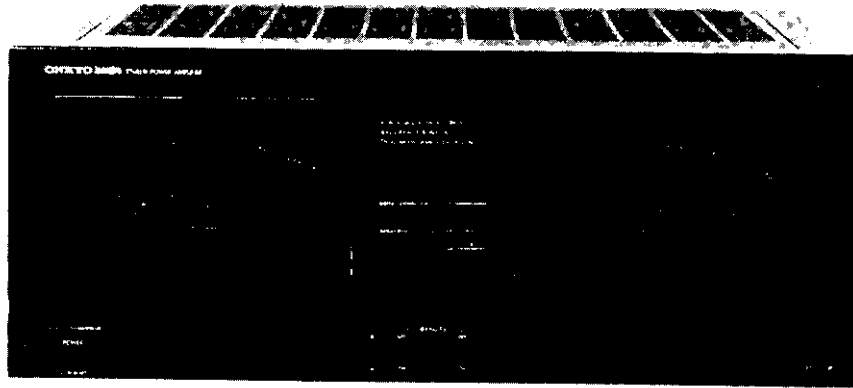


ONKYO SERVICE MANUAL

Stereo Power Amplifier

MODEL M-504



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

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK Δ 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.

TABLE OF CONTENTS

Specifications	2
Precautions	2
Block diagram	3
Exploded view	4
Parts list	5
Adjustment procedures	6
Packing view	7
IC block diagram	8
Schematic diagram	
Worldwide model	9
120V model	13
Printed circuit board view	11
PC board parts list	18



SPECIFICATIONS

Power output:	165 watts per channel, min. RMS, at 8 ohms, both channels driven, from 20 Hz to 20 kHz, with no more than 0.003% total harmonic distortion. 165 watts per channel, into 8 ohms at 1 kHz, 0.003% THD
Total harmonic distortion:	0.003% at rated power 0.003% at 1 watt output
Intermodulation distortion:	0.003% at rated power 0.003% at 1 watt output
Frequency response:	+0, -1.5 dB at 1 Hz - 100 kHz
Input sensitivity:	1 V
Input impedance:	20 kohms
Damping factor:	140 (8 ohms, 1 kHz)
S/N ratio:	120 dB (IHFA, Shorted)
Outputs:	SPEAKERS 1 & 2, AC OUTLET (UNSWITCHED x 1)
Inputs:	INPUT
Power supply:	AC 120V and 220V Switchable, 50/60 Hz
Dimensions:	465(W) x 185(H) x 422(D) mm 18-5/16" x 7-5/16" x 16-5/8"
Weight:	22.5 kg, (49.5 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
F801, F802	252051	6A (ST-6), Primary fuse
F803, F804	252076	3.15A-SE-EAK, Primary fuse (Worldwide model)
F702	252044	2A (ST-6), Secondary fuse

2. Replacing the lamp

This unit uses the lamp listed below.

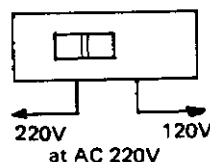
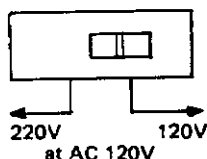
CIRCUIT NO.	PART NO.	DESCRIPTION
PL881, PL882	210191	PL14V 150mA
PL883, PL884		

