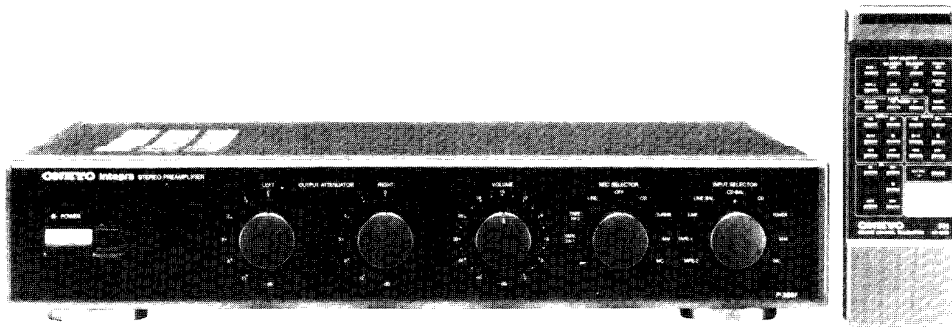


# ONKYO® SERVICE MANUAL

## Stereo Pre Amplifier MODEL P-388F



Silver and Black models

UD	120V AC, 60Hz
UP	230V AC, 50Hz
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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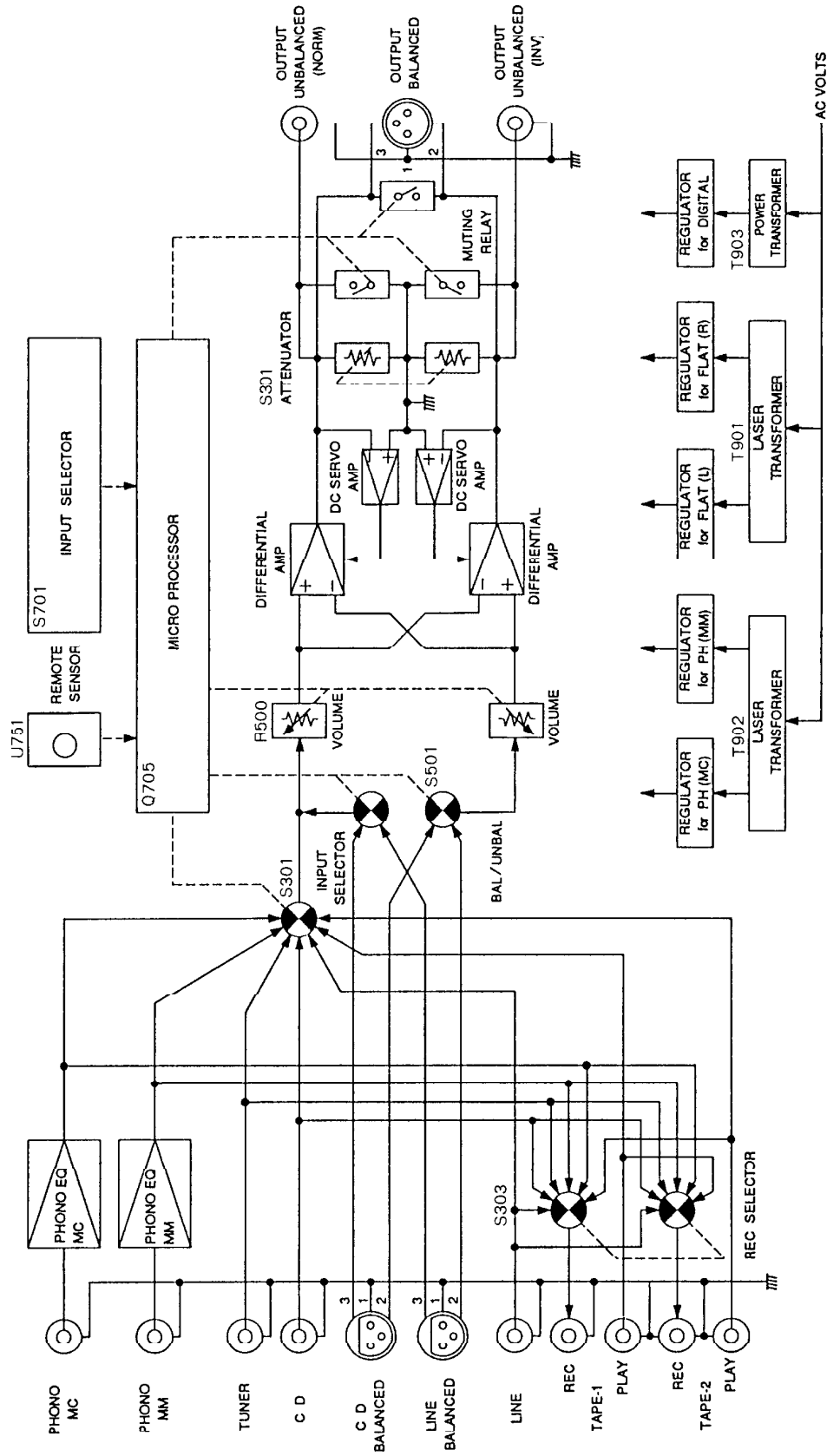
**ONKYO**  
**AUDIO COMPONENTS**

# SPECIFICATIONS

Input Sensitivity and Impedance:		
PHONO MC:	160 $\mu$ V	100 ohms
PHONO MM:	2.5 mV	47 kohms
BALANCED:	150 mV	30 kohms (Hot-Cold)
UNBALANCED:	150 mV	15 kohms
Rated Output and Impedance:		
BALANCED:	1.0V	200 ohms
UNBALANCED:	0.5V	100 ohms
TAPE REC:	150mV	1.1 kohms
Maximum Output:		
BALANCED:	10.0V	
UNBALANCED:	5.0V	
TAPE REC:	12.0V at Phono Input	
RIAA Deviation:	$\pm$ 0.2dB at 20-20,000 Hz	
Phono Overload:		
PHONO MC:	13 mV RMS at 1kHz, THD 0.05%	
PHONO MM:	200 mV RMS at 1kHz, THD 0.05%	
Frequency Response (CD):		
Balanced/Unbalanced	+0, -3 dB at 0.8 Hz - 170 kHz	
Total Harmonic Distortion:		
PHONO MC:	0.005% at 3V OUTPUT	
PHONO MM:	0.0008% at 3V OUTPUT	
CD (BAL, UNBAL):	0.0005% at 3V OUTPUT	
Intermodulation Distortion:		
CD (BAL, UNBAL):	0.003% at 70 Hz + 7kHz=4 : 1	
Signal-to-Noise Ratio:		
PHONO MC:	81 dB (0.5 mV Input A-Weighted)	
PHONO MM:	92 dB (5.0 mV Input A-Weighted)	
CD (BAL, UNBAL):	105 dB (150 mV Input A-Weighted) at Balanced Output	
Power Supply:		
Canadian models:	AC120V, 60 Hz	
European models:	AC230V, 50 Hz	
U.K & Australian models:	AC240V, 50 Hz	
Worldwide models:	AC120V, 60 Hz or AC220V, 50 Hz (switchable)	
Controls:		
POWER		
OUTPUT ATTENUATOR (L, R),	(0, -1, -2, -3, -6, -12dB)	
VOLUME		
REC. SELECTOR (MM, MC, TUNER, CD, LINE, TAPE1 $\blacktriangleright$ 2,	TAPE2 $\blacktriangleright$ 1)	
INPUT SELECTOR (MM, MC, TUNER, CD, CD-BAL, LINE-BAL,	LINE, TAPE-1, TAPE-2)	
OUTPUT MUTING ( $-\infty$ ) (Remote Control only)		
Inputs:		
MC (PHONO), MM (PHONO), TUNER, CD, CD-BAL (BALANCED)		
LINE-BAL (BALANCED), LINE, TAPE-1, TAPE-2		
Outputs:		
TAPE REC OUT	TAPE-1 & 2	
OUTPUT	BALANCED	
	UNBALANCED NORMAL & INVERT	
Dimensions:		
	455 (W) $\times$ 90 (H) $\times$ 418 (D)	
	17-15/16" (W) $\times$ 3-9/16" (H) $\times$ 16-7/16" (D)	
(side panels included)	475 (W) $\times$ 90 (H) $\times$ 418 (D)	
	18-11/16" (W) $\times$ 3-9/16" (H) $\times$ 16-7/16" (D)	
Weight:		
	8.9 kg, (19.6 lbs.)	
(side panels included)	9.2 kg (20.3 lbs.)	

