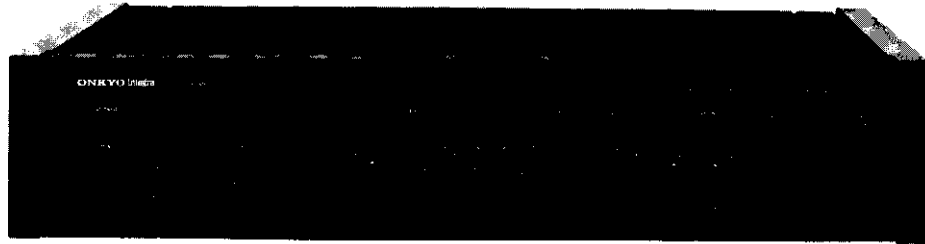


# ONKYO SERVICE MANUAL

## Stereo Preamplifier

### MODEL P-304



UD	120V AC, 60Hz
UW	120V or 220V AC, 50/60Hz

#### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  $\Delta$  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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## SPECIFICATIONS

Input Sensitivity and Impedance:	PHONO MC: 160 $\mu$ V/220 ohms PHONO MM: 2.5mV/47 kohms CD, TUNER, LINE, TAPE PLAY: 150mV/20 kohms	Signal-to-Noise Ratio: PHONO MC: 81dB (IHF A-202, Shorted) PHONO MM: 92dB (IHF A-202, Shorted) CD: 100dB (IHF A-202, Shorted)
Rated Output and Impedance:	TAPE REC: 150mV/1.2 kohms (PHONO) OUTPUT: 1.0V/160 ohms Max. 6V	Tone Control (Vol. -20dB): BASS: $\pm$ 10dB at 20Hz TREBLE: $\pm$ 8dB at 20kHz HIGH CUT: (TREBLE min.): 6dB/oct, 7 kHz
RIAA Deviation:	$\pm$ 0.2dB, 20-20,000Hz	Filters:
Frequency Response (CD, TUNER, LINE, TAPE):	+0, -3dB, 0.8MHz - 170kHz	Inputs:
Phono Overload:	PHONO MM: 210mV RMS at 1 kHz, THD 0.05% PHONO MC: 13mV RMS at 1 kHz, THD 0.05%	Outputs:
Total Harmonic Distortion:	0.0008% at PHONO MM, 3V output 0.003% at PHONO MC, 3V output 0.0005% at CD, TUNER, LINE and TAPE, 3V output	Power Supply (Two types): USA model: AC 120V, 60Hz Worldwide models: AC 120V and 220V Switchable, 50/60Hz
Intermodulation Distortion (CD):	0.003% (70Hz : 7kHz = 4 : 1)	Dimensions: 465 (W) x 102 (H) x 403 (D) mm 18-5/16" x 4" x 15-7/8"
		Weight: 7.8 kg, 17.2 lbs.
		Specifications and features are subject to change without notice.

## PRECAUTIONS

### 1. Replacing the fuses

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

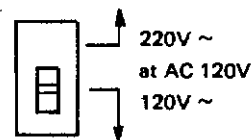
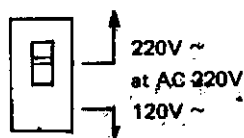
CIRCUIT NO.	PART NO.	DESCRIPTION
F901	252045	1A (ST-6), Primary fuse
F902	252063	0.5A-SE-EAWK, Primary fuse (Worldwide model)