3. Insulation resistance measurement (Only U.S.A. model)

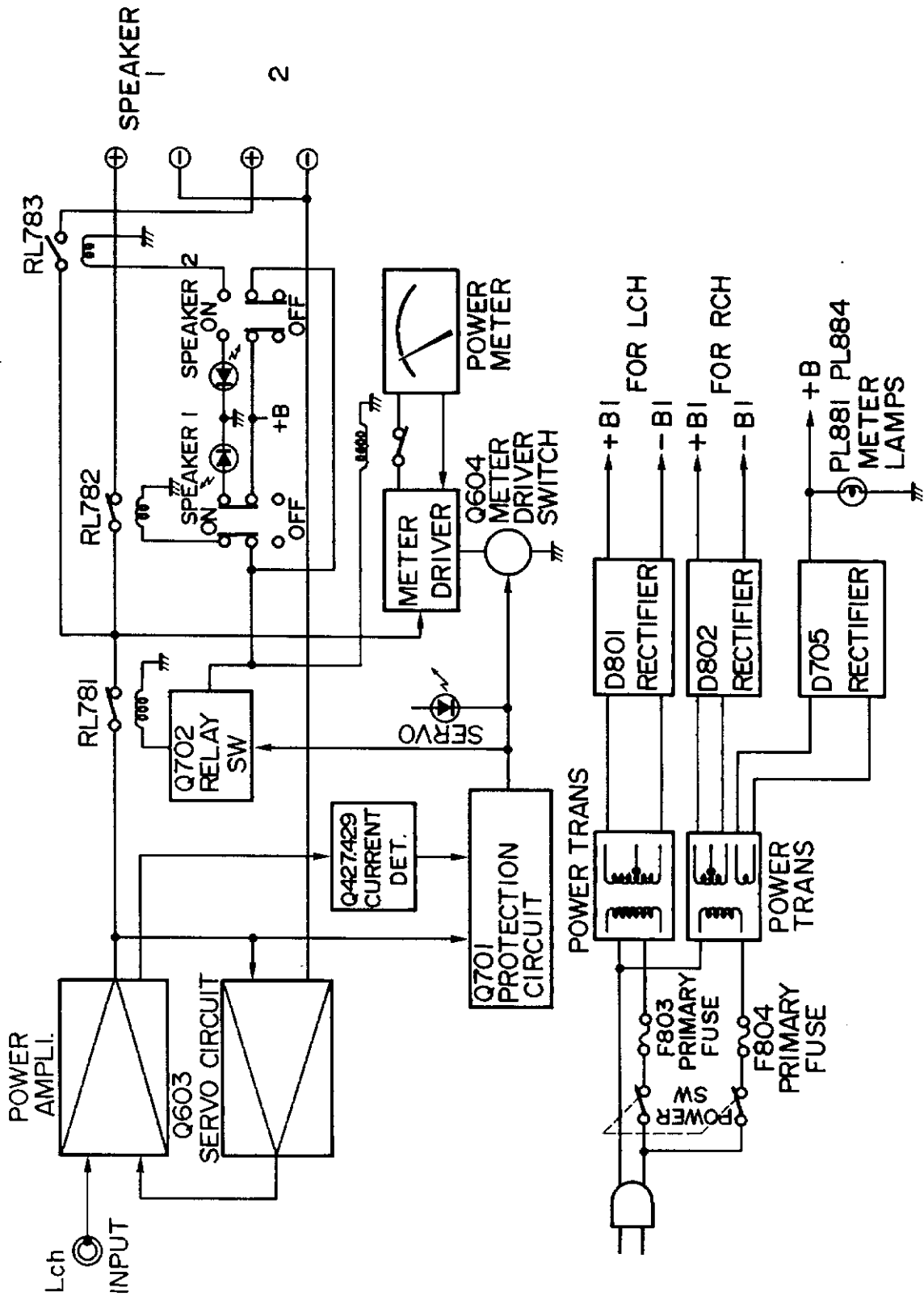
Connect the insulating-resistance tester between the plug of power supply cable and the terminal GND on the back panel.
Specifications; More than 10 M Ω at 500V.