Specifications and features are subject to change without notice.

# BLOCK DIAGRAM



## PRECAUTIONS

### 1. Replacing the fuses

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

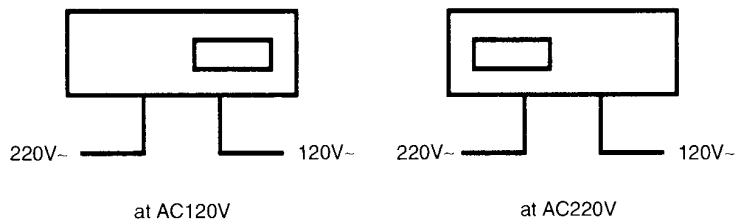
CIRCUIT NO.	PART NO.	DESCRIPTION
F901	252146	1.25A-TSC, Primary fuse (120V, 120V/220V models)
F902	252069 or 252069CC	0.8A-SE-EAK or 0.8A-SE-EAK, Primary fuse (230V, 120V/220V models)

### 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 MΩ at 500V.

### 3. Voltage selector (Bottom)

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 plugging in the unit. The voltage is changed by inserting a screw driver into the groove of the switch, and moving the switch from the right or left. Confirm that the switch has been moved all the way to the right or left before plugging in the unit. Models without a voltage selector can only be used in areas where the power supply is the same as that of the unit.



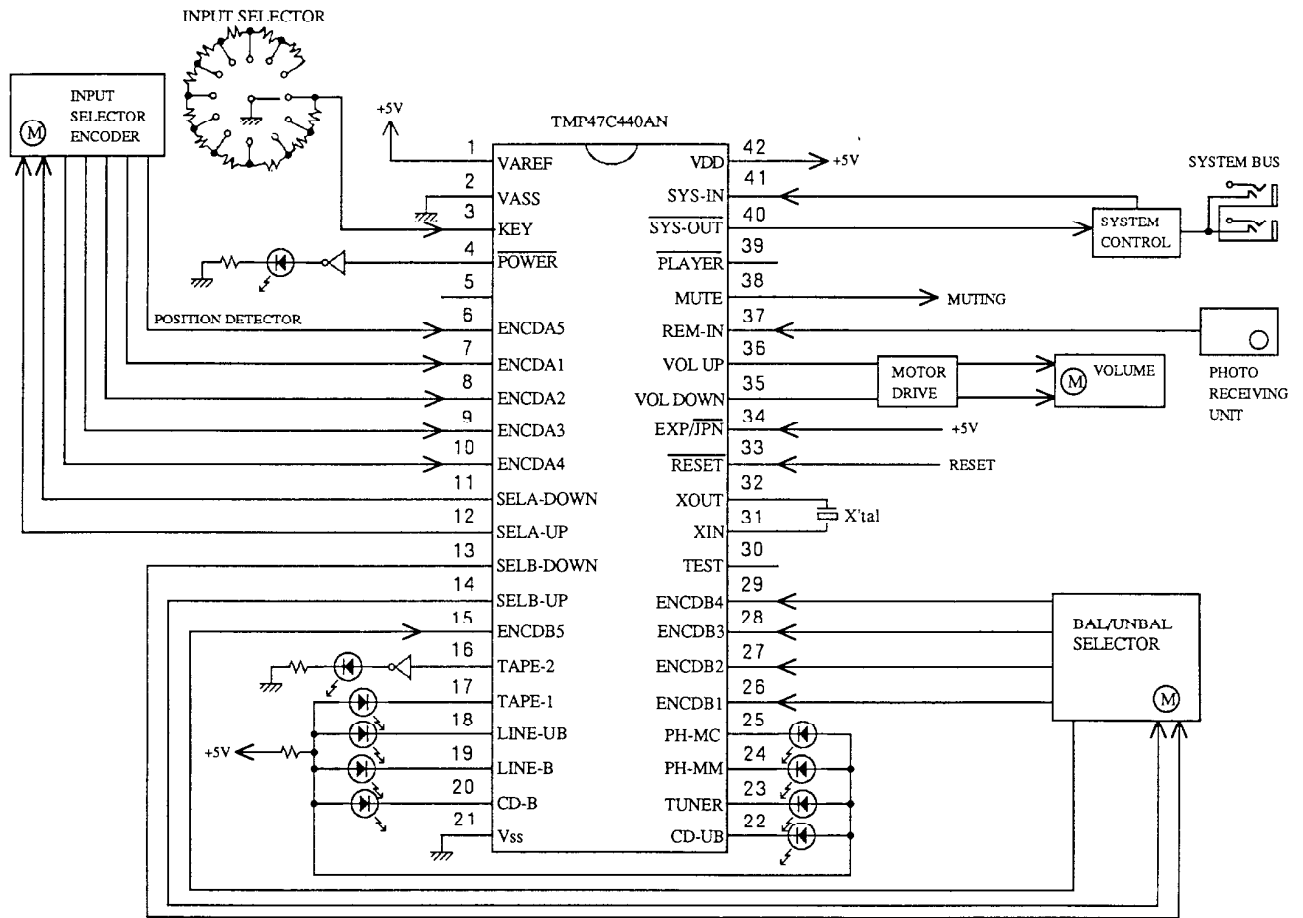
### 4. When replacing the power transformer (T903), make sure to affix a rating label to the transformer.

REF. NO.	PART NO.	DESCRIPTION
A859	29361439	Rating label (120V models)
A859	29361440	Rating label (230V models)
A859	29361442	Rating label (120V/220V models)

### 5. When installing the power transformer (T903) on the chassis, make sure to use the specified screws. (Safety)

Tap-tight screw → 4TTC+8C(BC), [830440089]

TMP47C440AN-G701 (Microprocessor)



Pin No.	Symbol	Description
1	VAREF	Analog reference voltage for A/D conversion.
2	VASS	Analog reference GND for A/D conversion.
3	KEY	Input terminal for Input selector key. Through A/D conversion, Input selector key will be fetched.
4	POWER	Output terminal for power display. Lighted in case of "L". "L" will be output at any time.
5	VOL	Output terminal for volume display. Lighted in case of "L". Winks in 1 Hz muting ON.
6	ENCDA5	Selector-A position detector input terminal.
7	ENCDA1	
8	ENCDA2	
9	ENCDA3	
10	ENCDA4	
11	SELA DOWN	UP/DOWN Output terminal for Input selector-A. Active "H".
12	SELA UP	