### 2. Insulation resistance measurement (Only U.S.A. model)

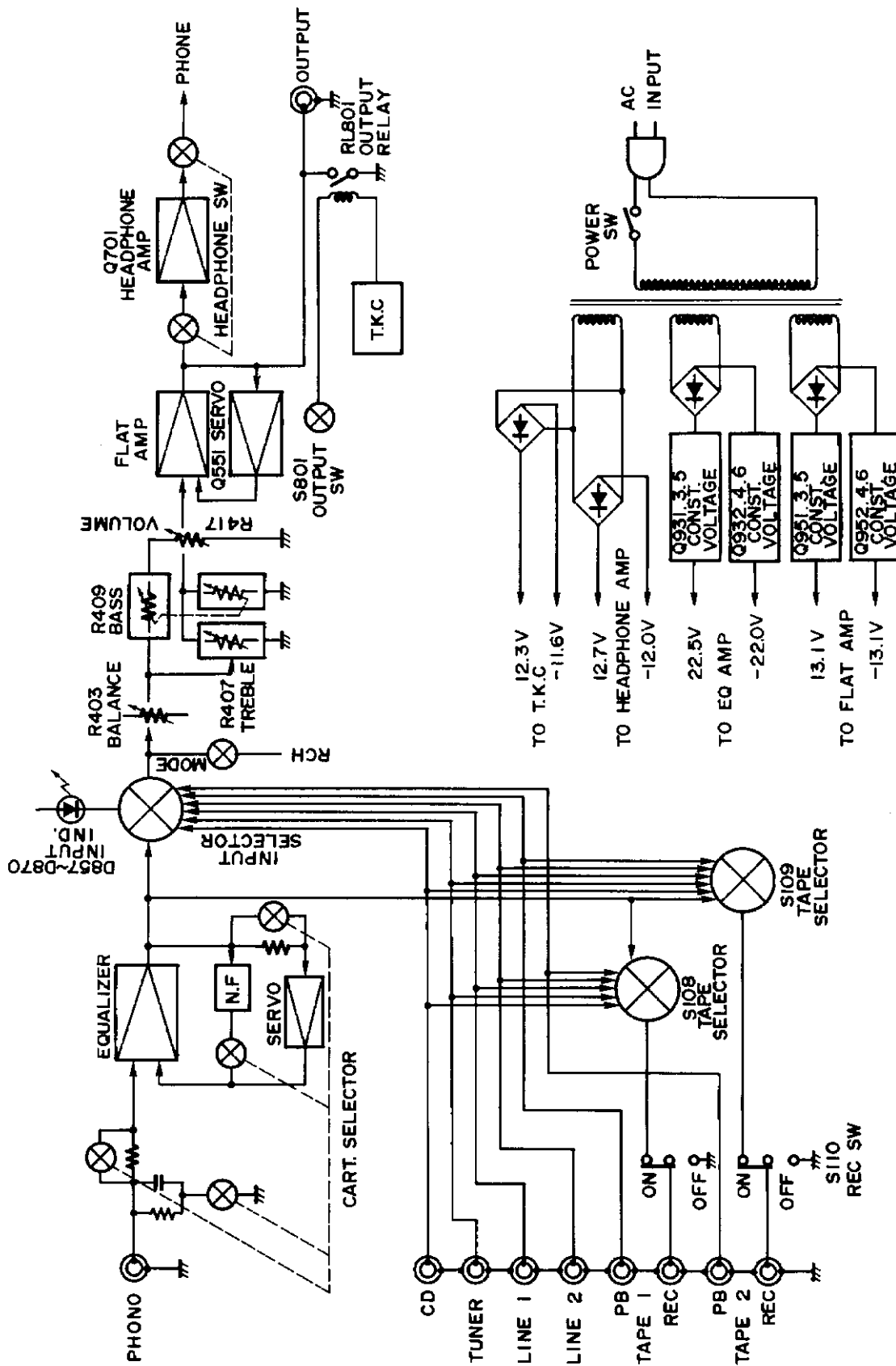
Connect the insulating-resistance tester between the plug of power supply cable and the terminal GND on the back panel. Specifications; More than 10 M $\Omega$  at 500V.

