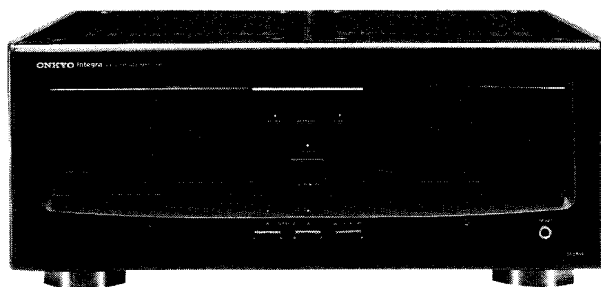


# ONKYO® SERVICE MANUAL

## Stereo Power Amplifier MODEL M-588F



Black and Silver models

UD	120V AC, 60Hz
UP	230V AC, 50Hz
UW	120V/220V AC, 50Hz/60Hz

### 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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## SPECIFICATIONS

Power Output:	200 Watts per channel, min. RMS, . . . 8 ohms, both channels driven from 20 Hz to 20 kHz, with no more than 0.005% Total harmonic Distortion
	215 Watts per channel, min. RMS, at 8 ohms, both channels driven from 1 kHz, with no more than 0.005% Total harmonic Distortion
Dynamic Power Output:	2 × 750 Watts at 2 ohms 2 × 505 Watts at 4 ohms 2 × 290 Watts at 8 ohms
Continuous Power Output:	2 × 360 Watts at 4 ohms, 1 kHz (DIN) 2 × 235 Watts at 8 ohms, 1 kHz (DIN)
Total Harmonic Distortion:	0.005% at rated power 0.005% at 1 watt output
Intermodulation Distortion:	0.005% at 70 Hz : 7 kHz = 4 : 1
Frequency Response:	BALANCED: +0, -1.5 dB at 1 Hz-100 kHz
Input Sensitivity and Impedance:	BALANCED: 1.0V 45 kohms (Hot-Cold) UNBALANCED: 1.0V 20 kohms
Damping factor:	180 at 8 ohms, 1kHz
Signal-to-Noise Ratio:	120 dB (A-Weighted, Shorted)
Power Supply:	Canadian models: AC120V, 60 Hz European models: AC230V, 50 Hz U.K & Australian models: AC240V, 50 Hz Worldwide models: AC120, 60 Hz or AC220V, 50 Hz (switchable)
Controls (Front):	POWER SPEAKERS (A, B) (ON/OFF) METER (ON/OFF)
(Rear):	INPUT SELECTOR (L, R) (BALANCED/UNBALANCED) LEVEL (UNBALANCED) (L, R)
Meter Range:	× 1 0 dB=200W at 8 ohms × 0.1 0 dB=20W at 8 ohms (Automatic Range Select)
Inputs:	BALANCED, UNBALANCED (VARIABLE)
Outputs:	HEADPHONE, SPEAKERS (A, B)
Dimensions:	455 (W) × 190 (H) × 426 (D) 17-15/16" (W) × 7-1/2" (H) × 16-3/4" (D)
(side panels included)	475 (W) × 191 (H) × 418 (D) 18-1 1/16" (W) × 7-1/2" (H) × 16-3/4" (D)
Weight:	29.6 kg (65.3 lbs.)
(side panels included)	31.0 kg (68.3 lbs.)

Specifications and features are subject to change without notice.

## 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,F902	252154	8A-TSC, Primary fuse (120V, 120V/220V models)
F903,F904	252077 or 252077CC	4A-SE-EAK or 4A-SE-EAK, Primary fuse (230V, 120V/220V, models)

### 2. Replacing the lamp

This unit uses the lamp listed below.

CIRCUIT NO.	PART NO.	DESCRIPTION
PL801~PL804	210191A	PL14V150mA

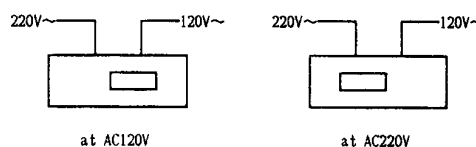
### 3. Insulation resistance measurement (Only U.S.A. model)

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&8 at 500V.

### 4. 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.



## ADJUSTMENT PROCEDURES

### 1. Preparation

- Place the unit on the work bench in the correct direction.
- Verify that it has no load no signal, and the LEVEL control is at minimum.
- Make sure that there is no air flow from outside when adjusting.
- Turn the switch from BALANCED to UNBALANCE.

### 2. Meter 0 Point Adjustment

- Turn the power OFF.
- By turning the 0 point adjustment screw on the meter, match the meter needle to 0.

NOTE: Do not make this adjustment right after turning the power OFF.

### 3. Idling Current Adjustment

Measuring Points: Check sockets P751 and P752 on PC board (NAMA-4516)

Adjustment Spots: Semi-fixed variable resistors R1508 and R1523.

- Turn the power ON.
- After conditioning it for 15 minutes or so, adjust it to  $23\text{mV} \pm 3\text{mV}$ .

### 4. Meter off-Set Adjustment

Adjustment Spots: Variable resistors R777 (R778) on PC board (NAETC-4526).

- Adjust it so that the meter needle indicates 0.

### 5. Meter Level Adjustment

Preparation : Apply 1 kHz signal to amp input.  
Bring amp output to 12.65V (22.0dBV).

Adjustment Spots: Semi-fixed Variable resistor R865 (R866) on PC board (NAETC -4526).

NOTE: Do not apply signals simultaneously to L channel and R channel.

- Adjust it so that the meter needle indicates 0dB.

### 6. Meter Range Adjustment

Preparation : Apply 1kHz signal to amp input.  
Bring amp output to 25.0dBV ( $20\text{w} \pm 3\text{dB}$ ).

Adjustment Spots: Variable resistor R867 (R868) on PC board (NAETC-4526).

NOTE: Do not apply signals simultaneously to L channel and R channel.

- Adjust it after the meter range LED is lit. (Turn variable resistor clock-wise.)

### 7. Protective Circuit Function Verification

- (1) Turn the power ON.
  - ① The meter dose not move if a signal is applied.  
The meter lamp dose not light.
  - ② The relay (RL701) on PC board (NAETC-4518) will close after approximately 5 seconds.  
The meter lamp will light.  
The meter will respond to incoming signals.