4. Voltage selector (rear panel)

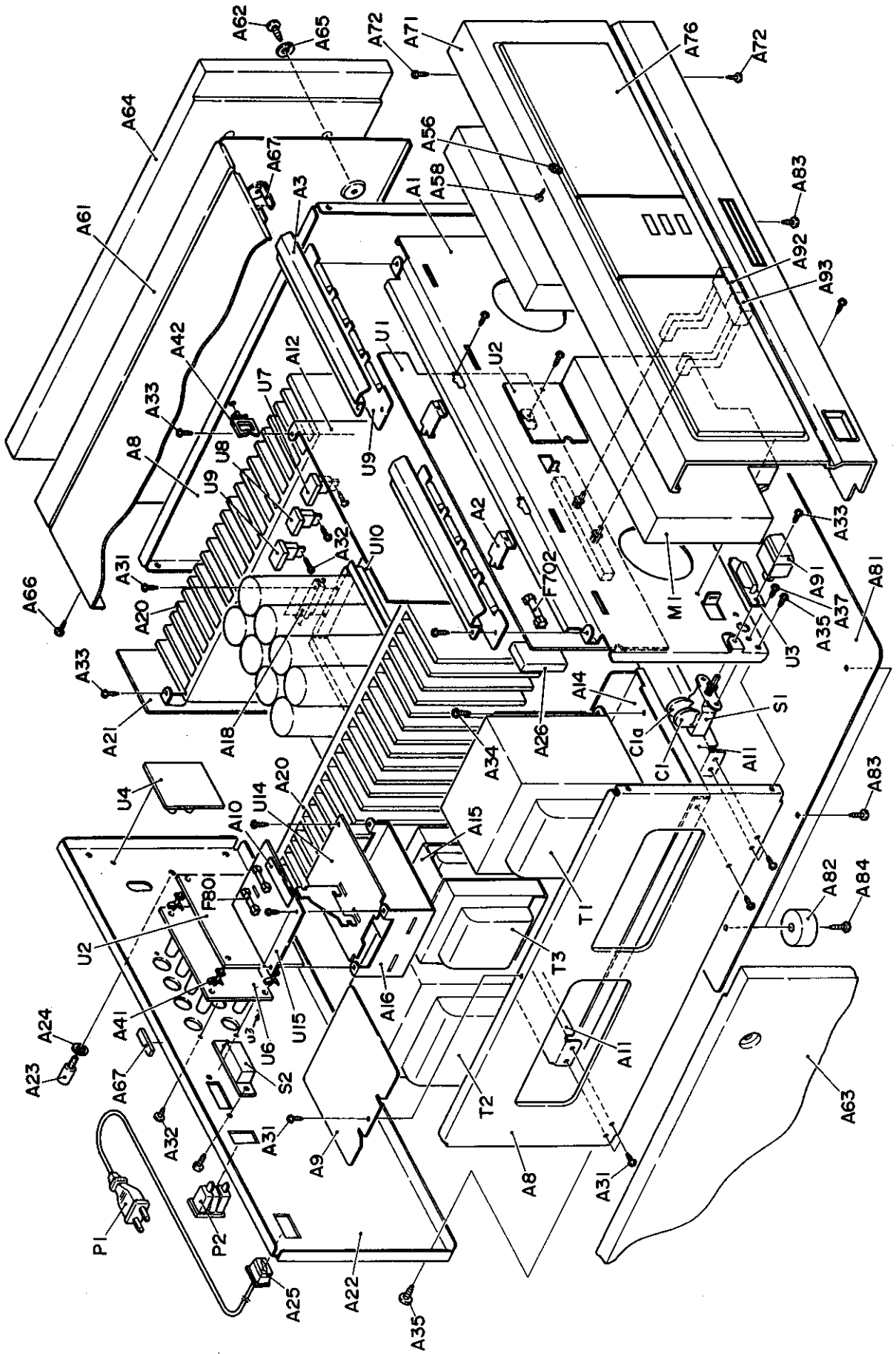
Worldwide models are equipped with a voltage selector to conform with local power supplies. Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on. Voltage is changed by sliding the groove in the switch with a screwdriver or similar instrument 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
A1	27110285B	Front bracket	U1	17788506-1	NAMA-2806-1, Main and meter amplifier pc board assy
A2	27141064	Bracket FPC	U2	17788510-1	NAOP-2810-1, Relay circuit pc board assy
A3	27141065A	Bracket, Lamp	U3	17788511-1	NAST-2811-1, Speaker terminal pc board assy
A8	27115204A	Side bracket	U4	17788512-1	NAPJ-2812-1, Input terminal pc board assy
A9	28175129	Insulating plate	U5	17788514-1	NAPL-2814-1, Meter lamp pc board assy
A10	29360626-1	Label	U6	17788516-1	NAPA-2816-1, Power amplifier pc board assy
A11	27130427	Bracket	U7	17788517-1	NACC-2817-1, Thermal detector pc board assy
A12	27150224	Shielded plate	U8	17788518-1	NADA-2818-1, Driver pc board assy
A14	27130428A	Bracket PT	U9	17788519-1	NADA-2819-1, Driver pc board assy
A15	27130429	Bracket PHT	U10	17788520-1	NARC-2820-1, Rectifier circuit pc board assy
A16	27141067	Bracket PC	U11	17788521-1	NAFU-2821-1, Fuse terminal pc board assy
A18	27141068	Bracket HE	U12	17788523-1	NADIS-2823-1, Servo indicator pc board assy
A20	27160195	Radiator	U13	17788524-1	NADIS-2824-1, Power indicator pc board assy
A21	27150215B	Shielded plate			
A22	27120905	Back panel <D>			
A23	27120909	Back panel <W>			
A24	25060041	3 x 14mm, Ground terminal			
A25	27300750	W4 x 10F(BC), Washer			
A26	28140676	Strainrelief			
A31	834430068	11 x 50 x 30mm, Cushion			
A32	834430108	3TTS+6B(BC), Tapping screw			
A33	831430080	3TTS+10B(BC), Tapping screw			
A34	830440089	3TTW+8B(BC), Tapping screw			
A35	836440089	4TTC+8C(BC), Tapping screw			
A36	830440109	4TTB+8C(BC), Tapping screw			
A37	82143006	4TTC+10C(BC), Tapping screw			
A40	27190009	3P+6FN(BC), Pan head screw			
A41	27190480	Holder			
A42	27300243	Holder			
A43	27190458	WS-2WS, Wire holder			
A45	870065	WLS-06-0, Holder			
A56	87313006	11x26x1.6,Cushion			
A58	801230	M-3B, Toothed washer			
A60	27190011	3STS+8BQ(BC), Tapping screw			
A61	28184319B	KGLS-6NS, Holder			
A62	836440303	Top cover			
A63	28185257	4STV+30FN(BC), Special screw			
A64	28185259	Side panel (L)			
A65	870086	Side panel (R)			
A66	838440089	4 x 12BS(BC), Special washer			
A67	28140020	4TTB + 8C(BC), Tapping screw			
A71	17788121	4 x 10 x 40mm, Cushion			
A71a	28191351B	Front panel ass'y			
A71b	27190451	Clear plate			
A71c	833430080	Holder, Glass			
A72	834430068	3TTP+8P(BC), Tapping screw			
		3TTS+6B(BC), Tapping screw			

28191531

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

NOTE: <D>: Only 120V model
<W>: Only Worldwide model

ADJUSTMENT PROCEDURES

1. Preparation

- (1) Leave the unit in a normal condition parallel to the work bench, maintaining a clearance of 15mm from the bottom for air circulation.
- (2) When making the adjustment, there must be no breeze blowing from the outside.