OPERATION	SEL-A UP	SEL-A DOWN
STOP	H	H
UP	H	L
DOWN	L	H

Pin No.	Symbol	Description												
13	SELB DOWN	UP/DOWN Output terminal for Bal/Unbal selector. Active "H". <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>OPERATION</th> <th>SEL-B UP</th> <th>SEL-B DOWN</th> </tr> </thead> <tbody> <tr> <td>STOP</td> <td>H</td> <td>H</td> </tr> <tr> <td>UP</td> <td>H</td> <td>L</td> </tr> <tr> <td>DOWN</td> <td>L</td> <td>H</td> </tr> </tbody> </table>	OPERATION	SEL-B UP	SEL-B DOWN	STOP	H	H	UP	H	L	DOWN	L	H
OPERATION	SEL-B UP		SEL-B DOWN											
STOP	H		H											
UP	H		L											
DOWN	L	H												
14	SELB UP													
15	ENCDB5	Selector-B position detector input terminal.												
16	TAPE-2	Output terminal for Input selector display. Output of the position currently selected will be "L" (Light). * UB ..... UNBALANCE. B ..... BALANCE												
17	TAPE-1													
18	LINE-UB													
19	LINE-B													
20	CD-B													
21	VSS	GND terminal.												
22	CD-UB	Output terminal for Input selector display. Output of the position currently selected will be "L" (Light).												
23	TUNER													
24	PH-MM													
25	PH-MC													
26	ENCDB1	Selector-B position detector input terminal.												
27	ENCDB2													
28	ENCDB3													
29	ENCDB4													
30	TEST	Shipment Test. To be connected with GND.												
31	XIN	Terminal for connecting with Ceramic oscillator (4 MHz).												
32	XOUT													
33	RESET	Input terminal for System reset.												
34	EXP/JPN	Input terminal for Remote control code Initialization when power switch ON.												
35	VOL DOWN	Volume UP/DOWN Output terminal. Active "H". <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>OPERATION</th> <th>VOL UP</th> <th>VOL DOWN</th> </tr> </thead> <tbody> <tr> <td>STOP</td> <td>H</td> <td>H</td> </tr> <tr> <td>UP</td> <td>H</td> <td>L</td> </tr> <tr> <td>DOWN</td> <td>L</td> <td>H</td> </tr> </tbody> </table>	OPERATION	VOL UP	VOL DOWN	STOP	H	H	UP	H	L	DOWN	L	H
OPERATION	VOL UP		VOL DOWN											
STOP	H		H											
UP	H		L											
DOWN	L	H												
36	VOL UP													
37	REM IN	Remote control signal input terminal. Active "L".												
38	MUTE	Muting output terminal. Active "H".												
39	PLAYER	Output terminal for Player control.												
40	SYS OUT/SYS EN	Output terminal for System code. Active "L".												
41	SYS IN	Input terminal for System code. Active "H".												
42	VDD	Power (+5V) Connecting terminal.												

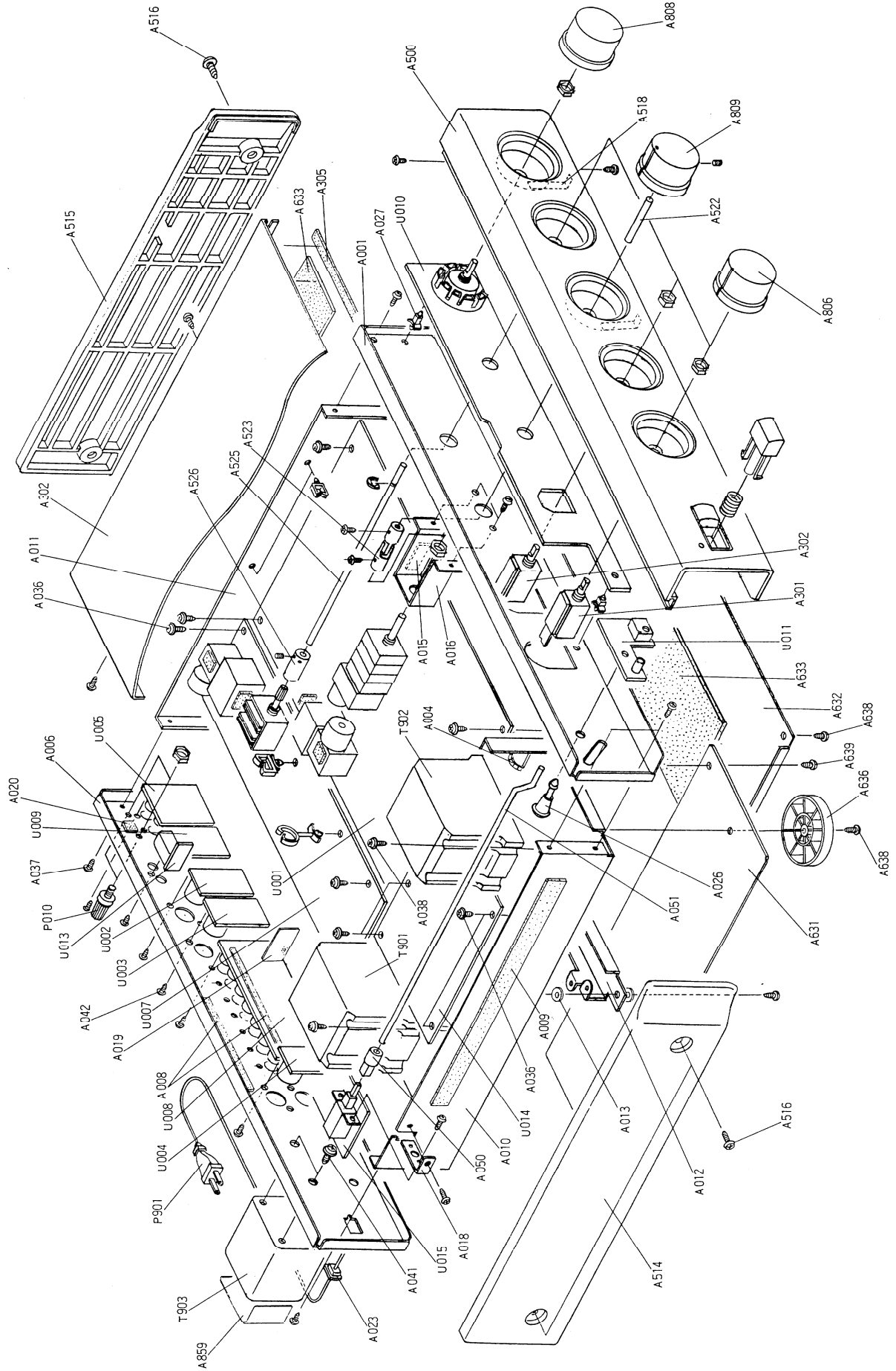
## CHASSIS-EXPLODED VIEW PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
A001	27110709	Front bracket ass'y	A806	28324631	Knob (AT) [BLK]
A004	28170031	Bushing	A806	28324665	Knob (AT) [SIL]
A006	27121592A	Rear panel [D,W]	A808	28324632	Knob (SEL) [BLK]
A006	27121593A	Rear panel [P]	A808	28324666	Knob (SEL) [SIL]
A007	28140972	t1.5x25x140, Cushion	A809	28324635	Knob (VOL) [BLK]
A008	28141220	t5x125 x12, Cushion	A809	28324664	Knob (VOL) [SIL]
A009	28140782	t1.5x25x170, Cushion	A859	29361439	Rating label [D]
A010	27130696	Bracket (L)	A859	29361440	Rating label [P]
A011	27130697	Bracket (R)	A859	29361442	Rating label [W]
A012	27130698	Bracket (PC)	▲ T901	2300821C	NPT-1148D, Power transformer [D]
A013	27270147	Spacer	▲ T901	2300822C	NPT-1148P, Power transformer [P]
A015	28141221	t1.5x20x45, Cushion	▲ T901	2300823B	NPT-1148DG, Power transformer [W]
A016	27141547A	Bracket (VOL)	▲ T902	2300825C	NPT-1149D, Power transformer [D]
A018	27141549	Bracket (POW)	▲ T902	2300826C	NPT-1149P, Power transformer [P]
A019	27141584	Bracket (SI)	▲ T902	2300827B	NPT-1149DG, Power transformer [W]
A020	28141226	t5x10x20, Cushion	▲ T903	2300829B	NPT-1150D, Power transformer [D]
A023	27300750	Bushing (CORD) [D]	▲ T903	2300830B	NPT-1150P, Power transformer [P]
A023	28190009	Bushing (CORD) [P,W]	▲ T903	2300831B	NPT-1150DG, Power transformer [W]
A026	27190657	KGLS-18RF, Holder	S301,S302	25030358	NRSF-106-20BU, Rotary switch
A027	27190897	KGLS-3S, Holder	▲ S903	25065123	NSS-1258P, Slide switch [W]
A036	831130088	3TTW+8B, Tap-tight screw	P010,P110	25060180	N1M-1SC106, Ground terminal
A037	801230	3STS+8BQ(BC), Tap-tight screw	▲ P901	253122	AS-UC-6#16, Power supply cable [D]
A038	830440109	4TTC+10C(BC), Tap-tight screw	▲ P901	253131A	AS-CEE-3, Power supply cable [P,W]
A041	830440089	4TTC+8C(BC), Tap-tight screw	▲ F901	252146	1.25A-TSC, Primary fuse [D,W]
A042	82142604	2.6P+4F(BC), Tap-tight screw	▲ F902	252069	0.8A-SE-EAK, Primary fuse or
A050	27273152	Joint (POW)		252069CC	0.8A-SE-EAK, Primary fuse [P,W]
A051	27260323	Shaft (POW)	U001	1A370500-1	NAAF-4500-1, Equalizer and Flat amplifier pc board ass'y
A061	250153	Shorted pin	U002	1A370501-1	NAETC-4501-1, Balanced CD input terminal pc board ass'y
A063	79087	Glass tube	U003	1A370502-1	NAETC-4502-1, Balanced LINE input terminal pc board ass'y
A302	28184526	Top cover	U004	1A370503-1	NAETC-4503-1, Balanced output terminal pc board ass'y
A303	28140695	t1.5x25x240, Cushion (Cover)	U005	1A370504-1	NAETC-4504-1, PHONO input terminal pc board ass'y
A305	28141222	t0.5x15x425, Cushion	U007	1A370506-1	NASW-4506-1, Input selector switch circuit pc board ass'y
A500	1A370701K	Front panel ass'y [BLK]	U008	1A370507-1	NAETC-4507-1, Output terminal pc board ass'y
(A504)	27267785	Guide (AT) [BLK]	U009	1A370508-1	NAETC-4508-1, Input terminal pc board ass'y
(A505)	27267786	Guide (REC) [BLK]	U010	1A370509-1	NADG-4509-1, Microprocessor circuit pc board ass'y
(A507)	27267787	Guide ass'y (SEL) [BLK]	U011	1A370510-1	NADIS-4510-1, Photo receiving circuit pc board ass'y
(A509)	27267789	Guide ass'y (VOL) [BLK]	U013	1A370512-1	NAETC-4512-1, R1 terminal pc board ass'y
(A511)	28135199	Name plate	U014	1A370513-1	NAPS-4513-1, Power supply circuit pc board ass'y
(A801)	28191593-1	Clear plate (RE)	U015	1A370514-1	NASW-4514-1, Power switch circuit pc board ass'y [D]
(A803)	28198721	Facet	U015	1A370514-1A	NASW-4514-1A, Power switch circuit pc board ass'y [P]
(A811)	27267790A	Guide ass'y (POW) [BLK]	U015	1A370514-1B	NASW-4514-1B, Power switch circuit pc board ass'y [W]
(A811b)	28324626	Knob ass'y (POW) [BLK]			
(A811c)	27180398A	Spring			
A500	1A385701K	Front panel ass'y [SIL]			
(A504)	27267803	Guide (AT) [SIL]			
(A505)	27267804	Guide (REC) [SIL]			
(A507)	27267806	Guide ass'y (SEL) [SIL]			
(A509)	27267809	Guide ass'y (VOL) [SIL]			
(A811)	27267808A	Guide ass'y (POW) [SIL]			
(A811b)	283224667	Knob ass'y (POW) [SIL]			
A514	28185369	Side board (L)			
A515	28185370	Side board (R)			
A516	837440169	4TTT+16C(BC), Tap-tight screw			
A518	29110066	W=5, Aluminum tape			
A522	27260319	Shaft ass'y (VOL)			
A523	27273133-1B	Joint ass'y			
A525	27260321	Shaft ass'y (SEL)			
A526	27273092A	Joint			
A631	27170290	Bottom board (L) [D,P]			
A631	27170295	Bottom board (L) [W]			
A632	27170291	Bottom board (R)			
A633	28141009	t1.5x195 x125, Cushion			
A636	27175254	Bottom leg ass'y			
A638	834430088	3TTS+8B(BC), Tap-tight screw			
A639	801230	3STS+8BQ(BC), Tap-tight screw			