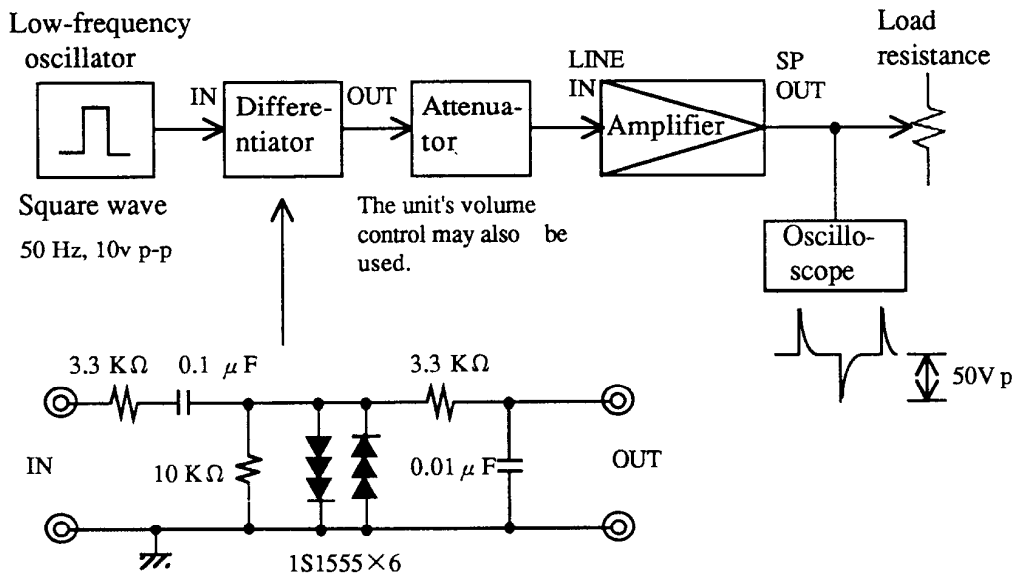
### 8. Verification of Direct Current Detection Circuit of the Protective Circuit

- (1) Apply 1v.DC to input with no load.  
The speaker relay will open.  
The lamp will turn off.
  - (2) It functions the same at 1v.DC.
- NOTE: Make sure to never connect it to any load or short-circuit load terminals during this test.

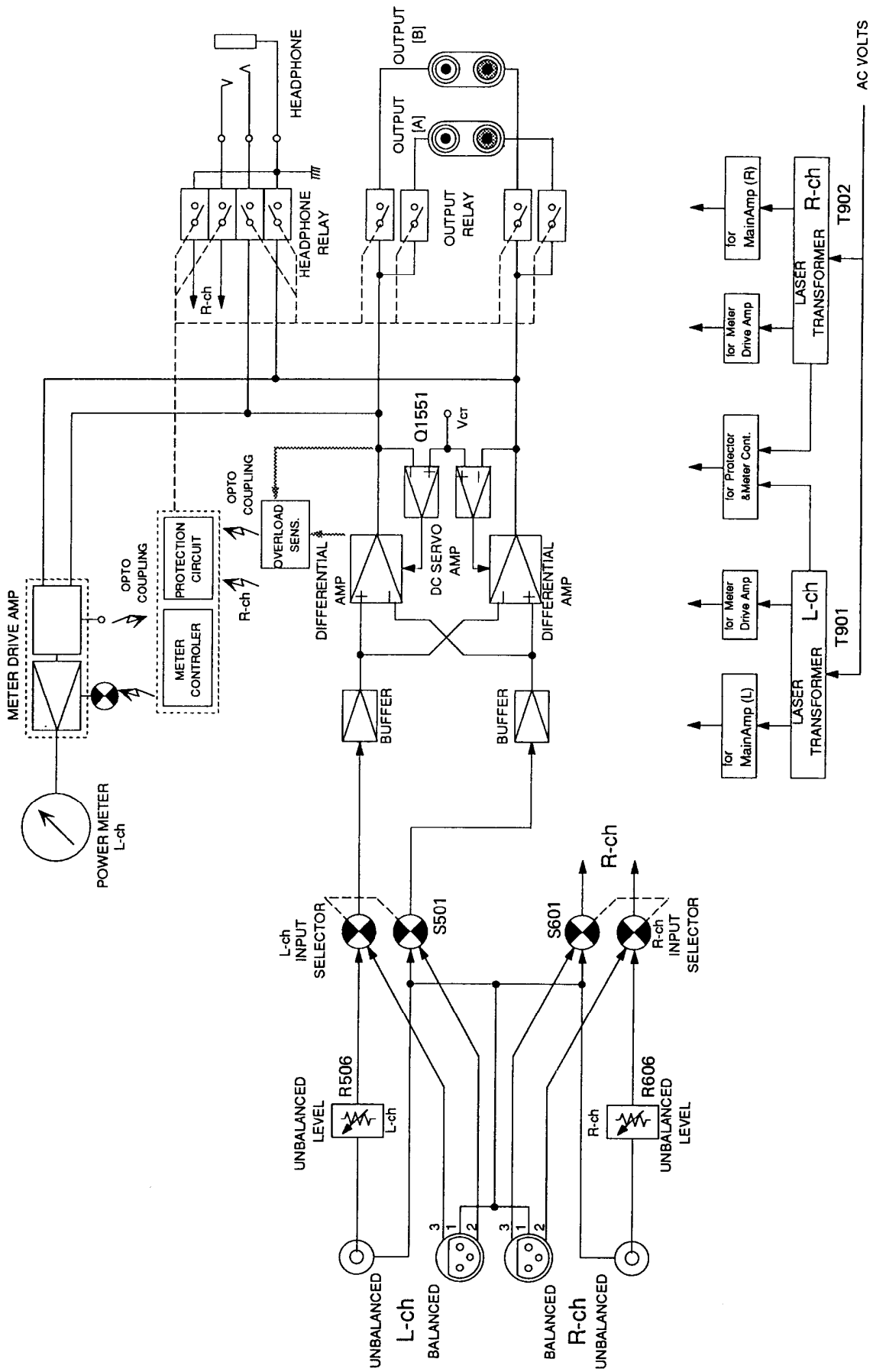
### 9. Verification of Current Detection Function of the Protective Circuit

- (1) With no load, apply a signal from the circuit as shown in the following diagram.  
Adjust the amp level so that the amp output peak will be 50V.
- (2) Verify that the speaker relay (RL701) will not open when a 2 ohm resistance is connected to the amp output terminals.
- (3) Verify that the speaker relay will repeatedly open/close for a few times then hold open when a 0.5 ohm resistance is connected to the output terminals.