2. Zero adjustment of meter

- (1) Turn power OFF.
- (2) Make the adjustment with the zero adjustment screw on the meter to set the meter needle to zero.

Caution: Do not make the adjustment immediately after turning off the power.

3. Adjustment of idling current

- (1) Turn ON the power switch, and leave the unit as if for about 5 minutes.
- (2) Adjust the semi-fixed resistor R423 (R424) so that the voltage between the terminals V_{CT} and I_{ID} of the printed circuit board NAPA-2816 is 15mV.

4. Meter circuit offset adjustment

- (1) Turn ON the power switch, and leave the unit as is for about 15 minutes.
- (2) Adjust the semi-fixed resistor R645 (R646) of the printed circuit board NAMA-2806 so that the meter needle is at zero.

5. Meter circuit level adjustment

- (1) Input the 1kHz signal from the CR oscillator so that the amplifier output is 40V.
- (2) Adjust the semi-fixed resistor R613 (R614) of the printed circuit board NAMA-2806 so that the meter needle is at 0dB.

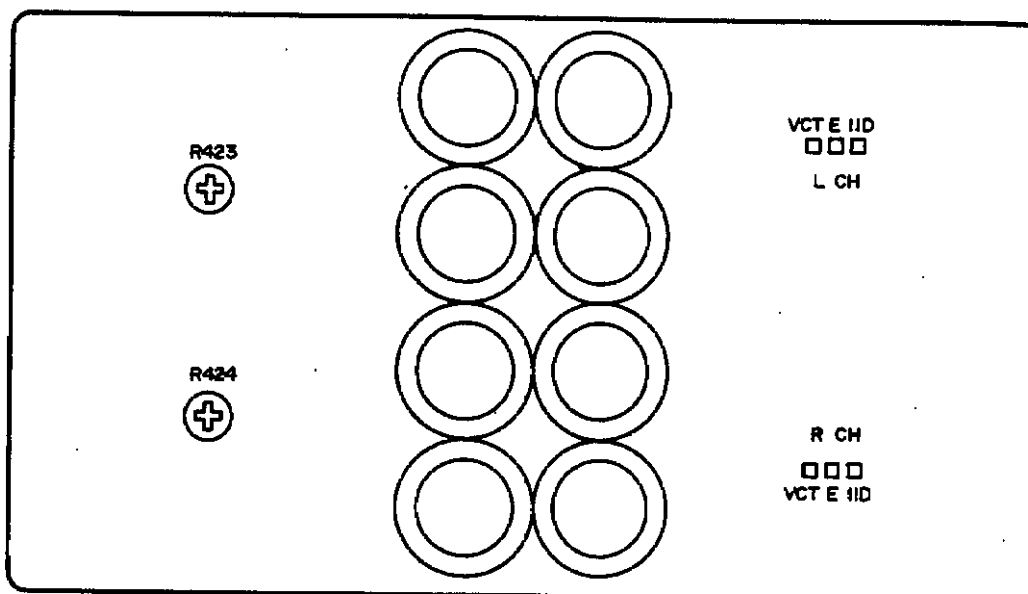
Caution: The adjustment must be made while inputting the signal to a each single channel of the L and R channels.

6. Check of direct current detection circuit of protection circuit

- (1) With no load, when 1V DC is input, the speaker relay operates, the SERVO OPERATION LED goes out.
- (2) Make the same check with -1V DC.

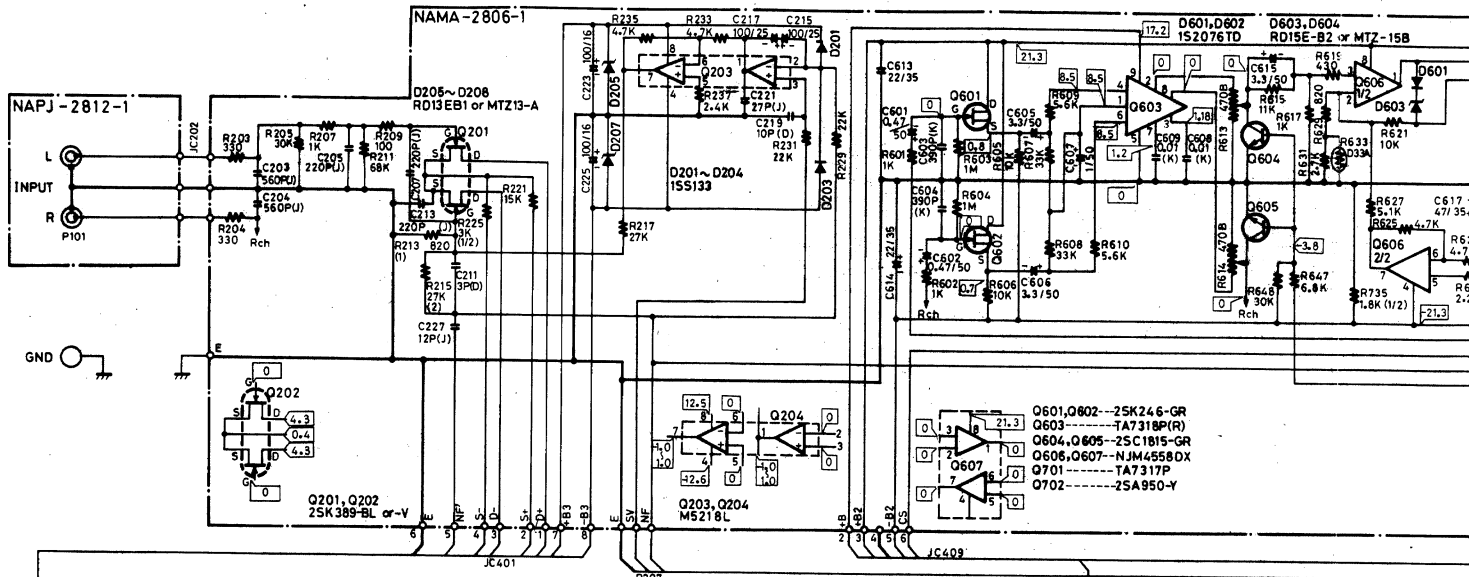
Caution: During this test, there should be absolutely no load connected and the speaker terminals must not be shorted.

