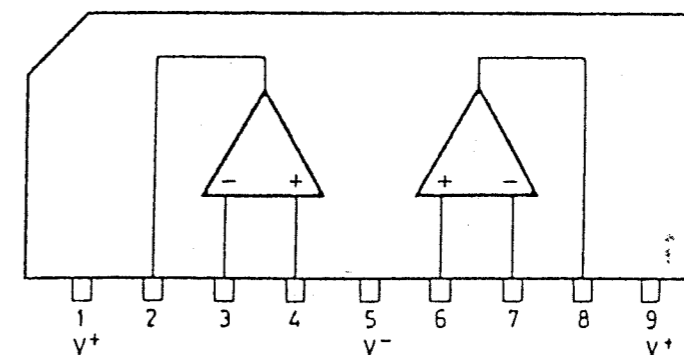
NJM-4560DX(OP Amp)



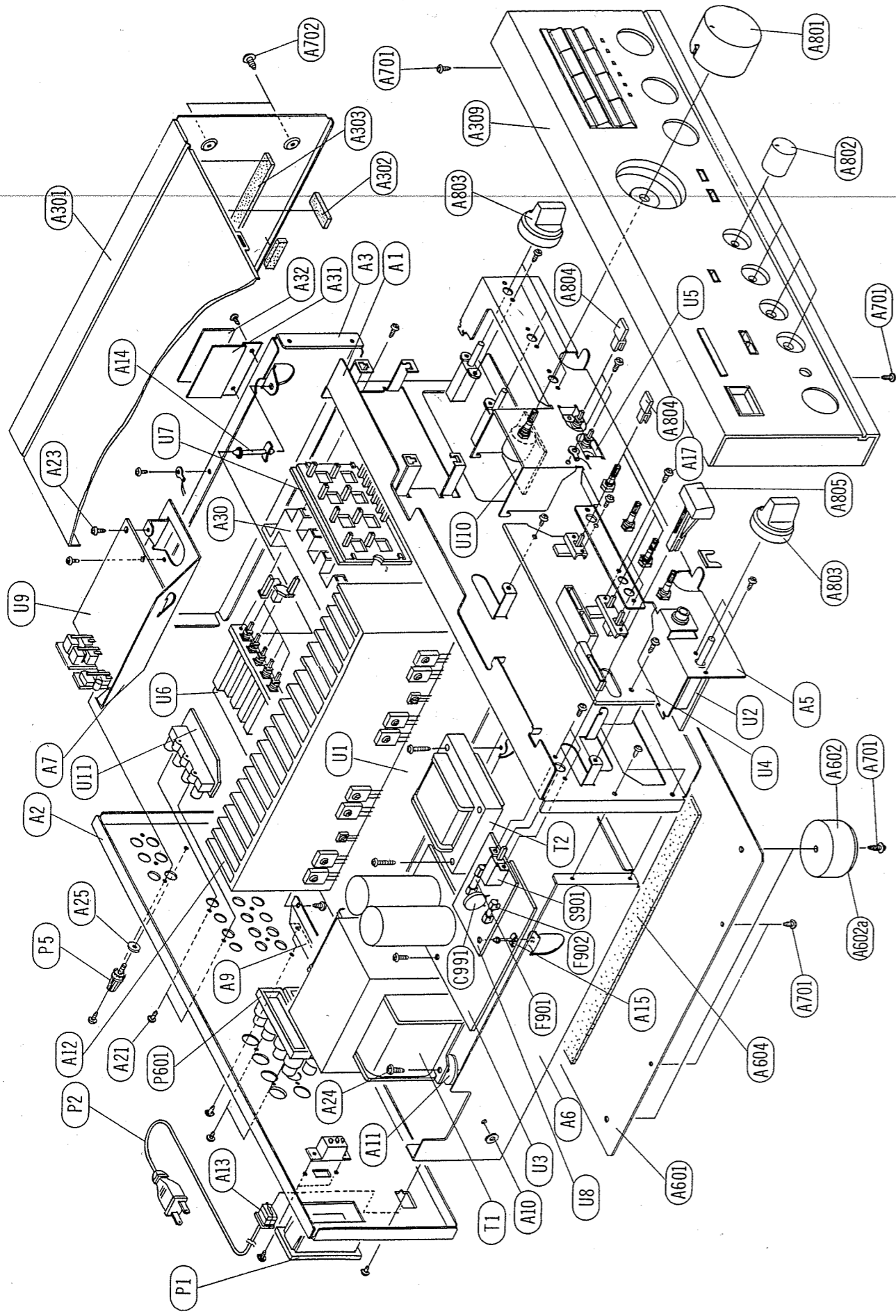
TA7317P(Protection Circuit)



NJM-4558SE (OP Amp)