NOTE: Do not continue this test for over 1 minute.

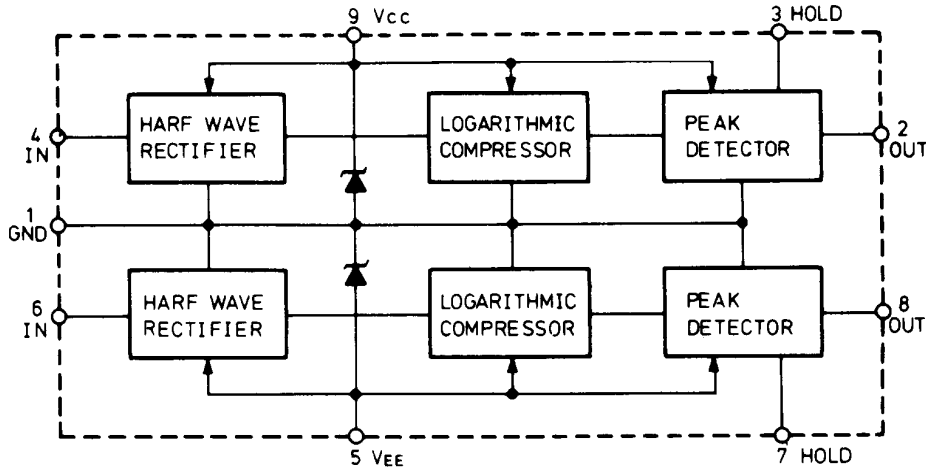


# BLOCK DIAGRAM

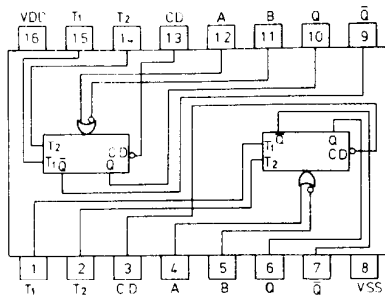


# IC BLOCK DIAGRAM

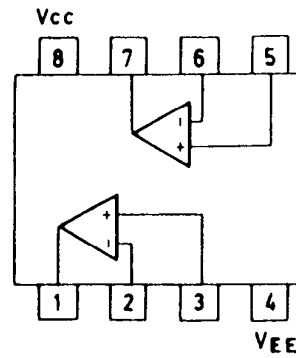
TA7318P (Meter Driver)



4538B (Dual precision retriggerable/resettable monostable multivibrator)



NJM5532DD (OP Amp)  
 NJM4558DX  
 NJM4560DX



Truth Table

Input			Output	
A	B	CD	Q	$\bar{Q}$
	H	H		
	L	H	Q	$\bar{Q}$
H		H	Q	$\bar{Q}$
L		H		
X	X	L	L	H

X: Hor L

# PRINTED CIRCUIT BOARD-PARTS LIST

## MAIN CIRCUIT PC BOARD(NAAF- 4516-1)

**CIRCUIT NO. PART NO. DESCRIPTION**

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>ICs</b>		
Q1551	222902	NJM5532DD
<b>Transistors</b>		
Q1501,Q1504	2211255	2SC1815-GR
Q1502,Q1503	2211455	2SA1015-GR
Q1505	2211733 or 2211732	2SC1845-E or 2SC1845-F
Q1506,Q1507	2211793 or 2211792	2SA992-E or 2SA992-F
Q1509,Q1512	2211455	2SA1015-GR
Q1510,Q1511	2211255	2SC1815-GR
Q1513	2211793 or 2211792	2SA992-E or 2SA992-F
Q1514,Q1515	2211733 or 2211732	2SC1845-E or 2SC1845-F
Q1516	2212864	2SC3419-Y
Q1517	2214725 or 2214726	2SC3708-S or 2SC3708-T
Q1518,Q1520	2214715 or 2214716	2SA1450-S or 2SA1450-T
Q1519	2214725 or 2214726	2SC3708-S or 2SC3708-T
Q1521,Q1523	2202625 or 2202626	2SD1724-S or 2SD1724-T
Q1522,Q1524	2202615 or 2202616	2SB1167-S or 2SB1167-T
Q1552,Q1554	2211654	2SC2235-Y
Q1553,Q1555	2211644	2SA965-Y
Q1556,Q1702	2211792 or	2SA992-F or
Q1704,Q1706	2211793	2SA992-E
Q1708,Q1709		
Q1557,Q1701	2211732 or	2SC1845-F or
Q1703,Q1705	2211733	2SC1845-E
Q1707,Q1710		

### Photo couplers

Q1711,Q1712 24120032 TLP-521-1

### Diodes

D1501~D1506	223163 or	1SS133 or
D1509,D1510	223205	1SS270A
D1507,D1508	22380029	HER102
D1511,D1512	225251	TLR112,LED
D1551~D1554		
D1555,D1556	224451503	MTZ15C,Zener

### Coils

L1601,L1602 231209 S-0.4A

### Capacitors

C1505	374722234	0.022 $\mu$ F,50V,Film(TF)
C1508,C1520	393300107	1 $\mu$ F,160V,Elect.(VX)
C1509,C1521	391654707	47 $\mu$ F,25V,Elect.(FS)
C1512,C1524	373792244	0.22 $\mu$ F,63V,Film(MKT)
C1517	374722234	0.022 $\mu$ F,50V,Film(TF)
C1525,C1528	3500149	330 $\mu$ F,160V,Elect.
C1526,C1527	393322217	220 $\mu$ F,6.3V,Elect.(VX)
C1529	393393317	330 $\mu$ F,100V,Elect.(VX)
C1530,C1531	373731034	0.01 $\mu$ F,100V,Film(MKT)
C1532~C1535	374733934	0.039 $\mu$ F,100V,Film(TF)
C1536,C1537	391654707	47 $\mu$ F,25V,Elect.(FS)