Note: When the protection circuit operates due to an abnormality in the circuit, after several seconds, the protection circuit holds. Also, even after the cause of the abnormality is eliminated, the circuit is held as is. To cancel, turn the power OFF for several minutes.

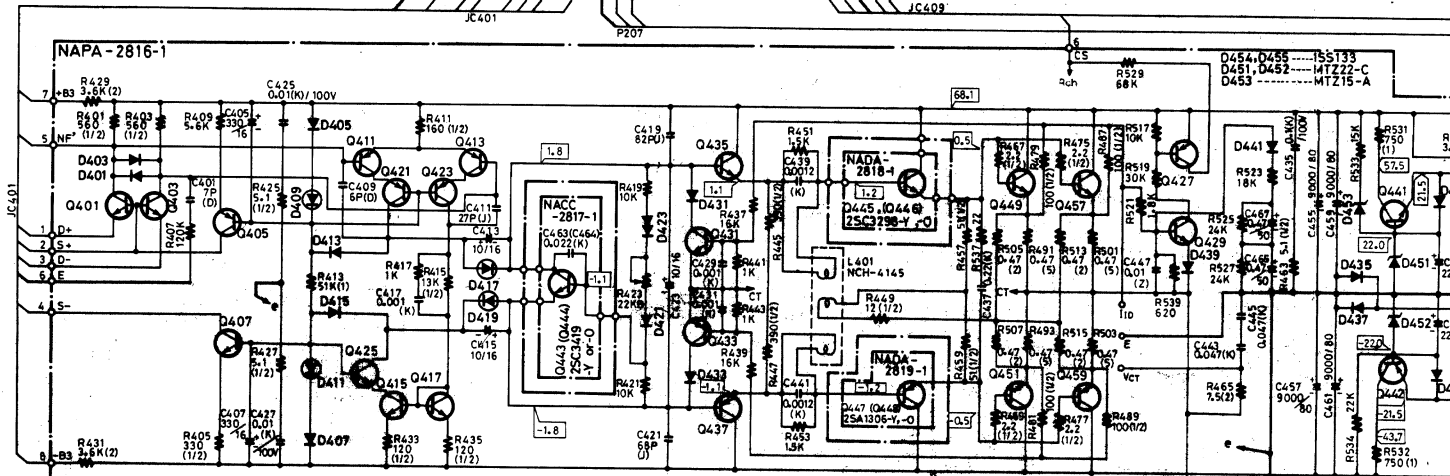


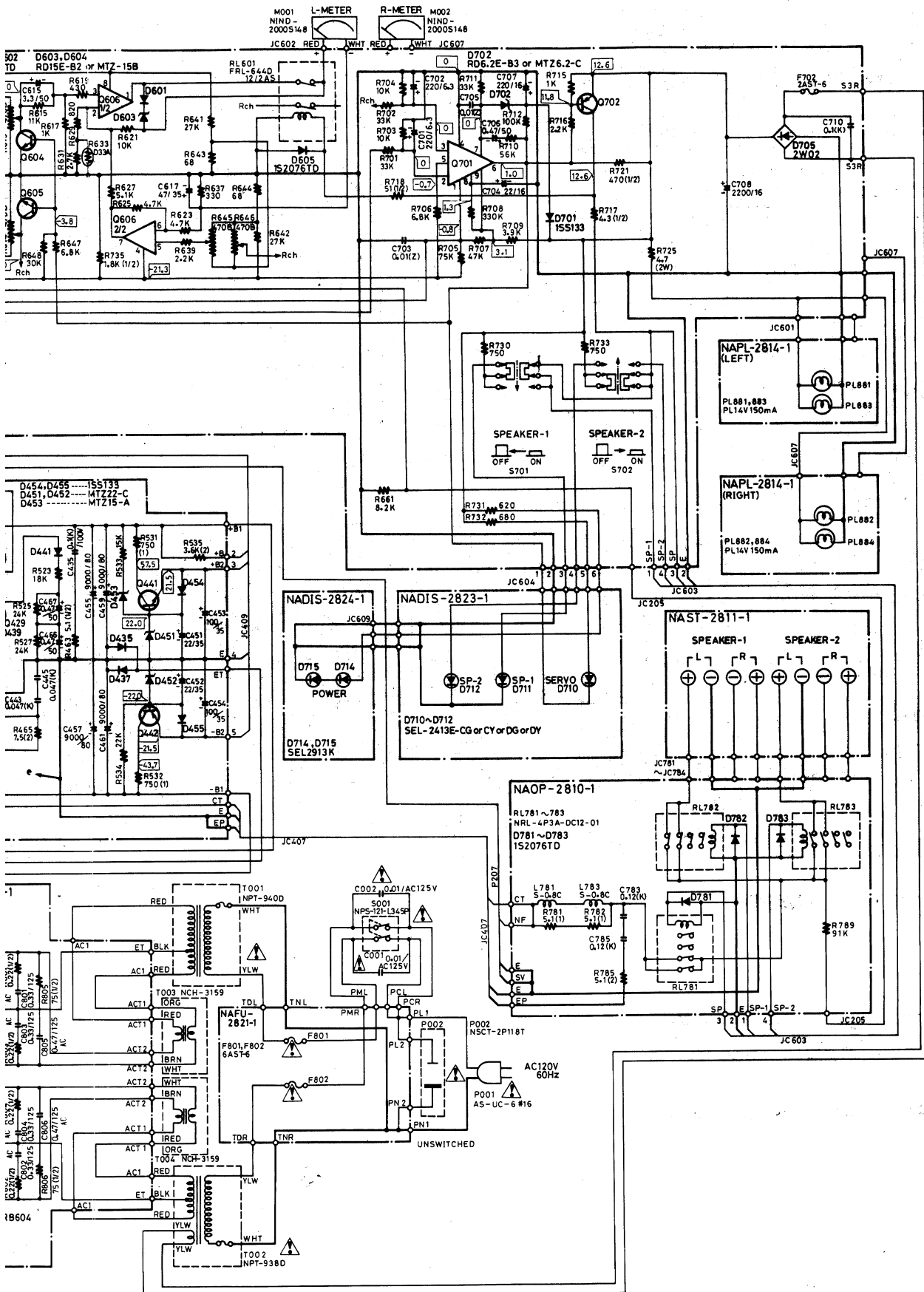
SCHEMATIC DIAGRAM (120V Model)

A



B





PRINTED CIRCUIT BOARD-PARTS LIST

MAIN AND METER AMPLIFIER PC BOARD (NAMA-2806-1)