### 3. Voltage selector (rear panel)

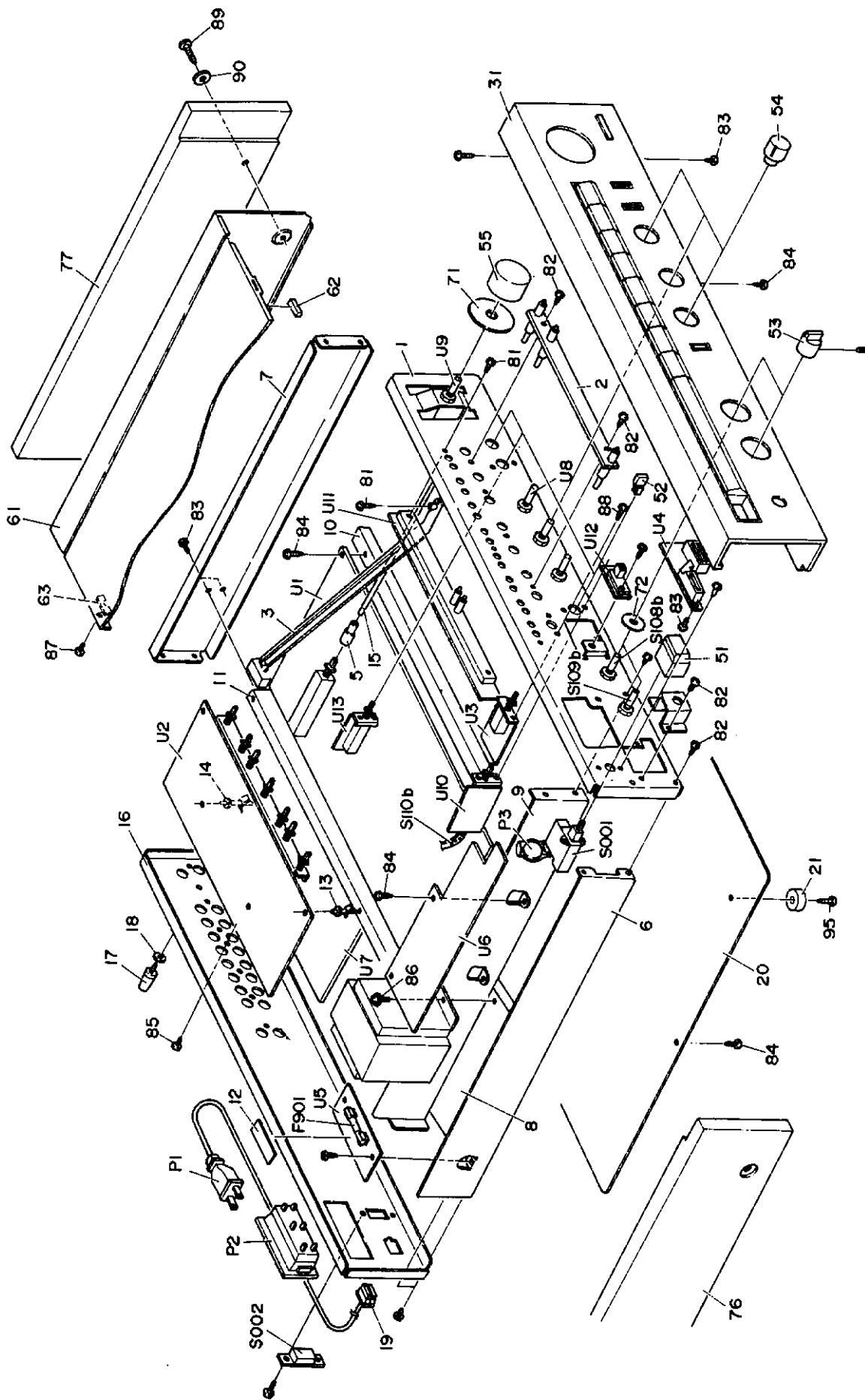
Worldwide models are equipped with a voltage selector to conform with local power supplies. Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on. Voltage is changed by sliding the groove in the switch with a screwdriver or similar instrument to the up or down position. Confirm that the switch has been moved all the way to the up or down before turning the power switch on. If there is no voltage selector switch on the unit you have purchased, it can only be used in areas where the power supply voltage is the same as that of the unit.