**CIRCUIT NO. PART NO. DESCRIPTION**

C1538~C1540	373552434	0.024 $\mu$ F,250V,Film(MKP)
C1551~C1554	391663307	33 $\mu$ F,35V,Elect.(FS)
C1555,C1556	393361017	100 $\mu$ F,35V,Elect.(VX)
C1557,C1558	391684717	470 $\mu$ F,50V,Elect.(FS)
C1559	391664717	470 $\mu$ F,35V,Elect.(FS)
C1560,C1561	373552434	0.024 $\mu$ F,250V,Film(MKP)
C1601~C1604	374731034	0.01 $\mu$ F,100V,Film(TF)
C1605,C1606	374731044	0.1 $\mu$ F,100V,Film(TF)
C1609,C1610	373791044	0.1 $\mu$ F,63V,Film(MKT)
C1611,C1612	373735634	0.056 $\mu$ F,100V,Film(MKT)
C1701	374734734	0.047 $\mu$ F,100V,Film(TF)
C1702,C1703	393344707	47 $\mu$ F,16V,Elect.(VX)
C1704~C1706	374734734	0.047 $\mu$ F,100V,Film(TF)

### Resistors

R1508,R1523	5210273	N06HR4.7KBEM,Semi-fixed
R1513,R1528	442528224	8.2K $\Omega$ ,1/2W,Metal oxide film
R1514,R1529	442521024	1K $\Omega$ ,1/2W,Metal oxide film
R1515,R1530	442521014	100 $\Omega$ ,1/2W,Metal oxide film
R1531,R1532	441625624	5.6K $\Omega$ ,1W,Metal oxide film
R1533,R1534	441621004	10 $\Omega$ ,1W,Metal oxide film
R1535,R1536	441623304	33 $\Omega$ ,1W,Metal oxide film
R1537	442521504	15 $\Omega$ ,1/2W,Metal oxide film
R1553,R1554	442524714	470 $\Omega$ ,1/2W,Metal oxide film
R1559,R1560	441623324	3.3K $\Omega$ ,1W,Metal oxide film
R1563	441624724	4.7K $\Omega$ ,1W,Metal oxide film
R1564,R1565	442521034	10K $\Omega$ ,1/2W,Metal oxide film
R1566	442523324	3.3K $\Omega$ ,1/2W,Metal oxide film
R1601~R1606	452530224	2.2 $\Omega$ ,1/2W,Metal
R1625~R1630		
R1613~R1624	4000134	0.15 $\Omega$ ,2W,Metal plate
R1637~R1648		
R1651	442721004	10 $\Omega$ ,2W,Metal oxide film
R1652,R1653	452530564	5.6 $\Omega$ ,1/2W,Metal
R1654,R1655	452730434	4.3 $\Omega$ ,2W,Metal
R1656,R1657	452530684	6.8 $\Omega$ ,1/2W,Metal
R1716~R1719	441626824	6.8K $\Omega$ ,1W,Metal oxide film

### Socket ass'y

P507	2009990237	NSAS-4P0342
P508	2009990239A	NSAS-16P0344
P512	2009990253	NSAS-6P0368
P510,P511	2009990254	NSAS-4P0369
P710	2009990033	NSAS-4P0063

### Plugs

P701a	25055234	NPLG-3P218
P703a	25055233	NPLG-2P217
P741a	25055168	NPLG-5P152
P751	25055366	NPLG-2P349
P752	25055366	NPLG-2P349

### Radiator

27160314 RAD-94

### Plate (Bus)

27301602 PCS3-1-T11

**POWER SUPPLY CIRCUIT PC BOARD  
(NAPS-4517-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Diodes</b>		
D901	22380044	RBV-1506
D902~D905	22380058	ERB93-02
D906,D907	22380029	HER102
<b>Capacitors</b>		
C901,C908	374501055	1 $\mu$ F,125V,Film(ME)
C902~C905	3500146	5200 $\mu$ F,100V,Elect.
C906,C907	3500150	1000 $\mu$ F,160V,Elect.
<b>Resistors</b>		
R901	442522704	27 $\Omega$ ,1/2W,Metal oxide film
R902	442521014	100 $\Omega$ ,1/2W,Metal oxide film
R903	441824724	4.7K $\Omega$ ,3W,Metal oxide film
<b>Socket ass'y</b>		
P741	2009990244A	NSAS-5P0349
<b>Plug</b>		
P744	25055168	NPLG-5P152
<b>Plates (Bus)</b>		
	27301601	
<b>Radiator</b>		
D921a	27160265	RAD-82

**SPEAKER TERMINAL CIRCUIT PC BOARD  
(NAETC-4518-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Diodes</b>		
D731AD735	223163 or 223205	1SS133 or 1SS270A
<b>Capacitors</b>		
C731,C732	374791044	0.1 $\mu$ F,63V,Film(TF)
C735	374721034	0.01 $\mu$ F,50V,Film(TF)
<b>Resistors</b>		
R741	441723914	390 $\Omega$ ,2W,Metal oxide film
R743	441621004	10 $\Omega$ ,1W,Metal oxide film
<b>Relaies</b>		
RL701,RL702	25065316	NRL-2P7A-DC12-043
RL705	25065282	NRL-2P1.25A-DC12-39
<b>Plugs</b>		
P706a	25055133	NPLG-3P117
P712a	25055135	NPLG-5P119
<b>Terminals</b>		
P731,P732	25060181A	NTM-2DMC107