CHASSIS-EXPLODED VIEW



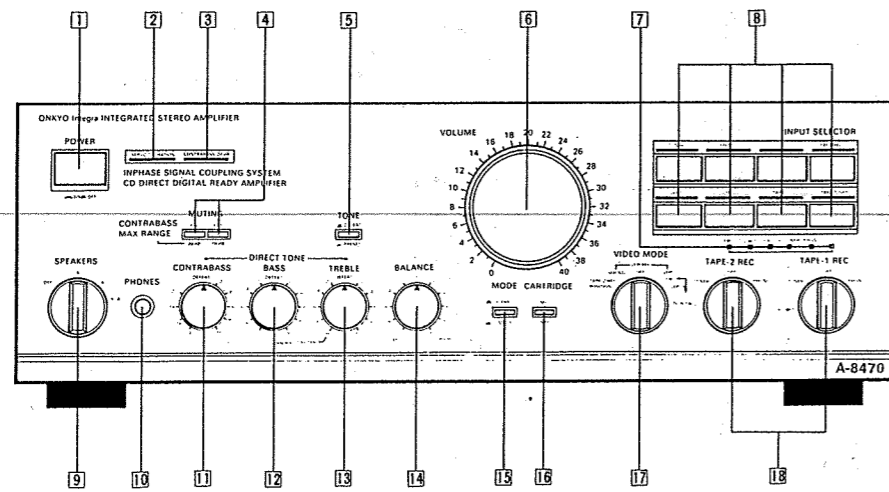
CHASSIS-EXPLODED VIEW-PARTS LIST

REF. NO	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
A1	27110305C	FRONT BRACKET	ΔT1	2300228A	POWER TRANSFORMER, NPT-935G	U8	1A030578-1A	NASW-2978-1A, POWER SWITCH PC BOARD ASS'Y
A2	27121000A	BACK PANEL	ΔT2	231125	CHOKO COIL	U9	1A032579-1A	NAAF-2979-1A, EQUALIZER CIRCUIT PC BOARD ASS'Y
A3	27115224	SIDE BRACKET	ΔS901	25035398	POWER SWITCH, NPS-111-L362P	U10	1A030580-1	TROL PC BOARD ASS'Y
A5	27130448A	BRACKET (F)	ΔP2	253130A or 253128B	AC CORD, AS-CEE or AC CORD, AS-CEE	U11	1A030582-1	NAETC-2982-1, VIDEO TERMINAL PC BOARD ASS'Y
A6	27130449A	BRACKET (L)	P5	25060044	TERMINAL			
A7	27130450	BRACKET (EQ)	P601, P602	25060108	TERMINAL, NTM-4PRMN42			
A8	28140730	CUSHION	ΔF902	252077 or 252077CC	FUSE, 4A-SE-EAK or FUSE, 4A-SE-EAK			
A9	27141084A	BRACKET (H)	ΔF902a	25050065	FUSE HOLDER, YSH403T			
A10	27270212	SPACER	ΔC991	3500065A	0.01μF, AC 400V/125V, CAPACITOR (IS)			
A11	27270213	SPACER (PT)	Q517, Q518	2212864 or 2212863	2SC3419 Y or 2SC3419 O			
A12	27160206	HEATSINK	Q609, Q610	2201703 or 2201694	2SC3855 O or 2SC3855 P or 2SC3855 Y			
A13	27300750	BUSHING (CORD)	Q611, Q612	2201704 or 2201696 or 2201694	2SA1491 O or 2SA1491 P or 2SA1491 Y			
A14	27190164	HOLDER LCBS-14NS	Q613, Q614	2201703 or 2201706 or 2201704	2SC3855 O or 2SC3855 P or 2SC3855 Y			
A15	27190062	HOLDER LCBS-12N	Q615, Q616	2201693 or 2201696 or 2201694	2SA1491 O or 2SA1491 P or 2SA1491 Y			
A17	82143006	PAN HEAD SCREW, 3P+6FNBC	C15~C18	372121024	1000PF, 50V, CAPACITOR			
A21	834430108	TAP-TIGHT SCREW, 3TTS+10BBC	C19	372121014	100 PF, 50V, CAPACITOR			
A23	831130088	TAP-TIGHT SCREW, 3TTW+8B	U1	1A032569-1B	STYRENE			
A24	830440109	TAP-TIGHT SCREW, 4TTC+10CBC	U2	1A030570-1	STYRENE			
A25	87613010	WASHER, W3X10F	U3	1A030573-1	STYRENE			
A30	27273059A	JOINT AS	U4	1A030574-1	STYRENE			
A31	27150236	SHIELD PLATE	U5	1A030575-1	STYRENE			
A32	28175140	INSULATING PLATE	U6	1A030576-1	STYRENE			
A301	28184333A	TOP COVER [BLACK]	U7	1A030577-1	STYRENE			
A301	28184363	TOP COVER						
A302	28140020	CUSHION						
A303	28140695	CUSHION						
A309	1A031121	FRONT PANEL [BLACK]						
A309	1A032121	FRONT PANEL						
A601	27170234B	BOTTOM BOARD						
A602	27175153	LEG ASS'Y						
(A602a)	28140747	CUSHION						
A604	28140961	CUSHION, 25 x 140mm						
A701	834430088	TAP-TIGHT SCREW, 3TTS+8BBC						
A702	83844089	TAP-TIGHT SCREW, 4TTB+8CBC						
A801	28323027	KNOB (VOL) [BLACK]						
A801	28323028	KNOB (VOL)						
A802	28323029	KNOB (TONE) [BLACK]						
A802	28323030	KNOB (TONE)						
A803	28322700	KNOB (SP) [BLACK]						
A803	28323036	KNOB (SP)						
A804	28322701	KNOB (PUSH) [BLACK]						
A804	28323037	KNOB (PUSH)						
A805	28322702	KNOB (POW) [BLACK]						
A805	28323034	KNOB (POW)						

NOTE: [BLACK] : ONLY BLACK MODEL

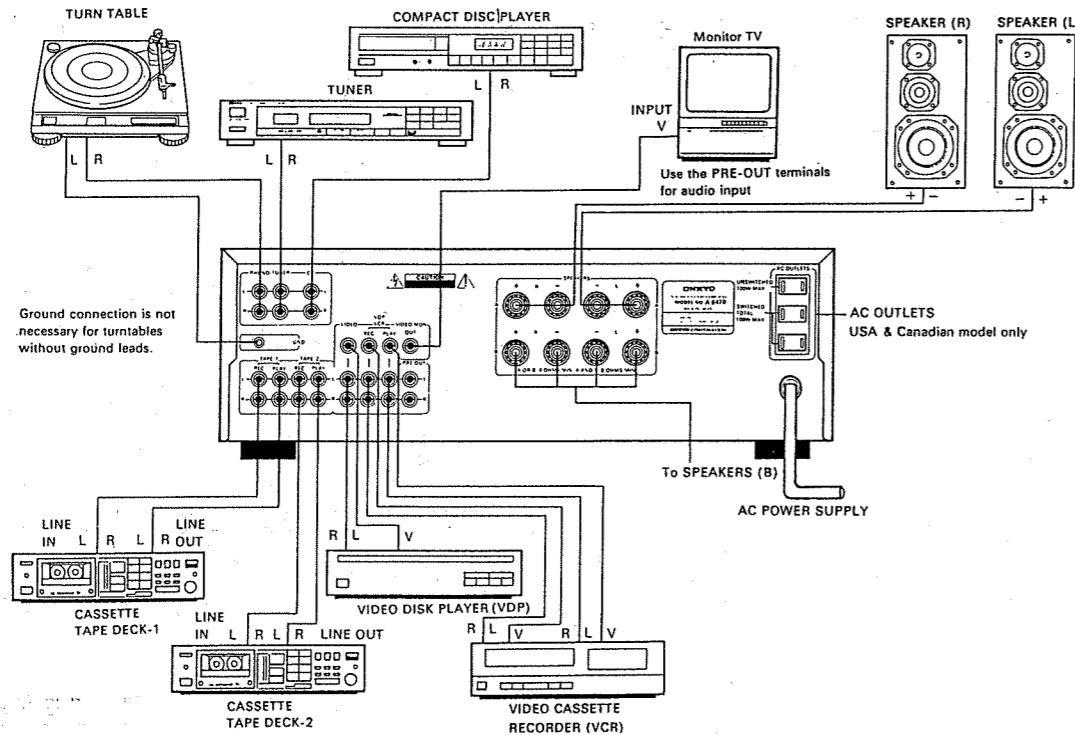
NOTE: THE COMPONENTS IDENTIFIED BY MARK Δ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PARTS NUMBER SPECIFIED.