NOTE [D]: Only 120V models  
[P]: Only 230V models  
[W]: Only 120V/220V models  
[BLK]: Only Black models  
[SIL]: Only Silver models

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

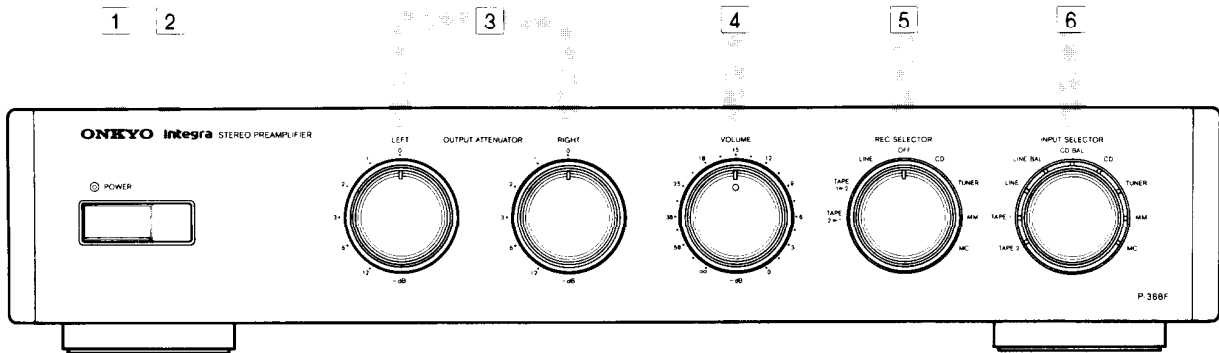
# CHASSIS-EXPLODED VIEW





# FRONT AND REAR PANEL

## Front panel



1 **Power Switch (POWER) and Indicator**

Press the power switch to turn the power on, and the indicator will light. Press it again, and the power will be turned off. For 5 seconds after the power is turned on, muting will prevent the signal from being output, until the internal circuit works properly.

2 **Remote Control Sensor**

This receives signals sent from RC-235S remote control transmitter.

3 **Output Attenuator Switch (OUTPUT ATTENUATOR LEFT/RIGHT)**

This switch adjusts the output level of the output terminal. Also use it for L and R level adjustment, since left and right are independent of each other. Set the attenuate amount to one of these 6 values: 0, -1, -2, -3, -6 and -12 (dB). Normal setting is 0.

4 **Volume Control Knob (VOLUME)**

This controls volume. Turning it clockwise increases volume. When controlling with the remote control transmitter, pressing "UP" or "DOWN" increases or decreases volume respectively.

5 **Rec Selector Switch (REC SELECTOR)**

This switch selects the recording source. Output signal of TAPE-1 and TAPE-2 REC terminal are switched.

MC ..... Select this to record the record player connected to the PHONO MC terminal.

MM ..... Select this to record the record player connected to the PHONO MM terminal.

TUNER ... Select this to record the source connected to the TUNER terminal.

CD ..... Select this to record the source connected to the CD terminal.

OFF ..... Select this to not record or dub.

LINE ..... Select this to record the source connected to the LINE terminal.

TAPE 1 ► 2 .. Select this to dub from TAPE-1 to TAPE-2.  
TAPE 2 ► 1 .. Select this to dub from TAPE-2 to TAPE-1.

\* Recording or dubbing can be performed regardless of the input selector's setting.