**INPUT CIRCUIT PC BOARD(NAAF-4519-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Transistors</b>		
Q501,Q502	2212185 or 2212186	2SK170-GR or 2SK170-BL
Q503,Q504	2214705 or 2214706	2SJ74-GR or 2SJ74-BL
Q505,Q506	2212654	2SC3421-Y
Q507,Q508	2212644	2SA1358-Y
Q509,Q510	2211792 or 2211793	2SA992-F or 2SA992-E
Q511,Q512	2211732 or 2211733	2SC1845-F or 2SC1845-E
Q513,Q514	2201944 or 2201945 or 2201946	2SD1763-D or 2SD1763-E or 2SD1763-F
Q515,Q516	2201934 or 2201935 or 2201936	2SB1186-D or 2SB1186-E or 2SB1186-F
Q517,Q518	2211792 or 2211793	2SA992-F or 2SA992-E
Q519,Q520	2211732 or 2211733	2SC1845-F or 2SC1845-E
Q521,Q522	2213334	2SK373-Y
Q523	2211792 or 2211793	2SA992-F or 2SA992-E
Q524~Q526	2211732 or 2211733	2SC1845-F or 2SC1845-E
Q527,Q528	2211792 or 2211793	2SA992-F or 2SA992-E
<b>Diodes</b>		
D501~D508	223163 or 223205	1SS133 or 1SS270A
<b>Capacitors</b>		
C503	273631014	100pF,100V,Film(KP)
C504	373631014	100pF,100V,Film(KP)
C505,C506	373631514	150pF,100V,Film(KP)
C507,C508	374731034	0.01 $\mu$ F,100V,Film(TF)
C511,C512	391654707	47 $\mu$ F,25V,Elect.(FS)
C513,C514	393322217	220 $\mu$ F,6.3V,Elect.(VX)
C515	3500149	330 $\mu$ F,160V,Elect.
C524,C525	373631014	100pF,100V,Film(KP)
C526~C529	393322217	220 $\mu$ F,6.3V,Elect.(VX)
C534~C537	373631014	100pF,100V,Film(KP)
<b>Resistors</b>		
R506	5104312	N27DGL20KA20,Variable
R529	441625624	5.6K $\Omega$ ,1W,Metal oxide film
<b>Switch</b>		
S501	25030360	NRS-142-20S, Rotary
<b>Plugs</b>		
P505a	25055132	NPLG-2P-116
P507a	25055099	NPLG-2P-83
P508a	25055138	NPLG-8P-122
<b>Radiator</b>		
	27160220 or 27160220-1	RAD-51(B) or RAD-51(B)



**INPUT CIRCUIT PC BOARD(NAAF-4520-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Transistors</b>		
Q601,Q602	2212185 or 2212186	2SK170-GR or 2SK170-BL
Q603,Q604	2214705 or 2214706	2SJ74-GR or 2SJ74-BL
Q605,Q606	2212654	2SC3421-Y
Q607,Q608	2212644	2SA1358-Y
Q609,Q610	2211792 or 2211793	2SA992-F or 2SA992-E
Q611,Q612	2211732 or 2211733	2SC1845-F or 2SC1845-E
Q613,Q614	2201944 or 2201945 or 2201946	2SD1763-D or 2SD1763-E or 2SD1763-F
Q615,Q616	2201934 or 2201935 or 2201936	2SB1186-D or 2SB1186-E or 2SB1186-F
Q617,Q618	2211792 or 2211793	2SA992-F or 2SA992-E
Q619,Q620	2211732 or 2211733	2SC1845-F or 2SC1845-E
Q621,Q622	2213334	2SK373-Y
Q623	2211792 or 2211793	2SA992-F or 2SA992-E
Q624~Q626	2211732 or 2211733	2SC1845-F or 2SC1845-E
Q627,Q628	2211792 or 2211793	2SA999-F or 2SA992-E
<b>Diodes</b>		
D601~D608	223163 or 223205	1SS133 or 1SS270A
<b>Capacitors</b>		
C603	373631014	100pF,100V,Film(KP)
C604	373631014	100pF,100V,Film(KP)
C605,C606	373631514	150PF,100V,Film(KP)
C607,C608	374731034	0.01 $\mu$ F,100V,Film(TF)
C611,C612	391654707	47 $\mu$ F,25V,Elect.(FS)
C613,C614	393322217	220 $\mu$ F,6.3V,Elect.(VX)
C615	3500149	330 $\mu$ F,160V,Elect.
C624,C625	373631014	100pF,100V,Film(KP)
C626~C629	393322217	220 $\mu$ F,6.3V,Elect.(VX)
C634~C637	373631014	100pF,100V,Film(KP)
<b>Resistors</b>		
R606	5104312	N27DGL20KA20,Variable
R629	441625624	5.6K $\Omega$ ,1W,Metal oxide film
<b>Switch</b>		
S601	25030360	NRS-142-20S,Rotary
<b>Plugs</b>		
P605a	25055132	NPLG-2P-116
P607a	25055099	NPLG-2P-83
P608a	25055138	NPLG-8P-122
<b>Radiators</b>		
	27160220 or 27160220-1	RAD-51(B) or RAD-51(B)

**BALANCED INPUT TERMINAL (Lch) PC BOARD (NAETC-4521-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Socket</b>		
P501	25050777	NSCT-3P572
<b>Socket ass'y</b>		
P502	2009990236	NSAS-6P0341

**BALANCED INPUT TERMINAL (Rch) PC BOARD (NAETC-4522-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Socket</b>		
P601	25050777	NSCT-3P572
<b>Socket ass'y</b>		
P602	2009990236	NSAS-6P0341

**UNBALANCED INPUT TERMINAL PC BOARD (NAETC-4523-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Terminal</b>		
P503	25045161	NPJ-2PDBL58
<b>Socket ass'y</b>		
P504	2009990234	NSAS-4P0339
P604	2009990235	NSAS-4P0340

**FUSE PC BOARD (NAETC-4524-1,-1A,-1B)**

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Fuse holder</b>		
$\Delta$ F901a	25050065	YSH403T [D,W]
$\Delta$ F903a	25050065	YSH403T [P,W]
<b>Plug</b>		
$\Delta$ P905	25055167	NPLG-4P151 [D,P]
$\Delta$ P905	25055170	NPLG-7P154[W]

**FUSE PC BOARD (NAETC-4525-1,-1A,-1B)**

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Fuse holder</b>		
$\Delta$ F902a	25050065	YSH403T [D,W]
$\Delta$ F904a	25050065	YSH403T [P,W]
<b>Plug</b>		
$\Delta$ P908	25055167	NPLG-4P151 [D,P]
$\Delta$ P908	25055170	NPLG-7P154 [W]