FRONT PANEL FACILITIES



1. Power switch (POWER)
2. Servo operation indicator (SERVO OPERATION)
3. Contra bass indicator (CONTRA BASS/20dB)
4. Muting switch (MUTING)
5. Tone switch (TONE)
6. Volume control (VOLUME)
7. Recording mode indicators
8. Input selector switches and indicator (INPUT SELECTOR)
CD DIRECT, CD, PHONO, TUNER, TAPE-1/DAT, TAPE-2, VDP, VCR
9. Speaker selector (SPEAKERS)
OFF, A, B, A+B
10. Headphone jack (PHONES)
11. Contra bass (CONTRA BASS)
12. Bass control (BASS)
13. Treble control (TREBLE)
14. Balance control (BALANCE)
15. Mode selector (MODE)
STEREO, MONO
16. Cartridge selector (CARTRIDGE)
MC, MM
17. Video mode switch (VIDEO MODE)
SOUND, OFF, VDP-VCR, VDP
18. Recording source selectors (TAPE-1 REC, TAPE-2 REC)
TAPE-1 DVB 2 ▶ 1, [V], TUNER, OFF, PHONO, CD
TAPE-2 DVB 1 ▶ 2, [V], TUNER, OFF, PHONO, CD

SYSTEM CONNECTIONS



PRINTED CIRCUIT BOARD PARTS LIST

REC. SELECTOR AND POWER AMPLIFIER CIRCUIT PC BOARD (NAAF-2969-1B)-PART LIST

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION	
Q519, Q520 Q701	222942 222584	NJM4558SE TA7317P	C903, C904 C905, C906 C911, C912	354764709 354754719 354782219	47µF, 35V, Elect. 470µF, 25V, Elect. 220µF, 50V, Elect.	
Q501, Q502	2212805 or 2212806 or 2212807	2SK389 GR or 2SK389 BL or 2SK389 V	R507, R508 R523, R524 R525, R526 R527, R528 R531, R532 R533, R534 R601, R602 R603~R606 R607~R614 R615~R630 R635~R638 R645~R648 R649, R650 R717 R901, R902 R903, R904 R905, R906	441623314NF 442520684F 442525614F 442524734F 5210062 442524314F 442521024F 442525104F 442520224F 4000063 4000061 441621604NF 442521204F 441522294F 441623004NF 442525114F 442528224F	330Ω, 1W, Metal oxide film 6.8Ω, 1/2W, Metal oxide film 560Ω, 1/2W, Metal oxide film 47kΩ, 1/2W, Metal oxide film N06HR4.7KBD, Semi-fixed 430Ω, 1/2W, Metal oxide film 1kΩ, 1/2W, Metal oxide film 51Ω, 1/2W, Metal oxide film 2.2Ω, 1/2W, Metal oxide film 0.47Ω, 2W, Metal plate 0.33Ω, 2W, Metal plate 16Ω, 1W, Metal oxide film 12Ω, 1/2W, Metal oxide film 0.22Ω, 1/2W, Metal oxide film 30Ω, 1W, Metal oxide film 510Ω, 1/2W, Metal oxide film 8.2kΩ, 1/2W, Metal oxide film	
Q503~Q506, Q617 Q618 Q507, Q508,	2211733 or 2211732 2211515 or 2211516	2SC1845 E or 2SC1845 F 2SA995 F or 2SA995 G	Relay	RL701	25065316	NRL-2P7A-DC12-43
Q509, Q510, Q515 Q516, Q601, Q602 Q511, Q512	2211634 or 2211633 2211455 or 2210803	2SA949 Y or 2SC2229 O 2SA1015 GR or 2SA733 P	Switches	S351 S352 S353	25030261 25030260 25030259	NRSM-146-15SS NRSM-166-15SS NRSM-164-15SS VIDEO MODE
Q513, Q514, Q603 Q604 Q605, Q606	2211354 or 2211353 2200864 or 2200863	2SA949 Y or 2SA949 O 2SC2238 Y or 2SC2238 O	Terminals	P391, P393 P392, P394	25045165 25045171	NPJ-4PDBL-59 NPJ-4PDBL-65
Q607, Q608	2200874 or 2200873	2SA968 Y or 2SA968 O	Sockets	P501	2000551	NSAS-6P507
Q901	2201512 or 2201513	2SD1200 Q or 2SD1200 R	Plate		27300879	Bus
Q902	2201502 or 2201503	2SB889 Q or 2SB889 R				
D351~D504, D513 D507~D510, D514 D517~D520, D704 D505, D506, D511 D512 D515, D516 D701 D702 D703	223163 223163 225232	1SS133 LTZ R15, LED	Coils	L501, L502 L601, L602	231098A 231134S	NCH-4145 S-0.8E
D901, D902	2239754 or 2243294	RD6.2E B3 or MTZ6.2-C RD22E B4 or MTZ22-D	Capacitors	C363~C370 C503, C504 C501, C502 C505, C506 C509, C510 C511, C512 C513~C516 C605, C606 C607, C608 C613~C616 C609, C610 C619, C620 C701 C703 C704 C706 C707 C708, C710 C712 C901, C902	372121014 372126804 354780229 379122235 372123304 391252207 372121024 379121045 379124735 372121024 354722219 354742209 354784799 354743319 354744719 379122235 354741019 354772219	100pF, 50V, Styrene 68pF, 50V, Styrene 2.2µF, 50V, Elect. 0.022µF, 50V, Film (DEW) 33pF, 50V, Styrene 22µF, 25V, Elect.(MUSE) 1200pF, 50V, Styrene 0.1µF, 50V, Film (DEW) 0.047µF, 50V, Film (DEW) 1000pF, 50V, Styrene 220µF, 6.3V, Elect. 22µF, 16V, Elect. 0.47µF, 50V, Elect. 330µF, 16V, Elect. 470µF, 16V, Elect. 0.022µF, 50V, Film (DEW) 100µF, 16V, Elect. 220µF, 63V, Elect.

SPEAKER SWITCH PC BOARD (NASW-2970-1)-PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
R753, R754	441623914F	390Ω, 1W, Metal oxide film
S751	25030275	NRSM-144-15SS
P752, P753	2000671	NSAS-3P-627
P751	25045164	HLJ-4317-01-3020

POWER SUPPLY PC BOARD (NAPS-2973-1)-PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
D951 D952, D953	22380014F 22380003F	PB102F 1N5402F
C951~C953 C954, C955	375104745 3504208	0.47µF, 125V, Film (ME) 12000µF, 71V, Elect.