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistors			Fuse	
Q201,Q202	2212806 or 2212807	2SK389(BL) or 2SK389(V)	F702	252044	△2A(ST-6)
Q601,Q602	2211945	2SK246(GR)		Fuse holders	
Q604,Q605	2211255	2SC1815(GR)	F702a	250113	△S-N5051
Q702	2211504	2SA950(Y)		Sockets	
	ICs		P202	2000553	NSAS-6P509
Q203,Q204	222652	M5218L	P207,P208	2000549	NSAS-8P505
Q603	222529	TA7318P(R)	P601,P607	25050282	NSCT-5P110
Q606,Q607	222502	NJM4558DX	P602,P604	25050283	NSCT-6P111
Q701	222584	TA7317P	P603	25050281	NSCT-4P109
	Diodes		P605,P606	25050285	NSCT-8P113
D201~D204	223163	1SS133	P703	2000550	NSAS-6P506.Socket ass'y
D205~D208	2239651 or 2243241	RD13E-B1 or MTZ13-A		RELAY CIRCUIT PC BOARD (NAOP-2810-1)	
D601,D602	223145	1S2076TD		CIRCUIT NO. PART NO. DESCRIPTION	
D603,D604	2239672 or 2243252	RD15E-B2 or MTZ-15B		Diodes	
D605	223145	1S2076TD	D781~D783	223145	1S2076TD
D701	223163	1SS133		Coils	
D702	2239493 or 2243163	RD6.2E-B3 or MTZ6.2-C	L781~L784	231015	S-0.8C
D705	223868	2W02		Capacitors	
	Capacitors		C783~C786	379121245	0.12μF, 50V, Film (DEW)
C203,C204	372125614	560pF, 50V, Styrene		Resistors	
C205~C208	372122214	220pF, 50V, Styrene	R781~R784	441620514	5.1 Ω, 1W, Metal oxide film
C215~C218	391251017	100 μF, 25V, Elect. (MUSE)	R785,R786	441720514	5.1 Ω, 2W, Metal oxide film
C223~C226	354741019	100 μF, 16V, Elect.		Relaies	
C601,C602	354784799	0.47μF, 50V, Elect.	RL781~RL783	25065036	NRL-4P3A-DC12-01
C605,C606	354780339	3.3 μF, 50V, Elect.		Sockets	
C607	354780109	1 μF, 50V, Elect.	P781,P782	25050273	NSCT-9P101
C608,C609	379121035	0.01μF, 50V, Film (DEW)	P784	25050268	NSCT-4P96
C613,C614	354762209	22μF, 35V, Elect.		SPEAKER TERMINAL PC BOARD (NAST-2811-1)	
C615,C616	354780339	3.3 μF, 50V, Elect.		CIRCUIT NO. PART NO. DESCRIPTION	
C617,C618	354764709	47μF, 35V, Elect.		Terminals	
C701,C702	354722219	220 μF, 6.3V, Elect.	P791,P792	25060109	NTM-4PDMN43,Speaker
C704	354742209	22μF, 16V, Elect.		INPUT TERMINAL PC BOARD (NAPJ-2812-1)	
C706	354784799	0.47μF, 50V, Elect.		CIRCUIT NO. PART NO. DESCRIPTION	
C707	354742219	220 μF, 16V, Elect.		Termical	
C708	354742229	2200μF, 16V, Elect.	P101	25045071	NPJ-2PDBL35
C710	379121045	0.1 μF, 50V, Film (DEW)		METER LAMP PC BOARD (NAPL-2814-1)	
	Resistors			CIRCUIT NO. PART NO. DESCRIPTION	
R213,R214	441628214	820 Ω,1W, Metal oxide film		Lamps	
R215,R216	441722734	27 kΩ, 2W, Metal oxide film	PL881~PL884	210:91A	PL14V150mA (Green)
R225,R226	442523024	3kΩ, 1/2W, Metal oxide film			