# BLOCK DIAGRAM



EXPLODED VIEW



# PARTS LIST

REF NO.	PART NO.	DESCRIPTION	REF NO.	PART NO.	DESCRIPTION
1	27110306A	Front bracket	C001	3500065A	△0.01μF, AC400V, Capacitor IS
2	27267469B	Guide joint ass'y	F901	252045	△1A ST-6, Primary fuse
3	27273051B	Joint M	F902	252063	△0.5A SE-EAWK, Primary fuse <PX>
5	28320135	Connector	P001	253122	△AS-UC-6#16, Power supply cable
6	27115217A	Side bracket L	P002	25050293	△NSCT-6P120, AC outlet
7	27115202A	Side bracket R	P003	27300601	△SB-1925, Cover for C001
8	27130451	Bracket,power transformer	S001	25035345A	△NPS-111-L308P, Power switch
9	27130452B	Bracket SUB	S108b	25030287	NRSM-106-30BU, Wire section, remote switch
10	27130453	Bracket FR	S109b	25030288	NRSM-106-30BU, Wire section, remote switch
11	27130425	Bracket RE	S110b	25065309A	Wire section, remote switch
12	29360626-1	Label,Fuse	T001	2300158	△NPT 941D, Power transformer <D>
13	27190480	KGLS-8S,Holder	U1	2300160	△NPT-941DG, Power transformer <PX>
14	27190470	KGLS-18S,Holder	U2	17798528-1	NAEF-2828 1, Equalizer amplifier pc board ass'y
15	27260224	Shaft,push	U3	17798529-1	NASW-2829-1, Input selector switch pc board ass'y
16	27120899A	Back panel <D>	U4	17798530-1	NASW 2830 1, Output switch pc board ass'y
17	27120903A	Back panel <PX>	U5	17798531-1	NADIS-2831-1, Power indicator pc board ass'y
18	25060041	Ground terminal	U6	17798532 1	NAFU-2832-1, Fuse terminal pc board ass'y <D>
19	87644010	W4 × 10F(BC), Washer	U7	17793532-1C	NAFU-2832-1C, Fuse terminal pc board ass'y <PX>
20	27300750	△ Strainrelief	U8	17798533-1	NAPS-2833-1, Power supply and headphone terminal pc board ass'y
21	27170233	Bottom board	U9	17798534-1	NASW-2834-1, Rec. selector switch pc board ass'y
22	2715009A	Leg	U10	17798535-1	NATC-2835-1, Rec.Selector switch pc board ass'y
23	27141085A	Bracket,headphone	U11	17798536-1	NAVR-2836-1, Volume control pc board ass'y
31	27225075	Shielded plate	U12	17798537 1	NASW-2837-1, Recording output switch pc board ass'y
51	17798121	Front panel ass'y	U13	17798538-1	NADIS-2838-1, Input display pc board ass'y
52	28322522A	Knob,power	U14	17798539-1	NADIS-2839-1, Recording indicator pc board ass'y
53	28322703	Knob,push	U15	17798540-1	NASW-2840-1, Mode switch pc board ass'y
54	28322705A	Knob,recording			
55	28322704	Knob,tone			
56	28322529A	Knob,volume			
61	28184318A	Top cover			
62	28140020	Cushion			
63	27270209	Spacer,cover			
71	28140126	Φ53mm,Cushion			
72	28140127	Φ32mm,Cushion			
76	28185255	Side panel L			
77	28185256	Side panel R			
81	833430080	3TTP+8P(BC),Tapping screw			
82	838430068	3TTB+6B(BC),Tapping screw			
83	838430088	3TTB+8B(BC),Tapping screw			
84	831430088	3TTW + 8B(BC), Tapping screw			
85	831430100	3TTW - 10P(BC),Tapping screw			
86	830440089	4TTC+8C(BC),Tapping screw			
87	801230	3TTS+8B(BC),Tapping screw			
88	82143006	3P-6FN(BC),Pan head screw			
89	836440303	4STV - 30CQ(BC), Screw			
90	870086	4 × 12BC(BC), Special washer			
91	87313006	M-3B,Toothed washer			