CIRCUIT NO.	PART NO.	DESCRIPTION
	Resistors	
R951	442525104F	51Ω, 1/2W, Metal oxide film
R961, R962	442522294F	0.22μF, 1/2W, Metal oxide film

Plate	
27300732	Bus

TONE AND MUTING SWITCH PC BOARD (NASW-2974-1)-PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	Diodes	
D711	225137CG or 225137CY or 225137DG or 225137DY	SEL2413E CG, LED SEL2413E CY, LED SEL2413E DG, LED SEL2413E DY, LED
D712, D713, D714	225142DX2	SEL2913K DX2, LED
	Capacitors	
C351, C352	354782299	0.22μF, 50V, Elect.
C353, C354	354784799	0.47μF, 50V, Elect.
	Switches	
S311, S312	25035540	NPS-162-122-L502
S314	25035541	NPS-142-L503
	Socket	
JL701	25050267	NSCT-3P95
	Holder	
	27190493-1	(LED-3)

TONE CONTROL CIRCUIT PC BOARD (NAAF-2975-1)-PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C315, C316	379128225	8200pF, 50V, Film (DEW)
C317, C318	379125625	5600pF, 50V, Film (DEW)
C319, C320	379121025	1000pF, 50V, Film (DEW)
C321, C322	379123935	0.039μF, 50V, Film (DEW)
C325, C326	379128235	0.082μF, 50V, Film (DEW)
	Resistors	
R317	5148107	N16RGM250KMN25, Variable
R321	5148108	N16RGM11C219K25, Variable
R323	5144001	N16RQM11C139K176K25, Variable
R337	5148113A	N16RGM11C176K25, Variable
	Switches	
S309, (S310)	25035539	NPS-142-122-L501
	Sockets	
P101, P102	2000676	NSAS-6P632

INPUT SELECTOR SWITCH PC BOARD (NASW-2976-1)-PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
S301~S308	25035538	NPS-742-162-L500

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Sockets	
P103	2000551	NSAS-6P507
P301	2000564	NSAS-6P520
P303	2000607	NSAS-18P563
JL103	25050267	NSCT-3P95
P351, P354	25050272	NSCT-8P100
P352, P353, P356	25050267	NSCT-3P95
P355	25050273	NSCT-9P101

	Plugs	
P302	25055137	NPLG-7P121
P501	25055133	NPLG-3P117
	Holder	
	27190494A	(LED-4)

DISPLAY LED PC BOARD (NADIS-2977-1)-PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	Diodes	
D302~D308	225137DG or 225137DY or 225137CG or 225137CY	SEL2413E DG, LED or SEL2413E DY, LED or SEL2413E CG, LED or SEL2413E CY, LED
D311~D316, D301	225142CX1 or 225142CX2 or 225142DX1 or 225142DX2	SEL2913K CX1, LED or SEL2913K CX2, LED or SEL2913K DX1, LED or SEL2913K DX2, LED
	Plug	
P303	25055190	NPLG-9P174
	Socket	
JL357	25050272	NSCT-8P100

POWER SWICTH PC BOARD (NASW-2978-1A)-PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	Switch	
S901	25035398	NPS-111-L362P
	Capacitor	
C991	3500065A	0.01μF, AC400V/125V (IS)
	Fuse holder	
F902a	25050065	YSH403T

EQUALIZER CIRCUIT PC BOARD (NAAF-2979-1A)-PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q105	222570	NJM4560DX
	Transistors	
Q101~Q104	2212185 or 2212186	2SK170 GR or 2SK170 BL
	Coils	
L101, L102	231133	NCH-1188
L301, L302	231069A	NCH-1119

CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C101, C102	372121814	180pF, 50V, Styrene
C105, C106	372122714	270pF, 50V, Styrene
C107, C108	372121014	100pF, 50V, Styrene
C109, C110	379122225	2200pF, 50V, Film (DEW)
C111, C112	379122234	0.022μF, 50V, Film (DEW)
C113, C114	379121834	0.018μF, 50V, Film (DEW)
C115, C116	379124734	0.047μF, 50V, Film (DEW)
C117, C118	391222227	2200μF, 6.3V, Elect.(MUSE)
C119, C120	391280227	2.2μF, 50V, Elect.(MUSE)
C121, C122	379121225	1200pF, 50V, Film (DEW)
C123, C124	372121024	10000pF, 50V, Styrene
C129		
C131, C132	354754719	470μF, 25V, Elect.
C371, C372	372121014	100pF, 50V, Styrene
C397, C398		

	Terminals	
P191	25045218	NPJ-4PDBL-96
P395	25045190	NPJ-2PDBL-74
	Plugs	
P101~P103, P301	25055133	NPLG-3P117
	Socket	
JL104, JL360	25050267	NSCT-3P95

VOLUME CONTROL PC BOARD (NAAF-2980-1)-PARTS LIST

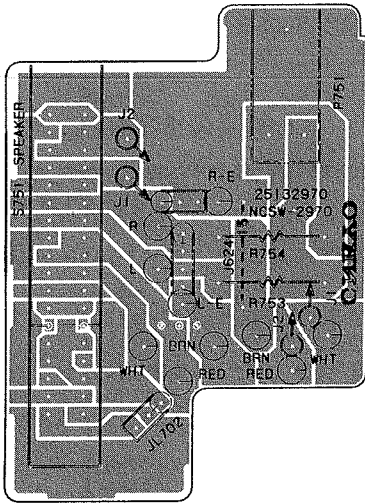
CIRCUIT NO.	PART NO.	DESCRIPTION
	Resistors	
R361	5144004	N16RQM100KBT100KBT25, Variable
	Socket	
P302	2000622A	NSAS-14P578

VIDEO TERMINAL PC BOARD (NAETC-2982-1)-PARTS LIST

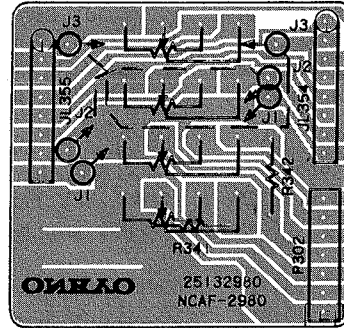
CIRCUIT NO.	PART NO.	DESCRIPTION
	Diodes	
D801, D802	223145	1S2076TD
	Relays	
RL801, RL802	25065298	NRL-1P1A-DC12-40
	Socket	
JL801	25050268	NSCT-4P96
	Terminal	
	25045207	NPJ-4PDBL87

PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE

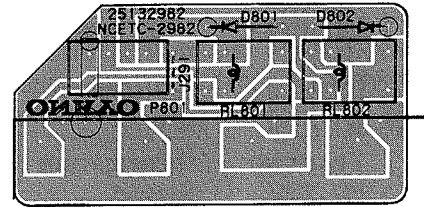
NASW-2970



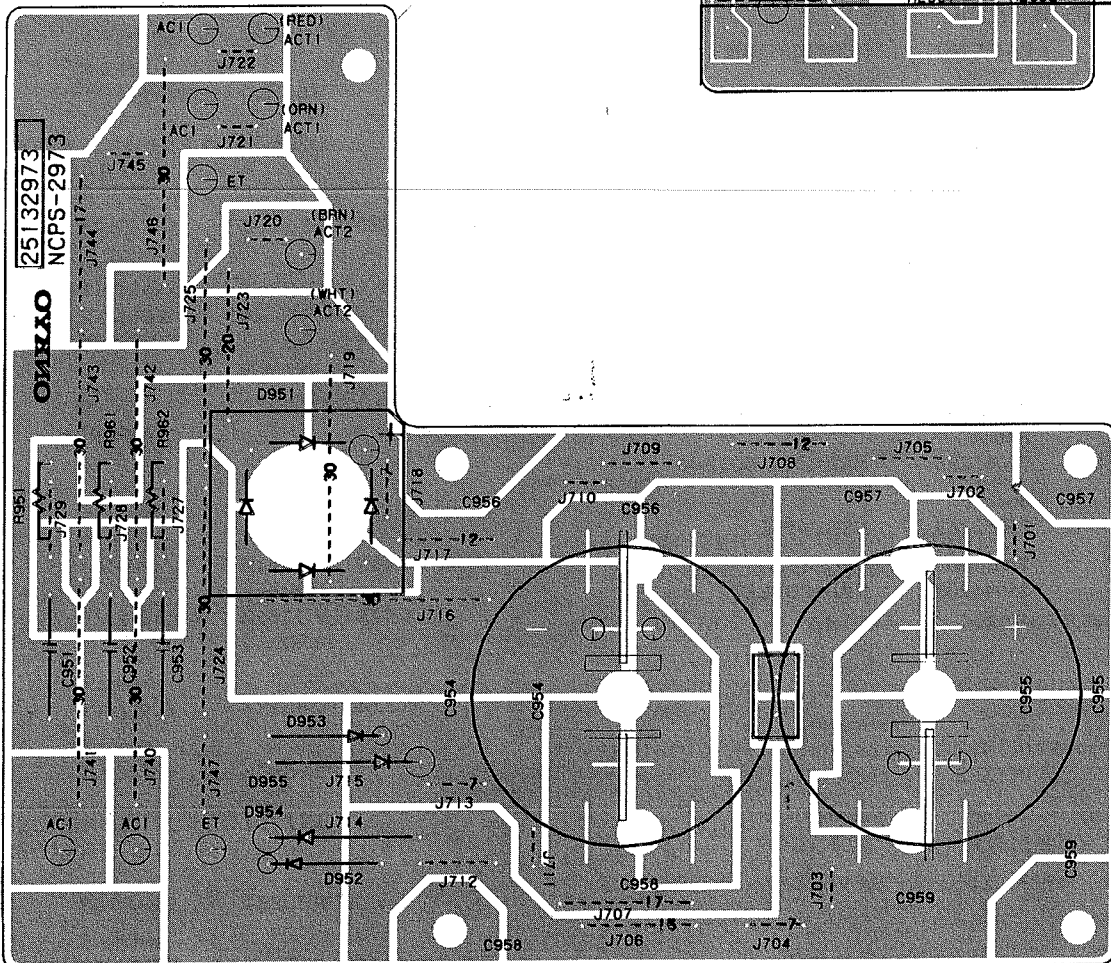
NAAF-2980



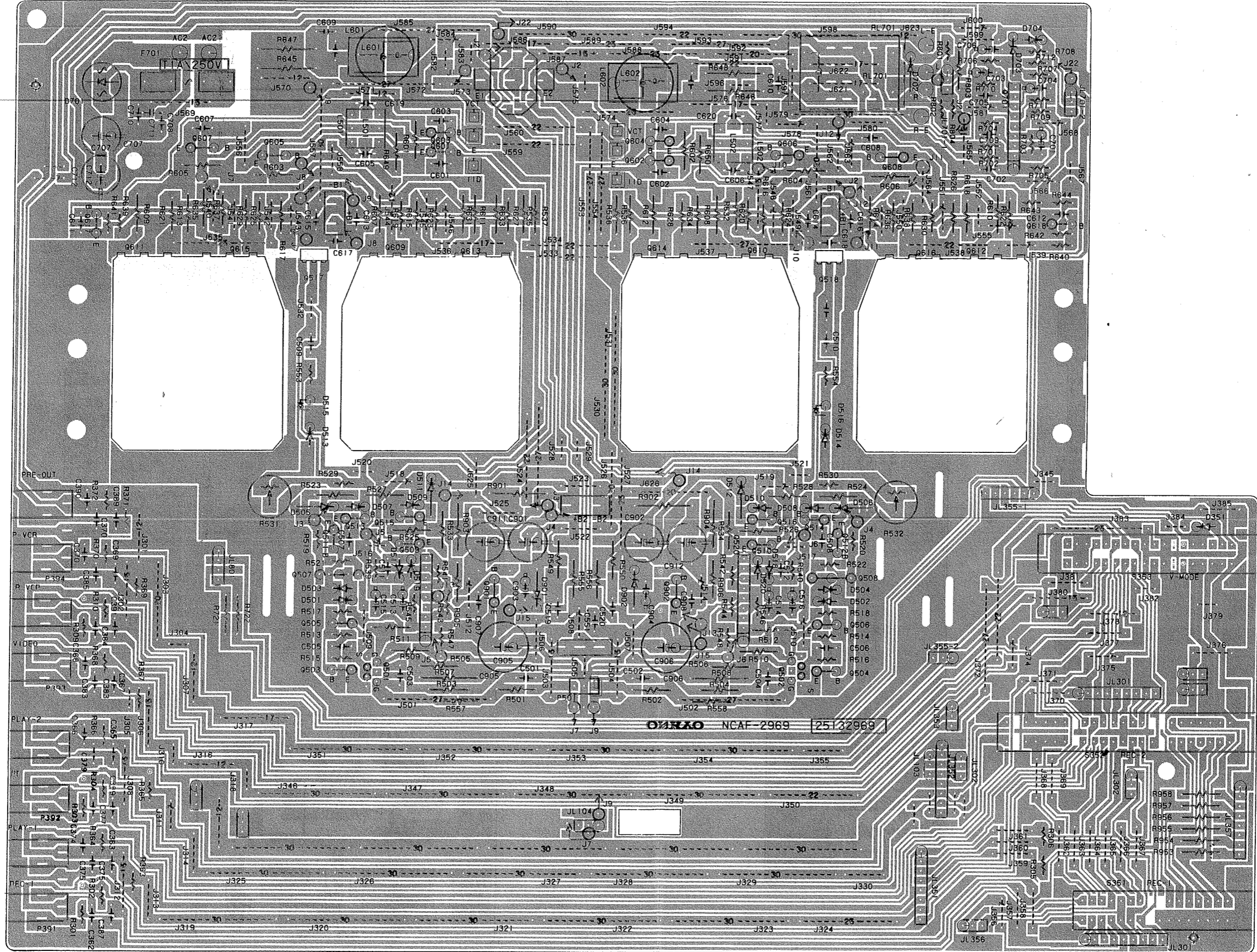
NAETC-2982