R613,R614	5221023	N10HR470BEM, Semi-fixed			
R633,R634	4000028	D33A, Thermistor			
R645,R646	5221023	N10HR470BEM, Semi-fixed			
R717	442520434	4.3 Ω, 1/2W, Metal oxide film			
R718	442525104	51Ω, 1/2W, Metal oxide film			
R721	442524714	470 Ω, 1/2W, Metal oxide film			
R725	441720474	4.7 Ω, 2W, Metal oxide film			
R735	442521824	1.8kΩ, 1/2W, Metal oxide film			
	Switches				
S701,S702	25035544	NPS-222 L506			
	Relay				
RL601	25065048	FRL-644D-12/2AS			

POWER AMPLIFIER PC BOARD (NAPA-2816-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistors	
Q401~Q404	2211732 or 2211733	2SC1845(F) or 2SC1845(E)
Q405,Q406	2211792 or 2211793	2SA992(F) or 2SA992(E)
Q407,Q408	2211414	2SC1627(Y)
Q411~Q414	2211782 or 2211783	2SA991(F) or 2SA991(E)
Q415~Q418	2211902 or 2211903	2SC1844(F) or 2SC1844(E)
Q421~Q424	2211359 or 2211358	2SA949-Y(ONK) or 2SA949-O(ONK)
Q425,Q426	2211639 or 2211638	2SC2229-Y(ONK) or 2SC2229-O(ONK)
Q427,Q428	2211792 or 2211793	2SA992(F) or 2SA992(E)
Q429,Q430	2212560	2SC3333
Q431,Q432	2211255	2SC1815(GR)
Q433,Q434	2211455	2SA1015(GR)
Q435,Q436	2211639 or 2211638	2SC2229-Y(ONK) or 2SC2229-O(ONK)
Q437,Q438	2211359 or 2211358	2SA949-Y(ONK) or 2SA949-O(ONK)
Q441	2200394	2SC1625(Y)
Q442	2200404	2SA815(Y)
Q449,Q450	2201653,	2SC3856(O),
Q457,Q458	2201655 or 2201654	2SC3856(P) or 2SC3856(Y)
Q451,Q452	2201663,	2SA1492(O),
Q459,Q460	2201665 or 2201664	2SA1492(P) or 2SA1492(Y)
	Diodes	
D401~D408	223163	1SS133
D409~D412	225218	LTZ-MR15, LED
D413~D416	223162	1SS82
D417~D420	225218	LTZ-MR15, LED
D421,D422	223163	1SS133
D423,D424	223168	DA210S
D431,D432	223163	1SS133
D433,D434	223145	1S2076TD
D435~D438	223863	GP-30DL
D439~D442	223162	1SS82
D451,D452	2243293	MTZ22-C
D453	2243251	MTZ15-A
D454,D455	223163	1SS133
	Coils	
L401,L402	231098A	NCH-4145
	Capacitors	
C405~C408	354723319	330 μ F, 6.3V, Elect.
C413~C416	391241007	10 μ F, 16V, Elect. (MUSE)
C417,C418	379121025	0.001 μ F, 50V, Film (DEW)
C423,C424	391241007	10 μ F, 16V, Elect. (MUSE)
C425~C428	379131035	0.01 μ F, 100V, Film (DEW)
C435,C436	379131045	0.1 μ F, 100V, Film (DEW)
C437,C438	379122245	0.22 μ F, 50V, Film (DEW)
C443~C446	379124735	0.047 μ F, 50V, Film (DEW)
C451,C452	354762209	22 μ F, 35V, Elect.
C453,C454	354761019	100 μ F, 35V, Elect.
C455~C462	3504219	9000 μ F, 80V, Elect.
C465~C468	354784799	0.47 μ F, 50V, Elect.
	Resistors	
R401~R404	442525614	560 Ω , 1/2W, Metal oxide film
R405,R406	442523314	330 Ω , 1/2W, Metal oxide film