NOTE: <D>:Only 120V model  
<PX>:Only PX Model

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

# PRINTED CIRCUIT BOARD-PARTS LIST

## EQUALIZER AMPLIFIER PC BOARD (NAEF-2828-1)

CIRCUIT NO.	PART NO.	DESCRIPTION			
		<b>Transistors</b>			
Q201~Q204	2211535 or 2211536	2SK146(GR) or 2SK146(BL)	C209,C210 C211,C212	372121814 372122214	180pF, 50V, Styrene 220pF, 50V, Styrene
Q205~Q208	2211895 or 2211896	2SC1815L(GR) or 2SC1815L(BL)	C213~ C216 C217,C218	379121535 379125625	0.015 $\mu$ F, 50V, Film (DEW) 5600pF, 50V, Film (DEW)
Q209,Q210	2211414	2SC1627(Y)	C219,C220	372122214	220pF, 50V, Styrene
Q211,Q212	2211515 or 2211516	2SA995(F) or 2SA995(G)	C221,C222 C223~ C226	379127524 379121034	7500pF, 50V, Film (DEW) 0.01 $\mu$ F, 50V, Film (DEW)
Q213~Q218	2211975	2SA1015L(GR)	C227,C228	379124334	0.043 $\mu$ F,50V, Film (DEW)
Q219,Q220	2211895 or 2211896	2SC1815L(GR) or 2SC1815L(BL)	C229,C230 C231,C232	379123634 372126804	0.036 $\mu$ F, 50V, Film (DEW) 68pF, 50V, Styrene
Q221,Q222	2211414	2SC1627(Y)	C237,C238	391232217	220 $\mu$ F, 10V, Elect. (MUSE)
Q223,Q224	2211424	2SA817(Y)	C239,C240	379122725	2700pF, 50V, Film (DEW)
Q225,Q226	2211414	2SC1627(Y)	C241~ C244	354761019	100 $\mu$ F, 35V, Elect.
Q227,Q228	2211424	2SA817(Y)	C245,C246	354784709	47 $\mu$ F, 50V, Elect.
Q501,Q502	2212805 or 2212806	2SK389(GR) or 2SK389(BL)	C301,C302 C303~ C306	354741009 391252217	10 $\mu$ F, 16V, Elect. 220 $\mu$ F, 25V, Elect. (MUSE)
Q503~Q508	2211255	2SC1815(GR)	C307,C308	372123304	33pF,50V, Styrene
Q509,Q510	2211515 or 2211516	2SA995(F) or 2SA995(G)	C501,C502 C503,C504	372121014 372122214	100pF, 50V, Styrene 220pF, 50V, Styrene
Q511~Q514	2211455	2SA1015(GR)	C505,C506	354784799	0.47 $\mu$ F,50V, Elect.
Q515,Q516	2211255	2SC1815(GR)	C507,C508	372122704	27pF, 50V, Styrene
Q517,Q518	2211164	2SC2120(Y)	C515,C516	391232217	220 $\mu$ F, 10V, Elect. (MUSE)
Q519,Q520	2211504	2SA950(Y)	C517~ C520	354761019	100 $\mu$ F, 35V, Elect.
Q521,Q522	2211164	2SC2120(Y)	C521,C522	354784709	47 $\mu$ F, 50V, Elect.
Q523,Q524	2211504	2SA950(Y)	C551~ C554	354762209	22 $\mu$ F,35V, Elect.
Q931	2201404 or 2201403	2SD1406(Y) or 2SD1406(O)	C555,C556 C931,C932	372123304 354782219	33pF, 50V, Styrene 220 $\mu$ F, 50V, Elect.
Q932	2201394 or 2201393	2SB1015(Y) or 2SB1015(O)	C935,C936 C937,C938	354741019 354753319	100 $\mu$ F,16V, Elect. 330 $\mu$ F, 25V, Elect.
Q933	2211254 or 2211255	2SC1815(Y) or 2SC1815(GR)	C951,C952 C955,C956	354762219 354741019	220 $\mu$ F, 35V, Elect. 100 $\mu$ F,16V, Elect.
Q934	2211454 or 2211455	2SA1015(Y) or 2SA1015(GR)	C957,C958	354743319	330 $\mu$ F, 16V, Elect.
Q935	2211254 or 2211255	2SC1815(Y) or 2SC1815(GR)			
Q936	2211454 or 2211455	2SA1015(Y) or 2SA1015(GR)	R225~ R228 R239,R240	442526804 442528204	68 $\Omega$ , 1/2W, Metal oxide film 82 $\Omega$ , 1/2W, Metal oxide film
Q951	2201404 or 2201403	2SD1406(Y) or 2SD1406(O)	R265,R266 R267~ R274	442524314 442523304	430 $\Omega$ , 1/2W, Metal oxide film 330, 1/2W, Metal oxide film
Q952	2201394 or 2201393	2SB1015(Y) or 2SB1015(O)	R275,R276 R529~ R536	441625614 442522404	560 $\Omega$ , 1W, Metal oxide film 24 $\Omega$ , 1/2W, Metal oxide film
Q953	2211254 or 2211255	2SC1815(Y) or 2SC1815(GR)	R539,R540	441622014	200 $\Omega$ , 1W, Metal oxide film
Q954	2211454 or 2211455	2SA1015(Y) or 2SA1015(GR)	S201	25035546	Switch NPS 182-L508
Q955	2211254 or 2211255	2SC1815(Y) or 2SC1815(GR)	P456,P851 P852	25050272 25050267	Sockets NSCT-8P100 NSCT-3P95
Q956	2211454 or 2211455	2SA1015(Y) or 2SA1015(GR)			
		<b>ICs</b>	P201a,P202a P551a,P552a P602a,P751a	25055132 25055133 25055133	NPLG-2P116 NPLG-3P117 NPLG-3P117
Q301,Q302	222585	NJM4558DXB			
Q551,Q552	222465	NJM4558D			
		<b>Diodes</b>	P931,P932 P951,P952	27160176 27160145	Radiator RAD-56 RAD-51
D201~ D204	223163	1SS133			
D205~ D210	225232	LTZ-R15,LED			
D501~ D504	223163	1SS133			
D804	223163	1SS133			
D505~ D510	225232	LTZ-R15,LED			Plate 25060032B
D931,D932,D951	2239511 or	RD6.8E-B1 or			Buss
D952	2243171	MTZ6.8-A	RL801	25065282	Relay NRL-2P1.25A DC12-39