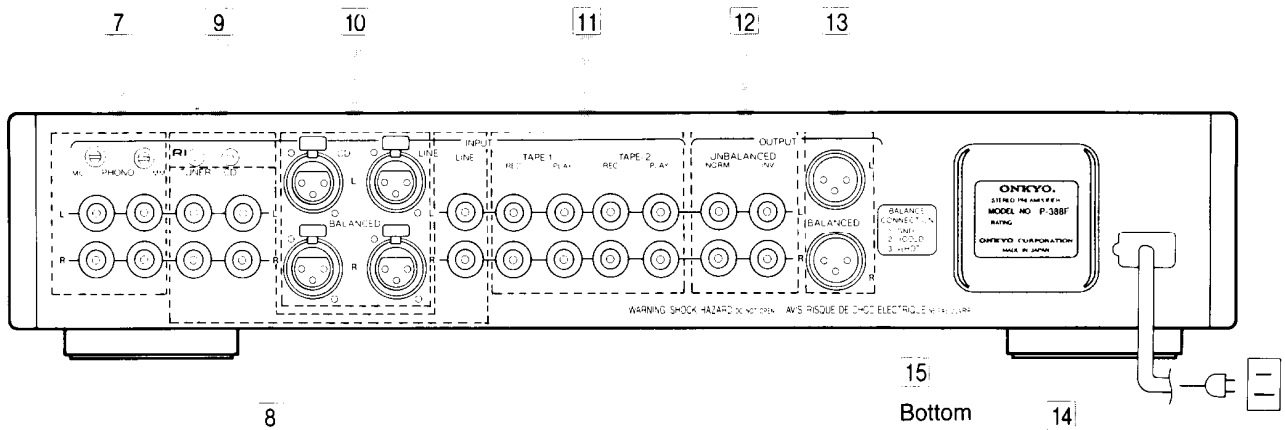
\* A source connected to the BALANCED terminal cannot be recorded.

6 **Input Selector Switch and Indicators (INPUT SELECTOR)**

This switch is used to select the desired program source. The switch can be turned in either direction without end stops. An indicator lights to show which program has been selected. The switch is also able to be switched directly using the Input Selector buttons on the remote control transmitter.

● Make sure that the device of the selected source is connected to the appropriate terminal.

## Rear panel



### 7 Record Player Input Terminal (PHONO MM • MC)

This terminal connects the record player. Make a selection in accordance with the cartridge to be used.

MM ..... Connect to this terminal when using a MM type cartridge.

MC ..... Connect to this terminal when using a MC type cartridge.

When using a step-up transformer or head amplifier, connect to the MM terminal, even when using a MC type cartridge.

- \* A short pin is inserted to this terminal before shipment from the factory. To use this terminal, remove the short pin and store it, or insert it to another input terminal. Do not insert it into the output terminal or TAPE REC terminal. Doing so may terminate sound production or cause abnormal operation.

### 8 TUNER, CD and LINE Input Terminals

This terminal connects the CD player, tuner, etc.

### 9 Remote Control Jacks

The remote control jacks are used to connect ONKYO products bearing the "RI" mark via the accessory remote control cable. When this unit is connected with ONKYO CD players or cassette decks bearing the "RI" mark, it can also be controlled by the remote control transmitter RC-235S. (Refer to page 7.)

### 10 Balance Input Terminal (BALANCED CD/LINE)

This terminal connects devices with balance output, such as the CD player. This terminal is equivalent to XLR-3-31.

Pin polarity    1 : GND  
                   2 : - (COLD)  
                   3 : + (HOT)

### 11 Tape Deck Connecting Terminal (TAPE-1 PLAY/REC, TAPE-2 PLAY/REC)

The unit can connect two tape decks.

### 12 Unbalance Output Terminal (OUTPUT UNBALANCED NORM/INV)

NORM .... Outputs the same phase signal in response to the input signal

INV ..... Outputs the reverse phase signal in response to the input signal.

- \* The output impedance is 100Ω. Normally, it is connected to the amplifier by using the NORM side.

### 13 Balance Output Terminal (OUTPUT BALANCED NORM/INV)

The output impedance is 200Ω. This terminal is equivalent to XLR-3-32. Suitable connectors are XLR-3-11C equivalent products.

Pin polarity    1 : GND  
                   2 : - (COLD)  
                   3 : + (HOT)

### 14 Power Supply Cord.

### 15 Voltage Selector (Bottom)

This is provided only for worldwide models. For details, see page 3.

# PRINTED CIRCUIT BOARD PARTS LIST

## EQUALIZER AND FLAT AMPLIFIER PC BOARD (NAAF-4500-1)

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION
			Q809,Q810	2202175 or 2202176	2SB1370-E or 2SB1370-F
			O811,O812	2202115 or 2202116	2SD2061-F or 2SD2061-F
			Q851,Q852	2211945	2SK246-GR
			Q853	2211455	2SA1015-GR
			Q854	2211255	2SC1815-GR
			Q855	2202175 or 2202176	2SB1370-E or 2SB1370-F
			Q856	2202115 or 2202116	2SD2061-E or 2SD2061-F
			Q871,Q872	2211945	2SK246-GR
			Q873	2211455	2SA1015-GR
			Q874	2211255	2SC1815-GR
			Q875	2202175 or 2202176	2SB1370-E or 2SB1370-F
			Q876	2202115 or 2202116	2SD2061-E or 2SD2061-F
			<b>Diodes</b>		
			D001-D006	225251	TLR112, LED
			D101-D106		
			D501-D516		
			D791	223163 or 223205	1S133 or 1SS270A
			D801-D804	224450512	MTZ5.1B, Zener
			D851,D852		
			D871,D872		
			<b>Capacitors</b>		
			C005,C006	373631024	1000 pF, 100V, Film (KP)
			C007,C008	372122214	220 pF, 50V, Styrene
			C009,C010	373631014	100 pF, 100V, Film (KP)
			C011-C014	373552434	0.024 μF, 250V, Film (MKP)
			C015,C016	373554334	0.043 μF, 250V, Film (MKP)
			C017,C018	372126804	68 pF, 50V, Styrene
			C019-C022	372122204	22 pF, 50V, Styrene
			C023,C024	391622217	220 μF, 6.3V, Elect.(FS)
			C025,C026	373631024	1000 pF, 100V, Film (KP)
			C027-C030	391651017	100 μF, 25V, Elect.(FS)
			C031,C032	391622217	220 μF, 6.3V, Elect.(FS)
			C051-C058	391652217	220 μF, 25V, Elect.(FS)
			C059,C060	372123304	33 pF, 50V, Styrene
			C103,C104	373631014	100 pF, 100V, Film (KP)
			C107,C108	373632224	2200 pF, 100V, Film (KP)
			C111-C114	373552434	0.024 μF, 250V, Film (MKP)
			C115,C116	373554334	0.043 μF, 250V, Film (MKP)
			C117,C118	372126804	68 pF, 50V, Styrene
			C119-C122	372122204	22 pF, 50V, Styrene
			C123,C124	391622217	220 μF, 6.3V, Elect.(FS)
			C125,C126	373632224	2200 pF, 100V, Film (KP)

Caution: Specification of transistors 2SK369(ONK) used in this unit have been precisely selected so that DC voltage does not appear at the speaker terminals.

Transistors belonging to one of the following groups must be matched type.

- Group 1: Q001, Q003, Q005, Q007  
 2: Q002, Q004, Q006, Q008  
 3: Q101, Q103  
 4: Q102, Q104

When you replace some of these transistors, do not forget to replace all the transistors in each group with matched type which have been delivered from ONKYO parts Center at the same time on the same day.