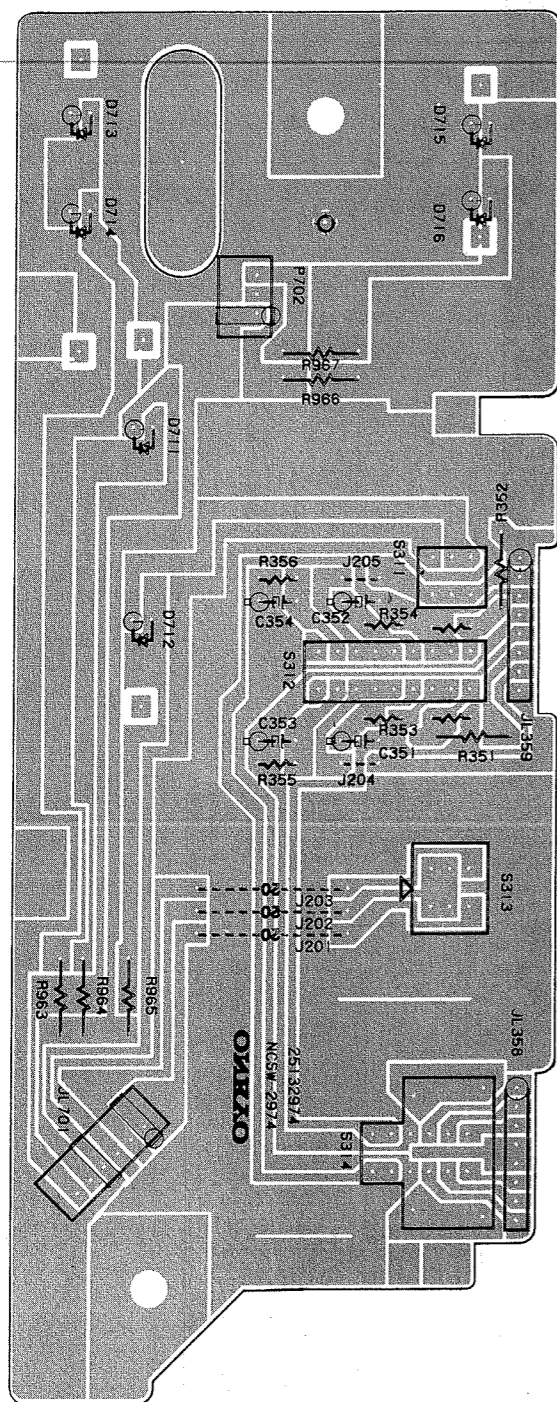
NAPS-2973



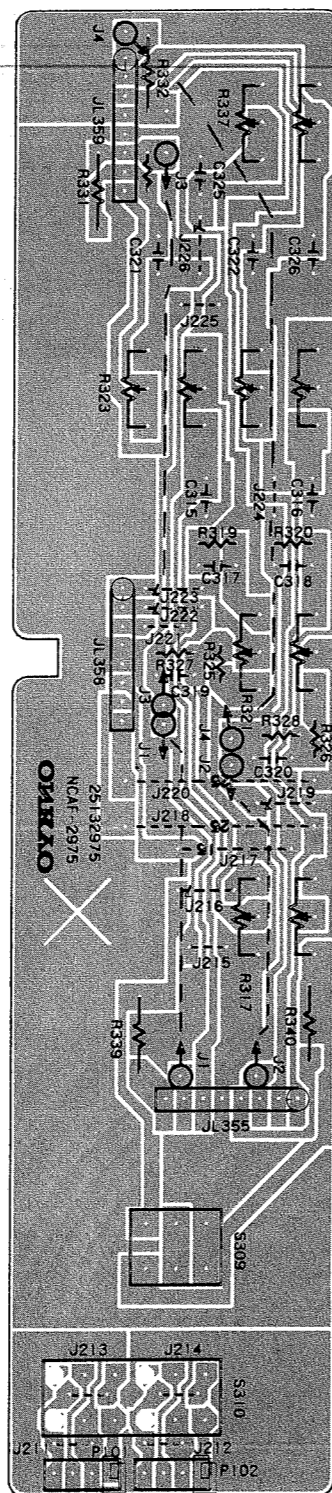
NAAF-2969



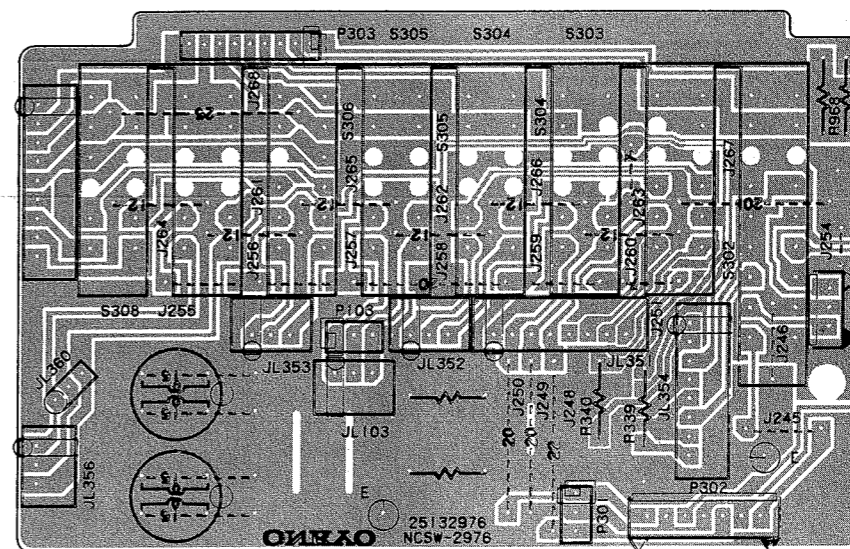
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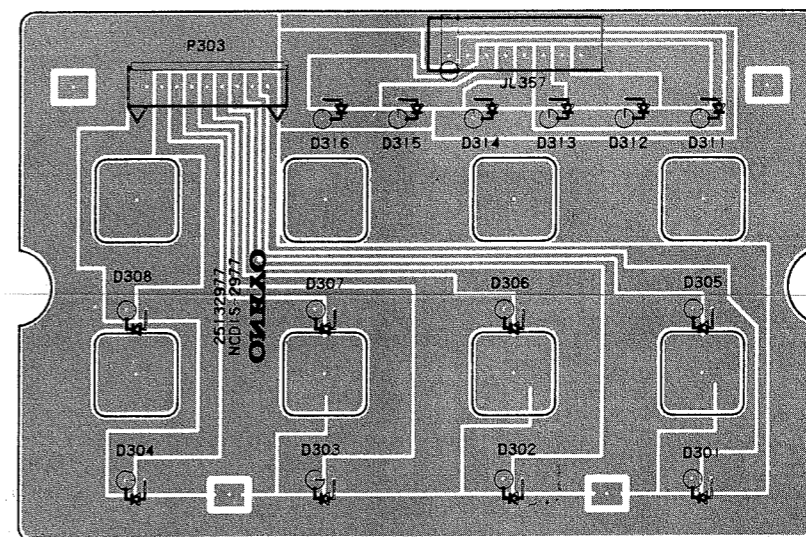