### INPUT SELECTOR SWITCH PC BOARD (NASW-2829-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Coils	
L101 ~ L104	231069A	NCH-1119
L601, L602	231069A	NCH-1119
	Switches	
S101 ~ S107	25035524	NPS-742-L486
	Terminals	
P101, P102	25045190	NPJ-2PDBL74
P103	25045191	NPJ-6PDBL75
P104	25045208	NPJ-4PDBL88
P105	25045165	NPJ-4PDBL59
P601	25045180	NPJ-2PDBL70
	Sockets	
P151 ~ P154	25050273	NSCT-9P101
P201	2000631	NSAS-4P587
P202	2000632	NSAS-4P588
P203	2000556	NSAS-6P512
P204	2000557	NSAS-6P513
P205	2000552	NSAS-6P508

### VOLUME CONTROL PC BOARD (NAVR-2836-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
R417	5104194	N27DGL50KT30M, Variable resistor
P551, P552	2000630	NSAS-6P586, Socket ass'y

### TONE CONTROL CIRCUIT PC BOARD (NATC-2835-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistors	
Q801	2211255	2SC1815(GR)
Q802	2211455	2SA1015(GR)
Q803	2211164	2SC2120(Y)
	Diodes	
D801	223145	1S2076TD
D802, D803	2239492 or 2243162	RD6.2E-B2 or MTZ6.2-B
	Capacitors	
C401 ~ C404	379121634	0.016 $\mu$ F, 50V, Film (DEW)
C405, C406	379121824	1,800pF, 50V, Film (DEW)
C407, C408	379128234	0.082 $\mu$ F, 50V, Film (DEW)
C801	354744709	47 $\mu$ F, 16V, Elect.
C802	354761009	10 $\mu$ F, 35V, Elect.
	Resistors	
R403	5148114A	N16RGM C50KMN30, Variable, Balance
R407	5148115A	N16RGM11C99.8K30, Variable, Treble
R409	5144005	N16RQM11C69.6K88K30, Variable, Bass
R801	442521324	1.3k $\Omega$ , 1/2W, Metal oxide film
R807	442526214	620 $\Omega$ , 1/2W, Metal oxide film
R809	442521324	1.3k $\Omega$ , 1/2W, Metal oxide film
R810	442521524	1.5k $\Omega$ , 1/2W, Metal oxide film
	Sockets	
P451, P452	25050267	NSCT-3P95