CIRCUIT NO.	PART NO.	DESCRIPTION
C127-C130	391651017	100 $\mu$ F, 25V, Elect.(FS)
C131,C132	391622217	220 $\mu$ F, 6.3V, Elect.(FS)
C151-C158	391652217	220 $\mu$ F, 25V, Elect.(FS)
C159,C160	372123304	33 pF, 50V, Styrene
C501,C502	373631014	100 pF, 100V, Film (KP)
C505-C508	391654707	47 $\mu$ F, 25V, Elect.(FS)
C509-C512	391661017	100 $\mu$ F, 35V, Elect.(FS)
C521-C524	372122704	27 pF, 50V, Styrene
C525-C528	372124704	47 pF, 50V, Styrene
C529-C532	391654707	47 $\mu$ F, 25V, Elect.(FS)
C533-C540	391622217	220 $\mu$ F, 6.3V, Elect.(FS)
C601,C602	373631024	1000 pF, 100V, Film (KP)
C621-C626	373722254	2.2 $\mu$ F, 50V, Film (MKT)
C791	374721034	0.01 $\mu$ F, 50V, Film (TF)
C801-C804	391621017	100 $\mu$ F, 6.3V, Elect.(FS)
C805-C808	374721034	0.01 $\mu$ F, 50V, Film (TF)
C809-C812	393361007	10 $\mu$ F, 35V, Elect.(VX)
C813-C816	391642227	2200 $\mu$ F, 16V, Elect.(FS)
C817-C820	374722234	0.022 $\mu$ F, 50V, Film (TF)
C851,C852	391621017	100 $\mu$ F, 6.3V, Elect.(FS)
C853,C854	374721034	0.01 $\mu$ F, 50V, Film (TF)
C855,C856	391680107	1 $\mu$ F, 50V, Elect.(FS)
C857,C858	391651027	1000 $\mu$ F, 25V, Elect.(FS)
C871,C872	391621017	100 $\mu$ F, 6.3V, Elect.(FS)
C873,C874	374721034	0.01 $\mu$ F, 50V, Film (TF)
C875,C876	391680107	1 $\mu$ F, 50V, Elect.(FS)
C877,C878	391651027	1000 $\mu$ F, 25V, Elect.(FS)
<b>Resistors</b>		
R011-R014	442526804	68 $\Omega$ , 1/2W, Metal oxide film
R019,R020	442528204	82 $\Omega$ , 1/2W, Metal oxide film
R037,R038	442524714	470 $\Omega$ , 1/2W, Metal oxide film
R039-R042	442521804	18 $\Omega$ , 1/2W, Metal oxide film
R111-R114	442521314	130 $\Omega$ , 1/2W, Metal oxide film
R119,R120	442521614	160 $\Omega$ , 1/2W, Metal oxide film
R137,R138	442524714	470 $\Omega$ , 1/2W, Metal oxide film
R139-R142	442521804	18 $\Omega$ , 1/2W, Metal oxide film
R500	5104311	N27RQL20KA20F, Variable
R515-R522	442522204	22 $\Omega$ , 1/2W, Metal oxide film
R613-R620	442521004	10 $\Omega$ , 1/2W, Metal oxide film
<b>Relay</b>		
RL311	25065335	NRL-2P1.25A-DC5-045
<b>Switch</b>		
S501	25030356	NRS-283-BA, Rotary
<b>Socket ass'y</b>		
P001,P101	2009990222A	NSAS-8P0323
P353	2009990224	NSAS-12P0325
P451,P452	2009990200	NSAS-6P0787
P455,P457	2009990223	NSAS-12P0324
P711	2009990249	NSAS-6P0362
P803,P804	2009990225	NSAS-4P0326
P852,P872	2009990250	NASA-6P0363
P873		
<b>Plugs</b>		
P355a	25055136	NPLG-6P120
P462a,P704a	25055133	NPLG-3P117
P702a	25055139	NPLG-9P123
<b>Radiator</b>		
	27160220	RAD-51(B)
<b>Plates</b>		
	27160313	Bus
	27160215-2	Bus
<b>Ground plate</b>		
	27141059	

**BALANCED CD INPUT TERMINAL PC BOARD (NAETC-4501-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Sockets</b>		
P409,P410	25050777	NSCT-3P572

**BALANCED LINE INPUT TERMINAL PC BOARD (NAETC-4502-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Sockets</b>		
P411,P412	25050777	NSCT-3P572

**BALANCED OUTPUT TERMINAL PC BOARD (NAETC-4503-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Sockets</b>		
P305,P306	25050776	NSCT-3P571

**PHONO INPUT TERMINAL PC BOARD (NAETC-4504-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Capacitors</b>		
C401,C402	373631524	1500 pF, 100V, Film (KP)
<b>Terminals</b>		
P401,P403	25045161	NPJ-2PDBL58

**INPUT SELECTOR SWITCH CIRCUIT PC BOARD (NASW-4506-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Diode</b>		
D782	223163 or 223205	1SS133 or 1SS270A
<b>Capacitor</b>		
C782-C784	374721034	0.01 $\mu$ F, 50V, Film (TF)
<b>Relays</b>		
RL301,RL302	25065335	NRL-2P1.25A-DC5-045
<b>Switches</b>		
S301a,S302a	25065457	NSS-26162, Slide
S401	25030330	NRS-2211-BA, Rotary
S403	25030357	NRS-448-20RJ, Rotary
<b>Sockets</b>		
P351	2009990219	NSAS-14P0320
P355	2009990221	NSAS-12P0322
P453,P454	2009990230	NSAS-6P0333
P459		
P460,P461	2009990219	NSAS-14P0320
P462	2009990231A	NSAS-6P0334
<b>Plugs</b>		
P451a,P452a	25055133	NPLG-3P117
P705a,P711a		
P701a	25055139	NPLG-9P123

**OUTPUT TERMINAL PC BOARD (NAETC-4507-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Terminals</b>		
P301,P303	25045161	NPJ-2PDBL58
P413,P415		
P417,P419		
P421		

**INPUT TERMINAL PC BOARD (NAETC-4508-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Terminals</b>	
P405,P407	25045161	NPJ-2PDBL58

**MICROPROCESSOR CIRCUIT PC BOARD (NADG-4509-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>ICs</b>	
Q701,Q702 Q707	22240358	LB1638
Q705	22240616	TMP47C440AN-G701
Q706	222951	M51943BSL
Q730,Q731	222780058MAT	AN7705F
	<b>Transistors</b>	
Q703,Q704 Q708	2213090	DTA114YS
Q709	2213650	DTD113ZS
	<b>Diodes</b>	
D701	223163 or 223205	1SS133 or 1SS270A
D702	224450562	MTZ5.6B, Zener
D703-D711 D712,D713	225142DX2 22380046 or 22380035	SEL2913K-DX2, LED AM01Z or GP104003E
D730	22380039	1D4B42
	<b>Cores</b>	
L701-L704 L706-L708	230906	BL02RN2-R62
	<b>Coils</b>	
L705	233409K220	NC11-1284
L730	231069A	NCH-1119
	<b>Capacitors</b>	
C701,C703 C713,C714	374721035	0.01 $\mu$ F, 50V, Film (TF)
C702,C704 C709,C712 C734	354744709	47 $\mu$ F, 16V, Elect.
C706	354741009	10 $\mu$ F, 16V, Elect.
C707	375524744	0.47 $\mu$ F, 50V, Film (MMT)
C711	354784799	0.47 $\mu$ F, 50V, Elect.
C718,C719	3020033	B8XC0113-33N, C-Block
C720,C721	374721034	0.01 $\mu$ F, 50V, Film (TF)
C730	3500151	2200 $\mu$ F, 16V, Elect.
C731	354722219	220 $\mu$ F, 6.3V, Elect.
C736	354724719	470 $\mu$ F, 6.3V, Elect.
C738,C739	374722235	0.022 $\mu$ F, 50V, Film (TF)
	<b>Osc.element</b>	
X701	3010150	CST4.00MGW
	<b>Resistors</b>	
R725,R726	49163103405	10K*5, Resistor network
R730	441628204	82 $\Omega$ , 1W, Metal oxide film
R731	452530104	1 $\Omega$ , 1/2W, Metal
	<b>Sockets</b>	
P701	2009990110	NSAS-18P0167
P702	2009990226A	NSAS-18P0327
P703	2009990227	NSAS-4P0328
P704	2009990233	NSAS-6P0336
P705	2009990232	NSAS-6P0335
	<b>Plug</b>	
P730	25055174	NPLG-2P158

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Switch</b>	
S701	25030359	NRSF-112-20RM
	<b>Holder</b>	
	27190894	(LED9)

**PHOTO RECEIVING CIRCUIT PC BOARD (NADIS-4510-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Photo Receiving unit</b>	
U751	24130007	GP1U571X
	<b>Transistor</b>	
Q751	2213090	DTA114YS
	<b>Diodes</b>	
D751	225142DX2	SEL2913K-DX2, LED
D752,D753	223163 or 223205	1SS133 or 1SS270A
	<b>Capacitor</b>	
C751	354744709	47 $\mu$ F, 16V, Elect.
	<b>Holder</b>	
	27190787	(LED1)

**RI-TERMINAL PC BOARD (NAETC-4512-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Stereo jack</b>	
P700	25045330	NPJ-2PDBL184, ST-Jack
	<b>Plug</b>	
P703a	25055132	NPLG-2P116