## PROTECT AND METER CIRCUIT PC BOARD (NAETC-4526-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>ICs</b>		
Q716	222850381	4538B
Q801,Q802	222502	NJM4558DX
Q805,Q806		
Q815,Q816		
Q803,Q804	222570	NJM4560DX
Q809,Q810	222509	TA7318P
Q931	222780125	78M12HF
Q951,Q952	222780205MIT	M5F78M20L
Q953,Q954	222790205MIT	M5F79M20L
<b>Diodes</b>		
D701~D703	223163 or	1SS133 or
D705~D708	223205	1SS270A
D711,D712		
D714~D717		
D753,D754		
D801,D802		
D807,D808		
D811~D815		
D704	224450623	MTZ6.2C,Zener
D713	224450823	MTZ8.2C,Zener
D751,D752	224451203	MTZ12C,Zener
D755,D756	224451203	MTZ12C,Zener
D757~D760	225251	TLR112,LED
D803~D806	224450512	MTZ5.1B,Zener
D931~D943	22380046 or	AM01Z or
D951~D960	22380035	GP104003E
<b>Capacitors</b>		
C702	393321017	100 $\mu$ F,6.3V,Elect.(VX)
C703	393384797	0.47 $\mu$ F,50V,Elect.(VX)
C704	393343317	330 $\mu$ F,16V,Film(VX)
C706	393342207	22 $\mu$ F,16V,Elect.(VX)
C707	393344707	47 $\mu$ F,16V,Elect.(VX)
C709	393380477	4.7 $\mu$ F,50V,Elect.(VX)
C805~C818	393380337	3.3 $\mu$ F,50V,Elect.(VX)
C819~C822	393380107	1 $\mu$ F,50V,Elect.(VX)
C823,C824	374723944	0.39 $\mu$ F,50V,Film(TF)
C825~C828	393380477	4.7 $\mu$ F,50V,Elect.(VX)
C829,C830	393344707	47 $\mu$ F,16V,Elect.(VX)
C841~C845	374721035	0.01 $\mu$ F,50V,Film(TF)
C931,C932		
C933	393362207	22 $\mu$ F,35V,Elect.(VX)
C934	3500148	3300 $\mu$ F,35V,Elect.
C935	393341017	100 $\mu$ F,16V,Elect.(VX)
C936	393344717	470 $\mu$ F,16V,Elect.(VX)
C951~C956	374721035	0.01 $\mu$ F,50V,Film(TF)
C957~C960	3500147	6800 $\mu$ F,35V,Elect.
C961~C964	393361017	100 $\mu$ F,35V,Elect.(VX)
C965,C966	374721035	0.01 $\mu$ F,50V,Film(TF)
<b>Resistors</b>		
R757,R758	4000028	D-33A,Thermistor
R777,R778	5210272	N06HR470BEM,Semi-fixed
R853,R854	442522714	270 $\Omega$ ,1/2W,Metal oxide film
R865~R868	5210272	N06HR470BEM,Semi-fixed
R895~R898	441724704	47 $\Omega$ ,2W,Metal oxide film
R931~R934	452532294	0.22 $\Omega$ ,1/2W,Metal
R951~R958		
R935	442522224	2.2K $\Omega$ ,1/2W,Metal oxide film

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Switch</b>		
S801	25035644	NPS-322-L597
<b>Relaies</b>		
RL811~RL814	25065282	NRL-2P1.25A-DC12-39
RL815	25065458	NRL-2P2A-DC12-077
<b>Socket ass'y</b>		
P505	2009990258	NSAS-4P0376
P605,P703	2009990238	NSAS-4P0343
P704		
P701,P702	2009990240	NSAS-6P0345
P705	2009990242	NSAS-6P0347
P708	2000750	NSAS-20P706
P712,P713	2009990255	NSAS-10P0370
<b>Jumper sockets</b>		
JL801,JL802	25050280	NSCT3P108
<b>Plugs</b>		
P801,P802	25055233	NPLG-2P-217
P911,P912	25055175	NPLG-3P159
P913,P914	25055174	NPLG-2P158
<b>Radiator</b>		
	27160311	RAD-92

## METER LAMP (Lch) PC BOARD (NAETC-4527-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Lamps</b>		
PL801,PL802	210191A	PL14V150mA

## METER LAMP (Rch) PC BOARD (NAETC-4528-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Lamps</b>		
PL803,PL804	210191A	PL14V150mA

## HEADPHONE TERMINAL PC BOARD (NAAF-4529-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Socket ass'y</b>		
P706	2009990259	NSAS-6P0377
P707	2009990241A	NSAS-6P0346
<b>Stereo jack</b>		
P716	25045368	HLJ4307-01-3110

**LED DISPLAY PC BOARD (NADIS-4530-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Transistor</b>		
Q911	2213160	DTC124ES
<b>Diodes</b>		
D571,D572 D821,D911	225142DX2	SEL2913K-DX2.LED
<b>Jumper socket</b>		
JL571	25050267	NSCT-3P95
JL911	25050269	NSCT-5P97
<b>Holders</b>		
	27190787	(LED-1)

**LED DISPLAY PC BOARD (NADIS-4531-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Diodes</b>		
D737,D738	225142DX2	SEL2913K-DX2.LED
<b>Jumper socket</b>		
JL731	25050267	NSCT-3P95
<b>Holders</b>		
	27190787	(LED-1)

**POWER SWITCH CIRCUIT PC BOARD  
(NASW-4532-1,-1A)**


CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Capacitors</b>		
△ C911,C912	3500065A	0.01 $\mu$ F,AC400V/125V,Film(IS)
△ C913,C914	3500163	4700pF,AC250V,Film(IS)
<b>Cover (Capacitor)</b>		
C911a,C912a	27301216	SB1925A[P,W]
<b>Switch</b>		
△ S901	25035614	NPS-121-L576P
<b>Terminals</b>		
	25060092	NTM-1S33