### POWER SUPPLY AND HEADPHONE TERMINAL PC BOARD (NAPS-2833-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
Q701	222957	M-5216L
	Diodes	
D701-D704	223145	1S2076TD
D901, D902	223867	WL02
D903, D904	223890	W01RL
D905 ~ D910	223896	1N4003F
	Capacitors	
C701, C702	354780479	4.7 $\mu$ F, 50V, Elect.
C703, C704	372122214	220pF, 50V, Styrene
C705, C706	352744709	47 $\mu$ F, 16V, Elect.
C707, C708	379121035	0.01 $\mu$ F, 50V, Film (DEW)
C901, C902	375104745	0.47 $\mu$ F, 125V, Film (ME)
C903 ~ C906	375101045	0.1 $\mu$ F, 125V, Film (ME)
C907, C908	354782229	2200 $\mu$ F, 50V, Elect.
C909, C910	354762229	2200 $\mu$ F, 35V, Elect.
C911, C912	354741029	1000 $\mu$ F, 16V, Elect.
C913	354753319	330 $\mu$ F, 25V, Elect.
C914	379121035	0.01 $\mu$ F, 50V, Film (DEW)
C915, C916	354780109	1 $\mu$ F, 50V, Elect.
	Resistors	
R711, R712	441624704	47 $\Omega$ , 1W, Metal oxide film
R901, R902	442523304	33 $\Omega$ , 1/2W, Metal oxide film
R903 ~ R906	442520104	1 $\Omega$ , 1/2W, Metal oxide film
R907, R908	442520204	2 $\Omega$ , 1/2W, Metal oxide film
R909, R910	442523304	33 $\Omega$ , 1/2W, Metal oxide film
R911	441621224	1.2k $\Omega$ , 1W, Metal oxide film
	Socket	
P751	2000551	NSAS-6P507
	Terminals	
P701	25045203	HLJ-4318-01-3010, Headphone

### REC. SELECTOR SWITCH PC BOARD (NASW-2834-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Switches	
S108a, S109a	25065079	NSS-4643, Remote switch
S110a	25065190	NSS-4285, Remote switch
	Socket	
P155	25050267	NSCT-3P95

### OUTPUT SWITCH PC BOARD (NASW-2830-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
S801	25035372	NPS-122-L336, Output ON/OFF switch
P853	25050267	NSCT-3P95, Socket

### RECORDING OUTPUT SWITCH PC BOARD (NASW-2837-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
S110C	25035227	NPS-122 L191, Switch

**FUSE TERMINAL PC BOARD (NAFU-2832-1/1C)**

CIRCUIT NO.	PART NO.	DESCRIPTION
F901a	250113	△ S N5051, Fuse holder
F901	252045	△ 1A-ST6, Fuse
F902a	25050065	△ YSH-403T Fuse holder <W>
F902	252063	△ 0.5A-SE-EAWK, Fuse <W>

**INPUT DISPLAY PC BOARD (NADIS-2838-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
	L.E.Ds	
D857~D872	225137CG or 225137DG or 225137DY	SEL2413CG or SEL2413DG or SEL2413DY
	Resistor	
R854	442521324	1.3kΩ, 1/2W, Metal oxide film
	Holder	
	27190456	Holder (LED)

**POWER INDICATOR PC BOARD (NADIS-2831-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
D851, D852	225142 27190455	SEL2413K, LED Holder (LED)

**RECORDING INDICATOR PC BOARD (NADIS-2839-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
D856	225233RB or 225233RC 27190319A	GL5HY40-PB or GL5HY40-RC Holder (LED)

**MODE SWITCH PC BOARD (NASW-2840-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
S401	25035372	NPS-122-L336, Push

**NOTE: <W>: Only Worldwide model**