**POWER SUPPLY CIRCUIT PC BOARD (NAPS-4513-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Transistors</b>	
Q921-Q924	2211945	2SK246-GR
Q951,Q952 Q961,Q962	2211455	2SA1015-GR
Q925,Q926 Q953,Q963	2211255	2SC1815-GR
Q927,Q928 Q954,Q964	2202115 or 2202116	2SD2061-E or 2SD2061-F
Q929,Q930 Q955,Q965	2202175 or 2202176	2SB1370-E or 2SB1370-F
Q931,Q932 Q956,Q966		
	<b>Diodes</b>	
D921	22380057	RBA-402L
D923,D925	223194	EL1Z
D952,D953 D962,D963		
D927-D930 D954,D955 D964,D965	225251	TLR112, LED
D951,D961	22380057	RBA-402L
	<b>Capacitors</b>	
C921,C923 C951,C952 C961,C962	373554334	0.043 $\mu$ F, 250V, Film (MKP)
C925,C927	3500152	4700 $\mu$ F, 25V, Elect.
C929-C932 C955,C956 C965,C966	391621017	100 $\mu$ F, 6.3V, Elect.(FS)
C953,C954 C963,C964	3500153	2200 $\mu$ F, 35V, Elect.

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Resistors</b>		
R621-R924	452530624	6.2 Ω, 1/2W, Metal
R925,R926	442524724	4.7 KΩ, 1/2W, Metal oxide film
R951,R952	442521204	12 Ω, 1/2W, Metal oxide film
R961,R962		
R953,R963	442528224	8.2 KΩ, 1/2W, Metal oxide film
<b>Radiator</b>		
	27160315	RAD-95(B)
	27160316	RAD-96(B)
<b>Ground plate</b>		
	27141059	

**POWER SWITCH CIRCUIT PC BOARD  
(NASW-4514-1,-1A,-1B)**

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Capacitors</b>		
△ C901	3500065A	0.01 μF, AC400V/125V, Film (IS)
△ C902	3500065A	0.01 μF, AC400V/125V, Film (IS) [D,W]
△ C903	3500077	4700 pF, Film (IS) [P]
△ C903	3500065A	0.01 μF, AC400V/125V, Film (IS) [W]
<b>Switches</b>		
△ S901	25035550	NPS-111-L512P
<b>Covers (Capacitor)</b>		
△ C901a	27301216	SB1925A
△ C902a	27301216	SB1925A [D,W]
△ C903a	27301216	SB1925A [P,W]
<b>Fuse holder</b>		
△ F901a	25050065	YSH-403T [D,W]
△ F902a	25050065	YSH-403T [P,W]
<b>Label</b>		
	29360626-1	(Fuse) [D]

NOTE [D]: Only 120V models  
 [P]: Only 230V models  
 [W]: Only 120V/220V models

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

## PACKING PARTS LIST

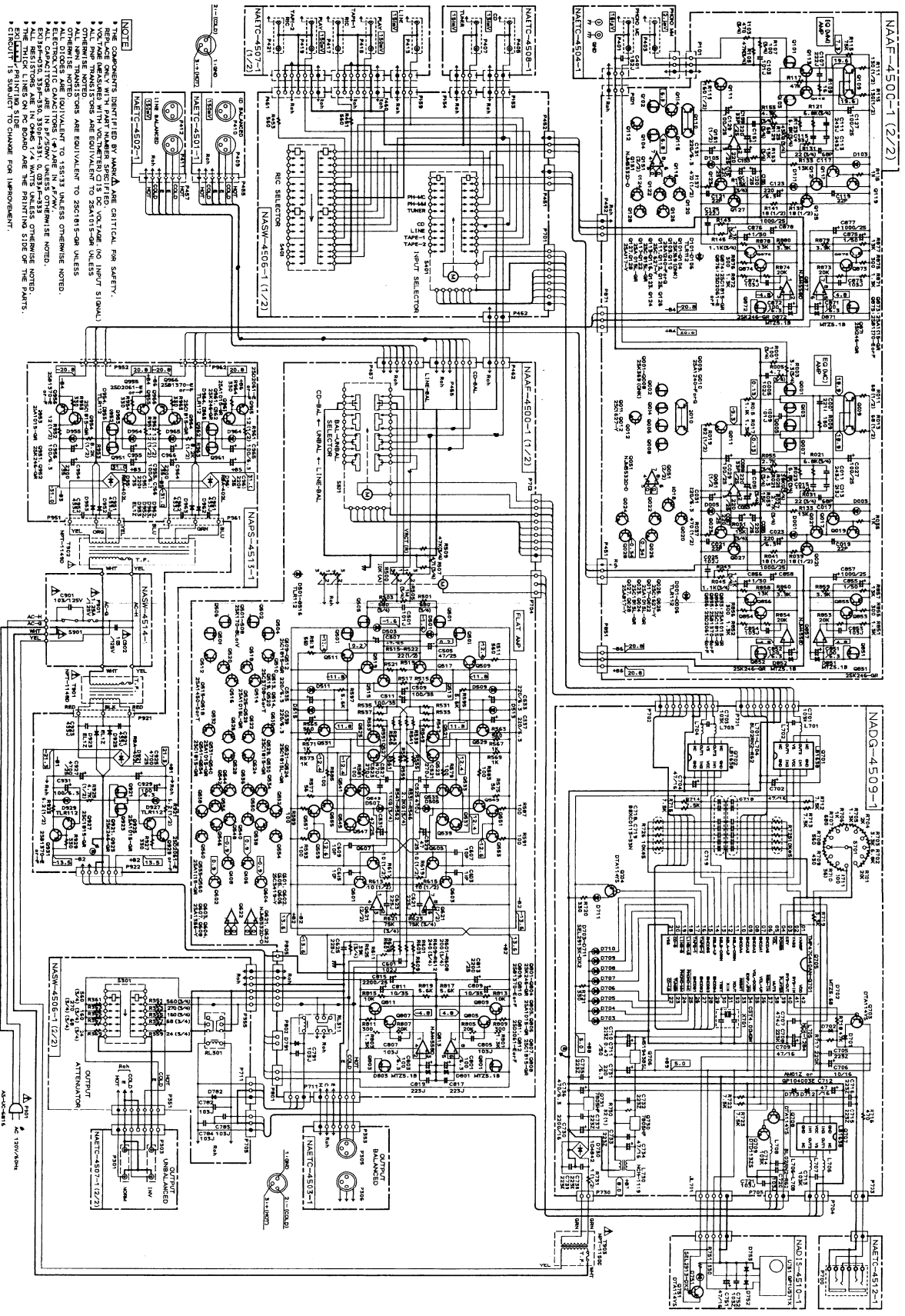
REF. NO.	PART NO.	DESCRIPTION
A851	29052410	Carton box [BLK]
A851	29052460	Carton box [SIL]
A852	29091574	Pad, Left
A853	29091575	Pad, Right
A854	261504	Paper tape
A855	29100037A	650×500 mm, Poly-vinyl bag
A857	282301 or 282311	Sealing hook or Sealing hook
A858	29110071	Damplon tape
	29360778	Label (FLASH) [N]
	<b>Accessory bag ass'y</b>	
A902	29341739	Instruction manual [D]
A902	29341740	Instruction manual [P,W]
A904	24140235A	RC-235S, Remote control unit
A905	3010054	UM-3, Battery
A906	29100097	Poly-vinyl bag for accessory
A907	2010200	3.5 mm Mini plug ass'y
	29365019A	Warranty card [N]
	29365024	Warranty card [F]
	29100107	Poly-vinyl bag (Warranty) [F]
	29358002J	Service station list [N]
	25055018	CV-K-1, Conversion plug [W]

NOTE	[D]:	Only 120V models
	[P]:	Only 230V models
	[W]:	Only 120V/220V models
	[N]:	Only U.S.A. models
	[F]:	Only French models
	[BLK]:	Only Black models
	[SIL]:	Only Silver models

SCHEMATIC DIAGRAM

MODEL P-388F (AC 120V TYPE)