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.**

# CHASSIS-EXPLODED VIEW PARTS LIST

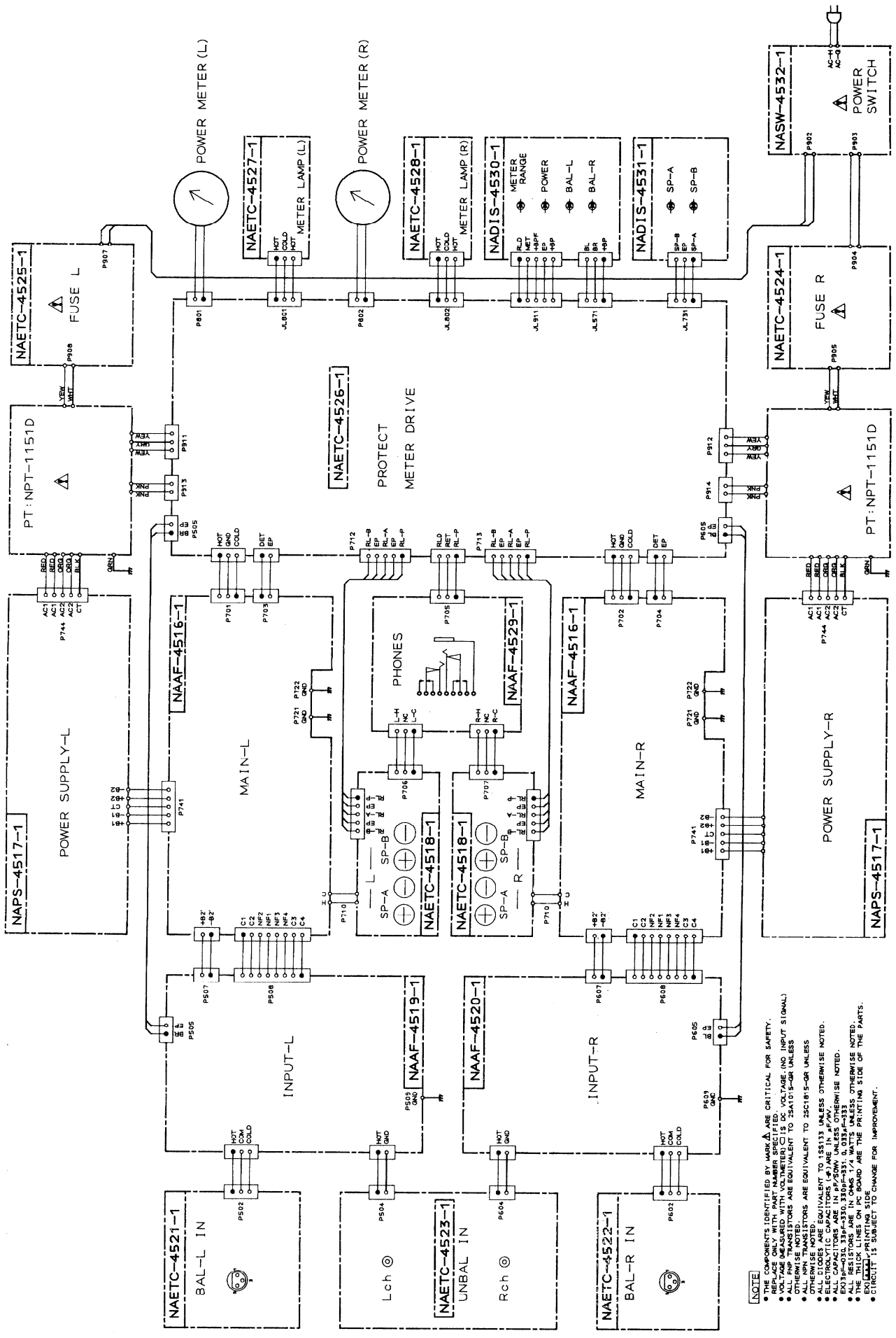
REF NO.	PART NO.	DESCRIPTION	REF NO.	PART NO.	DESCRIPTION
A001	27110697	Front bracket	A631	27170292A	Bottom board(R)
A002	27141550	Bracket(HIP)	A632	28140693	t1.5×10×185,Cushion
A003	27141543	Bracket(POW)	A633	28140835	t0.5×10×135,Cushion
A004	27273151A	Joint(PUSH)	A634	28140782	t1.5×25×170,Cushion
A005	27190814	KGLS-24RF,Holder	A635	27170293A	Bottom board(L) [W]
A006	27190266	KGLS-12RF,Holder	A636	27175251	Bottom leg
A007	27141065A	Bracket(LAMP)	A642	831430088	3T1W+8B(BC),Tap-tight screw
A008	27130706	Bracket(CR)	A643	801230	3STS+8BQ(BC),Tap-tight screw
A009	27130707	Bracket(CL)	Q1601~Q1603	2202644 or	2SC3284-Y or
A010	27115252A	Side bracket	Q1607~Q1609	2202646 or	2SC3284-P or
A011	27130691	Bracket(SH)		2202643	2SC3284-O,Transistor
A012	27130689	Bracket(BO)	Q1604~Q1606	2202634 or	2SA1303-Y or
A013	28140695	t1.5×25×240,Cushion	Q1610~Q1612	2202636 or	2SA1303-P or
A015	27301328	BFG-20,Sheet(Transistor)		2202633	2SA1303-O,Transistor
A016	27160310	Radiator	△T901,T902	2300833B	NPT-1151D,Power transformer [D]
A017	27160309	Radiator(SUB)	△T901,T902	2300834B	NPT-1151P,Power transformer [P]
A019	29110083	Tepe(Cloth-16U)	△T901,T902	2300835B	NPT-1151DG,Power transformer [W]
A020	27130692A	Bracket(PC)	△P901	253122	AS-UC-6#16,Power supply cable [D]
A021	27130687	Bracket(PT)	△P901	253131A	AS-CEE-3,Power supply cable [P, W]
A023	27190891A	Holder(Elect. capacitor)	M801,M802	243151A	NIND-2000S151,Power meter [BLK]
A024	27190892A	Holder(S)	M801,M802	243153A	NIND-2000S153,Power meter [SIL]
A025	27270352	Spacer(PT)	△F901,F902	252154	8A-TSC,Fuse [D,W]
A027	27121578B	Rear panel[D]	△F903,F904	252077 or	4A-SE-EAK or
A027	27121579B	Rear panel[P]		252077CC	4A-SE-EAK,Fuse [P,W]
A027	27121581B	Rear panel[W]	△S902	25065195	NSS-1288P,Slide switch [W]
A028	27141545	Bracket(PC)		79185	Glass tube
A029	27300750	# 2271,Bushing(CORD)[D]	U001	1A368516-1	NAAF-4516-1,Main circuit pc board ass'y
A029	28190009	# 2272,Bushing(CORD)[P,W]	U002	1A368517-1	NAPS-4517-1,Power supply circuit pc board ass'y
A030	27141570	Bracket(BUSH)	U003	1A368518-1	NAETC-4518-1,Speaker terminal circuit pc board ass'y
A031	27130688A	Bracket(COVER)	U005	1A368519-1	NAAF-4519-1,Input circuit pc board ass'y(Lch)
A033	27130708	Bracket(TRANS)	U006	1A368520-1	NAAF-4520-1,Input circuit pc board ass'y(Rch)
A035	831130088	3T1W+8B, Tap-tight screw	U007	1A368524-1	NAETC-4521-1,Balanced input terminal pc board ass'y(Lch)
A037	834430128	3T1S+12B(BC),Tap-tight screw	U008	1A368522-1	NAETC-4522-1,Balanced input terminal pc board ass'y(Rch)
A039	833440200	4T1P+20P(BC),Tap-tight screw	U009	1A368523-1	NAETC-4523-1,Unbalanced input terminal pc board ass'y
A040	801514	5SMP,SW+12FN,Special screw	U010	1A368524-1A	NAETC-4524-1,Fuse pc board ass'y (Lch) [D]
A041	801433	3SMS10WSW+14B(BC), Special screw	U010	1A368524-1B	NAETC-4524-1A,Fuse pc board ass'y (Lch) [P]
A043	830440109	4TTC+10C(BC),Tap-tight screw	U011	1A368525-1	NAETC-4524-1B,Fuse pc board ass'y (Lch) [W]
A044	87344008	M-4B(BC),Toothed washer	U011	1A368525-1A	NAETC-4525-1,Fuse pc board ass'y (Rch) [D]
A045	82142604	2.6P+4F(BC),Pan head screw	U011	1A368525-1A	NAETC-4525-1A,Fuse pc board ass'y (Rch) [P]
A047	87313006	M-3B,Toothed washer	U011	1A368525-1B	NAETC-4525-1B,Fuse pc board ass'y (Rch) [W]
A301	28184517A	Top cover(L)	U012	1A368526-1	NAETC-4526-1,Protect and Meter circuit pc board ass'y
A302	28184518A	Top cover(R)	U013	1A368527-1	NAETC-4527-1,Meter lamp pc board ass'y(Lch)
A303	27265155A	Decorative ring(COVER)	U014	1A368528-1	NAETC-4528-1,Meter lamp pc board ass'y(Rch)
A304	28194355A	Decorative bar	U015	1A368529-1	NAAF-4529-1,Headphone terminal pc board ass'y
A306	28140693	t1.5×10×185,Cushion	U016	1A368530-1	NADIS-4530-1,LED display pc board ass'y
A308	837440169	4T1T+16C(BC),Tap-tight screw	U017	1A368531-1	NADIS-4531-1,LED display pc board ass'y
A309	838440109	4T1S+10C(BC),Tap-tight screw	U018	1A368532-1	NASW-4532-1,Power switch circuit pc board ass'y [D]
A310	28141219	t1.5×20×240mm,Cushion	U018	1A368532-1A	NASW-4532-1A,Power switch circuit pc board ass'y [P,W]
A311	28140972	t1.5×25×140mm,Cushion			
A312	27270293	Spacer			
A351	28185381A	Side board(L)			
A352	28141210	Cushion			
A354	28185382A	Side board(R)			
A356	28140898	1.5×70×140,Cushion			
A357	28140807	1.5×50×50,Cushion			
A500	1A368701K	Front panel ass'y [BLK]			
(A502)	28135199	Name plate			
(A505)	27215230B	Decorative frame [BLK]			
(A506)	27180520	Spring			
(A507)	28324627	Knob(PUSH) [BLK]			
(A508)	28198742	Facet			
(A509)	28198721	Facet			
(A510)	27211428A	Front panel(F) [BLK]			
A500	1A382701K	Front panel ass'y [SIL.]			
(A505)	27215233B	Decorative frame [SIL.]			
(A507)	28324687	Knob(PUSH) [SIL.]			
(A510)	27211452A	Front panel(F) [SIL.]			
A503	28191631A	Glass board			
A511	27141554	Bracket(ME)			
A512	28324628	Knob ass'y(POW) [BLK]			
A512	28324685	Knob ass'y(POW) [SIL.]			
A514	28324649	Knob(SEI.)			