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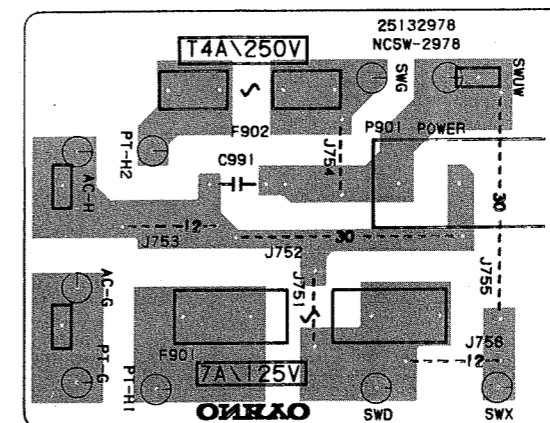
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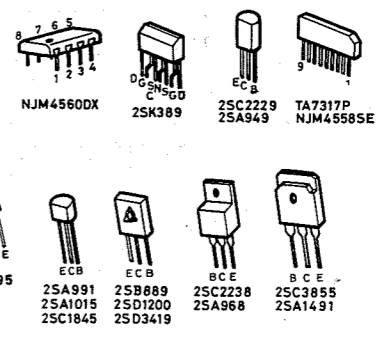
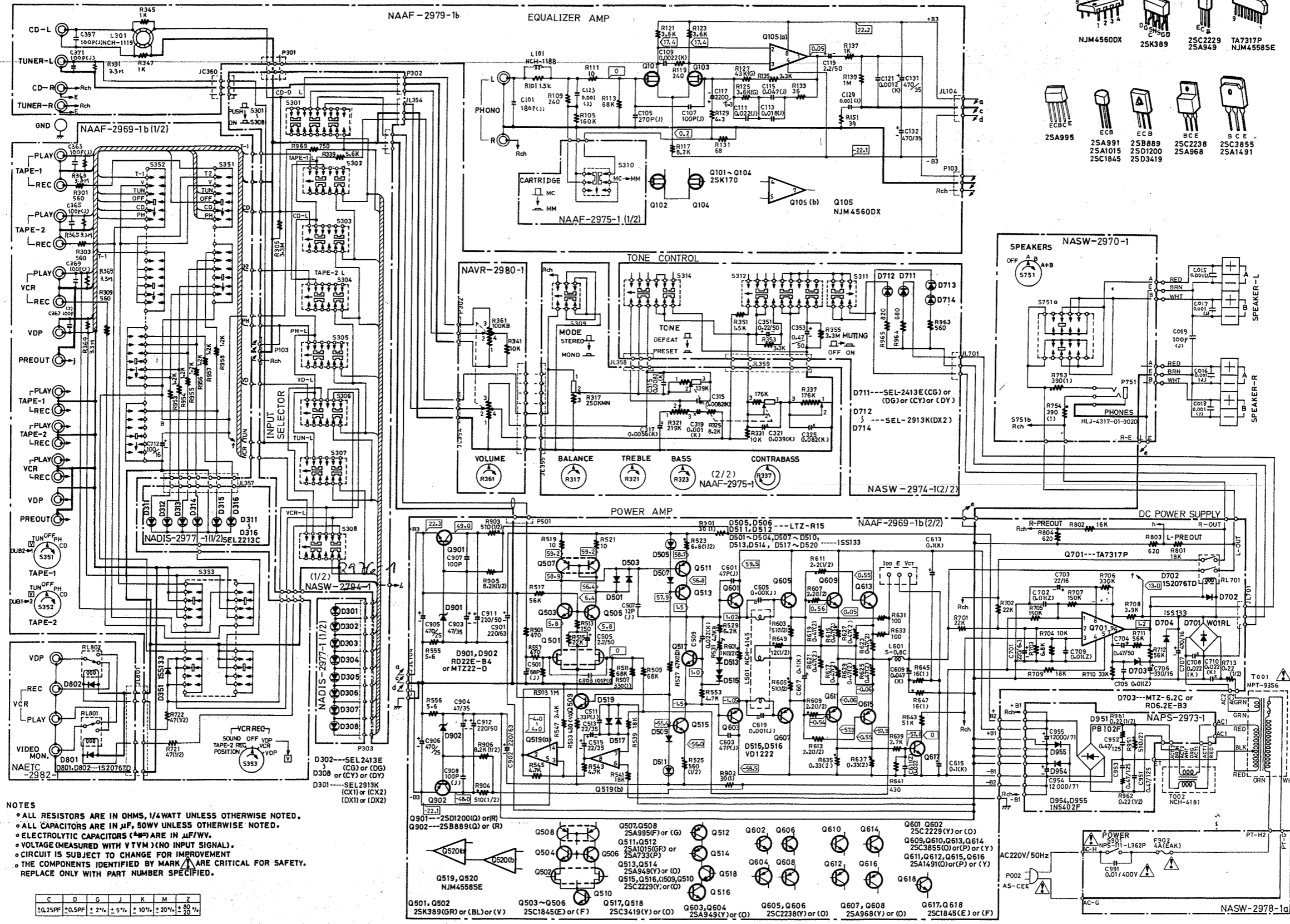
NADIS-2977