P-388F

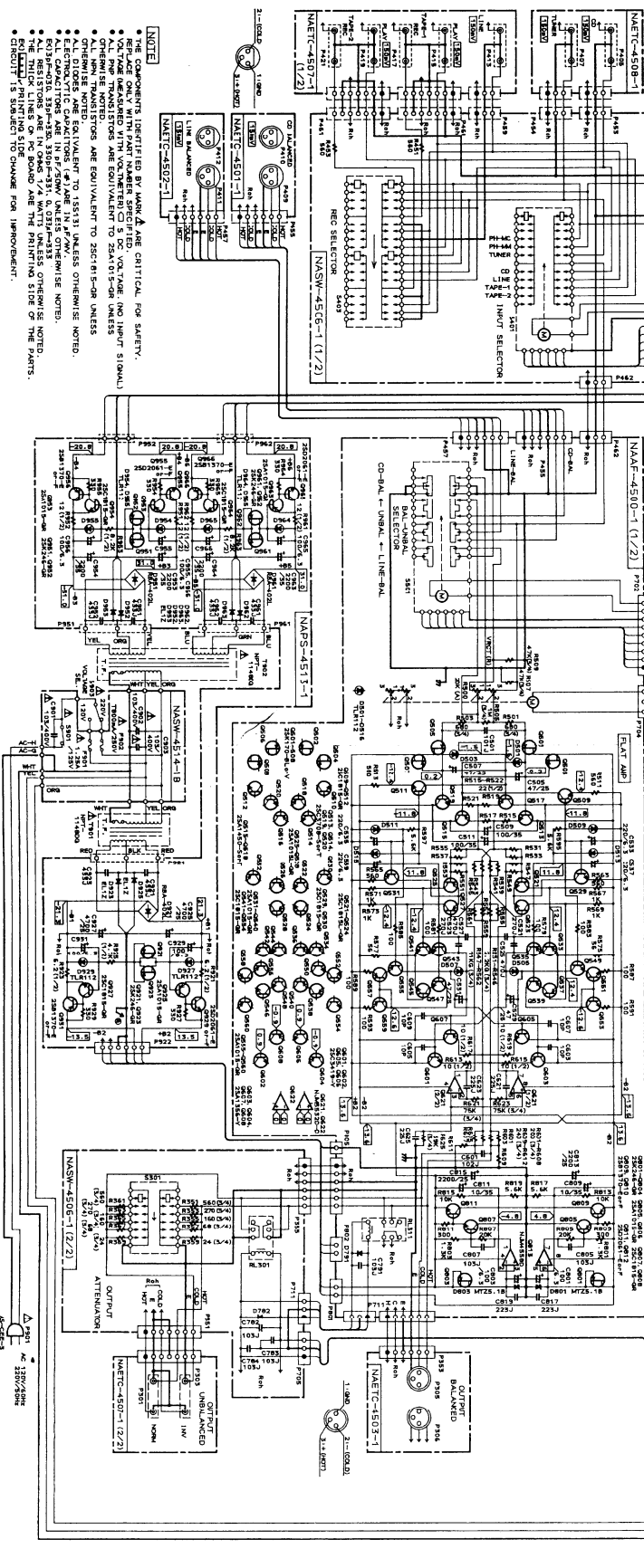
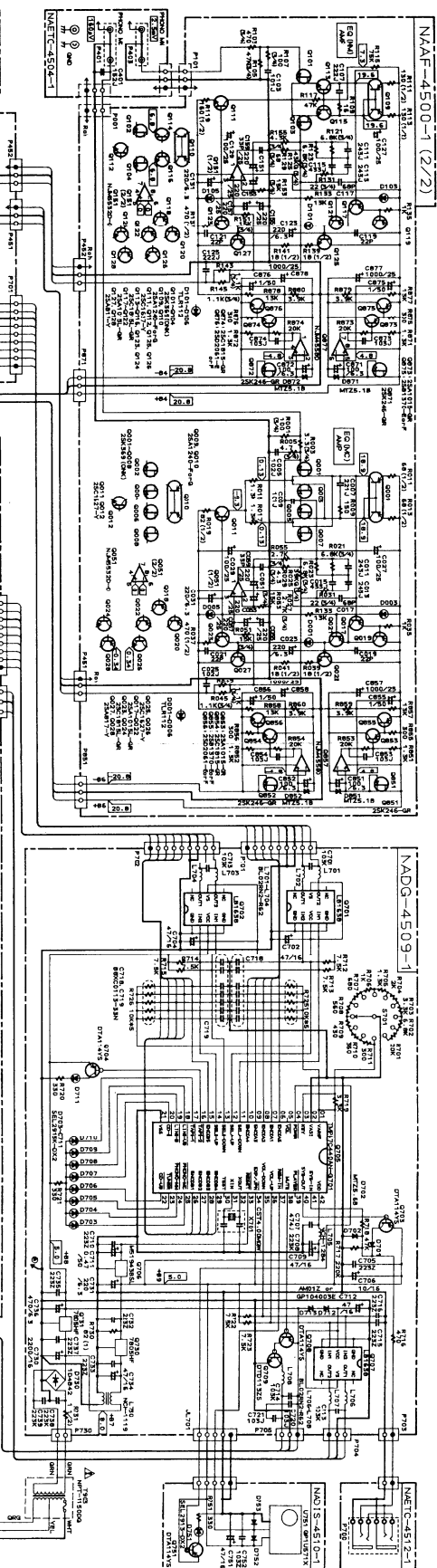


- NOTE**
- 1. COMPONENTS IDENTIFIED BY ANGLES ARE CRITICAL FOR SAFETY.
  - 2. REFER ONLY TO PART NUMBER SPECIFIED.
  - 3. VOLTAGE UNLESS OTHERWISE SPECIFIED IS DC VOLTAGE (NO INPUT SIGNAL).
  - 4. RESISTOR VALUES ARE SHOWN IN OHMS UNLESS OTHERWISE NOTED.
  - 5. ALL CAPACITORS ARE IN P.P.S.W. UNLESS OTHERWISE NOTED.
  - 6. ALL CAPACITORS ARE IN P.P.S.W. UNLESS OTHERWISE NOTED.
  - 7. THE THICK LINES ON PC BOARD ARE THE PRINTING SIDE OF THE PARTS.
  - 8. DIMENSION IS SUBJECT TO CHANGE FOR IMPROVEMENT.



A B C D E F G H

SCHEMATIC DIAGRAM MODEL P-388F (AC 120V/220V type)



- NOTE
- THE COMPONENTS IDENTIFIED BY MARK A ARE CRITICAL FOR SAFETY.
  - REPLACE ONLY WITH PART NUMBER SPECIFIED. USE EXACT PART NUMBER (SIGNAL).
  - ALL PNP TRANSISTORS ARE EQUIVALENT TO 2N4156-GR UNLESS OTHERWISE NOTED.
  - ALL CAPACITORS ARE IN P.F./50V UNLESS OTHERWISE NOTED.
  - ALL RESISTORS ARE IN OHMS 1/4 WATT UNLESS OTHERWISE NOTED.
  - THE THICK LINES ON PC BOARD ARE THE PRINTING SIDE OF THE PARTS.
  - CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

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**ONKYO CORPORATION**

International Division: Onarimon Yusen Bldg., 23-5,  
Nishi-Shimbashi 3-chome, Minato-ku, TOKYO 105, JAPAN  
Tel: 03-3432-6987 Fax: 03-3436-6979

**ONKYO U.S.A. CORPORATION**

200 Williams Drive, Ramsey, N.J. 07446, U.S.A.  
Tel: 201-825-7950 Fax: 201-825-8150

**ONKYO EUROPE**

Immeuble Le Diamant, Domaine Technologique de Saclay, 4 Rue Rene Razel,  
91892 SACLAY, FRANCE Tel: (1) 69 33 14 15 Fax: (1) 69 41 29 66

**ONKYO FRANCE**

Immeuble Le Diamant, Domaine Technologique de Saclay, 4 Rue René Razel,  
91892 SACLAY, FRANCE Tel: (1) 69 33 14 00 Fax: (1) 69 41 35 84