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



# SCHEMATIC DIAGRAM

MODEL M-588F (AC 120V type) PART-1



- NOTE**
- THE COMPONENTS IDENTIFIED BY MARK  $\Delta$  ARE CRITICAL FOR SAFETY.
  - VOLTAGE MEASURED WITH VOLTMETER IS DC VOLTAGE, (NO INPUT SIGNAL)
  - ALL PNP TRANSISTORS ARE EQUIVALENT TO 2SA1015-OR UNLESS OTHERWISE NOTED.
  - ALL NPN TRANSISTORS ARE EQUIVALENT TO 2SC1815-OR UNLESS OTHERWISE NOTED.
  - ALL CAPACITORS ARE IN PF/20W UNLESS OTHERWISE NOTED.
  - ELECTROLYTIC CAPACITORS (E) ARE IN  $\mu$ F/VOLTS UNLESS OTHERWISE NOTED.
  - ALL RESISTORS ARE IN OHMS  $\Omega$  UNLESS OTHERWISE NOTED.
  - THE THICK LINES ON PC BOARD ARE THE PRINTING SIDE OF THE PARTS.
  - THIN LINES ON PC BOARD ARE THE MOUNTING SIDE.
  - CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.







# PARTS LIST OF PACKING

## REF. NO. PART NO. DESCRIPTION

A 851	29052421	Carton box [BLK]	A 910	29365019A	Warranty card [N]
A 851	29052462	Carton box [SIL]	A 910	29365024	Warranty card [F]
A 852	29091570	Pad, Left		29100107	Poly-vinyl bag (Warranty) [F]
A 853	29091571	Pad, Right	A 911	29358002J	Service station list [N]
A 856	261504	Paper tape		25055018	CV-K-1, Conversion plug [W]
A 858	29110071	Damplon tape			
A 862	29100035A	1020 × 720mm, Poly-vinyl bag			
A 863	282301 or 282311	Sealing hook or Sealing hook			
	29360778	Label (FRASH) [N]			

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

## ACCESSORY BAG ASS'Y

A 901	29341743A	Instruction manual [D]
A 901	29341745A	Instruction manual [P, W]
A 902	2010238	Connection cable
A 903	2010270	NBC-150B, Balanced cable ass'y
A 904	2010271	NBC-150R, Balanced cable ass'y
A 905	29095658	Sheet (F)
A 906	29100097	350 × 250mm, Poly-vinyl bag for accessory

# SYSTEM CONNECTION

Do not plug in the power cord until all other connections have been completed and checked.