NASW-2978



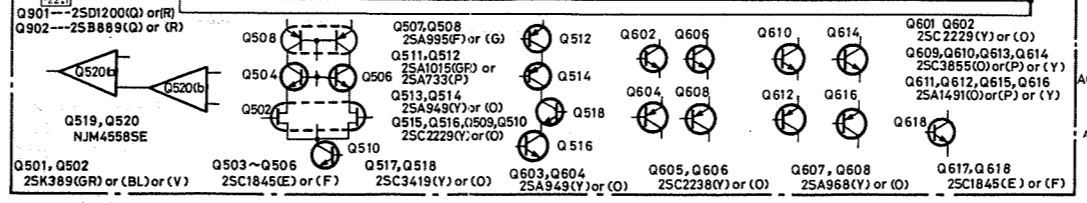
SCHEMATIC DIAGRAM



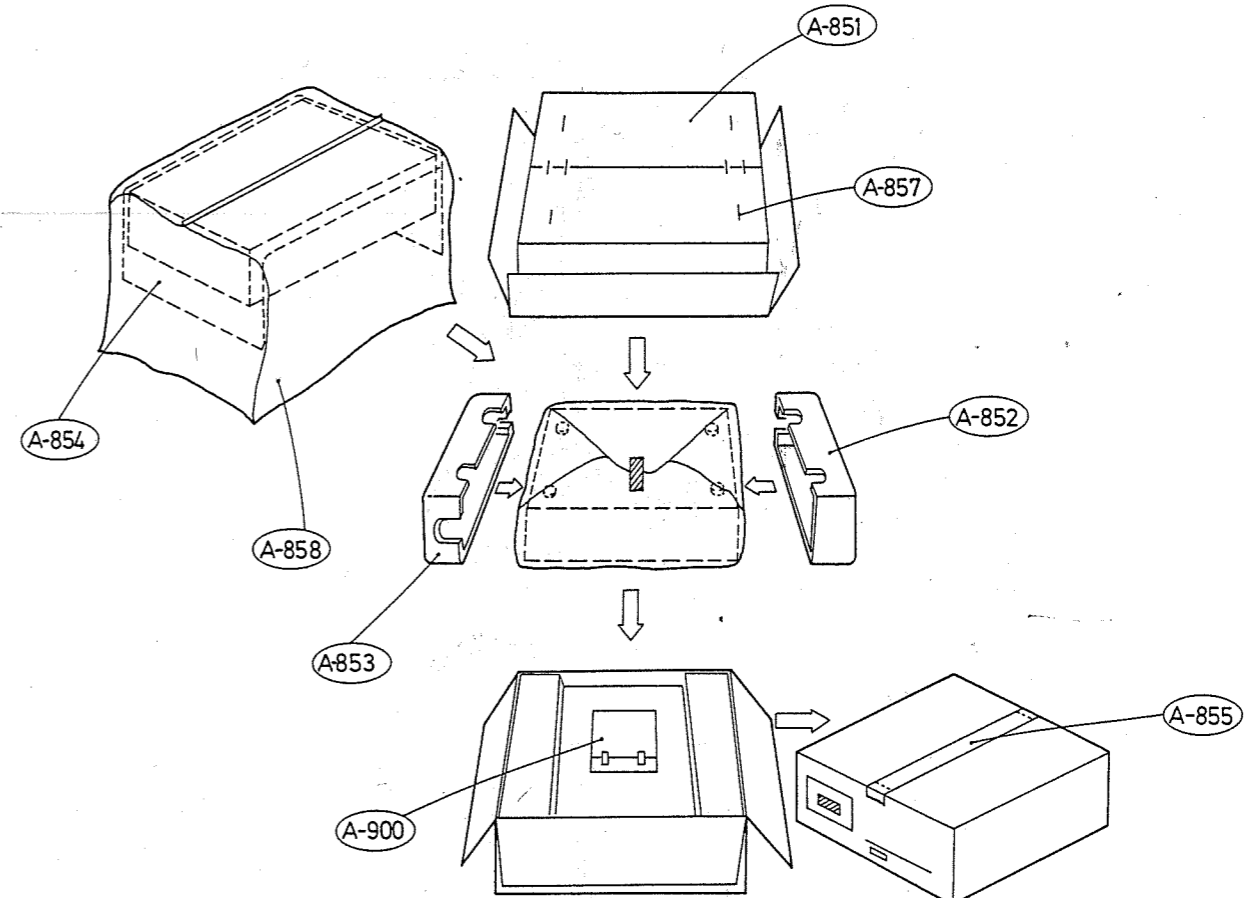
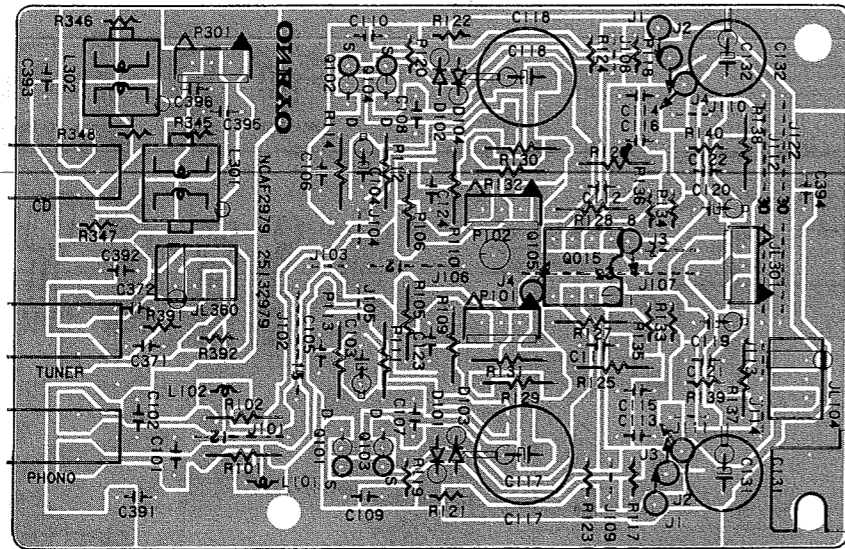
NOTES

- ALL RESISTORS ARE IN OHMS, 1/4 WATT UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN μ F, 50V UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (E) ARE IN μ F/WV.
- VOLTAGE MEASURED WITH V T.V.M. (NO INPUT SIGNAL).
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.
- THE COMPONENTS IDENTIFIED BY MARK Δ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.

C	D	G	J	K	M	Z
±0.25PF	±0.5PF	±2%	±5%	±10%	±20%	±80%



PACKING PROCEDURES



REF. NO.	PART NO.	DESCRIPTION
A851	29051536	MASTER CARTON BOX
A851	29051535	MASTER CARTON BOX [BLACK]
A852	29091125-1A	PAD ASS'Y LEFT
A853	29091126-1A	PAD ASS'Y RIGHT
A854	29095012-1	SHEET 800X500
A855	260012	DAMP LON TAPE W50 BROWN
A857	282301	STAPLE 16H
A858	29100038A	POLY BAG 720X950
A858	29100094	POLY BAG (WARRANTY CARD)
A900		ACCESSARY BAG
	29341156	INSTRUCTION MANUAL
	29365020	WARRANTY CARD
	29100006A	POLY BAG 350X250

NOTE: [BLACK]: ONLY BLACK MODEL

ONKYO CORPORATION

International Division: No. 24 Mori Bldg., 23-5, Nishi-Shimbashi 3 chome, Minato-ku, TOKYO 105. JAPAN Telex: 242-3551 ONKYO J Tel. 03-432-6981
ONKYO DEUTSCHLAND GmbH ELECTRONICS
 Industriestrasse 18, 8034 Germering, WEST GERMANY
 Telex: 41-521726 ONKY. Tel. 089-84-9320