CIRCUIT NO.	PART NO.	DESCRIPTION
R411,R412	442521614	160 Ω , 1/2W, Metal oxide film
R413,R414	441625134	51 k Ω , 1W, Metal oxide film
R415,R416	442521334	13 k Ω , 1/2W, Metal oxide film
R423,R424	5225076	N10HR22KBDM, Semi-fixed
R425~R428	442520514	5.1 Ω , 1/2W, Metal oxide film
R429~R432	441723624	3.6k Ω , 2W, Metal oxide film
R433~R436	442521214	120 Ω , 1/2W, Metal oxide film
R445~R448	442523914	390 Ω , 1/2W, Metal oxide film
R449,R450	442521204	12 Ω , 1/2W, Metal oxide film
R457~R460	442525104	51 Ω , 1/2W, Metal oxide film
R463,R464	442520514	5.1 Ω , 1/2W, Metal oxide film
R465,R466	441720754	7.5 Ω , 2W, Metal oxide film
R467~R470	442520224	2.2 Ω , 1/2W, Metal oxide film
R475~R478	442520224	2.2 Ω , 1/2W, Metal oxide film
R479~R482	442521014	100 Ω , 1/2W, Metal oxide film
R487~R490	442521014	100 Ω , 1/2W, Metal oxide film
R491~R494	4000080	0.47 Ω , 5W, Metal plate
R501~R504	4000080	0.47 Ω , 5W, Metal plate
R505~R508	4000063	0.47 Ω , 2W, Metal plate
R513~R516	4000063	0.47 Ω , 2W, Metal plate
R531,R532	441627514	750 Ω , 1W, Metal oxide film
R535	441723624	3.6k Ω , 2W, Metal oxide film
	Sockets	
JC403,JC404	25050267	NSCT-3P95
JC405,JC406,JC409	25050270	NSCT-6P98
	Bracket	
	27130430	Bracket (KE)
	Buss	
	27300826	Buss(S)
	27300827	Buss(C)

THERMAL DETECTOR PC BOARD (NACC-2817-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistor	
Q403(Q444)	2212864 or 2212863	2SC3419(Y) or 2SC3419(O)
	Capacitor	
C463(C464)	379122235	0.022 μ F, 50V, Film (DEW)

DRIVER PC BOARD (NADA-2818-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistor	
Q445(Q446)	2201644 or 2201643	2SC3298(Y) or 2SC3298(O)

DRIVER PC BOARD (NADA-2819-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistor	
Q447(Q448)	2201634 or 2201633	2SA1306(Y) or 2SA1306(O)

RECTIFIER CIRCUIT PC BOARD (NARC-2820-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
D801,D802	Diodes	
	22380008	RB604
C801~C804 C805,C806	Capacitors	
	375103345	0.33 μ F, 125V, Film (ME)
	375104745	0.47 μ F, 125V, Film (ME)
R801~R804 R805,R806	Resistors	
	442522294	0.22 Ω , 1/2W, Metal oxide film
	442527504	75 Ω , 1/2W, Metal oxide film

SERVO INDICATOR PC BOARD(NADIS-2823-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
D710~D712	LEDs	
	225137CG,	SEL-2413E-CG,
	225137CY,	SEL-2413E-CY,
	225137DG or 225137DY	SEL-2413E-DG or SEL-2413E-DY
	Holder	
	27190495	Speaker

FUSE TERMINAL PC BOARD (NAFU-2821-1/1B)

CIRCUIT NO.	PART NO.	DESCRIPTION
F801a,F802a F803a,F804a	Fuseholders	
	250113	Δ S-N5051
	25050065	Δ YSH403T <W>
P801,P802	Terminals	
	25060092	NTM-1S33
F801,F802 F803,F804	Fuses	
	252051	Δ 6A(ST-6)
	252076	Δ 3.15A-SE-EAK <W>

POWER INDICATOR PC BOARD(NADIS-2824-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
D714,D715	225142	SEL2913K,LED
	27190454	Holder

NOTE: <W>:Only Worldwide model

ONKYO CORPORATION

International Division: No 24 Mori Bldg., 23-5, 3-chome, Nishi-Shinbashi, Minato-ku, Tokyo, Japan
 Telex: 2423551 ONKYO J. Phone: 03-432-6981

ONKYO U.S.A. CORPORATION

200 Williams Drive, Ramsey, N.J. 07446 Tel. 201-825-7950